Rules Development Implementation Working Group (RDIWG)

Meeting No. 15: Agenda

Location: Level 3, Governor Stirling Tower, 197 St Georges Terrace, Perth

Date: Tuesday, 9 August 2011

Time: 9.30am – 12.00pm

1. Previous meeting's minutes
2. LFAS Detailed Design
3. LFAS Drafting (as incorporated into the new balancing drafting)
   To be tabled on the day
4. Balancing and LFAS Detailed Design (Summary of final design details including an updated 12 box diagram)
5. Reserve Capacity Refund Decision Paper
6. Rule Drafting Timetable
7. Market Procedure List and Timetable
   To be tabled on the day
8. Outstanding Action items
9. Next meeting date and time: Tuesday, 30 August 2011

Independent Market Operator

Rules Development Implementation Working Group

Minutes

Meeting No.	14
Location:	IMO Board Room Level 3, Governor Stirling Building, 197 St Georges Terrace, Perth
Date:	Tuesday 21 June 2011
Time:	Commencing at 9.35am to 11.10pm

Attendees	
Allan Dawson	IMO (Chair)
Douglas Birnie	IMO
John Rhodes	Market Customer
Andrew Everett	Market Generator
Phil Kelloway	System Management
Geoff Gaston	Market Customer
Andrew Sutherland	Market Generator
Wana Yang	ERA
Steve Gould	Look on the RDIWG ToR for this title on here
Corey Dykstra	Market Customer
Andrew Stevens	Market Generator
Alasdair Macdonald	Minutes
Chris Brown	Office of Energy
Cameron Parrotte	Observer
Ingrid	Observer
Ben Williams	Presenter
Jim Truesdale	Observer
Greg Thorpe	Observer

Item	Subject	Action
	WELCOME AND APOLOGIES / ATTENDANCE The Chair opened the 14th meeting of the Rules Development Implementation Working Group (RDIWG) at 9.40am. Apologies were noted from Paul Hynch,	
1.	**PREVIOUS MEETING'S MINUTES** The minutes of RDIWG Meeting No. 13, held on 31 May 2011, were circulated prior to the meeting. The following amendments were	

Item	Subject	Action
	agreed: **Page 4 Item 4 paragrah 3** Mr Dykstra suggested re-ordering the words in this section of the paper to put the word "refund" after "NET Stem Shortfall". **<u>Page 4 Item 4 last paragraph:</u>** Insert at the end of the paragraph: <u>Following the decision to incorporate consideration of a revised capacity refund mechanism into the broader RCM review, a member suggested that reinstatement of System Management's discretion on outage classification be considered. The Chair indicated that the IMO is supportive of the initiative provided that transparency is enhanced. It was agreed that a meeting would be convened of interested generators, System Management and the Chair to discuss the matter</u>. *Mr Sutherland asked for confirmation whether the intent was to get rid of merit and dispatch quantity and not the capacity calculation. SM also expressed concerns with this and referred to a general burden on the SM to be a policeman which would be a new role for them. Mr Dykstra referred to the disincentives provided by such a mechanism. SM stated that issues arise when deviations are significant, for example when there is a deviation from the resource plan and balancing instruction. Mr Kelloway also referred to work being done on tolerances and asked whether it has relevance in the balancing market. A discussion ensued on this topic. Mr Truesdale informed the members that deviations do raise compliance issues but not necessarily penalty but a monitoring issue.* *Mr Sutherland referred to a problem in the current rules with the requirement to pay capacity refunds even when an outage issue has been rectified within the same day.* *Mr Birnie informed the members that there is a pre-rule-change paper being prepared that addresses these issues and advised members that they can consider the paper and discuss this further in due course.* *Action Point: The IMO to amend the minutes of Meeting No. 14 to reflect the points raised by the RDIWG and publish on the website as final.*	**IMO**
2.	**UPDATES ON BALANCING DESIGN DETAILS** Mr Williams provided a verbal update on the MEP design and implementation process. Mr Williams summarised the Paper in Agenda Item 2 containing the resolution pathways of key issues, including Pricing, DSM and other Load types, Resource Plan system security check by System Management, and Testing Process. <u>Pricing</u> Mr Williams provided a verbal summary on this part of the paper.	

Item	Subject	Action
	Mr Dykstra sought clarification whether the settlements will require input of MWh. Mr Williams confirmed that was the case. A discussion ensued regarding whether 'quantity' means requested or achieved quantity. Mr Williams confirmed the quantity is the actual quantity total. Mr Dykstra questioned the meaning of Energy Equivalent Balancing Merit Order (EEBMO). Mr Williams explained that the alternative methodology was preferred which is less complex than EEBMO and averages trends in the interval. This latter option more closely reflects how system management determines operates in real time. Mr Dykstra suggested the reason given in the paper was somewhat weaker than the explanation given at the meeting and that it would be better to refer to the latter i.e. that the alternative arrangement was more aligned with current practice. My Kelloway asked whether SCADA information was satisfactory for it to use or did the information need to be more reliable. Mr Truesdale responded that the widely accepted convention is to rely on SCADA. Mr Sutherland asked whether a one page summary on pricing could be distributed. The Chair agreed to circulate a one pager summary on pricing.	
	Action – IMO to prepare and circulate a one page example on how pricing will operate.	**IMO**
	Mr Gaston sought assurance that the market will have sufficient and accurate information at gate closure. Mr Truesdale responded that it is not just the last 2 hours that is important to the market but includes the whole window. The Chair advised that participants would be able to control whether they would be exposed to the balancing market at any time. Mr Dykstra asked whether, after gate closure, the market can expect to see load forecast and price change data for a set load and your expected quantity. Mr Williams referred to the workshop that will be held within the next few weeks where the process maps will be used to help explain the process. Mr Sutherland initiated a discussion whether the balancing market will enable system management's tasks to be performed more easily or add complexity to it. Mr Kelloway stated that, although their tasks will not be made easier, it will remove many physical issues and achieve a better outcome for the market. <u>DSM and other Load types</u> Mr Rhodes questioned whether that it is discriminatory in terms of the market objectives to exclude all load types from the balancing market. A discussion ensued between the members on this issue. It was noted that load is not prevented from affecting or setting price as a participant in the market. Mr Williams noted that load, if offered, would be very high in the stack and unlikely to be dispatched but they could be dispatched out of merit in an extreme situation where system management has the discretion to reduce load. Mr Sutherland requested confirmation whether system management can call DSM even though liquids are still available for dispatch. Mr Williams confirmed that DSM can be and that they lay halfway between an ancillary service and capacity reserve. Mt Sutherland queried whether the IMO was addressing the potential	

Item	Subject	Action
	double payment to DSM issue. Mr Williams stated that this issue, although not being dealt with in the balancing rule changes, is noted in the issues log for future attention. <u>Resource Plan security check by System Management</u> Mr Williams provided a verbal summary on this part of the paper noting that SM considered it no longer required this check. <u>Testing Process</u> Mr Williams provided a verbal summary on this part of the paper. Mr Dykstra initiated a discussion whether there would still be a need to put in quantities even though a resource plan was not required. Mr Williams noted that there would still be a need for Net Contract Position to be zero. Mr Dykstra asked why not use the current arrangement to get settled through the normal settlement process. My Williams answered that the proposed method was simpler. Mr Sutherland sought confirmation that there was no need to buy energy that could not be delivered. Mr Williams confirmed that will be the position in the normal situation, however if a participant needs to buy for its NCP then there may be a cost. <u>Conclusion</u> Subject to the comments above, the members noted the following design changes to the 12 boxes paper (from which the rules were being drafted): • Replacing the EEBMO with a pricing based on end of interval generation requirements; • Removing DSM from the Balancing market; • Removing the Resource Plan system security check by System Management. Mr Williams informed the RDIWG that the IMO will be providing a workshop in a few weeks time, the date to be confirmed, for some of their operational people to be run through the detail and to provide feedback on operational issues. The members agreed to advise the IMO of operational staff to attend workshop in late June.	
3.	**GENERAL BUSINESS** Mr Birnie reminded the members that there would be two rule draft workshops, one on the 5th July and the other on the 19th July as agreed by members. He informed the members that the draft rules will be provided at the workshop and that the Ancillary Services rule draft will be presented at the second workshop. The workshops would commence at 9.30 am and continue for the rest of the day as needed.	**IMO**
4.	**OUTSTANDING ACTION POINTS** Mr Birnie explained that many of the action points were able to be	

Item	Subject	Action
	culled from the list, pointing out that only 2 remain outstanding while the others were either “done” or “done enough”. Members indicated no concerns with this review of the action points.	
5.	**NEXT MEETING** Meeting No. 15 will be held on Tuesday 5 July (9.30am-2.00pm).	
6.	**CLOSED:** The Chair thanked members and declared the meeting closed at 11.50pm.	

LFAS Design

Background

In the April Meeting, the RDIWG recommended that the Balancing and Load Following Ancillary Services (LFAS) market design as presented in the 12 boxes paper be proposed to MAC and progressed towards a rule change proposal. In the same 12 boxes paper, the following LFAS design principles were recommended:

- IPP and Verve Stand Alone Facilities (VSAF) LFAS offers would have the following format:
    - An enablement price ($/MW),
    - upward capability (MW),
    - downward capability (MW); and a
    - Steady State Ancillary Service Base point (the pre loading required when no Ancillary Service is being called on but is needed in order for the relevant Facility to be capable of providing the service).
- Verve Energy would be required to submit a series of price-quantity pairs for the provision of LFAS including:
    - An enablement price per tranche ($/MW);
    - upward capability per tranche (MW); and
    - downward capability per tranche (MW).
- LFAS offers submitted by IPPs and VSAF would be included with Balancing Bids/Offers and would be issued as "mutually exclusive"
- The IMO would run a selection process to determine the "optimal" LFAS provider based on the expected effects different choices would have on the balancing price. Note that the IMO clearly indicated that this would not be a full "co-optimisation" methodology but a simpler heuristic approach to finding the optimal LFAS providers.
- If an IPP or VSAF facility was selected for LFAS duties the IMO would automatically adjust the BMO to reflect that the mutually exclusive capacity would be no longer available.

At an internal IMO meeting in May, the LFAS market was discussed in terms of the extent that the "heuristic approach" would be able to mimic co-optimisation, and the inclusion of the SSASB in the IMO's determination of LFAS providers.

The meeting concluded that a simpler approach was appropriate for the start of the new arrangements, with LFAS duty assigned to facilities with the lowest enablement fees over the LFAS Selection Horizon (simple price based selection). Once advised of the success of their offer to provide LFAS, potential providers would be responsible for ensuring the facilities would be operating at a level where the LFAS could be physically achieved.

Payment to all assigned LFAS providers would be on the basis of the highest enablement price accepted plus a balancing transaction for increase or decrease in energy output for LFAS operation (through the assumption that any deviation from dispatch instruction by facilities enabled for LFAS duty will be due to LFAS operation) . There will be two LFAS prices set for each interval of the day: LFAS Marginal Price Upwards and LFAS Marginal Price Downwards, both in $/MW.

Recommendations

The design team recommends that the following design be endorsed:

LFAS Market

Before the start of each day, SM will provide the quantity of LFAS that it expects will be required for each Trading Interval over the Balancing Horizon. There will be the ability for SM to update the LFAS requirement prior to LFAS Gate Closure if it believes it needs more (or less) LFAS for an interval.

There will be a requirement on Verve to offer into LFAS based upon the assumption that it will provide the entire amount of LFAS specified by SM through its Portfolio and/or Stand Alone Facilities.

For the purposes of offering LFAS in its Portfolio, Verve would offer any required pre-loading at the negative price cap within its PSC and flag this quantity as LFAS for use in tie-breaker situations.

All IPPs/VSAF who wish (and are eligible) to provide LFAS will submit a series of price-quantity pairs for the provision of LFAS including:

- Upwards LFAS Capability per tranche;
- An upwards enablement price per tranche ($/MW); and
- Downwards LFAS Capability per tranche;
- An downwards enablement price per tranche ($/MW).

Note that the above LFAS submission would be deemed "mutually exclusive to Balancing capacity" and that if an LFAS submission was accepted for an interval, the IMO will take this into account while forming the BMO, to reflect the exclusivity. (Note that the IMO will not physically amend any IPP Balancing Submissions and that Settlement will use "as entered" submissions rather than BMO adjusted values).

While there will be a requirement for LFAS submissions to be "up to SRMC", the IMO has not proposed any price limits to the LFAS Market at this time[1], however this will need to be discussed with the ERA and the wider RDIWG in due course.

Timing details

LFAS is scheduled in 6-hour "fixed" windows (the "LFAS Selection Horizon"). For each Trading Interval within a schedule, the selected providers of LFAS may differ.

[1] This is because LFAS prices will need to incorporate the risks associated with a volatile balancing price. Additionally (but of lesser importance), for a price limit to be established the IMO would need to conduct a review similar to the Energy Price Limits review currently undertaken each year – this would be time-consuming and expensive.

LFAS Gate Closure will occur 3 hours prior to the Balancing Gate Closure. Assuming a two-hour Balancing Gate Closure, we arrive with the following timetable:

LFAS Selection Horizons	LFAS Gate Closure[2]	IPPs/VSAF Balancing Gate Closure
8PM – 2AM	3:00PM	6PM
2AM – 8AM	9:00PM	12AM
8AM – 2PM	3:00AM	6AM
2PM – 8PM	9:00AM	12PM

Prior to LFAS Gate Closure, Market Forecasts[3] published by the IMO will indicate who is likely to be providing LFAS by comparing IPP/VSAF submissions for each interval in the LFAS Selection Horizon against those from the Verve Portfolio. If a Facility submission is of lower cost than the Verve Portfolio, then it will be forecasted to provide LFAS.

At LFAS Gate Closure, the final comparison of IPP/VSAF LFAS submissions against those from the Verve Portfolio is computed and the lowest cost combination of LFAS providers will be provided to SM using the latest LFAS merit order (LFMO) issued by the IMO. Market Participants will be advised of the LFAS Market outcomes. Before the start of an interval for which the LFAS Market has determined LFAS providers, SM will issue activation instructions to LFAS Providers. These instructions will include the LFAS quantities activated. The IMO will also receive these instructions for the purposes of LFAS settlement.

After Gate Closure, no further changes can be made to a provider's LFAS submissions for the 6-hour LFAS Selection Horizon.

