Revision of Generator Offer Procedure and Tie Break Procedure

Consultation Paper

3 July 2020

PowerWater

Contents

1 Scope

This consultation paper is intended to inform consultation on proposed changes to both the I-NTEM Generator Offer Procedure (GOP) and Generating Unit Tie Break Procedure (TBP). It provides a standalone record of what we are now proposing and why.

These procedures are being revised to reflect some fundamental shifts that are occurring in the Darwin-Katherine system. The specific drivers for the revisions include:

- The changing generation technology mix, particularly with the entry of solar generation. Solar generation has different characteristics that need to be factored into the generation offer procedures.
- Adopting the tie breaking rules for ordering the scheduling and backing off of energy to recognise that there may be more zero priced generation, and it would be undesirable to back off the entire dispatchable output of solar farms (or other units) in one step (which reduces diversity of supply).
- Clarifying the tie breaking rules for off-loading for self-scheduled and fast start units to recognise their different scheduling characteristics.
- Tie breaking rules needs to take into account the likely congestion in the Darwin-Katherine 132kV line.
- The introduction of new generator performance standards requires amendments to terminology around the allowed ranges of generator offer bands.

Given the fundamental changes that are required, the structure of the procedures are being updated to improve the logical structure and clarity of the documents.

In revising these procedures, we have kept the contents of each procedure specific to, and within the limitations of, the procedure scope. This has meant that some material has been removed from one procedure and added to another.

2 Procedure change process

The revised GOP and TBP has been prepared by Power and Water Corporation in its capacity as the Power System Controller under Section 4.4B (e) of the System Control Technical Code (SCTC). The SCTC requires Power and Water Corporation to consult with system participants in making or revising these procedures.

Submissions from stakeholders and interested parties on the proposed GOP and TBP are invited by Thursday 23rd July 2020 [14 working days from publication].

It should be noted that Power and Water will publish submissions in full. Should a stakeholder consider sections of their submission as confidential, a separate public version of the submission should be provided to Power and Water Corporation for publication.

Please send your submissions and any queries to market.operator@powerwater.com.au.

3 Consultation questions

Comments are specifically sought on the following questions:

1. Does the proposed Tie Break Procedure provide sufficient detail on the revised tie break processes?
2. Does the proposed Generator Offer Procedure provide sufficient detail of the requirements of a generator to populate and submit a daily offer?

4 Security constrained economic dispatch

In applying the tie break logic, the commitment and dispatch priority remains about achieving security constrained economic dispatch. In practice, this means that:

- Generators that are constrained on for security reasons are brought online first and must remain online whilst the relevant security requirement persists.
- System Control will attempt to maintain all self-committed generators online at or above minimum stable load (subject to offload order, band 2 price, tie break process and security constraints).
- System Control will only start a fast start unit (in accordance with band 2 set 1 prices) when it is needed for energy purposes (and will turn it off at the first opportunity as load decreases). Therefore, a commitment tie break between fast start and self-commitment generators cannot occur.
    - Note: Currently set 2 short run bid prices are not used. However, we are intending to use set 2 bid prices and band 3 prices (for already committed generators for short runs of less than 4 hours).
- Once committed, dispatch levels of generators are on the basis of their offer prices.
    - Territory Generation is responsible for providing ancillary services, hence dispatch levels of their units will typically be lower than bid quantities as this is managed via AGC with efficiency curves adjusted for contingency response.
- An energy tie break can occur between the Band 2 (regulating) quantities of any generator if they are both committed at the same time (regardless of self-commitment or fast start).

5 Current tie break logic

The current tie break rules were established with the I-NTEM. At that time, there were only two generating companies and all generating units were thermal units. The tie break rules were designed to determine which company's bid to accept first when prices were tied, both with respect to scheduling energy and determining the off-loading order to apply when decommitting generator units when more generation is running than could be supported by the load.

