MEMO

TO:	Katherine Shufflebotham, Vector
DATE:	November 27, 2012
FROM:	James Mellsop and Kevin Counsell
SUBJECT:	Assessment of the VTC Change Request (VTC Balancing Arrangements)

1.   Introduction

Vector Gas Limited (Vector) has issued a Change Request on 30 October 2012 seeking to amend the balancing arrangements in the Vector Transmission Code (VTC). The VTC Change Request follows a similar Change Request amending the balancing arrangements in the Maui Pipeline Operating Code (MPOC). The VTC Change Request is being proposed to ensure that the balancing arrangements of the VTC and MPOC are compatible.

You have asked us to undertake an economic assessment of the VTC Change Request against the objectives of the Gas Act and the Government Policy Statement on Gas Governance (GPS), and more generally as to whether the VTC Change Request would result in more efficient arrangements than the status quo. While the objectives of the Gas Act and GPS are wide ranging, the Gas Industry Company (GIC) has developed a set of criteria as a "logical exposition" of the Gas Act and GPS objectives as they relate to balancing.[1] These criteria are divided into categories of efficiency, cost and governance as follows:

- Efficiency: criteria of maximising productive efficiency, maximising allocative efficiency, maximising security of gas transportation, and ensuring user risks are reasonable and manageable;

- Cost: criteria of minimizing the cost of agreeing, implementing and operating the relevant balancing arrangements; and

- Governance: criteria of ensuring transparency, ability to adapt to future circumstances, effective enforcement and dispute resolution, balance between stakeholder interests, and stability of the regime.

For the purposes of this memo we have adopted this exposition of the GIC's regarding the objectives of the Gas Act and GPS.

The VTC Change Request proposes three key changes to the VTC balancing arrangements:

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[1]   Gas Industry Company Limited (2012), "Draft Recommendation on 13 October 2011 MPOC Change Request", February, p.23.

- Removing the Imbalance Limit Overrun Notice (ILON) process and replacing it with a back-to-back cash-out balancing mechanism;

- Incorporating the new MPOC "Peaking Charge" in the VTC, including a new methodology for allocating peaking costs; and

- Limiting the scope for disputing invoices related to balancing.

Most of the changes are being proposed to ensure compatibility between the VTC and MPOC. The GIC assessed the MPOC Change Request, and issued a recommendation supporting the amendments.[2] We have reviewed the GIC's assessment (contained in both its Draft[3] and Final Recommendations), and we consider it to be appropriate. In summary, the GIC assessment against its criteria (outlined above) finds that the MPOC Change Request will improve the efficiency of the MPOC balancing arrangements, potentially increase costs (through users allocating more resources to managing their balancing positions), but at a level that is appropriate to the existing contractual arrangements, and generally enhance governance.

To the extent that the VTC Change Request seeks mainly to implement the MPOC amendments into the VTC, we are of the view that the GIC assessment would also apply to the VTC Change Request. However, there are two particular aspects of the VTC Change Request that were not part of the MPOC Change Request. We understand the GIC considers change requests as a whole, and that Vector considers the full VTC Change Request is needed in order to achieve in full the efficiency gains the GIC concluded would flow from the MPOC Change Request. With that in mind, we have however looked separately at:

- The methodology for allocating peaking costs in the VTC; and

- Limitation of the scope for disputing invoices related to balancing.

We consider these two issues in more detail in the following sections of this memo, against the criterion of economic efficiency. We then return to consider the VTC Change Request as a whole. We apply the GIC's more specific criteria in appendix A.

2.   Allocating peaking costs in the VTC

The MPOC Change Request included the introduction of a "peaking charge". The charge is described by the GIC as an "incentive charge" or "penalty charge",[4] and is charged to welded parties when gas use by end users downstream of the welded point peaks relative to scheduled gas use at the welded point. The specific circumstances under which a peaking charge is levied are as follows:

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[2]   Gas Industry Company Limited (2012), "Final Recommendation on 13 October 2011 MPOC Change Request", April.

[3]   Gas Industry Company Limited (2012), "Draft Recommendation on 13 October 2011 MPOC Change Request", February.

[4]   GIC Draft Recommendation, p.20.

- If the (metered) quantity of gas flowing through a particular welded point during any hour exceeds the "peaking limit" at that welded point. The peaking limit is the hourly scheduled quantity at a welded point (calculated by dividing the daily scheduled quantity by 24 hours), multiplied by a 125% peaking tolerance;

- If, on the day in which the peaking limit is exceeded at a welded point, either:

  – Maui pipeline line pack has fallen below a pre-determined threshold; or

  – Maui Development Limited (MDL) purchases balancing gas; and

- On the day in which the peaking limit is exceeded at a welded point, there has been no claim on the incentives pool for the welded party to pay liquidated damages in respect of a daily imbalance or exceeding the peaking limit.

