

ELECTRICITY COMMISSION

Consultation Paper: Disconnected Nodes

12 November 2008

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A INTRODUCTION

Purpose

- 1 The Electricity Commission (Commission) is considering rule changes to parts A and G (and very minor consequential amendments to parts H and J) of the Electricity Governance Rules 2003 (Rules) in order to clarify how disconnected nodes should be identified and priced, and to ensure that the Rules do not inadvertently form a barrier to the provision of improved functionality through the system operator's Market Systems Project (MSP). The purpose of this paper is to consult with parties in accordance with section 172E of the Electricity Act 1992 (Act).
- 2 The Commission is proposing three sets of rule changes for these purposes. The details of each proposed change, the reason for each change, and the effects of the changes, are described in section G.

Effect of Proposed Rule Changes is Minor

- 3 Under section 172F(3) of the Act, the Commission is satisfied that the effect of these proposed rule changes is minor and will not adversely affect the interests of any person in a substantial way.
- 4 Accordingly, the Commission is not required to comply with the requirements of section 172F(1) of the Act (preparation of a statement of proposal, identification of all reasonably practicable options, and assessment of those options).
- 5 The reason why the Commission considers each rule change proposal is "minor and will not adversely affect the interests of any person in a substantial way" is explained at the end of the description of each proposal below.

Submissions

- 6 The Commission invites submissions on the proposals contained in this paper by 5pm on Monday 15 December 2008. Please note that submissions received after this date may not be considered.
- 7 The Commission's preference is to receive submissions in electronic format (Microsoft Word). The electronic version should be emailed with 'Disconnected Nodes' in the subject header to submissions@electricitycommission.govt.nz.

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- 8 The Commission will acknowledge receipt of all submissions electronically. Please contact the Commission if you do not receive electronic acknowledgement of your submission within two business days of sending it.
- 9 Your submission is likely to be made available to the general public on the Commission's website. Submitters should indicate any documents attached, in support of the submission, in a covering letter and clearly indicate any information that is provided to the Commission on a confidential basis. All information provided to the Commission is subject to the Official Information Act 1982.

Abbreviations used in this paper

| | |
|------------|---|
| Act | Electricity Act 1992 |
| Commission | Electricity Commission |
| CVP | Constraint Violation Penalty |
| GIP | Grid Injection Point |
| GPS | Government Policy Statement on electricity governance |
| GXP | Grid Exit Point |
| Minister | Minister of Energy |
| MSP | Market Systems Project |
| PDS | Pre-Dispatch Schedule |
| PME | Pricing Manager's software application |
| RTP | Real Time Pricing |
| Rules | Electricity Governance Rules 2003 |
| SDPQ | Schedule of Dispatch Prices and Quantities |
| SO | System Operator |
| SPD | Scheduling, Pricing and Dispatch Tool |
| TOPPER | Topology Processor |

B PROCESS FOR AMENDING THE RULES

- 10 The process for amending the Rules is outlined in sections 172E to 172I of the Act.
- 11 Under the Act, the Minister of Energy (Minister) may make a rule for all or any of the purposes for which an electricity governance regulation may be made.¹ A rule is made by publishing a notice in the *Gazette*.²
- 12 If the Minister makes, or the Commission recommends, a rule for a purpose for which an electricity governance regulation may be made, the Minister and the Commission must comply with the same conditions and process that would apply under section 172D(3)³, section 172E, or section 172F of the Act if they were making recommendations on that electricity governance regulation, and those sections apply (with all necessary modifications) accordingly.
- 13 Sections 172X and 172Z of the Act also apply.⁴ The Commission must, in formulating recommendations, give effect to its principal objectives and specific outcomes and its Government Policy Statement on electricity governance (GPS) objectives and outcomes⁵, outlined in Appendix 1. The Minister must have regard to a recommendation by the Commission in exercising any of his functions or powers in relation to the Rules.⁶
- 14 Under section 172E(2)(b), before making a recommendation, the Commission must:
- a. undertake an assessment under section 172F;
 - b. consult with persons that the Commission thinks are representative of the interests of persons likely to be substantially affected by the proposed rules;
 - c. give those persons the opportunity to make submissions; and
 - d. consider those submissions.
- 15 Under section 172F(1), before making a recommendation, the Commission must:
- a. seek to identify all reasonably practicable options for achieving the objective of the rule;

¹ Section 172H of the Act.

² Section 172I.