The tie break rules consider two separate situations:

- ties between the units with the respect to their energy output above their minimum generation level, requiring some combination of units to reduce energy output but they can stay on.
- ties between the units with respect to turning a unit off when their energy output is already at minimum stable load.

The logic does not currently contemplate a tie break to resolve network congestion.

Generators do not provide start-up costs under current market arrangements. Instead, generators either self-commit their units or are fast start units that can be started by System Control. However, generators do provide an "off load ordering" for their units with a zero cost first bid step indicating the order to turn them off if required.

Pre-dispatch or real-time dispatch with commitment ties

The current rule for when a unit needs to come off due to a commitment tie – in either pre-dispatch or real-time – where all candidates are priced equally, is as follows:

- Open cycle units are processed before considering combined cycle units (which run continuously in baseload).
- The units will come off based on the off-load ordering specified by the generator.
- A tie exists where there are two or more units with the same bid band 1 price (which must be zero for self-scheduled units).

- If there is a tie between units belonging to two different companies then a "random period selection process" applies in which one of two generator companies gets priority to stay on for a period of 4 weeks at a time. The other company gets priority in the subsequent 4 weeks.
- System security rules take precedence over tie break rules, so a unit may remain on if required.
- Units taken off in this manner effectively have "first right of refusal" to come back on when load increases again.

The current procedure does contemplate processes for more than two generator companies being in a tie. E.g. if there were five companies there would be five sets of 4-week periods associated with each different company until the cycle repeats, with further tie breaking beyond the first company selected being based on the registration order of the companies registered after the first company.

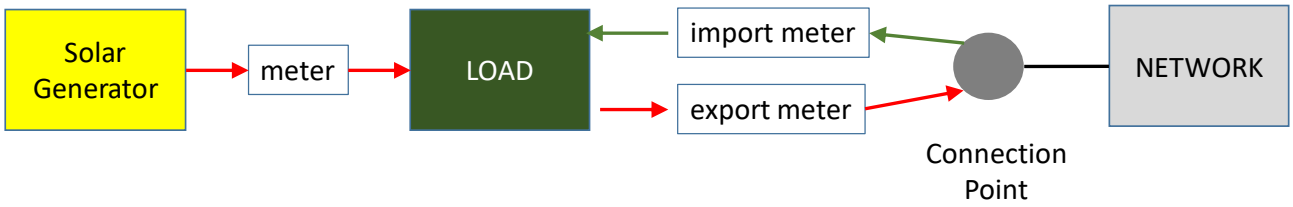
Pre-dispatch with energy tie

Pre-dispatch ranks bids based on price. With two generator companies, if any bids are in an energy tie then the bids are ranked in merit order with one company ranked ahead of the other based on a "random day selection process" to determine priority on one day, and the other on the next day. As with the random period selection process, there are rules to generalise this arrangement for more than two companies.

6 Key changes proposed

Embedded solar generators

Some of the new solar farms are expected be embedded generators, as shown in the diagram below.



The arrangement proposed is that embedded solar generators will bid, accounted for in scheduling processes, and will be metered. However, they will not necessarily be settled in the I-NTEM. Instead, if the load is net exporter (solar generation exceeds load) then the metered export will be settled as a generator in the I-NTEM. If the load is net importer (load exceeds solar generation) then the load will be settled as a consumer. The output of the solar generator that supplies the load will be settled between those parties based on the solar generator meter.

This arrangement will require the embedded solar generator to provide the same information as any other solar generator under the GOP. Therefore, the only relevant change to the GOP is to make it applicable to a generator that is not itself to be settled.

Bidding for solar generators

Solar generators (and other technologies such as wind farms if they enter the market in the future) could offer within the current generator offer rules. This is based on the following assumptions.

- The units are likely to be self-scheduled but not precluded from being fast start units.
- The units should typically have a zero minimum stable load, though the rules do not require this. Consequently, their Band 1 quantity would be zero and the Band 1 price zero.
- The units would offer their full installed capacity in Band 2 with a price of zero (though there would be no restriction on using a non-zero price).
- Band 3 would not be used by these units.

