

This version of the Dispatch Protocol has been prepared pursuant to discussions held in accordance with the Discussions Framework between Stanwell, MCPL, SCL North West Pty Ltd, MIM Co, DPS Co, EHM Co, MMG, EECL and EEQ over the period since January 2018.

North West Power System Dispatch Protocol

Version Date: 18 July 2018

CONTENTS

1. Definitions	1
2. Overview	10
2.1. The North West Power System (NWPS)	10
2.2. Participants and Disconnected Participants in the NWPS	10
2.3. Relationship between the Participants and Disconnected Participants	10
2.4. Dispatch Protocol	11
2.5. Effective Date	11
2.6. Purpose	11
2.7. Objectives	12
2.8. Obligations of Participants	12
2.9. High Level Principles	13
2.10. Review and Amendment of the Dispatch Protocol	15
2.11. System Management – The Working Committee	15
2.12. Generation Coordinator	16
2.13. Decisions of the Generation Coordinator	17
2.14. Appointment & Termination of Generation Coordinator	17
3. NWPS Requirements	17
3.1. Quality of supply	17
3.2. NWPS Model	18
3.3. Asset Maintenance	18
3.4. Threshold Changes to the NWPS	18
3.5. Removal of equipment in the NWPS	18
4. Process for admitting new Participants	19
4.1. Overview	19
4.2. Applicants	19
4.3. Intending Participants	19
4.4. Participant	20
5. Metering and Loss Allocation	21
6. Generation	21
6.1. Major Generators	21
6.2. Energy Dispatch	21
6.3. System Time Clocks	21
6.4. Energy Balance	22
6.5. Generation Capacity	22
6.6. Operation of Small Power Stations and Large Power Stations in the NWPS	22
6.7. Isolated Power Stations	22
6.8. Obligation to Keep Informed	22
6.9. Future Generation Capacity	23
7. The Supply Network	23
7.1. Network Owners	23
7.2. Auto reclosing of the Supply Network	25
7.3. Future Additions to the Supply Network	25
8. Energy dispatch	26
8.1. General	26
8.2. Notification of Energy Requirements and Demand	27
8.3. Starting of Single Large Capacity Equipment	28
8.4. Connection of Large Collection of Loads	28
8.5. Control of Large Cyclic Loads during Generating Unit Synchronising	29

9. Communication and distribution of information	29
9.1. Overview	29
9.2. Information required	30
9.3. Voice Communications	31
9.4. Key Contact Details for inclusion in Register of Representatives	32
10. NWPS System Security	32
10.1. General	32
10.2. Design	32
10.3. Maintenance	33
10.4. Operational Matters	33
10.5. NWPS Constraints	33
10.6. Operation of Small and Large Power Stations on the NWPS	34
10.7. Contingency Events	34
10.8. Major Generation Shortfall	35
10.9. Reconnecting Offtakers after a Major System Contingency Event	37
10.10. Procedure for restoration	37
10.11. Supply Network Restoration	37
10.12. Reactive Power (VAr) Control	39
11. Co-ordination of work	39
11.1. Overview	39
11.2. Across Boundary Connections and Services	39
11.3. Across Boundary Isolation and Earthing	39
11.4. Planned Outages	40
11.5. Non-Conformance	40
12. CCA	40
13. Confidentiality	41
14. Dispute Resolution	41
15. Review of Working Committee Decisions	42
16. Force Majeure	42
17. Liability	42
18. Governing Law	43
19. Assignment and novation	43

1. DEFINITIONS

1998 Dispatch Protocol means the original protocol developed to regulate certain technical and operational matters as between MCPS and its Offtakers, originally issued on 30 June 1998 and as revised from time to time (the most recent amendments being as agreed on 29 January 2013), including by variation or practice adopted or acted upon by MCPL, EECL and the Offtakers.

2014 Dispatch Protocol means the version of the protocol that was approved by the ACCC on 29 January 2015, which was effective from 1 November 2014 to the Effective Date.

2014 Effective Date means 1 November 2014.

"A" Switchyard means the 132 kV "A" Switchyard located at the MCPS, where the assets located in that switchyard are owned by MCPL.

ACCC means the Australian Competition and Consumer Commission.

AEMO means the Australian Energy Market Operator.

Annual Meeting means the first meeting of the Working Committee in a calendar year.

Applicant has the meaning given in clause 4.2.

Authorised Demand means the maximum average rate of transfer of electricity across a Point of Connection, for either import or export (as relevant), as permitted in the relevant CAA, PPA or ESA, where the rate is measured over a 30-minute period finishing on the hour or on the half-hour. For the avoidance of doubt, while 'Authorised Demand' is a CAA defined term, PPAs and ESAs include similar concepts.

AVR means **Automatic Voltage Regulator**, an automatic control system to regulate the terminal voltage of a Generating Unit or transformer or the voltage of a busbar.

"B" Switchyard means the 132 kV "B" Switchyard located adjacent to the MCPS, where the majority of the assets located in that switchyard are owned by EECL.

Black Start means the process of restoring the Generating Units at the Major Power Stations and the Supply Network, after a total de-energisation of the NWPS, to re-establish power supply to the NWPS.

Black Start Capability means the ability to turn on a Generating Unit without drawing electricity from the Supply Network.

Block means a collection of individually sheddable loads connected into an Offtaker's SLSS.

"C" Switchyard means the 220 kV "C" Switchyard located adjacent to MCPS, where the majority of the assets located on that switchyard are owned by EECL.

CAA means a connection and access agreement, which is a current or future arrangement either between a Network Owner and a Generator, or between a Network Owner and an Offtaker, under which that Network Owner makes its part of the Supply Network available for the transmission of electricity for the benefit of the Generator or Offtaker (as relevant).

Capricorn Copper Co means Capricorn Copper Pty Ltd ACN 106 396 801.

Capricorn Copper Mine means the mine of that name owned by Capricorn Copper Co, which is located approximately 120 km north of Mount Isa.

CB means a circuit breaker.

CCA means the *Competition and Consumer Act 2010* (Cth).

Century Mine means the mine owned by Century Mining Co and located approximately 238 km north-north-west of Mount Isa.

Century Mine Substation means EECL's 220 kV substation located approximately 238 km north-north-west of Mount Isa.

Century Mining Co means Century Mining Limited ACN 006 670 300.

Chairperson means the chairperson of the Working Committee appointed in accordance with the Charter.

Charter means the Working Committee Charter in Schedule 1 (Working Committee Charter).

Chumvale Substation means EECL's 220 kV substation located approximately 95 km east of Mt Isa and 10 km west of Cloncurry.

Confidential Information has the meaning given to that term in clause 13(a).

Confidentiality Deed Poll means a confidentiality deed poll that is executed by an Applicant (making that Applicant an Intending Participant) in favour of the Participants and Disconnected Participants, in the form set out in Schedule 12 (Form of Confidentiality Deed Poll) or otherwise approved by the Working Committee, to facilitate an Intending Participant deciding whether or not to connect its premises to the Supply Network and in what manner.

Contact Details means:

- (a) a list of the Representatives on the Register of Representatives;
- (b) contact personnel for each Metering Provider and MDP; and
- (c) relevant emergency and routine contact details for each of the above (including name, position, telephone numbers, e-mail, fax and postal addresses).

Contingency Event has the meaning given to that term in clause 10.7(a).

Contract Day means from 0800 hours on one day to immediately before 0800 hours on the following day.

Controllable Input Generating Unit or CIGU means a Generating Unit that can generate electricity on a predictable basis, such as, for example, by having direct control of the input energy to that Generating Unit.

CST Lady Annie Co means CST Minerals Lady Annie Pty Limited ABN 90 136 930 222.

Customer means a party to a PPA or ESA with either an Offtaker or Generator for an aggregate load of less than 10 MW, whose premises are connected (whether directly or indirectly) to any part of the Supply Network.

"D" Switchyard means the 132 kV "D" Switchyard located adjacent to MCPS, where the majority of the assets located on that switchyard are owned by DPS Co.

Dataset means the input and output data prepared for the NWPS by the Generation Coordinator using data provided by MIM Co and EECL, as referred to in Item 2(b) of Schedule 3 (System Studies and Planning).

Disconnected Participant means an entity that was a Participant in respect of premises, where those premises have been physically disconnected from the Supply Network in a manner that prevents the flow of electricity across the relevant Point of Connection and such that normal switching processes cannot restore supply. For the avoidance of doubt, a Disconnected Participant is not obliged to contribute to relevant losses.

Dispatch Protocol means this document as amended from time to time, and includes all Schedules to this document.

Dispute Notice has the meaning given in clause 14(a).

DPS means:

- (a) the Diamantina Power Station, a 242 MW gas-fired power station; and
- (b) the Leichhardt Power Station, a 60 MW open cycle gas turbine Power Station (with diesel and Black Start Capability),

owned by DPS Co and situated five km south-west of Mount Isa.

DPS Co means Diamantina Power Station Pty Limited ACN 149 762 176, owned 100% by APA Power PF Pty Ltd ACN 153 498 894.

Duchess Road Substation means EECL's 132 kV substation in the town of Mount Isa, which is connected to the "B" Switchyard.

Dugald River Mine means the mine owned by MMG Dugald River Co and located approximately 59 km north-west of Cloncurry.

EDMS means an electronic document management system maintained by the Generation Coordinator at which Participants and Disconnected Participants can access copies of the Dispatch Protocol, NWPS Model and Dataset, load shed tables, meeting minutes, technical reports and audits and other relevant documents as agreed from time to time.

EDNC means the Electricity Distribution Network Code made under the *Electricity Act 1994* (Qld).

EECL means Ergon Energy Corporation Limited ACN 087 646 062, owned 100% by Energy Queensland.

EEQ means Ergon Energy Queensland Pty Limited ACN 121 177 802, owned 100% by Energy Queensland.

Effective Date has the meaning given in clause 2.5(a).

EHM Co means Ernest Henry Mining Pty Limited ACN 008 495 574, a company whose ultimate parent company is Glencore plc.

Energy Balance Agreement means an energy balance agreement entered into by DPS Co and MCPL, dated 12 December 2014, as amended from time to time.

Energy Queensland means Energy Queensland Limited ACN 612 535 583.

Ernest Henry Mine means the mine owned by EHM Co and located approximately 36 km north-east of Cloncurry.

ESA means a current or future energy supply agreement between a Major Generator and an Offtaker or Customer for the supply of energy from a Major Generator to that Offtaker or Customer.

Extraordinary Meeting means a meeting of the Working Committee as contemplated in Item 10(d) of the Charter.

FILS means a frequency initiated load shed function, which is one of the functions performed by the LSS, and which is triggered by a frequency signal alone and does not rely on a signal from a Generating Unit CB. The FILS is also a back-up function in the event of a PLS failure to stabilise frequency above a predetermined level.

FILSB means a reactive frequency initiated Load Shed Block, which is an agreed block of load made available by an Offtaker to be shed by operation of the LSS.

FILS Event means a circumstance that results in the LSS carrying out a FILS under Item 5.1(c) of Schedule 7 (Load Shedding System (LSS)).

Force Majeure Event means:

- (a) an event or circumstance defined as a 'Force Majeure Event', 'Force Majeure' or 'Event of Force Majeure' or similar term under an existing CAA, PPA or ESA (as the case may be) that is affecting a Participant; or
- (b) an event or circumstance in connection with the NWPS that is affecting a Participant and which is not within the reasonable control of the affected Participant (acting in accordance with GEOP), including matters that are colloquially referred to as "acts of God", including earthquakes, drought, floods, washouts, landslides, bush fire, lightning, and storm.

Generating Unit means an individual generating unit at a Power Station. Generating Units are classified as either:

- (a) Controllable Input Generating Units; or
- (b) Uncontrollable Input Generating Units.

The classification of each Generating Unit is set out in Schedule 10 (Facilities status).

Generation Coordinator means the party responsible for coordinating the operation of generation on the NWPS. As at the Effective Date, DPS Co is the Generation Coordinator.

Generator means an owner or operator of a Power Station.

GEOP means Good Engineering and Operating Practice and means those practices, methods and acts, as varied from time to time, that are commonly used in the energy or resources industry in Australia (including the practices, methods and acts which are applicable having regard to the age, type and size of the relevant infrastructure (as the case may be), their design configuration and their remote geographic location) and the exercise of that degree of skill, diligence, prudence and foresight that would reasonably be expected from recognised owners and operators of power facilities to design, construct, operate, maintain and repair electricity facilities lawfully, safely, reliably, efficiently and economically.

George Fisher Mine means the lead zinc mine owned by MIM Co located approximately 22 km north of Mount Isa (which was previously known as the Hilton Mine). The George Fisher Mine includes the George Fisher North Mine and 2 x 132 kV switchyards at the George Fisher Mine and the George Fisher North Mine.

GT means a gas turbine Generating Unit.

Gunpowder Substation means EECL's 220/11 kV substation located approximately 120 km north of Mount Isa.

Hilton Substation means the Hilton substation, a 132 kV substation within MIM Co's lease adjacent to MIM Co's George Fisher Mine.

HV means high voltage, which is a voltage of more than 1,000 V.

ICPL Acid Plant means the acid production facility located adjacent to MIM Co's copper smelter in Mount Isa, which is owned and operated by Incitec Pivot Limited and which generates nominally 9 MW of electricity.

Intending Participant has the meaning given in clause 4.3.

Interconnected means, in relation to an electrical installation, where that electrical installation is physically connected to the Supply Network (or a network that is connected to the Supply Network).

Interval Meter has the meaning given to that term in the EDNC.

Island means the formation of a network with or without one or more Power Stations and/or users that, prior to some event, were connected to the rest of the Supply Network and which, after that event, may potentially operate at a different power system frequency.

Isolated Power Station means any source of electricity generation that is not Interconnected with the Supply Network and therefore is not able to operate in parallel with the Supply Network. The Isolated Power Stations current as at the Effective Date are listed in Schedule 10 (Facilities Status).

kW means a kilowatt.

Lady Annie Mine means the copper mine of that name owned and operated by CST Lady Annie Co, which is located approximately 120 km north-west of Mount Isa.

Lady Loretta Mine means the mine of that name owned by MIM Co, which is located approximately 140 km north-west of Mount Isa.

Large Power Station means any source of electricity generation (other than one operated by a Major Generator) that is able to operate in parallel with the Supply Network and that is:

- (a) if it does not contain a UIGU – 10 MW or greater in aggregate; or
- (b) if it does contain a UIGU – 3 MW or greater in aggregate,

as at the upstream Point of Connection.

In accordance with Item 14 of Schedule 2 (Technical Standards for the NWPS), Large Power Stations must not export electricity beyond the relevant upstream Point of Connection.

The Large Power Stations current as at the Effective Date are listed in Schedule 10 (Facilities Status).

Load Encroachment is where there is a mismatch between system load and available generation where that mismatch causes frequency to fall slowly.

Load Encroachment Event is a situation where there is Load Encroachment that meets the parameters for shedding of Load Shed Blocks in accordance with Item 5.1(d) of Schedule 7 (Load Shedding System (LSS)).

Load Losses are defined in Item 4.7(f) of Schedule 4 (Metering Requirements).

Load Management System or **LMS** means a load management system that is designed to permit the operation of UIGUs such that the normal frequency range set out in Item 9 of Schedule 2 (Technical Standards for the NWPS) is maintained.

Load Management System Model is a model developed to confirm that the use of UIGUs in conjunction with the LMS will result in those UIGUs and the Supply Network remaining compliant with Schedule 2 (Technical Standards for the NWPS).

Load Shed Block or **LSB** means an amount of MW that is available to be shed by the Load Shedding System, and which is determined in accordance with the relevant portion of Schedule 7 (Load Shedding System (LSS)).

Load Shed Blocks may be either:

- (a) Proactive Load Shed Blocks (PLSB) (see Item 5.1(b) of Schedule 7 (Load Shedding System (LSS))); or
- (b) Frequency Initiated Load Shed Blocks (FILSB) (see Item 5.1(c) of Schedule 7 (Load Shedding System (LSS))).

Load Shedding System or **LSS** means the MLSS and the SLSS, which, together with the FILS system as a back-up function, form an automated process of disconnection of loads from the NWPS in a controlled, safe and pre-determined manner. The LSS is further described in Schedule 7 (Load Shedding System (LSS)).

Major Generators means DPS Co and MCPL, and any future owner of a Major Power Station, and, where applicable, means either of these entities individually.

Major Power Station means any source of electricity generation that can operate in parallel with the Supply Network and that is:

- (a) owned and operated by a Major Generator;
- (b) 10 MW or greater in aggregate and can export electricity outside the premises of the operator; or
- (c) contains a UIGU and is 3 MW or greater in aggregate and can export electricity outside the premises of the operator.

The Major Power Stations current as at the Effective Date are listed in Schedule 10 (Facilities Status).

Manual Load Management means the intervention of the Generation Coordinator or a Major Generator in relation to an Offtaker's load to, for example, prevent or manage a potential Contingency Event.

MCPL means Mica Creek Pty Ltd ACN 075 522 093.

MCPS means the Mica Creek Power Station, a 218 MW power station at Mount Isa, Queensland, owned by MCPL, which is a subsidiary of Stanwell.

MDP has the meaning given to that term in the EDNC.

Metering Data has the meaning given to that term in the EDNC.

Metering Dynamics means the business unit of Energex Limited ACN 078 849 055 trading as Metering Dynamics.

Metering Installation has the meaning given to that term in the EDNC.

Metering Obligations means the obligations under the Dispatch Protocol and Chapter 5 of the EDNC.

Metering Provider has the meaning given to that term in the EDNC.

MIM Co means Mount Isa Mines Limited ACN 009 661 447, a subsidiary of Glencore plc.

Minister means a Minister of the Queensland Government.

MIT Substation means the Mount Isa Terminal, a 132 kV substation within the Mount Isa Mine.

MLSS means the Master Load Shedding System, which is an automatic system installed to disconnect load in the event of a sudden loss of generation or a drop in system frequency.

MMG Dugald River Co means MMG Dugald River Pty Ltd ACN 083 405 556.

Modbus means the serial communications protocol of that name that is promulgated by Schneider Electric.

Mount Isa Mine means the mine of that name owned by MIM Co, which is located in the town of Mount Isa.

MPS means the Mines Power Station, being the 9.8 MW, 12.5 MW and 15 MW (being G5, G1 and G4 respectively) waste heat recovery Generating Units operated by MIM Co, situated at Mount Isa and for which, for the purposes of the Dispatch Protocol, MIM Co is the responsible Participant. The MPS control room is the contact point for MIM Co's communications with the Generation Coordinator.

MVA_r means megavolt ampere reactive.

MW means a megawatt.

National Grid means the interconnected electricity transmission and distribution network that, as at the Effective Date, extends down the east coast of Queensland and New South Wales and into the ACT, Victoria, Tasmania and South Australia.

NEM12 means the interval meter reading file specification and validation set out in AEMO's "Meter Data File Format Specification NEM12 & NEM13" dated 14 May 2014, as amended from time to time.

Network Connection Point means, where a Customer does not connect directly to the Supply Network or a Major Generator's assets, the point at which the Customer's network electrically connects to the relevant Participant's network.

Network Owner means any Participant that owns any part of the Supply Network.

No Load Losses are defined in Item 4.7(f) of Schedule 4 (Metering Requirements).

North West Power System or **NWPS** means the system comprising the Supply Network and Power Stations that are connected to that Supply Network.

NWPS Model means a computer-based model used to carry out studies on the existing NWPS, or proposed changes to the NWPS, and which is generated from the Dataset.

OEM means the original equipment manufacturer for a piece of equipment.

Offtaker means any entity (including an electricity retailer) that is party to a PPA or ESA that provides for the supply of electricity from the Supply Network at greater than or equal to 10 MW at any time during the term of that PPA or ESA.

Participant has the meaning given in clause 4.4(a) and excludes a Disconnected Participant.

Pendine Street Substation means the Pendine Street substation, a 132 kV substation within MIM Co's lease adjacent to MIM Co's copper smelter in Mount Isa.

PLS means Proactive Load Shedding, which is a function of the MLSS and which is triggered by a trip signal from a Generating Unit CB.

Point of Connection means a point:

- (a) on the Supply Network which the relevant Network Owner makes available to a Major Generator, Offtaker or Customer for the electrical connection of its operations to that portion of the Supply Network and hence the greater NWPS; or

- (b) at a Major Generator's assets which that Major Generator makes available to an Offtaker or Customer for the electrical connection of its operations to the Power Station and hence the greater NWPS,

and any additional or substituted points as may be agreed in writing from time to time between the relevant entities (and notified in writing to the Generation Coordinator), and where applicable, means each point individually.

Power Factor is the cosine of the phase angle between the voltage and the current for an alternating current (AC) power circuit.

Power Purchase Agreement or PPA means a current or future power purchase agreement between a Major Generator and an Offtaker for the sale of electricity from a Power Station to that Offtaker.

Power Station means each Major Power Station, Small Power Station, Large Power Station and Isolated Power Station, and any future source of electricity generation approved for connection under the Dispatch Protocol. A Power Station includes those parts of any switchyards and substations that are located in close proximity to that Power Station, to the extent that those parts function as an operational or integrated part of that Power Station.

Proactive Load Shed Block or PLSB means a pre-armed and proactive Load Shed Block, which is an agreed block of load made available by an Offtaker to be shed by operation of the MLSS in accordance with Table 7 of Schedule 7 (Load Shedding System (LSS)) in the event of certain Generating Units tripping (being, as at the Effective Date, those at Major Power Stations). The MLSS may also be adjusted to provide for such shedding if Large Power Station Generating Units trip.

Proponent means an entity proposing to make a Threshold Change, which may be an Intending Participant, Participant or Disconnected Participant.

PSS means a power system stabiliser, a system used to assist in stabilising power networks.

PSS@e is a power system simulation software program that uses the Dataset to facilitate the computer modelling of the NWPS load and fault studies, stability studies etc. required by the Working Committee.

Ramp Rate means the increase or decrease in electricity output from a Generating Unit over time (usually expressed in MW/min).

Register of Representatives means a list of all appointed Representatives that sets out, from time to time:

- (a) the then-current Participants and Disconnected Participants; and
- (b) their respective Representatives and other key staff members.

Representative means a person selected by a Participant or Disconnected Participant to be a member of the Working Committee in accordance with the Charter.

Reserve Plant Margin means an amount of generation capacity available at a Major Generator's Power Station that is generally not electrically interconnected with the NWPS under normal operating conditions, but which is available for such Interconnection in order to either supply that Major Generator's Offtakers' loads or replace unavailable generation, if required.

Responsible Person means the person who is ultimately responsible for the provision of Metering Installations and the collection of Metering Data in respect of a Point of Connection in accordance with the Metering Obligations.

Review Notice has the meaning given in clause 15(b).

ROCOF means rate of change of frequency.

SCADA means a supervisory control and data acquisition system used to manage a process or system.

Schedule means a schedule of the Dispatch Protocol.

Secretary means the secretary to the Working Committee appointed in accordance with the Charter.

SLSS means a Slave Load Shedding System, which forms an integral part of the LSS, in conjunction with the MLSS, and which is located at each Offtaker's premises.

Small Power Station means any source of electricity generation (other than one operated by a Major Generator) that is able to operate in parallel with the Supply Network and that is:

- (a) if it does not contain a UIGU – less than 10 MW in aggregate; or
- (b) if it does contain a UIGU – less than 3 MW in aggregate.

In accordance with Item 14 of Schedule 2 (Technical Standards for the NWPS), Small Power Stations must not export electricity beyond the relevant upstream Point of Connection.

The Small Power Stations current as at the Effective Date are listed in Schedule 10 (Facilities Status).

Spinning Reserve means the total amount of spare generating capacity at a Major Generator's Power Station which is electrically Interconnected with the NWPS, but which is not currently committed to supply that Major Generator's Offtakers' demands, and which is immediately available to supply either a shortfall in generated capacity or increase in demand to a Major Generator's Offtaker.

Stanwell means Stanwell Corporation Limited ACN 078 848 674, the ultimate holding company of the owner and operator of MCPs, and includes its wholly-owned subsidiaries, MCPL and SCL North West Pty Ltd ACN 075 522 119.

STG means a steam turbine Generating Unit.

Supply Network means the electricity transmission and distribution systems located in the Mount Isa-Cloncurry area that are not connected to the National Grid (including any parts of any switchyards and substations located in close proximity to these systems to the extent that they function as an operational or integrated part of these systems), except for the electricity distribution network owned by EECL that is subject to economic regulation under Chapter 6 of the National Electricity Rules. As at the Effective Date, the main components of the Supply Network are set out in the table in clause 7.1. Further detail is included in DPS Co's drawing DPS-00-ELE-0007.

Threshold Change means a change listed in Item 1(a) of Schedule 3 (System Studies and Planning).

Threshold Demand is the minimum nameplate capacity of equipment connected or to be connected to the NWPS that requires compliance with the requirements of the Dispatch Protocol. As at the Effective Date, the Threshold Demand is set at 10 MW for CIGUs and 3 MW for UIGUs. These values may be varied from time to time by the Working Committee.

U/G means underground.

Uncontrollable Input Generating Unit or UIGU means a Generating Unit that generates electricity on a variable, unpredictable and/or intermittent basis, such as, for example, by using certain intermittently occurring natural resources (such as sunlight and wind) to generate electricity.

Unservd Energy is defined in Item 8 of Schedule 7 (Load Shedding System (LSS)) of this Dispatch Protocol.

Voice Communications means communication between Participants by means of telephone.

Working Committee means the group of Representatives nominated in accordance with the Charter, who are responsible for the administration and implementation of this Dispatch Protocol.

X41 Substation means the 132 kV substation located adjacent to the XPS.

XPS means, as at the Effective Date, an existing 41 MW natural gas fired power station operated by MIM Co, which is situated in Mount Isa and for which, for the purposes of this Dispatch Protocol, MIM Co is the responsible Participant.

2. OVERVIEW

2.1. The North West Power System (NWPS)

The NWPS is an isolated grid and is not connected to the National Grid.

The Participants in the NWPS include a number of Major Generators, Network Owners and Offtakers (some of which are also Generators).

Customers are not classed as Participants and are not directly involved in the administration of the Dispatch Protocol. Instead, the relevant Major Generator or Offtaker from whom they receive their electricity supply:

- (a) takes their interests into account; and
- (b) is responsible for ensuring that its Customers comply with this Dispatch Protocol.

Where a Network Owner does not operate its own network and instead delegates operational responsibility to a subcontractor, that Network Owner:

- (c) is responsible for ensuring that the subcontractor complies with this Dispatch Protocol; and
- (d) must liaise with other relevant Participants to establish appropriate operating protocols to facilitate the application of this Dispatch Protocol.

The Participants agree that it is necessary to coordinate certain activities of all Participants in the NWPS, using protocols to achieve a safe, reliable and stable system with formal procedures to allow for growth of the NWPS over time.

The Dispatch Protocol has been created for the mutual benefit of all of the Participants, and applies to all Participants and Disconnected Participants, except to the extent otherwise expressly stated.

2.2. Participants and Disconnected Participants in the NWPS

The Participants and Disconnected Participants as at the Effective Date are set out in Schedule 9 (List of Participants and Disconnected Participants in the NWPS). The Working Committee must update this Schedule as required from time to time.

2.3. Relationship between the Participants and Disconnected Participants

- (a) The obligations of the Participants and Disconnected Participants under this Dispatch Protocol are owed severally (and not jointly or jointly and severally).
- (b) Nothing in the Dispatch Protocol constitutes a partnership between the Participants or Disconnected Participants, and no Participant or Disconnected Participant is constituted as an agent (or other fiduciary relationship) of any other Participant or Disconnected Participant for any purpose.

2.4. Dispatch Protocol

- (a) The Dispatch Protocol is based on the 1998 Dispatch Protocol, which established, in relation to the NWPS:
 - (i) the responsible parties for planning adequate capacity to meet the Offtakers' and other Customers' energy needs;
 - (ii) the general requirements for the quality of energy supplied;
 - (iii) the procedures for dispatch of energy by certain Generators;
 - (iv) the principles and procedures applying to the Load Shedding System;
 - (v) the responsible parties and processes for ensuring that the NWPS is operated safely and securely; and
 - (vi) the general requirements for the metering of energy.
- (b) The 2014 Dispatch Protocol replaced the 1998 Dispatch Protocol and incorporated the following amendments:
 - (i) dispatch procedures to accommodate the addition of the DPS;
 - (ii) other updates to capture changes in operating practices;
 - (iii) additional definition around technical standards and procedures for NWPS operation and the connection of new load and generation and any extensions to the Supply Network, or new supply networks; and
 - (iv) the inclusion of a Charter.
- (c) This version of the Dispatch Protocol replaces the 2014 Dispatch Protocol and incorporates the following amendments:
 - (i) dispatch procedures and changes to certain technical parameters to accommodate the addition of future renewable energy Generating Units (both UIGUs and CIGUs) that may impact on NWPS operation;
 - (ii) other updates to capture changes in operating practices; and
 - (iii) other updates to reflect other changes in ownership and operation.

2.5. Effective Date

- (a) The 2014 Dispatch Protocol took effect on 1 November 2014 and remains in effect until the date specified in clause 2.5(b).
- (b) This version of the Dispatch Protocol will come into effect on 31 August 2018.

2.6. Purpose

The Dispatch Protocol:

- (a) establishes the membership and obligations of the Working Committee;
- (b) governs the conduct and interaction between the Participants in relation to the safe and reliable supply of power in the NWPS;
- (c) defines a set of protocols to be used by the Participants for the safe and reliable delivery of electricity of agreed quality throughout the NWPS;

- (d) defines a set of technical standards for the NWPS which will apply to any future development of the NWPS;
- (e) recognises the need for energy interchange and settlement agreements between the Major Generators; and
- (f) establishes a framework for Black Start and Supply Network restoration processes.

2.7. Objectives

The objectives of the Dispatch Protocol are to establish:

- (a) responsible parties for planning and operating various portions of the Supply Network;
- (b) a responsible party for co-ordinating the operation of generation in the NWPS;
- (c) parameters to ensure that adequate generation capacity is provided for stand-by plant to reliably supply Offtakers and Customers;
- (d) standards for quality of energy supply;
- (e) procedures for dispatch of electricity;
- (f) procedures to ensure system security including load shedding and load management;
- (g) responsible parties and processes to ensure that the NWPS is operated safely and securely;
- (h) appropriate metering standards;
- (i) the principles for calculating and allocating system transmission losses;
- (j) the requirements for interchange of system information between the Participants as necessary for the safe and secure operation of the NWPS;
- (k) the frequency of Working Committee meetings, and guidelines for the conduct of such meetings; and
- (l) procedures for scheduling NWPS equipment outages to minimise the impact on system reliability.

2.8. Obligations of Participants

In order to successfully implement the Dispatch Protocol, the Participants must:

- (a) comply with the requirements of the Dispatch Protocol, and, in particular, for the Participants, with the technical standards set out in Schedule 2 (Technical Standards for the NWPS);
- (b) provide suitably qualified and authorised staff members to act as the relevant Participant's Representative and to take an active role in the working of the NWPS; -
- (c) contribute equitably to the cost of the routine works programme established under Item 12 of Schedule 1 (Working Committee Charter);
- (d) recognise the importance of the MLSS to the security of the NWPS;
- (e) have the capability of shedding loads to match blocks of generation determined by, and relative to, their respective Major Generator;
- (f) accurately allocate their Load Shed Blocks to appropriate Blocks to reflect the increasing impact of the relevant Load Shed Blocks to the relevant Participant's business;

- (g) participate fully with the Working Committee in relation to the studies, reports and audits carried out to provide oversight of the NWPS;
- (h) comply with GEOP and the requirements of the Dispatch Protocol in relation to any of their assets which could impact on NWPS operation; and
- (i) comply with the Generation Coordinator's directions where required to assist in system restoration.

