



Draft Rule Change Report
Title: Energy Price Limits Methodology
and Consultation Process

Ref: RC_2009_35
Standard Rule Change Process

Date: 8 March 2010

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DOCUMENT DETAILS

IMO Notice No.: RC_2009_35
Report Title: Draft Rule Change Report: Energy Price Limits Methodology and Consultation Process
Release Status: Public
Confidentiality Status: Public domain

http://www.imowa.com.au/RC_2009_35.html

Published in accordance with Market Rule 2.7.6

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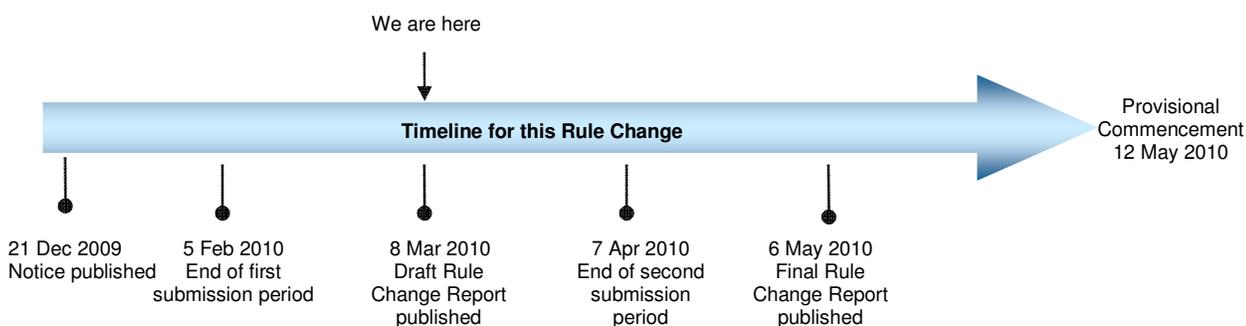
1. INTRODUCTION

On 21 December 2009 the Independent Market Operator (IMO) submitted a Rule Change Proposal regarding the amendment of clauses 6.20.7, 6.20.9, 6.20.10 and the proposed new clause 6.20.9A of the Wholesale Electricity Market Rules (Market Rules).

This proposal is being processed using the Standard Rule Change Process, described in section 2.7 of the Market Rules. The standard process adheres to the following timelines:



The key dates in processing this Rule Change Proposal, as amended in the extension notice, are:



Please note the commencement date is provisional and may be subject to change in the Final Rule Change Report.

The IMO's draft decision is to accept the Rule Change Proposal as proposed in the Rule Change Proposal and modified following the first submission period. The detailed reasons for the IMO's decision are set out in section 5 of this report.

In making its draft decision on the Rule Change Proposal, the IMO has taken into account:

- the Wholesale Market Objectives;
- the practicality and cost of implementing the proposal;
- the views of the Market Advisory Committee (MAC); and
- the submissions received.

All documents related to this Rule Change Proposal can be found on the IMO website: http://www.imowa.com.au/RC_2009_35.

2 CALL FOR SECOND ROUND SUBMISSIONS

The IMO invites interested stakeholders to make submissions on this Draft Rule Change Report. The submission period is 20 Business Days from the publication date of this report. Submissions must be delivered to the IMO by 5.00pm, **Wednesday 7 April 2010**.

The IMO prefers to receive submissions by email (using the submission form available on the IMO website: <http://www.imowa.com.au/rule-changes>) to: market.development@imowa.com.au

Submissions may also be sent to the IMO by fax or post, addressed to:

Independent Market Operator
 Attn: Manager Market Development and System Capacity
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 Cloisters Square, PERTH, WA 6850
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3. THE RULE CHANGE PROPOSAL

3.1 Submission Details

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Date submitted:	21 December 2009
Urgency:	Standard Rule Change Process
Change Proposal title:	Energy Price Limits Methodology and Consultation Process
Market Rules affected:	6.20.7, 6.20.9, 6.20.10 and new clause 6.20.9A

3.2 Summary details of the Proposal

The IMO's Rule Change Proposal sought to amend the Market Rules to:

- replace "Profit Margin" with "Risk Margin"¹ to allow for the uncertainty faced by the IMO in setting the price limits to be accurately reflected when annually reviewing its appropriateness (clause 6.20.7);
- clarify that the IMO will publish draft reports and seek public consultation only when undertaking the annual review required under clause 6.20.6 (clause 6.20.9); and
- allow for a second consultation period, if required, after submissions have been received on the draft report (new clause 6.20.9A and 6.20.10).

Full details of the Rule Change Proposal are available in Appendix 1 of this report.

3.3 The Proposal and the Wholesale Market Objectives

The IMO's assessment of the proposed changes against the Market Rules was as follows:

¹ Where Risk Margin refers to the margin between the price cap and the expected highest short run cost generating works in the South West interconnected system (SWIS)

- a) *to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;*

The IMO submitted that the proposed Amending Rules will better achieve Wholesale Market Objective (a) by transparently reflecting the current approach to calculating the price limits in the Market Rules. The IMO considered that by embedding current accepted practices into the Market Rules a more transparent and efficient approach to undertaking the review will result. This is because interested parties will no longer need to refer to the draft and final reports to understand the approach adopted in undertaking the review.

The IMO considered that the proposed Amending Rules were consistent with the remaining Wholesale Market Objectives.

