IMPACT & IMPLEMENTATION REPORT – SUMMARY SECTION
(For AEMO to complete and administer)

Issue Number	**IN033/12**		
Impacted Jurisdiction (s)	Victoria		
Proponent	Justin Luu	Company	AEMO
Affected Gas Markets(s)	Retail	Consultation process (Ordinary or Expedited)	Expedited
Industry Consultative forum(s) used	GRCF and RBPWG	Date Industry Consultative forum(s)consultation concluded	14 December 2011
Short Description of change(s)	Grampians Net System Profile Methodology Procedure		
Procedure(s) or Documentation impacted	N/A		
Summary of the change(s)	Grampians Net System Profile Methodology procedure in accordance with 2.8.2(b) the Retail Market Procedures (Victoria)		
I&IR Prepared By	Justin Luu	Approved By	Peter Alberts
Date I&IR published	19 December 2012	Date Consultation under 135EE or 135EF concludes	14 January 2013
Contact address for written responses	Justin Luu, Australian Energy Market Operator, GPO Box 2008, Melbourne VIC 3001		
Email Address for Responses	grcf@aemo.com.au		
Other key contact information	Justin.luu@aemo.com.au		

IMPACT & IMPLEMENTATION REPORT – DETAILED REPORT SECTION

CRITICAL EXAMINATION OF PROPOSAL	
1. Description of change(s) and reasons for change(s)	In accordance with clause 2.8.2(b) of the Retail Market Procedures (Victoria) (RMP-V), AEMO must apportion the consumed energy in relation to each meter that relates to a supply point connected to a distribution pipeline that is not part of a declared distribution system, in accordance with published procedures agreed from time to time between AEMO, the relevant Distributor and other affected Market Participants. AEMO and industry participants undertook a review of the non-DTS (non-declared transmission systems), which resulted in the identification of the need for a new procedure under the RMP-V in relation to consumed energy to a distribution pipeline that is not part of a declared distribution system. The new procedure is required to ensure that the non-DTS areas are managed correctly under the RMP-V head of power. This Impact and Implementation Report (IIR) deals with the proposal for a new Procedure. Prior to the commencement of the NGR and the RMP-V, the Grampians area (previously known as Coastal) which runs between Stawell, Ararat and Horsham and connects to the DTS at Carisbrook was a standalone area that was not included in the AEMO or VENCorp systems. The area is currently operated by SP AusNet. As a result of the operation of the NGR, Grampians and the other non-DTS areas (South Gippsland and Bairnsdale) are now part of the Victorian Retail Market. Therefore, AEMO needs to include all Grampians customers into the AEMO MR to ensure consistent management of FRC in that area. Once the information is loaded into the AEMO MR, AEMO systems, processes and reports will be configured to receive and produce the information for the non-DTS Grampians area as AEMO's systems currently do for the other non-DTS areas. This IIR aims at providing a procedure for Net System Load (NSL) methodology to be applied to the Grampians network.
2. Reference documentation ▪ Procedure Reference ▪ GIP/Specification Pack Reference ▪ Other Reference	RMP-V clause 2.8.2(b)
3. The high level details of the change(s) to the existing Procedures This includes: ▪ A comparison of the existing operation of the Procedures to the proposed change to the operation of the	See **Attachment A** for a copy of the Procedure

Procedures ▪ A marked up version of the Procedure change	
4. Explanation regarding the order of magnitude of the change (eg: material, non-material or non-substantial)	From a procedural basis, this change is a non-material and non-substantial change. The new procedure is required to ensure that the non-DTS areas are managed correctly under the RMP-V head of power.

ASSESSMENT OF LIKELY EFFECT OF PROPOSAL	
5. Overall Industry Cost / benefit (tangible / intangible / risk) analysis and/or cost estimates	**Stakeholder consultation** AEMO does not foresee any industry related costs for this proposal. As this procedure is an obligation under the RMP-V, there is an intangible benefit and a reduction of risks relating to non-compliance from its implementation. There is a benefit for Participants in that there is a documented methodology of how AEMO calculates Net System Load in the Grampians non-DTS network.
6. The likely implementation effect of the change(s) on stakeholders (e.g. Industry or end-users)	If this proposal is not implemented, AEMO will not be able to completely achieve its obligations under the RMP-V, and participants will not have a documented methodology of how AEMO calculates Net System Load in the Grampians non-DTS network.
7. Testing requirements	Nil.
8. AEMO's preliminary assessment of the proposal's compliance with section 135EB: - consistency with NGL and NGR, - regard to national gas objective - regard to any applicable access arrangements	<u>Consistency with NGL and NGR:</u> AEMO's view is that the proposed change is consistent with the NGL and NGR. Implementation of this change is consistent with the policy intent on AEMO establishment. Additionally, AEMO believes that this change is consistent with the NERL and NERR. <u>National gas objective</u> "*Promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.*" It is AEMO's view that this change facilitates efficient operation of the retail gas market by providing documentation and clarity under obligations of the RMP-V. AEMO also notes that this change has regard for the National Energy Retail Objective which states: "*The objective of this Law is to promote efficient investment in, and efficient operation and use of, energy services for the long term interests of consumers of energy with respect to price, quality, safety, reliability and security of supply of energy*".