2.9. High Level Principles

The Dispatch Protocol is based on the following high-level principles:

- (a) the Dispatch Protocol is developed for the primary benefit of stakeholders in general and the Generators and Offtakers who are directly connected to the Supply Network, as well as to indirectly benefit Customers;
- (b) new generation capacity (including new generation using UIGUs) in, new load on, and changes to the network configuration within, the NWPS are welcome, subject to complying with relevant technical requirements necessary to address any issues that this change may have on the safety, security, reliability and quality of electricity supply and NWPS operations;
- (c) if there is a conflict between the Dispatch Protocol and the terms of a PPA, ESA or CAA (as it exists as at the Effective Date), the terms of the relevant PPA, ESA or CAA will prevail as between the parties to the relevant PPA, ESA or CAA. The terms of any PPA, ESA or CAA entered into after the Effective Date must not be inconsistent with the Dispatch Protocol;
- (d) the Working Committee is the body responsible for the management, planning, technical standards and operating rules, as detailed in the Charter;
- (e) the Working Committee will appoint a Major Generator connected to the NWPS as the Generation Coordinator - see clauses 2.12 and 2.14;
- (f) equity between stakeholders is to be applied while ensuring safety and system security, subject to technical constraints, operational restrictions and contractual obligations. This means that, subject to the technical constraints, operational restrictions will be applied fairly and equitably on all Offtakers, and only to the extent necessary to maintain the safety and security of the NWPS;
- (g) Participants will comply with GEOP;
- (h) the Generation Coordinator will be responsible for coordinating the operations of the Major Power Stations so that the following factors are controlled effectively and in accordance with Schedule 2 (Technical Standards for the NWPS):
 - (i) system frequency;
 - (ii) voltage and reactive power flows through suitable control mechanisms;
 - (iii) Major Generator loading in compliance with contractual obligations through application of appropriate governor control mechanisms; and
 - (iv) management of the Major Generators' energy balance process;
- (i) Major Generators must have sufficient generation capacity available (either at its Major Power Station or through contracted arrangements) to ensure that they can satisfy their contractual obligations to relevant Offtakers or Customers in relation to:
 - (i) contracted load (including, for the avoidance of doubt, commissioning and ramp-up load);

- (ii) Spinning Reserve;
 - (iii) Reserve Plant Margin; and
 - (iv) system frequency.
- (j) each Participant or Customer must have sufficient commercial arrangements in place to satisfy all of the system stability requirements identified in any system studies applicable to that Participant or Customer's (as relevant) Threshold Change or other relevant change;

- [REDACTED]
- (l) each asset owner is responsible for the operation and maintenance of its assets;
 - (m) each Major Generator must have (or have available by contract arrangements) Black Start Capability to be able to restore power to their respective Offtakers and Customers, to the extent required by, and otherwise in accordance with, relevant contracts between it and its Offtaker;
 - (n) each Major Generator and any Power Station that contains a UIGU must have ramp-up commissioning and decommissioning procedures to manage Contingency Events to maintain system stability;
 - (o) automatic load shedding, implemented through the LSS, will be used to protect the NWPS and to mitigate the risk of a system collapse. The MLSS, together with the SLSS, will automatically disconnect agreed Load Shed Blocks within Offtakers' facilities in a structured manner, and FILS installed at each Offtaker's premises will act to back up the MLSS;
 - (p) if a change in the NWPS creates a need for modifications to existing components of the NWPS, then the relevant costs associated with that modification will be borne by the Participant or Disconnected Participant requesting the change and making any required application for approval under the Dispatch Protocol;
 - (q) subject to clause 2.9(s), all equipment installed and commissioned before the 2014 Effective Date will be grandfathered from, and will not have to comply with, the technical requirements set out in the Dispatch Protocol (other than Items 2-10 of Schedule 2 (Technical Standards for the NWPS));
 - (r) subject to clause 2.9(s), any equipment installed and commissioned after the 2014 Effective Date must comply with the requirements of the Dispatch Protocol, including Items 2-17 of Schedule 2 (Technical Standards for the NWPS) and any other Schedules that may be applicable;
 - (s) other than where equipment is replaced using an identical spare (or a spare that has the identical electrical characteristics and load of the equipment being replaced) or the replacement equipment does not impact on contracted capacity or load, the benefit of the clause 2.9(q) grandfathering provision will cease to apply in respect of any item of equipment when the item is replaced or upgraded. Any replacement or upgraded equipment must comply with the requirements of the Dispatch Protocol (including any Schedules that may be applicable); and
 - (t) the Working Committee will permit a Threshold Change to occur as long as the Working Committee is satisfied that the proponent of that change complies with Schedule 2 (Technical Standards for the NWPS). The Working Committee has no role in respect of the connection of generation or load, or changes to networks comprising the NWPS, where that change is not listed in Item 1(a) of Schedule 3 (System Studies and Planning).

2.10. Review and Amendment of the Dispatch Protocol

- (a) Subject to clauses 2.10(b), 2.10(d) and 2.10(e), the Dispatch Protocol may be amended from time to time by a minuted resolution of the Working Committee at a Working Committee meeting.
- (b) The 2014 Dispatch Protocol was authorised by the ACCC for 5 years from 20 February 2015. A condition of the authorisation is that any changes to the Dispatch Protocol or the Schedules (except for Schedules 5 (Forecast Data Format) and 6 (Key Contact Details)) are notified to the ACCC in writing via DPS Co and MCPL within 10 days.
- (c) The 2014 Dispatch Protocol was amended in 2017 to accommodate the likely future entry of renewable electricity generators onto the NWPS. The amendments incorporated in this version of the Dispatch Protocol were notified in writing to the ACCC on 20 October 2017 and 1 December 2017. The ACCC raised no objections to these amendments.
- (d) A Schedule must not be amended so that it is inconsistent with the body of the Dispatch Protocol.
- (e) The written consent of all Participants is required to amend the following clauses:
 - (i) clause 2.9 – High Level Principles;
 - (ii) clause 2.12 – Generation Coordinator;
 - (iii) clause 3.4 – Changes to the NWPS;
 - (iv) clause 4 – Process for admitting new Participants;
 - (v) clause 6.9 – Future Generation Capacity;
 - (vi) clause 7.3 – Future Additions to the Supply Network;
 - (vii) clause 8 – Energy Dispatch; and
 - (viii) clauses 10.6, 10.7, 10.8, 10.9, 10.10 and 10.11 – System Security.
- (f) No less frequently than every three years, within 14 days after the anniversary of the 2014 Effective Date, the Generation Coordinator will ensure that the Secretary to the Working Committee circulates to all Participants a clean copy and a marked-up copy of the Dispatch Protocol containing all changes to the Dispatch Protocol since its last review.

2.11. System Management – The Working Committee

The Working Committee is the body with overall responsibility for administering the Dispatch Protocol to ensure the safe and effective management of the NWPS. The roles, responsibilities, membership and operation of the Working Committee are set out in the Charter.

The Working Committee consists of Representatives from each Participant and Disconnected Participant, who must each be authorised by their relevant Participant or Disconnected Participant to act on that entity's behalf in their dealings with the Working Committee.

EECL and EEQ may be represented on the Working Committee by the same individuals, and MIM Co and EHM Co may also be represented on the Working Committee by the same individuals.

As at the Effective Date, the relevant Representatives are listed in Schedule 6 (Key Contact Details).

2.12. Generation Coordinator

The Generation Coordinator is appointed by the Working Committee and must:

- (a) act impartially in all dealings relating to the NWPS;
- (b) ensure that any Intending Participant becomes a signatory to the Dispatch Protocol prior to the physical connection of its load, generation, distribution or transmission assets (as relevant) to the NWPS;
- (c) coordinate the process for generation dispatch between Major Generators in compliance with their respective contractual obligations, including any energy balance program;
- (d) consolidate the daily, 7th day, monthly and annual energy and demand forecasts for Offtakers, and plan and coordinate the necessary generation outputs from the Major Generators as outlined above;
- (e) oversee the implementation and operation of control facilities necessary to provide reliable and stable control of:
 - (i) voltage and reactive power at the Major Generators' Points of Connection; and
 - (ii) frequency throughout the Supply Network;
- (f) liaise with Network Owners to achieve safe, reliable and efficient management of the NWPS;
- (g) oversee the implementation and operation of both governor and AVR control systems for frequency, system time control, voltage and reactive power, which are necessary to provide stable and responsive power production into the NWPS;
- (h) implementing, managing and maintaining the MLSS, including reviewing MLSS operations and detailed reporting to the Working Committee about its operation in a Contingency Event;
- (i) reporting to the Working Committee at each regular meeting on the performance of the NWPS, Major Generators, Supply Network and Offtaker issues;
- (j) consulting with the Working Committee to review any technical procedures required for safe operation of the NWPS, for example, Black Start, load shed and restoration of supply procedures (to the extent the procedure affects the NWPS and not individual Power Stations), etc.;
- (k) coordinating the restoration of supply to the NWPS following a system disturbance or system blackout and, following any such process, providing a report to the Working Committee;
- (l) implementing and maintaining an EDMS, including ensuring that a complete set of current relevant documents can be viewed on the EDMS;
- (m) ensuring adequate Spinning Reserve is maintained to:
 - (i) enable the Generating Units to provide the forecast changes in demand as notified by the Offtakers and Major Generators; and
 - (ii) ensure system stability for normal operating conditions; and
- (n) notifying the Working Committee of:
 - (i) any approach by an Applicant (including, without limitation, the execution of any Confidentiality Deed Poll by that entity); and

- (ii) any proposal by any Participant to undertake a Threshold Change.

The Participants acknowledge that it is expected that the Generation Coordinator will use its best endeavours to perform its obligations under the Dispatch Protocol, but:

- (a) the Generation Coordinator role is a not-for-profit role undertaken voluntarily for the benefit of all Participants;
- (b) the Generation Coordinator role does not include an ability or obligation to legally enforce the Dispatch Protocol against other Participants, or require the Generation Coordinator to enforce any obligations under its agreements with other Participants; and
- (c) certain parts of the performance of the Generation Coordinator role depend on other Participants complying with their obligations under the Dispatch Protocol.

2.13. Decisions of the Generation Coordinator

- (a) The Generation Coordinator's decisions can be reviewed by the Working Committee at any time at a meeting of the Working Committee.
- (b) The Working Committee will provide Participants with opportunities to provide feedback and concerns to the Generation Coordinator.

2.14. Appointment & Termination of Generation Coordinator

- (a) The Working Committee has the authority to appoint the position of Generation Coordinator in accordance with the Charter. The appointment of the Generation Coordinator is expected to be permanent except as outlined in clause 2.14(b).
- (b) The Working Committee will review the Generation Coordinator's performance at least annually, and may seek to reallocate the position of Generation Coordinator if there are major changes to the roles of Major Generators in the NWPS, or if the Generation Coordinator is not carrying out its functions under the Dispatch Protocol to the satisfaction of the majority of the Working Committee.

3. NWPS REQUIREMENTS

3.1. Quality of supply

Specific obligations for the quality of supply of energy to individual Offtakers are currently contained in the relevant ESAs, PPAs and CAAs. Where possible, these conform to the Australian Standards, the EDNC and recognised industry codes of practice.

All ESAs, PPAs and CAAs that are executed by Participants or Intending Participants after the 2014 Effective Date must either reference or include standards that do not conflict with the standards listed in Schedule 2 (Technical Standards for the NWPS).

Generators, Network Owners and Offtakers must comply with the requirements set out in Schedule 2 (Technical Standards for the NWPS) to ensure that the quality of supply throughout the NWPS is maintained for the benefit of all Participants. Furthermore, Generators and Offtakers must ensure that their Customers also comply with the requirements set out in Schedule 2 (Technical Standards for the NWPS) for this reason.

The Working Committee will maintain Schedule 2 (Technical Standards for the NWPS) to ensure that future Threshold Changes can be made while maintaining the required quality of supply, system security and overall reliability.

3.2. NWPS Model

DPS Co established a NWPS Model and Dataset covering the NWPS when developing the DPS. The Generation Coordinator will:

- (a) manage the Dataset on behalf of all Participants.
- (b) make the Dataset (and any proposed Dataset for a Threshold Change received under Item 3(a)(iii) of Schedule 3 (System Studies and Planning) available (via the EDMS) to any Participants and Intending Participants.
- (c) maintain the Dataset in a format suitable for direct use by PSS@e (without conversion). If necessary, the Dataset can also be made available in R.A.W. format.

Participants must advise the Generation Coordinator of any relevant planned changes to assets, and give the Generation Coordinator revised data (in PSS@e format) for the Dataset, before implementing the changes. The Working Committee may direct a Participant to undertake system modelling to ensure that the relevant changes will not materially adversely effect the operation of the NWPS. Where the Participant has a UIGU, that Participant must give the Working Committee a model that demonstrates that the LMS developed for those UIGUs will not adversely impact the frequency on the NWPS.

Participants must ensure that they do not permit third parties to implement such changes to the NWPS through their assets without first requiring that third party to become a Participant in accordance with clause 4 so that they can directly comply with this provision.

3.3. Asset Maintenance

Participants must operate and maintain their assets that are connected to the NWPS in accordance with the Dispatch Protocol and GEOP.

3.4. Threshold Changes to the NWPS

- (a) Certain changes to the NWPS are defined as Threshold Changes (refer Item 1(b) of Schedule 3 (System Studies and Planning)). The Working Committee will permit a Threshold Change in accordance with the principles set out in clause 2.9(t), provided there is compliance with this clause 3.4.
- (b) Schedule 3 (System Studies and Planning) outlines the procedures to be followed by any Participant wishing to make a Threshold Change.
- (c) Without limiting clause 3.4(a), the implementation of a Threshold Change and the end result of a Threshold Change must comply with relevant technical requirements set out in Schedule 2 (Technical Standards for the NWPS), as well as clauses 6.9 (Future Generation Capacity) and 7.3 (Future Additions to the Supply Network) (where relevant).

3.5. Removal of equipment in the NWPS

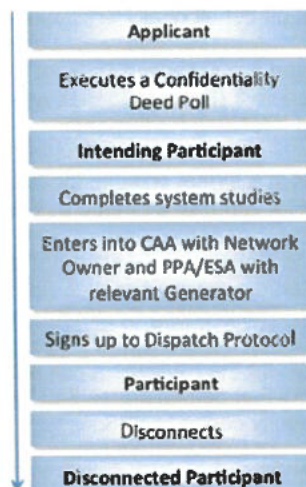
If a Participant wishes to remove a major component of its existing facilities (or a major piece of equipment), and that removal could impact on fault currents, system stability, integrity or performance of the NWPS, that Participant must:

- (a) advise the Working Committee of this in writing; and
- (b) at least six months (or other date approved by the Working Committee) before the proposal removal, give the Working Committee a set of system studies (including stability studies) completed in accordance with the technical requirements set out in Schedule 3 (System Studies and Planning).

4. PROCESS FOR ADMITTING NEW PARTICIPANTS

4.1. Overview

The Working Committee will admit an entity to be a Participant, provided that it follows the relevant process for admission set out in this clause 4, as set out in the diagram below:



4.2. Applicants

An Applicant is, in respect of premises, an entity (other than an Intending Participant, Participant or Disconnected Participant) that has expressed interest in either connecting those premises to the Supply Network, or making a Threshold Change, where that will make them a Participant in respect of those premises.

Subject to any confidentiality restrictions, if a Participant or Disconnected Participant becomes aware that an entity is an Applicant, they must as soon as reasonably practicable, advise the Working Committee of this and give the Working Committee any relevant contact details that it has.

The Secretary of the Working Committee must, within a reasonable time after receiving this advice:

- (a) if the entity is not already party to the Dispatch Protocol in respect of other premises, advise the entity of the operation of the Dispatch Protocol and that the entity will need to become a Participant under the Dispatch Protocol in order to carry out the desired activities; and
- (b) if the entity is not already party to a suitable Confidentiality Deed Poll, provide the entity with a copy of Schedule 12 (Form of Confidentiality Deed Poll).

If the Applicant wishes to enter into a Confidentiality Deed Poll, the Working Committee must negotiate with the Applicant in good faith for this purpose.

4.3. Intending Participants

An Intending Participant is an Applicant that has executed a Confidentiality Deed Poll. An Intending Participant:

- (a) may, in respect of the premises for which it is an Intending Participant:
 - (i) using the Dataset, carry out a set of system studies (including stability studies) as described in Schedule 3 (System Studies and Planning) for the connection of the facilities at those premises to demonstrate that these facilities will not adversely impact on the safety, security, reliability and quality of electricity supply and NWPS operations; and
 - (ii) provide the results of these studies to the Working Committee for approval; and
 - (iii) may become a signatory to the Dispatch Protocol;

- (b) is expected to:
 - (i) commence negotiations with the relevant Network Owner to enter into a CAA for the connection of those premises to the Supply Network; and
 - (ii) if a load, commence negotiations to enter into a PPA or ESA for the sale of electricity for use at those premises; and
- (c) must:
 - (i) be a party to a Confidentiality Deed Poll; and
 - (ii) at least monthly (or as otherwise agreed with the Working Committee), keep the Working Committee advised of its progress in respect of the above matters at intervals considered necessary by the Working Committee (having regard to the stage of progress).

4.4. Participant

Once each of the matters referred to in clause 4.3 have been completed, an Intending Participant becomes a Participant. As such, a Participant must:

- (a) be, or intend to be, connected to the Supply Network in a manner that will make it a Major Generator, Offtaker or Network Owner (as referred to in clause 4.2);
- (a) have carried out a set of system studies (as referred to in clause 4.3(a)(i));
- (b) have obtained the Working Committee's approval to the system studies (as referred to in clause 4.3(a)(ii));
- (c) be a party to:
 - (i) a Confidentiality Deed Poll (as referred to in clause 4.3(c)(i));
 - (ii) the Dispatch Protocol (as referred to in clause 4.3(a)(iii));
 - (iii) a CAA for the connection of those premises to the Supply Network (as referred to in clause 4.3(b)(i)); and
 - (iv) (if a load), a PPA or ESA for the sale of electricity for use at its premises (as referred to in clause 4.3(b)(ii)); and
- (d) where the premises are not yet connected to the Supply Network, or there is a Threshold Change, keep the Working Committee advised of progress (as referred to in clause 4.3(c)(ii));
- (e) ensure that any facilities on its premises which are connected to the Supply Network are designed and operated to comply with the Dispatch Protocol (particularly the technical requirements); and
- (f) appoint a Representative to be on the Working Committee.

5. METERING AND LOSS ALLOCATION

Participants must comply with Schedule 4 (Metering Requirements).

Subject to legally enforceable exemptions (if any), the transfer of electricity across any Points of Connection or Network Connection Points must be metered in compliance with the more stringent of Chapter 5 of the EDNC and Schedule 4 (Metering Requirements).

To determine energy losses and loss allocation in the NWPS, an MDP will allocate energy (including losses) between Participants, and provide data to Participants, in accordance with the principles set out in Schedule 4 (Metering Requirements).

As at the Effective Date, and unless changed in accordance with Schedule 4 (Metering Requirements), EECL is the appointed MDP.

6. GENERATION

6.1. Major Generators

On and from the 2014 Effective Date, there are two Major Generators selling electricity to third parties on the NWPS, being:

- (a) MCPL, which owns and operates MCPS; and
- (b) DPS Co, which owns and operates the DPS.

The MCPS and DPS are located adjacent to one another, and supply power into the Supply Network.

All other Power Stations as at the 2014 Effective Date and Effective Date are classed as Large Power Stations, Small Power Stations or Isolated Power Stations. As at the 2014 Effective Date, each of these Power Stations comprises CIGUs.

6.2. Energy Dispatch

Each Major Generator is subject to contractual obligations with their respective Offtakers and Customers, as set out in their PPAs and ESAs, and must have sufficient capacity available to meet its forecast Offtaker and Customer loads.

The Generation Coordinator must coordinate the respective levels of generation into, and load from, the Supply Network to enable the delivery of the necessary generation and to maintain system frequency, voltage and time error control for the NWPS as required by the Dispatch Protocol (including Schedule 2 (Technical Standards for the NWPS)).

Subject to the Energy Balance Agreement, each Major Generator must comply with the instructions of the Generation Coordinator given in accordance with the Dispatch Protocol.

6.3. System Time Clocks

- All Participants must have access by GPS to Australian Eastern Standard Time in Mount Isa to ensure accurate and consistent event reporting and to identify the root cause of system faults.

The Generation Coordinator:

- (a) is responsible for the management of system time control;
- (b) will monitor system time error and manage system time corrections; and
- (c) must have a system clock and a discrepancy clock to maintain system frequency in accordance with Schedule 2 (Technical Standards for the NWPS).

6.4. Energy Balance

The Generation Coordinator must use reasonable endeavours to ensure generation dispatched into the Supply Network matches actual contracted load on the Supply Network at all times. However, the Participants agree that it is not possible for energy dispatched into the Supply Network by Generators to meet contractual load obligations to instantaneously match Offtaker and Customer demand (including allocated losses) on the Supply Network.

Accordingly, the Major Generators will need to settle imbalances between energy dispatch and load between them, which is, as at the 2014 Effective Date, done through the Energy Balance Agreement. The terms of this agreement are outside the scope of the Dispatch Protocol.

6.5. Generation Capacity

The capacity of Power Stations in service at any time will be subject to the terms of the Participants' ESAs and PPAs for loads contracted and forecast by Offtakers and Customers.

Each Major Generator must provide Spinning Reserve and Reserve Plant Margin as required under the ESAs and PPAs with their respective Offtakers. Other than the obligation to ensure adequate Spinning Reserve is maintained under clause 2.12(m), there is no specific requirement for Spinning Reserve or Reserve Plant Margin under the Dispatch Protocol.

The LSS provides protection for the NWPS and mitigates against system collapse. If there is a loss of generation capacity, the LSS will automatically operate to disconnect an amount of load to match the respective deficiency in generation.

Reserve Plant Margin in the NWPS has been established as part of the bilateral negotiations between Offtakers and Generators in the establishment of their PPAs and ESAs, including a risk assessment process in considering commercial positions under the PPAs and ESAs.

6.6. Operation of Small Power Stations and Large Power Stations in the NWPS

Each Offtaker that has a source of electricity generation downstream of its Point of Connection that can be connected in parallel with the Supply Network must ensure that:

- (a) it has obtained the approval of the relevant Network Owner to the interconnection of this Power Station;
- (b) (without limiting the obligation to comply with Schedule 2 (Technical Standards for the NWPS)) the Power Stations are operated at a Power Factor consistent with the Power Factor specified in their respective ESA, PPA or CAA, and as close to the Power Factor of their load as practicable;
- (c) at all times, the necessary protection and control systems are in service, and appropriate protection settings have been applied, so as to coordinate with the relevant Network Owner's protection and control systems and settings to prevent damage to the NWPS, including the ability to disconnect the Power Station from the NWPS if the MLSS operates or there is remote CB operation so that no Island is formed.

6.7. Isolated Power Stations

A Participant must comply with the relevant requirements of Schedule 2 (Technical Standards for the NWPS) where it intends to commission Generating Units in an Isolated Power Station

6.8. Obligation to Keep Informed

All Generators shall keep the Working Committee informed on the detail and settings of protection and control systems and settings on their relevant portions of the Supply Network and on their internal assets that could impact on the Supply Network. Any proposed change in schemes or settings that could have an impact on the Dataset, or on the safety, security, reliability and quality of electricity supply and NWPS operations, must be submitted to the relevant Network Owner and Generation Coordinator for referral to the Working Committee for approval.

6.9. Future Generation Capacity

Generators and Network Owners must not add, or allow the addition of, generation capacity to the NWPS where the nameplate rating of the new generation capacity exceeds the Threshold Demand, unless the following conditions are met:

- (a) compliance with the technical requirements set out in Schedule 2 (Technical Standards for the NWPS); and
- (b) approval from the Working Committee, which approval must not be withheld if:
 - (i) the set of system studies (including stability studies) has been completed as per the technical requirements set out in Schedule 3 (System Studies and Planning); and
 - (ii) either:
 - (A) the results of the system studies show that the proposed activities will not adversely impact on the safety, reliability and quality of electricity supply in the NWPS and its Participants; or
 - (B) the studies identify an adverse impact on the safety, reliability and quality of electricity supply, and the entity addresses those issues to the satisfaction of the Working Committee (acting honestly and reasonably) before connecting.

The proposed operation of new generation in parallel with the Supply Network requires careful prior study and system design approval authorisation by the Working Committee and any relevant Network Owners. Consultation with all Offtakers will also be required to ensure that current fault ratings within the Offtakers' own systems are not exceeded because of the connection of any such generation.

7. THE SUPPLY NETWORK

7.1. Network Owners

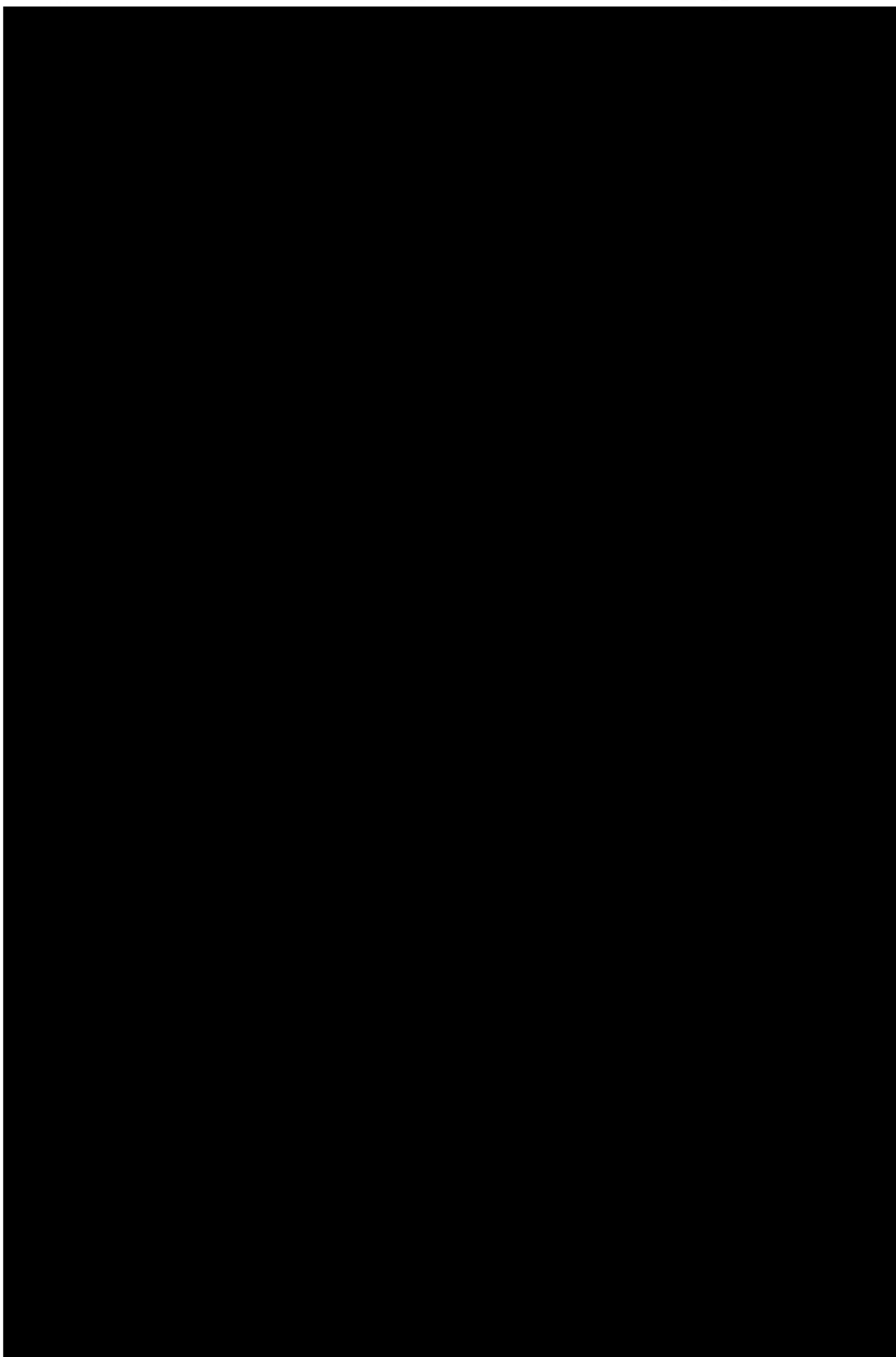
Each Network Owner is responsible for:

- (a) operating and maintaining its assets; and
- (b) controlling those elements of electricity quality under their control to ensure compliance with the electricity quality provisions set out in Schedule 2 (Technical Standards for the NWPS).

The table below sets out, as at the Effective Date, a high-level working description of the main components of the Supply Network and their function, as well as the owners of those components.

Note that:

- the precise Points of Connection are defined in the relevant CAAs; and
- the "B", "C" and "D" Switchyards are located in and adjacent to the MCPS site, and interconnect the Major Power Stations with each other and to the Supply Network so that they constitute the main supply points for the distribution of electrical energy to Offtakers and Customers.

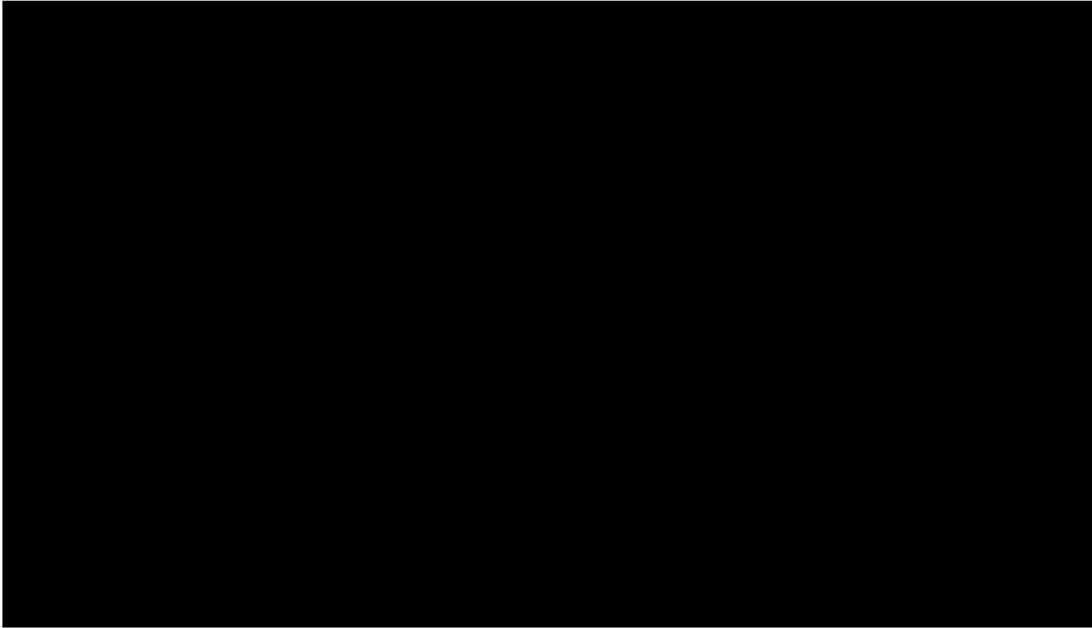




7.2. Auto reclosing of the Supply Network

Automatic reclosing of line feeder switchgear after interruption due to faults on the Supply Network is implemented as set out in the table below.

Where this is present, the reclosing will be attempted without first determining whether any load or generation is connected. Offtakers must ensure that their installations (and any relevant Small and Large Power Stations) have the necessary interlocks to prevent damage to equipment when automatically re-energised in this manner, or to automatically disconnect such equipment before such re-energisation can occur.



7.3. Future Additions to the Supply Network

Network Owners must not undertake (or allow) any extension to the Supply Network or major changes of load to the NWPS where the value of the load change exceeds the Threshold Demand, unless the following conditions are met:

- (a) compliance with the technical requirements set out in Schedule 2 (Technical Standards for the NWPS); and
- (b) approval from the Working Committee, which approval must not be withheld if:
 - (i) the set of system studies (including stability studies) has been completed as per the technical requirements set out in Schedule 3 (System Studies and Planning); and
 - (ii) either:
 - (A) the results of the system studies show that the proposed activities will not adversely impact on the safety, reliability and quality of electricity supply in the NWPS and its Participants; or

- (B) the studies identify an adverse impact on the safety, reliability and quality of electricity supply, and the entity addresses those issues to the satisfaction of the Working Committee (acting honestly and reasonably) before connecting.

The proposed connection of any dynamic devices that operate using a phase-locked loop to the Supply Network requires careful prior study and system design approval authorisation by the Working Committee and any relevant Network Owners. Consultation with all Offtakers will also be required to ensure that current fault ratings within the Offtakers' own systems are not exceeded because of the connection of any such dynamic devices.

8. ENERGY DISPATCH

8.1. General

Normal operating conditions on the Supply Network are when:

- (a) the system frequency and voltages are within the normal ranges set out in Schedule 2 (Technical Standards for the NWPS); and
- (b) the available generation and network capacities are adequate to meet the actual and forecast needs.

Offtakers' loads are added and removed in accordance with normal operational requirements at each of the Offtakers' locations.

The operating procedures are intended to prevent excursions in frequency and voltages outside the abovementioned normal ranges. This will avoid system disturbances that might eventually result in widespread large load shedding by the LSS, and consequent severe disruption to Offtakers' operations and to the Power Stations.

However, actions by Generators, Network Owners or Offtakers can cause relatively large electrical disturbances on the NWPS that will result in it experiencing abnormal operating conditions. This can cause system instability unless portions of the Supply Network are quickly isolated or loads quickly curtailed.