3.4 Amending Rules proposed by the IMO

The amendments to the Market Rules originally proposed by the IMO are available in the Rule Change Notice and presented in Appendix 2 of this report.

3.5 The IMO's Initial Assessment of the Proposal

The IMO decided to proceed with the proposal on the basis of its preliminary assessment, which indicated that the proposal was consistent with the Wholesale Market Objectives.

4. FIRST SUBMISSION PERIOD

The first submission period for this Rule Change Proposal was between 22 December 2009 and 5 February 2010.

4.1 Submissions received

The IMO received submissions from Landfill Gas & Power (LGP) and Perth Energy. The main points raised in the submissions are noted below; additional detail along with the IMO's response is contained in section 4.3 of this paper. The full text of all submissions is available on the IMO website.

4.1.1 Submission from Landfill Gas & Power

LGP supports the Rule Change Proposal on the grounds that it harmonises the underlying philosophy and practice of the process without changing the substance of the outcome.

LGP note that STEM and Balancing prices now rarely attain the maximum value, in which case the LGP considers that the revised approach outlined in the Amending Rules would be of only academic consequence.

Wholesale Market Objectives

LGP supports the IMO's contention that the proposal enhances market objective (a) by transparently reflecting the current practice in the Market Rules. The proposal is consistent with the other market objectives.

4.1.2 Submission from Perth Energy

Perth Energy is of the view that price limits are not a natural part of any well functioning, competitive market. Perth Energy therefore supports measures which act to improve competition in the Wholesale Electricity Market (WEM) to the point where it is no longer necessary to rely on artificial limits on prices.

Perth Energy makes a number of comments regarding the Rule Change Proposal. These relate to the:

- perceived conflict between the SRMC bidding principle and the inclusion of a Profit Margin when calculating the price limits;
- approach adopted to calculate the Risk Margin, including the applicable statistical percentiles; and
- use of short run average cost .

Perth Energy supports the IMO's proposal to allow for additional consultation on the price limits when the IMO considers it necessary.

Further details of Perth Energy's comments and the IMO's response are contained in the table in section 4.3 of this report.

Wholesale Market Objectives

Perth Energy is concerned that it is conceivable that the marginal generator in the SWIS will not in all instances be compensated for its marginal cost when called to generate. This is a matter of interest to financiers of new generators and over time this may lead to a lessening of competition in the WEM. Perth Energy considers that this would be detrimental to Wholesale Market Objectives (a) and (b).

4.2 Public Forums and Workshops

No public forums or workshops were held in relation to this Rule Change Proposal.

4.3 The IMO's response to submissions received during the First Submission Period

During the first submission period a number of points were raised regarding the IMO's proposed amendments to the Market Rules. The IMO's response to each of the issues is presented in the table over the page:

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Clause	Submitter	Comment/Change Requested	IMO's response
All	Perth Energy	Price Limits are not a natural part of any well functioning competitive market.	<p>The IMO notes that the price limits were a design feature included at market start, and constitute just one aspect of the market power mitigation strategy. The basic premise is that a competitive market should have a price equivalent to the fixed costs of a peaking plant operating at low levels. Under a competitive market there would be no need for a price cap. But given that the WEM was dominated by one large generator at market start a price cap was required to protect consumers.</p> <p>The Rule Change Proposal does not propose any amendments to the fundamental basis for the need to determine price limits nor does it propose to amend any other market power mitigation features which had been incorporated at market start. Consequently the IMO has not undertaken any assessment of the continued need for the price caps as a part of this rule change.</p> <p>The IMO does however note that the Market Rules require the ERA to review the methodology for setting the price limits no later than the fifth anniversary of first Reserve Capacity Cycle. This review includes among other things an assessment of the effectiveness and appropriateness of the methodology in curbing the use of market power (clause 2.26.3 (c)).</p> <p>The IMO considers that the continued need for the price limits as a market power mitigation strategy would be best addressed during this review.</p>
6.20.7 (b)	Perth Energy	Perth Energy does not consider there to be a conflict between clause 2.16.9G and 6.20.7(b) in the current version of the Market Rules (as noted in the Rule Change Proposal).	The IMO disagrees and notes that the concept of bidding at SRMC is inconsistent with allowing a profit margin to be applied when calculating the price limits. This position is consistent with McLennan Magasnik Associates (MMA) proposal that the Profit Margin is actually a Risk Margin which has been adopted in undertaking the review of the price limits since 2007.

