
Wholesale Electricity Market Pre Market Rule Change Discussion Paper

Submitted by

Name:	Anne Nolan
Phone:	9254 4300
Fax:	
Email:	imo@imowa.com.au
Organisation:	Independent Market Operator
Address:	Level 22, Forest Centre, 221 St Georges Tce, Perth WA 6000
Date submitted:	
Urgency:	Medium
Change Proposal title:	NTDL Determination
Market Rule(s) affected:	4.28.9, Appendix 5 and Appendix 5A (new)

Introduction

This Pre Market Rule Change Discussion Paper can be posted, faxed or emailed to:

Independent Market Operator

Attn: Dora Guzeleva, Manager Market Administration
PO Box 7096
Cloisters Square, Perth, WA 6850

Fax: (08) 9254 4399
Email: marketadmin@imowa.com.au

The discussion paper should explain how it will enable the Market Rules to better contribute to the achievement of the wholesale electricity market objectives. The objectives of the market are:

- (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;
- (b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;
- (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;
- (d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and
- (e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

Details of the proposed Market Rule Change

1) Describe the concern with the existing Market Rules that is to be addressed by the proposed Market Rule change:

In October 2007, the Market Advisory Committee appointed a Working Group to assess the current definition of Non Temperature Dependent Loads (NTDLs) in the Market Rules and to propose any amendments to the Rules, if appropriate. This rule change proposal is a result from the Working Group's deliberations.

The Issue

Concerns have been raised by market participants regarding the definition of a load as an NTDL in clause 4.28.9 of the current Market Rules. In summary, the current rules are considered to be too restrictive in regard to which loads can be considered to be NTDLs. The concern was that under the current definition, some loads that are actually non-temperature dependent may not qualify for Non-Temperature Dependent Load classification.

One example is business which structures its processes so that its load is higher overnight – taking advantage of the lower electricity prices in off-peak periods. Under the current rules, if this lower load during the daytime is more than 10% of its maximum load during the hot season, the load cannot be classified as a NTDL. That is, it cannot be classified as a NTDL even though the reason for the deviation is not related to temperature and the load may have contributed a lesser amount to peak system load than if its processes were not optimised for overnight running.

Currently clause 4.28.9 of the Market Rules, states that in order to qualify as a NTDL, a load can not deviate downwards from its peak consumption during the previous hot season by more than 10% for more than 10% of the time, apart from certain circumstances specified in clause 4.28.9. In this Market Rule Change Proposal, the first term (which refers to the magnitude of the allowable deviation in consumption level) is called “deviation” and the second (which refers to the allowable frequency with which deviations are considered acceptable) is called “frequency”.

The IMO has analysed available meter data and considers that under the current rules, there are only three loads that qualify as NTDLs relative to their consumption during the 2006/07 hot season.

The Working Group's Proposed Changes to the NTDL Definition

The Working Group considered that the definition of NTDLs in the current Market Rules is too restrictive and that in many cases, the current provisions deny the opportunity for some loads that are genuinely “non-temperature dependent” to qualify as such.

It was agreed that the current method of using deviations from a load's peak consumption over the hot season was not an adequate mechanism. This peak consumption could occur in any period during the hot season i.e. not necessarily during the overall system peak. To capture the appropriate level of variation when assessing the status of a load with regard to temperature dependency, it was proposed to use the load's median consumption during the

four peak SWIS intervals in each month as the value from which any allowable deviation is determined.

This proposed change would resolve the issues raised by Market Participants by allowing an NTDL to deviate upwards from its median level of consumption during the system peak intervals, for example increasing its load during the night time or other off-peak periods.

To capture behaviour during the hot season, the Working Group proposed to calculate the median values by looking at the loads' consumption over the 4 system peak intervals during the nine months, from November to August, of each year. The application of the proposed new method to existing and new loads is outlined below.

Existing NTDLs

The Working Group proposed that existing NTDLs, that have been NTDLs for at least 9 months including the previous hot season, should apply for re-qualification as a NTDL each year as is intended by the current rules. This re-qualification would be in the form of a test, as follows:

- Market Customers are required to reapply in August of each year;
- The assessment will be conducted by the IMO annually in September;
- At least 9 months of data will be used for the test, i.e. the load had to become an NTDL in November the year before at the latest;
- The test will be based on the median of the 4 system peak intervals for each month of the test (i.e. the median of the 36 peak intervals will be calculated over the 9 months of the test);
- The load must have had consumption (the median consumption over the 4 system peak intervals for each month of the test) in excess of a prescribed MWh threshold; and
- The load will be considered as an NTDL from 1 October if the load meets the assessment criteria.