To prevent this from occurring, key elements in procedures used to control the connection of large loads are:

- (a) short and medium term forecasting for loading conditions at Offtakers' operations;
- (b) detailed demand and energy notification requirements on an annual, monthly, 7 day ahead and daily basis as set out in the ESAs and PPAs and as required by the Dispatch Protocol;
- (c) communication by data signalling and telephone between the Generation Coordinator, an Offtaker, and the Major Generator responsible for supplying the Offtaker's load, before the connection and intentional disconnection of large loads (other than those already advised to the Generation Coordinator and Major Generator in load forecasts). Similarly, any significant event affecting power generation, transmission or load at any Participant's operations (including the Major Power Stations), must be quickly communicated between the Generation Coordinator and affected Offtaker(s);
- (d) real time data acquisition by the Generation Coordinator and relevant Network Owners of the status and loading at each Offtaker's Point of Connection. This will inform the Generation Coordinator as soon as there is a significant change in Supply Network equipment status and loading by Offtakers; and
- (e) regular review and amendment of operating procedures in light of actual experience (which can be particularly important during the initial period of a new Generator's or Offtaker's operations).

8.2. Notification of Energy Requirements and Demand

Energy and demand forecasting allows the Generation Coordinator and the Major Generators to plan to meet their Offtakers' requirements. Each Offtaker must, from the 2014 Effective Date, give the Generation Coordinator and its respective Major Generator its energy forecast (in Microsoft Excel format) on an annual, monthly and daily basis, as follows:

(a) Annual Requirements

Energy (MWh) and maximum half hourly MW demand for each month in the following year.

Unless otherwise agreed, annual forecasts for the following calendar year must be provided to the Generation Coordinator prior to the end of August.

(b) Monthly Requirements

Energy (MWh) and maximum half hourly MW demand for each day in the following calendar month.

Unless otherwise agreed, monthly forecasts for the following month must be provided to the Generation Coordinator on the 15th day of each month.

(c) Daily Requirements

Unless otherwise agreed, before 2100 hours each day, each Offtaker must give the Generation Coordinator its daily requested energy forecast (MWh) and maximum half hourly MW demand forecast for the second and seventh following Contract Days.

Participants that own or operate Small or Large Power Stations must provide "gross" (total energy demand for the day) and "net" (difference between the gross energy demand and the energy to be generated using its Small or Large Power Stations) energy requirements.

(d) Future Year Requirements

Unless otherwise agreed, Offtakers must use their best endeavours to provide the annual Energy (MWh) and maximum half hourly MW demand) for the following four years at each Annual Meeting.

(e) Changes to Notified Energy Requirement

Requirements notified prior to 0600 for the following Contract Day may be amended in writing prior to 0600 on the Contract Day. After 0600 on the Contract Day, the Offtaker's written forecast cannot be changed.

In the event of unplanned outages, the Offtaker must, as soon as possible, verbally communicate changes to the forecast with the Generation Coordinator and Major Generator via telephone in the Participant's control room.

(f) Offtaker Outage

Within two weeks after the commencement of each quarter, Participants must notify the Generation Coordinator of their planned shut downs in each quarter for the next 12 months. This information will be incorporated into a regional shut down schedule to assist all Participants with the development of long term outage plans. The regional outage shut down schedule will be issued to all Participants.

(g) **Format of Notification**

Examples of the format for presenting forecast requirements to the Generation Coordinator are set out in Schedule 5 (Forecast Data Format). Verbal notification may still be used for unplanned changes, followed by formal notification in writing.

The data structures have been designed to suit the electronic transfer of all forecast types including modifications, and all Offtakers must provide the required outputs to the Generation Coordinator in this format by email. The Offtakers are responsible for developing and maintaining their own energy forecast systems to support this requirement.

8.3. Starting of Single Large Capacity Equipment

Large individual loads rated greater than 3 MW, or those with an instantaneous apparent power demand during starting greater than 10 MVA, must follow the permission to connect procedure described below, and obtain the Generation Coordinator's approval, before starting such loads. The Generation Coordinator and the relevant Offtaker or Customer must include the relevant Major Generator in all communications under this clause 8.3.

The MW limit for large loads will be reviewed periodically and increased where possible to match system capability as the installed power generation capacity increases over time, or as the procedures for forecasting daily requirements become more accurate and comprehensive. Any proposals to amend these load ratings must be submitted to the Working Committee for consideration and approval.

- (a) **Step 1:** This takes the form of Voice Communications between the Offtaker/Customer and the Generation Coordinator at least 30 minutes before the intended starting time of such large loads, in which the Offtaker/Customer nominates the intended starting time of day and the particular load to be started.
- (b) **Step 2:** If sufficient generation capacity will be available from the relevant Generator at the nominated time, the Generation Coordinator will promptly advise permission to start. The Generation Coordinator must not withhold or delay permission where the notice has been given less than 30 minutes prior but the required generation capacity is immediately available.
- (c) **Step 3:** The Offtaker/Customer must communicate again if the intended starting or stopping time of day, or duration of the plant operation, is to be varied substantially from that previously nominated to the Generation Coordinator and relevant Generator.
- (d) **Step 4:** The Offtaker/Customer must communicate to the Generation Coordinator any substantial unscheduled interruption (i.e. greater than a 10 MW load and 30 minutes duration) by the Offtaker/Customer of a load that automatically stops and restarts, is cyclic in operation, and is operating under a previous permission. The load may be restarted following the unscheduled interruption without a further permission to connect, provided the load will operate within the previously nominated forecast limits.

8.4. Connection of Large Collection of Loads

The rapid loading (i.e. high rate of load ramp-up) of large plant load collections comprising individual loads that are smaller than those nominated in clause 8.3, but which collectively exceed those nominated in clause 8.3, must be managed so that the loading rate does not exceed the rate at which available generation capacity can be increased.

Specifically, none of the following loads may be started without following the permission to connect procedure described below, and obtain the Generation Coordinator's approval. The Generation Coordinator and the relevant Offtaker or Customer must include the relevant Major Generator in all communications under this clause 8.4:

- (a) loads aggregating greater than 10 MW over a 30 minute period; and

- (b) loads aggregating greater than 5 MW over any 5 minute period.

The MW limit for large load groups will be reviewed periodically and increased where possible to match system capability as the installed power generation capacity increases over time, or as the procedures for forecasting daily requirements become more accurate and comprehensive. Any proposals to amend these load ratings must be submitted to the Working Committee for consideration and approval.

- (a) **Step 1:** This takes the form of Voice Communications between the Offtaker/Customer and the Generation Coordinator at least 30 minutes before the intended starting time of such large load groups, in which the Offtaker/Customer nominates the intended starting time of day and the particular loads to be started (including their size and duration).
- (b) **Step 2:** If sufficient generation capacity will be available from the relevant Generator at the nominated time, the Generation Coordinator will promptly advise permission to start. The Generation Coordinator must not withhold or delay permission where the notice has been given less than 30 minutes prior but the required generation capacity is immediately available.
- (c) **Step 3:** The Offtaker/Customer must communicate again if the intended starting or stopping time of day, or duration of the plant operation, is to be varied substantially from that previously nominated to the Generation Coordinator and relevant Generator.

8.5. Control of Large Cyclic Loads during Generating Unit Synchronising

The potential coincidence during start-up of demands from large loads with regular cyclic demand pattern (such as large mine hoists, shovels and drag-lines) may result in abnormal operating conditions on the Supply Network.

In future, the Generation Coordinator may need to coordinate some such loads (as agreed with the Major Generator whose Offtakers and Customers are affected) to minimise any such coincidence of cyclic large loads and consequent excessive real and reactive power demands on generation.

The normal operation of such large cyclic loads may present difficulties to any Power Station operation during synchronisation of Generating Units to the NWPS. As such, the Generation Coordinator:

- (a) must advise all relevant Offtakers ahead of the intended time of synchronisation;
- (b) may need to issue a verbal direction to an Offtaker to temporarily halt the operation of certain large cyclic loads for a brief period immediately before synchronisation (provided that the number of requests is kept to the minimum absolutely necessary and the halt is for a duration of less than five minutes per synchronisation event); and
- (c) must advise all relevant Offtakers immediately after synchronisation when conditions are stable.

An Offtaker must comply with any such verbal direction.

9. COMMUNICATION AND DISTRIBUTION OF INFORMATION

9.1. Overview

The following information constitutes valuable data for all Participants in the NWPS and must be provided to all Participants where it is possible to do so and directly relevant to that Participant:

- (a) the status and output of Generating Units, including parameters of volts, MW, MVar and Hz; and

- (b) the status and load information for key sections of the Supply Network and Offtaker loads and incomer circuit breakers.

The Participants agree that this information can be shared with other Participants, but is otherwise confidential, and that further disclosure of that information could be adverse to the commercial interests of a Participant. The written consent of Participants must be obtained prior to further disclosure of this information.

Each Participant has the right to restrict the provision of commercially sensitive data to other Participants. The basic conduit for this data flow will be EECL's SCADA, with additional inputs from the MLSS as required where possible.

Any future Network Owner will need to provide the necessary communication facilities and information to the satisfaction of the Working Committee.

Information relevant to a particular Offtaker can be made available to the Offtaker at the relevant Network Owner's SCADA terminal in the main substation at that Offtaker's premises.

Each Participant is responsible for translating data from the SCADA and MLSS protocols to meet their internal system requirements.

9.2. Information required

The following information must be made available by each Participant (at its cost) to the Major Generators and relevant Network Owners via an agreed communications channel, unless agreed in writing by the Generation Coordinator and relevant Network Owners:

(a) Supply Network

The Network Owners must provide real time data through their SCADA systems where their existing SCADA systems permit. Existing Network Owners will only provide additional SCADA data on the basis of a commercial agreement to do so.

This information will include:

- (i) loadings on key elements of the Supply Network;
- (ii) system voltage;
- (iii) circuit breaker status (closed/open);
- (iv) position of line isolators and earth switches; and
- (v) information re protection trips and alarms.

(b) Additional information provided by Network Owners

A Network Owner's SCADA must also monitor the following information at the Points of Connection to its 132 kV and/or 220 kV portions of the Supply Network:

- (i) status of the Offtaker's incoming circuit breaker (closed/open);
- (ii) voltage at the Point of Connection;
- (iii) instantaneous and half-hourly MW and MVar demand; and
- (iv) the connection status and load of Large Power Stations.

Some of this data is critical information required for the MLSS and will be provided to the Generation Coordinator and the Major Generators.

(c) MIM Co's 132 kV network

MIM Co will give the Generation Coordinator the following information about its five 132 kV feeders at the "D" Switchyard that supply its loads at the Mount Isa Mine and the George Fisher Mine:

- (i) voltage;
- (ii) MW and MVar demand;
- (iii) feeder circuit breaker status;
- (iv) information re trips and alarms; and
- (v) where possible, status of line isolators and earth switches.

(d) Connected Generating Units

Each Generator must provide real time data in relation to each of its Generating Units (where those Generating Units form part of a Major Power Station or Large Power Station) to the Generation Coordinator and the Major Generators, where that data includes:

- (i) MW generation at each Generating Unit;
- (ii) for Major Power Stations, MVar absorption/injection from each of the Generating Units;
- (iii) HV bus volts at the Offtaker's substation; and
- (iv) status (closed/open) of circuit breakers connecting the Offtaker's generation to the Supply Network.

This information should be available from the MLSS.

(e) Network Interfaces

Relevant information on the status and control of the network interfaces will be provided using Modbus.

9.3. Voice Communications

Dedicated telephone connections have been installed for Voice Communications at:

- (a) the Generation Coordinator's DPS control room;
- (b) EECL at each of its Substations;
- (c) the Major Generators (at the DPS for DPS Co and the MCPS for MCPL);
- (d) the MPS (as the central controller of MIM Co's Power Stations and network).

Each Offtaker and Generator must, at their relevant control rooms, provide telephone connections to receive Voice Communications from the Generation Coordinator's DPS control room.

Any future Network Owner must install and maintain:

- (a) a dedicated telephone connection to the Generation Coordinator; and
- (b) telephone communications arrangements with EECL, Major Generators and MPS that are satisfactory (acting reasonably) to those entities.

Control rooms at the Major Power Stations, which manage the interface to the Supply Network and Offtakers, must:

- (a) as soon as possible after a Voice Communication about the operation of the NWPS, log that Voice Communication, regardless of whether they are the sender or receiver;
- (b) ensure that telephones associated with these communication systems include voice recording facilities to ensure that a full record of Voice Communications is maintained;
- (c) keep the electronic voice recordings for at least five years.

9.4. Key Contact Details for inclusion in Register of Representatives

The Secretary of the Working Committee must:

- (a) maintain and keep current the Register of Representatives and relevant Contact Details in the form set out in Schedule 6 (Key Contact Details) or another format approved by the Working Committee;
- (b) make this Register of Representatives and Contact Details available to each Participant and Disconnected Participant on request;
- (c) confirm relevant Contact Details at each Working Committee meeting; and
- (d) advise, in a timely manner, Participants and Disconnected Participants of any changes to the Register of Representatives or Contact Details.

Each Participant must give the Secretary relevant updates in a timely manner and ensure that the contact numbers provided will result in a response at all times.

10. NWPS SYSTEM SECURITY

10.1. General

All Participants must ensure that their equipment connected to the NWPS is designed, operated and maintained in accordance with GEOP so that the security of the NWPS is not put at risk.

All Participants must, in a timely manner and in accordance with GEOP, address any identified non-conformances within their facilities that could impact on the reliable performance of the NWPS, to maintain the integrity of the NWPS. The cost of correcting non-conformances will be borne by the owner of the non-conforming facilities.

10.2. Design

Plant and equipment connected to the NWPS must comply with:

- (a) GEOP;
- (b) Schedule 2 (Technical Requirements for the NWPS); and
- (c) any agreed ESA, PPA or CAA.

Equipment and relevant protection and control systems and settings must be designed to demonstrate acceptable performance under steady state and transient conditions through the NWPS Model (as required by Schedule 3 (System Studies and Planning)) when connected to the NWPS.

All stakeholders acknowledge that excursions beyond the normal tolerances may occur during Contingency Events such as system faults, short circuits or sudden changes in generating capacity or system loads.

The exchange of information between Participants during the design phase of changes such as those referred to in Item 1(a) of Schedule 3 (System Studies and Planning) is critical to allow projects to be effectively developed. Participants must respond to requests for information and requests for approvals in a timely manner.

10.3. Maintenance

Participants in the NWPS must maintain the equipment connected to the Supply Network in compliance with GEOP. In particular, the testing of protective devices required to prevent damage to Offtakers' equipment or the Supply Network should be carried out in accordance with Item 15 of Schedule 2 (Technical Requirements for the NWPS). The testing regime should include circuit breaker tripping (unless this is not possible for production purposes). Where circuit breaker tripping is not carried out as part of protection testing, this test must be carried out at the earliest opportunity. Copies of these test reports should be available for review by the relevant Network Owner if required.

10.4. Operational Matters

These measures must take account of factors unique to the isolated NWPS, such as:

- (a) individual Offtaker's power demands being relatively large in comparison both with each Generating Unit's rated output capacity, and the total installed generation capacity on the NWPS;
- (b) unscheduled connection of individual large motors (as detailed in clause 8.4), representing a significant proportion of the Spinning Reserve;
- (c) large collections of load that can be quickly brought into service by individual Offtakers can exceed the rate at which additional generation capacity is able to be provided by the Generation Coordinator;
- (d) coincidence during start-up of large loads with regular cyclic demand pattern such as large mine hoists, shovels and drag-lines could cause excessive real and reactive power demands on the generation, as well as result in abnormal operating conditions on the Supply Network;
- (e) large capacitive (leading Power Factor MVAR) loading on the generation caused by the long 220 kV and 132 kV portions of the Supply Network (this will create operational constraints when reconnecting unloaded portions of the Supply Network following widespread disconnections within the Supply Network);
- (f) infrequent load shedding, to be purposefully actioned to maintain overall system integrity following a Contingency Event. This would normally be automatic but may also be manually initiated by the Generation Coordinator; and
- (g) the fact that it is a weak power system and is therefore more susceptible to experiencing adverse impacts on frequencies resulting from the use of renewable energy and UIGUs.

10.5. NWPS Constraints

The current constraints in the NWPS include: –

- (a) a transformer capacity restriction in the event of the loss of a 132 kV/220 kV transformer supplying electricity to the "C" Switchyard; and
- (b) in an Islanding event, the 220 kV portions of the Supply Network have a line charging MVAR demand that requires a minimum online generation capacity, as set out in clause 10.11.

As at the Effective Date, there are no existing fault current rating constraints on the maximum amount of generation. However, if the aggregate amount of generation approaches 400 MW,

then further studies on this aspect will be required (as provided for in Schedule 3 (System Studies and Planning)).

10.6. Operation of Small and Large Power Stations on the NWPS

Participants with Small and Large Power Stations operating in parallel with the Supply Network must provide appropriate protection and control systems, and apply appropriate settings coordinated with the relevant Network Owner, to support the stable operation of the NWPS and to prevent damage to other Participants' equipment (which must include over-current and reverse power protection and, if necessary, pole-slip protection).

The MPS, XPS and ICPL Acid Plant are currently approved to operate in parallel with the Supply Network.

10.7. Contingency Events

(a) Circumstances

A Contingency Event may arise following an unexpected major disturbance to the usual stable operating state of the NWPS. Possible Contingency Events could include:

- (i) loss of a major amount of generation capacity;
- (ii) unauthorised connection of large amounts of load exceeding available Spinning Reserve;
- (iii) major failures on the Supply Network;
- (iv) loss of a major transmission transformer or associated switchgear;
- (v) major damage to a Participant's facilities;
- (vi) significant constraint on regional infrastructure;
- (vii) a Force Majeure Event; and
- (viii) anything resulting in a Load Encroachment Event or a FILS Event (whether or not listed above).

It is expected that such events would occur infrequently, but when they do, it may be without prior warning.

(b) Planned Responses

Following a significant Contingency Event involving a generation shortfall (such as the first two items in clause 10.7(a)), it is usually necessary to rapidly attempt to restore the NWPS to a stable state by activating the MLSS and automatically selectively disconnecting loads. The alternative of taking no action is likely to result in more widespread disruption and larger loss of loads, with more generation being disconnected and resulting in longer reconnection times.

Manual Load Management may be used to manage generation shortfalls, stabilise the NWPS or manage a Contingency Event.

The key elements required to respond to Contingency Events are a fast speed of response, and the ability to take progressive action in discrete steps to restore stability to minimise the extent of the necessary disruption to Offtakers and Customers.

There are two main situations requiring planned responses:

- (i) a major shortfall of generation capacity in relation to loads (see clause 10.8); and

- (ii) reconnection of loads following a major disconnection (see clause 10.9).

10.8. Major Generation Shortfall

(a) Effects

If there is a sudden loss of a substantial amount of connected generation capacity, system frequency will begin to fall. Simultaneously, there will be some consequent small load reduction due to frequency-dependent loads. Unless some other action is taken, this loss is likely to cause a drop in system frequency and the operation of generator under frequency protection and cascade tripping of generation. Cascade tripping of generation will lead to a system collapse.

Unless load is disconnected so that the remaining system loading matches the available amount of generation, protection and control systems will automatically Island the Generating Units at the Major Power Stations from the Supply Network in order to avoid the complete shutdown of each Generating Unit. Resupply of all previously connected loads could then take some hours.

(b) Load Shedding System – LSS

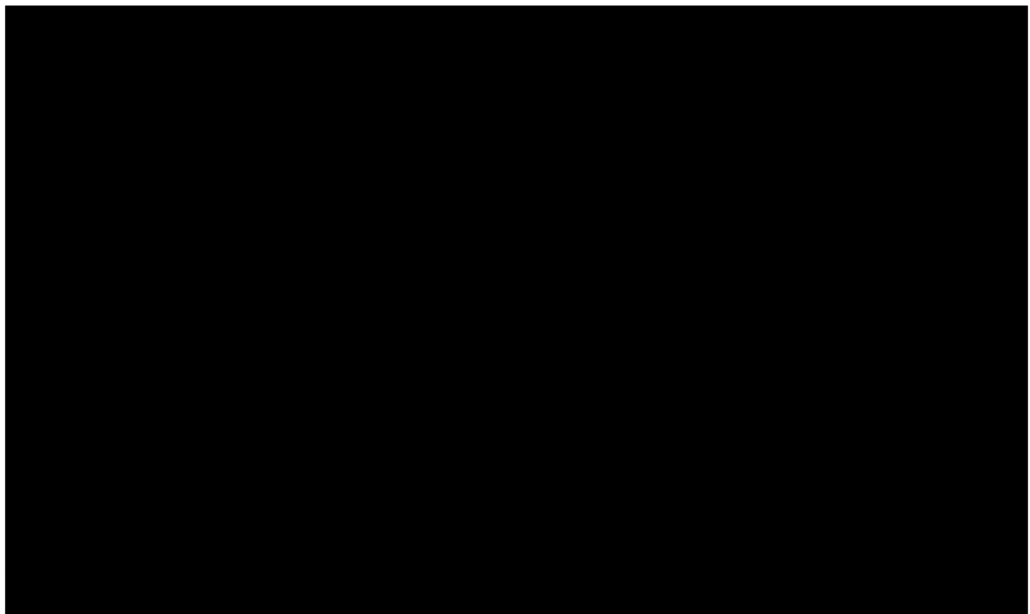
To avoid cascade tripping of Generating Units, the MLSS will action the PLS system, supported by a back-up FILS, following a generation shortfall. DPS Co has installed the MLSS at DPS and the necessary connections via dedicated communication links to MCPS and to the relevant SLSS at each Offtaker's premises.

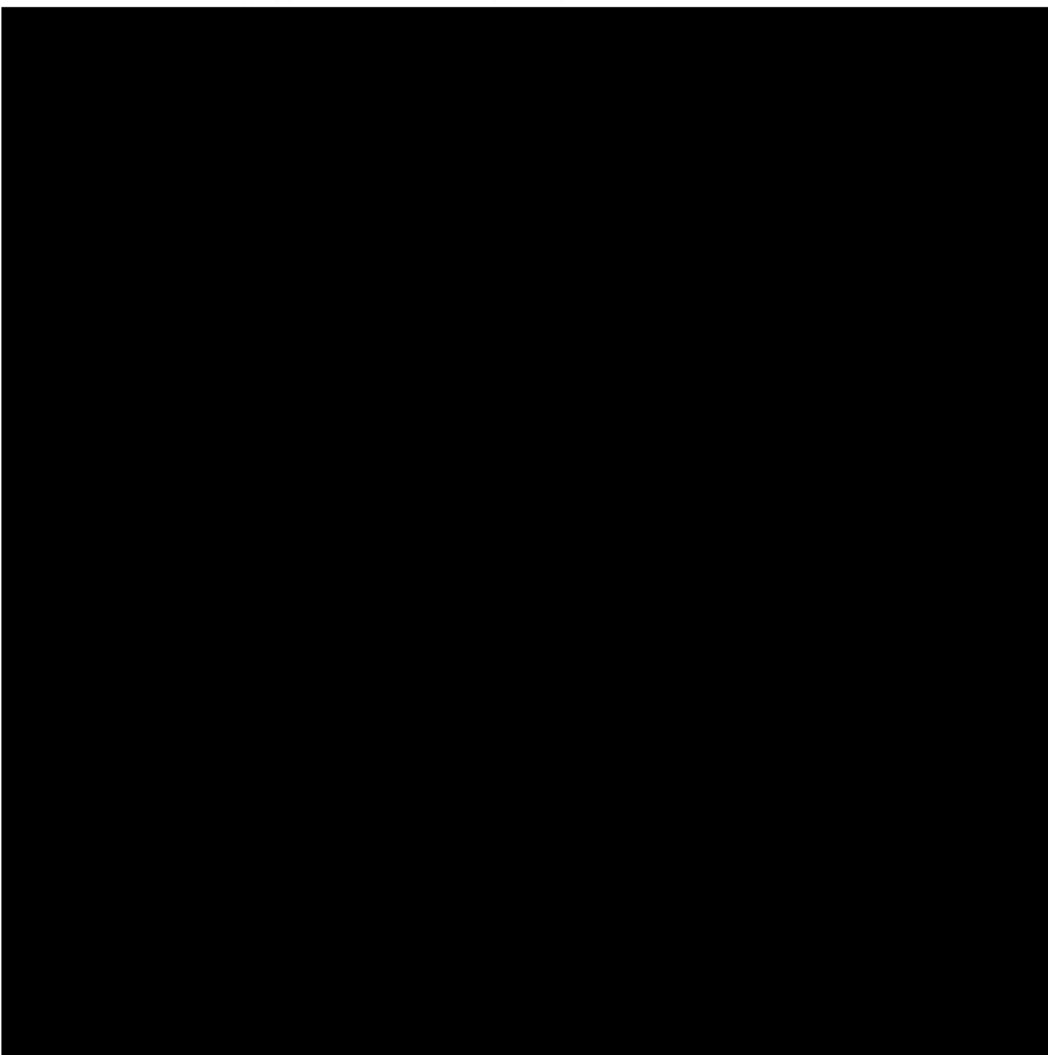
A PLS trip is initiated by a Generating Unit circuit breaker opening and causing a deficiency in total system on-line generation capacity compared with the system load at the time.

For a PLS trip, load shed signals are sent quickly (typically less than 50 milliseconds) to an SLSS unit at each Offtaker's premises. The SLSS unit is connected directly to interrupters controlling the loads nominated for shedding.

Schedules 7 (Load Shedding System (LSS)) and 8 (System Restoration Procedures after Load Shed Events) describe the MLSS and SLSS, including prioritisation of shedding and the procedures to be followed for implementation.

(c) Allocation of Loads to be shed





The Working Committee must review the performance of the LSS at each meeting and consider its effectiveness in protecting the equity of Unserved Energy among Participants in the NWPS where appropriate.

The Working Committee must ensure that:

- (ix) the requirements of the LSS are satisfied if a Participant connects to the NWPS; and
- (x) the Participant's load or generation is incorporated appropriately into the LSS.

(d) Back-up Systems

In the event of failure of the MLSS, a Supply Network fault or a major fault in a Participant's facility, the under frequency relay (FILS) installed at each Offtaker's premises will monitor the frequency and ROCOF and operate in a reactive manner dependent upon the ROCOF.

The FILS is to back-up the MLSS in event of its failure, or the failure of the communication system to each Offtaker's SLSS, or a failure to respond to a generation shortfall situation undetectable by the MLSS. FILS operations will be delayed to allow the PLS time to act (where relevant and available).

As a final resort, should the under frequency systems at the Offtakers' premises fail to shed sufficient load quickly enough to restore system frequency, the FILS system will trip the 132 kV and 220 kV feeders from the Generating Units to Island the Major Power Stations.

10.9. Reconnecting Offtakers after a Major System Contingency Event

Two areas of activity that must be considered for restoring power after a shortfall in generation capacity are:

- (a) operational issues; and
- (b) non-Power Station issues (relevant priority issues are set out in Schedule 8 (System Restoration Procedures after Load Shed Events)).

Operational Issues

Operational issues relate to activities necessary for the safe, orderly and rapid restoration of electricity supply to all of the Offtakers' facilities and to any Customers. The complexity and extent of these actions will depend on the level of load shed. This could range from the loss of part of a Power Station's output or the loss of a single Generating Unit at a Major Power Station to the loss of the entire generation output at a Major Power Station or the loss of all generation in the NWPS.

Relevant drawings, documents and control screens must clearly identify those points within the NWPS where sections of the Supply Network can be synchronised to help restore the NWPS.

Schedule 8 (System Restoration Procedures after Load Shed Events) details the procedures to be followed during restoration of supply. These procedures will need to be reviewed and updated if any UIGUs are to be interconnected.

10.10. Procedure for restoration

Each Major Generator must have installed (or have available via contract arrangements) sufficient Black Start Capability to enable their respective Generating Units to be restarted to restore power to their respective Offtakers.

Managing the restoration in the most appropriate manner is likely to require a detailed exchange of data between the affected control centres. It may be necessary for the Generation Coordinator, in consultation with the Major Generators, to make decisions regarding the restoration schedule to satisfy the priorities presented by all Offtakers and Customers and the operational capability of the NWPS.

It is unlikely that any two load shed events will be the same. In order to manage the complexities of the restoration process, the procedures detailed in Schedule 8 (System Restoration Procedures after Load Shed Events) have been established to assist with the decision-making process.

Each load shed event or system black event will need to be addressed as an individual event. Past operating experience will be of value in understanding the range of issues to be resolved during a system restoration. It is essential that the Generation Coordinator leads the coordination of the restoration program (in consultation with the Major Generators) and that all Participants in the NWPS cooperate to the fullest possible extent with requests made of them. Any such event will need to be the subject of a review by the Working Committee, in which performance concerns and improvement opportunities are identified for future application.

10.11. Supply Network Restoration

Following a major system Contingency Event that involves the loss of a long HV portion of the Supply Network, care needs to be taken with line re-energisation as these long HV portions have a line charging MVAR demand as set out below:

The connection of long unloaded HV portions of the Supply Network on to a lightly MW loaded generating base may cause the Generating Units to operate at a high leading Power Factor. This could cause instability at low excitation and could cause the Generating Units to trip.

Any imbalance of energy between the Major Generators' Offtakers will be accounted for in the Energy Balance Agreement. Periods of energy imbalance are expected to be less than 24 hours.

The amount of local load to be first connected will vary depending upon the number of Generating Units available and also which Generating Units are available, due to the different capacity of each Generating Unit at leading Power Factors.

The Generation Coordinator must, to the extent possible, ensure that one Generator/Offtaker pairing (as per an ESA or PPA) is not prejudiced if the Contingency Event was the fault of another Generator/Offtaker pairing.

Capabilities at zero Power Factor, i.e. entirely reactive leading MVar generation and no MW, are:

NWPS Generating Units Capability					
Plant			Plant		
DPS	MW	MVar	MCPS	MW	MVar
	Rating	At 0 MW		Rating	At 0 MW
STG 10	41.6	32.85	A5	32.0	18.79
GT11	41.6	32.85	A6	35.6	18.26
GT12	41.6	32.85	A7	35.6	18.26
STG 20	41.6	32.85	B1	34.1	9.9
GT 21	41.6	32.85	C1	35.9	21.76
GT 22	41.6	32.85	C2	20.5	10.8
			M1	5.0	2.7
GT31	60	23	M2	5.0	2.7
			M3	14.3	6.75

The different scenarios of generation capacity that might first become available will determine what MW load (with normal lagging MVar) needs to be connected first.

10.12. Reactive Power (VAr) Control

- (a) The Generation Coordinator is responsible for coordinating with relevant Network Owners and Major Generators to manage overall system voltages and resultant reactive power flows in the NWPS.
- (b) EECL will control the system voltages at the 220 kV network.
- (c) DPS Co will control the system voltages at the 132 kV "D" and "B" Switchyards.
- (d) All Generators are responsible for managing reactive power.
- (e) As a general principle, VAr loading allocated to each Major Generator shall be matched to its respective Offtaker VAr demands, taking into account the system VAr requirements relative to the load.

11. CO-ORDINATION OF WORK

11.1. Overview

Each asset owner is responsible for operating its assets. As the NWPS consists of independently owned and operated but interdependent assets, operations and maintenance activities must be planned and managed as far in advance as possible to try to minimise the impact on the NWPS and the Participants.

11.2. Across Boundary Connections and Services

Where a Participant relies on another Participant for provision of connections and/or services to ensure the correct functioning of equipment, the Participants must keep each other informed of any planned or unplanned interruptions to these connections and/or services, and keep the interruptions to the minimum practicable duration.

If two Participants are bound by the requirements of a single CAA, ESA or PPA, then the requirements of that agreement will apply in this regard.

11.3. Across Boundary Isolation and Earthing

Where a Participant relies on the operation of another Participant's switchgear to provide isolation or earthing to allow safe electrical access to its plant and equipment in accordance with its high voltage operating procedures, then:

- (a) the Participants must agree upon a 'safe system of work' to be implemented between them for such work. This safe system of work will require that an approved switching sheet is prepared by one Participant and forwarded to the other Participant for review and for approval, prior to carrying out the works;
- (b) the document "The Queensland Electricity Entity Procedures for Safe Access to High Voltage Apparatus" will be used as a guide to the practices which should be adopted;
- (c) persons who prepare and authorise switching sheets must be authorised by their employers to do so;
- (d) persons who are responsible for carrying out high voltage switching procedures must also be qualified and authorised by both their employers and the Participant that owns or operates the assets; and
- (e) each Participant will be responsible for applying their safety locks to the relevant isolation point in accordance with their approved practices.