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Clause	Submitter	Comment/Change Requested	IMO's response
6.20.7 (b)	Perth Energy	Reversing the changes made by CR5 ² would also achieve the IMO's objective of removing any perceived conflict between 2.16.9G and 6.20.7(b).	The IMO notes Perth Energy's suggestion but however does not consider reversing this rule change necessary as it would not be consistent with the original intent of the Market Rules, as noted in the Rule Change Proposal: Short Run Marginal Cost of Generation (CR5), that the STEM should reflect the SRMC consistent with pricing practices in a competitive market. The IMO notes that the proposed changes to remove the reference to a "Profit Margin" will ensure consistency with the Amending Rules which resulted from CR5. In addition, the IMO notes that the determination of SRMC is outside the scope of this Rule Change Proposal.
6.20.7 (b)	Perth Energy	There is merit in further investigation of Option 2 (as outlined in the IMO's Rule Change Proposal) for calculating the Risk Margin	<p>The IMO notes that the approach adopted in determining the Risk Margin would be best considered during each relevant Annual Review of the Energy Price Limits and not prescribed in the Market Rules. The IMO has revised the drafting of the proposed Amending Rules to remove the specific reference to the approach to be adopted in calculating the Risk Margin.</p> <p>The IMO however notes that the price limits should be both low enough to mitigate market power and high enough to ensure that new entrants peaking plants are not discouraged. The IMO considers that the adoption of Option 2 would result in parameters at the extreme end of the range and most likely result in a very high Maximum STEM Price.</p> <p>The IMO also notes that prices in the STEM during the Varanus Island incident did not approach the Maximum Alternative STEM Price. In fact the maximum ratio observed of the STEM price relative to the market cap was 78% - providing evidence that a reduction in the upper cap on the STEM prices may be appropriate by reducing the probability level downwards (from 90% to 80%). Further details are available in MMA's Final Report available on the IMO website: http://www.imowa.com.au/2009_EPL_Review</p> <p>The IMO considers that the approach adopted previously by MMA ensures that a capped price does not impede participation of high cost generators in</p>

² Details of the Rule Change Proposal: Short Run Marginal Cost of Generation (CR5), are available on the following webpage: http://www.energy.wa.gov.au/3/3192/64/formal_wem_rule.pm

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Clause	Submitter	Comment/Change Requested	IMO's response
6.20.7 (b)	Perth Energy	New rules would imply that the Market Participant with the marginal generator in the SWIS will be out of pocket 20% of the time when it is running on natural gas and 10% of the time when it is running on distillate fuel. Market Rules should ensure that the price limits allow for cost recovery, even in the worst case scenario and not merely most of the time	<p>the market under high demand or low reserve supply conditions.</p> <p>The IMO considers that the price limits should allow for cost recovery but notes that there are a large range of risks faced by Market Participants that could be potentially incorporated when determining the appropriate Risk Margin to apply. The IMO notes that it is not however feasible to cover every possible scenario when applying the Risk Margin given the inherent inability to identify all potential risks. The IMO also notes the price limits are a market design feature to mitigate market power. To be effective the price limits need to be both low enough to mitigate market power and high enough to ensure that new entrant peaking plants are not discouraged.</p> <p>The IMO notes that the range of 80-90% is typical of risk margins observed in electricity markets where traders can not accurately predict future market conditions and yet must strike a fixed price for the purposes of managing uncertainty. The IMO considers that the Risk Margin based on 80% probability provides a Maximum STEM Price which is in keeping with current market operations. The IMO notes that the appropriateness of the 90% probability for assessing the parameters of the Alternative Maximum STEM was raised by MMA during the 2009 review and will be considered further during the 2010 review. Following from the outcomes of the 2010 review further changes to the Market Rules may be required.</p> <p>Further, the ERA is required to undertake an assessment of the effectiveness of the price limits within 5 years of the first Reserve Capacity Cycle. The IMO considers that the appropriateness and effectiveness of the price limits as a market power mitigation strategy would be best addressed during this review.</p> <p>In addition, the proposed drafting has been amended to remove the level of detail on the calculation of the Risk Margin for consistency with the level of detail provided for the other variables included in determining the Maximum STEM Price and Alternative Maximum STEM Price. The details of the margins used for each review will be provided in the IMO's draft report, prepared under clause 6.20.9, thereby providing Market Participants with an opportunity to consult on the proposed ranges. To ensure transparency of this process in the Market Rules, clause 6.20.9 has been amended to require</p>

Clause	Submitter	Comment/Change Requested	IMO's response
			the draft report to reflect any changes to the values of the Risk Margins or other variables adopted in undertaking the study.
6.20.7 (b)	Perth Energy	The percentiles applied for the two price limits should be the same	<p>The IMO notes that it has revised the drafting to reduce the level of detail on the calculation of the Risk Margin and so the Market Rules will no longer detail the percentiles to apply for the two price limits. Any decisions over the values of the percentiles to be adopted for each relevant review period will be contained to the report required under clause 6.20.9.</p> <p>Additionally, the IMO notes that the appropriateness of the 90% probability for assessing the parameters of the Alternative Maximum STEM was raised by MMA during the 2009 review following its assessment of the impacts of Varanus Island. For further information refer to MMA's Final Report.</p> <p>This issue was also raised by the MAC at the 9 December 2009 meeting. In response to the query the IMO noted that the percentiles were determined based on the IMO's perception of uncertainty and current market operations. In particular, MMA notes in its Final Report for the 2009 review that a conservative risk margin based on 80th probability provides a risk margin of about 15% over the expected level of costs of peaking power from 40 MW gas turbines. Larger gas turbines would not be affected by these considerations because of their lower unit cost structure and longer run times in the STEM.</p>
6.20.7 (b)	Perth Energy	Further definition and clarification of exactly how the calculation using a statistical distribution would be performed, including how to decide on an appropriate statistical distribution for the Risk Margin and its parameters. This could perhaps be confined to a Market Procedure document.	The IMO notes that the nature of the statistical distributions of the parameters included in the calculation would be determined based on the nature of the data. The statistical properties of the cost related parameters are likely to differ and will need to be taken into account when attempting to fit the right distribution to the data. Any decisions around the statistical distributions to apply and the details of the calculations will be presented in the draft report and at the public workshop presenting the draft report, thereby allowing interested stakeholders an opportunity to comment on the methodology, including the statistical distribution, proposed by the consultant. The IMO notes that this has been the practice adopted in undertaking previous reviews.
6.20.7(b)v	Perth Energy	Amend the clause further to provide greater clarity, such that the marginal loss factor to be applied is defined as the	The IMO agrees with Perth Energy's suggestion to provide greater clarity around the calculation of the Loss Factor for the 40 MW Open Cycle Gas