The proposed changes to TBP would have these units considered in ties for energy. However, since they would have minimum stable load of zero, they would not be considered in ties to off load capacity (i.e. decommit units).

If a solar generation unit were to have a non-zero minimum stable load, then it would be required to provide synchronisation timing data. They would then need to provide a non-zero Band 1 quantity and would be required to submit off-load information for use in tie breaking.

Clarification of Bands

Specific definitions for Band 1, Band 2, and Band 3 have been proposed in the revised GOP. These definitions establish new requirements around price and quantity.

The band 1 quantity is intended to reflect “minimum stable generation". A definition for minimum stable generation has been introduced which makes clear that the value should reflect the physical characteristics of the unit. This is to ensure that the value is not used as a device to influence how the unit is scheduled or dispatched.

Band 2 is intended to be the range the unit can be dispatched within normally without requiring any additional actions.

The band 3 quantity has been clarified to represent a separately dispatchable quantity such as wet mode or SPRINT capacity capacity. This means that use of band 3 can be viewed as a commitment decision in much the same way as committing an off-line unit is a commitment decision.

Short run merit order

The I-NTEM rules require generator offers to be submitted for the day ahead incorporating full cost of unit start up and ongoing operational costs for the unit. With the introduction of additional generation competition, and the variable utilisation of solar generation throughout the day, it will become increasingly difficult for generator companies to predict the probable run time of generation units when placing their bids.

To address these possible variations of run-times within the current rules, the tie breaking logic has been updated to allow for use of fast start units based on short run bids prices (used for run times of less than 4 hours). Further, as band 3 is now described as a capacity that must effectively be committed before it can provide energy, this must be factored into tie breaking. The tie break logic now contemplates that the decision on which fast start capacity to schedule next could involve a tie between committing a new fast start unit for a short run, or committing band 3 wet-mode or sprint capacity from a unit already running.

Thus, a fast start commitment tie can apply to the commitment of either:

- two or more off-line units (belonging to different generators) that have the same band 2 price in long run mode; or
- two or more units that have the same price for short run, either for the band 2 price of an offline unit in short run mode, or the band 3 price for an available separately dispatchable quantity (if available at time of commitment).

Ending of revised offer processes

The current GOP allows Generators to submit revised offers after gate closure under a number of scenarios. The processes associated with allowing submission of revised offers after gate closure have been removed in the revised GOP. This is to ensure that one generator cannot make alterations after the pre-dispatch has been established and impact the dispatch arrangements of other generators. This will also allow a smoother move towards future market arrangements incorporating a centralised commitment process.

The revised offer process has been replaced with a de-commitment order process for fast-start units.

Decommitment order

The order in which a fast start unit is taken offline following the evening peak load period is based on the price of the units. In some scenarios, for a generator offering multiple fast-start units, this would result in increased start and stops of units i.e. where a unit taken offline in the evening would be brought online at 04:00 start of trading day to replace another unit that isn't offered on the second trading day. Given generators no longer have the option to elect to make these changes via a revised offer process, the concept of a de-commitment order is introduced for fast start units.

A new column will be added to the Generator Offer Template, for generators to nominate the order that fast start unit(s) will come off-line in the evening, with the first being labelled 1, the second 2, etc. The order would only be applied until all the units identified have been de-committed, with any units with no number specified being de-committed based on bid price.

It is not anticipated that this feature will be regularly used. However, situations do occur where it would be useful. System Control will utilise the decommitment order to establish the off load order followed in the dispatch processes after 18:00 when system load in decreasing following the evening peak load.

The application of the decommitment order provides generators with the option to move units to the top end (highest priced) of the decommitment (subject to security constraints). When these processes identify a particular unit to be decommitted, and the decommitment order of that generator has not been exhausted, the next on-line unit or units in the generator's decommitment order will be taken off-line first ahead of the selected unit. If a unit in the decommitment order was required to remain on-line for security reasons, then the next unit in the decommitment order would be selected instead. It should be noted that this option does not allow a generator to replace units in the order, only insert units to be decommitted prior to other units owned by the same generator. This counters any gaming incentives as these will be lower cost units than the ones that would normally be decommitted.