New NTDL loads

All new loads applying to become NTDLs (i.e. new meters) or existing loads that have implemented new measures during a Capacity Year will be treated as Temperature Dependent Loads until they apply to be NTDLs and pass the NTDL test at any point during the year. These will include loads that do not have at least 9 months of data as NTDLs in August or loads that apply to become NTDL during the Capacity Year.

The NTDL test will be conducted by the IMO as follows:

- The test will be conducted each month until there are at least 9 months of data in August including the hot season;
- Should the application be made at a date such that by the next August there is not 9 months of data accumulated, then the load will continue to go through the month by month test until August the following year;
- The test will be based on all data from the first month for which consumption data was used to conduct the first test; and
- The test will be based on the median value of the load during the 4 system peak intervals for each month of the test.

This means that while a load may qualify as a NTDL in one month, it may not qualify in subsequent months.

Additional Analysis

Analysis Based on the Current Definition

The IMO conducted initial analysis and found that, under the current rules, there are only three loads that qualify as NTDLs relative to their consumption during the 2006/07 hot season.

To support the changes that have been proposed in this Rule Change Proposal, the IMO has also analysed how many loads would qualify as NTDLs if the allowable percentages for number of intervals (“Frequency”) and the amount of deviation (“Deviation”) were increased (using the current definition in the Market Rules). The table below shows how many loads would qualify as NTDLs with the increasing thresholds:

No of NTDLs

Frequency	Downward deviation from median		
	10%	15%	20%
	NTDL	NTDL	NTDL
10%	3	7	10
15%	6	8	14
20%	7	9	19

The next table shows how the IRCR proportions will change (MW amount allocated to TDLs, NTDLs & ILs) with increasing thresholds:

IRCRs (MW)

Frequency	Downward deviation from median								
	10%			15%			20%		
	NTDL	TDL	IL	NTDL	TDL	IL	NTDL	TDL	IL
10%	67.78	3925.99	6.23	110.28	3883.49	6.23	123.11	3870.66	6.23
15%	105.82	3887.95	6.23	118.59	3875.18	6.23	159.62	3834.15	6.23
20%	114.13	3879.64	6.23	125.86	3867.91	6.23	190.10	3803.67	6.23

The following table shows how the TDL ratio would change with increasing thresholds:

TDL & NTDL Ratios

Frequency	Downward deviation from median					
	10%		15%		20%	
	NTDL	TDL	NTDL	TDL	NTDL	TDL
10%	1.0927	1.3319	1.0927	1.3351	1.0927	1.3361
15%	1.0927	1.3348	1.0927	1.3358	1.0927	1.3390
20%	1.0927	1.3354	1.0927	1.3363	1.0927	1.3414

Analysis Based on the Proposed New Definition

The Working Group also sought to determine which loads should qualify as NTDLs, using a range of values for allowable deviation, and frequency, from the median consumption (i.e. using the proposed new definition).

In defining what loads are non-temperature dependent, the Working Group considered that loads that qualify shall have demand that has a low correlation with the overall system demand. This was based on the expectation that a TDL is one that, to a large extent, follows that of the system load.

Under the current Market Rules only loads that have a peak consumption in excess of 1 MWh qualify to be considered as NTDLs. The Working Group also discussed if this requirement was adequate. Analysis showed that lowering the limit to 0.5 MWh while using the proposed median consumption would allow loads that are genuinely non-temperature dependent (i.e. have low correlation with system demand) to qualify. Lowering the limit further was not supported with certainty by the analysis, as smaller loads were found to be more inconsistent in their behaviour and correlation with the system load.

The IMO simulated the proposed amending rules (for loads with a median consumption of at least 0.5 MWh) and, for different combinations of deviation and frequency, analysed:

- the highest correlation with the system load in each group;
- how many loads would qualify as a NTDL;
- the total amount of load (MWh) in each group;
- the proportion (in MW) of IRCRs determined for NTDLs, TDLs and Intermittent Loads; and
- the changes to the TDL ratio in each group.