If IPPs or VSAFs are selected to provide LFAS:

1) The IMO will amend the BMO to reflect the mutually exclusive nature of the selected LFAS submission quantities via the following process:

    a) Adjust the lowest priced tranche(s) in the latest relevant Facility Balancing Submission by removing the amount of capacity equivalent to the minimum generation (as specified in standing data) required by the LFAS generator. This generation amount would be moved to the Minimum Price Cap; then

        - For LFAS –ve (DOWN), adjust the next lowest Balancing tranche(s) by removing the selected LFAS DOWN capacity and moving to the minimum price cap (force to run); and/or

        - For LFAS +ve (UP), adjust the highest Balancing tranche(s) by removing the selected LFAS UP capacity and moving to the maximum price cap (force to be available)

    b) The BMO will contain an LFAS identification "flag" for all selected LFAS providers to differentiate them from any other capacity that is submitted at the price caps. The purpose of this flag is to aid in the prioritisation of capacity in the event of "tie-break" situations. Details of the prioritisation methodology are described within the "Tie Breaker Summary" decision paper.

2) Verve will be required to account for their lower levels of LFAS in their Portfolio by revising their Balancing Submission quantities within its PSC. To enable this

[2] This assumes a 2 hour Balancing Gate Closure + 2 hours for IPPs to respond to any subsequent changes as a result of Verve updating its PSC

[3] Information may need to be provided to the market indicating that Verve has "lost" a portion of LFAS which it had "presumed" in its PSC, so the market is prepared for a potential price change.

resubmission, there is a need for Verve to have more opportunities throughout the day to resubmit its PSC than has previously been proposed to the RDIWG. As such, the times in the table below are proposed for Verve to resubmit its PSC[4]. These times are closely aligned with the LFAS Gate Closure times outlined earlier within this paper.

Verve PSC Re-Bid Time	For Trading Intervals
By 4PM	8PM +
By 6PM[5]	10PM +
By 10PM	2AM +
By 4AM	8AM +
By 10AM	2PM +

Forced Outages of LFAS Facilities

If an IPP/VSAF Facility was selected to provide LFAS within the 6 hour LFAS Selection Horizon but at some time after LFAS Gate Closure the facility experienced a reduction in their ability to provide their LFAS Enablement Band (either partially or wholly), it would be the LFAS providers responsibility to inform SM (if the failure occurred during the 6 hour Selection Horizon). The Facility would also be required to update their LFAS and Balancing Submissions (and availability declaration) for the effected intervals to reflect the reduced capacity.

When the IMO receives an updated LFAS submission (capability and availability) after LFAS Gate Closure, the IMO take the reduced LFAS band into account in the next recalculation of the BMO and subsequent issuance of Market Forecasts.

Note that SM would be expected to use the Verve Portfolio where a shortfall in LFAS occurs following a reduction in LFAS capability.

Backup Enablement Cost

Given the continued role of Verve as the default provider of Ancillary Services, Verve will be required to provide LFAS in situations where either an IPP/VSAF fails to provide sufficient LFAS (e.g. forced outage), or SM requires a greater amount of LFAS than originally requested (and supplied by the market). If activated, "Backup" LFAS would need to be provided by the Verve Portfolio (no changes would be made to the PSC for providing this service).

Verve will be required to provide a "Backup Enablement Cost Upwards" and a "Backup Enablement Cost Downwards" ($/MW) for providing LFAS within each LFAS submission. This cost will be used by the settlements systems to price Verve's default LFAS services. It is likely that this "Backup cost" would be priced higher than the true cost of Verve providing the service, as it would be set based on a "worst case scenario".

[4] Note that the previously proposed 8AM re-bid time for Balancing has been removed as it has been replaced with the 4 LFAS re-bid options

[5] The 6PM resubmission time is still required even though it does not line up with the LFAS Gate Closures as it is the first time that the Balancing Horizon is extended for the next trading day – and for the balancing market to work a Verve PSC is required for each interval in the balancing Horizon

Agenda Item 4: Updates on Balancing Design Details

1. BACKGROUND

Workshops and meetings have continued to progress some of the more detailed issues requiring resolution before implementation can commence. This paper seeks to update the RDIWG on these remaining design details.

2. AREAS OF FOCUS

At the June 2011 RDIWG meeting it was noted that final details around the following resolutions had been incorporated into the 12 Boxes document for subsequent inclusion in the Rule drafting:

- Pricing
- DSM and other Load types
- Resource Plan system security check by System Management
- Testing processes

This paper seeks to update RDIWG members on final design details in relation to::

- Participation of all facilities
- Removal of Net STEM shortfall calculation
- Loss factor adjusting Balancing Submissions
- Load following Market Details
- Running out of Ancillary Services and High Risk States
- VE Portfolio Ramp Rate Limit requirement
- Tie breaker summary
- Sensitivity analysis

The design issues raised in the design workshops and subsequent meetings were at a business process level i.e. at the "next layer down" below the current 12 box diagram paper seen by the RDIWG. However, some of which have a material effect on design details currently proposed in the 12 boxes paper, so the updated thinking in these areas is described below. These changes will subsequently be reflected in Rule drafting.

Participation in Balancing

All registered facilities, other than Loads (as discussed in the previous Updates on Balancing Design Details RDIWG Paper) are to participate in the Balancing market through the submission of "Balancing Submissions". As such, all registered generators must submit price-quantity pairs into Balancing for all intervals. System Management will be required to implement an automated dispatch tool to enable the issue of Dispatch Instructions electronically, although it is unlikely that this automated tool will be available for the start of the Balancing market trial in December.

Due to the new dispatch complexity introduced by Balancing, participants will need to meet a certain level of capability for inclusion in the Balancing market. Facilities will be required to meet a minimum standard of technical and communication requirements. SM and IMO are currently developing a set of criteria and will make it available in due course. The market rules will therefore state that all active participants in the Balancing market will need to meet a certain level of technical and communication standards by a certain grace period (e.g. 2013) to receive Capacity Credits.

Although this may place a regulatory burden on a number of smaller players (e.g. small land fill gas generators), this burden could be minimised through the use of standing Balancing Submissions to price them out of Balancing for most intervals. Participants who are not able to meet the technical and communication standards will be able to apply for a suspension of the Rule requirements. If such a suspension is granted, the Participants behaviour in the balancing market will be restricted (e.g. they must bid at the caps to ensure that they are not dispatched away from Resource Plan) and the BMO will be constructed to ensure that these facilities are only dispatched in an emergency.

To incorporate generation levels from facilities without SCADA in the RDQ estimates (the quantity which will set the Balancing price) and to issue Dispatch Instructions, System Management will need to develop a way of estimating these generation levels. Any estimates developed by SM will be used in the determination of Dispatch Instructions, setting the Balancing price, and the calculation of constrained on/off quantities for these facilities and will be outlined in a PSOP.

Removal of Net STEM shortfall calculation

There is a separate paper being presented to the RDIWG today which details the proposal for the removal of Net STEM Shortfall. The recommendations associated with the Net STEM Shortfall calculation design are presented in that paper – they have also been incorporated into the attached 12 Boxes Document where appropriate.

Loss factor adjusting Balancing Submissions

Balancing Submission Quantities

Because dispatch is a real time physical process whereby generation must be actively matched to demand plus losses, System Management needs to know the actual generation capacity available, and the order in which it is to be dispatched to meet demand, including losses.

In order for System Management to formulate dispatch instructions from the BMO based on forecasted system generation requirements (demand including losses), the design team recommends that:

- Quantities in facility Balancing Submissions and in Verve's portfolio balancing submissions should be sent out values (as is currently the case for Resource Plan submissions).
- For settlement purposes:
    - Balancing volumes should be calculated on a loss adjusted basis at Muja (as now).

- Calculation of constrained on or off volumes should be on a consistent basis – loss adjusted to Muja. For the Verve Portfolio, a composite adjustment factor should be calculated from the generation weighted average of the Marginal Loss Factors (MLFs)for facilities which generated in the interval.

Balancing Submission Prices

In order to enable a more efficient market dispatch, it is proposed that marginal loss factors be factored into the formation of the BMO as follows:

- Prices in facility Balancing submissions should be as sent out for IPPs and Verve Stand Alone Facilities. Prices in the Verve Portfolio Supply Curve submission should be regarded as at Muja.
- Creation of the BMO will include a transparent (and auditable) MLF conversion of prices in facility submissions to prices at Muja. This calculation (including MLFs used) will be published to Market Participants.
- The balancing price should be determined from the intersection of the final Balancing Merit Order and the ex-post total generation quantity (the RDQ).
- Constrained on and off compensation should be calculated on a consistent basis. i.e. based on differences between the Balancing price at Muja and the prices in balancing submissions referred to Muja.

Load Following Market Details

There is a separate paper being presented to the RDIWG today which details the proposal for the Load Following Market design details. The recommendations associated with the Load Following Market design details are presented in that paper – they have also been incorporated into the attached 12 Boxes Document where appropriate.

Running out of Ancillary Services and High Risk States

Under the new Balancing market design, all energy in each interval will be provided by facilities dependent upon their place in the BMO. Hence if Verve (as the sole provider of Ancillary Services) is required to have a number of facilities operating to provide Ancillary Services, they will need to bid these facilities into the Balancing Market at the negative cap to ensure they run.

This behaviour in the balancing market effectively matches the current process of Verve receiving MCAP for energy provided by these facilities. However, SM have expressed concern that if the system load requires SM to make choices between facilities which have all bid at the negative cap SM might be required by the market rules to dispatch Facilities providing Ancillary services down, resulting in the provision of an inadequate level of Ancillary Services and be in breach of the technical rules (or vice-versa if at the alternative maximum cap).

This issue highlights the need for the BMO to reflect the need to for facilities providing Ancillary Services to remain running (or not running as the case may be) in order to ensure that the system is dispatched in a way that maintains system security at all times. This will ensure that both the technical code and market rules are adhered to.

The general principle when dispatching Ancillary Services will be the same for all other forms of dispatch - SM is to follow the BMO unless there is a high risk state. As such the BMO needs to reflect the 'must run' quantities being provided by facilities providing Ancillary Services as effectively unavailable for balancing dispatch. Therefore it is proposed that:

- Verve will nominate its Ancillary Service Quantities (ASQ) as part of its PSC
  - o These are the quantities at the positive and negative cap within the Verve Portfolio which are unavailable for general balancing duties;
- ASQ will be flagged in the system and in a tie break situation will lose (as per LFAS); and
- Verve ASQ need to be monitored by compliance.

VE Portfolio Ramp Rate Limit requirement

The requirements for VE Portfolio Ramp Rate Limits are:

- Verve Energy can include Ramp Rate Limits in its Portfolio Balancing Submission that take into account which facilities it expects to be synchronised and to what level during the interval;
- Ramp Rate Limits are able to be expressed at a “per interval” level (as per IPP/VSAF Balancing Submissions);
- As with any “out-of-merit” dispatch, System Management will be required to advise the IMO through a Market Advisory of any intervals where it plans to, or has dispatched the Verve Portfolio in a manner which is not in strict accordance to the BMO (i.e. dispatch is above the Portfolio Ramp Rate Limit submitted by Verve);
- Verve Energy should be required to demonstrate, if the IMO requests, that any Portfolio Ramp Rate Limit it has submitted was a reasonable estimate (“compliance issue”); and
- The IMO will investigate instances when the Verve Portfolio is dispatched in excess of its stated Ramp Rate Limits as part of its compliance regime. If the IMO determines that Verve Energy were “unjustly enriched” as a result of this “out of merit” dispatch, the compliance regime will be able to (retrospectively) review and make judgement on Verve’s eligibility for constrained on/off payments for the affected intervals.

Tie breaker summary

When the IMO constructs the BMO and a tie breaker situation occurs, Facility bids and offers will be dispatched down in the following sequence:

1. Facilities with identical bids/offers that are not in the following categories - the highest number based on the daily random number generator assigned;
2. Generators that cannot meet the minimum “active participation” criteria;
3. Facility flagged as LFAS; then
4. Facility flagged as other Ancillary Service.

Sensitivity analysis

Instead of sensitivity forecasts, an anonymous version of the Final BMO will be sent out to all Market Participants with their own quantities indicated in the stack. This is because all quantities will be expressed in the BMO, including commissioning/equipment tests and wind farm quantities which are potentially highly volatile.

The information in respect to the quantities above will be available to Market Participants. Given that these quantities will vary from the sensitivity forecast levels previously proposed, the IMO proposes to provide Market Participants with the information so that Market

Participants can assess the risks associated with different sensitivities. For example, a Market Participant may decide that a commissioning test quantity may be more volatile than an equipment test quantity, and choose to bid in a manner that doesn't expose them to the volatility associated with a commissioning test but are comfortable to bid with the levels associated with equipment tests.

3. RECOMMENDATIONS

The IMO recommends that the RDIWG:

- **Note** the following design changes to the 12 boxes paper, which will be reflected in the draft rules released for formal consultation by mid September:
  - Market rules will state that all participants required to submit Balancing Submissions must meet a certain level of technical and communication standards;
  - Participants who are not able to meet the communication standards will be able to apply for a suspension of the requirement;
  - IMO replaces the Generation Level Shortfall aspect of the Net STEM Shortfall calculation with an ability to call upon a Reserve Capacity Test;
  - Inclusion of Load Following Market Design Details as per separate Load following Design Details paper presented to the RDIWG at this meeting;
  - When dispatching Ancillary Services SM is to follow the BMO and the BMO needs to reflect 'must run' quantities for facilities providing Ancillary Services;
  - VE can include Ramp Rate Limits in its Portfolio Balancing Submission that take into account which facilities it expects to be synchronised and to what level during the interval, these can be expressed at a "per interval" level;
  - BMO tie breaker dispatch down order of: Facilities with identical bids/offers (highest number from daily number generator); Generators that cannot meet minimum "active participation" criteria; Facilities flagged as LFAS; then Facilities flagged as Ancillary Services; and
  - An anonymous version of the Final BMO will be sent out to all Market Participants with their own quantities indicated in the stack.

New Balancing Market proposal – design details

1. INTRODUCTION

This document describes the key design features proposed for revised arrangements for short term operation of the Wholesale Electricity Market (WEM) in a manner that retains the core hybrid framework of the current design. This is where IPPs develop Resource Plans for their own facilities and System Management develops dispatch plans for the Verve Energy (Verve) portfolio. The design expands on the high level concept previously presented to the RDIWG at its 14 December 2010 meeting.