Pricing is not governed by the procedures covered by this consultation. The intention is that the pricing process will be modified to exclude units from the same participant that remain on as a result of use of the decommitment order from setting the price. This would apply for the remainder of the day or until the next time that unit is committed on in the same day (having subsequently gone off-line).

This decommitment order does not change the tie break logic. As an example, consider the case where unit A1 belonging to generator participant A is tied with unit B1 belonging to generator participant B, and the normal tie breaking logic picks unit B1 to decommit. If generator participant B has indicated a decommitment order where the first on-line unit in that order is unit B2, then unit B2 would be taken off-line first (subject to system security constraints). That is, B2 is treated as being at the top of the merit order. The units involved in the tie break would then be taken off in the order that the tie break logic requires being B1 first, then A1.

In the example above, B1 would be a higher cost unit than B2, but B2 goes offline while B1 remains on-line. It follows that B1 should not be allowed to set the price for the remainder of the time that it is on. The price should therefore be lower than it would otherwise be (unless it is already at zero).

Movement of offering rules out of tie breaking rules

A number of details on the treatment of off-load orders for open and closed cycle units were included in both the GOP and the TBP. While they were likely added to the TBP in an attempt to aid clarity, the presentation of this material in different ways in two places has created ambiguity. All material relating to this is now presented only in the GOP.

Previously the tie breaking rules relating to the off-load order included discussions of the treatment of open and closed cycle units.

The tie breaking rules also included provisions requiring the rejecting of generator offers, and the submission of new generator offers, if a generator submitted an offer with a tied price between its own units. This provision has been moved to the GOP as it relates to offering, not ties.

Tie breaking changes

The tie breaking rules now describes three classes of ties. These are:

1. Self-commitment ties. These are ties between self-committed units which have non-zero band 1 quantities (which will be at a zero price).
    - While the tie breaking logic has not fundamentally changed, if a self-scheduled solar generator were to have a non-zero minimum stable generation it would be included and treated like any other self-committed unit.
    - A random period selection process will be used and that process is not changed. A new rule has been introduced to make it clear that units are to be returned to service in the same order as they were taken off-line (i.e. first unit taken off is first unit brought back online).
2. Fast-start commitment ties. A tie breaking category for fast start units has been introduced.
    - These ties are distinct from self-commitment unit ties as the tie applies to bringing the units on (while self-commitment ties are about bringing the units off).
    - A requirement that the units are taken off-line in the same order they are put on-line is included.
    - Ties apply between band 2 set 1 (long-run) prices and, separately, between band 2 set 2 (short run) prices and/or band 3 prices.
    - As these units are fast starting and fast stopping, the random day selection process is applied.
3. Energy tie. These are for ties in energy in the dispatchable band 2 range and apply across all unit types.
    - A random day selection process is used to determine the order of units in the merit order.
    - To maximise the number of units on-line, and to increase solar diversity by having more solar farms running, tie breaking no longer schedules an entire bid step of one unit before considering the next. Instead, the merit order breaks tied bids into 5 MW steps and defines the order for increasing or decreasing output across these steps. Specifically:
        - All tied units have their band 2 divided into 5 MW steps.
        - The random day selection process is used to determine the order in which the first 5 MW of each unit will be scheduled to increase output;
        - The process repeats for those units that have remaining capacity in band 2.
    - As solar units will tend to have a zero band 1 quantity, an allowance is made to keep their band 2 output slightly above zero to prevent them being isolated from the power system.

Tie breaking logic has also been generalised so that a tie can be resolved at the system level or in a constrained area of the network. In the event of a scenario with a Katherine transmission constraint creating any of the three types of tie, then they could be resolved simultaneously at that level and at the system level.