³ Section 172D(3) provides that the Commission and the Minister must ensure, before making a recommendation for any rules under section 172D(1)(2), that those rules do not provide for undue discrimination between electricity generators.

⁴ Section 172E(2)(a).

⁵ Section 172X.

⁶ Section 172Z.

- b. assess those options by considering the benefits and costs of each option, the extent to which the objective would be promoted or achieved by each option, and any other matters that the Commission considers relevant;
- c. ensure that the objective of the rule is unlikely to be satisfactorily achieved by any reasonably practicable means other than the making of the rule (for example, by education, information or voluntary compliance); and
- d. prepare a statement of proposal for the purpose of consultation under section 172E(2)(b)(ii).⁷

16 Under section 172F(3), the Commission is not required to comply with section 172F(1) if it is satisfied that the effect of the recommendation is minor and will not adversely affect the interests of any person in a substantial way.

⁷ Section 172F(2) provides that the statement of proposal must contain a detailed statement of the proposal, a statement of the reasons for the proposal, an assessment of the reasonably practicable options, including the proposal, and other information that the Commission considers relevant.

C BACKGROUND

- 17 The system operator is currently developing new market systems, including changes to the software and hardware used for running scheduling and dispatch systems. This project is known as MSP.
- 18 The system operator has indicated that MSP may go live in March or April 2009.
- 19 The Commission understands that the system operator has made every effort to ensure that MSP complies with the Rules. However, MSP will carry out some tasks slightly differently from the systems it is replacing, which might create some “tension” with the Rules.
- 20 In particular, MSP adopts a new approach to identifying and pricing disconnected nodes. Disconnected nodes are Grid Exit Points (GXPs) or Grid Injection Points (GIPs) that have no load and no generation at, or connected to, them in the modelling system.
- 21 The system operator has written to the Commission informing the Commission that MSP’s treatment of disconnected nodes may not be consistent with the Rules and requesting amendments to the Rules.
- 22 The following sections provide more detail on the current treatment of disconnected nodes, their treatment under MSP, the policy issues that arise, and proposed rule changes to resolve these problems.

D CURRENT TREATMENT OF DISCONNECTED NODES

- 23 When a “node” (that is, a GXP or GIP), or a collection of nodes, becomes electrically separated from the rest of the transmission grid, it forms an electrical “island”⁸. Prices at the nodes within those islands are calculated in the usual way, using the “scheduling, pricing and dispatch” (SPD) modelling system.
- 24 If an island has zero cleared generation and zero load, all nodes within that island are described in this paper as “disconnected”. The term “disconnected” is not currently defined in the Rules, but in practice the system operator uses this definition when determining whether a node is disconnected.
- 25 Disconnected nodes require a special approach to pricing. As part of the normal scheduling and pricing process, the SPD solver determines the set of nodal prices, and therefore the pattern of dispatch, that maximises the value of market trades subject to constraints. Given that the model has no trades to make at disconnected nodes, any prices at those nodes will achieve the same value for the objective function, so the optimal nodal price is undefined. A feature of the SPD solver is that it will produce prices at those nodes, although the prices are essentially meaningless. The prices produced by the SPD solver at disconnected nodes will lie somewhere between -\$100,000 and +\$100,000 per MWh. Those limits are set by the Constraint Violation Penalty (CVP) value of \$100,000 used for deficit and surplus bus generation. The SPD solver often assigns a price of \$100,000 to such nodes.
- 26 Those prices are published in the pre-dispatch schedule (PDS), the schedule of dispatch prices and quantities (SDPQ) and the schedule of real time prices (RTP). However, the Rules recognise that it is not appropriate to use these arbitrary prices for settlement, so a different approach is used for final pricing.
- 27 Although the final price at a node could be viewed as irrelevant if there are no quantities settled at that price, it is possible that the reconciliation process may identify small reconciled volumes for settlement at a disconnected node. The final pricing schedule is produced using metered demand as an input. It is possible that an electrical island may have no metered demand for the purposes of the final pricing schedule (and no offered generation, so nodes within the island are “disconnected”), but the reconciliation process may identify some small reconciled quantities used for settlement at one or more nodes within the island⁹. It is more appropriate to use a zero price to settle those quantities rather than an arbitrary price that could be very highly positive or negative.

