Amendments to the Gas Governance (Critical Contingency Management) Regulations 2008

RECOMMENDATION TO THE MINISTER FOR ENERGY

June 2024

Gas Industry Co.

Executive Summary

You are asked to approve "*Recommendation to the Minister for Energy: Amendments to the Gas Governance (Critical Contingency Management) Regulations 2008".*

The amendments are recommended to improve the regime for managing critical contingencies in the gas sector.

You are also asked to note our recommendation that the Gas Governance (Critical Contingency Management) Amendment Regulations, made 19 February 2024 and which urgently amended Schedule 1 of the Gas Governance (Critical Contingency Management) Regulations 2008, should not be revoked, replaced or amended.

The regime for managing critical contingencies is managed by Gas Industry Co as co-regulator of the gas sector.

A critical contingency occurs when a failure occurs at a gas production station, or a pipeline rupture occurs. (Potential examples of causes include earthquake ruptures or diggers cutting into pipeline.) When an incident occurs, it may reduce or stop the flow of gas into or through the affected pipeline. The remaining gas pressure in the transmission and distribution systems will cause the gas to keep flowing to delivery points or customer premises. In such an event, there is a risk that pressure in the gas transmission and gas distribution systems could fall to a level where gas is unable to flow.

The main objective of the Regulations is to avoid de-pressurisation of distribution networks. If sufficient pressure is not maintained in downstream networks, recovering a distribution network serving a large urban area could take many months and cause significant costs.

Falling system pressures can also impact the delivery of gas to designated consumers, such as hospitals, who require gas for essential and critical care services or providing time for an orderly shutdown of a plant to prevent or mitigate major plant or environmental damage.

If there is a risk of pipeline pressures dropping below specified pressures, then a critical contingency may be declared. The critical contingency operator may direct certain activities, such as requiring some gas users to reduce load, and isolating some sections of the network.

As decisions can have serious effects on various consumers, the critical contingency process is tightly regulated. Regulations concern issues such as the order in which users may be curtailed, the process to be followed, and thresholds for declaring a critical contingency event.

Gas Industry Co is recommending to you, as Minister for Energy, new regulations to make the critical contingency management regime more efficient and effective without compromising long-term security of supply. The recommendations relate to various elements of the Regulations, including:

- Critical contingency price setting
- Curtailment band definitions and curtailment instructions
- Information provided to critical contingency operator
- Critical contingency management plans
- Critical care and essential services designations

- Critical contingency threshold limits
- Asset owner information obligations
- Minor amendments to clarify meanings and update drafting.

Most of the changes relate to process improvements identified during previous contingency events and exercises, as well as updating wording, removing ambiguity, and improving communication and information quality for parties involved in the management of a critical contingency event.

You are asked to recommend to the Governor General, by Order in Council, amendments to the CCM Regulations.

Following our initial consultation in 2020, Firstgas, as the operator of the transmission system, requested further changes to the Regulations. Its request concerned regulations that govern how critical contingency pressure thresholds are set for the transmission system so that it would have more operational flexibility. These pressure threshold limits are set out in Schedule 1 of the CCM Regulations.

We recommend that some of those requested changes to Schedule 1 are made.

Gas Industry Co also recommends that you do not revoke, replace, or amend the urgent Regulation change related to the removal of the Taupo/Broadlands gas gates from the critical contingency threshold limits [1].

These recommendations follow an initial and a final Statement of Proposal and consultation process with industry participants and other stakeholders providing feedback on the proposals.

While most of the recommendations are routine in nature, one requires sensitive judgement and there are different views among stakeholders based on what role they have in the gas industry. The item in particular is the change to the pressure threshold limits in Schedule 1 of the CCM Regulations. The reasons for sensitivity and the balance of interests are discussed in section 3.2.

Greymouth Gas New Zealand Limited provided the most detailed feedback. There is some dissent on how improvements can be progressed into the Regulations. We have fully considered Greymouth's feedback, balancing it with other submitters' feedback and are comfortable that our recommendations are meeting the regulatory objective.

While none of the proposed changes have a direct impact on safety, the CCM Regulations do have an underlying safety element related to the repressurising of distribution networks.