Power and Water Corporation considers factoring a tie break for congestion into the dispatch order to be consistent with the requirements of section 4.4B(e) of the SCTC. Effectively the tie break order for energy ties would rank tied units but the scheduling of units behind a transmission constraint would be limited by that constraint.

To illustrate this, suppose that there were five identical units A, B, C, D and E which were all in an energy tie. Units A, B and C are in Katherine and a transmission limit would only allow two of them to be scheduled but the market needs 4 units scheduled to serve load. The tie breaking rules on one day may order them as A, B, C, D and E, in which event the solution taken will be A, B, D and E, with C skipped as it cannot be taken because of congestion. On another day the order might be D, E, A, B, C, in which event the solution taken will be D, E, A. This has only one unit scheduled in Katherine so no congestion arises. This approach seems fairest as it treats all units the same except to the extent that a constraint limits them.

Random day tie breaking

The original drafting of random day tie breaking assumed two generation companies. While it included adjustments to account for new units entering, these were confused by mixing adjustments for an increased number of companies within the rules for ordering companies.

These rules have been rewritten in what is intended to be a clearer, more general form, though generally the same as the intent of the original rules. The rules describe an ordering of units based on registration date where at the end of the list (most recent unit to register) the list cycles back to the earliest unit to register. The priority is then the generator associate with the random day, with others take in priority order of those that following this generator in the list.

The one change is that a special case has been allowed for any periods for which the number of generators is equal to seven (the number of days in the week) or a multiple of it. The concern in this case is that the tie ordering will be linked to the day of the week. This is addressed by adding a different rule for one day between repetitions of the normal cycle. Thus, if there are seven participants, with participant 1 the first to register and participant 7 the last, the participant with tie breaking priority will follow the pattern: 1, 2, 3, 4, 5, 6, 7, 1, 1, 2, 3, 4, 5, 6, 7, 2, 1, 2, 3, 4, 5, 6, 7, 3, 1, 2, 3, 4, 5, 6, 7, 4, 1, 2, 3, 4, 5, 6, 7, 5, 1, 2, 3, 4, 5, 6, 7, 6, 1, 2, 3, 4, 5, 6, 7, 7, 1, 2, 3, 4, 5, 6, 7, 1, etc, where extra day results is underlined. Tie breaking for this day uses the same basic tie breaking as the normal random day process, but rather than changing order each day, it changes each cycle.

It is also important to understand the implications of the random tie breaking order for fast start units. Tie breaking ordering for the random day process is linked to the number of companies registered, but not all of these may have fast start units. Suppose there were eight companies but only two companies with fast start units. The random day process will consider all eight companies (as this process is use for energy tie breaking) but only the two companies can be in a fast start commitment tie. The random day process would effectively give priority to the first company for the first four days in each eight and to the second company for the second four days in each eight.

7 Summary of proposed Changes

Generator offer procedure

A mark-up of the proposed changes to the current GOP is provided as a separate document, available from the market operator's website at https://www.powerwater.com.au/market-operator/consultation-papers. The following table summarises the proposed changes in the revised GOP.

SECTION	SUB SECTION	CHANGE	REASON
1-Purpose	Intro	Removed references to offer submission after gate closure and revised offers.	No longer needed as revised offer process removed.
2-Scop	2.1/2.2 All subsequent subsection numbers incremented by 1	Introductory text added, with new 2.1 taking some text from old 2.1 and new 2.2 based on old 2.3	Aligns with existing introduction of TBP.
2- Scope	2.3	Modified old 2.2. to make clear that even though embedded generators may not be subject to settlement, they are subject to this procedure.	Some solar generators will be embedded behind loads. While required to be centrally dispatched and metered, settlement will operate at the point of connection of the load to the network. This load will be settled as a generator when a net supplier to their grid.