The results of the analysis, for loads with median consumption above 0.5 MWh are presented below. It can be seen from the analysis that the proposed change of the NTDL definition (to use the load's median consumption during the four peak SWIS intervals in each month as the value from which to determine the allowable deviation) would increase the eligible loads from 3 to 9, using the same threshold for frequency (10%) and deviation (10%) as in the current rules.

Highest correlation

Frequency	Downward deviation from median					
	5%	10%	15%	20%	25%	30%
5%	-0.08	-0.08	0.43	0.43	0.43	0.54
10%	-0.08	0.16	0.43	0.43	0.43	0.54
15%	-0.01	0.16	0.43	0.43	0.49	0.54
20%	0.16	0.16	0.43	0.43	0.54	0.54
25%	0.16	0.19	0.43	0.43	0.54	0.64
30%	0.27	0.39	0.43	0.43	0.54	0.64

Count of loadsDownward deviation
from median

Frequency	5%	10%	15%	20%	25%	30%
5%	1	3	5	9	13	19
10%	4	9	20	26	38	47
15%	8	19	36	44	48	55
20%	14	30	43	50	58	64
25%	23	41	51	54	64	71
30%	31	52	58	62	71	79

Total MWhDownward deviation
from median

Frequency	5%	10%	15%	20%	25%	30%
5%	4.78	8.79	13.29	18.90	24.71	63.75
10%	10.94	44.54	80.26	99.16	122.87	144.05
15%	45.58	88.23	122.49	141.34	151.08	159.04
20%	74.11	117.39	139.97	156.76	164.23	170.39
25%	106.32	136.51	159.21	161.63	168.93	179.71
30%	113.34	159.27	164.35	167.13	181.15	192.86

IRCRs (MW)Downward deviation
from median

Freq.	10%			15%			20%			25%		
	NTDL	TDL	IL	NTDL	TDL	IL	NTDL	TDL	IL	NTDL	TDL	IL
10%	97.8	3896.0	6.2	167.7	3826.1	6.2	201.3	3792.4	6.2	240.7	3753.1	6.2
15%	175.8	3818.0	6.2	237.1	3756.8	6.2	274.6	3719.2	6.2	293.5	3700.2	6.2
20%	226.7	3727.1	6.2	271.5	3722.3	6.2	300.4	3693.3	6.2	317.3	3676.5	6.2
25%	260.2	3733.5	6.2	306.4	3687.4	6.2	311.7	3682.1	6.2	327.1	3666.7	6.2

TDL and NTDL RatiosDownward deviation from
median

Frequency	10%		15%		20%		25%	
	NTDL	TDL	NTDL	TDL	NTDL	TDL	NTDL	TDL
10%	1.0927	1.3378	1.0927	1.3433	1.0927	1.3460	1.0927	1.3493
15%	1.0927	1.3439	1.0927	1.3490	1.0927	1.3522	1.0927	1.3539
20%	1.0927	1.3481	1.0927	1.3519	1.0927	1.3545	1.0927	1.3560
25%	1.0927	1.3510	1.0927	1.3550	1.0927	1.3555	1.0927	1.3568

Conclusion and Proposed Additional Changes to the NTDL Definition

The following principles were agreed by the Working Group:

- the magnitude of the allowed deviations is more important than their frequency; and
- while acknowledging that circumstances may change as loads alter their behaviour, a maximum positive correlation of 0.2 with the system demand for any load is desired.

Based on the analysis that was conducted, the Working Group concluded that a maximum downward deviation of 10% from the median consumption, as determined under the proposed rules, was appropriate. The frequency with which the load is allowed to deviate was deemed less important and setting the allowable frequency value to 25% would currently bring all loads qualifying as NTDLs to a total of 41, while still keeping to the maximum correlation of 0.2 for each qualifying load.

The Working Group accepted that with the proposed method new loads may qualify as an NTDL in the future in spite of having a correlation with system load of above 0.2.

The Working Group also discussed using a correlation coefficient in defining NTDLs, instead of the current method for assessing the magnitude and frequency of deviations. However, for simplicity and transparency, the Working Group considered that the current definition should be retained, but relaxed as appropriate in order to capture loads with low correlation with system demand.