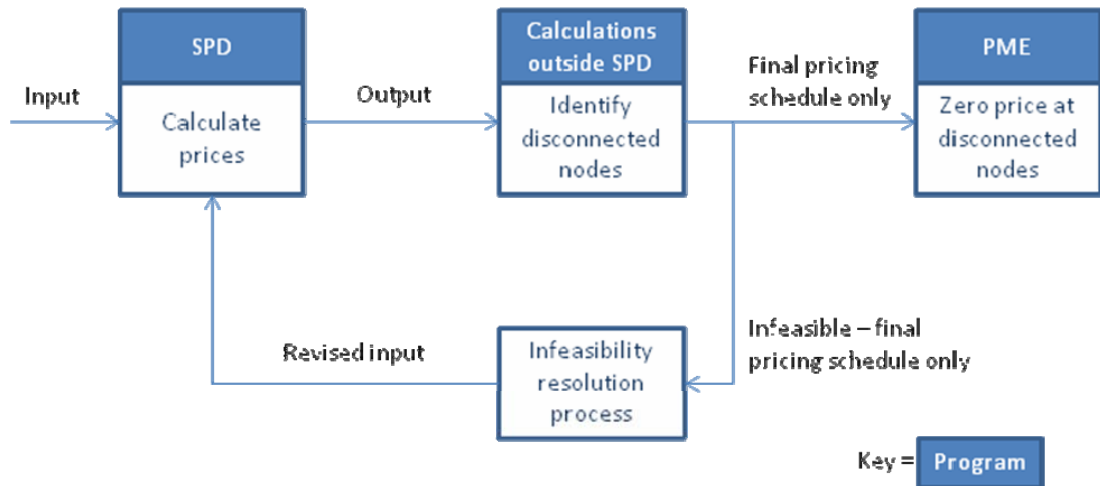
Map of current process

⁸ Note that “island” in this sense has a different meaning from the term “island” defined in part A of the Rules, which specifically refers to the South Island and the North Island.

⁹ This could occur, for example, if the actual start or finish of the physical disconnection is slightly different from that modelled.

28 Figure 1 shows the current price determination process. Currently all GIPs and GXPs are provided as an input to the SPD market clearing solver, which calculates prices. Disconnected nodes are identified after SPD has completed solving, by calculations external to SPD. The only schedule type for which disconnected nodes are assigned a zero price is final pricing. The pricing manager assigns zero prices using the “PME” software program, although the process is quite manual.

Figure 1 Current price determination process



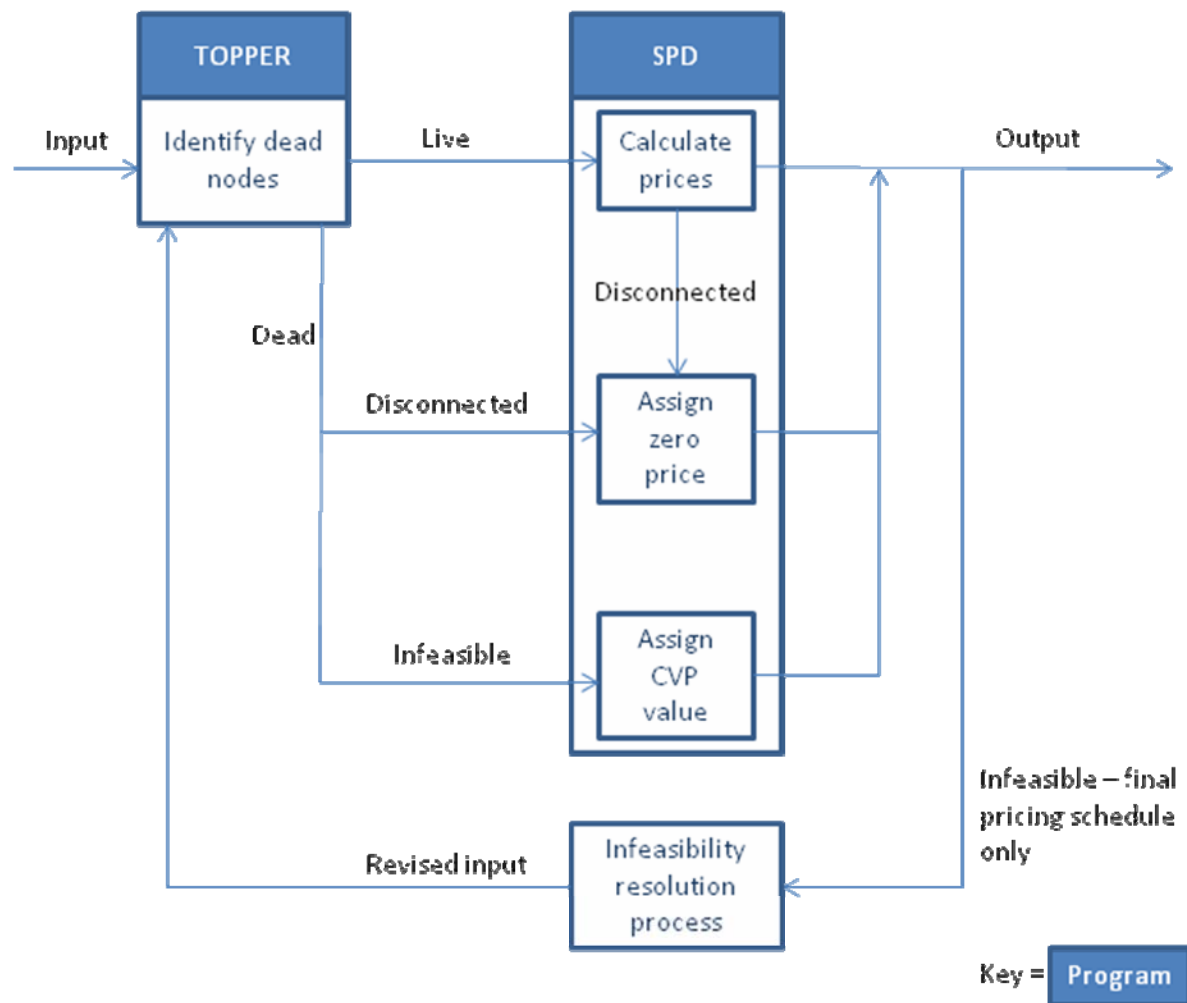
Source: Transpower, Disconnected Nodes Rule Change Proposal, August 2008