SECTION	SUB SECTION	CHANGE	REASON
2 Scope	2.5	Removed references to offer submission after gate closure and revised offers.	No longer needed as revised offer process removed.
3- Roles and responsibilities	General Manager System Control	Modified to refer to Power and Water / Market Operator with details of responsibilities modified. Reference to Section 4B(e) should be to 4.4B(e)	Updated terminology and removes imprecise reference.
3- Roles and responsibilities	Operations System Manager	Deleted	Covered by change to definition above it.
4 - Definition	Band 1	Definition introduced. Term italicised throughout document.	Consolidates key relationships and requirements in one place
4 - Definition	Band 2	Definition introduced. Term italicised throughout document.	Consolidates key relationships and requirements in one place
4 - Definition	Band 3	Definition introduced. Term italicised throughout document.	Consolidates key relationships and requirements in one place
4 - Definition	Base Maximum Capacity	Moved from body of document to definitions Term italicised throughout document.	This term is used throughout the procedure but was previously defined only within one table entry (12) associated with the description of the offer template.
4 - Definition	Closed Cycle Mode	Definition introduced. Term italicised throughout document.	Aids reader understanding
4 - Definitions	Decommitment Order	Definition introduced. Term italicised throughout document.	Introduces new generator offer template field. Also appear in tie breaking procedure as impacts decommitment order for fast start units.
4 - Definition	Minimum Stable Generation	Moved from body of document to definitions and modified to make clear that the value is a physical limit rather than a discretionary value in making offers. Term italicised throughout document.	This term is used throughout the procedure but prior definition was only within one table entry (12) associated with the description of the offer template.
4 - Definition	Open Cycle Mode	Definition introduced. Term italicised throughout document.	Aids reader understanding
4 - Definition	Out of hours	Deleted	No longer needed as revised offer process removed.
4 - Definition	Revised offers	Deleted	No longer needed as revised offer process removed.

SECTION	SUB SECTION	CHANGE	REASON
5 - Principles	Intro	Removed references to offer submission after gate closure and revised offers.	No longer needed as revised offer process removed.
5 - Principles	5.1	Changed reference to appendix A to attachment A	They are labelled as attachments.
5 - Principles	5.2	Text on revised offers removed	No longer needed as revised offer process removed.
5 - Principles	5.3	Changed reference to appendix B to attachment B	They are labelled as attachments.
5 - Principles	5.4	"then" added	Minor wording change
5 - Principles	5.5 to 5.7.	Deleted	Revised offer process removed.
5 - Principles	5.5 (new)	Requirement added explicitly stating that offers must comply with procedure.	Makes procedure more explicit and clearer.
5 - Principles	5.6 (new)	Rejection and resubmission of offers with tied prices within one Generators offers	This clause was previously in the tie break procedure but more naturally relates to the process of offer submission (and rejection). .
5- References	All	Updated	Aligned to current documents. System Secure Guidelines referenced as part of Base Maximum Capacity definition.
6- Attachments	6.3	Reference to Attachment 3 deleted	Revised offer process removed.
7-Records	Intro	"guidelines" change to "document"	The procedure is not a guideline.
9-Document history	Table	Updated	Aligned to current version.
Attachment A Generator Offer Template	Generator Offer Template	New template added	No includes decommitment order
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #1	Functional Specification references removed	References to Functional Specification removed as relates to practices around revised offers which are being removed. Further the Functional Specification related to the original market design and is out of date and not an official market document (or published).
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #1	Statement added preventing tied offers in a generator offer	To date this has been enforced by tie breaking procedure but enforcement now via new clause 5.6 in this procedure so there needs to be an explicit requirement on how to offer.