	Applicable access arrangements AEMO's view is that the proposed change is not in conflict with existing Access Arrangements. No Distributor raised concerns with the proposed amendments in relation to their Access Arrangement.
9. Consultation Forum Outcomes (e.g. the conclusions made on the change(s) whether there was unanimous approval, any dissenting views)	AEMO received submissions from AGL, Origin Energy and Energy Australia. AGL and Energy Australia submissions supported the Grampians Net System Profile Methodology Procedure. Origin Energy made a submission to provide no comment as they believe that they are not an affected Participant.

RECOMMENDATION(S)	
10. Should the proposed Procedures be made, (with or without amendments)?	AEMO recommends that these procedures be made as outlined in **Attachment A**, should be made without further amendments.
11. If applicable, a proposed effective date for the proposed change(s) to take effect and justification for that timeline.	AEMO proposes an effective date on 1 February 2013 to align to the implementation date of IN031/11 (Grampians Network). • IIR to be raised on 20 December 2012 and closes on 15 January 2013 • AEMO decision by 18 January 2013 for this Procedure to become effective on 1 February 2013.

ATTACHMENT A – PROCEDURE CHANGES
(SEE SECTION 3)
Blue represents additions Red and strikeout represents deletions – Marked up changes

GRAMPIANS NET SYSTEM PROFILE METHODOLOGY

PREPARED BY: Market Development

DOCUMENT REF: [Keywords]

VERSION: 1.0

EFFECTIVE DATE: 1 February 2013

FINAL

Version Release History

VERSION	DATE	AUTHOR	COMMENTS
0.1	24 Oct 12	Justin Luu	Draft for review
1.0	1 Feb 13	Justin Luu	Final

Contents

GLOSSARY

In this document, a word or phrase *in this style* has the same meaning as given to that term in the Retail Market Procedures (Victoria).

1 Introduction

This Grampians Net System Profile Methodology document is made in accordance with clause 2.8.2 of the Retail Market Procedures (Victoria), this document details the methodology used to calculate *Net System Load (NSL)* by application of Profile Preparation Service, Basic Meter Profiling and *Effective Degree Days*.

The specific data supplied by the *Distribution Businesses* is described in the *Gas Interface Protocol (GIP)* Participant Build Pack 2 Systems Interface Definitions document.

The NSL is an estimate of the quantity of gas used by all basic metered customers in a distribution area.

2 NET SYSTEM PROFILE METHODOLOGY

2.1 Profile Preparation Service (PPS)

2.1.1 Calculation of the NSL

AEMO must calculate the net system load (***NSL***) for each *distribution area* in accordance with this section 2.

For each *distribution area*, the *NSL* for each *gas day* is derived from the total energy entering the *distribution area* (***ET***) less the total energy leaving the *distribution area* (***EL***) and less the sum of all *interval metered* energy withdrawn at a *distribution supply point* within the *distribution area* (***EI***) adjusted for distribution unaccounted for gas within the *distribution area* (***$UAFG_D$***). AEMO calculated *NSL* for each *distribution area* for each *gas day* cannot be a negative value.

The *NSL* for a *gas day* can be represented by the following formula:

$$NSL_{i,D} = ET_{i,D} - EL_{i,D} - \left(\frac{\sum EI_{i,D}}{(1 - UAFG_D)} \right)$$

Where:

- $NSL_{i,D}$ is the NSL for *distribution area* D for *gas day i*;
- $ET_{i,D}$ is the total energy entering *distribution area* D during *gas day* i;
- $EL_{i,D}$ is the total energy leaving *distribution area* D during *gas day* i;
- $EI_{i,D}$ is the *interval metered* energy withdrawn at a *distribution supply point* within *distribution area* D during *gas day* i; and
- $UAFG_D$ is the relevant value assigned to:
    (a) the *Distributor* on whose distribution pipeline the *distribution supply point* is located; and
    (b) the quantity of gas withdrawn by a *Market Participant* at the *distribution supply point*,

in accordance with Part C of Schedule 1 of the *Distribution Code* or as defined in the Declared Metering Requirement.