11.4. Planned Outages

Planned works on major plant and equipment, whether in Major Power Stations, the Supply Network, or an Offtaker's installation, have the potential to reduce both the quality of supply and availability of supply. Participants must, through the Working Committee, keep each other informed of the proposed timing and extent of such outages, and use reasonable endeavours to co-operate to minimise the impact on other Participants.

The following procedures are required between Participants to minimise the impact of outages on other Participants.

Participants must establish a set of operating protocols under the CAAs with the Network Owners, outlining procedures for planned works, unplanned works and switching procedures.

In general, the operating protocols will establish:

- (a) the frequency of meetings;
- (b) notification procedures for planned and unplanned events;
- (c) target response time for the Network Owner;
- (d) agreed methods of supplying loads under abnormal operating conditions;
- (e) agreed methods of switching and outage procedures; and
- (f) an up to date list of contact personnel involved in operational matters as well as planned and unplanned outages.

11.5. Non-Conformance

- (a) Each Participant must promptly rectify any non-conformances in relation to its assets that are identified by its own routine inspection and test programmes, or by studies, reports and audits carried out regarding the NWPS by the Working Committee, where such non-conformances could impact on the performance of the NWPS or the NWPS's compliance with GEOP, or be contrary to the requirements of the Dispatch Protocol.
- (b) Where the Working Committee considers rectification to be critical to the function of the NWPS, the rectification work must be undertaken immediately. Otherwise, a non-critical non-conformance must be rectified within 18 months.

12. CCA

- (a) In operating under the Dispatch Protocol, the Participants will not discuss or disclose:
 - (i) the pricing under PPAs or ESAs;
 - (ii) information which will prevent, restrict or limit the Participants' production capability or capacity to supply electricity, other than as required to maintain the safety and stability of the NWPS;
 - (iii) confidential information relating to each of the Participants, unless its disclosure is not prohibited by a PPA/ESA or a CAA, as the case may be, and is required for the operation of the Dispatch Protocol; or
 - (iv) any other matter which may be in breach of the CCA.
- (b) The Participants are committed to complying with all applicable laws, in particular, the CCA, during the operation of the Dispatch Protocol, including obtaining any necessary authorisation from the ACCC.

- (c) The 2014 Dispatch Protocol was authorised by the ACCC for 5 years from 20 February 2015 until 20 February 2020, and the Participants will need to seek re-authorisation prior to 20 February 2020.

13. CONFIDENTIALITY

- (a) The Dispatch Protocol, Working Committee business and all information received by a Participant under or in connection with the Dispatch Protocol (including by a Representative in the course of fulfilling its duties as a member of the Working Committee) shall be confidential (**Confidential Information**). Confidential Information must not be disclosed to persons other than Participants unless the communication is specifically authorised by the Dispatch Protocol or the Working Committee from time to time. This obligation continues after a Participant ceases to be a Participant.
- (b) Participants may utilise Confidential Information received as a consequence of their membership of the Working Committee solely for tasks necessary to implement requirements of the Dispatch Protocol.
- (c) The obligation in clause 13(a) above does not apply to the extent the disclosure is:
 - (i) by a Participant to its legal and other professional advisers, auditors and other consultants, suppliers and employees of that Participant, or that Participant's Related Bodies Corporate who require the information for the purposes of the Dispatch Protocol or for the purpose of advising that Participant in relation to the same, provided that such other party agrees to maintain the confidentiality of the Confidential Information as per clause 13(a);
 - (ii) of information which is publicly available other than as a result of breach of the Dispatch Protocol;
 - (iii) required by law;
 - (iv) in the case of DPS Co, to its financiers (and their advisers), provided that such other party agrees to maintain the confidentiality of the Confidential Information as per clause 13(a); or
 - (v) in the case of Stanwell, EECL and EEQ, to its shareholding Ministers (whether direct or indirect) and its departmental officers.

14. DISPUTE RESOLUTION

- (a) If a dispute arises between the Participants under the Dispatch Protocol (including between Representatives under the Charter) which cannot be settled between the Participants by negotiation within 30 days, then one of the Participants may give written notice to each other Participant involved in the dispute ("**Dispute Notice**").
- (b) The Dispute Notice must set out the details of the dispute, the steps taken to resolve the dispute, and request that the Participant nominate, within 7 days, a senior officer authorised to settle the dispute.
- (c) The senior officers of the relevant Participants must meet within 14 days of the date of the Dispute Notice and shall use their reasonable endeavours to resolve the dispute.
- (d) If the senior officers fail to reach agreement within 14 days of that meeting, the dispute will be determined by an independent expert appointed by the Working Committee, taking account of the nature of the dispute.
- (e) If the Working Committee cannot agree on the identity of an independent expert within 14 days of the date that the senior officers fail to reach agreement, the independent expert will be appointed by the Institute of Arbitrators and Mediators Australia (Queensland branch).

- (f) The independent expert's determination will be binding on the affected Participants.
- (g) The costs of the independent expert will be borne equally between the Participants involved in the dispute, unless otherwise determined by the independent expert.

15. REVIEW OF WORKING COMMITTEE DECISIONS

- (a) If an Applicant or Intending Participant wishes to participate in the review process provided by this clause 15, it must agree in writing to be bound by the Dispatch Protocol.
- (b) If a dispute arises between any of: an Applicant, Intending Participant, Participant or Disconnected Participant (on the one hand) and the Working Committee (on the other hand) in relation to clauses 3.4, 6.9 or 7.3 which cannot be settled between the relevant entity and the Working Committee by negotiation within 30 days, then the relevant entity may give written notice to the Working Committee of the dispute (Review Notice).
- (c) The Review Notice must set out the details of the dispute and the steps taken to resolve the dispute, and must request a review of the Working Committee's decision by an independent expert.
- (d) If the parties cannot agree on the identity of an independent expert within 14 days of the date of the Review Notice, the independent expert will be appointed by the Resolution Institute (Queensland branch).
- (e) The independent expert's determination will be binding on the relevant entity and the Working Committee.
- (f) The costs of the independent expert will be borne equally between the relevant entity and the Working Committee, unless otherwise determined by the independent expert.

16. FORCE MAJEURE

- (a) Subject to the terms of an existing CAA, PPA or ESA (as applicable), no Participant is liable to another Participant for any failure to perform or delay in performing its obligations under the Dispatch Protocol if that failure or delay is due to a Force Majeure Event.
- (b) The Participant that is prevented from performing its obligations under this clause (the Affected Participant) must:
 - (i) remedy or minimise the effects of the Force Majeure Event to the extent required under any applicable CAA, PPA or ESA (as applicable) or as otherwise may be reasonably practicable; and
 - (ii) take all action reasonably practicable to inform the other Participants of the impact of the Force Majeure Event on the Affected Participant's ability to carry out its obligations under the Dispatch Protocol and the Affected Party's plans to remedy or minimise the effects of the Force Majeure Event pursuant to this clause.

17. LIABILITY

- (a) Where:
 - (i) any liability arises under the Dispatch Protocol on the part of one Participant in relation to another Participant; and
 - (ii) those Participants are parties to a CAA, PPA or ESA with each other in relation to the NWPS,

those Participants acknowledge and agree that the terms of that CAA, PPA or ESA will regulate the liability of those respective Participants under the Dispatch Protocol.

- (b) The Participants acknowledge and agree that to the fullest extent permitted by law, the Generation Coordinator has no liability to any Participant for any acts or omissions by the Generation Coordinator to the extent that it has acted in good faith and in its capacity as Generation Coordinator.
- (c) The Participants acknowledge and agree that to the fullest extent permitted by law, the Dispatch Protocol does not limit any duty of care at law or under statute that a Participant may owe to another Participant.
- (d) Subject to clauses 16, 17(a), 17(b) and 17(c), the terms of any applicable CAA, PPA or ESA, and any applicable statute, the Participants acknowledge and agree that to the fullest extent permitted by law, no Participant will be liable to another Participant in connection with the Dispatch Protocol to the extent it has acted honestly, reasonably and in accordance with GEOP.

18. GOVERNING LAW

The Dispatch Protocol is governed by the laws of the Queensland and each Participant unconditionally and irrevocably submits to the non-exclusive jurisdiction of the courts of that State.

19. ASSIGNMENT AND NOVATION

If a Participant or Disconnected Participant transfers its interest in:

- (a) the relevant NWPS assets; or
- (b) any CAA, PPA or ESA,

to a third party, that Participant or Disconnected Participant must, before doing so:

- (c) advise the Working Committee of the proposed transfer; and
- (d) cause that third party to:
 - (i) enter into a deed in favour of the remaining Participants under which that third party covenants to comply with the obligations of the relevant Participant or Disconnected Participant under the Dispatch Protocol from the date of such asset transfer; and
 - (ii) provide the Working Committee with all necessary contact information and any other information that is reasonably requested by the Working Committee in order for that third party to become a fully operational Participant or Disconnected Participant (as relevant).
 - (iii) do everything else necessary to be, and comply with the requirements of being, a Participant or Disconnected Participant as at the date of the transfer.

Upon the completion of such asset transfer, the original Participant or Disconnected Participant automatically ceases to be a Participant or Disconnected Participant (as relevant) in respect of the transferred assets and the new entity becomes a Participant or Disconnected Participant (as relevant) in respect of those assets.

Signing page

Signed for **MICA CREEK PTY LIMITED ABN 82 075 522 093** by an authorised officer in the presence of:


Signature of witness

IRVINE TEMBO
Name of witness (print)


Signature of officer


PAUL SMITH
Name of officer (print)

MANAGER - MICA CREEK POWER STATION
Office held

Signed for **DIAMANTINA POWER STATION PTY LIMITED ABN 55 149 762 176** by an authorised officer in the presence of:


Signature of witness


JANELLE FENWICK
Name of witness (print)


Signature of officer

R.S. PEARCE
Name of officer (print)

DIRECTOR
Office held

Signed for **MOUNT ISA MINES LIMITED ABN 87 009 661 447** by an authorised officer in the presence of:


Signature of witness

Erin Dean
Name of witness (print)


Signature of officer

TODD BROWN
Name of officer (print)

CHIEF FINANCIAL OFFICER
Office held NORTH QUEENSLAND COPPER

Signed for **ERNEST HENRY MINING PTY LIMITED** ABN 18 008 495 574 by an authorised officer in the presence of:

Signature of witness

Name of witness (print)

Signature of officer

TOOD BROWN

Name of officer (print)

CHIEF FINANCIAL OFFICER

Office held NORTH QUEENSLAND
COPPER.

Signed for **MMG DUGALD RIVER PTY LIMITED** ABN 19 083 405 556 by an authorised officer in the presence of:

Signature of witness

Name of witness (print)

Signature of officer

IVY LEE

Name of officer (print)

GENERAL MANAGER

Office held

Signed for **CAPRICORN COPPER PTY LTD MINING LIMITED** ACN 106 396 801 by an authorised officer in the presence of:

Signature of witness

Name of witness (print)

Signature of officer

Carl Halloran

Name of officer (print)

Managing Director

Office held

Signed for **CENTURY MINING LIMITED ACN 006 670 300** by an authorised officer in the presence of:

Signature of witness

MEAGAN KEENAN

Name of witness (print)

Signature of officer

PATRICK WALSH

Name of officer (print)

MANAGING DIRECTOR

Office held

Signed for **ERGON ENERGY QUEENSLAND PTY LIMITED ABN 11 121 177 802** by an authorised officer in the presence of:

Signature of witness

Danielle Blanche

Name of witness (print)

Signature of officer

Jane Nant

Name of officer (print)

Company Secretary

Office held

Signed for **ERGON ENERGY CORPORATION LIMITED ABN 50 087 646 062** by an authorised officer in the presence of:

Signature of witness

Danielle Blanche.

Name of witness (print)

Signature of officer

Jane Nant

Name of officer (print)

Company Secretary

Office held

Schedule 1 – Working Committee Charter

1. PURPOSE

The Working Committee is the body that has the overall responsibility for overseeing the effective management of the NWPS through the implementation of the Dispatch Protocol.

2. MEMBERSHIP

All Participants and Disconnected Participants in the NWPS are deemed to be members of the Working Committee until they resign from the Working Committee (and thereby cease to be a party to the Dispatch Protocol and therefore also cease to be Participants and Disconnected Participants) under Item 4 of this Schedule 1 (Working Committee Charter).

3. REPRESENTATIVES

Each Participant must, as soon as possible after becoming a signatory to the Dispatch Protocol, nominate one Representative to represent it on the Working Committee by giving written notice to the Chairperson, except that the Participant in the role of Generation Coordinator must nominate two Representatives to the Working Committee – one to represent the Generation Coordinator and one to represent the Major Generator.

Each Representative must be suitably qualified and experienced in the electricity industry, and must have the necessary authority from the Participant or Disconnected Participant (as relevant) to take any actions required by the Working Committee on behalf of the Participant or Disconnected Participant (as relevant). Each Representative must provide the Chairperson with written evidence that the person has been given authority by the relevant entity to act in that capacity.

Each Representative is taken to have authority to exercise the rights and privileges and perform all obligations of the relevant entity in connection with the Dispatch Protocol. The Representative is responsible for briefing its relevant entity in relation to issues arising at meetings.

A Representative, acting reasonably, may report to the Chairperson if they form a view that another Representative does not have the skills or authority appropriate to fulfil the relevant entity's obligations and responsibilities under this Charter and the Dispatch Protocol. The Chairperson will consult with the affected entity as to whether its Representative should be replaced or another course of action should be implemented.

A Participant or Disconnected Participant may nominate a new Representative at any time by giving written notice to the Chairperson, who will inform the other Participants and Disconnected Participants.

The Secretary will maintain a record of all appointed Representatives and relevant Contact Details as required under clause 9.4 of the Dispatch Protocol.

4. RESIGNATION FROM WORKING COMMITTEE AND AS A PARTICIPANT

Resignation from the Working Committee will occur as follows:

- (a) if a Participant ceases to meet the definition of a Participant (other than where the Participant becomes a Disconnected Participant), then that Participant may either:
 - (i) give the Working Committee notice of its resignation, with such notice being issued as far as reasonably practicable in advance; or

- (ii) give the Working Committee sufficient reasonable justification demonstrating that they will continue to be involved in the operations of the NWPS and, provided the Working Committee is (acting reasonably) satisfied of this, then that entity will be taken to remain a Participant for a maximum of three years,

provided that, if the Participant does not do either of these things within six months of the date on which it ceases to meet the definition of a Participant, that Participant formally ceases to be any of: a Participant; a party to the Dispatch Protocol; and a member of the Working Committee;

- (b) a Disconnected Participant may give the Working Committee notice of its resignation at any time, and, upon such resignation, will cease to be each of a Disconnected Participant, a party to the Dispatch Protocol and a member of the Working Committee; and
- (c) a Disconnected Participant may only remain a Disconnected Participant in respect of premises for a maximum of three years, at which time it automatically ceases to be each of a Disconnected Participant, a party to the Dispatch Protocol and a member of the Working Committee, in respect of those premises.

Each resignation will take effect on the later of the date it has been received by, and minuted at, a meeting of, the Working Committee, or the date set out in those minutes.

5. APPOINTMENT & TERMINATION OF CHAIRPERSON AND SECRETARY

The Chairperson of the Working Committee will be a Representative elected by the Working Committee on terms of 3 years. Chairpersons may be re-elected.

The Secretary of the Working Committee will be provided by the Generation Coordinator (because the Generation Coordinator will hold essential data in relation to the performance of the NWPS and the MLSS) and approved by the Working Committee.

The Working Committee may, at its discretion, replace the Chairperson and/or the Secretary (as the case may be), should it have reasonable grounds to do so.

6. RESPONSIBILITIES OF CHAIRPERSON

The Chairperson is responsible for:

- (a) leading the Working Committee in reviewing and discussing Dispatch Protocol issues;
- (b) organising, chairing and coordinating meetings;
- (c) ensuring the efficient organisation and conduct of the Working Committee;
- (d) briefing all Representatives in relation to issues arising at meetings;
- (e) facilitating effective contribution by all Representatives; and
- (f) performing the tasks, exercising the rights and bearing the responsibilities set out in this Charter.

The Chairperson may delegate the role to another person of its choice at any time and for any period, with the approval of the Working Committee, provided that the delegation does not result in a material reduction in the efficiency or effectiveness of the Working Committee in carrying out its activities.

7. RESPONSIBILITIES OF SECRETARY

The Secretary is responsible for:

- (a) attending all meetings as required;
- (b) preparing minutes of meetings and resolutions of the Working Committee and circulating these to all Representatives;
- (c) maintaining the Register of Representatives and Contact Details in accordance with clause 9.4 of the Dispatch Protocol;
- (d) no less frequently than every 3 years, within 14 days after the anniversary of the 2014 Effective Date, circulating to all Participants a clean copy and a marked-up copy of the Dispatch Protocol containing all changes to the Dispatch Protocol since its last review.

The Secretary's role is administrative only and the Secretary does not have any voting or other rights.

8. FUNCTIONS OF THE WORKING COMMITTEE

The functions of the Working Committee are to:

- (a) agree and adopt this Charter;
- (b) be the responsible body for managing the Dispatch Protocol;
- (c) make decisions regarding the implementation and operation of the Dispatch Protocol;
- (d) amend the Dispatch Protocol, subject to the limitations contained in clause 2.10 of the Dispatch Protocol;
- (e) appoint a Chairperson;
- (f) manage changes in the appointment of the Secretary and Generation Coordinator;
- (g) oversee the provision of independent system modelling to ensure ongoing system standards are maintained when significant new loads or generation are to be established;
- (h) approve the MLSS and its attendant components;
- (i) agree upon process and operating rules conducive to safe, reliable and efficient operation of the system which will apply to Offtakers, Network Owners and Generators;
- (j) agree on the technical standards that will apply to the changes referred to in Item 1(a) of Schedule 3 (System Studies and Planning) or upgrades to, or significant changes at, existing Participant facilities;
- (k) receive reports and recommendations in relation to proposals for such changes;
- (l) approve proposals for such changes that comply with the technical requirements of the Dispatch Protocol;
- (m) receive regular reports on the performance of system components from Participants in relation to their components of the system;
- (n) establish a routine work programme and budget in accordance with Item 12 of this Charter;
- (o) perform a risk assessment and develop a risk register and a process for dealing with Contingency Events; and

- (p) at each Annual Meeting:
 - (i) confirm what the latest version of the PSS@e is that is being used and ensure that all Participants are using the same version;
 - (ii) determine whether the Participants need to upgrade from the current version of the PSS@e to the latest version;
 - (iii) if the Participants need to upgrade, approve any such upgrade; and
 - (iv) review the equity of Unserved Energy between Offtakers supplied by a common Major Generator (provided that any resultant inequity is a matter for the relevant Major Generator and its Offtakers).

9. RIGHTS AND OBLIGATIONS OF REPRESENTATIVES

Each Representative must:

- (a) use best endeavours to attend all meetings of the Working Committee;
- (b) perform all functions and duties as provided under this Charter and the Dispatch Protocol in relation to the Working Committee;
- (c) provide reasonable assistance to the Chairperson, Secretary and Generation Coordinator in respect of its Participant's or Disconnected Participant's (as relevant) compliance with the Dispatch Protocol;
- (d) discharge their duties honestly and reasonably and for a proper purpose;
- (e) exercise the degree of care and diligence that a reasonable person would exercise if they were in the Representative's position;
- (f) avoid or fully disclose any actual, potential or perceived conflicts of interest of a professional or personal nature;
- (g) not improperly disclose, or make improper use of, information gained through their position as a Representative, and acknowledge that such information might be inadvertently disclosed and/or confidential or commercially sensitive;
- (h) not take improper advantage of their position as a Representative; and
- (i) make reasonable enquiries if relying on information or advice provided by others.
- (j) Representatives have the right to be supported at a meeting by a suitably qualified technical member of the Participant or Disconnected Participant (as relevant) (or their consultant) to assist in the presentation and discussions of technical matters.

Should a Representative:

- (k) intend to be accompanied at a meeting as outlined above; or
- (l) wish to appoint an alternative temporary representative in the event they are unable to attend a meeting;

this should be notified to the Chairperson at least two days prior to the meeting.

10. MEETINGS

- (a) The Chairperson must convene and conduct meetings at least every three months (and more frequently if necessary) for the purpose of consulting with Participants and

Disconnected Participants on the management of the NWPS and the operation and implementation of the Dispatch Protocol. Generally, these meetings are held approximately one month after the end of each quarter.

- (b) Issues to be considered by the Working Committee include:
 - (i) the performance of the NWPS and quality of supply;
 - (ii) the operations of load shedding events;
 - (iii) the MLSS and SLSS performance; and
 - (iv) interface and safety issues between Participants.
- (c) The first meeting of each calendar year is the Annual Meeting. The Chairperson must convene and conduct each Annual Meeting to consider the key items of the Dispatch Protocol, including:
 - (i) the operation of the LSS during Contingency Events through the year;
 - (ii) establishing an audit to prove that the effectiveness of the MLSS equipment and that the actions of the SLSS at each Participant's premises are compliant with the agreed programmes;
 - (iii) reviewing the Unserved Energy and the impact on all Offtakers (as referred to in Item 8(p)(iv) of this Schedule);
 - (iv) reviewing and adjusting load shedding priorities as required and updating the MLSS and SLSS details in Schedule 7 (Load Shedding System (LSS)) accordingly;
 - (v) reviewing the maintenance programmes for equipment associated with the NWPS to identify the risks of equipment failure which could adversely impact the NWPS;
 - (vi) reviewing the operational performance of all the Participants (and Disconnected Participants where appropriate) and their equipment and identifying areas where improvements are required; and
 - (vii) considering proposed changes or additions to the NWPS from all Participants and Disconnected Participants and confirming that such changes are reflected in future energy forecasts provided to the Generation Coordinator.
- (d) The Chairperson may, if there have been sufficient changes in the NWPS in the first half of a calendar year, re-table at a later Working Committee meeting (which will be known as an Extraordinary Meeting) some or all of the issues that are normally considered at an Annual Meeting for discussion and re-allocation.
- (e) The Chairperson must give Participants and Disconnected Participants at least 14 days notice of a meeting, or such notice as those entities agree. Such notice must include the agenda, date, time and location of the meeting.
- (f) Any Participant or Disconnected Participant may also convene a meeting on 14 days notice or such other period of notice as those entities agree. Such notice must include the agenda, date, time and location of the meeting.
- (g) Meetings may be held using any technology agreed to in writing by all Participants and Disconnected Participants, for example, teleconference or video conference.
- (h) The quorum for a meeting is four Representatives, which must include the Representative performing the role of Generation Coordinator. If a quorum is not present within 30 minutes of the scheduled start time for the meeting, the meeting is to be adjourned to such time and place that the Representatives present decide. The Chairperson must

ensure that all other Representatives are notified in writing of the date, time and location of the rescheduled meeting.

- (i) The Chairperson, utilising the Secretary, must keep, or arrange to be kept:
 - (i) minutes of the Working Committee meetings; and
 - (ii) records of the Working Committees' reports and recommendations.
- (j) The Secretary must circulate copies of the minutes to all Participants and Disconnected Participants within seven days after the meeting.
- (k) The minutes, reports or recommendations must be made available to all Participants and Disconnected Participants upon their request.
- (l) A copy of any such minutes, reports or recommendations signed by the Chairperson will be taken to be a true record unless the contrary is proven.
- (m) The Participant performing the role of Generation Coordinator, acting reasonably, is entitled to require the Chairperson to:
 - (i) include any matter pertaining to generation co-ordination issues on the meeting agenda;
 - (ii) provide the Generation Coordinator's Representative with reasonable time to present generation co-ordination issues on any matter listed on the agenda; and
 - (iii) provide the Generation Coordinator's Representative with a reasonable opportunity to address the meeting on any relevant matter pertaining to generation co-ordination issues not included on the agenda. However, the Generation Coordinator's Representative will use its best endeavours to ensure that all known relevant matters are on the agenda.

11. VOTING RIGHTS

- (a) Where a decision is to be made by the Working Committee, a consensus is required to carry the vote unless otherwise stated in the Dispatch Protocol or this Charter.
- (b) Subject to Item 11(d) of this Charter, each Representative has one vote (broadly representing the network, Major Power Station or premises), except that:
 - (i) the Participant in the role of Generation Coordinator with two Representatives does not get two votes, but only has one vote for the two Representatives;
 - (ii) the Representative of Participant or Disconnected Participant (as relevant) in the role of Chairperson does not get an additional vote due to being Chairperson;
 - (iii) if EECL and EEQ appoint a single person to be their Representative, that person will have two votes (i.e. one for each Participant); and
 - (iv) if MIM Co and EHM Co appoint a single person to be their Representative, that person will have two votes (i.e. one for each Participant).
- (c) Relevant voting entitlements are set out in Schedule 9 (List of Participants and Disconnected Participants in the NWPS).
- (d) Representatives of:
 - (i) Disconnected Participants in attendance at NWPS Working Committee meetings have voting rights only in relation to decisions of the Working Committee that are directly relevant to the Disconnected Participant's proposed activities;

- (ii) Participants have full voting rights.

12. ROUTINE WORK PROGRAMME

- (a) The Working Committee will establish a routine work programme and budget on a four-year cycle designed to maintain the integrity and good management of the NWPS for the benefit of all Participants.
- (b) An indicative NWPS work programme is outlined below:
 - (i) Year 1 – audit of the LSS;
 - (ii) Year 2 – fault level and relay coordination study;
 - (iii) Year 3 – system stability study and metering review; and
 - (iv) Year 4 – audit of Participants' maintenance programmes relevant to the NWPS.
- (c) This work programme may be repeated for future years.
- (d) At each Working Committee meeting, the Secretary will provide a report detailing:
 - (i) funds received from Participants and Disconnected Participants during the previous quarter;
 - (ii) commitments and payments made during the previous quarter;
 - (iii) funds available; and
 - (iv) activities planned for the following twelve month period.
- (e) At the Working Committee meeting immediately prior to the Annual Meeting, the Generation Coordinator will present and distribute:
 - (i) an annual report setting out a summary of the costs incurred by the Generation Coordinator on behalf of the Working Committee in that financial year (including a comparison of costs incurred against budgeted costs);
 - (ii) reasonable supporting information; and
 - (iii) a proposed annual budget.
- (f) The Working Committee will, at each Annual Meeting, approve the annual budget to carry out the work and request funding from Participants and Disconnected Participants. The Working Committee must use its best endeavours to keep the annual works programme budget to within \$100,000 per year, but may agree a future higher budget to suit the needs of the NWPS at the relevant time.
- (g) For the purposes of the above, Annual Budgets must be proposed at least six months in advance of the commencement of the work programme to allow Participants and Disconnected Participants to make the necessary internal budget commitments.

13. "NON ROUTINE" COSTS

- (a) Where there are any other costs, the following procedure will apply:
 - (i) where a Participant or Disconnected Participant (other than the Generation Coordinator) identifies a cost, that entity must submit a business case (including a budget of cost impacts (to the extent known by that entity at the time)) to the Generation Coordinator;

- (ii) the Generation Coordinator must advise the Working Committee of this business case, circulate the business case, and agree on a meeting with the Working Committee to discuss this business case; and
 - (iii) the Generation Coordinator must, prior to the agreed meeting, submit a proposed budget to the Working Committee for all identified costs (including those submitted pursuant to paragraph (i) but not including those costs that will be covered in the budget for the routine work programme under Item 12 of this Charter).
- (b) The Working Committee will, at that meeting, either approve or not approve the proposed budget of additional costs submitted to the Working Committee pursuant to clause 13(a)(ii). If the Working Committee does not approve the proposed budget, it must give its reasons for this.

14. CONTRIBUTION TO COSTS

The Participants and Disconnected Participants agree that costs incurred in connection with the NWPS shall be allocated among these entities and full Participants on an equitable basis.

To that end:

- (a) clause 2.9(p) of the Dispatch Protocol provides that the costs of changes to the NWPS are borne by the Participant requesting the change;
- (b) clauses 14(g) and 15(f) of the Dispatch Protocol set out the allocation of costs for an independent expert;
- (c) the Working Committee will consider the budgets for the routine works programme and non-routine works and determine an appropriate allocation for the costs amongst the Participants and Disconnected Participants, taking into account the general principles that:
 - (i) the entity that triggers the requirement for the costs should bear those costs;
 - (ii) where the need for costs arises from a general decision of the Working Committee, relevant members of the Working Committee should bear those costs; and
 - (iii) cost allocations should, where appropriate and subject to the above, take into account the relevant benefit being received by each member of the Working Committee.

Schedule 2 – Technical Standards for the NWPS

1. INTRODUCTION

These technical standards have been developed to ensure the safe and reliable operation of the NWPS under all operating conditions. Each Participant's facilities (including related systems and facilities) that are connected to the Supply Network must operate satisfactorily for the full range of variation of system parameters and characteristics, and at the distortions and disturbances, specified in this Schedule.

The technical standards included in the Dispatch Protocol are minimum standards to be applied. Participants may adopt higher standards, provided that these comply with the requirements of the relevant CAA and are approved by the Working Committee.

This Schedule may not be amended without the written consent of all Participants and Disconnected Participants.

2. VOLTAGE AT THE POINTS OF CONNECTION

The Supply Network has been designed to be three phase supply with a nominal frequency of 50 Hz and a nominal voltage of either 132 kV or 220 kV. However, Participants have a key role in controlling voltage and frequency on the Supply Network.

Voltage control at the 132 kV busbars in the "A", "B" and "D" Switchyards shall be the responsibility of the Generation Coordinator (noting that voltage at the "D" Switchyard will be controlled by DPS generation). Voltage control on the 220 kV portions of the Supply Network shall be the responsibility of EECL.

In order for the Generation Coordinator and EECL to control voltage, the Participants must co-operate with and assist these entities by doing each of the following:

- (a) operating their facilities to, and promptly complying with reasonable requests of either the Generation Coordinator or EECL that are designed to assist in, maintaining the voltage of the Supply Network within the range of 90% and 110% of the nominal voltage for normal operating conditions; and
- (b) promptly complying with any reasonable requests of either the Generation Coordinator or EECL to reduce the voltage of the Supply Network below 100% of nominal voltage under light load conditions where this is necessary or desirable in order to assist in reducing high voltage conditions on the Supply Network.

3. VOLTAGE FLUCTUATIONS

Equipment connected to the Supply Network must be designed and operated so that:

- (a) voltage fluctuations at Points of Connection do not, as a whole, exceed those shown in Figure 1 of AS2279, Part 4 for the "Threshold of Perceptibility", except on infrequent occasions and for short intervals of time; and
- (b) voltage fluctuations do not reach the "Threshold of Irritability" defined in AS2279, except during abnormal operating conditions such as where there are voltage dips associated with short circuits caused by faults, and voltage changes associated with unexpected loss of generation plant.

Under fault conditions the voltage in the Supply Network may fall to very low levels for brief intervals. These intervals are often of a duration less than 200 milliseconds, but may be as long as two seconds. It is each Participant's responsibility to ensure that its electrical installations

are capable of withstanding voltage transients due to switching operations or faults (such as by setting protection to trip units if this condition puts them at risk).

4. VOLTAGE CONTROL AND REACTIVE POWER CAPABILITY

Generating Units at Major Power Stations must:

- (a) be continuously capable of supplying or absorbing at the Points of Connection an amount of reactive power of at least 0.395 times the Authorised Demand for export; and
- (b) have excitation control systems sufficient to maintain stable voltage at their Points of Connection to within 0.5% of the voltage set point nominated by the Generation Coordinator.

5. VOLTAGE IMPULSE WITHSTAND LEVEL

All of the equipment associated with each Point of Connection shall be designed to withstand, without damage, the applicable voltage impulse levels specified in Table 1 of AS62271.1 and the range of operating conditions that may arise, in a manner consistent with this Schedule.

6. POWER FACTOR

- (a) Subject to Item 6(b) below, under normal operating conditions:
 - (i) Offtakers will use reasonable endeavours to maintain a Power Factor at the Points of Connection of between 0.80 lagging and unity ("Optimal Power Factor Range"); and
 - (ii) if an Offtaker wishes to maintain a Power Factor at the Points of Connection outside the Optimal Power Factor Range, it must seek the approval of the relevant Network Owner and the Generation Coordinator.
- (b) Notwithstanding Item 6(a) above, even when Participants are operating their assets in accordance with GEOP, variations are likely to occur which will lead to a Power Factor at the Points of Connection of between 0.80 lagging and 0.95 leading.

Where a Power Station contains a UIGU, the relevant Generator must ensure that the Power Factor at the relevant upstream Point of Connection remains between 0.9 lagging and 0 leading.