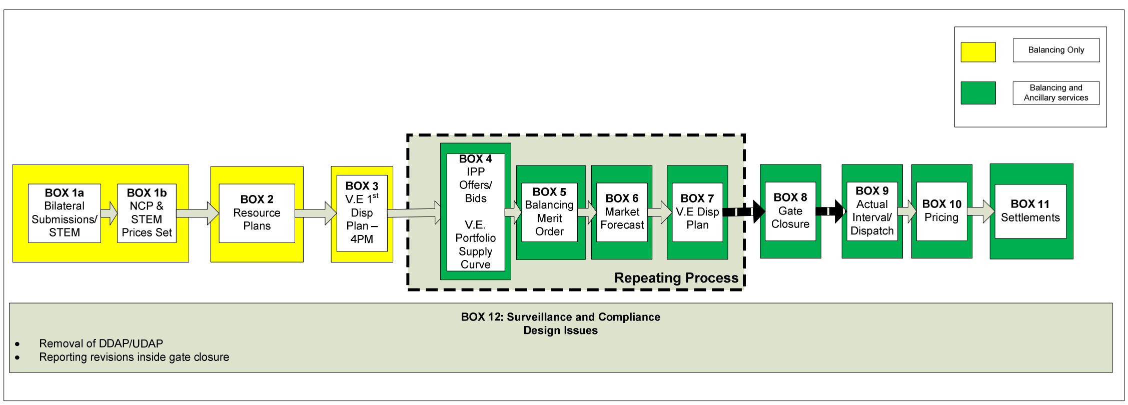
Sections 1 and 2 provide a high level overview (see figure 1). Section 3 provides additional detail of the proposed design in 12 stages.

Appendices A and B provides:

- A more detailed overview showing the roles and responsibilities for each process; and
- an example of the ability of the Balancing design to enable an IPP to de-commit a Facility if appropriate pricing conditions occur.

Finally, appendix C presents a glossary, which outlines the new defined terms that are being proposed in this design paper.

Figure 1: 12 stages of WEM operation



2. DESIGN SUMMARY

- The proposal is designed as an enhancement of the current hybrid design where IPPs are dispatched on the basis of Resource Plans and Balancing submissions (offers up/ bids down) around that level and Verve's portfolio dispatched by System Management on the basis of gross supply offers. The design also allows Verve to submit offers/bids for selected facilities.

- The design will allow for IPPs to participate in Balancing and provide for competitive provision of Ancillary Services.

- Verve will remain the ~~default balancer and~~ default Ancillary Service provider. System Management will continue to provide a dispatch coordination service to Verve and determine the dispatch of Verve's facilities on a portfolio basis in accordance with dispatch guidelines. As system and market conditions change (for example with weather, availability of fuel, capability of unscheduled wind generation) System Management will amend the Verve portfolio dispatch plan (as it does now), including commitment of units to optimise use of those resources whereas IPPs will renominate Balancing bids and offers. Verve will be able to restate its Portfolio Supply Curve following major changes. Verve will be required to nominate its Ancillary Service 'must run' Quantities (ASQ) as part of its Portfolio Supply Curve and bid ASQ's at the price caps;

- The initial stages of operation of the market are little changed from the status quo (see the sections on bilateral and STEM submissions and operation of STEM – box 1a and 1b from Figure 1).

- Resource Plans will be submitted by IPPs (and for any facilities Verve chooses to manage on a Facility basis). Resource Plans will be broadly required to match Net Contract Position (NCP) and self-supplied load (as now) except when the amount of energy (MWh) required by the NCP changes from one interval to the next. In these cases Market Participants will be entitled to elect to include Balancing energy on a planned basis around their Facility MW ramping rates.

- The first significant change to the design will be the introduction of submission of ~~bids/offers~~Balancing Submissions for Balancing and Ancillary Service from IPPs and Verve. These submissions will follow the submission of Resource Plans and calculation of the first dispatch plan for Verve plant. IPPs will make these submissions on a Facility basis and Verve on a portfolio basis. The submissions will be for the full or gross potential Balancing range being offered and Ancillary Service capability and note where these might be mutually exclusive (or conditional) (see box 4).

- The market rules will describe the principles for deciding which Balancing offers/ bids and Ancillary Service offers will be selected for service from the conditional gross capabilities submitted (see box 5).

- The Balancing Merit Order (BMO) will be determined from the Balancing submissions taking account of accepted Ancillary Service offers (see box 5).

- IPPs and Verve will have specified rights to update Balancing and Ancillary Services submissions within nominated gate closure times (see box 8).

- System Management will continue to determine the timing of commitment and decommitment of Verve plant (other than facilities Verve has elected to manage outside its portfolio). In the first instance IPPs will manage commitment and decommitment of their facilities, as currently occurs (as expressed in Facility Resource Plans). However the design of the rules around resubmissions and gate closure will facilitate IPP participation in Balancing including decommitment when appropriate (see box 7).

- Non scheduled resources (e.g. wind) may submit an offloading price and will be incorporated in the Balancing Merit Order used by System Management at the time of dispatch.

- System Management will dispatch all plant to meet demand and ensure secure operating conditions are maintained in accordance with the final merit order. The Final Balancing Merit Order (Final BMO) is developed by updating the BMO and accounting for operational limitations advised to System Management (see box 9).

- The Balancing price will be determined ex post from the total generation requirements used and the Final BMO used for dispatch – no Upward Deviation Administrative Price (UDAP) or Downward Deviation Administrative Price (DDAP) factors will apply. Constrained on/off payments will be made for Facility offers/bids dispatched at prices inconsistent with their submissions (see box 10).

- System Management will retain wide authority to manage security of operation (see box 9).

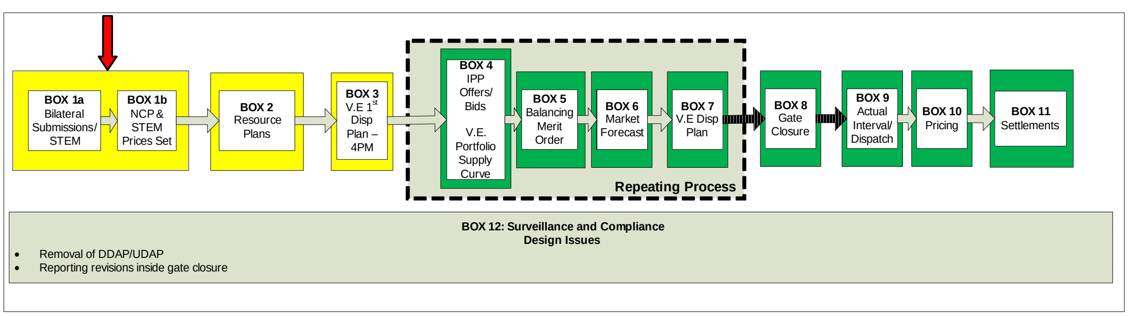
3. DETAILED DESIGN

The following pages describe each of the 12 stages in more detail. This current version of the paper provides only dot point summary of design details and later versions will be expanded with greater detail including rationale for design decisions.

3.1 BILATERAL SUBMISSIONS/STEM AND NCP AND STEM PRICES (Box 1)

3.1.1 Purpose:

This section describes the potential impacts on the current STEM process of implementing the new competitive Balancing market.



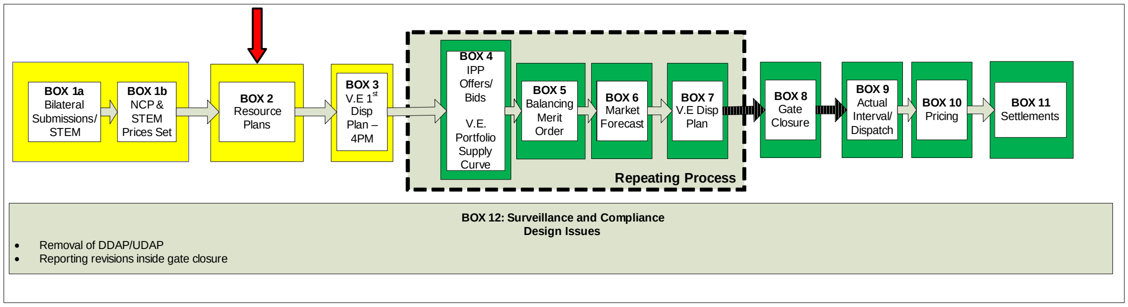
3.1.2 Proposal:

No Changes to Current STEM process and setting of NCP.

3.2 RESOURCE PLANS (Box 2)

3.2.1 Purpose:

This section explains the role of Resource Plans (RPs).



3.2.2 Background:

Once accepted RPs can be seen as self issued Dispatch Instructions (DIs) that self scheduled facilities need to comply with in order to meet their NCPs and any self supplied load. Proposed RPs must be reviewed and accepted as technically viable by System Management from a system security perspective.

Currently, RPs state the energy (MWh) proposed to be generated in a Facility in each interval and this energy must match the total NCP and self-supplied load of the relevant Market Participant.

No change to this general principle is proposed, however, the format of the submissions and the stringent requirement for energy within RPs to match NCP when NCP changes, is to be amended.

3.2.3 Proposal:

- RPs will be required for all IPP scheduled facilities (no change) and any facilities Verve elects to operate on a Facility basis. The sum of RPs submitted by a participant must match the participant's NCP plus self-supplied load except where this quantity is changing from one interval to the next.

- For each dispatch interval, RPs are to specify a MW target (sent out) with a specified ramp rate from a specified time:

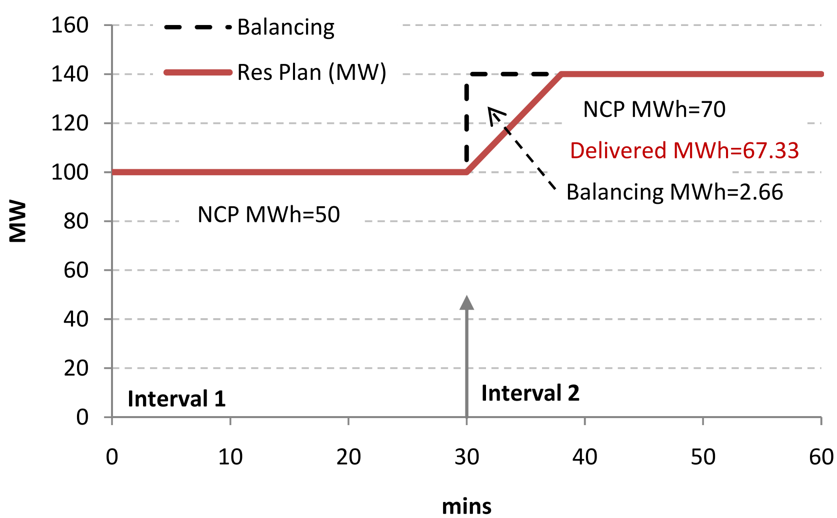
    - This will make the format of the implied self DIs through RPs consistent with the form of System Management DIs for Balancing in any interval (subject to development of necessary dispatch support tools).

    - Facilities operating to a RP will thus ramp up or down linearly in an interval and will be operating at a nominated level by the end of the interval.

    - The linear ramp rates must be realistic estimates of how the participant will dispatch the facility to meet the target level specified, accepting that for practical reasons a facility may not be able to ramp continuously at a uniform rate.

However, the specified ramp rate should reflect the time the participant expects to take, from the start of the interval, to ramp to the specified target MW level.

- The RP will form the reference level for Balancing offers/bids.
- RPs in each interval from each Market Participant must match the energy (MWh) in the corresponding NCP except when the NCP changes from one interval to the next.
  - When NCP changes from one interval to the next a RP may indicate more or less energy than the relevant NCP, this may result in one of two scenarios:
    1. The total energy provided by the facility is less than NCP (if NCP is increases as illustrated below), or more energy is produced when NCP decreases, this scenario exposes a participant to balancing energy; or
    2. when NCP is increasing (or decreasing) a participant may chose to "overshoot" (or undershoot) the NCP implied MW value, in this scenario a participant will choose a MW target that is above the NCP implied MW value so that the energy produced is equal to the MWhs in the NCP
  - The RP indicates ramping at 5 MW per minute at the start of interval 2 to a target of 140 MW, equivalent to the MW level implied by the 70 MWh NCP.

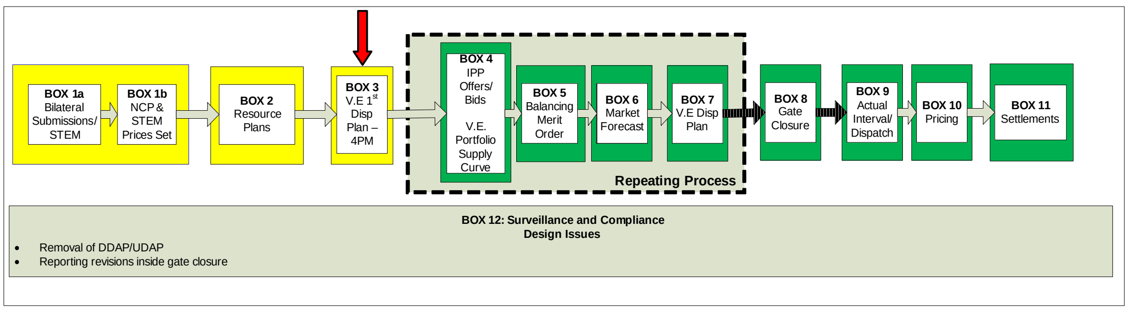


Note: RPs will contain sufficient information for half hour market processes and will not need to account for the level of Balancing or Ancillary Services that may be accepted by System Management. Bids and offers for Balancing and Ancillary Services will be submitted relative to the RPs. Renominations and operational protocols will provide for System Management to receive all information needed for secure operation of the power system through the Final Balancing Merit Order (Final BMO) and within half hour operational details e.g. short term interactions between Resource Plan ramping and Balancing capability (for additional information see Box 9).

3.3 VERVE ENERGY 1ST DISPATCH PLAN (Box 3)

3.3.1 Purpose:

This section explains the role of the first System Management created Verve Energy Dispatch Plan in the context of the implementation of the competitive Balancing market.



The Verve Energy Dispatch Plan is a service provided for Verve by System Management under the hybrid market design. System Management reviews and updates the dispatch plan as and when circumstances require.