2.1.2 Updating the NSL

2.1.2.1 The NSL is subject to changes as a result of revisions to either custody transfer meter data or interval meter data. Revisions to custody transfer meter data are less likely than revisions to interval meter data because most interval meters are read manually more than three business days after the relevant gas day (when prudential reporting is required).

2.1.2.2 The data validation procedures made by AEMO under Part 19 of the Rules and those provisions of Part 19 that deal with validation and substitution of metering data will be applied to estimate missing interval meter data. That data will be replaced with actual values when available.

AEMO must calculate the *net system load* for each *distribution area* for each *gas day* using revised or additional information provided or available to it in accordance with the timeframes specified in Division 2, Subdivision 6 and Division 2, Subdivision 7 of the Rules:

(a) for monitoring prudential exposure;

(b) for preliminary settlement statement;

(c) for final settlement statement; and

(d) for revised settlement statement.

2.2 Basic Meter Profiler (BMP)

2.2.1 Data for apportionment

The *consumed energy* data required by AEMO for the purpose of applying the *NSL* is provided to AEMO in accordance with sections 2.6.2(b) and 2.6.3 of the Retail Market Procedures (Victoria). AEMO must apply the validation rules described in the *Consumed Energy Scenarios (Victoria)* to the *consumed energy* data delivered to AEMO by the *Distributors*.

2.2.2 Load Apportionment Using the NSL

2.2.2.1 AEMO must apply the NSL prepared in accordance with section 2 to each basic meter for a second tier supply point, for which a validated meter reading is available, in accordance with this section 2.2.2. The aim of applying the NSL is to apportion the consumed energy for each such meter to each gas day in the reading period.

2.2.2.2 The load apportionment factor is the ratio of the NSL for the relevant gas day to the total NSL for the corresponding reading period as represented by the following formula:

$$LAF_d = \frac{NSL_d}{\sum NSL}$$

Where:

- LAF_d is the load apportionment factor for *gas day* d;
- NSL_d is the *NSL* for *gas day* d (Note: where NSLd > 0, NSLd = NSLd and where NSLd < = 0, NSLd = 0.001); and
- ΣNSL is the sum of the *NSL* for each *gas day* in the *reading period*.

2.2.2.3 The load apportionment factor for a gas day is applied to the consumed energy for a reading period for a basic meter to estimate the consumed energy for a gas day for that basic meter as follows:

$$\textit{Consumed energy}_{d,j} = \text{accumulated } \textit{consumed energy}_j \times LAF_d$$

Where:

- *consumed energy* is the *consumed energy* for *basic meter* j for a *second tier supply point* for *gas day* d;
- accumulated *consumed energy* is the *consumed energy* for the *reading period* for *basic meter* j; and
- LAF_d is the load apportionment factor for *gas day* d.

2.2.2.4 If a validated meter reading is not available, the consumed energy for a basic meter for a second tier supply point will be calculated in accordance with section 2.2.3 of this document.

2.2.3 Calculating Daily Load when Meter Readings are not available

2.2.3.1 Where a meter reading is not available, AEMO must estimate the consumed energy for a basic meter for a second tier supply point based on the weather measured in effective degree days and the base load and temperature sensitivity factor provided to AEMO by Distributors under clause 2.8.1(c) and 2.8.1(d) of the Retail Market Procedures (Victoria) as follows:

$$\textit{Consumed energy;}_{dj} = BL_j + (TSF_j \times EDD_d)$$

Where:

- $\textit{consumed energy}_{d,j}$ is the estimated *consumed energy* for *basic meter* j for a *second tier supply point* on *gas day* d;

- BL_j is the *base load* for *basic meter* j;
- TSF_j is the *temperature sensitivity factor* for *basic meter* j; and
- EDD_d is the *effective degree days* for *gas day* d.

2.2.3.2 When a validated meter reading for the basic meter becomes available, the consumed energy based on the validated meter reading will supersede the consumed energy estimated in accordance with this section 2.2.3.

2.2.3.3 Where the sum of the allocated consumed energy, supplied by the Distributors, and the generated consumed energy, as calculated by AEMO, is greater than the NSL for a gas day, AEMO will proportionately scale down the generated consumed energy to no less than zero such that the addition of the generated consumed energy to the allocated consumed energy does not cause the total energy to be profiled to exceed the NSL for that gas day.

2.2.4 Timeframe for BMP Calculations

2.2.4.1 The majority of meter readings for basic meters will not be available three business days after the gas day and hence the estimation method specified in section 2.2.3 of this document must be used by AEMO to calculate consumed energy for each gas day for basic meters for second tier supply points.