7. HARMONIC CURRENT DISTORTION

Each Participant must ensure that, when summated at Points of Connection, the harmonic currents for each harmonic frequency do not exceed the levels shown in the table below for more than one hour in any day, and do not exceed twice those levels except for very short periods associated with short circuit faults. In addition, Total Harmonic Current Distortion (%THDI) and the individual harmonic current levels (I_h/I_{h1}) must be limited to values based on the ratio of the short circuit current to the current for the Authorised Demand for import or export to the values shown in the table below during normal operating conditions.

Table 1: Table of Permitted Harmonic Content

Maximum harmonic current at Harmonic, h, as a percentage of the 50 Hz current for the Authorised Demand for import or export						
I_{sc} / I_L	THDI, %max	$I_{h<11} / I_{h1}$ %max	$I_{h11 \text{ to } <17} / I_{h1}$ %max	$I_{h17 \text{ to } <23} / I_{h1}$ %max	$I_{h23 \text{ to } <35} / I_{h1}$ %max	$I_{h>35} / I_{h1}$ %max

< 50	2.5	2.0	1.0	0.75	0.30	0.15
≥ 50	3.75	3.0	1.5	1.15	0.45	0.22
Even harmonics are limited to 25% of the values given above						
I_{sc} = Maximum short circuit current at the summated Points of Connection I_L = Maximum h_1 current for the Authorised Demand for import or export THDI = Total Harmonic Current Distortion						

NOTE: EECL will use a control system within the NWPS of 217 Hz for such functions as tariff control, etc.

8. VOLTAGE UNBALANCE

Each Participant must ensure that its equipment connected to the Supply Network only results in voltage unbalances that comply with each of the following restrictions:

- the voltage unbalance, expressed as the ratio of negative phase sequence voltage to positive phase sequence voltage, must not exceed 1% when averaged over any ten-minute period;
- the voltage unbalance may exceed 2% only on infrequent occasions and for short durations not exceeding one minute in any hour. Such large voltage unbalance may occur as a result of faults, switching operations or transformer energisation; and
- Participants shall provide suitable protection against voltage unbalance to protect their equipment where necessary.

9. FREQUENCY

The nominal operating frequency of the system is 50 Hz. As is the case with voltage on the Supply Network, Participants have a key role in controlling frequency on the Supply Network. Accordingly, Participants must co-operate with the Generation Coordinator to maintain frequency throughout the NWPS and restore system frequency in accordance with the limits presented in the following table. The MLSS may initiate automated load shedding to assist in restoring the frequency on NWPS.

The Generation Coordinator and the Major Power Stations must have Generating Units capable of complying with the minimum requirements of the table below, and must operate those Generating Units in compliance with those requirements.

Table 2: Table of recovery time

Condition	Containment	Stabilisation	Recovery
Accumulated time error	< 15 seconds for 99% of the time		
Normal	49.5 to 50.5 Hz		
Contingency Event	48.5 to 52 Hz	49 to 51 Hz within 5 minutes	49.5 to 50.5 Hz within 10 minutes

10. DISTURBANCE ISSUES

Each Participant acknowledges and agrees that:

- (a) the distortion, fluctuation and unbalance limits specified in this Schedule are specified for NWPS intact operating conditions;
- (b) the distortion, fluctuation and unbalance limits specified in this Schedule will be assessed at each Point of Connection; and
- (c) the respective Network Owner may undertake (or reasonably require to be undertaken) a program of tests to ensure compliance with the relevant limits.

11. SYSTEM DESIGN AND CONSTRUCTION

Each Participant must ensure that:

- (a) all of its electrical equipment associated with, and connected to, each Point of Connection, including earth grid and earthing connections, is designed and constructed to conform to the requirements of the Dispatch Protocol, GEOP, all relevant Laws and Australian Standards relevant to that equipment;
- (b) the earthing of any such equipment complies with the ENA EG1-2006: Substation Earthing Guide (as relevant) to reduce step and touch potentials to safe levels;
- (c) a Point of Connection:
 - (i) has an earth grid dedicated to the Participant's facilities at the Point of Connection;
 - (ii) has satisfactory earthing independent of the rest of the NWPS; and
 - (iii) is installed and maintained in accordance with GEOP;
- (d) any Generating Units are capable of:
 - (i) safe and satisfactory operation in parallel with the Supply Network;
 - (ii) effective and swift disconnection from the Supply Network to prevent injury to persons or damage to equipment; and
 - (iii) safe and effective shutdown in accordance with GEOP without supply from the Supply Network;
- (e) each HV circuit which forms a part of a Point of Connection circuit is capable of being earthed by a suitable fault current rated device. Where the design of the HV electrical apparatus does not allow testing with a voltage detector on all phases to prove the circuit is de-energised before earthing, then the earthing device must have suitably rated fault make earthing capability. For metal clad switchgear that is not withdrawable, this includes:
 - (i) a circuit to bus isolator plus a fault make earth switch; or
 - (ii) a circuit isolator with "test to prove de-energised" facilities for applying an earthing device;
- (f) the Working Committee is provided with the following for any:
 - (i) non-synchronous power electronic converter-based Generating Unit; and
 - (ii) any dynamic device that operates using a phase-locked loop,

- (iii) that will be connected downstream of the relevant Point of Connection;
- (iv) certification from the OEM of any inverter that is part of the abovementioned equipment as to the minimum short circuit ratio at which the Generating Units can reliably operate;
- (v) PSS®E models for pre-test simulation studies (including automatic and manual startup and shutdown control modules) and a Model User Guide;
- (vi) certification from the OEM of any inverter that is part of the abovementioned equipment as to the minimum short circuit ratio at which those PSS®E models are valid for the Generating Units;
- (vii) premises- and Generating Unit/device-specific electromagnetic transient-type simulation modelling (incorporating OEM-specific models, which may be black-box encrypted models) compatible with simulation software PSCAD/EMTDC version 4.6.0 or later and with an Intel Fortran compiler version 11 or later, that are sufficient for the Working Committee to assess the effect of connecting that equipment to the Supply Network, including any impacts on the system strength; and
- (viii) measurement results (from an equivalent facility and plant performance from other installations, laboratory tests, hardware in loop etc.) confirming the validity of the PSCAD vs PSS®E modelling using a set of benchmarking tests of faults and contingency scenarios.

12. PROTECTION OF ELECTRICAL INSTALLATIONS

- (a) Each Participant must implement appropriate measures, including the installation and maintenance of protection and control facilities and switching procedures (developed jointly with the relevant Network Owner) in accordance with GEOP and relevant Australian Standards, to protect the Participant's electrical installations connected to the Supply Network against material disruptions to the quality of electricity, including loss of synchronism, power surges, excursions in voltage outside usual parameters, load reductions or voltage changes due to lightning, switching or earth faults, or single phasing, or any other similar changes, or due to the operation of any protective or auto-reclosing device in the Supply Network.
- (b) Each Participant with a Generating Unit must ensure that such Generating Unit is maintained and operated in accordance with this Schedule and GEOP, and an appropriate maintenance strategy that is developed by the Participant, having regard to the recommendations of the original equipment manufacturer (OEM) of the Generating Units.

13. TECHNICAL STANDARDS FOR ISOLATED POWER STATIONS

Where there is an Isolated Power Station connected downstream of a Participant's Point of Connection, that Participant must ensure that the Isolated Power Station is not Interconnected with the Supply Network without first:

- (a) obtaining the prior written approval of the relevant Network Owner (which approval may be on conditions); and
- (b) ensuring that the Isolated Power Station complies with the relevant requirements of the Dispatch Protocol, including, without limitation:
 - (i) obligations on Small Power Stations or Large Power Station (as relevant); and
 - (ii) if the Interconnection would constitute a Threshold Change, the relevant Threshold Change provisions.

14. TECHNICAL STANDARDS FOR SMALL AND LARGE POWER STATIONS

Small and Large Power Stations must:

15. HAVE SUITABLE PROTECTIVE DEVICES TO DISCONNECT THE POWER STATION FROM THE SUPPLY NETWORK IN THE EVENT THAT AN UPSTREAM FEEDER IS DISCONNECTED FROM A MAJOR POWER STATION;

- (a) operate in parallel with the Supply Network;
- (b) have protection so that operation of the transmission system auto reclosers does not have adverse impacts on them;
- (c) be fitted with AVRs and governors which will operate in synchronism with the Supply Network in a stable manner under all normal operating conditions;
- (d) have protective devices installed and configured to comply fully with the requirements identified in system studies carried out in relation to their installation; and
- (e) have reverse power protection installed so that they cannot export electricity beyond the upstream Point of Connection with the Supply Network (otherwise than as necessarily required for them to operate in parallel with the Supply Network).

16. PROTECTION OF THE SUPPLY NETWORK

Each Participant must ensure that it complies with each of the following that is relevant to their assets:

- (a) its equipment at a Point of Connection is protected by devices and apparatus designed, installed, configured, commissioned, maintained and tested in accordance with this Schedule and GEOP, in order to safely and effectively automatically disconnect any faulty equipment from the NWPS;
- (b) (where the Participant is a Network Owner) design, install, configure, commission, maintain and test protection and control equipment necessary to safely and effectively disconnect faulty equipment from the Supply Network in accordance with the requirements of this Schedule and GEOP. These protective devices must be designed and configured to minimise damage to equipment and to minimise the level of disturbance to the Supply Network during faults;
- (c) (where the Participant owns or operates Major Power Stations, Large Power Stations or Small Power Stations) the protection and control systems for these Power Stations are designed, installed, configured, commissioned, maintained and tested in accordance with the Dispatch Protocol and GEOP;
- (d) (where the Participant owns or operates Major Power Stations or Large Power Stations) the protection and control systems for these Power Stations include protection to detect all faults on the Supply Network, including, but not limited to, earth faults, phase to phase faults, negative phase sequence, and overcurrent faults;
- (e) (where the Participant owns or operates Small Power Stations) the protection and control systems for these are designed, installed, configured, commissioned, maintained and tested to prevent damage from faults or disturbances on the Supply Network, and to disconnect from the Supply Network in the event of Supply Network faults;
- (f) all of the Participant's protection settings are coordinated with the Network Owner's protection systems, and, where relevant, the protection systems of the Network Owner and other users of the NWPS; and

- (g) no alterations to the protection and control equipment relating to a Point of Connection or Generating Units are performed without the Generation Coordinator's prior written consent (such consent not to be unreasonably withheld). The Generation Coordinator will consult with EECL and any other relevant Network Owner in this regard. If any changes involving more than relay settings are approved, and these changes are considered fundamental to the predictability of the protection system, then the whole protection system must be studied and tested in accordance with the applicable Items of Schedule 3 (System Studies and Planning) of the Dispatch Protocol.

17. TESTING INTERVAL FOR PROTECTION SYSTEMS

Each Participant must ensure that:

- (a) equipment constituting its protection system relating to a Point of Connection is subjected to comprehensive periodic testing within the following intervals:
 - (i) systems containing only protection relays or modules, which include self supervision functions, are tested at intervals not exceeding 60 months (or a lesser period agreed between the Participant and the Network Owner); and
 - (ii) systems containing any protection relays or modules, which do not contain self supervision functions, are tested at intervals not exceeding 48 months (or a lesser period agreed between the Participant and the Network Owner);
- (b) the testing referred to above is comprehensive and includes circuit breaker tripping (unless such tripping would result in unacceptable interruption or disruption to the Participant's operations);
- (c) it maintains records of any such testing referred to above;
- (d) it provides prior notice of the testing referred to above to EECL and any other relevant Network Owner; and
- (e) it allows EECL and any other relevant Network Owner to witness these tests.

18. TESTING INTERVAL FOR LOAD SHED SYSTEM

The Generation Coordinator shall coordinate testing of the LSS with Participants at a frequency determined by the Working Committee necessary to demonstrate that reliable operation can be achieved. However, this interval period must not exceed 48 months.

Schedule 3 – System Studies and Planning

1. INTRODUCTION

- (a) This Schedule outlines the procedure to be followed by any Proponent wishing to:
- (i) add or remove (including disconnect) generation capacity or load on the Supply Network where the nameplate rating of the aggregate Generating Units or the quantity of the load exceeds the Threshold Demand;
 - (ii) carry out major reconfigurations of, or augmentations to, the Supply Network;
 - (iii) establish new supply networks forming part of the NWPS;
 - (iv) replace equipment in the NWPS where that equipment has a nominal rating equal to or greater than the Threshold Demand and that equipment is not being replaced with an identical piece of equipment (or a piece of equipment that has the identical electrical characteristics and load of the equipment being replaced);
 - (v) permanently remove a major component of its existing facilities; or
 - (vi) significantly alter the protection and control equipment relating to a Point of Connection or Generating Units.
- each being a Threshold Change.
- (b) The requirements of these procedures are binding. Where a Proponent is responsible for a third party as a Customer, retailer, generator or network provider, that Proponent must ensure that third party's compliance with the Dispatch Protocol (including this Schedule 3).

2. SYSTEM STUDY

- (a) A Proponent wishing to carry out a Threshold Change must conduct a system study using the Dataset, at its cost, which details the relevant equipment the subject of the Threshold Change and considers those parameters that the Working Committee determines (acting reasonably), need to be considered in the circumstances, including, without limitation:
- (i) load and fault levels;
 - (ii) protection requirements;
 - (iii) critical fault clearance times;
 - (iv) steady state and transient stability;
 - (v) governor, AVR and PSS requirements; and
 - (vi) LMS operating time requirements for UIGUs, as per Schedule 11 (Load Management System (LMS)).

and provide the results of this system study to the Working Committee as soon as reasonably practicable (but no later than 6 months prior to the proposed Threshold Change, unless otherwise agreed by the Working Committee), for the Working Committee to consider whether the Threshold Change will comply with the requirements of the Dispatch Protocol.

For the avoidance of doubt, the Working Committee may (acting reasonably) determine that no parameters need to be considered for a particular Threshold Change.

- (b) As part of the establishment of DPS, consultants prepared a power system dataset for the NWPS using data provided by MIM Co and EECL (Dataset). The Generation Coordinator will maintain the Dataset as a current working document in accordance with clause 3.2 of the Dispatch Protocol. Consistent with the practices used for the National Grid, the Dataset will be maintained in a format compatible with PSS@e without conversion.
- (c) To enable system studies to be undertaken, Intending Participants, Participants and Disconnected Participants must provide relevant information relating to the impact of their installations on the Supply Network using the Dataset.
- (d) Proponents are required to provide the results of the internal system studies referred to in Item 2(c) above in PSS@e format to the Generation Coordinator. If necessary, the internal system studies referred to in Item 2(c) above and the Dataset can also be made available in R.A.W. format.
- (e) The Dataset will be located on the EDMS.

3. DEVELOPMENT OBLIGATIONS

- (a) A Proponent proposing to connect or remove equipment, or take any other action, where that action would result in a Threshold Change, must, at its own cost:
 - (i) engage technically qualified personnel to modify and re-run a model using the Dataset over a range of operating scenarios in accordance with GEOP. Once approved by the Working Committee in accordance with this Schedule and implemented by the relevant Proponent, this updated Dataset will become the new Dataset and the basis for the NWPS Model;
 - (ii) adopt all the technical requirements applicable to the development type defined in Schedule 2 (Technical Requirements for the NWPS) of the Dispatch Protocol;
 - (iii) return the updated Dataset in PSS@e format and associated documentation to the Generation Coordinator complete with all additional input and output data; and
 - (iv) provide a full copy of the study with a comprehensive review of the proposed development and its impact on the NWPS to the Working Committee for technical consideration. The study must include a review of both steady state and transient conditions, and must demonstrate that the development will comply with GEOP and the requirements of the Dispatch Protocol.

The Proponent must also bear the costs of any necessary changes to the LSS to appropriately incorporate the Threshold Change.

- (b) A Proponent connecting or removing generation, networks or load below the Threshold Demand (but which could still reasonably be expected to impact fault levels or system stability, integrity or performance) must:
 - (i) comply with the technical requirements listed in Schedule 2 (Technical Requirements for the NWPS);
 - (ii) provide full technical details of their proposal to the Generation Coordinator for inclusion in the NWPS Model. Where deemed necessary by the Working Committee, the Generation Coordinator may, at the Proponent's agreed cost, engage technically qualified personnel to incorporate the necessary changes into the NWPS Model and perform the necessary studies;
 - (iii) pay all directly attributable costs associated with the proposed development; and

- (iv) comply with the technical requirements relating to Large Power Stations or Small Power Stations, as relevant.
- (c) Promptly (and, in any event within 3 months) of receipt by the Working Committee of the updated Dataset referred to in Items 3(a)(i) and 3(a)(iii) above and the system study referred to in Item 3(a)(iv) above, the Working Committee will advise the Proponent wishing to connect equipment, generation, networks or load to the NWPS in writing of the date by which the Working Committee will respond to the request (which will not be unreasonably delayed). If this process does not take place in a timely manner, the Proponent wishing to connect equipment, generation, networks or load to the NWPS may raise its concerns directly with the Working Committee.

Schedule 4 – Metering Requirements

1. INTRODUCTION

This Schedule applies to the metering of electricity only, and governs:

- (a) the metering of electricity flows at Points of Connection;
- (b) the calculation and allocation of energy losses between Participants within the 220 kV portion of the Supply Network; and more detail about allocation between connection points for clarity
- (c) the use of Metering Data for:
 - (i) the Energy Balance Agreement between the Major Generators;
 - (ii) a Major Generator's billing purposes under the PPAs and ESAs; and
 - (iii) a Network Owner's billing purposes under the CAAs.

2. BACKGROUND

On and from the 2014 Effective Date, EECL is the Responsible Person, Metering Provider and MDP in respect of metering at all Points of Connection for the portions of the Supply Network owned by EECL. In addition, EECL is the Responsible Person, Metering Provider and MDP in respect of the Points of Connection between the "D" Switchyard and the "B" Switchyard. This may be changed in accordance with the Metering Obligations.

DPS Co is the Responsible Person in respect of metering at the Points of Connection for the portions of the Supply Network owned by DPS Co, with the exception of the metering at the Points of Connection between the "D" Switchyard and the "B" Switchyard. On and from the 2014 Effective Date, Metering Dynamics is engaged by DPS Co to be the Metering Provider and MDP at the Points of Connection for which DPS Co is the Responsible Person.

Any future Network Owner in the NWPS will be responsible, in respect of any part of the Supply Network for which it is responsible, for appointing a Responsible Person, Metering Provider and MDP to meter all relevant Points of Connection on those parts of the Supply Network.

3. METERING INSTALLATIONS AND METERING PROVIDERS

Each Responsible Person may enter into a separate agreement with a Metering Provider for the provision, operation and maintenance of Metering Installations in accordance with the Metering Obligations. However, if the Metering Provider or MDP is not a Participant (e.g. Metering Dynamics), the Responsible Person that engages the Metering Provider or MDP is ultimately responsible for ensuring that the Metering Provider or MDP complies with the Dispatch Protocol, uses the Metering Data (and any other Confidential Information) only for tasks necessary to implement requirements of the Dispatch Protocol, and does not disclose any Confidential Information.

Note that the Metering Obligations require Metering Installations to be inspected and checked on a five- or ten-year basis, and these inspections may result in an interruption of the supply of electricity across the relevant Point of Connection. As at November 2016, these require:

- (a) a maximum allowable level of testing uncertainty as set out below (refer Table S7.3.1 of the National Electricity Rules):

Description		Metering equipment class				
		Class 0.2	Class 0.5	Class 1.0	General Purpose	Class 2.0
In Laboratory	CTs ratio phase	0.05% 0.07 crad	0.1% 0.15 crad	n/a	n/a	n/a
	VTs ratio Phase	0.05% 0.05 crad	0.1% 0.1 crad	n/a	n/a	n/a
	Meters Wh	0.05/cosφ%	0.1/cosφ%	0.2/cosφ%	0.2/cosφ%	n/a
	Meters varh	n/a	0.2/sinφ%	0.3/sinφ%	n/a	0.4/sinφ%
In Field	CTs ratio Phase	0.1% 0.15 crad	0.2% 0.3 crad	n/a	n/a	n/a
	VTs ratio Phase	0.1% 0.1 crad	0.2% 0.2 crad	n/a	n/a	n/a
	Meters Wh	0.1/cosφ%	0.2/cosφ%	0.3/cosφ%	0.3/cosφ%	n/a
	Meters varh	n/a	0.3/sinφ%	0.4/sinφ%	n/a	0.5/sinφ%

(b) a maximum period between tests as set out below (refer Table S7.3.2 of the National Electricity Rules):

Description	Metering Installation Type				
	Type 1	Type 2	Type 3	Type 4	Types 5 & 6
CT	10 years	10 years	10 years	10 years	10 years
VT	10 years	10 years	10 years		n/a
Burden tests	When <i>meters</i> are tested or when changes are made				
CT connected Meter (electronic)	5 years	5 years	5 years	5 years	5 years
CT connected Meter (induction)	2.5 years	2.5 years	5 years	5 years	5 years
Whole current Meter	The testing and inspection requirements must be in accordance with an asset management strategy. Guidelines for the development of the asset management strategy must be recorded in the <i>metrology procedure</i> .				

Each Responsible Person is responsible for their Metering Provider fitting their relevant Points of Connection with Metering Installations in accordance with the Metering Obligations, and otherwise ensuring that those Metering Providers comply with the obligations on Metering Providers under those Metering Obligations. Each Metering Installation must be capable of measuring electricity flows across the Points of Connection in both directions. As at the 2014 Effective Date and Effective Date, the Metering Obligations require Metering Installations to be at least Type 2 Metering Installations.

For the avoidance of doubt, the virtual metering arrangement that previously applied in respect of the "B" Switchyard has been replaced with metering compliant with the Metering Obligations,

and, accordingly, the grandfathering provisions that previously applied in this area no longer apply.

The Metering Provider must operate, maintain, test, calibrate, repair, replace and remove Metering Installations in accordance with the Metering Obligations.

Each Participant consents to the Metering Providers for their Points of Connection accessing the relevant Metering Installations for any relevant purpose, including complying with the Metering Obligations (provided that the Metering Provider provides reasonable notice of its intended access to, and complies with the reasonable requirements and directions of, the owner of the relevant Metering Installations and the party in control of those premises, including entering into an access arrangement to specify the relevant site access conditions if requested). Each relevant Participant, Metering Provider and MDP must cooperate to allow the Metering Provider to carry out its relevant obligations under the Metering Obligations.

Any discrepancies in the operation of Metering Installations are to be dealt with:

- (c) in accordance with the Metering Obligations; and
- (d) where relevant and practicable, taking into account any provisions of the relevant PPAs, ESAs and CAAs (provided that the relevant parties to those agreements must give the Metering Provider copies of these relevant provisions).

The Generation Coordinator will maintain a comprehensive schematic and table of Metering Installations in the NWPS (containing each Metering Installation's name, serial number, function, location and owner/Responsible Person) and will make this schematic and table available to Participants via the EDMS. Each Participant and Disconnected Participant must give the Generation Coordinator sufficient information to allow it to maintain this schematic and table.

4. METERING DATA AND MDP OBLIGATIONS

Each MDP is responsible for collecting and managing Metering Data from their relevant Points of Connection in accordance with the Metering Obligations, and otherwise must comply with obligations on MDPs under those Metering Obligations.

Each MDP must disclose Metering Data in accordance with the relevant agreements between the parties and as follows:

- (a) half-hourly data in NEM12 format must be delivered on a daily basis to the Generation Coordinator for the purposes of the Energy Balance Agreement;
- (b) to Major Generators for the purposes of charging for the use of electricity generated and quantifying energy balance;
- (c) to the relevant Network Owner for the purposes of charging for the use of its portion of the Supply Network;
- (d) in respect of a Point of Connection to the entities that are connected to each other at that Point of Connection; and
- (e) otherwise as requested by a Participant for the purposes of billing or audit.

Each Participant consents to MDPs for their Points of Connection:

- (a) accessing the Metering Installations for those Points of Connection for any relevant purposes, including complying with the Metering Obligations (provided that the MDP provides reasonable notice of its intended access to, and complies with the reasonable requirements and directions of, the owner of the relevant Metering Installations and the party in control of those premises, including entering into an access arrangement to specify the relevant site access conditions if requested); and

- (b) accessing the Metering Data from those Metering Installations for any relevant purposes, including complying with the Metering Obligations and disclosure of the Metering Data as set out above.

Each relevant Participant, Metering Provider and MDP must cooperate to enable an MDP to carry out its relevant obligations under the Metering Obligations.

Any discrepancies in Metering Data are to be dealt with:

- (a) in accordance with the Metering Obligations; and
- (b) where relevant and practicable, taking into account any provisions of the relevant PPAs, ESAs and CAAs (provided that the relevant parties to those agreements must give the MDP copies of these relevant provisions).

5. ENERGY BALANCE

As at the 2014 Effective Date and Effective Date, the Major Generators are party to an Energy Balance Agreement, under which the Generation Coordinator uses certain energy balance software, together with half-hourly Metering Data in respect of all Points of Connection, to:

- (a) determine the energy interchange imbalance between Major Generators for each 24-hour period (from midnight to midnight); and
- (b) reconcile the energy generated by each Major Generator relative to the energy consumption and losses of their contracted Offtakers and Customers for each calculation period.

Each Participant consents to the Major Generators:

- (a) accessing the half-hourly NEM12 data in respect of their Points of Connection; and
- (b) using that data,

as described above.

6. ALLOCATION OF LOSSES

6.1. Loss calculations required for NWPS Supply Network

Electrical energy losses are incurred in the conveyance of the electricity through the Supply Network from relevant Power Stations to Offtakers, such as through line and transformer losses and due to auxiliary loads. As not all of the relevant points in the Supply Network are metered, these losses need to be calculated and then appropriately allocated to relevant Offtakers.

6.2. Loss allocation principles

The aim is to determine the share of MW losses attributed to each Offtaker using the 220 kV portion of the Supply Network and the "B" and "C" Switchyards.

To the maximum extent possible, losses will be allocated on a "causer" basis. Losses associated with assets dedicated to individual or groups of Offtakers and Customers will be allocated to those Offtakers and Customers before wider allocations are made.

6.3. Types of losses

For the purposes of this Schedule and the Dispatch Protocol generally:

- (a) "Load Losses" are losses that occur when energy is passed through electrical equipment (such as transformers and transmission lines) as part of delivery to an Offtaker or Customer;
- (b) "No Load Losses" are losses that occur when there is electrical equipment (such as transformers and transmission lines) energised on the system that are not delivering energy, including in relation to auxiliary supplies; and
- (c) "Load Losses" and "No Load Losses" shall be calculated and allocated separately in accordance with the relevant MDP's processes and procedures.

6.4. No loss calculations required for 132 kV or lower portions of Supply Network

As at the 2014 Effective Date and Effective Date, no loss calculations are required for the 132 kV or lower portions of the Supply Network, as the Metering Installations for Points of Connection to those portions of the Supply Network are correctly located to accurately record electricity flows across those Points of Connection.

All new Metering Installations for any Points of Connection to 132 kV or lower portions of the Supply Network must be correctly located to accurately record electricity flows across those Points of Connection.

6.5. Responsibility for determining losses in 220 kV portions of Supply Network

As at the 2014 Effective Date and Effective Date, the Responsible Person for the Points of Connection to the 220 kV portion of the Supply Network is responsible for carrying out the following determinations (which it may do by arranging for an MDP to do this):

- (a) calculation of the total energy losses within that portion of the Supply Network;
- (b) the allocation of those energy losses to relevant Points of Connection; and
- (c) loss-adjusted loads for those Points of Connection.

so as to ensure that there are no abnormally large losses that may indicate a metering issue. This process must be undertaken in accordance with the Metering Obligations and the principles to be provided by EECL (and approved by the Working Committee).

Loss calculation and energy reconciliation are to be undertaken on a half-hourly basis, and aggregate statements are to be issued to the relevant Participants on a monthly basis.

The relevant Responsible Person must ensure that the relevant calculations are transparent and auditable, including by:

- (a) documenting and implementing an energy loss calculation and allocation process that ensures that calculations are made in a repeatable and auditable manner in accordance with the principles in the Metering Obligations and GEOP; and
- (b) establishing and maintaining a register that records, for each Point of Connection included in the allocation process:
 - (i) a unique identifier for each Metering Installation at the Point of Connection;
 - (ii) the Offtaker responsible for the Point of Connection; and
 - (iii) the Generator responsible for the Point of Connection.

The Working Committee may agree to transfer the responsibility for making determinations, or terminate the obligation to carry out these determinations, but this requires a minimum of 12 months' notice and the Working Committee must be satisfied (acting reasonably) that:

- (a) in the case of transfer, alternative processes are implemented to permit appropriate liaison between the MDP and the person to be responsible for these determinations; and
- (b) in the case of termination of the obligation, that alternative processes will be implemented to ensure the accuracy of Metering Data in the 220 kV portions of the Supply Network.

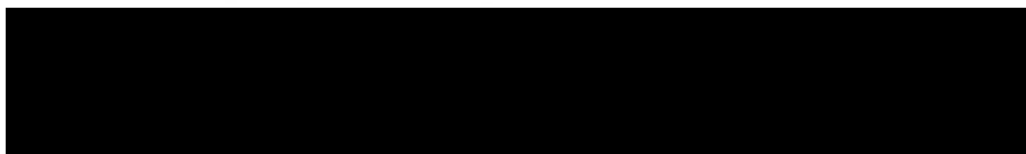
The relevant Responsible Person must carry out its obligations under this Item with appropriate ring-fencing from any related retail or generation roles.

6.6. Disclosure by Responsible Person of loss determinations

The entity responsible for carrying out the determinations referred to in Item 6.5 above must:

- (a) disclose those determinations to relevant Participants who request them, but only to the extent that they apply to the relevant Participant's operations or the operation of the Dispatch Protocol; and
- (b) provide loss-adjusted Metering Data for switchyard inputs and outputs in a format suitable for review by Participants.

6.7. Terminal points



6.8. Parameters to be measured

- (a) At each Point of Connection where an Offtaker connects to the 220 kV portion of the Supply Network (**Offtaker Point**), the Responsible Person will measure and record the following parameters for each half-hourly period in the relevant month:

Metered Values	
MW, MVar	(½ hourly average demand)
GWh	(Energy received)

- (b) At each point where the Major Generators export electricity into the 220 kV portion of the Supply Network (**Generator Point**), the Responsible Person will measure and record the following parameters for each half-hourly period in the relevant month:

Metered Values	
MW, MVar	(½ hourly average demand)
GWh	(Energy delivered)

6.9. Metering discrepancies

There will always be metering discrepancies between the calculated energy and demand sent by the Major Generators (e.g. Offtaker energy plus losses) and that measured at the Generator Points. This is because of:

- (a) metering discrepancies because of slight differences in metering systems accuracy at Offtaker Points and Generator Points;
- (b) dynamic changes in losses as the system voltage fluctuates;

- (c) changes in line resistance value with operating temperature, which is dependent on ambient temperature and load;
- (d) inaccuracies in representing elements in the loss calculation algorithms; and
- (e) changes in transformer losses on different voltage tapping positions.

Accordingly, the calculated percentage energy and demand of the individual Offtakers is applied to the actual metered energy and demand (respectively) set out at the Generator Points.

Any significant discrepancy between the calculated total usage and the actual total metered usage at the Generator Points must be investigated, and a new base case study undertaken if necessary.

Alternatively, if there are prolonged variations in load patterns within the month, it may be necessary to determine the losses for a number of intervals within each month.

6.10. Formula for calculating losses

$$\text{Losses } L\% = \frac{(\text{Energy sent out in a month}) - (\text{Energy received in a month})}{\text{Energy sent out in a month}} \times 100$$

- (a) The total energy and demand sent by the Major Generators to all Offtakers on the 220 kV portion of the Supply Network (e.g. losses plus consumption for all Offtakers) are calculated.
- (b) The percentage energy and demand allocation are calculated for each Offtaker as a ratio of the (loss + metered usage) to the calculated total energy usage and demand sent out by the Major Generators to all Offtakers on each circuit. These percentage figures are applied to the total energy and demand measured at the Generator Points to determine the actual energy and demand for which each Offtaker shall be billed.

Each Offtaker's share of the losses for a half-hourly interval is the sum of the relevant shares of the transformer load losses, line load losses and no load losses, where the individual components are determined using the principles below.

- (a) An Offtaker's share of load losses across a transformer is determined as set out below.

The Total Load Losses across a particular transformer (Tx_1) are determined using the formula below:

$$TLL_{Tx_1} \text{ Load Losses across } Tx_1 = 3 \times I_{Tx_1}^2 \times R_{Tx_1}$$

where:

TLL_{Tx_1} is the total load losses across Tx_1 ;

3 represents the total across each phase;

I_{Tx_1} is the total current flow through Tx_1 ; and

R_{Tx_1} is the resistance of Tx_1 .