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Clause	Submitter	Comment/Change Requested	IMO's response
		lower value marginal loss factor that applied to a generator connected to the SWIS, or alternatively, if the highest cost generator can be identified, the marginal loss factor of that generator	Turbine rather than simply stating "for that generator" in the Market Rules and has amended the proposed Amending Rules accordingly. The IMO notes that this amendment ensures consistency which the drafting approach adopted for clause 6.20.7(b) i.- iv.
6.20.7(b) i	Perth Energy	Queries whether the clause should be referring to short run marginal cost	<p>The IMO notes that it was intended that this clause refers to SRAC to allow for the recovery of startup and shutdown costs over the continuous hours the generators dispatch. This is consistent with the approach adopted by MMA in previous years when calculating the price limits.</p> <p>The concept of SRMC is not currently defined in the Market Rules, but rather a document prepared by ERA outlines the costs which can be included in determining the SRMC of a generator. The IMO notes that it is currently in discussion with the ERA on whether a similar approach to defining SRAC may be appropriate. The IMO notes that it is currently discussing this issue further with the ERA and will present the outcomes of this discussion in the Final Rule Change Report.</p>
Market Objectives	Perth Energy	Perth Energy is concerned that it is conceivable that the marginal generator in the SWIS will not in all instances be compensated for its marginal cost when called to generate. This is a matter of interests to financiers of new generators and overtime this may lead to a lessening of competition in the WEM. This would be detrimental to Wholesale Market Objectives (a) and (b).	As noted previously, the IMO disagrees that the price limits should allow for cost recovery even in the worst cost scenario and notes that estimating the price limits assuming worst case scenario would have little impact as a market power mitigation strategy. The IMO notes the proposed Amending Rules will simply embed existing practices and therefore increase transparency around the approach adopted during the review.
6.20.7	LGP	STEM and Balancing prices now rarely attain the maximum value, in which case the revised approach would be of only academic consequence	As noted above, the IMO intends to re-examine the percentiles used in calculating the price limits during the 2010 review.

4.4 Additional Amendments to the Amending Rules

Following the first public submission period the IMO has made some changes to the proposed Amending Rules to address some of the issues discussed in section 4.3. The IMO has also revised the drafting around the probability percentiles used in the calculation of the Risk Margin to remove the level of detail prescribed.

These changes are as follows (~~deleted text~~, added text):

6.20.7. In conducting the review required by clause 6.20.6 the IMO:

- (a) may propose revised values for the following:
 - i. the Maximum STEM Price, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by natural gas and is to be calculated using the formula in paragraph (b); and
 - ii. the Alternative Maximum STEM, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by distillate and is to be calculated using the formula in paragraph (b);
- (b) must calculate the Maximum STEM Price or Alternative Maximum STEM Price using the following formula:

$$(1 + \text{Risk Margin}) \times (\text{Variable O\&M} + (\text{Heat Rate} \times \text{Fuel Cost})) / \text{Loss Factor}$$

Where

- i. Risk Margin is a measure of uncertainty in the assessment of the mean short run average cost for a 40 MW open cycle gas turbine generating station, expressed as a fraction. ~~calculated using a statistical distribution of its various cost related parameters in accordance with clause 6.20.7(b), where:~~
 - a. ~~the Risk Margin is calculated for the Maximum STEM Price as the proportion by which the 80th percentile of the probability distribution for the short run average cost exceeds the mean short run average cost; and~~
 - b. ~~the Risk Margin is calculated for the Alternative Maximum STEM Price as the proportion by which the 90th percentile of the probability distribution for the short run average cost exceeds the mean short run average cost;~~
- ii. Variable O&M is the mean variable operating and maintenance cost for a 40 MW open cycle gas turbine generating station, expressed in \$/MWh, and includes, but is not limited to, start-up related costs;

- iii. Heat Rate is the mean heat rate at minimum capacity for a 40 MW open cycle gas turbine generating station expressed in GJ/MWh;
- iv. Fuel Cost is the mean unit fixed and variable fuel cost for a 40 MW open cycle gas turbine generating station, expressed in \$/GJ; and
- v. Loss Factor is the marginal loss factor for ~~the generator~~ a 40 MW open cycle gas turbine generating station relative to the Reference Node.

Where the IMO must determine appropriate values for the factors described in paragraphs (i) to (v) as applicable to the Maximum STEM Price and Alternative Maximum STEM Price.

- 6.20.9. In conducting the review required by clause 6.20.6 ~~the~~ IMO must prepare a draft report describing how it has arrived at a proposed revised value of an Energy Price Limit. The draft report must also include details of how the IMO determined the appropriate values to apply for the factors described in clause 6.20.8 (b)(i) to (v). The IMO must publish the draft report on the Market Web Site and advertise the report in newspapers widely published in Western Australia and request submissions from all sectors of the Western Australia energy industry, including end-users, within six weeks of the date of publication.