2.2.4.2 AEMO must calculate the aggregate consumed energy for each second tier supply point for each gas day using revised or additional information provided or available to it in accordance with the timeframes specified in Division 2, Subdivision 6 and Division 2, Subdivision 7 of the Rules:

(a) for monitoring prudential exposure;

(b) for preliminary settlement statement;

(c) for final settlement statement; and

(d) for revised settlement statement.

2.2.4.3 AEMO must use the most up to date NSL each time it performs the calculations referred to in sections 2.2.2 and 2.2.4.2 of this document.

2.2.5 Base Load & Temperature Sensitivity Factor

2.2.5.1 The base load is derived from the smallest consumed energy measured in a reading period during the summer period (defined as between 1 October and 31 March within the current 12 month period) according to the following formula:

$$BL = SE / PSE$$

Where:

- BL is the *base load;*
- SE is the smallest *consumed energy* between two consecutive scheduled reads during the summer period; and
- PSE is the number of days in the *reading period* during the summer period.

2.2.5.2 The temperature sensitivity factor applies a weather impact to the base load by reference to the effective degree day for each day in the reading period. The temperature sensitivity factor is derived from the difference between:

(a) the largest *consumed energy* measured in a *reading period* during the winter period (between 1 April and 30 September within the current 12 month period); and

(b) the smallest *consumed energy* between two consecutive scheduled reads measured in a *reading period* during the summer period,

divided by the sum of the *effective degree days* for the *reading period* over which the largest *consumed energy* value was derived. This is represented by the following formula:

$$TSF = \max\{0, (LE - (BL \times PLE)) / \Sigma EDD(LE)\}$$

Where:

- TSF is the temperature sensitivity factor;
- LE is largest consumed energy between two consecutive scheduled reads during the winter period;
- BL is the base load;
- PLE is the number of days in the reading period during the winter period; and
- **Σ** EDD (LE) is the sum of the effective degree days over the reading period during the winter period.

2.3 Effective Degree Days

2.3.1 Purpose of Effective Degree Day

Effective degree days are required for the calculation of the *temperature sensitivity factor*. The *effective degree day* is used to measure coldness which is directly related to gas demand for area heating. The *effective degree day* is a composite measure of weather coldness incorporating the effect of temperature, wind, sunshine and day of the year.

2.3.2 Calculation of Effective Degree Days

2.3.2.1 The effective degree day is calculated as follows:

$$EDD = DD(\text{temperature effect}) + 0.038 \times DD \times \text{average wind (wind chill factor)} - 0.18 \times \text{sunshine hours (warming effect of sunshine)} + 2 \times \cos\left(\frac{2\pi(\text{day} - 200)}{365}\right) \text{(seasonal factor)}$$

Where:

- EDD is the *effective degree day*;
- DD is the degree day and is described in section 2.3.2.2 of this Attachment;
- average wind is described in section 2.3.2.3 of this Attachment;
- sunshine hours is described in section 2.3.2.4 of this Attachment; and
- Cos is cosine and is described in section 2.3.2.5 of this Attachment.

EDD will be 0 if the calculated value is negative.

2.3.2.2 The degree day is calculated as follows:

$$DD = \begin{cases} 18 - T & \text{if } T < 18 \\ 0 & \text{if } T \geq 18 \end{cases}$$

Where:

- DD is degree day;
- T is the average of 8 three-hourly Melbourne temperature readings (in degrees Celsius) from midnight to 9.00 pm inclusive as measured at the Weather Bureau Melbourne Station;

Note: The gas day is defined as 6:00am day-0 to 6:00am day+0 so the effective degree day formula implies a 6 hour lag in demand to changes in ambient temperature.
and

- 18 degrees Celsius represents the threshold temperature for residential gas heating.

The colder the average temperature the higher the degree day and, accordingly, *effective degree day*.

2.3.2.3 The average wind is the average of the 8 three-hourly Melbourne wind (measured in knots) from midnight (day-1) to 9.00pm inclusive (day+0) as measured at the Bureau of Meteorology Moorabbin and the Laverton weather stations. Average wind is represented by the following formula:

Average wind = 0.604 x average (Moorabbin, Laverton) wind

2.3.2.4 Sunshine hours is the number of hours of sunshine above a standard intensity as measured at the Bureau of Meteorology Laverton weather station for the same duration of time between midnight (day-1) to 9.00 pm inclusive (day+0).

2.3.2.5 The cosine term models seasonality in *customers'* response to different weather. Residential consumers more readily turn on the heaters or leave heaters on in winter than in other seasons (early spring, late autumn) for the same change in weather conditions. This change in *customers*' behaviour is captured in the cosine term in the effective degree day formula, which implies that for the same weather conditions heating demand is higher in winter than in the shoulder seasons or in summer.