



**Recommendation to the Minister of  
Energy by the Gas Industry Co on the  
Specification for Reticulated Natural Gas**

July 2006

## **1 Introduction**

The Gas Industry Co is required by the Government's Policy Statement on Gas Governance (GPS) to provide for "the development of protocols and standards applying to wholesale gas trading, including quality standards, balancing and reconciliation".

Shortly after the Gas Industry Co was formed, a Wholesale Markets Working Group (WMWG) was established to assist the Company to deliver on the GPS objectives. The WMWG interpreted "quality standards" as applying to the standard for reticulated natural gas and suggested that it was appropriate to explore the current gas specification to ensure it was adequate in the light of potential new gas fields coming on stream.

The WMWG drew up terms of reference for a study and engaged Plant & Platform Consultants Ltd. The Terms of Reference sought a review of the New Zealand specification for reticulated natural gas to ascertain whether it continues to be adequate for producers, transmitters and end users (both large and small). Subsequently, the Gas Industry Co has conducted a consultation process on whether stakeholders consider it is necessary to change the gas specification.

## **2 Recommendation**

This paper presents the Gas Industry Co's recommendations relating to the Standard for reticulated natural gas in New Zealand. The recommendations consider (a) the limits defining NZS 5442:1999 and (b) the current arrangements to enforce the gas specification. The recommendations are the culmination of a technical review undertaken by an independent consultancy firm (Plant and Platform Consultants Ltd) and a rigorous consultation process by the Gas Industry Co. The main recommendation is that the current limits on the gas specification do not need to change as they achieve an appropriate balance between the various commercial interests. The report also recommends that further work is done on compliance arrangements to ensure the enforcement of this standard. This work has already been foreshadowed in the Gas Industry Co's Transmission Access Issues Review (currently out for consultation).

## **3 Background**

The current specification for reticulated natural gas, NZS 5442:1999, was approved by the Standards Council in November 1999. The standard was prepared by the New Zealand Reticulated Natural Gas Specification Committee for the Standards Council. The committee comprised a wide range of stakeholders including producers, pipeline companies, retailers, industry associations, end-users and the (then) Ministry of Commerce.

The Foreword to the standard states:

*“The specification provides limits for gas characteristics and components consistent with safe operation of the existing appliance population. By specifying limits for contaminants it seeks to ensure the integrity of the transportation systems and prevent operating problems for most end users.”*

The 1999 revision of the standard provided an extension to cover the introduction of gas from sources in addition to gas from petroleum based origins, in particular landfill gas. It also acknowledged that the previous version of the standard had been based largely on the specification in the original contract for supply of Maui gas (reflecting the fact that Maui had become the main source of reticulated gas in New Zealand). The current specification is designed to accommodate gas sourced from other oil and gas fields.

In discussing the derivation of the various limits the Standard makes the point that it is, necessarily, a compromise:

*“...a balance must be achieved between optimum gas performance, which requires the narrowest possible combustion limits, and cost of supply which, if possible, requires no limits at all...”*

The current specification limits for NZS 5442:1999 are shown in Table 1<sup>1</sup>.

**Table 1 NZS 5442:1999 Specification Limits**

Characteristics and Components	Limit	
	Wobbe Index	Minimum
	Maximum	52 MJ/m <sup>3</sup>
Relative density	Maximum	0.8
Oxygen -medium and low pressure	Maximum	1.0 mol%
-other cases	Maximum	0.1 mol%
Hydrogen	Maximum	0.1 mol%
Hydrogen sulphide	Maximum	5 mg/m <sup>3</sup>
Total sulphur (as S)	Maximum	50 mg/m <sup>3</sup>
Water	Maximum	100 mg/m <sup>3</sup>
Total halogens (as Cl)	Maximum	25 mg/m <sup>3</sup>

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<sup>1</sup> Note: Standard conditions, 15°C and 101.325 kPa, apply to all gas properties listed in the table except hydrocarbon dewpoint temperature. The limit for total sulphur content includes odorant added. The Wobbe Index and relative density limits imply a calorific value range of 35.2 MJ/m<sup>3</sup> to 46.5 MJ/m<sup>3</sup>.

Hydrogen dew point temperature	Maximum	2°C at 5 MPa
Temperature	Minimum	2°C
	Maximum	40°C

## 4 Analysis of Gas Specification Issues

### 4.1 Technical expert engaged

Following discussions with industry participants and a review of international gas standards the Gas Industry Co's technical expert has recommended that the specification limits of NZS 5442:1999 do not need to be changed. A copy of the report from this expert – Plant and Platform Consultants Limited is available on our website [www.gasindustry.co.nz](http://www.gasindustry.co.nz). The company considered that there was little value to be gained by undertaking an in depth, rigorous review that would be a costly and time-consuming exercise requiring formal presentation of evidence and argument from stakeholders.

### 4.2 Consultation undertaken

Industry submissions on the Gas Industry Co's consultation paper titled "*Review of New Zealand Specification for Reticulated Natural Gas*" strongly supported the recommendation that the current limits defined in NZS 5442:1999 are adequate and do not need to be changed. In addition, submissions highlighted that an in-depth review of the current standard would be both costly and time-consuming and unlikely to be of value as little has changed since the last review in 1999. A copy of all industry submissions is also available on our website [www.gasindustry.co.nz](http://www.gasindustry.co.nz).

### 4.3 Consistent with policy objectives

The Gas Industry Co has considered the Government's policy objectives for gas, and the relevant provisions of the GPS and Gas Act 1992 (the Act). Analysis of the recommendation against the GPS policy objectives and outcomes confirms that the current gas specification is adequate for new gas fields coming on stream. The Gas Industry Co considers that the current standard as set out in 1999 continues to strike an appropriate compromise between the diverse needs of participants across the supply chain.