As a general rule, where the load on that transformer is shared by more than one Offtaker, a particular Offtaker's (Offtaker₁) share of those Total Load Losses is then determined using the formula below:

$$\text{Offtaker}_1 \text{ Share}_{Tx_1} = TLL_{Tx_1} \times \frac{I_{\text{Offtaker}_1}}{I_{\text{Offtaker}_1} + I_{\text{Offtaker}_2} + I_{\text{Offtaker}_3}}$$

where:

Offtaker₁Share_{Tx1} is Offtaker₁'s share of the TLL_{Tx1}; and

I_{Offtaker} is the metered load for a particular Offtaker.

The situation is a little different for the "C" Switchyard, as the Offtaker loads across each of the two 220/132 kV transformers are not separately metered (but rather, only metered at their relevant Point of Connection). Accordingly, for those transformers, each Offtaker's share of the total load losses across a "C" Switchyard transformer is determined using the formula below. The load losses for each of the two "C" Switchyard transformers then need to be summated.

$$\text{Offtaker}_1 \text{Share}_{\text{C}^{\text{Switchyard Tx1}}} = 3 \times I_{\text{C}^{\text{Switchyard Tx1}}}^2 \times R_{\text{C}^{\text{Switchyard Tx1}}} \times \frac{I_{\text{Offtaker}_1}}{I_{\text{Offtaker}_1} + I_{\text{Offtaker}_2} + I_{\text{Offtaker}_3} + I_{\text{Offtaker}_4} + I_{\text{Offtaker}_5}}$$

where:

Offtaker₁Share_{C^{Switchyard Tx1}} is Offtaker₁'s share of the total load losses over the "C" Switchyard's 220/132 kV transformer;

I_{C^{Switchyard Tx1}} is the metered current flow through the "C" Switchyard's 220/132kV transformer;

R_{C^{Switchyard Tx1}} is the resistance of the "C" Switchyard's 220/132kV transformer; and

I_{Offtaker} is the metered load for a particular Offtaker.

- (b) An Offtaker's share of load losses for a particular segment of 220 kV line is determined as set out below. The load losses for each segment between the "C" Switchyard and the Offtaker's Point of Connection need to be summated.

The Total Load Losses across a particular segment of line (LineSeg₁) are determined using the formula below:

$$\text{Total Load Losses across LineSeg}_1 = 3 \times I_{\text{LineSeg}_1}^2 \times R_{\text{LineSeg}_1}$$

where:

TLL_{LineSeg1} is the total load losses across LineSeg₁;

3 represents the total across each phase;

I_{LineSeg1} is the total current flow through LineSeg₁; and

R_{LineSeg1} is the resistance of LineSeg₁.

Where the load on that line segment is shared by more than one Offtaker, a particular Offtaker's (Offtaker₁) share of those Total Load Losses is then determined using the formula below:

$$\text{Offtaker}_1 \text{Share}_{\text{LineSeg}_1} = \text{TLL}_{\text{LineSeg}_1} \times \frac{I_{\text{Offtaker}_1}}{I_{\text{Offtaker}_1} + I_{\text{Offtaker}_2} + I_{\text{Offtaker}_3}}$$

where:

Offtaker₁Share_{LineSeg1} is Offtaker₁'s share of the TLL_{LineSeg1}; and

I_{Offtaker} is the metered load for a particular Offtaker.

- (c) The Offtaker's share of relevant no load losses is determined using the principles set out below:
- (i) total no load losses will be calculated as the measured losses less the calculated load losses;
 - (ii) the no load losses will be attributed solely to the 220 kV portion of the Supply Network; and
 - (iii) the calculated no load losses will be allocated in accordance with the following formula (which uses the principle that, for common sections of a 220 kV portion of the Supply Network, the loss attributed to that section is divided equally across the number of 220 kV loads that are ultimately supplied by that portion of line):

The percentage (%) of calculated no load losses allocated to Offtaker1 is:

$$\frac{X}{(N_A \times A) + (N_B \times B) + (N_C \times C) + (N_D \times D)} \times 100$$

where:

X = total length (in km) of 220 kV line between the "C" Switchyard and the Offtaker's Point of Connection;

A, B, C, D = length of 220 kV line segments on the Supply Network (in km)

N_A = Number of Offtakers supplied from line segment A

N_B = Number of Offtakers supplied from line segment B

N_C = Number of Offtakers supplied from line segment C

N_D = Number of Offtakers supplied from line segment D

7. REPORTING FOR NWPS

Within three business days of the end of each month, each MDP responsible for a Point of Connection must use its best endeavours to issue to each relevant Generator and Offtaker:

- (a) a monthly statement in the standard meter data agent format (which will be in the same or similar format as issued by the Generation Coordinator's software program), showing:
 - (i) the Point of Connection identifier;
 - (ii) the relevant Generator;
 - (iii) the relevant Offtaker;
 - (iv) the meter numbers relevant to the Point of Connection;
 - (v) the start and end dates and time for the period covered by the statement;
 - (vi) for the period covered by the statement:
 - (A) total energy transferred at the Point of Connection (kWh);
 - (B) maximum demand recorded at the Point of Connection (kW);
 - (C) "Load Losses" allocated to the Point of Connection (kWh);
 - (D) "No Load Losses" allocated to the Point of Connection (kWh); and

- (vii) total energy allocated to the Point of Connection, including losses (kWh); and
- (b) where a Point of Connection has import and export metering, both sets of values shall be provided; and

7.2. an electronic file containing:

- (a) the Point of Connection identifier;
- (b) for each half hour for each Point of Connection covered by the statement above:
 - (i) demand in kW;
 - (ii) reactive power (in kVAr);
 - (iii) energy transferred (kWh);
 - (iv) "Load Losses" allocated to the Point of Connection during the month (kWh);
 - (v) "No Load Losses" allocated to the Point of Connection (kWh); and
 - (vi) total energy transferred (kWh); and
- (c) where a Point of Connection has import and export metering, both sets of values must be provided.

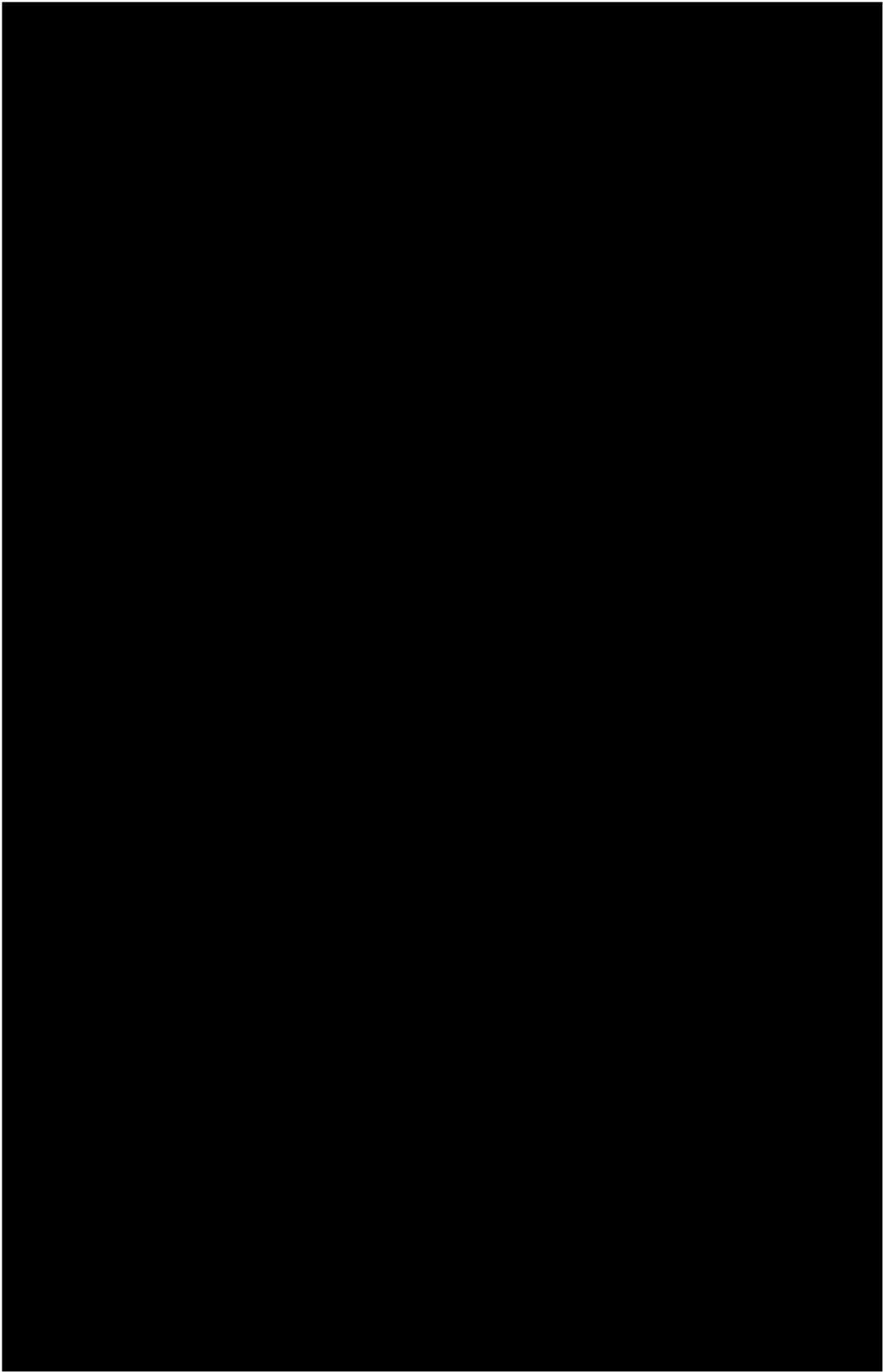
The MDP will use AEMO Meter Data File Format Specification NEM12 as specified by AEMO. This will ensure that all meter data files are in a format suitable for input into the loss and allocation assessment.

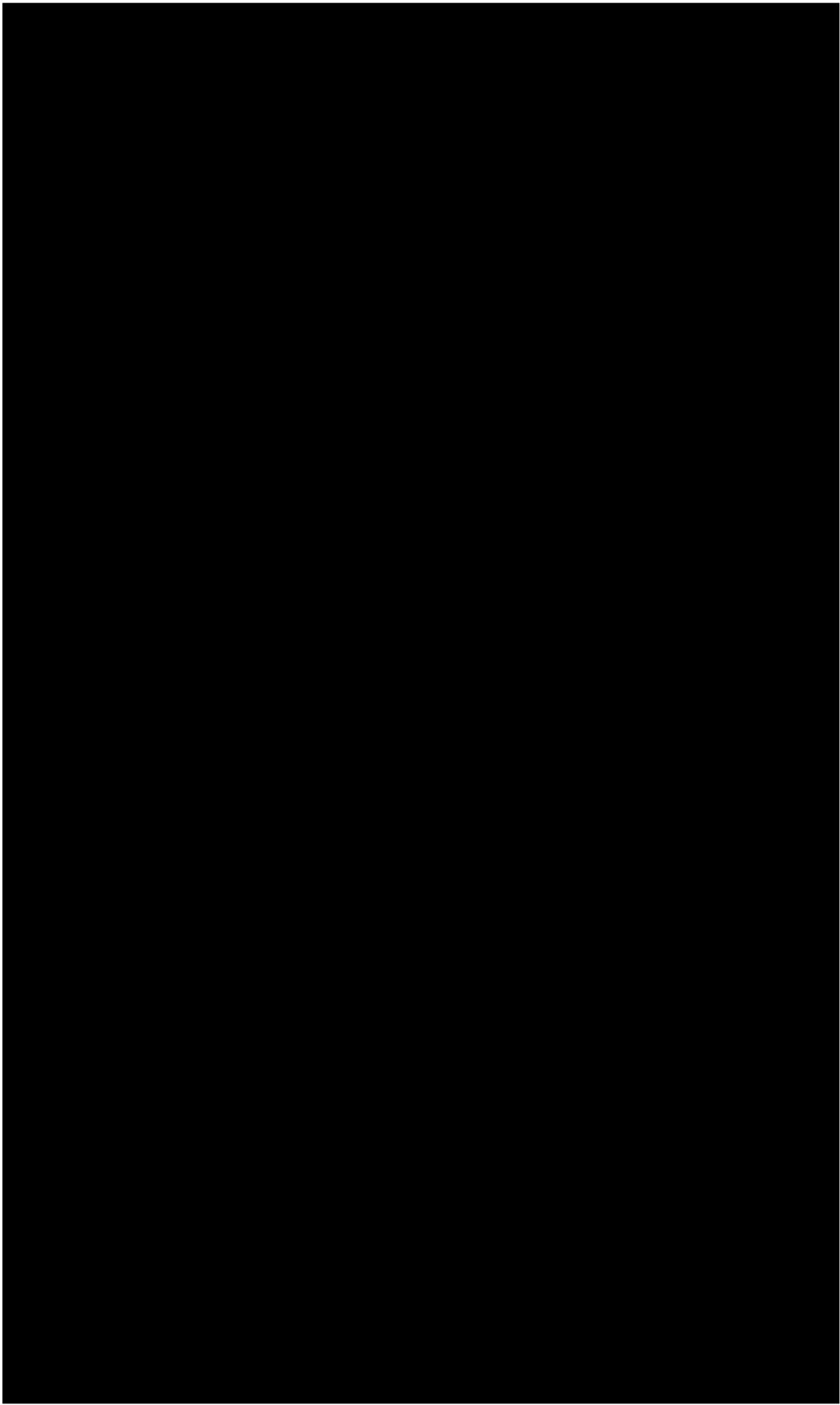
8. RIGHT TO AUDIT

- (a) In the event of a potential discrepancy in the operation of Metering Installations or in Metering Data, Participants must contact the relevant Metering Provider or MDP (as relevant) to resolve these concerns.
- (b) Participants have the right to request an independent audit of the loss allocation process and its outputs.
- (c) The auditor:
 - (i) must be acceptable to both the Participant and the relevant MDP;
 - (ii) will be entitled to access all information necessary to calculate the Participant's energy allocation over the period specified in the audit request; and
 - (iii) must maintain the confidentiality of any other Participant information provided during the audit.
- (d) The cost of the audit shall be borne by the initiating Participant (or as otherwise recommended by the auditor).

Table 3: Table of metering information

A solid black image with no visible content.





Schedule 5 – Forecast Data Format

The Participants agree that the nomination forms in this Schedule are indicative only and that the Working Committee may advise alternative indicative nomination forms from time to time.

1. DAILY FORECASTS – SECOND AND SEVENTH CONTRACT DAY

Forecast sheets are due to be delivered by email to the Generation Coordinator by 21.00 hours each day.

Daily Forecast for Offtaker for Contract Day DD/MM/YYYY		
Time	Total MWh	Maximum half hourly demand MW ¹
0800		
0830		
0900		
0930		
1000		
1030		
1100		
1130		
1200		
1230		
1300		
1330		
1400		
1430		
1500		
1530		
1600		
1630		
1700		
1730		
1800		
1830		
1900		
1930		
2000		
2030		
2100		

¹ EEQ does not have the capability to provide maximum half hourly demand MW data (being instantaneous peak demand). Instead of providing the maximum half-hourly demand MW, EEQ may provide a figure that represents the average of the MW demand applicable to the relevant half-hourly period.

Daily Forecast for Offtaker for Contract Day DD/MM/YYYY		
Time	Total MWh	Maximum half hourly demand MW ¹
2130		
2200		
2230		
2300		
2330		
0000		
0030		
0100		
0130		
0200		
0230		
0300		
0330		
0400		
0430		
0500		
0530		
0600		
0630		
0700		
0730		

2. DAILY FORECASTS – SECOND AND SEVENTH CONTRACT DAY – UIGUS AND LMS ONLY

Forecast sheets are due to be delivered by email to the Generation Coordinator by 21.00 hours each day.

Daily Forecast for UIGUs and LMS for Contract Day DD/MM/YYYY						
Time	MWh			Maximum half hourly demand MW		
	UIGUs	LMS	Total	UIGUs	LMS	Total
0800						
0830						
0900						
0930						
1000						
1030						
1100						
1130						
1200						

Daily Forecast for UIGUs and LMS for Contract Day DD/MM/YYYY						
Time	MWh			Maximum half hourly demand MW		
	UIGUs	LMS	Total	UIGUs	LMS	Total
1230						
1300						
1330						
1400						
1430						
1500						
1530						
1600						
1630						
1700						
1730						
1800						
1830						
1900						
1930						
2000						
2030						
2100						
2130						
2200						
2230						
2300						
2330						
0000						
0030						
0100						
0130						
0200						
0230						
0300						
0330						
0400						
0430						
0500						
0530						
0600						

Daily Forecast for UIGUs and LMS for Contract Day DD/MM/YYYY						
MWh				Maximum half hourly demand MW		
Time	UIGUs	LMS	Total	UIGUs	LMS	Total
0630						
0700						
0730						

3. MONTHLY FORECASTS

Monthly forecasts are due to be delivered by email to the Generation Coordinator on the 15th day of the month preceding the month of forecast.

Monthly Energy Forecast for Offtaker for [Month] [Year]		
Date (Day of Month)	Total MWh	Maximum half hourly demand MW ²
1 [Month]		
2 [Month]		
3 [Month]		
4 [Month]		
5 [Month]		
6 [Month]		
7 [Month]		
8 [Month]		
9 [Month]		
10 [Month]		
11 [Month]		
12 [Month]		
13 [Month]		
14 [Month]		
15 [Month]		
16 [Month]		
17 [Month]		
18 [Month]		
19 [Month]		
20 [Month]		
21 [Month]		
22 [Month]		
23 [Month]		
24 [Month]		
25 [Month]		

² Refer to footnote 1.

Monthly Energy Forecast for Offtaker for [Month] [Year]		
26 [Month]		
27 [Month]		
28 [Month]		
[29 [Month]]		
[30 [Month]]		
[31 [Month]]		

4. YEARLY FORECASTS

Yearly forecast are due to be delivered by email to the Generation Coordinator prior to the end of August in the year prior to the year of forecast.

Yearly Energy Forecast for Offtaker for [Year]		
Month	Total MWh	Maximum half hourly demand MW ³
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

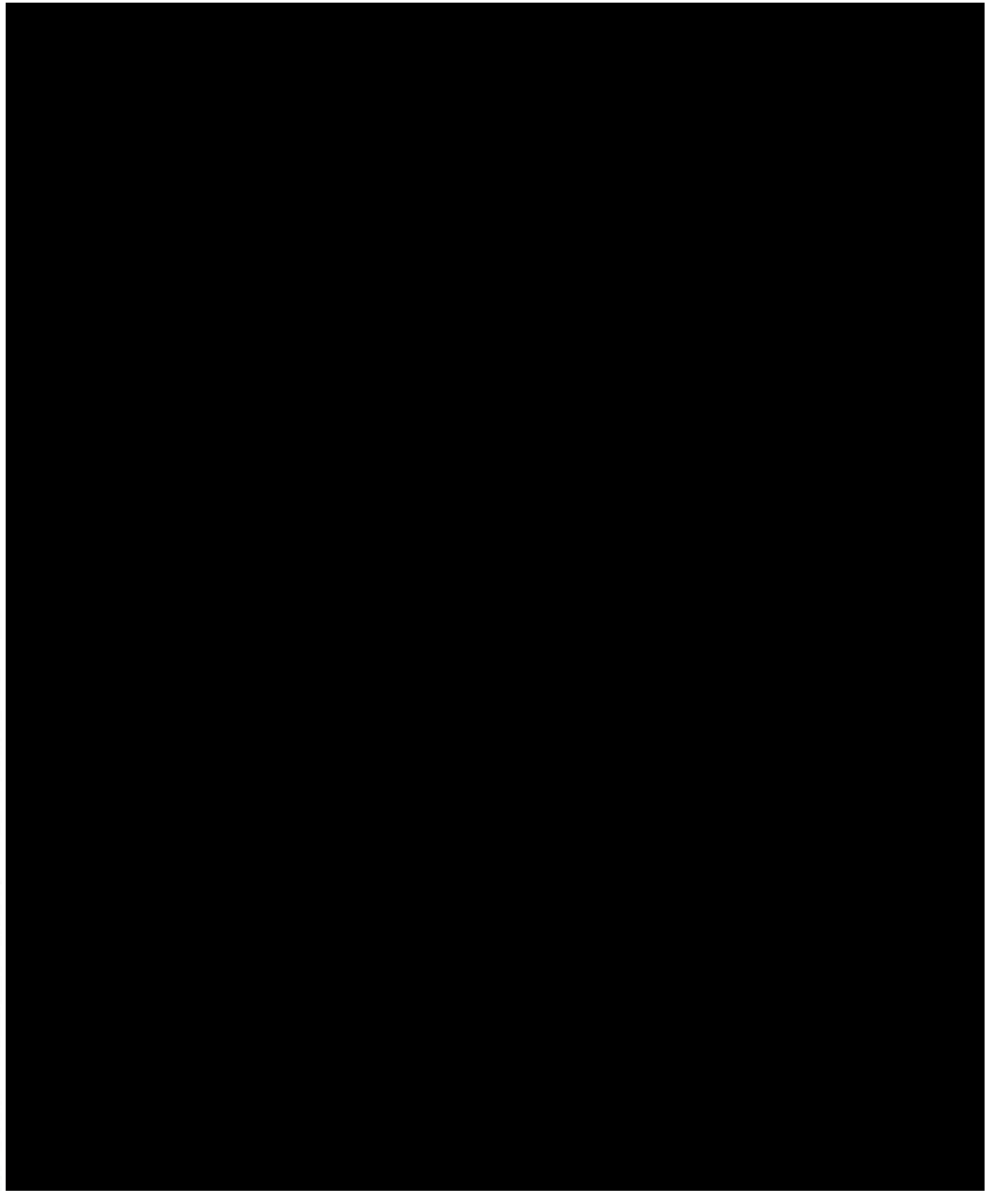
5. FUTURE 4-YEAR FORECAST

Future years beyond current	Projected MWh	Projected maximum half hourly demand MW ⁴
+1		
+2		
+3		
+4		

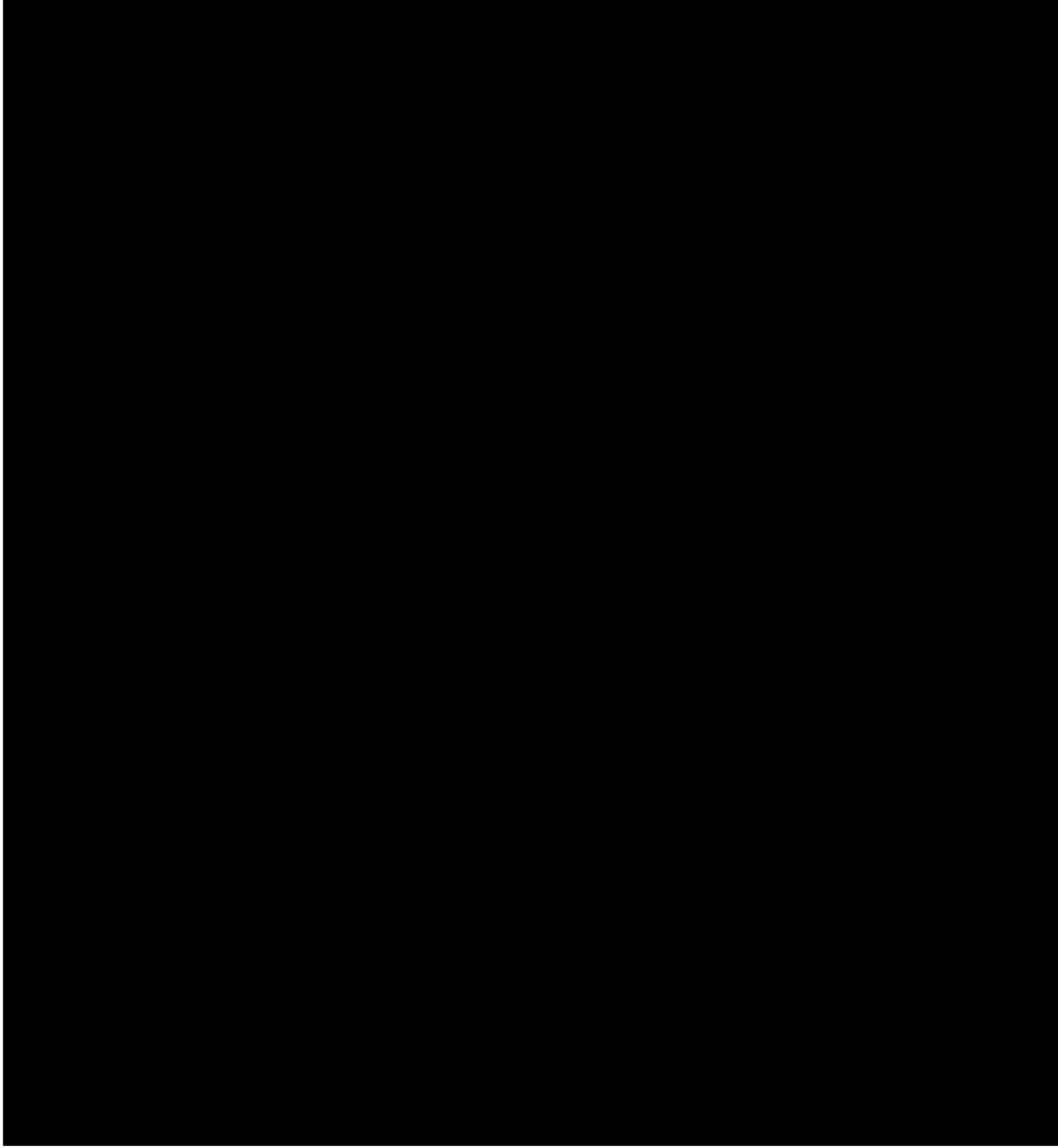
³ Refer to footnote 1.

⁴ Refer to footnote 1.

Schedule 6 – Key Contact Details

Participant	
Stanwell	
Mica Creek Power Station	
APA	
Diamantina Power Station	
ERGON Energy Corporation Limited EECL	

ERGON Energy Queensland EEQ
Minerals and Metals Group
Glencore
Ernest Henry Mine
Mount Isa Mines
Capricorn Copper
Mt Gordon
Lady Annie Mine
APA Group
Mt Isa Gas Gate Station
Carpentaria Pipeline
Metering Provider – Energex



Metering Provider – Ergon Energy

Schedule 7 – Load Shedding System (LSS)

1. INTRODUCTION

The purpose of this Schedule is to set out:

- (a) the need for a LSS;
- (b) an overview of the LSS;
- (c) the impact of PPAs & ESAs on the LSS process;
- (d) the principles for shedding loads, in relation to sharing the impacts on a Major Generator fairly among its Offtakers;
- (e) the function of the LSS, which is to provide protection against the collapse of the generation system in the NWPS;
- (f) examples to illustrate load shedding operations; and
- (g) how the LSS will function.

2. NWPS SUPPLY CONTRACTS AND COMMERCIAL CONSIDERATIONS

Where the cause of the load shedding is readily ascertainable, the LSS (excluding the Load Encroachment and FILS processes) is designed to reflect, as far as practicable, the commercial supply obligations of each of the Major Generators. Thus:

- (a) in the event of a MCPS-initiated generator trip, the LSS will shed those loads contracted to and supplied by MCPL; and
- (b) in the event of a DPS-initiated generator trip, the LSS will shed those loads contracted to and supplied by DPS Co.

For the PLS to be effective, each contracted Offtaker must make available to the LSS an amount of capacity to be load shed, where the Load Shed Blocks are sized to match the size of the respective generation blocks within their contracted Major Generator.

3. MASTER LOAD SHEDDING SYSTEM (MLSS)

The MLSS, which is installed at DPS, takes account of the changes to generation, transmission interconnections and Offtaker and Generator Customer supply agreements. The MLSS will operate to sustain NWPS integrity by shedding Offtaker load.

DPS Co confirms that:

- (a) the LSS functional specification is; and
- (b) the LSS will perform,

in accordance with the Dispatch Protocol.

4. THE NEED FOR LOAD SHEDDING

The purpose of the LSS is to minimise the need for the NWPS to operate large quantities of Spinning Reserve to protect the NWPS from collapse in the event of Contingency Events. This

allows the NWPS to operate with lower installed Generating Unit capacity than would otherwise be required, and hence reduces the capital costs borne by all Participants.

Following a Contingency Event, it is usually necessary to rapidly attempt to restore the NWPS to a stable state by activating an automatic LSS. This will require some interim loss of electricity supply to Offtakers. The alternative of taking no action is likely to result in larger load losses to Offtakers and more Generating Units being disconnected, resulting in longer reconnection times.

The key elements of any system required to respond to Contingency Events are fast speed of response, and the ability to take progressive action in discrete steps to restore stability to minimise the extent of the necessary disruption to Offtakers.

5. DESCRIPTION OF THE NWPS LSS

The LSS consists of a number of components, each with specific functions, which are all designed to allow the NWPS to operate safely and reliably without the need to operate substantial levels of Spinning Reserve. The function of the LSS components is to disconnect loads in an orderly manner so that the generation capacity available to the Supply Network during a shortfall of generation event is adequate to maintain stability of the NWPS.

All Participants who consume electricity from the NWPS must provide 50% (or such other amount that is agreed by the Working Committee) of their Authorised Demand to be available to be shed through the LSS.

5.1. Components and Functions

(a) Summary

In brief, at a high level:

- (i) Load Encroachment load shedding is a time-delayed process used to manage slow encroachments of load levels, and Proactive LSB1 is dedicated to managing Load Encroachment Events;
- (ii) Proactive Load Shedding applies for Major Power Station Generating Unit trips (using Proactive LSBs 2-7 to balance out lost generation);
- (iii) FILS applies for other frequency drops, or for Major Power Station Generating Unit trips when the Proactive Load Shedding system does not operate; and
- (iv) Islanding is the last line of defence.

(b) Proactive Load Shedding (PLS) via MLSS

The PLS function is designed to protect the stability of the NWPS in the event that a Generating Unit within a Major Power Station trips. In this event, the amount of load shed is calculated based on remaining capacity available to that Major Generator, taking account of its available Spinning Reserve, and a suitable amount of load is shed from the relevant contracted Offtaker(s).

The level of load to be shed is constantly calculated for each of the Proactive Load Shed Blocks (which relate to the size of the potential Generating Unit trip and available Spinning Reserve), and the MW value of the load is sent to the Offtaker's SLSS so that the SLSS is armed with a value of load to be shed.

In order to provide the necessary trip signal to an Offtaker's premises, the signals from the MLSS are transmitted to a SLSS installed at the Offtaker's premises via a high speed communication channel. In the event of a Generating Unit trip, the pre-armed amount of load can be shed in a very short period.

(c) Frequency Initiated Load Shedding (FILS) – Reactive Load Shedding

FILS is a reactive load shedding process. FILS has two functions in relation to the LSS.

Firstly, it acts as a backup to the MLSS in the event that the MLSS fails to disconnect loads following a reduction in generation and a fall in frequency. A Generating Unit trip is not a pre-requisite to FILS operation. FILS will trip a set of predetermined FILSB in response to falling frequency to protect the NWPS from collapse.

The second function of the FILS is to protect generation from a non-generation-triggered fault in a Supply Network which is not disconnected in a timely manner and which consequently causes the NWPS frequency to fall. The FILS will then trip a set of predetermined FILSB through the SLSS at the Offtakers' premises to allow the system frequency to recover.

FILS is operated by a set of ROCOF relays installed in each Offtaker's premises. The ROCOF relays are set to trip a set FILSB depending on the rate of change of frequency (as shown in Table 4 below). The faster the frequency falls, the larger the blocks of load that are shed. The MLSS does not initiate a FILS trip. The MLSS allocates two FILSB at each Offtaker's premises and the ROCOFs at the SLSS trip these FILSB based on the set values shown below in Table 4. These values are an aggregate amount of MW jointly contributed to by the Offtakers. FILS does not respond based on relevant contractual supply arrangements, and simply monitors system frequency as its source of initiation and acts to recover system frequency.

In the event of a communications failure, FILS will operate on the last valid data received.

The SLSS will confirm a FILS operation back to the MLSS.

Table 4: FILS Operations

Note that there is currently some dynamic testing work being carried out. Once these tests are completed (which is expected to be at the end of 2018) and the results have been analysed, this table will need to be updated to reflect those results.