E DISCONNECTED NODES UNDER THE MARKET SYSTEMS PROJECT

Map of the planned MSP process

- 29 MSP adopts a new approach to identifying disconnected nodes. Figure 2 shows the price determination process that MSP will follow.

Figure 2 MSP price determination process



Source: Transpower, Disconnected Nodes Rule Change Proposal. August 2008

- 30 As a first step, the MSP Topology Processor (TOPPER) will identify any electrical islands where no physical generation connection point exists, or no physical load connection point exists, or neither exists. These islands are termed “dead islands”, and the nodes within those islands are termed “dead nodes”.
- 31 Islands that are “live” (as opposed to “dead”) are input into the SPD solver, and prices are calculated for those nodes.

- 32 In order to reduce SPD solver time, dead islands (and the nodes within those islands) are excluded from the SPD solver.
- 33 The topology information for dead islands is also excluded from SPD. Topology information includes information such as the location of the nodes, what they are connected to, and the characteristics of transmission assets within the dead island such as any fixed transformer losses. .
- 34 Some dead nodes may meet the definition of “disconnected” – that is, they may have zero cleared generation and zero load. (Note that this is assessed without reference to the surrounding topology). In that case they will be assigned a zero price automatically in post-processing. Other dead nodes may have infeasibilities, in which case the appropriate CVP value will be assigned.
- 35 Some of the live nodes may also fall within the definition of disconnected nodes – that is, they may have zero cleared generation and zero load. SPD will assign a zero price to these (live but disconnected) nodes automatically in post-processing. Other nodes may have infeasibilities, in which case the appropriate CVP values will be used to calculate the price at the node.

Different treatment of disconnected nodes in some theoretical situations

- 36 Although the MSP approach involves different processes for “live” and “dead” nodes, for all practical purposes it will produce the same list of disconnected nodes as the existing SPD process. There are three exceptional cases, largely of theoretical interest only, where MSP would treat the node as disconnected while the current SPD system would not. The cases are:
 - a. Null generation but non-zero load in an island

Under the current SPD, this would have produced infeasibilities at those nodes. The non-zero load for the island as a whole would prevent each node in the island from being regarded as “disconnected”. Under MSP, the island would be “dead”. Since topology information for dead islands is not used, some of the nodes, assessed in isolation, may have null generation and zero or null load and be treated as disconnected. Other nodes within the dead island, where there is unserved or negative load will have infeasibilities and will be assigned a CVP value as a price. Infeasibilities will be resolved before final prices are published.