### 4.4 Changes Considered

As part of developing this recommendation a number of other issues raised by stakeholders which relate to the gas specification were considered. In particular, the prevention of step changes to the Wobbe Index for gas delivered to gas turbine and gas engine operators and the identification of swings in the Wobbe Index and the forewarning of gas turbine and gas engine operators were identified as desired outcomes by some stakeholders.

The Gas Industry Co considers that it is impractical for transporters to put any form of rate control on the Calorific Value (CV) or Wobbe index to prevent step changes

in these measures for gas delivered to gas turbine and gas engine operators. Further, putting such constraints on producers would not help as, with multiple fields feeding into the same pipelines, it is easy for significant changes to occur due to changes in production rates from multiple producers, albeit the gas received is all within specification.<sup>2</sup> As such, the Gas Industry Co concluded that little can be done to prevent significant changes in the pipeline CV, and it is therefore not practical to control the mixing ratios of dissimilar gases in the transmission pipeline.

The Gas Industry Co accepts that step changes in Wobbe number are an issue for a small group of large users. However, given that the prevention of significant changes in Wobbe is not practical, the Gas Industry Co considers that large customers are well equipped to invest in technology and systems to provide forewarning and thereby mitigate the effects of compositional swings. This is also in accord with the rationale underlying the recommendation in Plant & Platform Limited's report: that the cost of addressing this issue was best measured (and met) by those who stood to benefit directly.

#### 4.5 Future Reviews

The Gas Industry Co notes that there are a number of unknowns associated with new gas supplies coming on stream in the near future which have the potential to have a significant impact on gas quality. For example, the commissioning of Pohokura later this year will be the first time that the industry will directly experience potentially significant gas quality changes. Consequently, the Gas Industry Co considers that it is important that the issue of gas quality be reviewed periodically as supplies of gas come from a wider range of gas fields and the inherent characteristics of the gas injected into welded points vary.

Industry participants identified two issues that should be tracked as new gas supplies come on stream. First, a number of industry participants highlighted that new gas supplies may have total inerts content [essentially N<sub>2</sub> and CO<sub>2</sub>] much higher than values currently found in Maui gas. There is no current overall specification limit specifically for inerts, (although a limit is implicit in the specification for energy content). Second, some industry participants expressed a concern that the water content level within the specification may need tightening in light of the probable future development of the industry. Currently, the specified water content limit within NZS 5442:1999 (100mg/m<sup>3</sup>, based on a MAOP of 86 bar) is a little higher than comparable overseas specifications.

At this time, the Gas Industry Co does not consider that a change to the current limits defining the gas specification is warranted. However, the Gas Industry Co

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<sup>2</sup> Whilst it might be expected that gas from different sources would tend to mix in large transmission pipelines, this is not the case. As noted in the Plant & Platform report, in practice there is not a great deal of mixing and this gives rise to the swings in characteristics as "plugs" of gas from different producers arrive at differing times.

accepts that the changing nature of gas supplies in New Zealand necessitates periodic reviews. At such a time as a review is deemed appropriate the Gas Industry Co considers that the issues identified in this process should be re-examined.

## **5 Analysis of Compliance Issues**

Plant and Platform Limited's report also identified issues raised by stakeholders that, although outside of the scope of the standard itself, were considered worthy of further investigation. One such issue was the detection and prevention of out of specification gas from entering the gas transmission pipeline. Plant and Platform Limited's report recommended that this issue was most appropriately dealt with by industry participants through their contractual relationships.

However further analysis indicates this may not work in practice. The issue is not so much about the nature of the obligation to comply but more about the difficulties of enforcement. The Gas Regulations 1993 provide a clear obligation for suppliers to only produce specification gas. There are also similar obligations in the various gas sale contracts. However it is difficult to establish what the specification is for each gas which enters the pipeline and how that specification might change when mixed with other gas in the transmission system.

One industry participant in submissions on the gas specification indicated its strong concerns about the difficulty it has as a distribution company in securing compliance with the gas specification from producers. This is because there is no direct contractual nexus between distribution companies and producers. In order to seek a remedy for any damage caused to its pipelines from oil residues distribution companies need to pursue an action against their retailers who in turn need to seek recourse from the producer who supplied them with gas.

The issue of compliance and enforcement of gas standards is an issue which the Gas Industry Co has explored in the Transmission Access Issues Review consultation paper currently released for stakeholder comment. In this paper we note that the pipeline transmission contracts place responsibility on shippers (retailers) for gas quality. This is inefficient as such shippers have no direct ability to manage gas quality. The consultation paper therefore recommends the development of a rule based interconnection code on gas quality, gas odorisation and gas pressure. The code is an appropriate policy instrument because of the number of different parties which have an interest in gas quality along the supply chain. The consequence of failure to comply with the gas specification will also need to be addressed as this code is developed.

To avoid duplication across work streams - and ultimately in search of better outcomes for industry - the Gas Industry Co proposes to further address the issue of compliance with, and enforcement of, the gas specification as part of the Transmission Access work stream.

## 6 Conclusion

In summary the Gas Industry Co recommends:

1. That the specification limits defining NZS 5442:1999 do not need to be changed.
2. That the Gas Industry Co should continue to examine compliance and enforcement with the gas specification as part of its Transmission Access Review.

These two recommendations are the result of significant discussions between the Gas Industry Co and industry participants. The Gas Industry Co considers that the recommendation to retain the existing gas specification limits defining NZS 5442:1999 is appropriate at this time as the current gas standard does not represent a barrier to new gas fields coming on stream. Submissions from industry participants highlight that the industry is generally supportive of this recommendation.

We encourage the Minister to accept the recommendations contained in this report.