Action	Under frequency (Hz)	Rate of change Hz/sec	Time delay in SLSS secs	Load shed MW	Offtaker in FILS-LSB1 & 2
FILS - LSB1	49	> -0.1	0.0 secs	30	All
FILS - LSB2	49	≥ -0.75	0.0 secs after FILS 1	60	All

(d) Load Encroachment

Load Encroachment is a mismatch between system load and available generation that causes frequency to fall slowly. Load shedding for Load Encroachment Events can be caused by increases in Offtakers' loads above the forecast levels advised to the Major Generators or a gradual reduction of generated capacity from a Major Generator.

The Load Encroachment load shedding system will use PLS Load Shed Block 1 as a dedicated load block for managing load encroachment.

A Load Encroachment trip is achieved by the MLSS forcing arming of relevant Load Shed Blocks to 10 MW when frequency falls below 49.25 Hz. In this situation, the MLSS ROCOF's at DPS will force LSB arming to 10 MW and issue a Load Encroachment load shedding trip every 2 seconds when frequency falls below a set value of 49.1 Hz (as shown in Table 5 below).

Table 5: Load Encroachment

Note that there is currently some dynamic testing work being carried out. Once these tests are completed (which is expected to be at the end of 2018) and the results have been analysed, this table will need to be updated to reflect those results.

MLSS Block	Frequency	Time Delay	Block size	Trip repeats/ time
PLS1	49.1 Hz	0.0	10.0 MW	10 MW/2 sec

Trips will continue until frequency stabilises or FILS action is initiated.

A Load Encroachment trip status is also sent to the Offtakers to differentiate between "regular" PLS and a Load Encroachment Event.

The amount of arming and size of Load Shed Blocks is predetermined and is, as at the 2014 Effective Date and Effective Date, set at 10 MW.

If the MLSS can readily determine which Offtaker's load is exceeding the generation available from its contracted supplier, the MLSS will arm and trip that Offtaker's loads. If the event is not attributable to a particular Offtaker, the 10 MW blocks will be shed as equitably as possible across Offtakers.

DPS Co has installed new ROCOF relays to measure the frequency at the MLSS.

(e) Slave Load Shedding System (SLSS)

The SLSS are control devices located at each Offtaker's premises. The MLSS continually calculates the value of Load Shed Blocks to be shed based on the value of available Spinning Reserve and the size of Generating Units that could trip, and communicates arming levels for each LSB to the SLSS. Thus the SLSS are always armed to the correct value for both FILS and PLS, and will respond by shedding the necessary loads in a very short time in the event of a Generating Unit trip or ROCOF operation.

The target time from trip initiation at the Major Power Station to trip action at an Offtaker's SLSS is 250ms.

The Offtaker is responsible for minimising the time from receipt of a trip signal at their SLSS to the commencement of trip actions within the Offtaker's plant, and relevant systems should be designed to minimise delays in this function. A recommended target time is 250 ms.

(f) Major Power Station Islanding

The last line of defence used to protect generation plant is Islanding of the Major Power Stations.

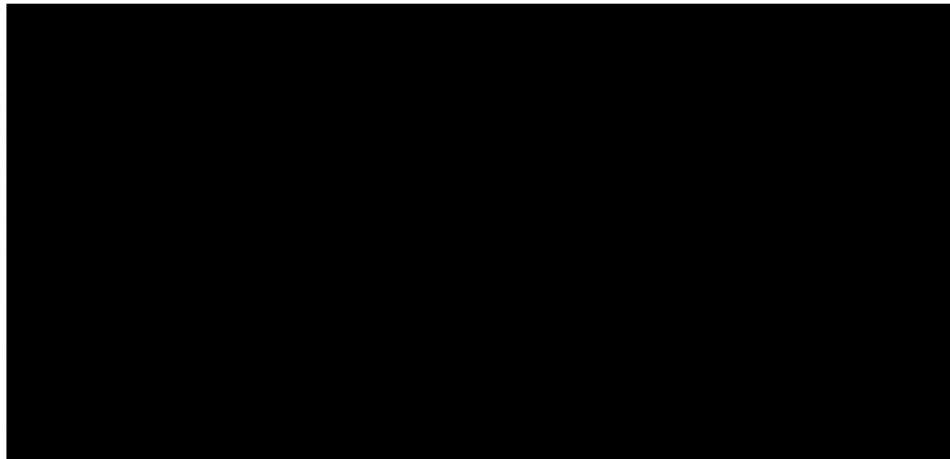
Under frequency relays installed at DPS are set at a lower frequency than FILS settings, and are coordinated with the protection and control systems of the Generating Units. An Islanding trip will open the feeder circuits on the 132 kV and 220 kV Supply Networks to remove all external load from the Major Power Stations, and to prevent export of generation into these Supply Networks. The objective is to allow the Generating Units to stay in service and continue to provide their own auxiliary loads to maintain operation of those Generating Units, so that restoration of the Supply Network can be completed without the need to use Black Start Capability to restart each of the Generating Units.

Should this facility fail to function, it is likely that the entire NWPS will be de-energised, with consequent long delays in restoring the Supply Networks.

Table 6 below shows the tripping channels that would be load shed after both PLS and FILS have operated. It is expected that there will already have been a significant loss of supply of load by this time.

Table 6: Islanding of Major Power Stations

Note that there is currently some dynamic testing work being carried out. Once these tests are completed (which is expected to be at the end of 2018) and the results have been analysed, this table will need to be updated to reflect those results.

A large black rectangular box redacting the content of Table 6.

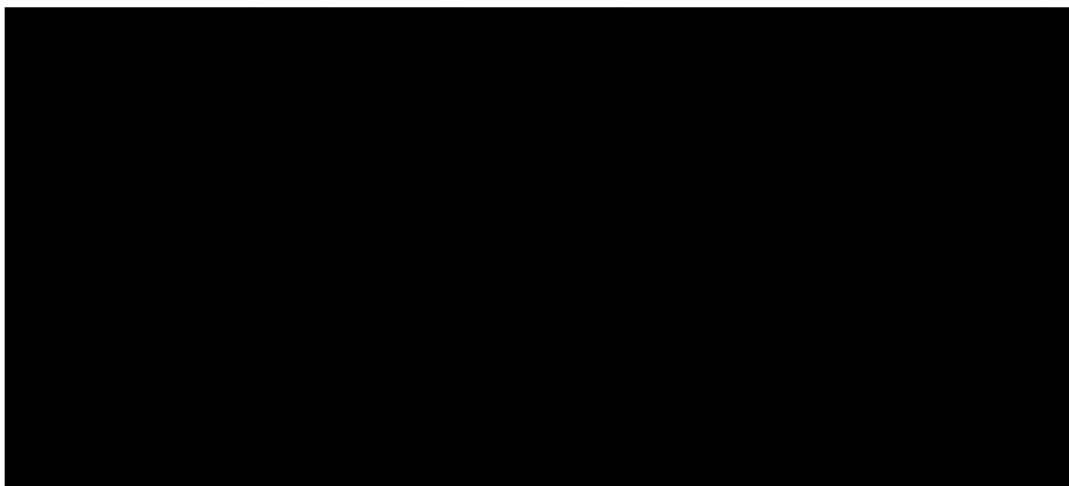
(g) Summary


The LSS is a regime designed to handle events that are not normal operating conditions. Load shedding is an automatic function through a pre-programmed system managed by the Generation Coordinator. The LSS will initiate a trip of sufficient load from the system in an attempt to maintain system stability. All Offtakers will be connected to the MLSS via a series of SLSSs at the Offtakers' premises. Collectively, these systems form the LSS.

6. LOAD SHED BLOCKS

As previously mentioned, for the LSS to be effective, it will be necessary for each Offtaker to make available to the LSS an amount of capacity to be load shed, where the relevant Load Shed Blocks are either sized to match the size of the generation blocks within their contracted Major Generator, or otherwise appropriately sized.

Table 7 – Load Shed Blocks for Load Encroachment & PLS

A large black rectangular box redacting the content of Table 7.



Note: the actual amount of load shed will also be determined by the available Spinning Reserve for that Major Generator and the Load Shed Blocks of that Offtaker.

Offtakers contracted to a Major Generator will have a total of three Load Shed Blocks in which to assemble their preferred load Blocks. The items of plant to be grouped to satisfy the size of the Load Shed Blocks are at the discretion of the Offtakers. However, each Offtaker is obliged to contribute sufficient sheddable load at all times to satisfy the Load Shed Block size as detailed in Table 7.

Offtakers are required to submit their selected Load Shed Blocks to the Generation Coordinator for programming into the MLSS. Offtakers must ensure that their SLSS is armed accordingly and functioning correctly at all times.

In order to confirm the status of loads available to be shed, the MLSS will display to the Generation Coordinator the "requested arming" and the "actual load armed".



7. CATEGORIES OF IMPORTANCE

As a guide, the following order of grouping importance is suggested for Offtakers when arming their Load Shed Blocks:

Block 1 - Minimal Disruption Loads:

These are loads that do not directly affect production processes or essential or safety services if disconnected for a period of up to 1 hour or thereabouts. Typical examples may include storage hot-water systems and some air-conditioning motors, some lighting, etc. Production plant or

utility services with substantial surge capacity that does not affect downstream processes for substantial periods of time is included in this category.

Block 2 - Production Loads:

These include loads that directly affect production - for example, crushers, conveyors, air compressors, mills, ore haulage winders, commercial and industrial loads.

Block 3 - Essential Loads:

These include loads that are essential to an operation, such as mine dewatering pumps, domestic dwellings, food refrigeration and accommodation camps.

Block 4 - Safety Loads:

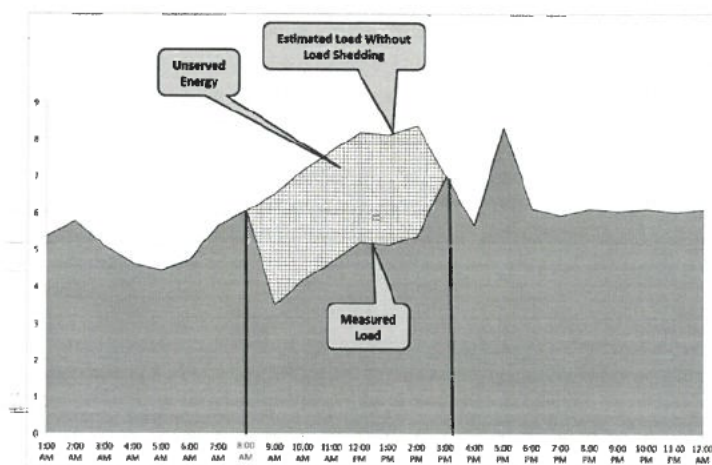
These include loads that are critical to the provision of health and fundamental safety services, and include hospitals, care centres, man-winders and essential ventilation to underground mines.

It is envisaged that Offtakers would nominate Block 3 - Essential loads and Block 4 - Safety loads as the last items to be shed.

8. DEFINITION OF UNSERVED ENERGY

The Unserved Energy, for the purpose of the Dispatch Protocol, pertaining to an Offtaker for a load shedding event, is the amount of energy expressed in MWh that, had it not been for the load shedding event, would have been supplied to an Offtaker less the amount that was actually supplied to the Offtaker during the load shedding event. That is, the gap between the amount that should have been received and the amount that was actually received. Conceptually, this is demonstrated in Figure 1.

Figure 1: Concept of Unserved Energy



9. MANAGEMENT OF UNSERVED ENERGY

- (a) **PLS** – The implementation of PPAs and ESAs which tie an Offtaker to one of the Major Generators means that for Proactive Load Shedding the concept of equalisation of Unserved Energy for this function will not apply and will not be accounted for as part of the Dispatch Protocol.

- (b) **FILS** – Where a FILS Event is caused by events outside the Major Generator's facility i.e. by a Supply Network, then the equalisation of Unserved Energy will not apply and will not be accounted for as part of the Dispatch Protocol.
- (c) **FILS** – Where a FILS Event is caused by a Major Generator and this event impacts on the capacity delivered to a non-contracted party, equalisation of Unserved Energy will be actioned. Following review by the Working Committee, the FILS tripping programme will be biased to correct this anomaly. An Unserved Energy account will be kept, distributed and reviewed by the Generation Coordinator for equity based on the calculation of Unserved Energy. The Generation Coordinator will determine the appropriate corrective actions to remedy any mismatch between generation and load.
- (d) **FILS** – Where a FILS Event is caused by an Offtaker, the energy not supplied to that Offtaker caused by this event will be recorded, but not be used to calculate Unserved Energy or remedy inequity.
- (e) **Load Encroachment** – Offtakers' loads above forecast – Provided that the MLSS has the necessary capacity to track the loads of individual Offtakers, then where an Offtaker causes a Load Encroachment Event and their load deviates from their load forecast for the day by more than 20% of that forecast, then the Offtaker responsible for the Load Encroachment Event will be subject to load shedding. The energy not supplied to that Offtaker caused by this event will be recorded, but will not be used to calculate Unserved Energy or remedy inequity.
- (f) **Load Encroachment** – Major Generator output decay – the MLSS will monitor the target generation levels for each Major Generator and will initiate Load Encroachment load shedding to the relevant Offtakers by sending a 10 MW shed signal at two-second intervals until frequency recovers. Unserved Energy under this scenario will not be accounted for as part of the Dispatch Protocol.
- (g) **Islanding** – During an Islanding event, the concept of Unserved Energy will not apply and will not be accounted for as part of the Dispatch Protocol.

10. CALCULATION OF UNSERVED ENERGY

An analysis of an Offtaker's Unserved Energy shall be made by comparing metered usage during the load shedding event with the most recent 30-minute demand projection provided to the Generation Coordinator under Schedule 5 (Forecast Data Format). Each Participant shall have an obligation to notify the Generation Coordinator if there has been a change in circumstances that would materially impact the 30-minute demand projection from that advised to the Generation Coordinator in the 2-day-ahead forecast of load provided by the Offtaker. The calculation of Unserved Energy will commence at the time of the LSS trip and will end when the MLSS is reset and the Major Generator has confirmed that the necessary generation capacity is available to supply the forecast load applicable to time of confirmation on the day in question. The rate at which the Offtaker increases load will be controlled by its relevant Major Generator.

The Generation Coordinator will, on a regular basis, review and present to the Working Committee meetings the summary of load shedding to date. This summary will include the position to date of Unserved Energy for each Offtaker. The values of Unserved Energy will be compared and presented at quarterly meetings and recommendations for changes to the Load Shedding System will be presented by the Generation Coordinator at each Annual Meeting in order to establish equity between Offtakers where the requirement for equity is agreed.

At each meeting of the Working Committee, the Working Committee will consider whether any changes to the FILS or Load Encroachment load shedding order are required to correct any inequity in the percentage of Unserved Energy between one Major Generator/its Offtakers and another Major Generator/its Offtakers, for example, where the percentage of Unserved Energy incurred by a Major Generator/its Offtakers (as a percentage of total Unserved Energy in the NWPS) is disproportionate by greater than 10% of that Major Generator/its Offtakers' percentage of contracted capacity (as a percentage of total contracted capacity in the NWPS) over a 12-month period. At the end of a two-year period, a further review of Unserved Energy will be undertaken to assess any inequality in Unserved Energy over this longer period. For

comparison purposes, new Offtakers will be allocated a nominal starting value of Unserved Energy equal to the previous 12-month year-to-date average of the current Unserved Energy of all other Offtakers of that Major Generator.

11. OBLIGATIONS OF OFFTAKERS

Offtakers must ensure that the level of loads available to be shed in each Load Shed Block is maintained and that suitable adjustments are made to maintain these levels when changes to an Offtaker's plant operations are made. Offtakers are obliged to notify the Generation Coordinator once they are aware of any fault with their SLSS, or where a Load Shed Block is not arming correctly.

Offtakers must give the Generation Coordinator a notice setting out the details of their equipment armed to Load Shed Blocks in order for those Load Shed Blocks to comply with the relevant MW rating referred to in Table 7. If the equipment armed to the Load Shed Blocks changes, Offtakers must provide an updated notice to the Generation Coordinator. [REDACTED]

Schedule 8 – System Restoration Procedures after Load Shed Events

1. KNOWLEDGE BASE

The Generation Coordinator will need to have a sound knowledge of regional issues and Offtakers' facilities. To this end, Participants shall provide the Generation Coordinator with the following information in order to ensure that the Generation Coordinator is positioned to assist in managing the restoration of supply following a load shed event:

- (a) details of the configuration and capacity of the Generating Units at Major Power Stations and Large Power Stations;
- (b) Network Owner's control responsibilities and contact details;
- (c) power system supply configuration for all Offtakers;
- (d) Offtakers' electrical loading and Points of Connection;
- (e) details of the current priority concerns within the system in relation to safety, people security, the community and other critical areas;
- (f) relevant Contact Details;
- (g) details of each Major Power Station's internal auxiliary systems and their limitations; and
- (h) the location and capability of Generating Units with Black Start Capability in the Major Power Station facilities.

In addition, the Generation Coordinator will be required to have knowledge of the following:

- (i) all Supply Network points which are capable of performing synchronising between the Supply Network and Offtaker facilities and the operational control of these facilities;
- (j) the functionality of the NWPS LSS;
- (k) operator interface actions required in relation to the LSS;
- (l) procedures for re-energising 132 kV or 220 kV busbars and transmission lines in the Supply Network;
- (m) the status of any auto-reclose facilities (single or three phase) available on the Supply Network;
- (n) alternator MW ratings for all Generating Units in the Major Power Stations and Large Power Stations;
- (o) alternator loading rate limits;
- (p) MVar limits of alternators;
- (q) MVar requirements for long feeders within the Supply Network;
- (r) voltage control parameters, in particular, the voltage management under low load operating conditions on the 220 kV portion of the Supply Network;
- (s) NWPS system frequency limits;

- (t) system block loads data;
- (u) standard priority listing of non-Power Station restoration issues as listed in Item 7 of this Schedule;
- (v) daily load forecasts provided by the Offtakers; and
- (w) LMS used by various Offtakers to manage the ramp up and ramp down of UIGUs.

2. LOAD SHEDDING EVENTS

Depending on the severity of the load shedding event and the performance of the installed protective devices throughout the NWPS and the LSS components, a load shedding event can result in a range of outcomes, such as:

- (a) for a normal or routine event, the shedding of Load Shed Blocks at any one or more of an Offtaker's premises;
- (b) for a major event, the Islanding of the Major Power Stations; or
- (c) for a major event where the Islanding of the Major Power Stations fails, it is likely that the NWPS will be totally de-energised.

Restoration procedures will vary dependent on the nature of the load shed event. There are three possible causes of a load shed event, being:

- (d) Loss of generation capacity – this could be caused by loss of generation capacity within the Major Power Stations but could also be caused by the loss of a Large Power Station at a period when Spinning Reserve is at a minimal level;
- (e) Load Encroachment – this could be caused by the start of a large electrical load or group of loads or by a slow degradation of output capacity from a Major Power Station or Large Power Station;
- (f) An electrical fault – this could include:
 - (i) an electrical fault in a Power Station, which should become obvious easily and quickly;
 - (ii) an electrical fault within the Supply Network without effective protection system operation; and
 - (iii) an electrical fault within an Offtaker's facilities without effective protection system operation.

In most cases, the LSS will result in a rapid stabilisation of the NWPS, and an orderly re-connection of loads can then commence. In unusual circumstances, the LSS may not operate sufficiently to prevent a significant cascading loss of generation capacity, resulting in Islanding of the Major Power Stations being required. Also, where installed protection devices fail to perform effectively, it is possible for the NWPS to be totally de-energised ("system black"). The following Items outline the principles to be adopted in recovering from "routine" and "system black" load shed events.

3. COORDINATION OF RECOVERY ACTIONS

The operation of a load shed event indicates that the normal stable state of power delivery throughout the NWPS has been changed by some abnormal event. For a routine event, such as the tripping or loss of capacity of a Major Generator's Generating Unit, the load shed event should, ideally, only impact on the contracted Offtaker of that Major Generator. More serious events such as the Islanding of a Major Power Station will impact on almost all the Participants.

The critical action required from all Participants is to make sure that all information relevant to the load shed event is made available to the Generation Coordinator as soon as possible. Clause 9.3 of the Dispatch Protocol contains relevant monitoring and recording provisions applicable to any Voice Communications made during restoration processes, to assist in any necessary review of the load shed event.

Participants should provide all available information on real-time events to the Generation Coordinator relating to any of the following:

- (a) loss of power supply or loss of a Generating Unit;
- (b) equipment faults or damage to plant under their control;
- (c) any information on potential duration of an outage due to their equipment;
- (d) abnormal supply conditions such as high or low voltage;
- (e) abnormal operation of equipment under their control;
- (f) circuit breaker status at their Points of Connection;
- (g) high risk events such as bush fires;
- (h) high levels of lightning events; or
- (i) abnormal operation of any LMS.

Once the Generation Coordinator has the necessary information, it must:

- (j) advise Participants of the nature of the load shed event or other system event;
- (k) confirm that the necessary isolation of faulted equipment has been completed;
- (l) if an LMS has malfunctioned, ensure that the relevant UIGUs are disconnected from the Supply Network;
- (m) confirm that Small and Large Power Stations have been disconnected from the NWPS as required to allow re-energisation of the NWPS;
- (n) confirm that NWPS system voltages have been returned to correct levels;
- (o) confirm or establish that the necessary connections on the 132 kV portions of the Supply Network interlinking Major Power Stations have been re-established and reenergised;
- (p) coordinate the restart of generation capacity as required to meet loading;
- (q) coordinate re-energisation of 220 kV portions of the Supply Network, taking care to manage MVar loading requirements on these portions in light of available Generating Unit VAr capacity; and
- (r) coordinate the reconnection of loads to match to generation.

NOTE – the Generation Coordinator is only required to confirm the above information to the relevant Participants.

The procedures and sequence of loading of Offtakers will depend on a range of power system and non-power system issues (see Item 7 of this Schedule). The Generation Coordinator will use its best endeavours to satisfy the many and varied demands of Participants.

4. RECOVERY FROM ROUTINE LOAD SHED EVENTS

The arrangement of PPAs and ESAs will impact on the load shedding process. In the case of a PLS, the LSS is designed so that, ideally, a generation shortfall by a Major Generator will result in load shedding of the relevant contracted Offtaker. Under this arrangement a routine load shed event should only impact one of the Major Generators and their contracted Offtaker(s). In the case of a FILS Event, it is possible that all Participants will be affected.

Following a load shedding event, the Generation Coordinator should:

- (a) ascertain the cause. This information may be readily available from information available in the control rooms of the Major and Large Power Stations, or may require contact with other Participants;
- (b) ensure that there are sufficient operational resources available to respond effectively to the event;
- (c) once this information is confirmed and the amount of Spinning Reserve available at the time has been established, the Generation Coordinator will commence corrective actions as outlined below:
 - (i) confirm that any faulted generation equipment, LMS, Supply Network equipment or Offtaker equipment has been effectively isolated from the NWPS;
 - (ii) liaise with relevant Participants to coordinate the restoration;
 - (iii) increase the level of generation capacity of the impacted Major Power Station to allow the restoration of forecast energy to suit Offtaker demand;
- (d) as a Major Generator's Load Encroachment Event should impact its respective Offtaker, the impacted Major Generator and Offtaker must coordinate to rectify the supply/demand imbalance;
- (e) for a Supply Network fault, advise the relevant Network Owner of any relevant information available and any known impact to Offtakers;
- (f) for a suspected fault within an Offtaker's facilities, advise the Offtaker of known facts and require that the cause of the event is identified and its impact on the NWPS eliminated before requesting permission to reconnect;
- (g) keep Participants informed of facts as they become available;
- (h) maintain a high level of communications between the Major Generators as well as MIM Co's MPS control room and Network Owners' operational control centres throughout such load shed events and subsequent system restoration;
- (i) retain records of LSS events, including necessary data to allow preparation of reports to Participants relating to the event including, but not limited to, Unserved Energy and outage durations etc.; and
- (j) as soon as possible after the LSS event, prepare a report on the details of the incident for consideration by the Working Committee.

An Offtaker that has been isolated from the NWPS or has otherwise had its load shed, must not reconnect to the NWPS or restart any such shed load other than in accordance with a direction from the Generation Coordinator.

5. SYSTEM RECOVERY FROM AN ISLANDING LSS EVENT

In the event of a major loss of system frequency, the LSS will commence a load shedding process that will continue to shed loads until such time as the system frequency stabilises at

level above 48 Hz. If the loads shed from the system are insufficient to prevent the system frequency from falling to 48 Hz, the load shed system will trigger the carrying out of Islanding. This means that a Power Station will be generating only sufficient electricity to run its auxiliary systems, and will not be exporting electricity. The purpose of this action is to prevent a total collapse of the NWPS (system black) or black shut down of the Power Station. This collapse would be brought about by opening of the 132 kV breakers on the machines, which will island the gas turbines. Such opening is required to prevent damage to these machines if they are allowed to operate at frequencies in a range below 48 Hz.

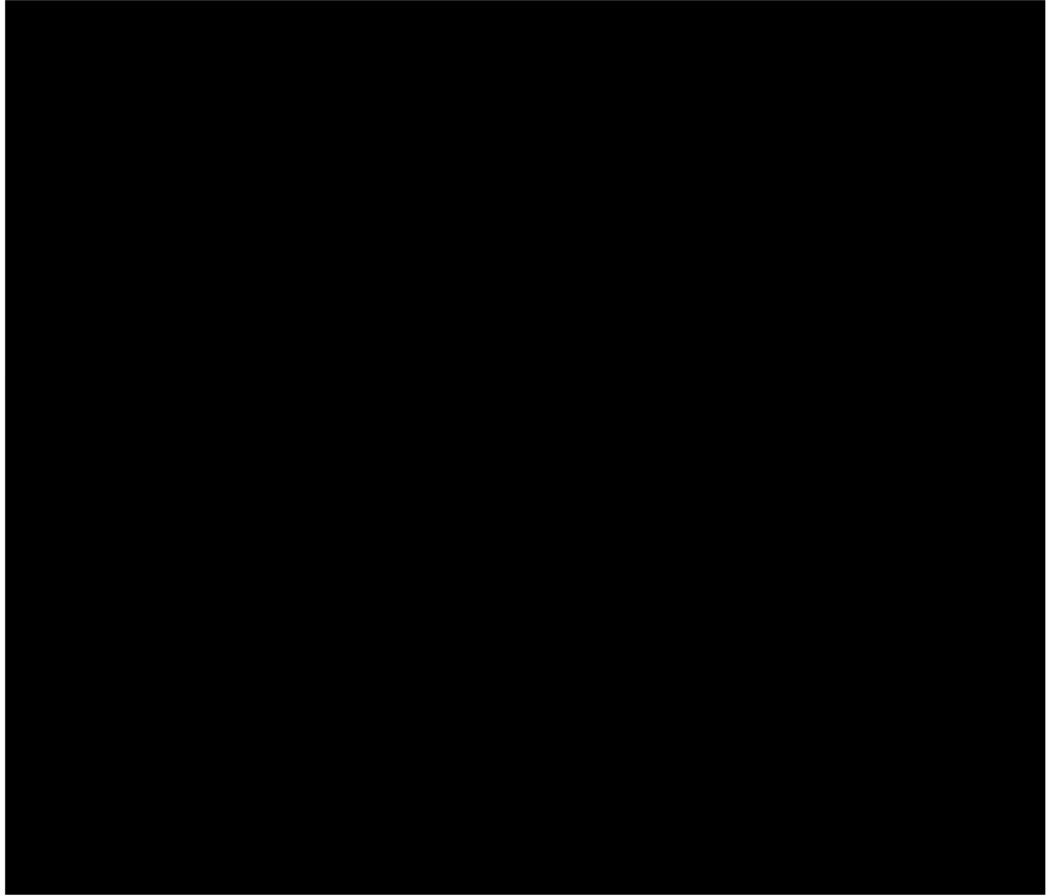
Following an Islanding, Participants must initially do the following:

5.1. Stage 1

- (a) the Generation Coordinator (initial actions):
 - (i) ascertain the cause. This information may be readily available from information available in the Power Station control rooms or may require contact with other Participants;
 - (ii) ensure that there are sufficient operational resources available to respond effectively to the LSS event;
 - (iii) confirm that any faulted generation equipment, Supply Network equipment or Offtaker equipment has been effectively isolated from the NWPS; and
 - (iv) check that the correct procedures are followed so that the interconnection between the Major Generators and the Network Owners is established for rapid restart of the system.
- (b) This process will require careful management as the capacity available for restart may be limited during this stage of the restart by the configuration and capacity of the internal auxiliary system within a Major Generator's facilities.
- (c) Major Generators and/or Network Owners:
 - (i) EECL will need to check and manage the voltage on the 220 kV portion of the Supply Network as this voltage will rise when loads are low; and
 - (ii) Operators at each Major Power Station may then commence restoration of the power supply to the auxiliary switchboards of Major Power Stations. Control of auxiliary system loadings will be managed by the relevant Major Generators within their respective plants.
- (d) Once the Major Power Stations are isolated by Islanding, each Offtaker will need to take action to:
 - (i) ensure that any Small and Large Power Stations in their system are isolated from the Supply Network;
 - (ii) open the incoming Points of Connection from the NWPS; and
 - (iii) confirm to the Generation Coordinator that it is now safe for the Generation Coordinator to restore power to the relevant section of the NWPS.

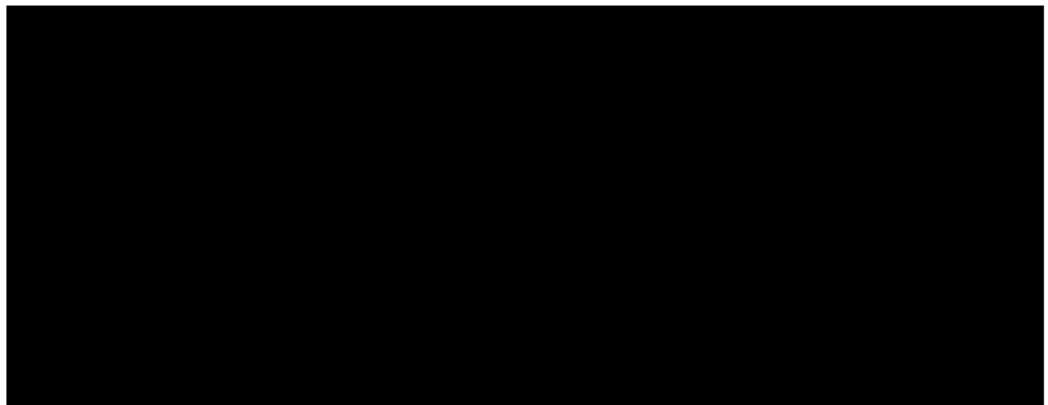
Note – this step must be completed and the Generation Coordinator notified before restoration can be commenced. It is important that all communications are recorded by automatic voice recording.

5.2. Stage 2



5.3. Stage 3

Following Stage 2, the Generation Coordinator will:



Control rooms associated with the NWPS should keep detailed logs of events during LSS events and system restoration processes to support any necessary reviews of these processes.

The Generation Coordinator must also retain records of LSS events, including necessary data, to allow preparation of reports to Participants relating to the event, including, but not limited to, Unserved Energy and outage durations etc., and, as soon as possible after the LSS event, prepare a report on the details of the incident for consideration by the Working Committee.

6. RESTORATION OF SUPPLY – BLACK START (SYSTEM BLACK)

The Generation Coordinator must maintain a set of procedures for Black Start on the EDMS. A general overview of the Black Start process is set out in this Item. To the extent that this overview is inconsistent with the Black Start procedures, the procedures will prevail.

The Working Committee must review the Black Start procedures each time there is a Threshold Change or a change in a Major Generator's ability to provide Black Start Capability.

The Participants must keep the Generation Coordinator informed of any Small Power Stations located downstream of the Point of Connection of any premises for which the Participants are responsible. The Generation Coordinator must include a list of current Small Power Stations in the Black Start procedures.

Each Major Generator must have (or have available by contract arrangements) Black Start Capability to be able to restore power to their respective Offtakers and Customers, to the extent required by, and otherwise in accordance with, relevant contracts between it and its Offtaker, as referred to in clause 2.9(m) of the Dispatch Protocol.

The following Items set out an overview of the process to be followed if the NWPS suffers a whole-of-system black out.

6.1. Stage 1

- (a) The Generation Coordinator (initial actions) must
 - (i) ascertain the cause. This information may be readily available from information available in the Power Station control rooms, or may require contact with other Participants;
 - (ii) ensure that there are sufficient operational resources available to respond effectively to the LSS event;
 - (iii) confirm that any faulted generation equipment, LMS, Supply Network equipment or Offtaker equipment has been effectively isolated from the NWPS;
 - (iv) check that the correct procedures are followed so that the interconnection between the Major Generators and relevant Network Owners is established for rapid restart of the system; and
 - (v) confirm with the relevant Network Owner that the two CBs in the "C" Switchyard that connect to the MCPS and the Gunpowder 220 kV line, and the two CBs at Chumvale that feed the Dugald River 220 kV line and EHM Co's 220 kV line, are all open.