5. THE IMO'S ASSESSMENT

In preparing its Draft Rule Change Report, the IMO must assess the Rule Change Proposal in light of clauses 2.4.2 and 2.4.3 of the Market Rules.

Market Rule 2.4.2 outlines that the IMO “*must not make Amending Rules unless it is satisfied that the Market Rules, as proposed to be amended or replaced, are consistent with the Wholesale Market Objectives*”.

Additionally, clause 2.4.3 states, when deciding whether to make Amending Rules, the IMO must have regard to the following:

- Any applicable policy direction from the Minister regarding the development of the market;
- The practicality and cost of implementing the proposal;
- The views expressed in submissions and by the MAC; and
- Any technical studies that the IMO considers necessary to assist in assessing the Rule Change Proposal.

The IMO notes that there has not been any applicable policy direction from the Minister in respect of this Rule Change Proposal.

The IMO's assessment is outlined in the following sections.

5.1 Wholesale Market Objectives

The IMO considers that the Market Rules as a whole, if amended, will be consistent with the Wholesale Market Objectives.

Wholesale Market Objective	Consistent with objective
(a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system	Yes
(b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors	Yes
(c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions	Yes
(d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system	Yes
(e) to encourage the taking of measures to manage the amount of electricity used and when it is used	Yes

Further, the IMO considers that the Market Rules if amended would not only be consistent with the Wholesale Market Objectives but also allow the Market Rules to better address Wholesale Market Objective (a):

Impact	Wholesale Market Objectives
Allow the Market Rules to better address objective	a
Consistent with objective	b, c, d, e
Inconsistent with objective	-

(a) *to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West Interconnected System*

The proposed Amending Rules will better achieve market objective (a) by transparently reflecting the current approach to calculating the price limits in the Market Rules. The IMO considers that by embedding current accepted practices into the Market Rules a more transparent and efficient approach to undertaking the review will result. This is because interested parties will no longer need to refer to the draft and final reports to understand the approach adopted in undertaking the review.

The IMO considers that the proposed changes are consistent with the remaining Market Objectives.

5.2 Practicality and Cost of Implementation

Cost:

The proposed changes do not require any change to the Wholesale Electricity Market Systems operated by the IMO or any of the systems operated by System Management. Further, the IMO notes that the proposal will not impact on the cost of annually completing the review as the proposed changes are implementing current practice.

In addition there have been no identified changes to other Rule Participant's compliance costs.

Practicality:

The IMO has not identified any issues with the practicality of implementing the proposed changes.

5.3 Market Advisory Committee

The MAC met to discuss the proposal at the 9 December 2009 MAC meeting. An overview of the discussion from the MAC meeting is presented below. Further details are available in the MAC meeting minutes available on the IMO website:

<http://www.imowa.com.au/market-advisory-committee>

December 2009 MAC meeting

The IMO outlined its proposal for MAC members. In response to the proposal LGP queried:

Point 1

- the reason for using the 80th percentile in the Maximum STEM Price calculation, but the 90th percentile in the Alternative Maximum STEM Price calculation.; and

Point 2

- whether the difference between “may” and “must” in proposed clause 6.20.9A regarding requests for submissions was deliberate.

The IMO responded to these two points after the MAC meeting, as follows:

- Point 1: The IMO noted that the proposed changes to the Market Rules to refer to the 80th and 90th percentiles in the Maximum STEM Price and Alternative Maximum STEM Price calculations, respectively, reflect the probabilities that the assessed cap price values would be higher than any particular random outcome in the market for 40 MW gas turbines. The proposed percentiles to apply for the Maximum and Alternative Maximum STEM prices reflect those adopted by MMA in past reviews (including the 2009 Energy Price Limits review). These percentiles were determined based on the IMO's perception of uncertainty and current market operations. In particular, MMA notes in its Final Report for the 2009 review that a conservative risk margin based on 80th probability provides a risk margin of about 15% over the expected level of costs of peaking power from 40 MW gas turbines. Larger gas turbines would not be affected by these considerations because of their lower unit cost structure and longer run times in the STEM.

In the case of the use of distillate (Alternative Maximum STEM Price calculations), the price is adjusted monthly to track changes in distillate prices and therefore the uncertainty only applies to the operating and maintenance costs and the heat rates. During the 2009 review MMA proposed that a 90% probability is suitable for assessing the parameters of the Alternative Maximum STEM Price, however following the 2009 review MMA suggested adopting an 80% probability for the liquids price cap. This is in view of the gap between STEM prices and the Alternative Maximum STEM Price during the Varanus Island incident in 2008. For more details refer to MMA's Final Report: http://www.imowa.com.au/2009_EPL_Review

The IMO noted that it called for submissions on reducing the probability level during the formal public consultation process. The IMO did not receive any submissions on this proposition during this time. However, during the clarification process the IMO did receive a submission from Synergy suggesting that the IMO should review the probability level to apply to the Alternative Maximum STEM Price calculation as part of the overall review process for the 2010/11 Capacity Year. The IMO noted that it has included this in the proposed scope for the 2011 EPL review.