SECTION	SUB SECTION	CHANGE	REASON
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #8	No change, point for noting on multiple offers	While no change made yet, changes are under consideration to end the current process whereby participant can submit multiple offers for a trading day with each applying from a specified commandment time. This allows units to be bought on-line in one-order, and taken off-line in a different order (based on another offer). This feature will not exist in I-NTEM 2.0 as offers will be fixed for the day.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.3 #9,7	Alignment of 9.3 and 9.7	These two sections have been rewritten to use common language and form between self-committed and fast-start units
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.5	Clarifications made to make clear that section relates to units with band 1 quantities exceeding zero, including open cycle and closed cycle operation, and that the alpha sequence would apply for a wind or solar generator that had a minimum stable load exceeding zero. A typo in the word "assumed", which should be "assume" is addressed. Final note removed.	The proposed revised tie breaking procedure for decommitting units ignores units with a minimum stable load of zero (though considers them in ties for energy). If a unit did have a non-zero minimum sable load then system control would need the ability to decommit it. More emphasis on open and closed cycle mode added as this material has been dropped from the tie break procedure to avoid describing off load orders in to places. Final note serves no purpose so removed.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.7	Clarified that negative prices cannot be submitted	Reflecting existing intent more clearly.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.7	See discussion of #9.3	Aligned with form and terminology of #9.3
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.9 old	Deleted	Replaced by clearer definition of Band 3 in definitions.

SECTION	SUB SECTION	CHANGE	REASON
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.9 new	Introduce field for decommitment order.	New field giving the option (though no requirement) to identify fast start generating units to decommitted in place of a unit selected on priced based logic (where that unit remains on-line - the intention is that it cannot set price but pricing is not covered by this procedure).
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.10	BMC limits only apply to thermal (i.e. synchronous) generators	Reflecting existing intent more clearly.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.11	No change, point for noting on synchronisation times	Intent is to switch to using forecast availability. It will be natural for this forecast availability to be provided through a difference submission template. It is expected that 9.11 will be deleted with data from the other submission used in it is place but left for now while details of that other submission being considered.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #9.12	Changed fast start unit to fast start generating unit	Change for clarity.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #11	Rewritten to reflect current practices and location of information.	This section lists the Unit IDs of all current units but these will change quickly in coming years so more appropriate to rely on other sources to avoid need to update procedure.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #12	Definitions of minimum stable load and base maximum capacity removed.	Moved to the table of definitions at front of section. Revisions made to minimum stable generation definition as well.
Attachment A Generator Offer Template	Instructions for complete the Generator Offer ('Offer') Template. #13	Clarification of the time from which an updated default generator offer applies (i.e. current one as at gate closure used)	Reflecting existing intent more clearly.
Attachment B: Gate Closure Details	Revised offers	Final sentence deleted (relating to Revised Offers)	Revised offer process removed.

SECTION	SUB SECTION	CHANGE	REASON
Attachment C: Re-submission arrangements.	Revised offers	Attachment deleted as on revised offers.	Revised offer process removed.

Generator unit tie break procedure

A mark-up of the proposed changes to the current TBP is provided as a separate document which available from the market operator's website at https://www.powerwater.com.au/market-operator/consultation-papers. The following table summarises the proposed changes in the revised TBP.

SECTION	SUB SECTION	CHANGE	REASON
Global	Global	*generating unit*	Italicised as a defined term in System Control Technical Code
2- Scope	2.3.2	This clause relates to energy ties. Removed wording suggesting that energy ties could only exist at zero price, and added condition that no tie exists where section 2.3.1 (on commitment ties) applies.	Solar units can have zero priced bids across entire range so need to remove assumption of a price greater than zero while making clear that clause is about energy ties, not commitment ties.
3- Roles and Responsibilities	General Manager System Control	Modified to refer to Power and Water / Market Operator with details of responsibilities modified. Reference to Section 4B(e) should be to 4.4B(e)	Updated terminology and removes imprecise reference.
3- Roles and Responsibilities	Operations System Manager	Deleted	Covered by change to definition above it.
4 - Definitions	Decommitment Order	Definition introduced. Term italicised throughout document.	Introduces new generator offer template field for fast start units. Restated here as impacts decommitment order.
4 - Definitions	Dispatch process	New definition	Added to avoid having to refer to both pre-dispatch and dispatch.
4 - Definitions	Energy tie	New definition related to ties in Band 2 unrelated to commitment decisions.	Defines ties at output above minimum stable generation (so no units need to decommit), both for a tie at the system level or in a congested area within the system.
4 - Definitions	Fast start commitment tie	New definitions related to ties between commitment of fast start units (for a long run) and, separately, ties between commitment of fast start units (for a short run) and the option to commit band 3 capacity of an operating unit.	Defines ties for decommitting (and returning to service) fast-start units, both for a tie at the system level or in a congested area within the system.
4 - Definitions	Generating Unit tie break	Simplified definition that refers to self-commitment ties, fast-start times and energy ties.	Modified to reflect new defined terms that replace existing text