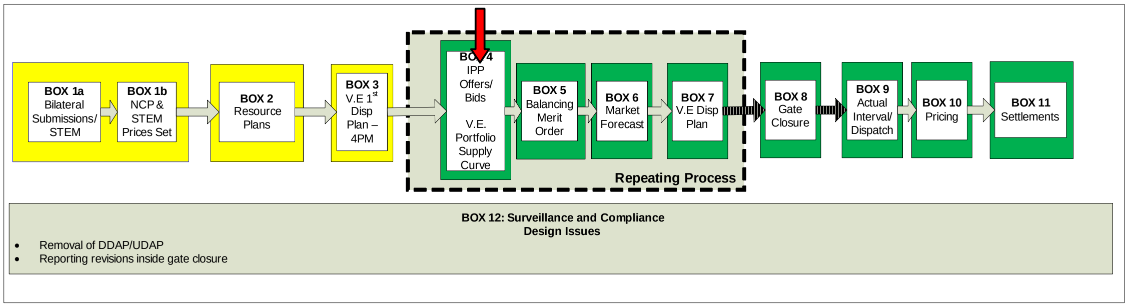
3.3.2 Proposal:

- The Market Rules will require System Management to provide dispatch plans in accordance with the Verve Dispatch Guidelines. As a minimum System Management must provide Verve an initial dispatch plan before Verve is required to submit Balancing offers/bids.
- The Rules will also need to ensure that System Management has the necessary information to account for expected IPP/Verve Stand Alone Facility generation in preparing the Verve dispatch plan (e.g. refer forecasting box 6).

3.4 BALANCING OFFERS/BIDS AND VERVE ENERGY PORTFOLIO SUPPLY CURVE AND LOAD FOLLOWING ANCILLARY SERVICE OFFERS (Box 4)

3.4.1 Purpose:

This section explains how bids and offers will be formulated for Balancing and Load Following Ancillary Services (LFAS) from both IPPs and Verve Energy (Verve) in the context of the implementation of the competitive Balancing market. Given that Verve will remain the default balancer.



3.4.2 *Proposal:*

Participation in Balancing

The current balancing market design is based upon mandatory participation. All generators must submit Balancing Submissions to reflect their facilities full capability.

All registered facilities, other than Loads[1] are to participate in the Balancing market through the submission of “Balancing Submissions”. As such, all registered generators must submit price-quantity pairs into Balancing for all intervals unless they get a suspension from these requirements. .

Generator Data Requirements

Due to the new dispatch complexity introduced by Balancing, participants will need to meet a certain level of capability for inclusion in the Balancing market. Facilities must be able to:

- Supply System Management with an estimate of Start of Interval (SOI) generation level of a facility to be able to dispatch these facilities. Note that market algorithms will need an estimate of SOI (or previous end of interval) generation levels for all facilities which have been assumed to be running to set the Balancing price ; and
- Receive electronic Dispatch Instructions (DIs) from System Management if they are to be dispatched and must be able to respond to System Management that these DIs have been received;

System Management will be required to implement an automated dispatch tool to enable the issue of Dispatch Instructions electronically (although it is unlikely that this automated tool will be available for the start of the Balancing market trial in December).

[1] As discussed in the previous Updates on Balancing Design Details RDIWG Paper Loads will be able to participate in the balancing Market by adjusting their consumption and receiving a clean balancing price for any deviations from NCP – they will just not be eligible to submit Balancing Submissions. The IMO notes that this increases a loads flexibility to respond to price signals but reduces the ability of a load to ‘lock in’ a particular price.

SM and IMO are currently developing a set of criteria around these dispatch requirements and will make it available in due course. The market rules will therefore state that all active participants in the Balancing market meet a certain level of technical and communication standards by a certain grace period (e.g. 2013) to receive Capacity Credits.

Although this may place a regulatory burden on a number of smaller players (e.g. small land fill gas generators), this burden could be minimised through the use of standing Balancing Submissions to price them out of Balancing for most intervals. Participants who are not able to meet the technical and communication standards will be able to apply for a suspension of the requirement. If such a suspension is granted, the Participants behaviour in the balancing market will be restricted (e.g. they must bid at the caps to ensure that they are not dispatched away from Resource Plan) and the BMO will be constructed to ensure that these facilities are only dispatched in an emergency.

To incorporate generation levels from facilities without SCADA in the RDQ estimates (the quantity which will set the Balancing price) and to issue Dispatch Instructions, System Management will need to develop a way of estimating these generation levels. any estimates developed by SM will be used in the determination of Dispatch Instructions, setting the Balancing price, and the calculation of constrained on/off quantities for these facilities and will be outlined in a PSOP.

Form of ~~bids and offers~~Balancing Submissions

- Initial ~~bids/offers~~Balancing Submissions for Balancing and Ancillary Services to be submitted by Verve and IPPs ~~at~~ by ~~(say 4pm to 5~~6pm).

- As a minimum, Verve will be required to submit a Portfolio Supply Curve for each trading interval comprising multiple pairs of sent out MW and price per MWh for its available capacity. This curve will be required to be submitted at the same time as the first IPP ~~bids/offers~~Balancing Submissions, approximately ~~4pm or 5~~6pm);

- Verve will be required to nominate its Ancillary Service Quantities (ASQ) as part of its Portfolio Supply Curve and bid ASQ's at the price caps. ASQ will be flagged in the system and in a tie break situation will lose (as per LFAS);

- Verve will be able to submit ~~bids/offers~~Balancing Submissions the same as IPP facilities if Verve chooses to separate out a Facility (or facilities) from its portfolio (and reduce capacity offered in its portfolio accordingly). IPP (and Verve Stand Alone facilities) ~~bids/offers~~Balancing Submissions on a Facility basis stating MW range, price:

  - IPPs *must* submit ~~a~~ price-quantity pairs covering the full *available* capacity of the Balancing Facility ~~for dispatch above Resource Plan up to the full capacity of each Facility (no change from current).~~

  - Balancing Submissions must indicate the expected ramp rate limit which will be applicable for each trading interval

- ~~IPPs *may* divide the capacity between Resource Plan and full capacity into up to [5] bands – these will form the basis for upward Balancing tranches in the Balancing merit order.~~
- ~~IPPs must submit a price for dispatch below Resource Plan including for decomittment (no change from current arrangement for a price within standing data for emergency de-commitment).~~
- ~~IPPs *may* divide the capacity below Resource Plan into up to [5] bands. These will form the basis for downward Balancing tranches in the merit order. Strongly negative prices would be expected below minimum load of generators seeking to avoid decommitment.~~

- Quantities in Facility Balancing Submissions and in Verve's Portfolio Balancing submissions should be sent out values (as is currently the case for Resource Plan submissions).
- VE can include Ramp Rate Limits in its Portfolio Balancing submission that take into account which facilities it expects to be synchronised and to what level during the interval, these can be expressed at a "per interval" level.
- All capacity expected to be available from a Facility must be included in ~~bids/offers~~Balancing Submissions.
  - Intermittent and non scheduled resources that can only control reduction in output will be able to provide a price for Balancing down. System Management will dispatch these resources down to the extent of prevailing output at the submitted price e.g. wind facilities might submit a bid (unspecified quantity) at –ve $40 and System Management will dispatch the prevailing output down if the price would otherwise fall below –ve $40. (Also see boxes 5, 6 and 9).

Ancillary Service offers:

IPPs (and VSAF) facilities which are deemed technically capable of providing LFAS by System Management will be eligible to offer Load Following Ancillary Services (LFAS) into the LFAS Market.

There will be a requirement on Verve to offer into LFAS based upon the assumption that it will provide the entire amount of LFAS specified by SM through its Portfolio and/or Stand Alone Facilities.

For the purposes of offering LFAS in its Portfolio, Verve would offer any required pre-loading at the negative price cap within its PSC and flag this quantity as LFAS for use in tie-breaker situations.

All IPPs/VSAF who wish (and are eligible) to provide LFAS will submit a series of price-quantity pairs for the provision of LFAS including:

- Upwards LFAS Capability per tranche;
- An upwards enablement price per tranche ($/MW); and
- Downwards LFAS Capability per tranche;
- An downwards enablement price per tranche ($/MW).

LFAS is scheduled in 6-hour "fixed" windows (the "LFAS Selection Horizon"). For each Trading Interval within a schedule, the selected providers of LFAS may differ.

LFAS Gate Closure will occur 3 hours prior to the Balancing Gate Closure. Assuming a two-hour Balancing Gate Closure, we arrive with the following timetable:

LFAS Selection Horizons	LFAS Gate Closure[2]	IPPs/VSAF Balancing Gate Closure
8PM – 2AM	3:00PM	6PM
2AM – 8AM	9:00PM	12AM
8AM – 2PM	3:00AM	6AM
2PM – 8PM	9:00AM	12PM

Forced Outages of LFAS Facilities

If an IPP/VSAF Facility was selected to provide LFAS within the 6 hour LFAS Selection Horizon but at some time after LFAS Gate Closure the facility experienced a reduction in their ability to provide their selected LFAS Enablement Band (either partially or wholly), it would be the LFAS provider's responsibility to inform SM (if the failure occurred during the 6 hour Selection Horizon). The Facility would also be required to update their LFAS and Balancing Submissions (and availability declaration) for the effected periods to reflect the reduced capacity.

[2] This assumes a 2 hour Balancing Gate Closure + 2 hours for IPPs to respond to any subsequent changes as a result of Verve updating its PSC

SM would be expected to use the Verve Portfolio where a shortfall in LFAS occurs following a reduction in LFAS capability. More information on how Verve would be compensated for the provision of this "backup LFAS" is provided in the LFAS Design Details Paper presented to the RDIWG at the August 9, 2011 meeting.

~~Registered (technically pre qualified) IPP and Verve Stand Alone LFAS Facilities may submit:~~

- ~~An enablement price ($/MW),~~
- ~~upward capability (MW),~~
- ~~downward capability (MW); and~~
- ~~Steady State Ancillary Service Base point (SSASB) a pre loading quiescent operating level (MW). The SSASB will reflect the any pre loading required when no Ancillary Service is being called on (e.g. system frequency at 50Hz) but is needed in order for the relevant Facility to be capable of providing the service such as part loading of gas turbines.~~

~~Verve Energy will be required to submit a Portfolio Supply Curve for the provision of LFAS including:~~

- ~~An enablement price per tranche ($/MW);~~
- ~~upward capability per tranche (MW); and~~
- ~~downward capability per tranche (MW).~~

Joint Balancing and Ancillary Service Conditions:

1) The IMO will amend the BMO to reflect the mutually exclusive nature of the selected LFAS submission quantities via the following process:

   a) ~~Adjust t~~The lowest priced tranche(s) in the latest relevant Facility Balancing Submission will be adjusted by removing the amount of capacity equivalent to the minimum generation (as specified in standing data) required by the LFAS generator. This generation amount would be moved to the Minimum Price Cap; then

      - For LFAS –ve (DOWN), adjust the next lowest Balancing tranche(s) by removing the selected LFAS DOWN capacity and moving to the minimum price cap (force to run); and/or
      - For LFAS +ve (UP), adjust the highest Balancing tranche(s) by removing the selected LFAS UP capacity and moving to the maximum price cap (force to be available)

   b) The BMO will contain an LFAS identification "flag" for all selected LFAS providers to differentiate them from any other capacity that is submitted at the price caps. The purpose of this flag is to aid in the prioritisation of capacity in the event of "tie-break" situations.

2) Verve will be required to account for their lower levels of LFAS in their Portfolio by revising their Balancing Submission quantities within its PSC. To enable this resubmission, there is a need for Verve to have more opportunities throughout the day to resubmit its PSC than has previously been proposed to the RDIWG. As such, the times in the table below are proposed for Verve to resubmit its PSC[3]. These times are closely aligned with the LFAS Gate Closure times outlined earlier within this paper.

Verve PSC Re-Bid Time	For Trading Intervals
By 4PM	8PM +
By 6PM[4]	10PM +
By 10PM	2AM +
By 4AM	8AM +
By 10AM	2PM +

~~Offers (by IPP and Verve Stand Alone Facilities) to provide Balancing and Ancillary Services will be presumed to be mutually exclusive and that Market Participants will be indifferent about which (if either) service is accepted based on the prices submitted. This will mean that a Balancing offer for +/- 30MW and LFAS offer of +/- 20MW can be made for a Facility with a capacity of 200MW providing the Resource Plan is for no more than 170MW. Market systems will determine which combination of Balancing and LFAS it is appropriate to accept at the time of dispatch e.g. 30MW Balancing with 0MW LFAS or 10MW Balancing and 20MW upward LFAS. Final selection will be made by System Management on the basis of data available just prior to time of dispatch.~~

~~An alternative approach whereby Ancillary Service providers would be pre-determined would require a separate consideration of offers to provide Ancillary Services and for those parties whose offers were accepted to submit Resource Plans and Balancing offers adjusted for those offers. Consistency between capacity, Resource Plans, Balancing and Ancillary~~

[3] Note that the previously proposed 8AM re-bid time for Balancing has been removed as it has been replaced with the 4 LFAS re-bid options

[4] The 6PM resubmission time is still required even though it does not line up with the LFAS Gate Closures as it is the first time that the Balancing Horizon is extended for the next trading day – and for the balancing market to work a Verve PSC is required for each interval in the balancing Horizon

~~Service amounts would need to be validated. An additional market process would need to be introduced.~~

~~Because submissions for provision of Balancing and Ancillary Services are to be made simultaneously and are to be conditional, the submissions from participants will be relatively simple. Market systems (software) will be used to select the combination of successful providers and this selection process can be relatively simple or involve complex trade-offs between Balancing and Ancillary Services. Such a framework allows for simple initial arrangements that can be refined over time by changing the design of the software support within market processes used by both IMO and System Management without need for subsequent changes to submissions.~~

~~Importantly details of the timing of submissions, resubmissions and reassignment of Ancillary Service duty should be chosen to align with the broader Balancing market design and design of software support and processes used by System Management.~~

Resubmissions:

In order to ensure System Management is presented with accurate information about the quantity available from each Facility and to ensure the prices for dispatch of Verve and IPP resources reflect changes in costs across each day:

- Verve will be eligible to re-submit its Portfolio Supply Curve at the ~~beginning of the trading day (say 8am)~~time the Balancing Horizon first extends (6PM), an hour after the four LFAS gate Closure times (as above) and/or when a Facility within the PSC experiences a demonstrable physical outage to one of the Facilities within the PSC.

- IPPs and Verve (in respect of resources it elects to submit on a Facility basis) may re-submit up to specified rolling gate closure times (see box 8).