- Point 2: To clarify, the use of the word “may” and “must” in the proposed Amending Rules is to reflect that the IMO may undertake a further consultation period if required and that if the IMO determines to undertake further consultation it must do so with all sectors of the Western Australian energy industry, including end-users. To further clarify this requirement the IMO amended the drafting as follows:

6.20.9A. Prior to proposing a final revised value to an Energy Price Limit in accordance with clause 6.20.10, the IMO may publish a request for further submissions on the Market Web Site. Where the IMO publishes a request for further submissions in accordance with this clause, it must request submissions from all sectors of the Western Australia energy industry, including end-users.

5.4 Views Expressed in Submissions

The IMO received one submission in favour of the Rule Change Proposal during the first submission period. In particular, LGP was supportive of the proposal on the grounds that it harmonises the underlying philosophy and practice of the process without changing the substance of the outcome.

Perth Energy raises some more fundamental issues regarding the use of price limits, in particular noting that price limits are not a natural part of any well functioning competitive market. Perth Energy does support the IMO’s proposal to allow for additional consultation on the price limits when the IMO considers it necessary.

The IMO has responded to each of the issues raised in submissions in section 4.3 of this report.

6. THE IMO’S DRAFT DECISION

The IMO’s draft decision is to accept the amendment of clauses 6.20.7, 6.20.9, 6.20.10 and the new clause 6.20.10A of the Market Rules. This is as proposed in the Rule Change Proposal.

6.1 Reasons for the decision

The IMO has made its decision on the following basis:

- The Amending Rules:
 - Will allow the Market Rules to better address Wholesale Market Objectives (a); and
 - Are consistent with the remaining Wholesale Market Objectives.

Additional detail outlining the analysis behind the IMO's reasons is outlined in section 5 of this Draft Rule Change Report.

7. PROPOSED AMENDING RULES

6.20.7. In conducting the review required by clause 6.20.6 the IMO:

- (a) may propose revised values for the following:
 - i. the Maximum STEM Price, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by natural gas and is to be calculated using the ~~methodology described~~ formula in paragraph (b); and
 - ii. the Alternative Maximum STEM, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by distillate and is to be calculated using the ~~methodology described~~ formula in paragraph (b);
- (b) must calculate the Maximum STEM Price or Alternative Maximum STEM Price using the following ~~methodology~~ formula:

$$(1 + \text{Profit Margin Risk Margin}) \times (\text{Variable O\&M} + (\text{Heat Rate} \times \text{Fuel Cost})) / \text{Loss Factor}$$

Where

- i. ~~Profit Margin is the allowable profit margin expressed as a fraction~~ Risk Margin is a measure of uncertainty in the assessment of the mean short run average cost for a 40 MW open cycle gas turbine generating station, expressed as a fraction.
- ii. Variable O&M is the mean variable operating and maintenance cost for a 40 MW open cycle gas turbine generating station, expressed in \$/MWh, and includes, but is not limited to, start-up related costs;
- iii. Heat Rate is ~~based on the mean heat rate at minimum capacity for~~ a 40 MW open cycle gas turbine generating station's, heat rate at minimum capacity, expressed in GJ/MWh;
- iv. Fuel Cost is the mean unit fixed and variable fuel cost for a 40 MW open cycle gas turbine generating station, expressed in \$/GJ; and
- v. Loss Factor is the marginal loss factor for ~~the generator~~ a 40 MW open cycle gas turbine generating station relative to the Reference Node.

Where the IMO must determine appropriate values for the factors described in paragraphs (i) to (v) as applicable to the Maximum STEM Price and Alternative Maximum STEM Price.

- 6.20.9. In conducting the review required by clause 6.20.6 the IMO must prepare a draft report describing how it has arrived at a proposed revised value of an Energy Price Limit. The draft report must also include details of how the IMO determined the appropriate values to apply for the factors described in clause 6.20.8 (b)(i) to (v). The IMO must publish the draft report on the Market Web Site and advertise the report in newspapers widely published in Western Australia and request submissions from all sectors of the Western Australia energy industry, including end-users, within six weeks of the date of publication.
- 6.20.9A. Prior to proposing a final revised value to an Energy Price Limit in accordance with clause 6.20.10, the IMO may publish a request for further submissions on the Market Web Site. Where the IMO publishes a request for further submission in accordance with this clause, it must request submissions from all sectors of the Western Australia energy industry, including end-users.
- 6.20.10 After considering the submissions on the draft report described in clause 6.20.9, and any submissions received under clause 6.20.9A, the IMO must propose a final revised value for any proposed change to an Energy Price Limit and submit those values and its final report, including any submissions received ~~on the draft report~~, to the Economic Regulation Authority for approval.

APPENDIX 1: FULL DETAILS OF THE PROPOSAL

Background

The Energy Price Limits (price limits) constitute a set of limits comprising the Maximum Short Term Energy Market (STEM) Price, the Alternative Maximum STEM Price and the Minimum STEM Price. Clause 6.20.6 of the Market Rules requires the IMO to annually review the appropriateness of the price limits.

In undertaking an annual review the IMO may propose revised values for the Maximum STEM Price and the Alternative Maximum STEM Price. The Minimum STEM Price to apply at any time is the Maximum STEM Price multiplied by negative one.

The applicable formula for calculating the price limits is set out in clause 6.20.7 (b) and is as follows:

$$(1 + \text{Profit Margin}) \times (\text{Variable O\&M} + (\text{Heat Rate} \times \text{Fuel Cost}))/\text{Loss Factor}$$

Further details pertaining to the definition of the price limits are provided in the Market Rules.