SECTION	SUB SECTION	CHANGE	REASON
4 - Definitions	Random day selection process and Random period selection process	Both definitions referred to Appendix C, this has been changed to a reference to Attachment C.	It is labelled as an attachment.
4 - Definitions	Self-commitment tie	New definition related to ties when decommitting self-scheduled units.	Defines ties for decommitting (and returning to service) self-scheduled units, both for a tie at the system level or in a congested area within the system.
5-Principles	Introduction and 5.1 to 5.4	Removed reference to submission of generator offers	Material deleted as moved to generator offer procedure (or duplicated in that procedure).
5-Principles	5.5 (now 5.1).	Introduces dispatch process for taking unit off-line.	Wording change for consistency with changed design.
5-Principles	5.6 (now 5.2)	Made clear that in the situation described a self-commitment tie exists.	Added for clarity.
5-Principles	5.8.2 (now 5.4.2)	Units that go off first will come on first.	Added as was not previously clear in the procedure.
5-Principles	New clauses 5.5. 5.6. and 5.7	Defines a fast start unit tie and its treatment. Similar logic to that for self-scheduled units	Need to be separate to self-scheduled ties – which are about turning units off - as these units are dispatched on, also, as fast start units we use a random day tie break rule. Paragraph 5.7. addresses the order for taking units off line, though decommitment order takes precedent.
5-Principles	5.9 (now 5.8) and new 5.9	A new logic defined that ties all units – thermal and solar – and backs them off in 5 MW increments. 5.8 recognises that units with a zero minimum stable generation may need to be kept at slightly above zero output to avoid isolating them from power system.	Aim is to implement a method that treats units of different technology equally and does not take entire bands down to zero in one go, which could be detrimental to maintaining solar diversity.
6- References	All	Updated	Aligned to current documents.
8-Records	Intro	“guidelines” change to “document”	The procedure is not a guideline.
10-Document history	Table	Updated	Aligned to current version.
Attachment B	B.3, B.4	Adjusted how TGen written and renumbered clauses in B.4	Typo and format corrections.

SECTION	SUB SECTION	CHANGE	REASON
Attachment B	B.4(d)	Deleted and replaced with B.6.	Section B.4 is about the registration of the third generator, but clause B.4(d) launches into treatment of the three generators only in that context. Section B.5 contemplates additional generators but it is difficult to clearly extrapolate how B.4(d) works with more and more generators. For clarity have introduced a more general B.6 to cover this.
Attachment B	B.6.	More clear and general statement of tie break order. It effectively describes an ordering of units based on registration date where at the end of the list (most recent unit to register) the list cycles back to the earliest unit to register. The priority is then the generator associate with the random day, with others take in priority order of those that following this generator in the list.	Greater clarity.
Attachment B	B.7	A modify to B.6 to add an extra step in the process when the number of participants is a multiple of 7	If there were 7 or 14 participants then the random day process could have a strong alignment with specific days of the week. A "circuit breaker" is added by adding an 8^{th} or 15^{th} day into the process with a different pattern of tie breaking so as to avoid this problem.
Attachment C	Example 2, First paragraph	Removed references to prices greater than zero.	Aligns with other changes which recognise that solar could be offered at zero and in an energy tie.