It is proposed that the load must not deviate downwards from its determined median consumption during the SWIS peak intervals by more than 10% for more than 25% of the time, in order to pass either of the tests (for a new NTDL or an existing NTDL). As indicated above the Working Group also proposed to reduce the threshold above which loads would qualify to be assessed as NTDLs to 0.5 MWh.

2) Explain the reason for the degree of urgency:

It is important that this change be implemented as soon as practicable. This in order to avoid further financial costs for loads that are non temperature dependent, but currently can't be classified as NTDLs under the Market Rules, and also to encourage efficient behaviour by loads in regard to managing their electricity consumption in an effective manner.

3) Provide any proposed specific changes to particular Rules (for clarity, please use the current wording of the Rules and place a ~~strikethrough~~ where words are deleted and underline words added)

4.28.9. The IMO must only accept the load measured by an interval meter in the list provided in accordance with clause 4.28.8(a) as a Non-Temperature Dependent Load if that load satisfies the requirements of Appendix 5A.

~~(a) had a peak consumption during the previous Hot Season in excess of 1 MWh; and~~

~~(b) did not deviate downwards from the peak consumption in paragraph (a) by more than 10% for more than 10% of the time during the Hot Season except during Trading Intervals where:~~

- i. ~~the consumption was 0 MWh; or~~
- ii. ~~consumption was reduced at the request of System Management; or~~
- iii. ~~evidence is provided by the Market Customer that the source of the consumption was operating at below capacity due to maintenance or a Saturday, Sunday or a public holiday throughout Western Australia.~~

APPENDIX 5: INDIVIDUAL RESERVE CAPACITY REQUIREMENTS.....

STEP 5: When determining the Individual Reserve Capacity Requirements for Trading Month n identify meters that were not registered with the IMO during one or more of the 12 peak Trading Intervals in the preceding Hot Season but which were registered by the end of Trading Month n-3.

Identify the 4 Peak SWIS Trading Intervals of Trading Month n-3, being the 4 highest demand Trading Intervals, where demand refers to total demand, net of embedded generation, in the SWIS.

For a new meter u that measures Non-Temperature Dependent Load set NMNTR(u) to be 1.1 times the MW figure formed by doubling the median value of the metered consumption for that meter during the 4 Peak SWIS Trading Intervals of maximum Trading Interval demand for that meter during Trading Month n-3.

For a new meter v that measures Temperature Dependent Load set NMTDCR(v) equal to be 1.3 times the MW figure formed by doubling the median value of the metered consumption for that meter during the 4 Peak SWIS Trading Intervals of Trading Month n-3.

APPENDIX 5A: NON-TEMPERATURE DEPENDENT LOAD REQUIREMENTS

This Appendix presents the method and requirements for accepting, in accordance with clause 4.28.9, a load measured by an interval meter in the list provided in accordance with clause 4.28.8(a) as a Non-Temperature Dependent Load.

For the purpose of this Appendix the meter data to be used in any calculations is to be the most current set of meter data as at the time of commencing the calculations.

The IMO must perform the following steps in deciding whether to accept, in accordance with clause 4.28.9, a load measured by an interval meter in the list provided in accordance with clause 4.28.8(a) as a Non-Temperature Dependent Load:

Step 1:

- If, in accordance with clause 4.28.8(a), the IMO is provided by a Market Customer in month (n-2) with a list that includes an interval meter associated with that Market Customer that it wants the IMO to treat as a Non-Temperature Dependent Load from month (n); and
- If the list including the interval meter is provided by the date and time specified in clause 4.1.23; and
- If the load was treated as a Non-Temperature Dependent Load in month (n-8),

then the IMO must accept the load as a Non-Temperature Dependent Load if:

- (a) The median value of the metered consumption for that load was in excess of 0.5MWh, calculated over the set of Trading Intervals defined as the four peak SWIS intervals in each of the months starting from the start of month n-11 to the end of month n-3; and
- (b) the load did not deviate downwards from the median consumption in paragraph (a) by more than 10% for more than 25% of the time during the period from the start of month (n-11) to the end of month (n-3) except during Trading Intervals where:
 - i. the consumption was 0 MWh; or
 - ii. consumption was reduced at the request of System Management; or
 - iii. evidence is provided by the Market Customer that the source of the consumption was operating at below capacity due to maintenance or a Saturday, Sunday or a public holiday throughout Western Australia.