McLennan Magasanik Associates (MMA), an independent consultant, was engaged by the IMO to undertake the 2009 Energy Price Limits review. MMA was also engaged in both 2007 and 2008 to undertake the review. One of the objectives of the 2009 review was to determine whether the cost assumptions, and previously used methodology for determining the price limits, are still suitable and if appropriate, recommend rule changes. The management of uncertainty in the calculations was also an important element of the review.

As an outcome of undertaking the 2009 review, MMA highlighted issues surrounding the use of Profit Margin when calculating the price limits and suggested that this should be replaced with Risk Margin. Further details pertaining to this issue are outlined below.

Issue

As first identified by MMA during the 2007 price limits review, the purpose of and basis for the use of a Profit Margin in clause 6.20.7(b) is seen to be problematic. In particular, it was considered that the reference to Profit Margin when calculating the price limits is inconsistent with the principle of generators bidding according to their Short Run Marginal Costs (SRMC).

The economic rationale for incorporating a Profit Margin in the calculation of the price limits, as outlined by MMA in the 2009 final report, is as follows:

In the presence of strong competition, a generator would be very near to its SRMC having regard to its operational decisions in order to maximise its profits. This works on the basis that bids above SRMC would be expected to miss out on profitable production as it could be displaced by lower priced bids. However, the last loaded generator having the highest costs has the opportunity to set the market prices without any competition from the supply side, since there are no

lower cost generating resources available. While there may be some demand side competition this is often at much higher bid prices than incurred by the highest cost generator.

As a result the level of competition under these extreme conditions when the Maximum STEM Price is likely to be applied is quite limited and therefore the perfect competition model is no longer applicable. This may provide some rationale for allowing for a Profit Margin to provide some additional incentive for the generator to generate since it would be setting the market price and therefore earning no profit on its output.

A Market Generator is required, under clause 2.16.9G of the Market Rules, to bid at its reasonable expectation of the SRMC of generating the relevant electricity. To apply a Profit Margin when determining the price limits would be inconsistent with the application of the SRMC bidding requirements. Instead, MMA suggest that the Profit Margin is actually a Risk Margin as it makes provision for uncertainty in the assessment rather than a profit on a known cost.

In particular, MMA recommend assessing the uncertainty to the IMO of the short run average cost of peaking power and striking a value that results in a price limit that exceeds the majority (for example 80 to 90 percent) of potential circumstances. MMA notes that this range is typical of Risk Margins observed in electricity markets where traders cannot accurately predict future market conditions and yet must strike a fixed price for trading purposes to manage uncertainty.

By adopting a Risk Margin when calculating the price limits rather than a Profit Margin, in the event that future market conditions prove that the Maximum STEM Price is constraining economic operation of peaking plant, the price settings will be able to be reviewed to reflect prevailing market conditions. Thus the risk that generators would be financially disadvantaged by the price cap is very low.

MMA outlined the following four potential methods for defining a Risk Margin:

1. The uncertainty could be ignored and expected costs and quantities could be used to determine the Maximum STEM Price. This approach creates the risk that the Maximum STEM Price is too low in many circumstances so as to discourage efficient operations and new entry in peaking services, potentially resulting in inefficient operations when system conditions are unfavourable for short-term running.
2. Addressing uncertainty by using the values of all parameters at the extreme end of their range, so that the Maximum STEM Price reflects the worst possible outcome. This approach would almost certainly result in a very high Maximum STEM Price that would have no practical use in mitigating market power.
3. The expected values could be applied in the cost assessment and the Profit Margin could be used to assess the impact of uncertainty from the viewpoint of the generator. This approach would be reflective of the uncertainty in the cost factors in a general manner. It does not rigorously represent the way the factors can work together to create uncertainty in the maximum cost as observed at the Market level.
4. The uncertainty of the input variables and how they work in combination could be assessed in the assessment of the Maximum STEM Price. The

Profit Margin could be set to zero or interpreted as a Risk Margin so as to make the Maximum STEM Price realistic from a commercial perspective. The Risk Margin of the assessed price over the expected or most probable price would be confirmed to ensure that it is not excessive in relation to the objective of market power mitigation. This represents a more rigorous test of uncertainty than option 3.

For the purposes of undertaking the 2007, 2008 and 2009 price limits reviews the fourth method was the preferred approach proposed by MMA and endorsed by the IMO. This was on the basis that assigning a single value to a cost parameter as defined in the Market Rules assumes a known cost with no margin of uncertainty. However, in setting the price limits, a likely range of costs with an expected value and a margin of uncertainty are assessed. Consequently, the Risk Margin was applied by MMA to the expected cost to ensure that the imposition of a capped price does not impede participation of high cost generators in the market under high demand or low reserve supply conditions.

Proposal

The IMO considers that MMA's interpretation is appropriate as perfect knowledge of all the possible conditions that determine the cost of generation at any particular time is unavailable to the IMO. The IMO notes the work of Mosquera, Reneses, Baraquin and Sanchez-Ubeda (2006) which identified that the main variables likely to be subject to uncertainty include system demand, hydro conditions³ and fuel costs.⁴ In the case of the determination of the price limits for the Wholesale Electricity Market, the IMO notes that fuel costs, and in particular gas costs, are likely to be the greatest cause of uncertainty.