The intention of the peaking charge is to help manage the effect of hourly peak usage on daily balancing on the Maui pipeline. One alternative approach to addressing this might be to undertake hourly balancing reconciliations, and allocate the costs of imbalances on an hourly basis. However the GIC has noted that there are practical difficulties with this approach.[5] As the GIC notes, the alternative is to set a penalty charge to discourage hourly peaks, which is exactly what the peaking charge is intended to do.

Where the Vector pipeline interconnects with the Maui pipeline (i.e., the Vector welded points), it is possible for Vector, as the welded party at those points of interconnection, to be charged the peaking charge if the circumstances listed above apply at any of those points. Vector is likely to be charged the peaking charge due to the actions of shippers on the Vector pipeline. For example, a shipper on the Vector pipeline might cause a peaking charge to be levied at a Vector welded point by shipping excess gas (relative to the scheduled gas and the 125% tolerance) on the Maui pipeline to supply its load on the Vector pipeline. To a lessor extent Vector may also contribute to peaking charges if it does not act as a reasonable and prudent operator in operating its compressors or does not ship sufficient gas to supply its compressors.

We understand that there is only a single metered measure of flow at a given Vector welded point, and so it is not possible to separately measure the flow actually shipped by Vector or different shippers at that point. The peaking charge is levied directly on Vector, but it is important for Vector to be able to recover that charge from other shippers that might also have caused the peaking charge to be levied. The VTC Change Request therefore introduces amendments to allow Vector to recover from shippers any peaking charge that Vector is required to pay to MDL.

The proposed amendments to the VTC allocate the total cost of any peaking charge payment made by Vector to MDL between Vector and shippers according to the following "peaking allocation methodology":

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[5]   GIC Draft Recommendation, p.20.

- For the period when a peaking limit was exceeded, Vector calculates each party's (being a shipper and Vector) hourly quantity of gas injected at receipt points on the Vector pipeline. If the receipt point is a gas producing or processing facility, then the metered quantity is used. However if the receipt point is a Vector welded point on the Maui pipeline, then the daily Maui nominated quantity (at that receipt point), divided by 24 hours, is used;

- For the period when a peaking limit was exceeded, Vector calculates each party's hourly quantity of gas withdrawn at delivery points on the Vector pipeline, based on metered quantity (or allocated delivery quantity, if the metered quantity is not available); and

- If a party's hourly delivery quantity exceeds its hourly receipt quantity (including the peaking tolerance), then the peaking cost is allocated in proportion to its share of the total imbalance according to the following formula:

$$Peaking\ cost_x = \\ Total\ peaking\ cost \times \frac{Peaking\ tolerance \times Hourly\ RQ_x - Hourly\ DQ_x}{Sum\ of\ (Peaking\ tolerance \times Hourly\ RQ_{ALL} - Hourly\ DQ_{ALL})}$$

Where x is any one of a shipper or Vector , *ALL* is all contributing shippers and Vector, *RQ* is receipt quantity, *DQ* is delivery quantity, and the *Peaking tolerance* is as explained above. The *Total peaking cost* is the total amount that MDL invoices Vector for the peaking charge.

It is useful to set out a stylized example as to how the above formula works. Suppose, for simplicity, that party A nominates (and is scheduled) to flow 2 units of gas at a particular Vector welded point on the Maui pipeline and for a particular hourly period, and party B nominates (and is scheduled) to flow 10 units of gas at the same point and over the same hour. Total scheduled gas flows are therefore 12 units, and the peaking limit for that hour is 15 units (being 125% of 12 units). Suppose, however, that metered gas use at that welded point for that hour was 20 units. As this is greater than the peaking limit, and assuming that the other conditions set out above are met, then Vector would incur a peaking charge on the excess of 5 units used relative to the peaking limit.

To see how this cost to Vector is allocated between party A and party B based on the above formula, consider first the delivery and receipt quantities of party A. For simplicity, assume that the Maui pipeline is the only source of injections into the Vector pipeline.[6] Suppose party A actually withdrew 4 units of gas from the Vector pipeline, compared with its nomination of 2 units of gas to be injected into the Vector pipeline from the Maui pipeline. Applying the peaking tolerance to those 2 units gives 2.5 units, and party A's actual deliveries exceed this by 1.5 units – this is the numerator in the equation above for party A.[7] The denominator in this instance (because we have assumed the Maui pipeline is the only source of injections) is simply the excess of 5 units

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[6] This example could be generalised to situations where there are other sources of gas injection on the Vector pipeline e.g., from gas producing or processing facilities. For simplicity, we have assumed there are no such injections.