It is difficult to identify whether one or other approach is “more accurate”. However, the process of resolving the infeasibility within the island for the purposes of final pricing will cause the outcomes to converge in most, if not all, cases.

- b. Null load but some offered generation in an island in circumstances such that some generation would have been scheduled by the current SPD system to meet fixed transformer losses within the island

In these circumstances, the current SPD would schedule generation to meet the fixed transformer losses, and would determine the nodal prices using the offer price for the generation. MSP would categorise the island (and therefore all nodes in the island) as dead. Topology information for that island, including the presence of a transformer with fixed electrical losses, would not be used. MSP would not identify any load at any of the nodes within that island. MSP would treat those nodes as disconnected and assign a zero price.

In this case, the approach adopted by MSP can be regarded as more accurate. The system operator would not, in practice, dispatch generation to match fixed losses on a transformer. Consequently, it is more accurate to schedule zero generation and zero load at each node within the island and treat the nodes as disconnected.

- c. Null load, but some offered generation in an island in circumstances such that some generation would have been scheduled due to a binding downwards ramp rate constraint

In these circumstances, the current SPD would recognise an infeasibility and use CVPs to set prices (e.g. the surplus bus generation CVP). MSP would categorise the island as “dead”. One of the features of MSP is that it can recognise that there is no load, and despite the downwards ramp rate constraint, it would not schedule any generation. Given the zero scheduled generation and zero scheduled load, the node would be treated as disconnected and assigned a zero price automatically by SPD in post-processing.

This approach can also be regarded as reflecting the most practical way in which dispatch could be managed if this situation arose. The system operator would not dispatch generation when no load is connected. This situation is largely of theoretical interest only. The Commission understands it has never arisen in practice.

No changes required to the SPD model formulation

- 37 The SPD model formulation is agreed between the Commission and the system operator as part of the service provider agreement between the parties. The model formulation does not specify which nodes must be input into the SPD solver, so with the introduction of MSP, no changes will be required to the model formulation relating to disconnected nodes.

Rule requirements in relation to forming constraints

- 38 Rules 3.1 and 3.2 of schedule G6 of part G may inadvertently create a barrier to the introduction of MSP. Those rules require bids, offers and ramp rates to be used to form constraints in the modelling system. The purpose of these rules is to prevent schedules producing results that are not consistent with the quantities that participants are willing and able to act upon.
- 39 However, MSP will not form constraints for dead nodes. Although MSP achieves outcomes consistent with the purpose of those rules (and produces outcomes very similar to those produced by the existing systems), it does not use *all* bids, offers and ramp rates¹⁰ to form constraints to be used by the modelling system. Consequently, it is possible to interpret rules 3.1 and 3.2 of schedule G6 of part G in a way that would mean that MSP breaches those rules by excluding dead nodes from the SPD solver.
- 40 In these circumstances, the Commission considers it appropriate to revise those rules so that they achieve their intended purpose without unnecessarily preventing MSP from achieving the desired outcome in a different way from existing systems.
- 41 This paper proposes rule changes to enable MSP to be implemented without breaching those rules.
- 42 Note that Transpower has applied for an exemption from rules 3.1 and 3.2 of schedule G6 of part G in case MSP is implemented prior to any rule changes coming into force.

SPD under MSP assigns zero prices automatically to disconnected nodes in all schedules

- 43 One of the positive features of SPD under MSP is that it can assign a zero price to disconnected nodes automatically in post-processing. This is considered an advantage because at present the Pricing Manager's process for assigning a zero price to disconnected nodes in the final pricing schedule requires some manual effort.
- 44 A further advantage of SPD under MSP is that it can assign these zero prices in any schedule run, not only in the final pricing schedule as at present. This is considered an advantage because including zero prices in those other schedules (PDS, SDPQ, and RTP) will provide a better representation of likely final prices.
- 45 At present, the Rules provide for zero prices to be assigned to disconnected nodes only for the final pricing schedule. (The reason that other schedules are not treated similarly is that the existing systems do not have the capability to assign these prices automatically, so manual intervention would be required). By assigning zero prices for disconnected nodes in other schedules, MSP may be acting inconsistently with the Rules.

¹⁰ I.e. it only uses those not excluded by TOPPER.

- 46 This paper proposes a rule change to provide for zero prices to be assigned to disconnected nodes in all schedules.