Given this uncertainty in the input data, the IMO considers that a margin for uncertainty is needed when applying the expected costs to set the price limits. The IMO therefore proposes that the Market Rules be amended to replace "Profit Margin" with "Risk Margin", where Risk Margin refers to the margin between the price cap and the expected highest short run cost generating works in the South West interconnected system (SWIS).

The IMO contends that this will allow for the uncertainty faced by the IMO in setting the price limits to be accurately reflected when annually reviewing its appropriateness. The IMO also considers that by including a Risk Margin between the price cap and the expected highest short run cost generating works in the SWIS in the calculation of the price limits, a price limit suitable for mitigating market power without inhibiting efficient operations will be achieved.

The IMO notes that this amendment would be reflective of the approach adopted in undertaking the review in previous years.

The IMO also proposes to amend clause 6.20.9 to clarify that the IMO will publish draft reports and seek public consultation only when undertaking the annual review required under clause 6.20.6 of the Market Rules. The IMO contends that currently there is uncertainty in the application of clause 6.20.9 with regards to the monthly recalculation of the Alternative Maximum STEM Price under clause 6.20.3 of the Market Rules. The IMO considers that it would be inefficient to undertake a public consultation process

³ Noting that this is not relevant in the case of Western Australia

⁴ N. Mosquera, J. Reneses, J. Baraquin, E.F. Sanchez-Ubeda (2006): Risk Analysis in Electricity Markets by using decision trees, 9th International Conference on Probabilistic Methods Applied to Power Systems KTGH, Stockholm, Sweden.

every month when the Alternative Maximum STEM Price is revised, and that the annual review and consultation process provides sufficient scope for interested stakeholders to express any concerns they might have with the values calculated for the Alternative Maximum STEM Price.

The IMO also proposes the addition of new clause 6.20.9A to allow for a second consultation period, if required, after submissions have been received on the draft report. This will allow the IMO to gauge industry views on any outstanding issues identified either during or following the first consultation period.

APPENDIX 2: PROPOSED AMENDING RULES IN THE RULE CHANGE PROPOSAL

The IMO proposed the following amendments to the Market Rules in its Rule Change Proposal (~~deleted text~~, added text):

6.20.7. In conducting the review required by clause 6.20.6 the IMO:

- (a) may propose revised values for the following:
 - i. the Maximum STEM Price, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by natural gas and is to be calculated using the ~~methodology described~~ formula in paragraph (b); and
 - ii. the Alternative Maximum STEM, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by distillate and is to be calculated using the ~~methodology described~~ formula in paragraph (b);
- (b) must calculate the Maximum STEM Price or Alternative Maximum STEM Price using the following ~~methodology~~ formula:

$$(1 + \text{Profit Margin} + \text{Risk Margin}) \times (\text{Variable O\&M} + (\text{Heat Rate} \times \text{Fuel Cost}))/\text{Loss Factor}$$

Where

- i. ~~Profit Margin is the allowable profit margin expressed as a fraction~~ Risk Margin is a measure of uncertainty in the assessment of the mean short run average cost for a 40 MW open cycle gas turbine generating station calculated using a statistical distribution of its various cost related parameters in accordance with clause 6.20.7(b), where:
 - a. the Risk Margin is calculated for the Maximum STEM Price as the proportion by which the 80th percentile of the probability distribution for the short

run average cost exceeds the mean short run average cost; and

- b. the Risk Margin is calculated for the Alternative Maximum STEM Price as the proportion by which the 90th percentile of the probability distribution for the short run average cost exceeds the mean short run average cost;
- ii. Variable O&M is the mean variable operating and maintenance cost for a 40 MW open cycle gas turbine generating station, expressed in \$/MWh, and includes, but is not limited to, start-up related costs;
- iii. Heat Rate is ~~based on the~~ mean heat rate at minimum capacity for a 40 MW open cycle gas turbine generating station's, ~~heat rate at minimum capacity~~, expressed in GJ/MWh;
- iv. Fuel Cost is the mean unit fixed and variable fuel cost for a 40 MW open cycle gas turbine generating station, expressed in \$/GJ; and
- v. Loss Factor is the marginal loss factor for the generator relative to the Reference Node.

Where the IMO must determine appropriate values for the factors described in paragraphs (i) to (v) as applicable to the Maximum STEM Price and Alternative Maximum STEM Price.

6.20.10. In conducting the review required by clause 6.20.6 ~~the~~ IMO must prepare a draft report describing how it has arrived at a proposed revised value of an Energy Price Limit. The IMO must publish the draft report on the Market Web Site and advertise the report in newspapers widely published in Western Australia and request submissions from all sectors of the Western Australia energy industry, including end-users, within six weeks of the date of publication.

6.20.9A. Prior to proposing a final revised value to an Energy Price Limit in accordance with clause 6.20.10, the IMO may publish a request for further submissions on the Market Web Site. Where the IMO publishes a request for further submission in accordance with this clause, it must request submissions from all sectors of the Western Australia energy industry, including end-users.

6.20.10 After considering the submissions on the draft report described in clause 6.20.9, and any submissions received under clause 6.20.9A, the IMO must propose a final revised value for any proposed change to an Energy Price Limit and submit those values and its final report, including any submissions received ~~on the draft report~~, to the Economic Regulation Authority for approval.