~~**Assessment of conditional Balancing and Ancillary Service offers:**~~

~~The objective of the assessment is to determine as close to optimum mix of Balancing and Ancillary Service providers at any given time. This section provides an example of a possible framework to select Ancillary Service providers – in effect the framework for support software or processes that could be employed. Simpler or more complex frameworks may be appropriate initially and over time. In principle the selection process should account for enablement costs, any SSASB and the resultant Balancing costs and may for example see more expensive Ancillary Services selected to allow cheaper Balancing at an overall lower cost than selecting Ancillary Service only on the enablement cost for Ancillary Service.~~

~~Ideally, selections would be based on a full co-optimisation analysis of Balancing and Ancillary Services. A move to full co-optimisation would be a complexity not warranted at such an early stage of an Ancillary Service market. As such approximate or rules based approaches will be needed (Note: The design allows for future development of a more complex selection criteria if needed).~~

~~Subject to further refinement before operation under new rules commences, the initial selection procedure will involve:~~

- ~~A LFAS merit order established by System Management [4] times per day and as appropriate at the discretion of System Management following material changes in operating conditions; and~~

- ~~The LFAS merit order to be based on minimising the cost of LFAS enablement payment and estimates of the average constrained on/off payments for any SSASB for the relevant period the merit order applies for (e.g. 6 hours). Enablement payments will be specified in Market Participants submissions and constrained on/off payments will be the difference between the market Balancing price and the price for Balancing submitted by the Market Participant. Initially the LFAS merit order will not normally be reviewed in the event of Balancing resubmissions other than at the [4] specified review times.~~

~~The procedure recognises that if all Resource Plans and demand forecasts are accurate and system frequency is steady at 50Hz then no Balancing and no LFAS will be dispatched. In this circumstance if no pre loading is required Balancing costs will be zero and unaffected by enablement of facilities to provide LFAS. The only cost relevant to selecting which Facility to provide LFAS will be the LFAS enablement charge.~~

~~In the case where a Facility can only provide LFAS if it is pre loaded to a SSASB, the BMO will be adjusted (see Box 5). The LFAS provider will then be entitled to receive a constrained on/off payment and different sources of Balancing will be required. The procedure requires an estimate of the average constrained on/off payment which will be based on the forecast average Balancing price (from the amended BMO). The use of average prices over a number of hours, the normal fluctuations in demand and intermittent generation as well as changes to Balancing submissions will mean that the Balancing price in this calculation will often differ from the final price meaning that there is a risk that when assessed after-the-fact the order in which LFAS was called will be inefficient. Monitoring of the market should include an assessment of the level of inefficiency as one factor in considering the benefit of refinement of the procedure.~~

~~Additionally there will be a mechanism within the Market Rules that will require selection to be on the most efficient basis that is practicable in accordance with available decision support tools and a procedure to be developed by the IMO. The selection methodology can be reviewed periodically (potentially each 6 months in consultation with Market Participants). This approach will establish the principle in the Market Rules but allow progressive improvement on a procedural basis~~

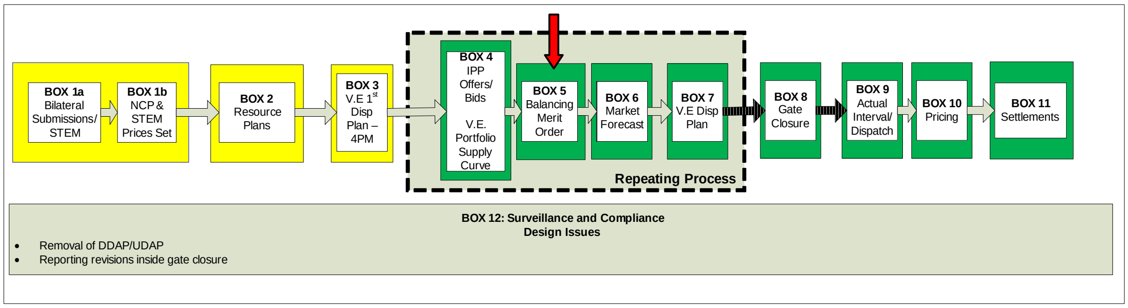
Verve Stand Alone Facilities:

Verve Energy will have the ability to elect to submit a “Stand Alone” Facility basis on a trial basis for one month prior to formal removal from the portfolio. Verve Energy will be required to seek System Management (or IMO?) approval for Stand Alone status of a facility at least 1 week prior to the facility being split out on either a trial or permanent basis.

3.5 BALANCING MERIT ORDER (Box 5)

3.5.1 Purpose:

This section explains how the Balancing Merit Order (BMO) described above will be constructed.



3.5.2 Proposal:

- A ~~Market~~ Forecast BMO (for future trading intervals) and a Final BMO (for the next trading interval) will be developed on an ongoing basis throughout each day. The ~~Market~~ Forecast BMO will be based on current Balancing ~~s~~Submissions ~~made prior to a defined period before trading the relevant interval (e.g. Facility gate closure). At that time, the Market BMO will become the Final BMO. The Final BMO will continue to be updated as circumstances change and submissions need to be updated (for example, due to a Facility failure) and will be used by System Management for dispatch.~~ Pricing will be based on the Final BMO for each trading interval.

- The BMO for each trading interval will be created by inserting Facility Balancing submission quantities (IPP or Verve Stand Alone facilities) into the Verve Portfolio Supply Curve (PSC) in price order. ~~For Facility offers/ bids, maximum Facility ramp~~Ramp ~~up and down rates~~ Rate Limits will also be identified in the BMO.

- Unscheduled / intermittent generation will be included in the BMO based on respective Balancing price submissions and forecast Facility quantities. Inclusion in the Final BMO will be based on their Balancing price submissions and the prevailing capability, which will be available for dispatch by System Management.

- Currently the market rules treat intermittent load as a non-dispatchable load (other than the fact it is not required to pay its proportion of IRCR associated with the temperature dependant part of the capacity procured). As such, the demand associated with an Intermittent Load would be eligible to participate in Balancing in the same way as any other non-dispatchable load (all be it with greater flexibility).

- The BMO~~/Final BMO~~ will not incorporate curtailable, dispatchable and interruptible loads. These load types should be excluded from the initial implementation of the Balancing market~~, as the integration of the various load types would require significant rule changes and complexity.~~.

- ~~Offers or bids with identical prices will be identified/linked in the BMO/Final BMO and subject to tie break rules~~.

- Their treatment in forecasting and dispatch is discussed later.

- Where facilities with identical prices will are identified, the IMO will implement a random number solution to dictate the order such facilities appear in the BMO, A random number will be assigned to a facility (for a whole day) and the facility with the lowest random number will be selected ahead of other facilities with the same Balancing Submission price.

- Note that it will not be practical to identify Verve liquids facilities specifically within the BMO/Final BMO unless Verve submits them for Balancing on a Facility basis i.e. quantity/price pairs within Verve's PSC are not linked to individual facilities. Discussed further in relation to dispatch.

- The BMO needs to reflect 'must run' quantities for facilities providing Ancillary Services to ensure that the system is dispatched in a way that maintains system security at all times.

In order to enable a more efficient market dispatch, marginal loss factors will be factored into the formation of the BMO as follows:

- Prices in Facility Balancing submissions will be regarded as prices as sent out for IPPs and Verve Stand Alone Facilities. Prices in the Verve Portfolio Supply Curve submission will be regarded as at Muja.

- Creation of the BMO will include a transparent (and auditable) MLF conversion of prices in facility submissions to prices at Muja. This calculation (including MLFs used) will be published to Market Participants.

- The Balancing price will be determined from the intersection of the Final BMO and the ex-post total generation quantity loss adjusted to Muja.

- Calculation of constrained on or off volumes should be on a consistent basis – loss adjusted to Muja. For the Verve Portfolio, a composite adjustment factor should be calculated from the generation weighted average of the MLFs for facilities which generated in the interval. .

3.5.3 Further work:

- The exclusion of load types from active participation in the Balancing market will require an appropriate strategy for handling dispatchable/interruptible load types. This will be determined between the IMO and System Management and initially only for the load types that currently exist.

3.5.4 Example:

Consider the following (stylised) scenario with Verve and 2 IPP facilities. For now it is assumed that Verve submits a Portfolio Supply Curve for its entire portfolio (i.e. Verve does not present any Stand Alone Facility based submissions). It is also assumed that there is no unscheduled/ intermittent generation.

Verve Submission		
Tranche	**MW**	**$/MWh**
14	50	$420
13	400	$276
12	200	$60
11	80	$40
10	300	$35
9	60	$30
8	20	$25
7	20	$5
6	100	$0
5	40	-$3
4	80	-$5
3	150	-$30
2	200	-$50
1	360	-$275
Tot Capacity	2,060	

IPP1 Facility Submission (Resource Plan = 50 MW[5])		
Parameter	**MW**	**$/MWh**
Tranche 3~~Up 1~~	~~10~~50	$50
Tranche 2~~Down 1~~	~~15~~40	$10
~~Down 2~~Tranche 1	25	-$275
Total Capacity	50	
	~~MW/min up~~	~~MW/min down~~
Max Facility ramp rate	2	~~2~~

IPP1 submitted a Balancing bid for some of the capacity below its Resource Plan at a very low price. That capacity would not be dispatched down and/or off unless System Management has no other options available within the Final BMO for normal Balancing purposes, creating an overall security of supply situation, or has to dispatch the Facility down for a localised security of supply situation.

5 Resource Plans will be in the form of ramp rate and MW target as discussed earlier (Box 2). This is ignored here for simplicity but will need to be taken into account in forming Dispatch Instructions (Box 9). For example, if a Balancing offer is to be dispatched and the Facility will already be ramping in accordance with its Resource Plan.

IPP2 Facility Submission (Resource Plan = 100 MW[6])		
Parameter	MW	$/MWh
Tranche 3~~Up 1~~	150	$70
Tranche 2~~Down 1~~	~~50~~100	$30
Tranche 1~~Down 2~~	50	-$275
Total Capacity	150	
	~~MW/min up~~	~~MW/min down~~
Max Facility ramp rate	3	~~3~~

Also assume that a wind farm has bid in to be dispatched down for negative $40 per MW and the participant has forecast that the Facility will be operating at 50 MW at the end of the interval.

Submissions would be aggregated into a Market BMO for System Management purposes along the following lines. (In practice, the BMO would also identify any identically priced offers and for Facility submissions maximum ramp up and down rates).

	Tranche MW Range		Cumulative MW Range[7]	
ID	From	To	From	To
VE PSC	1,610	2,060	1,760	2,210
IPP2	100	150	1,710	1,760
VE PSC	1,410	1,610	1,510	1,710
IPP1	40	50	1,500	1,510
VE PSC	1,030	1,410	1,120	1,500
IPP2	50	100	1,070	1,120
VE PSC	950	1,030	990	1,070
IPP1	25	40	975	990
VE PSC	560	950	585	975
Wind1 Down	50	0	635	585
VE PSC	360	560	435	635
VE PSC	0	360	75	435
IPP2	0	50	25	75
IPP1	0	25	0	25

6 Resource Plans will be in the form of ramp rate and MW target as discussed earlier. This is ignored here for simplicity but will need to be accounted for in formulating dispatch instructions.

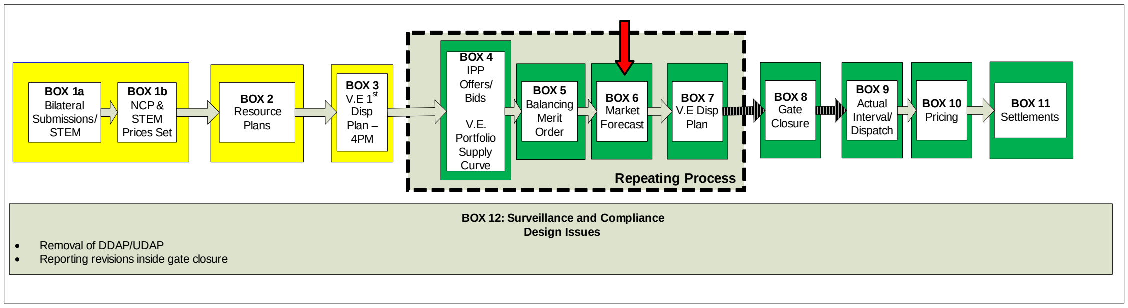
7 Aggregate MW range added.

Information in resubmissions would be used to update the Forecast BMO and the Final BMO. Accepted Ancillary Service offers that require pre loading away from Resource Plan in the case of IPPs or Verve where a defined MW quantity is required will be reflected in the BMO as appropriate – for example where partial loading is required on a Facility that would not otherwise be operating would be seen as an increase in the capacity at the bottom of the BMO/Final BMO. Similarly if acceptance of an Ancillary Service offer that was conditionally linked to Balancing and will reduce the amount available for Balancing then the capacity at the bottom of the BMO/Final BMO will increase and the relevant Balancing tranche decrease.

3.6 MARKET FORECAST (Box 6)

3.6.1 Purpose:

This section describes the market forecasts that are envisaged.



3.6.2 Proposal:

- Market Participants will be provided with regular 2 hourly (rolling) forecasts of the Balancing price and also their expected Balancing quantity to help them to make informed bids and offers, and prepare for any likely dispatch. Forecasts will extend over the period for which Balancing submissions apply i.e. forecasts issued today before initial bids and offers for the following trading are due (say prior to 5pm) will cover trading intervals out to 8am tomorrow. Forecasts issued after that time, will cover trading intervals out to 8am the day after. These future trading intervals are referred to as the Balancing Horizon.

- The forecasts are especially important in relation to Market Participants decisions about commitment, de-commitment and management of constrained fuel supplies etc and resubmissions to give effect to these decisions.

- It is proposed that the following forecasts will be provided at regular intervals leading into gate closure:

    - Expected system generation requirement (to all Market Participants);

    - Expected overall Balancing quantity (to all Market Participants);

- Expected overall wind/non-scheduled load (to all Market Participants)
- Expected Balancing price (to all Market Participants);
- ~~Expected Balancing price if total generation requirements are +/- 1% from forecast; and~~Anonymous BMO
- Expected Facility Balancing quantities (to relevant Market Participant only) including identification of any security constrained requirements.

- From the Market BMO and forecast total generation requirements, taking account of forecast unscheduled generation, a market forecasting model will determine expected dispatch quantities for facilities (IPP and Verve Stand Alone) and Verve's portfolio and expected Balancing prices.
- The initial forecasts for a trading day will effectively be a system generation schedule covering the rest of the current trading day out to the end of the following trading day i.e. the Balancing Horizon. System Management will review this information and advise the IMO of any constraints that need to be applied to generation within the schedule (for example due to a local transmission outage/constraint). The IMO will issue market advisories detailing this information when subsequent forecasts are issued.
- System Management will use forecast dispatch quantities for Verve's PSC and IPPs (Resource Plans +/- expected dispatch of Balancing offers/ bids) in preparing and updating the Verve dispatch plan.
- The above procedure will continue to be carried out each time a ~~bid/offer~~Balancing Submission is updated by an IPP (or Verve PSC updates are allowed) with new forecasts being provided to market at regular intervals. It may also be practical to re-issue forecasts whenever there is a change to input forecasts.
- Forecasts will continue to be provided after gate closure so that IPPs can be prepared for any likely Dispatch Instructions which they might receive.
- The adequacy of the forecasts will need to be reviewed after an initial period of time (it is proposed two years). This review will need to assess the accuracy and also the usefulness to Market Participants.