[7] The numerator is actually a negative number, which in this case will be given by 2.5 minus 4, which equals -1.5. Since the denominator is also negative, the share of the peaking cost is positive. For simplicity, we just refer to positive numbers throughout this example.

on the Maui pipeline relative to the peaking limit.[8] Therefore, party A contributes 30% (1.5 units out of 5 units) to the excess gas use on the Maui pipeline, so is allocated 30% of the cost of the peaking charge.

A similar calculation applies for party B. We assume party B withdraws 16 units of gas from the Vector pipeline. Note that the total withdrawals (4 from party A and 16 from party B) match the metered gas use at the Vector welded point on the Maui pipeline of 20 units. Party B nominated 10 units, so applying a 125% peaking tolerance to this gives 12.5 units. Party B's actual deliveries of 16 units exceed this by 3.5 units. That is, party B contributes 70% (3.5 units out of 5 units) to the excess gas use on the Maui pipeline, so is allocated 70% of the cost of the peaking charge.

Ideally, the appropriate cost allocation would be based on metered delivered quantities at the Vector welded point where the Maui pipeline interconnects with the Vector pipeline. However, as noted above, there is only a single metered flow at this point, rather than a metered flow that can be identified for each shipper and Vector. In the absence of such an approach, the above methodology is an efficient proxy, as it allocates the peaking cost between the relevant parties in proportion to each party's contribution to the peaking imbalance.

3.   Disputing balancing invoices

3.1.   Overview

The proposed changes include limiting the scope of shippers' ability to dispute invoices relating to balancing.

We can see the rationale for what Vector is seeking to achieve, and we think the proposal seeks to address what is quite a fundamental problem with aspects of the overall gas pipeline governance regime across both pipelines, being the indirect relationship between the purchaser of balancing gas and the causer of the balancing action. The proposed changes to the dispute provisions have both benefits and costs, but the costs could be mitigated through some further changes to the governance arrangements.

3.2.   Analysis

The broader changes being proposed to the VTC, and those already recommended by the GIC in respect of the MPOC, relate to imbalances caused by shippers on the Maui pipeline. In respect of such imbalances, Vector is largely a passive party, but being the welded party, is liable to pay the balancing costs to MDL. Vector then has to recover those costs from the causing shippers.

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[8]   Again, as noted above the denominator is actually -5, but we just refer to a positive number for simplicity.

Subject to MDL having access to the required metering data, this governance is not efficient. If the shippers and MDL were directly liable to each other, both sides would have sharper incentives to take the appropriate level of care.

Instead there is a "middleman", being Vector. This provides a degree of insulation to both shippers and MDL:

- Because Vector does not ultimately bear the balancing costs, it does not have the same incentives as shippers to efficiently dispute decisions by MDL,[9] and is not compensated for undertaking such a role; and

- There is a delay in the exposure of shippers to balancing costs, which is valuable due to the time value of money. Furthermore, Vector can be "held up" by shippers:
  - MDL invoices Vector for shipper imbalance, which Vector then has to recover from shippers; and
  - This may lead to an inefficiently high level of disputes being raised by shippers, who (potentially) benefit from a dispute, but do not bear any of the costs of taking up the dispute with MDL (and indeed benefit from delaying payment to Vector).

So optimally there would be a change to the governance arrangements to permit shippers to directly dispute decisions by MDL (e.g., by stepping into/taking on Vector's dispute rights), and indeed for shippers to be invoiced directly by MDL (obviously this would also require MDL to have access to downstream metering data, whether from Vector meters or the allocation agent).

As we understand it, Vector's proposed amendment to clause 16.17 would mean that shippers could only withhold money in respect of a Vector manifest error, not in respect of an MDL error. This would be efficient, in the sense that it would reduce hold up risks and inefficient disputes, and limit Vector's liability to decisions it is responsible for. It would also increase the exposure of shippers to their balancing decisions.

However, MDL would still remain somewhat insulated from shipper disputes, and indeed Vector's already suboptimal incentives to efficiently dispute MDL actions would be further blunted, given that Vector would have been paid.

Accordingly, the efficiency of the proposal would be further enhanced if changes were also made to the governance arrangements to permit shippers to take disputes against MDL, e.g., by stepping into/taking on Vector's dispute rights. As already noted, an even better reform would involve making the relationship between MDL and shippers more direct.

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9   In economic terms, Vector is an agent for the shippers in respect of disputes with MDL. Our point is that Vector is a poor agent, as it is not properly incentivized.