Clarification of definitions relating to disconnected nodes

- 47 The Commission also notes that some of the existing definitions relating to disconnected nodes could be more clearly expressed. For example, the term “disconnected” is currently undefined, while the definition of “disconnected price situation” may lead to some confusion because of the way it mentions model variables (technically, SPD does not use model variables or CVPs to calculate prices at disconnected nodes). The Commission proposes amendments to the Rules to clarify the definitions.

F POLICY PROBLEMS

48 The following table identifies the three problems relating to the current rules around disconnected nodes, as discussed above.

| Ref. | Description |
|------|--|
| 1 | MSP may breach rules 3.1 and 3.2 of schedule G6 of part G by not using bids, offers and ramp rates associated with “dead nodes” to form constraints in the modelling system. This breach could arise despite MSP’s compliance with the intent of those rules. |
| 2 | MSP may breach the Rules by allowing SPD to assign zero prices to disconnected nodes in <i>all</i> schedules automatically, rather than only in the schedule of final prices. This feature of MSP is in fact a desirable characteristic. The Rules should not prevent that functionality from being used. |
| 3 | A lack of clarity currently exists around disconnected nodes. The term “disconnected” is undefined in the Rules, while the definition of “disconnected price situation” may lead to some confusion because of the way it mentions model variables (technically, SPD does not use model variables or CVPs to calculate prices at disconnected nodes). |

G PROPOSED SOLUTIONS

49 The following table proposes three sets of rule changes that would address the policy problems identified above. The three sets of rule changes could be implemented together (that is, they are not mutually exclusive). Each set of proposed rule changes is designed to address one of the policy problems described above.

| Ref. | Description of proposed rule amendment | Rules affected <i>(Rules are in part G unless otherwise stated)</i> | Date proposed to come into force |
|------|---|--|--|
| 1 | Amendments to remove the requirement to use bids, offers and ramp rates at dead nodes to form constraints, and to replace that requirement with another that achieves the same purpose in a way that is consistent with MSP | Amendments to rules 3.1 and 3.2 of schedule G6 | As soon as reasonably possible, although this must be at or prior to the MSP implementation date (unless an exemption is granted to cover an interim period) |
| 2 | Amendments to require the modelling system to assign a zero price to disconnected nodes in all schedules so that the additional MSP functionality can be provided and so that MSP will comply with the rules | Insert new rule 6.1A of schedule G6 and delete rule 3.27A of section V | At the MSP implementation date |
| 3 | Amendments to provide greater clarity to definitions related to disconnected nodes | <ul style="list-style-type: none"> • Insert a definition of “disconnected” in part A • Delete definition of “disconnected price situation” from part A • Amend definitions of “infeasibility situation” and “high spring washer price situation” in part A • Amend various references in the Rules to disconnected nodes to use the new defined term disconnected | At the MSP implementation date |

50 Each proposed solution is discussed in detail below. Submitters are invited to comment on any or all of these proposals.

Set 1: Remove the requirement to use bids, offers and ramp rates at dead nodes to form constraints

Proposed rule changes

- 51 The Commission proposes that the following amendments be made to rules 3.1 and 3.2 of schedule G6 of part G to enable MSP to comply with the Rules. This proposal will resolve the first policy problem identified above.

3 The constraints

In maximising the objective function above, the **system operator** must ensure that the following constraints ~~must be~~ are met (to an accuracy specified in the model formulation):

3.1 Generator offers

Generators ~~will~~ that wish to submit **offers** to the **system operator** must do so in the form outlined in Form 1 in schedule G1-.

3.1.1 Scheduled generation not to exceed quantity offered

~~The **offers** will be used by the modelling system to form such a constraint that, for each price band, the expected level of **electricity** to be generated will not be more than the quantity offered for that price band. For each price band, the modelling system must not schedule **electricity** generation that would result in the scheduled quantity of **electricity** to be generated by a **generator** being greater than the quantity offered by that **generator** for that price band.~~

3.1.2 Scheduled generation to be within offered ramping limits

~~The maximum ramp up and ramp down rates will be used by the modelling system to form such a **constraint** that the expected level of **electricity** to be generated for a **generating unit** or **generating station** in a **trading period** will be within the ramping limits of that **generating unit** or **generating station**, given the expected (or actual) output at the start of that **trading period**.~~

The modelling system must schedule **electricity** generation for each **generating unit** or **generating station** in a **trading period** within the offered maximum ramp up and ramp down rates of that **generating unit** or **generating station**, given the expected (or actual) output at the start of that **trading period**.