Appendix A includes an overview of the above processes.

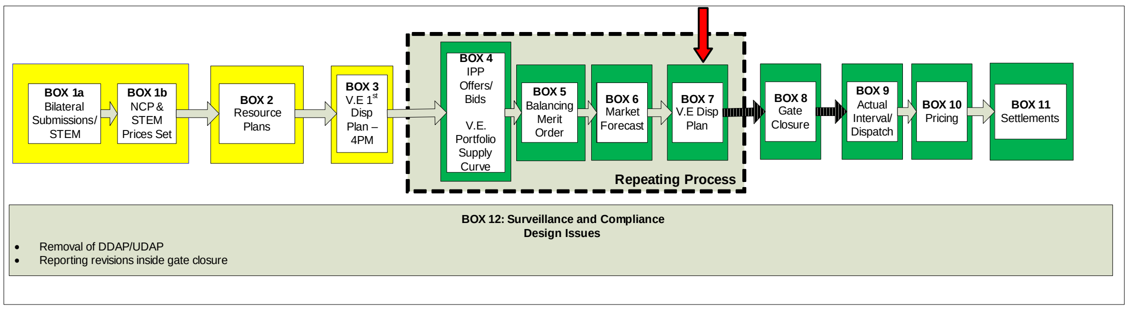
3.6.3 Further Work:

- Discussion with System Management re new systems it may require to support forecasting processes e.g. more real time load forecasting and/or wind forecasting tools?

3.7 VERVE ENERGY DISPATCH PLAN (Box 7)

3.7.1 Purpose:

This section explains the ongoing need for System Management to re-calculate the Verve Energy Dispatch Plan over the scheduling day to account for forecasted IPP Balancing ~~bids/offers~~ Submissions.

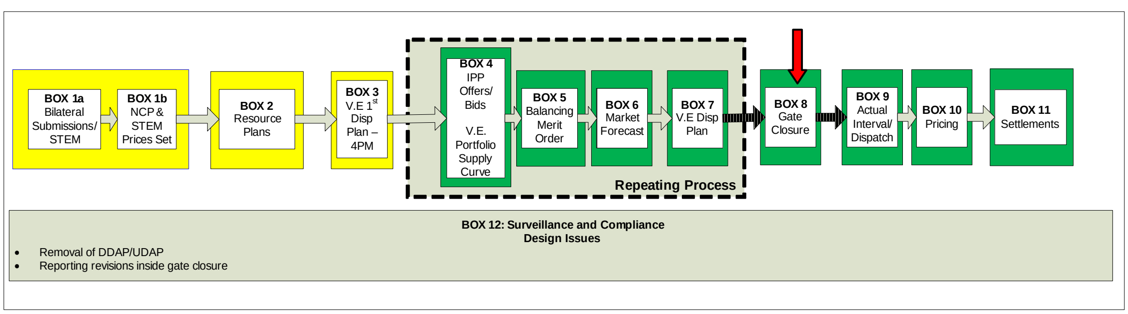


The Verve Energy Dispatch Plan is prepared by System Management as a service to Verve within the hybrid design and reviewed as needed. In updating the Verve Energy Dispatch Plan, System Management is in effect undertaking a review and revisions to Balancing ~~bids/offers~~ Submissions for facilities within the Verve PSC leading up to resubmissions (subject to PSC gate closure).

3.8 GATE CLOSURE (Box 8)

3.8.1 Purpose:

This section explains gate closure or the time up to which Market Participants may resubmit specified market information and offers/bids.



3.8.2 Proposal:

- At fixed gate closure times and/or when a major change in circumstances occurs, such as a Facility failure or having to switch a Facility from gas to liquids Verve may update its Portfolio Supply Curve (PSC).
- Up to a normal rolling gate closure, say 2 hours, ahead of dispatch intervals IPPs (and Verve Stand Alone facilities) may resubmit Facility bids and offers for Balancing/Ancillary Services relative to their Resource Plan.

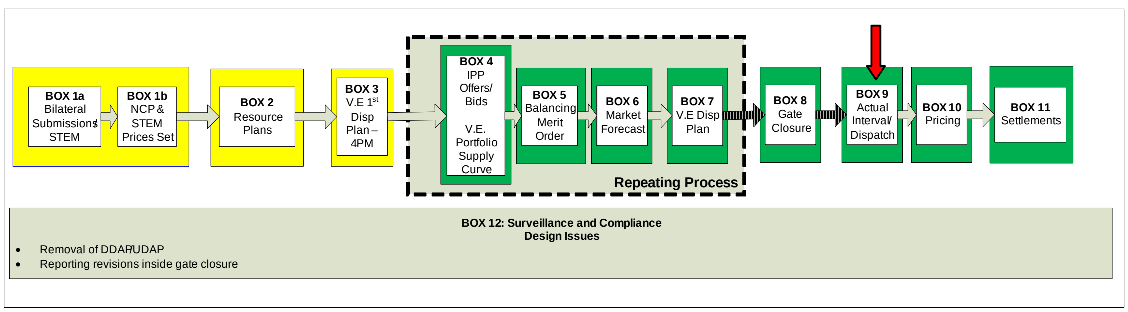
- Normal Facility gate closure requirements may be relaxed if System Management issues a system security advisory indicating a supply shortfall forecast or a supply excess forecast. In these cases Market Participants would be able to increase their offered quantities inside the normal gate closure period in response to a System Management supply shortfall advisory. Market Participants would be able to increase bid quantities (e.g. to effect a de-commitment) within the normal gate closure if System Management has issued a supply excess advisory notice.

- Once normal gate closure has occurred, changes to the BMO/Final BMO will still be required (e.g. for bona fide physical changes to offers/ bids, responses to security advisories, actual wind generation levels etc). The Final BMO used by System Management for dispatch will be the Final BMO for pricing purposes.

3.9 ACTUAL INTERVAL/DISPATCH (Box 9)

3.9.1 Purpose:

This section explains how the Balancing market structures outlined above would be implemented. It will explain Dispatch Instructions leading into a half hour period, real time management of load over the half hour and the role of LFAS within the new Balancing Market.



3.9.2 Background:

Instantaneous supply must match instantaneous demand using production under Resource Plans, non-scheduled generation, Balancing service and Ancillary Services.

The Balancing service follows the expected trend during the half hourly dispatch interval in the difference between Resource Plans and the net of total demand, non-scheduled resources and steady state requirements of plant providing Ancillary Services8. The Load Following Ancillary Service (LFAS) tracks the instantaneous difference between demand, including losses, and all other production. This principle is unchanged from the status quo.

Instructions to deliver Balancing (Balancing Dispatch Instructions or Balancing DIs) will be formulated just prior to the start of each half hour in accordance with the Final BMO to ramp to specified MW targets at specified ramp rates at (or from) a specified time within the interval.

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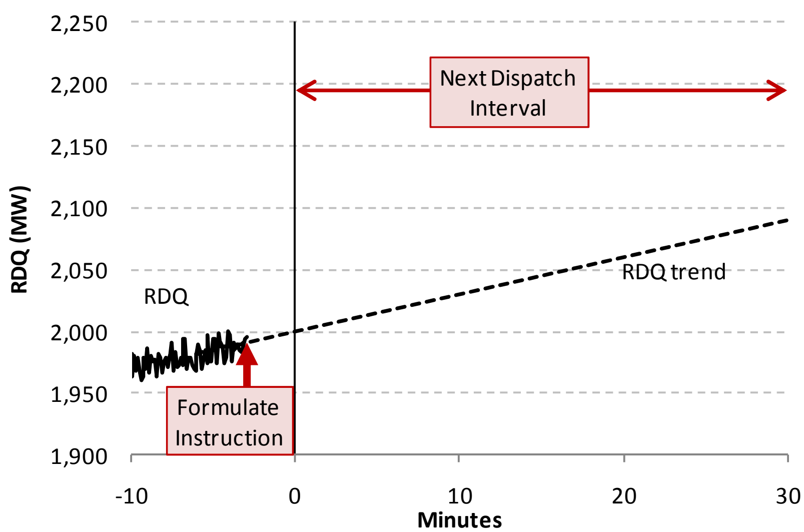
8 See previous discussion on requirements to provide Ancillary Services.

The primary objective of dispatch is to maintain security and minimise the cost of dispatch.

3.9.3 Proposal:

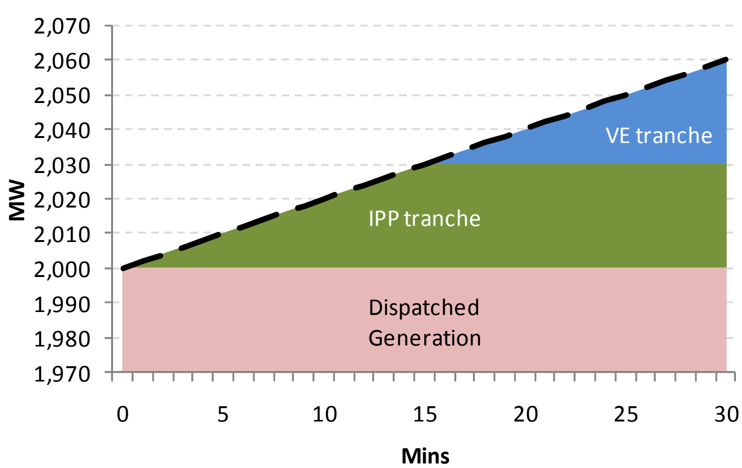
- System Management will use the Final BMO to formulate Balancing DIs.
- If the facilities providing LFAS are to change, relevant LFAS providers would be instructed to enable/disable the service and System Management would bring the relevant facilities into/out of the AGC system.
- Prior to a dispatch interval, System Management will estimate the underlying MW trend in total generation requirements during the next dispatch interval.
    - o This quantity is called Relevant Dispatch Quantity (RDQ) for the remainder of this paper.



- System Management will formulate Balancing DIs in accordance with the Final BMO so as to meet the expected RDQ with the objective of minimising the cost of dispatch. System Management will need to develop systems to formulate Balancing DIs. Where a Facility is selected for LFAS, AGC capability will be required and any conjoint Balancing DI would be issued via AGC. For facilities not selected for LFAS, systems will be required for System Management to issue and for Market Participants to receive Balancing DIs.
- System Management will have overriding authority to intervene in order to maintain security but will be expected to follow market based processes where feasible.
- System Management would continue to monitor security and Facility responses to Balancing DIs during an interval and would issue new instructions if required.

Format of Dispatch Instructions:

- A Balancing DI is an instruction to a Facility to change output:
    - For an IPP or Verve Stand Alone Facility, an instruction is relative to Resource Plan (assumed to be zero if no Resource Plan submitted).
    - For Verve's portfolio, System Management will issue instructions to facilities to adjust their gross output so that the portfolio is dispatched to meet Final BMO requirements.
- A Balancing DI is an instruction to change output once and in one direction:
    - System Management will typically issue one only ramp rate and MW target to a Facility just before a trading interval (with LFAS compensating for residual imbalances within the trading interval).
    - If necessary, System Management may need to issue new instructions within a trading interval (for example, to maintain LFAS services within their offered MW regulation ranges or to address unexpected system events within a dispatch interval).
- Subject to the above, Balancing DIs will typically be issued prior to an interval and consist of:
    - A MW target;
    - A ramp rate (less than or equal to specified maximum Facility ramp up/down rates); and
    - A time to start ramping (to distinguish clearly between the Balancing and LFAS roles, under normal circumstances this time will be no later than say 15 minutes (to be confirmed) into the interval).
- These concepts are illustrated below:

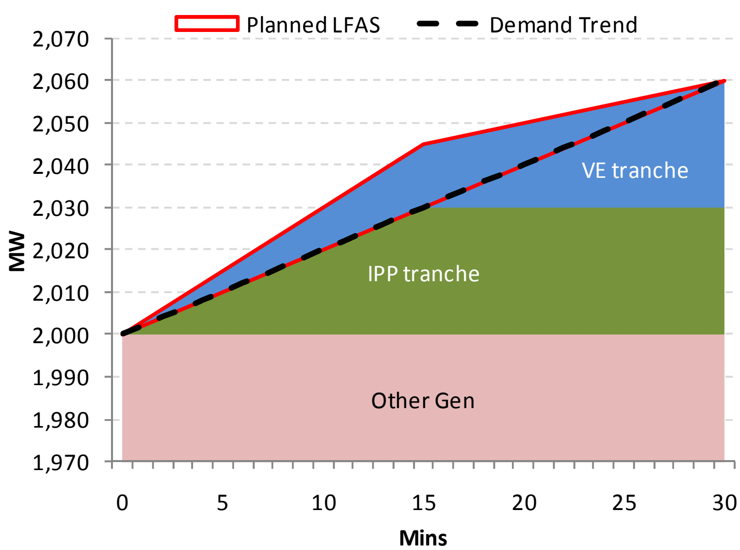


- In the example shown, an IPP Facility Balancing offer is able to be dispatched at less than its specified maximum ramping rate to follow the expected trend in RDQ (the dashed line). This minimises the use of the higher priced Verve tranche.

Planned LFAS:

- A consequence of the above methodology is that where it is necessary to dispatch multiple offer/ bid tranches in a dispatch interval, they could be instructed to ramp up linearly to an end of interval target as illustrated below.

- As illustrated, this implies a certain level of LFAS is in effect planned (aside from variations from trend) during dispatch intervals – which is called “planned LFAS” in the remainder of the paper.



Practical dispatch considerations:

- It is important to recognise that Balancing DIs will be based on market parameters which do not account for all factors that affect operation of a generating Facility within a half hour. For example; to reflect automatic governor response to system frequency changes; having to put equipment in/out of service while ramping (such as coal mills, feed pumps etc); block loading/ ramping/ hold requirements when bringing a Facility into service etc; or Facility problems/ delayed start-ups etc. As a result Balancing DIs are incapable of defining sub half hour production requirements precisely. Dispatch via AGC will reduce some of the sources of imprecision but not all and is not mandatory in order for a Facility to contribute to Balancing.