4.   Conclusion

We understand the GIC considers change requests as a whole. In our view, the net effect of the VTC Change Request would be to improve efficiency, lower transaction costs and improve governance as compared to the status quo.

The back-to-back cash out balancing mechanism and introduction of a peaking charge are necessary to achieve compatibility with the MPOC Change Request, and secure the improvements already identified by the GIC. The proposed methodology for allocating peaking costs would improve efficiency and better promote the objectives of the Gas Act and GPS than the status quo. And the proposed changes regarding the disputing of balancing invoices seek to address a fundamental problem with aspects of the overall gas pipeline governance regime across both pipelines.

The proposed changes to the dispute provisions would create distinct benefits as compared to the status quo in the way they would reinforce the causer pays principle (by increasing the exposure of shippers to their balancing decisions) and reduce the potential for inefficient disputes. They would also give rise to some costs, to the extent they would reduce Vector's (already suboptimal) incentives to efficiently dispute MDL actions, resulting in turn in less incentive for MDL to take the efficient level of care. On the information we currently have, it is not possible to say whether the net effect would be positive.

However, when the benefits of the other changes are taken into account, it is likely that taken as a whole the benefits of the entire VTC Change Request would outweigh the costs.

We have identified in this report possible further improvements to the overall gas pipeline governance regime across both pipelines that could be developed by the industry going forward.

Appendix A. Assessment against GIC evaluation criteria

Table 1
Assessment against GIC evaluation criteria

Category	Evaluation criterion	Peaking allocation methodology	Disputing balancing invoices
Efficiency	Productive efficiency	Costs of peaks would be allocated to the parties that cause those costs, providing incentives for parties to find least cost options to avoid peaking.	There would be a reduction in hold up and a reduction in inefficient disputes, leading to lower costs associated with disputes. The change would also increase the exposure of shippers to their balancing decisions, providing incentives for parties to find least cost options for balancing.
	Allocative efficiency	Allocating the cost of peaking to parties that cause these costs provides incentives for efficient decisions as they relate to peaking.	Current system leads to inefficiently high level of disputes, as shippers potentially benefit from a dispute but do not bear any costs. There would therefore be a reduction in inefficient disputes, implying better use of resources expended in disputes. Also Vector would only be responsible for decisions it can control. The change would increase the exposure of shippers to their balancing decisions, providing incentives for more efficient use of resources as they relate to balancing. On the other hand, Vector would become a poorer disputes agent for shippers, and there would be less incentive for MDL to take the efficient level of care.
	Security	No change – while allocating peaking costs to causers should improve user balancing, the GIC's logic would apply: there would be no reduction in the number of times line pack falls outside the thresholds.	GIC's logic would apply. No change – should improve user balancing behaviour, but should not reduce the number of times line pack falls outside the thresholds.
	User risks	As portended in the GIC's	Lowers risk to Vector, but

		draft recommendation on the MPOC Change Request, with changes to the VTC to properly allocate balancing costs to shippers, some shippers may face increased risks but these could be mitigated.	increases risk to shippers, as reduces their dispute rights. Increased risk to shippers could be mitigated by other changes to governance.
Cost	Transaction costs	We have interpreted the GIC's criteria regarding costs to mainly relate to the need to minimise transaction costs. Transaction costs would be minimal, as the formula is relatively simple and the metering arrangements are already in place.	Transaction costs would be reduced, as there would be a reduction in inefficient disputes.
Governance	Transparency and non-discrimination	Transparent, as the methodology specifically sets out how peaking costs are allocated. Non-discriminatory, as allocates costs on the basis of causation.	No change to transparency. Changes would be non-discriminatory, i.e., would not discriminate between shippers.
	Adaptability	No change – the methodology would not alter the ability to reform and amend the approach in the future.	No change – the dispute provisions would not alter the ability to reform and amend the approach in the future.
	Enforcement	The methodology is simple, so we would not expect it to cause any issues in relation to enforcement.	Counteracting effects – Vector's dispute liability would be limited to decisions it is responsible for, but at the same time it would be harder for shippers to dispute invoices. This could be rectified if changes were made to permit shippers to take disputes against MDL.
	Balance	No change – the methodology does not alter the balance of interests of stakeholders.	Counteracting effects – the dispute provisions benefit the interests of Vector, but they limit the scope for shippers to dispute invoices. This could be rectified if changes were made to permit shippers to take disputes against MDL.
	Stability	By allocating costs to the	Counteracting effects – the

parties that cause them, the system would be efficient, and therefore likely to be stable.	provisions might improve stability to the extent that they rectify a problem adversely affecting Vector, but they might also reduce stability by limiting the scope for shippers to dispute invoices. This could be rectified if changes were made to permit shippers to take disputes against MDL.