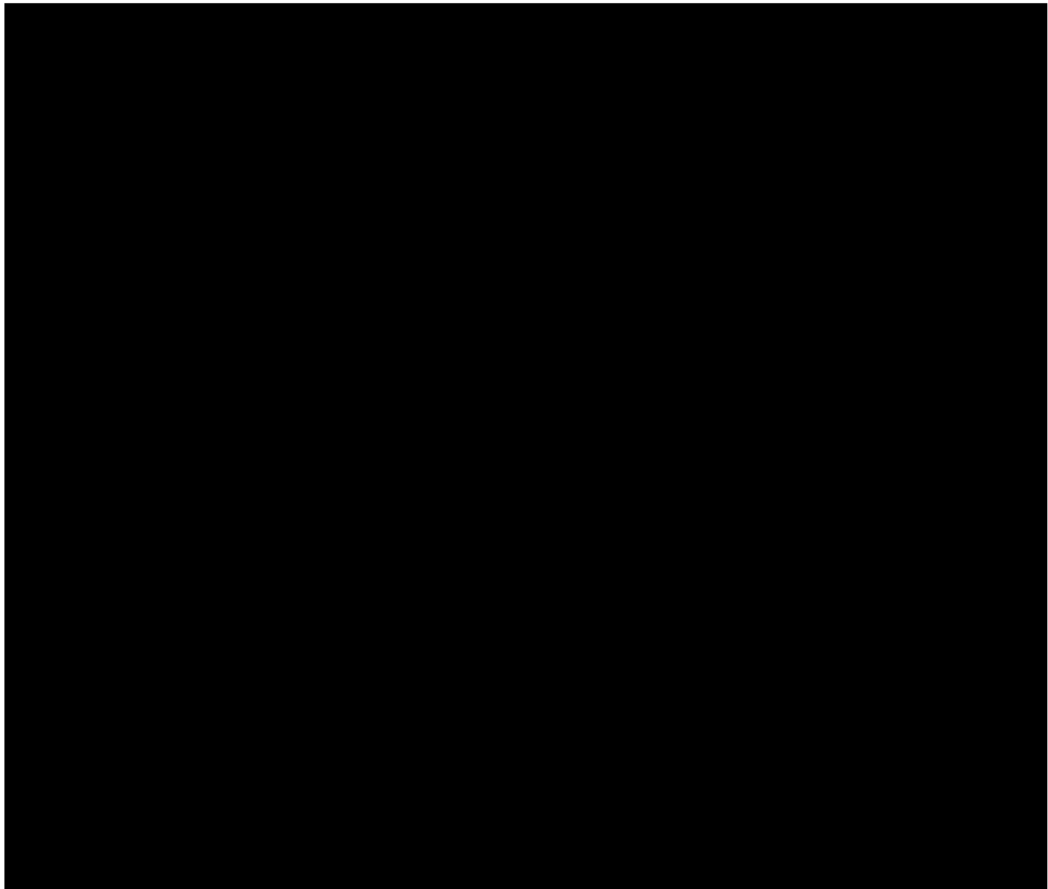
This process will require careful management as the capacity available for restart may be limited during this stage of the restart by the configuration and capacity of the internal auxiliary system within a Major Generator's facilities.

- (b) Major Generators and/or the Network Owners must:
 - (i) confirm that all of the feeder breakers from the Major Power Stations are disconnected from the de-energised sections of the NWPS (note that the 132 kV circuit breakers interconnecting DPS, the "A" Switchyard, the "B" Switchyard and the "D" Switchyard are to remain closed to facilitate rapid recovery);
 - (ii) check that the correct procedures are followed so that the interconnection between the Major Generators and the relevant Network Owners is established for rapid restart of the system. This process will require careful management as the capacity available for restart may be limited during this stage of the restart by the configuration and capacity of the internal auxiliary system within a Major Generator's facilities; and

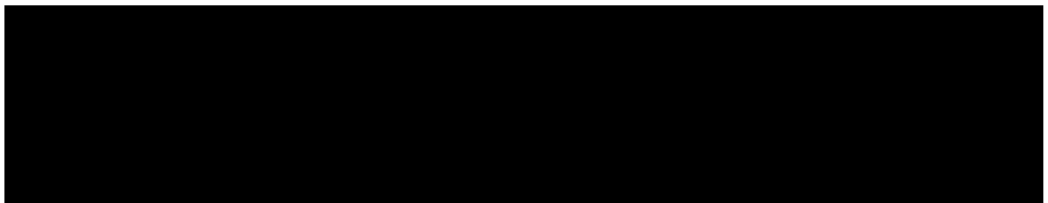
- (iii) in the case of the Major Generators only, have within their facility (or have arrangements in place for) Black Start Capability.
- (c) Each Offtaker will need to take action to:
 - (i) ensure that any Small and Large Power Stations located downstream of their Point of Connection to the Supply Network are isolated from the NWPS;
 - (ii) open the incoming Points of Connection from the Supply Network;
 - (iii) confirm to the Generation Coordinator that it is now safe for their Major Generator to restore power to the relevant section of the Supply Network; and
 - (iv) if relevant, ensure that any relevant LMS is functional.

Note: this step must be completed and the Generation Coordinator notified before restoration can be commenced.

6.2. Stage 2



6.3. Stage 3



Control rooms associated with the NWPS should keep detailed logs of events during LSS events and system restoration processes to support any necessary review of the system recovery.

The Generation Coordinator must also retain records of LSS events, including necessary data, to allow preparation of reports to Participants relating to the event, including, but not limited to, Unserved Energy and outage durations etc., and as soon as possible after the LSS event, prepare a report on the details of the incident for consideration by the Working Committee.

7. NON-POWER STATION RESTORATION ISSUES

Each Major Generator shall fulfil the contractual requirements to their own respective Offtakers and Customers and is not obliged to supply power to any other Generator's Offtakers or Customers. In considering the needs for emergency power supply following a NWPS blackout scenario, there are a number of issues to be considered by the Generation Coordinator, and the Major Generators in relation to their Offtakers, in terms of the priority of restoration of power. The restoration of supply between a Major Generator's Offtakers may be delayed while the below issues are considered and resolved as required:

For communities:

- (a) hospital emergency power supplies;
- (b) water supply;
- (c) sewage systems;
- (d) food storage;
- (e) fuel delivery; and
- (f) emergency services.

For mine sites:

- (a) personnel safety;
- (b) critical ventilation;
- (c) emergency egress for people;
- (d) emergency mine pumping;
- (e) emergency power supplies;
- (f) management of slurry pipelines;
- (g) management of hot metal; and
- (h) critical processes.

The MPS control room will be responsible for power to MIM Co's Mount Isa Mine and George Fisher Mine, but must coordinate with, and comply with directions from, the Generation Coordinator.

8. LOSS OF GAS SUPPLY

Loss of gas supply is not covered under the Dispatch Protocol and is a contractual matter between Generators and Offtakers.

Schedule 9 – List of Participants and Disconnected Participants in the NWPS

Participant	No. Representatives	Representing	No. Votes
DPS Co	1	Generation Coordinator	1
DPS Co	1	DPS	
Starwell	1	MCPS	1
EECL	1	EECL's part of the Supply Network	1
EEQ	1	Retail loads in Mount Isa and Cloncurry	1
MIM Co	1	Mount Isa Mine George Fisher Mine Lady Loretta Mine Lady Annie Mine	1
EHM Co	1	Ernest Henry Mine	1
MMG Dugald River Co	1	Dugald River Mine	1
Capricorn Copper Co	1	Capricorn Copper Mine	1
Century Mining Limited	1	Century Mine	1

Schedule 10 - Facilities status

The table below identifies the status of facilities in the NWPS as at the Effective Date, and, for Generating Units, identifies whether they are CIGUs or UIGUs.

Function	Facilities
Major Generator	DPS Co, MCPL
Major Power Stations	DPS (CIGU), MCPS (CIGU)
Large Power Stations	MPS (CIGU), XPS (CIGU)
Small Power Stations	ICPL Acid Plant (CIGU) (connected via MIM Co's network)
Isolated Power Station	Multiple small emergency/standby CIGUs at the Ernest Henry Mine and the Dugald River Mine.
Network Owner	DPS, MCPL, MIM Co, EECL, MMG Dugald River Co Note that EECL is appointed by MMG Dugald River Co as its agent in respect of the Chumvale-Dugald River feeder.
Offtaker	MIM Co, EHM Co, EEQ, MMG Dugald River Co, Capricorn Copper Co, Century Mining Co

Schedule 11 – Load Management System (LMS)

1. INTRODUCTION

The purpose of this Schedule is to set out:

- (a) the need for an LMS;
- (b) an overview of the LMS;
- (c) monitoring requirements; and
- (d) the principles to be employed in establishing and using an LMS.

2. THE NEED FOR AN LMS

The introduction of UIGUs (such as are typically used in renewable power projects) may result in potentially rapid changes in the level of electricity generated, principally due to the intermittent and uncontrolled nature of the form of energy that is used as an input into the relevant Generating Unit.

As Major Generators are not required by the Dispatch Protocol to provide any Spinning Reserve above the levels required to supply either a shortfall in their generated capacity or an increase in demand to their particular Offtakers, any rapid changes in output from a UIGU are able to change the frequency in the Supply Network. This is unacceptable, as the LSS contains a FILS component, which will shed certain Load Shed Blocks when the frequency changes, and this would adversely impact on the stability of the NWPS.

Accordingly, where a Participant has one or more UIGUs embedded downstream of its upstream Point of Connection, where those UIGU have an aggregate nameplate capacity of 3 MW or greater, that Participant must:

- (a) design an LMS in accordance with Item 3 below to manage the Ramp Rate of the UIGU and mitigate the impacts of any changes in UIGU output so that:
 - (i) the UIGU will comply with the requirements of Item 9 of Schedule 2 (Technical Standards for the NWPS); and
 - (ii) the operation of the UIGU will not adversely affect the frequency of the Supply Network;
- (b) give the Working Committee a model that demonstrates the capability of the proposed LMS to perform within the relevant technical requirements;
- (c) obtain the Working Committee's preliminary approval to that LMS;
- (d) implement any necessary technical and/or commercial arrangements to establish that LMS;
- (e) during commissioning and testing of the connection of the UIGU, demonstrate, to the Working Committee's satisfaction, that the LMS can manage any changes in UIGU output without adversely affecting the frequency of the Supply Network;
- (f) ensure that the UIGU is never operated without the LMS also being fully operational; and
- (g) if, for any reason whatsoever, the LMS is not complying with Item 2(a) above to the satisfaction of the Working Committee:

- (i) immediately notify the Generation Coordinator of this fact;
- (ii) promptly modify the LMS to the satisfaction of the Working Committee, or implement an alternative LMS that is approved by the Working Committee using a similar process to that used for approval of the pre-existing LMS; and
- (iii) until the modification/implementation referred to above has been done, either:
 - (A) suspend the operation of the UIGU; or
 - (B) operate the UIGU subject to conditions approved by the Working Committee (which may include limitations on the output level of the UIGU).

3. DESIGN REQUIREMENTS

3.1. Technology types

An LMS may use the following technologies:

- (a) battery storage;
- (b) mechanical or other energy storage technologies;
- (c) direct interface to control the contracted customer's load;
- (d) contracted replacement energy sources from a CIGU that is able to respond to changes in the output of the UIGU; and
- (e) any other technologies that are approved by the Working Committee.

3.2. Balancing requirements

An LMS must be designed to balance the available contracted generation with contracted loads so that the operation of the UIGU under normal operating conditions on the NWPS complies with the "Normal" range of frequency set out in Item 9 of Schedule 2 (Technical Standards for the NWPS).

3.3. Communication requirements

The proponent of the UIGU must ensure that high-speed communication channels are present between all entities involved in the operation of the UIGU and the LMS. The speed of these communications must be faster than the FILS operating times.

3.4. Recording

The LMS must:

- (a) record the level of unbalance between the available contracted generation and the contracted load on a one second cycle; and
- (b) retain this information for a minimum of 3 months.

This information must be made available to the Generation Coordinator on request for the review of system performance or irregularities.

Schedule 12 – Form of Confidentiality Deed Poll

Date

Parties

Name [Insert # ABN #]

Short Form Name [Insert]

Notice Details [Address]

Facsimile: [insert facsimile]

Attention: [insert contact name]

(the Recipient)

1. BACKGROUND

- (a) The Participants are signatories to the Dispatch Protocol.
- (b) The Participants and the Recipient wish to have discussions during which the Recipient will receive information about the Dispatch Protocol (**Discussions**) for the Permitted Purpose.
- (c) The Participants have agreed to disclose certain information to the Recipient to assist in the Discussions.
- (d) The Recipient is investigating the connection of [insert] to the NWPS.
- (e) The Recipient has agreed to keep confidential all information disclosed by the Participants pursuant to the terms of this deed poll.

2. OPERATIVE PROVISIONS

By this deed poll, the Recipient, for the benefit of each of the Participants, covenants and agrees as follows.

3. DEFINITIONS AND INTERPRETATION

3.1. Definitions

These definitions apply unless the context requires otherwise.

Confidential Information means the following information, whether or not in material form:

- (a) the Dispatch Protocol and all information relating to the Dispatch Protocol;
- (b) all information disclosed to the Recipient by or on behalf of a Participant; and
- (c) the fact that the Participants and the Recipient will have, or are having, the Discussions, or have entered into this deed poll,

and includes each note, calculation, conclusion, summary or other material derived or produced by any person partly or wholly from any of the above.

Discussions means discussions and correspondence between the Participants and the Recipient with respect to the Dispatch Protocol.

Dispatch Protocol means the North West Power System Dispatch Protocol dated in or around December 2017, as amended from time to time.

NWPS or North West Power System means the isolated electricity generation and transmission network centred on Mt Isa, Queensland, which is not connected to the national electricity grid.

Participants means each of:

- (d) Stanwell Corporation Limited (ABN 37 078 848 674);
- (e) Mica Creek Pty Limited (ABN 82 075 522 093);
- (f) SCL North West Pty Limited (ABN 89 075 522 119);
- (g) Diamantina Power Station Pty Limited (ABN 55 149 762 176);
- (h) Mount Isa Mines Limited (ABN 87 009 661 447);
- (i) Ernest Henry Mining Pty Limited (ABN 18 008 495 574);
- (j) Capricorn Copper Pty Ltd ACN 106 396 801;
- (k) MMG Dugald River Pty Limited (ABN 19 083 405 556);
- (l) Century Mining Limited (ACN 006 670 300);
- (m) Ergon Energy Queensland Pty Limited (ABN 11 121 177 802);
- (n) Ergon Energy Corporation Limited (ABN 50 087 646 062); and
- (o) any other entity that becomes a participant in the NWPS and signatory to the Dispatch Protocol after the date of execution of this deed poll (as may be notified by such signatory to the Recipient in writing from time to time).

Permitted Purpose means the provision of information to the Recipient for the purpose of it becoming a participant in the NWPS or as a person with a genuine interest in the NWPS to allow it to understand the operation of the Dispatch Protocol.

Permitted Recipient has the meaning given in clause 6.1 of this deed poll.

Recipient means the party receiving the Confidential Information from the Participants.

Related Body Corporate has the meaning given to that term in the *Corporations Act 2001* (Cth).

Representative of the Recipient means an employee, officer, contractor, financier or agent of, or consultant or professional adviser to, the Recipient or (as the case may be) a Related Body Corporate of the Recipient.

Term means a period of 5 years from the date of execution of this deed poll.

3.2. Interpretation

These rules of interpretation apply unless the context requires otherwise.

- (a) The singular includes the plural, and the converse also applies.

- (b) If a word or phrase is defined, its other grammatical forms have a corresponding meaning.
- (c) A reference to a clause, schedule or annexure is a reference to a clause of or a schedule or annexure to this deed poll.
- (d) A reference to a document or instrument includes the document or instrument as novated, altered, supplemented or replaced from time to time.
- (e) A reference to a party to this deed poll or another agreement or document includes the party's successors, permitted substitutes and permitted assigns (and, where applicable, the party's legal personal representatives).
- (f) A reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them.
- (g) A reference to a person includes a natural person, partnership, body corporate, association, governmental or local authority or agency or other entity.
- (h) A reference to dollars and \$ is to Australian currency.
- (i) The mention of anything after "includes", "including", "for example" or similar expressions does not limit what else might be included.
- (j) Any agreement, representation, warranty or indemnity in favour of two or more parties (including where two or more persons are included in the same defined term) is for the benefit of them jointly and severally.

3.3. Headings

Headings are for convenience of reference only and do not affect interpretation.

4. PROVISION OF INFORMATION

4.1. No obligation to provide Confidential Information

The Participants may, but are not obliged to:

- (a) disclose Confidential Information to the Recipient;
- (b) update any Confidential Information disclosed to the Recipient; or
- (c) give the Recipient notice if they become aware of any inaccuracy, incompleteness or change in the Confidential Information.

4.2. Cessation of supply of information

The Participants may at any time cease to supply Confidential Information to the Recipient.

4.3. No obligation to enter further agreement

The provision of Confidential Information does not of itself oblige the Participants and the Recipient to enter into any, or any further, agreement relating to the Permitted Purpose.

5. CONFIDENTIALITY

5.1. Recipient's covenants

The Recipient must:

- (a) hold all Confidential Information in strict confidence and not disclose any of it to any person except as permitted by this deed poll;
- (b) use the Confidential Information only for the Permitted Purpose and ensure that any Permitted Recipients to whom Confidential Information is disclosed does not use Confidential Information for another purpose;
- (c) take all action reasonably necessary to maintain the confidentiality of Confidential Information possessed by the Recipient and to secure it against theft, loss or unauthorised disclosure or use;
- (d) not cause or allow any Confidential Information to be photocopied, reproduced or recorded in any manner, including in any computer or data base except to the extent necessary for the Permitted Purpose;
- (e) take reasonable steps to ensure that any person, including any Representative, who has access to any Confidential Information through the Recipient or on its behalf, lawfully or otherwise, fully understands the confidential nature of the information and the obligations imposed by this deed poll; and
- (f) take reasonable steps to enforce the confidentiality obligations imposed or required to be imposed by this deed poll, including diligently prosecuting at the Recipient's cost any actual or threatened breach of those obligations by any person, including any Representative, to whom the Recipient has disclosed Confidential Information, lawfully or otherwise.

5.2. Recording or use, copying or disclosure of Confidential Information

The Recipient must:

- (a) maintain complete, accurate and up-to-date records of the use, copying and disclosure of Confidential Information of the Participants;
- (b) ensure that any Permitted Recipient to whom Confidential Information of the Participants is disclosed maintains complete, accurate and up-to-date records of the use, copying and disclosure of that Confidential Information; and
- (c) produce those records to the Participants on request.

5.3. Unauthorised use, copying or disclosure of Confidential Information

The Recipient must:

- (a) immediately give the Participants notice if it becomes aware of any suspected or actual unauthorised use, copying or disclosure of Confidential Information of the Participants;
- (b) immediately take all steps to prevent or stop the suspected or actual unauthorised use, copying or disclosure of Confidential Information of the Participants; and
- (c) ensure that any Permitted Recipient to whom Confidential Information of the Participants is disclosed does each of those things.

5.4. No prior disclosures

The Recipient warrants that it has made no use or disclosure of any Confidential Information prior to the date of this deed poll, except as would have been permitted by this deed poll had it been in place when the use or disclosure was made.

5.5. Exceptions

This deed poll does not prevent the Recipient from using or disclosing Confidential Information if the Recipient can prove that:

- (a) at the time of the first disclosure by the Participants, it was already in the lawful possession of the Recipient;
- (b) it is or becomes generally available to the public otherwise than by disclosure in breach of the covenants of this deed poll; or
- (c) it becomes available to the Recipient from a third person legally entitled to possess the information and provide it to the Recipient, provided that the disclosure accords with the right or permission legally granted to the Recipient by that third person.

This deed poll does not prevent the Recipient from disclosing (but not using) Confidential Information if disclosure is required by law (including judicial or administrative proceedings and government authorities) or the rules of any stock exchange which apply to the Recipient, provided that the Recipient:

- (a) immediately informs the Participants in writing of any disclosure that is so required before the disclosure is made so that the Participants can take such actions to seek to protect their Confidential Information as they deem appropriate; and
- (b) takes all reasonable measures, if required by and at the cost of the Participants, to oppose or restrict the disclosure of the Confidential Information, or to make the disclosure on terms which preserve, as far as possible, the confidentiality of the Confidential Information, as far as is permitted by law or the rules of any stock exchange which apply to the Recipient; and
- (c) takes all reasonable steps to permit the Participants to have a reasonable opportunity to oppose or restrict the disclosure by lawful means; and
- (d) consult with the Participants and endeavour to agree the content of any announcement that the Recipient is required to make.

6. PERMITTED DISCLOSURE

6.1. Permitted recipients

The Recipient may disclose the Confidential Information to those of its Related Bodies Corporate and Representatives who are directly concerned with and need access to the Confidential Information for the Permitted Purpose, but only to the extent required for the Permitted Purpose (**Permitted Recipients**). Before disclosing any of the Confidential Information, the Recipient must ensure that each Related Body Corporate and Representative to whom the Recipient wishes to disclose Confidential Information has an obligation to maintain the confidentiality of the Confidential Information that is no less stringent than the obligations undertaken by the Recipient under this deed poll.

6.2. Responsibility remains with Recipient

The Recipient:

- (a) must ensure that the Representatives, Related Bodies Corporate or third parties that receive or have access to Confidential Information from or through the Recipient comply with all the Recipient's obligations under this deed poll as if they were the Recipient; and
- (b) is responsible to the Participants for all use, misuse and disclosure of Confidential Information by all such people that is not permitted by this deed poll.

7. DISCLAIMERS

7.1. Independent assessment

The Recipient:

- (a) has made, or will make, an independent assessment of the Confidential Information;
- (b) must, to its own satisfaction, verify the accuracy and completeness of all Confidential Information on which it intends to rely; and
- (c) accepts full responsibility for any interpretation, opinion or conclusion that it forms regarding, or as a result of examining, the Confidential Information.

7.2. No representations or liability

Except as required by law and only to the extent so required, the Participants, their directors, officers, agents, employees and advisers:

- (a) do not make any representation, warranty or undertaking, express or implied, as to, or accept any responsibility or liability for; and
- (b) are not in any way liable, directly or indirectly, to the Recipient for any loss, damages, costs, expenses or reliance arising out of or in connection with,

the authenticity, origin, validity, accuracy, completeness, relevance, usefulness or balance of, or any errors in or omissions from, any information, statement or forecasts contained in the Confidential Information.

7.3. Participants' rights

- (a) The Participants reserve all rights in the Confidential Information. No rights or obligations, other than those expressly contained in this deed poll, are granted or to be implied from this deed poll.
- (b) In particular, no licence is granted, directly or indirectly, of any copyright, trade mark or other intellectual property right now or in the future held, made, obtained or licensable by the Participants.
- (c) The Recipient acknowledges that the Confidential Information and all intellectual property and other tangible and intangible rights in the Confidential Information are and remain the exclusive property of the Participants.
- (d) Unless the Participants and the Recipient otherwise agree in writing, all the legal and equitable interest in any intellectual property and any product created, developed or derived from the Confidential Information at any time by or on behalf of the Recipient, whether in compliance with or in default under this deed poll, and all proceeds of any such intellectual property or product, are and will be vested in the sole, exclusive, absolute and entire beneficial ownership of the Participants or any Related Body Corporate of the Participants specified by them.

8. RE-DELIVERY

8.1. Redelivery

If:

- (a) demanded by any Participant; or
- (b) ordered by a court,

the Recipient must (and must ensure that each Representative, Related Body Corporate and each other person who has received Confidential Information from or through the Recipient) immediately:

- (c) re-deliver to the Participants (or destroy, where delivery is not physically possible) any or all:
 - (i) copies of Confidential Information held by it or which is under its control;
 - (ii) notes, calculations, summaries or other material derived or produced partly or wholly from any Confidential Information; and
 - (iii) computer records (including copies, reproductions and recordings of them) derived or produced partly or wholly from any of the Confidential Information; and
- (d) provide to the Participants, if requested, a statutory declaration from an authorised senior officer of the Recipient certifying that, to that officer's personal knowledge, all such records have been delivered, erased or destroyed, other than those that the Recipient is entitled to retain under clause 8.2.

8.2. Exceptions

Despite clause 8.1, the Recipient may retain:

- (a) that part of the Confidential Information that is in electronic form and which cannot be detached from valuable equipment; and
- (b) a copy of the minimum amount of Confidential Information that is necessary to satisfy good corporate governance practice and audit requirements for so long as is necessary to satisfy those requirements,

subject to that Confidential Information continuing to be dealt with in accordance with the obligations of confidentiality under this deed poll.

1. No release of obligations

The return of Confidential Information to the Participants under clause 8.1 does not of itself release the Recipient from its obligations of confidence under this deed poll.

9. FOR THE BENEFIT OF RELATED BODIES CORPORATE

This deed poll is for the benefit of the Participants and their Related Bodies Corporate who have an interest in any of the Confidential Information. The Participants hold that benefit on trust for their Related Bodies Corporate and may enforce the rights conferred on them under this deed poll on behalf of their Related Bodies Corporate directly against the Recipient and Representatives.

10. REMEDIES

The Recipient acknowledges that any unauthorised use or disclosure of the Confidential Information or any part of it in breach of this deed poll may cause material damage to the Participants. Consequently, the Participants have the right, in addition to any other remedies available at law or in equity, to seek injunctive relief against the Recipient and any Representative in respect of any breach of this deed poll by the Recipient or any Representative.

11. WARRANTIES

The Recipient warrants and represents to the Participants that it:

- (a) has the right, power and authority to enter into and fully perform; and
- (b) will not enter into any agreement with a third party that may interfere with its ability to fully perform,

its obligations under this deed poll.

12. LIABILITY

The Recipient will indemnify the Participants, their Related Bodies Corporate and their respective Representatives against all reasonably foreseeable claims, costs, expenses, losses and liabilities (including legal costs on a full indemnity basis) suffered or incurred by them (including, without limitation, in connection with the enforcement of this deed poll) as a result of or in connection with:

- (a) the inaccuracy of any warranty or representation made by the Recipient in this deed poll; and
- (b) any breach of this deed poll by the Recipient, any Representative, Related Body Corporate or other person who has received Confidential Information through the Recipient.

13. NOTICES

- (a) Any notice to or by the Participants or the Recipient under this deed poll must be in writing and signed by the sender or, if a company party, an authorised officer of the sender.
- (b) Any notice may be served by delivery in person or by post or transmission by facsimile to the address or number of the recipient specified in this deed poll as varied by any notice given by the recipient to the sender.
- (c) Any notice is effective for the purposes of this deed poll upon delivery to the recipient or production to the sender of a facsimile transmittal confirmation report before 5.00pm local time on a day in the place in or to which the written notice is delivered or sent or otherwise at 9.00am on the next day following delivery or receipt.

14. TERM OF CONFIDENTIALITY OBLIGATIONS

- (a) The Recipient agrees that the obligations of confidentiality in this deed poll commence on the date of this deed poll and expire at the end of the Term (being determined from the date of this deed poll) or the date referred to in paragraph (b), whichever is the earlier.
- (b) The obligations and restrictions imposed on the Recipient under this deed poll continue in relation to each part of the Confidential Information until such time as that part of the Confidential Information satisfies clause 5.5(b) or clause 5.5(c).

15. GENERAL

15.1. Entire agreement

This deed poll:

- (a) contains the entire agreement by the Recipient in favour of the Participants with respect to its subject matter as at the date of this deed poll;
- (b) sets out the only conduct relied on by the Participants and the Recipient; and
- (c) supersedes all earlier conduct and prior agreements and understandings between the Participants and the Recipient in connection with its subject matter.

15.2. Amendment

This deed poll may be amended only by another deed executed by the Participants and the Recipient.

15.3. Assignment

The rights and obligations of the Participants and the Recipient under this deed poll are personal and must not be assigned, transferred, encumbered or otherwise dealt with without the prior written consent of the Participants or the Recipient, as the case may be.

15.4. Severability

Any provision of this deed poll that is prohibited or unenforceable in any jurisdiction is ineffective as to that jurisdiction to the extent of the prohibition or unenforceability. That does not invalidate the remaining provisions of this deed poll or affect the validity or enforceability of that provision in any other jurisdiction.

15.5. Waiver

The failure, delay, relaxation or indulgence on the part of the Participants or the Recipient in exercising any power or right given to the Participants or the Recipient under this deed poll does not operate as a waiver of that power or right, nor does any single exercise of the power or right preclude any other exercise of it or the exercise of any other power or right under this deed poll. A power or right may only be waived in writing, signed by the person to be bound by the waiver.

15.6. Continuing performance

The obligations contained in this deed poll continue until satisfied in full and do not merge with any action performed or document executed by the Participants or the Recipient for the purposes of performance of this deed poll.

15.7. Further assurance

The Recipient must do everything (including executing agreements and documents) necessary or reasonably required by the Participants to give full effect to this deed poll.

15.8. Other rights preserved

Except as otherwise expressly provided in this deed poll, the rights, powers and remedies under this deed poll are in addition to, and do not exclude or limit, any right, power or remedy provided under statute, at law or in equity.

15.9. Governing law and jurisdiction

- (a) The laws of Queensland govern this deed poll.

- (b) The Participants and the Recipient submit to the non-exclusive jurisdiction of the courts of that jurisdiction and the courts of appeal from them for determining any dispute concerning this deed poll.

EXECUTED as a deed poll:

EXECUTED BY [insert Recipient name])

(ABN [insert ABN]))

in accordance with section 127 of the *Corporations Act 2001* (Cth) by authority of its directors:)

.....

Signature of Director

.....

Signature of Director/Secretary

(delete whichever is not appropriate)

.....

Name of Director (please print)

.....

Name of Director/Secretary

(delete whichever is not appropriate)



Our ref: 55727
Contact officer: Gavin Jones
Contact phone: 03 9290 1475

Level 17, Casselden
2 Lonsdale Street
Melbourne Vic 3000
GPO Box 520
Melbourne Vic 3001
tel: (03) 9290 1800
www.accc.gov.au

17 August 2018

Vishal Ahuja
Partner
King & Wood Mallesons

By email: vishal.ahuja@kwm.com

Dear Mr Ahuja

Authorisations A91448 & A91449 - North West Power System (NWPS) - proposed amendments to dispatch protocol

I refer to your letter of 8 August 2018 in relation to the above listed authorisations.

In January 2015, the Australian Competition and Consumer Commission (ACCC) granted authorisation for participants in the NWPS to agree to rules relating to the coordination of electricity dispatch schedules at electricity generators in the NWPS. Authorisation was granted subject to a condition that:

The Applicants must notify the ACCC in writing of any amendment to the Dispatch Protocol or schedules to the Dispatch Protocol within 10 days of the amendment being made, with the exception of amendments made to Schedule 5 – Forecast Data Format or Schedule 6 – Key Contact Details.

The condition was imposed to provide the ACCC with the opportunity to raise any concerns regarding the amendments with the Applicants during the period of authorisation.

Your letter, and attachments, provide details of amendments to the Dispatch Protocol and schedules that the Applicants are proposing to make. The Applicants propose to implement the proposed amendments by 31 August 2018.

The ACCC has reviewed the proposed amendments and does not have any concerns at this time.

Please note that if at any time circumstances change, or the ACCC receives further information raising concerns about the amendments, the ACCC may reconsider its position about the amendments including, potentially, initiating a review of the authorisation.

I have also considered your request that the confidential version of Dispatch Protocol and schedules be excluded from the ACCC's public register.

As you are aware, the ACCC is generally required under section 89 of the *Competition and Consumer Act 2010* (the Act) to place documents provided to it in relation to an application for authorisation on the ACCC's public register. The Act provides that a person submitting a

document in relation to an authorisation application may request that the document or parts thereof be excluded from the public register by reason of the nature of certain information contained in the document.

As a person authorised to make a decision for and on behalf of the ACCC in relation to such a request, I advise that the confidential version of the Dispatch Protocol and schedules dated 18 July 2018 and provided to the ACCC on 8 August 2018 will not be placed on the public register.

I note that you also provided a redacted version of the Dispatch Protocol and schedules. That version will be placed on the public register in the form it was provided to the ACCC.

This letter will also be placed on the ACCC's public register.

Should you have any queries in relation to this matter, please do not hesitate to contact Gavin Jones on 03 9290 1475.

Yours sincerely



David Jones
General Manager
Adjudication