- To the extent practical, offers/ bids should take all relevant factors into account (being reasonable estimates of the capability of a Facility if dispatched) and Market Participants will be expected to follow instructions to the extent practical. Consistent and material deviations from instructions developed in accordance with ~~bids/offers~~Balancing Submissions would be a compliance matter. Deviations from instructed DIs are to some extent inevitable and need to be viewed in the context that half hourly dispatch in any event is inherently imprecise, being based on estimates of trends in demand and intermittent supply during a dispatch interval, and made prior to the interval.

While System Management is entitled to rely on instructions being implemented in accordance with offers through the market over a half hour, Market Participants will also be required to inform System Management of all relevant limitations on response to DIs. This will enable System Management to determine dispatch of Balancing and Ancillary Services across the power system as a whole.

Outstanding issues:

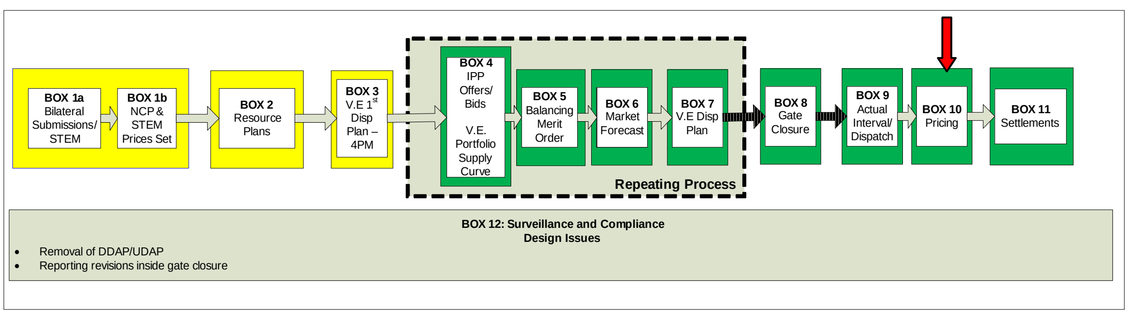
- As noted above, System Management will require decision support software that incorporates the above rules with the total generation forecasts and the Final BMO. For example, to manage the potential of multiple tranches being dispatched in an interval, including one ramping down while another ramps up, to help determine the appropriate start times, targets and ramp rates for Facility instructions (taking into account Resource Plans where a Facility is already ramping to a MW target during the interval).

- Verve liquid facilities: Verve will be able to separate dual fuelled facilities from its portfolio submission, with associated resubmission flexibility up to gate closure. Verve will also be able to update Facility submissions if a material change in circumstances criterion is met (need to define). The alternative of requiring System Management to dispatch IPP submissions ahead of Verve liquid facilities (as now) and adjusting the Final BMO could be considered further but is problematic given that the Verve PSC is not Facility specific.

3.10 PRICING (Box 10)

3.10.1 Purpose:

This section describes the calculation of prices within the short term operation of the WEM.



Balancing Price:

Objective: Balancing price to reflect the marginal price of resources dispatched by System Management to provide actual balancing from IPP and any Verve facility prices and Verve PSC prices.

3.10.2 Proposal:

- The balancing price is to be calculated ex post from the Relevant Dispatch Quantity (RDQ) and the Final BMO for the half hour trading interval, based on actual sent out MW (SCADA) levels for facilities and the Verve portfolio at the end of each interval and maximum facility ramp rates.

- Constrained on/off payments will be made to participants dispatched by System Management where the price of the bid or offer dispatched is inconsistent with the balancing price. This is discussed under Settlements.

3.10.3 Details:

- The RDQ is the total amount of energy generated ('sent out') by facilities at the end of the trading interval. This will need to be calculated using SCADA given delays in obtaining metering data and lack of metering at Verve facilities.

- The RDQ will be calculated using end of interval MW values as this mirrors the process System Management (SM) will use for determining Dispatch Instructions (i.e. SM will estimate the trend in generation requirements during the interval and issue instructions in accordance with the BMO).

- It is possible, as with any measured parameter, that SCADA totals may not always be available and the rules/systems will need to address that (as now). It is proposed that if validated SCADA totals are unavailable within a stipulated timeframe, values will be estimated by interpolation from adjacent intervals or, if this is impractical, the most recent forecast price issued prior to the interval would suffice as a backstop. The methodology involves calculating the amounts of energy that could have been generated in merit order from each tranche in the Final BMO, and in the case of unscheduled supply what was actually generated, to satisfy the RDQ.

- The balancing price will be set the day following the trading day at the price of the marginal tranche in the above calculation.

Some other benefits of Ex-Post pricing method are as follows:

- Aligning pricing with the dispatch methodology should provide more efficient price signals than if ex-post MWh or forecast MWh were to be used.
- Constrained on/off payments will inevitably be required under any methodology but the proposed solution strikes a balance between efficient prices and the level of constrained on/off payments necessary.
- With ex-post prices based on hindsight 30 minute trends, rather than forecast MWh, improvements in dispatch performance will show up in the levels of constrained on/off payments.

Some data estimation or averaging may need to be incorporated to ensure that end of interval values are representative of 30 minute trends. This estimation would be agreed with and applied by System Management.

Pricing systems would receive a single end of period value (whether estimated or discrete) along with a Start of Interval (SOI) value per generator and End of Interval (EOI) value per Intermittent generator.

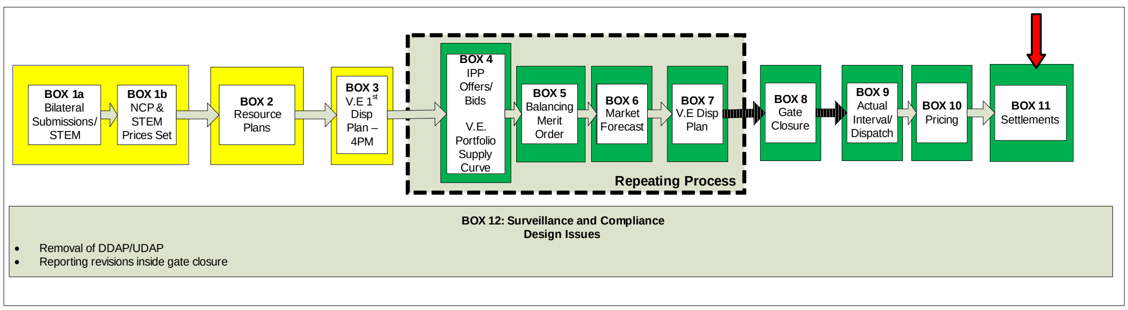
Constrained on/off

Constrained on/off payments will be made to participants dispatched by System Management where the price of the bid or offer dispatched is inconsistent with the balancing price. This is discussed under Settlements.

3.11 SETTLEMENTS (Box 11)

3.11.1 Purpose:

This section describes the primary settlement transactions.



In principle settlement transactions are unchanged from the current market in that Parties providing Balancing up are paid the Balancing price and parties Balancing down pay the Balancing price.

New transactions are to be created in relation to constrained on/off payments where payments at the Balancing price are inconsistent with participant offers. (For system security constrained on/off situations, the net result will effectively be the same under the current pay as bid constrained on/off regime).

Principle:

- A market transaction will exist whenever metered half hour (hh) dispatch differs from hh NCP (no change).
- A market transaction will have occurred when an IPP Facility or Verve Stand Alone Facility output is increased or decreased from Resource Plan or when Verve's portfolio is dispatched above or below residual NCP (i.e. NCP less any Verve Stand Alone Facility Resource Plans) as a result of:
  - Any differences between NCP and Meter Schedules
    - Eligibility for constrained on/off will be subject to an instruction from System Management for Balancing.
  - An instruction from System Management to load to a specified level, the SSASB, (consistent with the offer from the market participant in order to be capable of providing Ancillary Service (e.g. part loading for LFAS). See also constrained on/off payment).

- o Automatic response from individual plant providing Ancillary Service.

- All market transactions will be paid at the Balancing price.

- Balancing volumes will be calculated on a loss adjusted basis at Muja (as now).

- Under defined circumstances a constrained on/off payment will also be made (discussed below).

- Calculation of constrained on or off volumes will be on a consistent basis - loss adjusted to Muja. For the Verve Portfolio, a composite adjustment factor will be calculated from the generation weighted average of the MLFs for facilities which generated in the interval.

- Parties selected to provide Ancillary Service will also receive an enablement payment in accordance with the design of the particular Ancillary Service.

- Market Participants dispatched by System Management to operate at an SSASB that is different to their Resource Plan will be entitled to be paid a constrained on/off payment (as appropriate) in addition to payment for the market transaction at the Balancing price as noted above.

  - o Note: Dispatch of energy as part of the delivery of an Ancillary Service around a relevant SSASB will not attract a constrained on/off payment (any cost impacts will be presumed to be reflected in the enablement fee submitted by the Market Participant).

Windfarms will receive payment for being dispatched down based on difference between actual output and ex-post estimate of actual output possible during the interval.

Settlement of constrained on/ off amounts:

Objective: To recompense Market Participants where the price of a Facility Balancing offer or bid dispatched by System Management is inconsistent with the calculated Balancing price.

- A Facility dispatched by System Management above (below) its Resource Plan will pay the market Balancing price for the quantity involved (normal settlement of Balancing amounts). Constrained on or off payments may also be required to compensate for differences between the Balancing price and the price of offers or bid tranches dispatched by System Management.

- For example, suppose the Balancing price is determined to be $15 per MWh. A Market Participant that was dispatched down below its Resource Plan by System Management and had a bid price of $10 per MWh, would have expected to pay that amount, not $15/MWh. So the Market Participant would receive a 'constrained off' compensation payment of $5/MW to compensate for the difference.

- This holds for negative priced bids as well. For example, had the Balancing price been negative $15 per MWh and the Market Participant's bid price negative $20 per MWh, the IPP would have paid negative $15 per MWh (i.e. received $15/MWh) but expected to have paid negative $20 per MWh (i.e. receive $20 per MWh) for the quantity of downwards Balancing it provided. In this instance, compensation would be paid at negative $5 per MWh (the Market Participant would receive $5 per MWh) for the quantity of downwards Balancing it was instructed to provide).

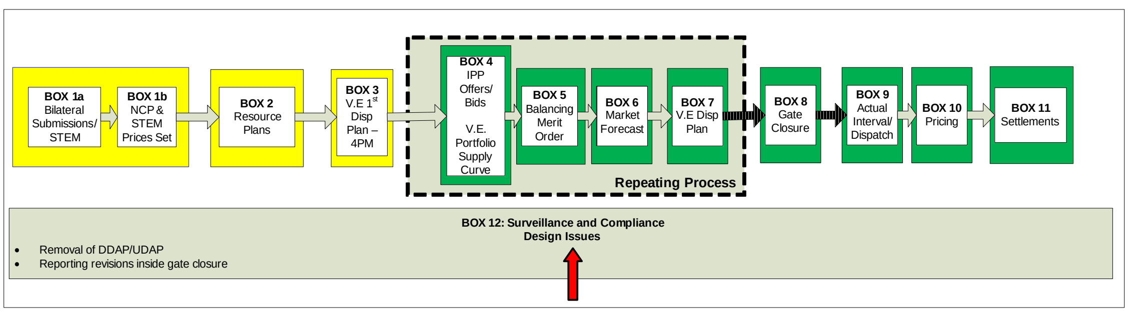
- The constrained off (or on) event may have been because of a system security situation[9] (in effect as now) or (a new requirement) due to approximations that must be made in formulating Dispatch Instructions to follow expected trends in dispatch intervals and in calculating half hourly Balancing prices ex post.

- Constrained on/off payments will be allocated to Market Customers proportional to their energy use in the interval the payment was made.

3.12 MARKET POWER, SURVEILLANCE AND COMPLIANCE (Box 12)

3.12.1 Purpose:

This section explains the expanded role of surveillance and compliance monitoring in the context of the new competitive Balancing Market.



3.12.2 Background:

Market power can have a positive or negative impact on market outcomes. The ability to exercise market power detrimentally to the objective of the market is common in many electricity markets. On the other hand the threat or actual exercise of temporary of market power can be a key incentive for competitors to enter a market or reduce costs. Detrimental market power can be managed by careful design of the market to incentivise participants to bid at SRMC and/or including provisions such as the requirement in the WEM for parties with market power to bid at SRMC, by countering the effects through contracts and also by ex post penalties or threats of penalty.

Monitoring and surveillance of a market can be used to identify both the exercise of market power and compliance with market rules. Compliance with market rules is important for the orderly conduct of an electricity market especially where coordination of operation must

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[9] The WEM currently provides for as bid payments for security constrained dispatch of IPP facilities. Going forward, that will still be the case $Q_{dispatch}$ * PriceAsBid (now) is same as $Q_{dispatch}$ * $Price_{Balancing}$ + $Q_{dispatch}$ * ($Price_{Balancing}$ - $Price_{bid}$)

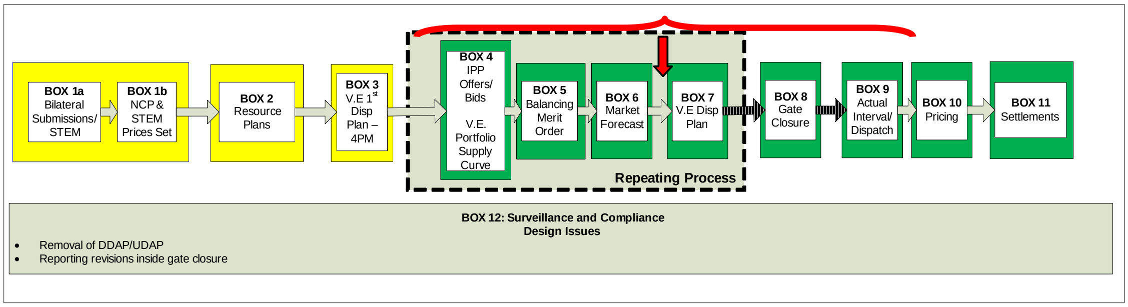
occur in very short timescale. Compliance is also important where rules have been designed to manage market power.

This section briefly notes the impact on market power, surveillance and compliance of the package of changes proposed in this document.

- Compliance with formation of Resource Plans given that UDAP and DDAP penalties are proposed to be removed and the requirement is to be relaxed when NCP changes;
- Surveillance of the basis for renominations – given the proposal to allow renominations under some circumstances such as following material change and for bona fide physical reasons specially within gate closure periods;
- Compliance with Balancing instructions;
- Compliance with provision of Ancillary Services;
- Level and reason for constrained on/off payments (to assist future development);
- Ancillary service offer prices; and
- If appropriate - Operational definition of market power and existing requirement for SRMC prices in ~~bids/offers~~Balancing Submissions.