The main objective of the Regulations is to avoid depressurisation of distribution networks which would cause a major safety issue. The changes to the curtailment order reduces the risk of depressurising distribution networks and therefore reducing any safety issues and potential costs of recovery. This change will also benefit designated consumers such as essential services (hospitals, age care facilities, etc) as there is more load available that can be curtailed before they receive a curtailment direction.

Regarding security of supply during a critical contingency event, restructuring the order of curtailment has put larger loads, but fewer consumers in the first curtailment bands. Larger consumers will be curtailed first to prevent a depressurisation of distribution networks, which would be considered as a catastrophic event. Some of these changes will not benefit some large consumers with designations, because some designations will be able to be curtailed earlier, to prevent depressurisation of distribution networks.

However, the changes will benefit other types of designated critical care consumers on distribution networks such as hospitals and age care facilities as there is more load that can be curtailed before they receive a curtailment direction.

[1] The urgent Regulation change was made on 19 February 2024 and came into effect on 8 March 2024

Gas Industry Co is recommending that the Minister make these amendments in reliance on regulation making provisions in section 43F of the Gas Act. A table summarising the recommended amendments can be found in section 4.3 of this paper.

Contents

1. Purpose and Background

1.1 Purpose

The purpose of this recommendation to the Minister for Energy is to recommend that the Governor General amends the CCM Regulations to increase efficiency and effectiveness of the critical contingency event management.

This paper also recommends that the Minister does not revoke, replace or amend the urgent Regulation change that removed the Taupo and Broadlands gas gates from Schedule 1 of the Regulations to enable Firstgas to operate the transmission system between Reporoa and Taupo at a lower pipeline pressure without triggering the critical contingency management process.

1.2 Background

Gas Governance (Critical Contingency Management) Regulations 2008

When a gas supply interruption such as a gas production station failure or a pipeline rupture occurs, it reduces or stops the flow of gas into or through the affected pipeline. The remaining gas pressure in the transmission and distribution systems will cause the gas to keep flowing to delivery points or customer premises, at least until the pressure is no longer sufficient to maintain the flow.

In case of such an event, in the absence of a requirement that consumers stop or reduce their gas usage, there is a risk that pressure in the gas transmission and gas distribution systems could fall to a level where gas is unable to flow. The main objective of the Regulations is to avoid depressurisation of distribution networks. If sufficient pressure is not maintained in downstream networks, it is estimated that recovering a distribution network serving a large urban area could take many months and cause significant costs.

Falling system pressures can also impact the delivery of gas to designated consumers, such as hospitals, who require gas for essential and critical care services or providing time for an orderly shutdown of a plant to prevent or mitigate major plant or environmental damage.

Management of critical contingency events

The Critical Contingency Operator (CCO), an independent service provider appointed under the CCM Regulations to manage critical contingency events, is required to declare a critical contingency in relation to a critical gas outage or security of supply event if the timeframes for the transmission system to reach certain pressure thresholds specified in a critical contingency management plan are breached.

The CCM Regulations came into force in January 2010. With a purpose of achieving the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply, the CCM Regulations provide for:

1. A Critical Contingency Operator (CCO) which is tasked with:
   (a) determining the onset of a gas supply event (termed a “critical contingency”)
   (b) using the power to direct and revise customer curtailment arrangements so as to ration available gas to balance remaining supply and demand

(c) directing restoration of load once it is safe to do so

(d) communicating with key stakeholders throughout the incident

(e) terminating the critical contingency

(f) reporting on the incident and the CCO's performance after the incident is resolved

2. Each Transmission System Owner (TSO) to create a Critical Contingency Management Plan (CCMP) that defines the processes and procedures it will follow to implement the CCO's curtailment and other directions. TSOs are required to pass the CCO's curtailment directions on to the retailers that use their pipelines to convey gas to customers.
3. A system of classifying customers into groups defined by consumption – curtailment bands – so that the process of load curtailment can be efficiently managed.
4. Processes for deferring curtailment for certain classes of customers that provide essential and critical care services or where providing time for an orderly shutdown of the plant would prevent or mitigate major plant or environmental damage.
5. A post-facto settlement among pipeline users and interconnected parties that is designed to ensure suppliers are paid for the gas used during a critical contingency whether that gas was used by their customers or those of another retailer.