Step 2:

- If, in accordance with clause 4.28.8(a), the IMO is provided by a Market Customer in month (n-2) with a list that includes an interval meter associated with that Market Customer that it wants the IMO to treat as a Non-Temperature Dependent Load from month (n); and
- If the load is not treated as a Non-Temperature Dependent Load in month (n-1); and
- If the load was not treated as a Non-Temperature Dependent Load for any of the months in the Capacity Year in which month (n) falls,

then the IMO must accept the load as a Non-Temperature Dependent Load for month (n) if:

- (a) the median value of the metered consumption values for that load during the 4 Peak SWIS Trading Intervals in month (n-3) was in excess of 0.5 MWh; and
- (b) the load did not deviate downwards from the median consumption in paragraph (a) by more than 10% for more than 25% of the time during month (n-3) except during Trading Intervals where:
 - i. the consumption was 0 MWh; or
 - ii. consumption was reduced at the request of System Management; or
 - iii. evidence is provided by the Market Customer that the source of the consumption was operating at below capacity due to maintenance or a Saturday, Sunday or a public holiday throughout Western Australia.

Step 3:

- If a load was not accepted under Step 1 as a Non-Temperature Dependent Load for month (n); and
- If the load was accepted under Step 2, or previously under this Step 3, as a Non-Temperature Dependent Load for month (n-1),

then the IMO must accept the load as a Non-Temperature Dependent Load for month (n) if:

- (a) the median value of the metered consumption values for that load during the 4 Peak SWIS Trading Intervals in all months from the month for which metered consumption values were used by the IMO to accept the load as a Non-Temperature Dependent Load under Step 2 to month (n-3) was in excess of 1 MWh; and
- (b) the load did not deviate downwards from the median consumption in paragraph (a) by more than 10% for more than 10% of the time during the period from the start of the month for which metered consumption values were used by the IMO to accept the load as a Non-Temperature Dependent Load under Step 2 to the end of month (n-3) except during Trading Intervals where:
 - i. the consumption was 0 MWh; or
 - ii. consumption was reduced at the request of System Management; or
 - iii. evidence is provided by the Market Customer that the source of the consumption was operating at below capacity due to maintenance or a Saturday, Sunday or a public holiday throughout Western Australia.

Step 4:

Otherwise, the IMO must treat a load as a Temperature Dependent Load.

4) Describe how the proposed Market Rule change would allow the Market Rules to better address the Wholesale Market Objectives:

The objectives of the market as set out in clause 1.2.1 of the Wholesale Electricity Market Rules are:

- (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 changes support objective (a) of the Market Objectives by encouraging economically efficient behaviour of loads in the SWIS.

- (b) *to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors.*

The proposed changes support objective (b) of the Market Objectives by allowing more loads to qualify as NTDs, and thus making them more attractive for retailers to churn.

- (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.*

The IMO considers that the proposed changes do not impact on, and therefore are consistent with, the operation of objective (c) of the Market Objectives.

- (d) *to minimise the long-term cost of electricity supplied to customers from the South West interconnected system*

The IMO considers that this rule change supports objective (d) of the Market Objectives, by allowing a load to be classified as Non Temperature Dependent when its operating pattern is adjusted to take advantage of cheaper electricity in off-peak intervals. The change will also reduce the overall cost of supply by shifting demand from peak to off-peak periods, thus reducing the need for additional peaking capacity.

- (e) *to encourage the taking of measures to manage the amount of electricity used and when it is used.*

The IMO considers that this rule change proposal supports objective (e) of the Market Objectives, by allowing a load to be classified as Non Temperature Dependent when its operating pattern is adjusted to reduce the amount of electricity used during peak intervals.

5) Provide any identifiable costs and benefits of the change:

This change will require changes to the existing Market Systems. The change would also create an ongoing administrative workload to process applications and evidence provided by Market Customers seeking to be considered as being Non-Temperature Dependent. However, these costs would be minimised by limiting the number of allowable applications per Capacity Year to one per Market Customer for each load.

The change will also encourage efficient behaviour and provide incentives to reduce overall peak consumption in the SWIS.