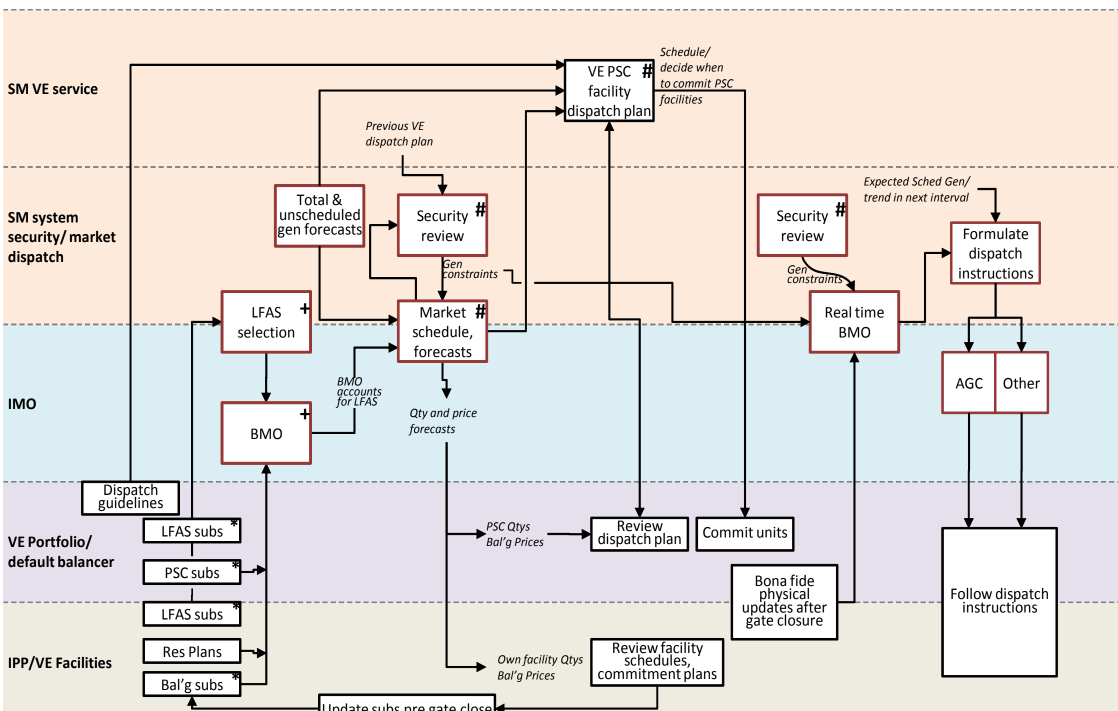
imo Independent Market Operator

APPENDIX A: PROCESS, ROLES AND RESPONSIBILITIES



The following diagram illustrates the processes (including where process are repeated over the course of a day) and the roles and responsibilities within the proposed design described in the 12 stages.

Overview of Market Processes



Notes:

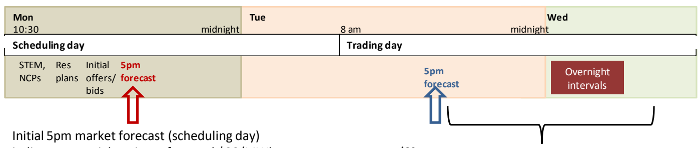
*
- Can revise pre relevant gate closure
- Otherwise only for bona fide reasons
- Or in response to SM 'security states'

\+
- Update when submissions revised and/or regular intervals
- Real time BMO accounts for bona fide changes after gate closure, up to interval

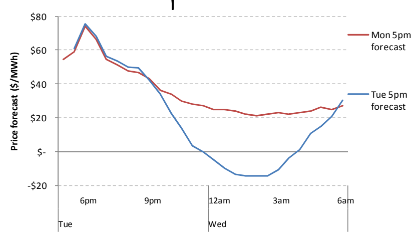
#
- Ongoing and as required

APPENDIX B: OVERNIGHT EXAMPLE

Overnight example

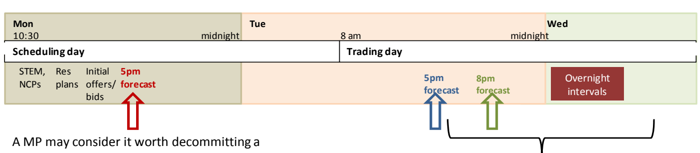


- Initial 5pm market forecast (scheduling day) indicates overnight prices of around $20/MWh
    - Issued 30+ hours ahead of overnight intervals
    - Issued several hours after NCPs established, resource plans submitted
- 5 pm forecast (trading day) indicates lower overnight prices
    - e.g. lower demand/ higher wind than forecast 24 hours beforehand
    - 7-8 hours before overnight intervals*

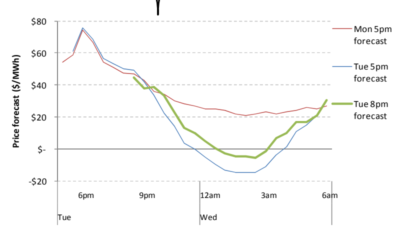


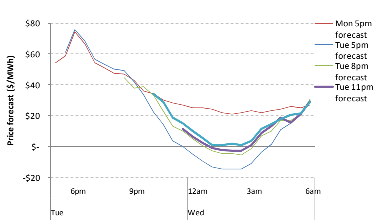
Had intermediate price forecasts indicated this trend, participants could have responded earlier given flexibility to revise facility submissions

Overnight example *(cont'd)*



- A MP may consider it worth decommitting a facility and submit a bid that would do so (e.g. low –ve price)
- Reflected in later 8pm market forecast
- If de-commitment opportunity seen as worthwhile (taking start up into account etc), leave bid at gate closure
- If gate closure 2 hours out, could also leave decision until 11 pm





APPENDIX C: GLOSSARY

Agenda Item 5: Net STEM shortfall refund obligations

1. BACKGROUND

The Net STEM Shortfall calculation in the Market Rules is a settlement calculation which exposes Market Participants (MPs) to Reserve Capacity Refunds in situations where it is considered that they have not made all of their capacity available to the market. The calculation of the Net STEM shortfall does this in two separate but related ways:

1. **Bid/Offer Shortfall**: analysing the capacity in a participant's STEM bids/offers relative to their capacity credits; and
2. **Generation Level Shortfall**: analysing their actual generation output relative to their dispatch level (Resource plan +/- and Dispatch Instructions).

2. TWO COMPONENTS: ONLY ONE PROPOSED FOR REMOVAL

Bid/offer Shortfall:

The Net STEM Shortfall calculation assesses the total capacity associated with a Market Participant's STEM bids and offers and compares it against the capacity which it has been granted as Capacity Credits minus capacity which has been declared as on an outage (either forced or planned). If any capacity is found to be missing from the STEM bids/offers the participant is exposed to a refund for the difference.

Generation Level Shortfall:

The other aspect of the Net STEM Shortfall calculation assesses the level of generation required by MPs to be delivered within an interval against their Resource Plans and Dispatch Instructions (plus a tolerance level). If a facility is found to not have provided the energy required of it, then the facility is faced with refunds (to the level of full capacity). E.g. if a facility is found to have not reached the required level of generation by 1MW and is operating at 50% of full load, it is deemed to be on a forced outage from [50% - 1MW] to its full level of Capacity.

The RDIWG discussed the removal of the Net STEM Shortfall in the context of removing the shortfall associated with the Generation Level Shortfall given the challenges some generators have in *exactly* meeting their resource plans for all intervals. Consequently, the proposal is to only remove that aspect of the calculation.

3. OPERATIONAL TEST

The proposal from the RDIWG is to replace the Net STEM Shortfall with an "operational test". This test was flagged as a possible replacement mechanism for the Net STEM Shortfall in a number of Reserve Capacity Refund papers presented to the RDIWG (in December 2010 and February 2011). The proposal was for MPs which appear to be consistently operating at levels which would currently expose them to refunds calculated by Net STEM Shortfall to be subjected to an operational test. If a participant fails this test, the MP would then be faced with refunds to the extent to which the test failed, until such a time that they pass an operational test.

There are two options for delivering this test. Either a specific Operational Test could be developed or the current Reserve Capacity Test could be used.

Currently the Reserve CapacityTest reduces the number of Capacity Credits (CCs) associated with a facility when it is deemed to have not passed a test. However there is also an allowance for a MP to attempt to have these CCs reinstated upon successfully completing a subsequent test.

Currently the rules associated with the RC Test make it difficult for a test to be called if a facility has proven in the last 6 months that it is capable of passing such a test – however the rule change to allow this is relatively simple.

Pros and cons of each method

Operational test: A new operational test would require complex changes to the current Market Rules (in regards to the process of testing and settlement of RC Refunds), require additional systems to be designed and funded, and new internal processes to be developed to enable the testing to occur (both at IMO and SM).

RC Test: Utilising the RC Test has the benefit of being an existing process with extensive procedures and systems and would not likely introduce any further complexity into the Market Rules. However, the RC Test exposes MPs to a uniform cost for non compliance (reduction in CCs) unlike the “sculpted” costs due to an exposure to refunds (which both the current Net STEM shortfall and the proposed Operational Test incorporate).

4. RECOMMENDATION

It is recommended that the RDIWG agree to the Generation Level Shortfall aspect of the Net STEM Shortfall calculation being replaced by an ability to call upon a Reserve Capacity Test.

Agenda Item 6: Rule Drafting Timetable

KEY RULES DATES FOR THE BALANCING AND LFAS MARKET ARRANGEMENTS

30 August	RDIWG consulted on draft Rule Change paper and Draft Rules
14 September	MAC consulted on draft Rule Change paper and Draft Rules
15 September	IMO Board discussion on the Rule Change paper and Draft Rules
Week commencing 19 Sept	First Draft of Rules released for consultation
Beginning of November	First round of submissions due
End of November	Second Draft of the Rules i.e. the draft decision released for consultation
Third week of January	Second round of submissions due (taking into account Christmas break)
Third week of February	Final Rule Change report considered by the IMO Board.
Up to end of March	Minister's approval
April	Commencement of new arrangements

Independent Market Operator

RDIWG Action Points

Legend:

Shaded	Shaded action points are actions that have been completed since the last RDIWG meeting (contained in table 2).
Unshaded	Unshaded action points are still being progressed (contained in table 1).
Missing	Action items missing in sequence have been completed from previous meetings and subsequently removed from log.

Table 1: Outstanding

#	Action	Responsibility	Meeting arising	Status/Progress
51	The IMO to arrange a workshop in early 2011 with the Bureau of Meteorology (BoM) and RDIWG members, to discuss options for the enhancement of BoM forecasts and the wider usage of forecasts by Market Participants.	IMO	6	
91	The IMO to work with Verve Energy on how to submit note a Portfolio Supply Curve and a Load Following Portfolio Supply Curve.	IMO	11	Underway

Table 2: Completed

#	Action	Responsibility	Meeting arising	Status/Progress
19	The IMO to investigate with System Management whether wind generation forecasts could be provided to participants at the same time as load forecasts.	IMO	3	Part of the new design
42	The IMO to offer site presentations to Working Group members and invite Working Group members to participate in the presentations.	IMO	5	Arranged.
43	The IMO to confirm the accounting advice it has received previously that its expenditure on the Market Evolution Program can all be capitalised.	IMO	6	Done - available to any members that wish to see it.
52	The IMO and System Management to discuss System Management's dispatch system and whether it is able to accommodate future enhancements.	IMO and SM	6	Underway.
68	The IMO to update the scenario to include summation information.	IMO	9	The Project Team has developed a model for MPs to use.
70	The IMO to provide an additional scenario(s) to include plant commitment and decommitment.	IMO	9	The Project Team jas developed a model for MPs to use.
72	The IMO to review its practice of publishing draft minutes on website before made final.	IMO	9	IMO wishes to retain the status quo for transparency reasons: such minutes are expressed as draft.
83	Mr Dykstra to review the SRC rule change within 1 week of meeting 10 and inform the IMO whether he supported the SRC fund proposal or not.	Mr Dykstra	10	Complete.
85	IMO to write to participants requesting whether the specific balancing model can be distributed.	IMO	10	Model has now been sent out
87	The IMO to circulate the updated CBA to the RDIWG on 6 April 2011.	IMO	11	Circulated to all MAC members and is now available to others if they wish to see it.

#	Action	Responsibility	Meeting arising	Status/Progress
88	Shane Cremin and Geoff Gaston to provide the IMO with any feedback for improvement on the model by 12 April 2011.	Shane Cremin/Geoff Gaston	11	Model has been sent out now
89	Following receipt of Griffin Energy and Perth Energy's advice on the Balancing market model, the IMO to circulate the model to relevant stakeholders.	IMO	11	Model available early June.
90	Mr Dykstra to provide the IMO with his comments on the recommendation paper.	Corey Dykstra	11	Complete.
92	The IMO to amend the minutes of Meeting No. 11 to reflect the points raised by the RDIWG and publish on the website as final.	IMO	13	Done
93	The IMO to consider providing a workshop after the next RDIWG meeting for some of their operational people be run through the detail.	IMO	13	Workshop to be set up for operational people to run through the business process design.
94	Mr Birnie informed the group that the IMO desired that the group see the draft rules prior to the commencement of formal consultation and to this end advised there would be two workshops, one on the 5th July and the other on the 19th July. Members agreed to hold these workshops.	IMO	13	Two Workshops have been booked at the Perth Convention Exhibition Centre for 5th July and 19th July.
95	A clear go/no decision point is needed early in 2012 prior to April 2012.	IMO	13	Has been added into the timelines and milestones for the MEP – for March 2012.
96	The RDIWG accepted the advice from the IMO/Lantau group regarding wrapping the refund solutions into the Reserve Capacity Review itself with one exception. The group requested that the removal of the refund Net STEM Shortfall obligation proceed with the other MEP changes. The IMO agreed to recommend this to the Board.	IMO	13	The IMO Board is comfortable with the removal of the Net STEM shortfall refund obligation to continue being progressed as part of the MEP

#	Action	Responsibility	Meeting arising	Status/Progress
97	A general discussion then ensued between group members regarding the outage planning process and associated transparency issues. RDIWG discussed outage planning approvals and associated transparency issues and the IMO agreed to hold an informal discussion on the issues and options surrounding this after the next RDIWG on 21 June.	IMO	13	Informal Workshop to take place after Meeting 14.
98	The IMO agreed to review the Action list to rationalise it in light of where the work of the RDIWG was now at.	IMO	13	Done