3.2 Purchaser bids and metered demand

~~**Purchasers** will submit **bids** in the form outlined set out in Form 23 in schedule G1. Where a **pre-dispatch schedule** is being prepared, the **bids** will be used by the modelling system to form such a constraint that, for each price band, the expected level of demand will not be more than the quantity bid for that price band. the modelling system must not schedule **demand** for a price band that would result in the~~

scheduled quantity of demand being greater than the quantity bid for that price band. Otherwise, for the purposes of preparing **provisional prices** and **final prices**, the modelling system must use metered demand ~~demand~~ will be used by the modelling system.

Timing of proposed rule changes

- 52 It is proposed that these amendments to the Rules would be made at or prior to the MSP implementation date so that there is no risk that MSP would be held to be in breach of the Rules.
- 53 It is proposed that the rule change would come into force 28 days after the date on which it is notified in the *Gazette*, and that the Commission would arrange this in sufficient time to enable the rule change to come into force prior to the MSP implementation date.

Minor nature of proposed rule changes

- 54 The Commission considers that the proposed amendments to rules 3.1 and 3.2 of schedule G6 of part G are minor and would not adversely affect the interests of any person in a substantial way. The amendments are technical in nature and are designed to allow MSP to achieve essentially the same outcomes as at present but in a way that will achieve benefits in terms of the SPD solve time.

Set 2: Assign zero price to disconnected nodes in all schedules

Proposed rule changes

- 55 The Commission proposes that rule 6.1A of schedule G6 of part G be inserted to allow MSP to provide for zero prices to be assigned to disconnected nodes in all schedules. Rule 3.27A of section V of part G would be deleted because it would no longer be required. These changes would resolve the second policy problem identified above.

Part G Schedule G6

6.1A Zero prices for disconnected points

The modelling system will assign a zero price for **electricity** at each **grid injection point** and **grid exit point** that is **disconnected**.

Part G Section V

~~3.27A Pricing manager to set prices at disconnected nodes to \$0~~

~~The **pricing manager** must assign a **final price** of \$0.00 to all **grid injection points** and **grid exit points** where the **software** used by the **pricing**~~

~~manager to calculate final prices has identified a disconnected price situation.~~

Timing of changes

- 56 It is proposed that these amendments would come into force on the MSP implementation date. If the amendments were to come into force earlier, the current SPD system will not comply with the Rules. If the amendments were to come into force later, MSP would not be able to comply with the Rules.
- 57 Section 172I(3) of the Act provides: “A rule comes into force 28 days after the date on which it is notified in the *Gazette* or on any later date stated in the notice”. The Commission therefore proposes that, once the system operator informs the Commission of the MSP implementation date, the Commission would recommend that the Minister publish a Gazette notice notifying the proposed rule change and specifying the implementation date (such notice to be provided at least 28 days prior to the MSP implementation date).

Minor nature of proposed rule changes

- 58 The Commission considers that the amendments are minor and would not adversely affect the interests of any person in a substantial way. The proposed amendments will, however, promote better information for participants if disconnected nodes are treated in all schedules in the same way that they are treated in final pricing.

Set 3: Provide greater clarity to definitions related to disconnected nodes

Proposed rule changes

- 59 The Commission proposes to insert a new definition of the term “disconnected”, delete the definition of “disconnected price situation” and amend the definitions of “infeasibility situation” and “high spring washer price situation” to remove reference to “disconnected price situation”, all in part A of the Rules.
- 60 The Commission also proposes to change a number of references in the Rules to the term “disconnected” to **bold** as shown below.

Part A

disconnected means, in relation to a **grid injection point, grid exit point or point of connection**, there is no load or generation at, or connected to, the **grid injection point, grid exit point or point of connection** in the modelling system

~~“disconnected price situation” means a situation where:~~

- (a) the ~~software~~ used to determine **final prices** and **final reserve prices** substitutes a model variable for a nodal price equivalent to

~~a model variable for deficit bus generation or surplus bus generation; and~~

- ~~(b) there is no load or generation at the relevant **grid injection point** or **grid exit point** at the relevant **trading period** in the model; and~~
- ~~(c) the relevant **grid injection point** or **grid exit point** is not connected to the **network** for the duration of the relevant **trading period** in the model;~~

high spring washer price situation means a situation in a **trading period** where:

- (a) one or more **transmission security constraints bind**; and
- (b) the **software** used by the **pricing manager** to calculate **provisional prices** and **final prices** calculates a price for **electricity** at any **grid injection point** or **grid exit point**, excluding **grid injection points** and **grid exit points** where a **disconnected price situation** exists that are **disconnected**, that is equal to or greater than the product of the **high spring washer price trigger ratio** and the highest **unconstrained cleared offer price** in that **trading period**

“infeasibility situation” means a situation where the **software** used to determine **final prices** and **final reserve prices** calculates a model variable with a value (either positive or negative) as set out in the list given to the **pricing manager** pursuant to schedule G2 of part G, ~~but excludes a **disconnected price situation**;~~

outage constraint means any **grid injection point** or **grid exit point** that ~~has been disconnected~~ is **disconnected** as notified by the **system operator** in accordance with rule 6 of Part J

Part G Section III

10.2.3 Disconnected nodes and infeasibility situations

The **grid injection points** and **grid exit points** that are ~~disconnected~~ **disconnected** and the **grid injection points** and **grid exit points** where an **infeasibility situation** has occurred.

10.4.8 Publishing disconnected nodes and infeasibility situations

Grid injection points and **grid exit points** ~~where they have been disconnected~~ that are **disconnected** or where an **infeasibility situation** has occurred.

Part H Schedule H5

4. This Agreement applies to the [following **grid injection points** and/or **grid exit point(s)** [] /**grid injection points** and/or **grid exit points** listed in the attached table]. [In addition where a **grid injection point** or **grid exit point** [listed above/included in the attached table] is ~~disconnected~~**disconnected**, then the **grid injection point** or **grid exit point** notified to the **clearing manager** by either party is the relevant **grid injection point** or **grid exit point** (as the case may be) for the purposes of this Agreement from and including the **trading period** during which the **clearing manager** was notified until the **clearing manager** is notified otherwise.] [Note :The parties are to elect the appropriate wording, including the possible deletion of the last sentence of this clause.]

Part J

6.1 System operator notifies reconciliation manager of points of connection to the grid subject to outages

No later than two hours after the **publication** of the **final prices** for any **consumption period**, the **system operator** must notify the **reconciliation manager** of all **points of connection** to the **grid** in the **consumption period** that were ~~disconnected~~**disconnected**, and all **trading periods** during which each such **point of connection** to the **grid** was ~~disconnected~~**disconnected**.

Timing of changes

- 61 It is proposed that these amendments to the Rules would come into force at the same time as the “Set 2” amendments described above.

Minor nature of proposed rule changes

- 62 The Commission considers these proposed changes to the Rules are minor and will not adversely affect the interests of any person in a substantial way. The changes are being made to provide greater clarification around disconnected nodes but would not alter existing practices.

APPENDICES

Appendix 1: Consideration against objectives and outcomes

| Objectives and Outcomes under section 172N of the Act and GPS | Response |
|--|---|
| The Commission's principal objectives are as follows: | |
| <ul style="list-style-type: none"> • To ensure that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable, and environmentally sustainable manner; and • To promote and facilitate the efficient use of electricity. | The proposed changes would have no impact. |
| The Commission's specific outcomes are as follows: | |
| a. energy and other resources are used efficiently; | The proposed changes would have no impact. The introduction of MSP, facilitated by the proposed rule changes, will provide better scheduling information to participants to enable them to manage resources more efficiently. |
| b. risks (including price risks) relating to security of supply are properly and efficiently managed; | The proposed changes would have no impact. |
| c. barriers to competition in the electricity industry are minimised for the long-term benefit of end-users; | The proposed changes would have no impact. |
| d. incentives for investment in generation, transmission, lines, energy efficiency, and demand-side management are maintained or enhanced and do not discriminate between public and private investment; | The proposed changes would have no impact. |
| e. the full costs of producing and transporting each additional unit of electricity are signalled; | The proposed changes would have no impact. |
| f. delivered electricity costs and prices are subject to sustained downward pressure; and | The proposed changes would have no impact. |

| Objectives and Outcomes under section 172N of the Act and GPS | Response |
|--|---|
| <p>g. the electricity sector contributes to achieving the Government's climate change objectives by minimising hydro spill, efficiently managing transmission and distribution losses and constraints, promoting demand-side management and energy efficiency, and removing barriers to investment in new generation technologies, renewables, and distributed generation.</p> | <p>The proposed changes would have no impact.</p> |