The CCO's declaration of a critical contingency provides a signal to industry participants and large consumers of an event that may potentially impact supply and provides the CCO with a legal basis to issue mandatory curtailment directions. The purpose of curtailment is to preserve available linepack in the gas transmission system with the aim of avoiding loss of pressure on downstream networks.

The timeframes and pressure thresholds in the critical contingency management plan are proposed by the TSO, reviewed by an expert advisor, and are subject to Gas Industry Co's approval.

Schedule 1 of the CCM Regulations specifies the permissible limits for the thresholds in the critical contingency management plan and the points on the transmission system where the minimum operating pressure is measured. The actual trigger threshold is in the CCMP and must be within the permissible limits of the Regulations.

The permissible limits in Schedule 1 have remained unchanged since the CCM Regulations were made in 2008, apart from the urgent Regulation amendment removing the Taupo/Broadlands gas gates from the Schedule 1 to allow for the injection of biomethane[2].

Industry consultation process

In mid-2020, Gas Industry Co consulted with stakeholders on proposed amendments to the CCM Regulations in an initial Statement of Proposal (initial SOP) to improve efficiency and effectiveness of the critical contingency management processes.

Following the publication of Gas Industry Co's *Summary of Submissions Paper*[3] based on the initial SOP in November 2021, Firstgas Group requested further adjustments to Schedule 1 thresholds to potentially improve its operational flexibility. As this request was a material change to the original proposal, we considered that further consultation was necessary.

In parallel with the consultation on the SOP, we provided the Minister for Energy with an urgent recommendation that Schedule 1 of the CCM Regulations is amended to remove the Broadlands and

[2] The urgent Regulation were made on 19 February 2024 and came into force on 8 March 2024

[3] https://www.gasindustry.co.nz/assets/WorkProgrammeDocuments/Summary-of-Submissions-and-Next-Steps-for-Amending-the-Critical-Contingency-Management-Regulations.pdf

Taupo gas gates as points of measurement. Firstgas intended to reduce the operating pressure on the section of the transmission pipeline between Reporoa and Taupo to enable the injection of biomethane from the Ecogas facility at Reporoa. An amendment to Schedule 1 of the Regulations was necessary to avoid declaration of a critical contingency event due to the lower operating pressure. This urgent change came into force on 8 March 2024. Gas Industry Co is required to consider whether this change is permanent, or should be revoked, replaced or amended through a recommendation to the Minister for Energy.

The final SOP incorporating Firstgas's request to change the pressure thresholds in Schedule 1 was published on 8 March 2024 and closed on 30 April 2024.

This recommendation paper follows the final SOP proposals and incorporates feedback Gas Industry Co has received from interested parties on our proposals.

The need to amend the CCM Regulations

Based on experience and feedback by stakeholders on contingency events and annual exercises, opportunities for improvement of the CCM Regulations were identified. Stakeholders generally agreed the CCM Regulations could be amended to improve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply.

Developing governance arrangements under the Gas Act 1992 (Gas Act) ties back to the regulatory objective. We consider that the regulatory objective should be as stated in the purpose of the CCM Regulations:

> *"The purpose of these regulations is to achieve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply" (regulation 3)*

The recommended amendments to the CCM Regulations are intended to further achieve this objective.

2. Process to amend the CCM Regulations

2.1 Power to regulate arrangements relating to management of critical contingency events

Section 43F(2)(e) of the Gas Act 1992 provides the Governor General, on the recommendation of the Minister for Energy, with the power to make regulations for the following purposes:

Arrangements relating to outages and other security of supply risks

> *(e) providing, in relation to wholesale or any other markets for gas, for arrangements relating to outages and other security of supply risks, including imposing requirements in connection with those matters on any industry participant or consumer (other than a domestic consumer):*

The Minister's power to recommend regulation under section 43F of the Gas Act is subject to section 43J of the Act. That section provides that, in relation to the section 43F regulation making powers, the Minister may only recommend regulation if the recommendation gives effect to a recommendation from Gas Industry Co and does not differ from Gas Industry Co's recommendation in any material way.

Section 43S provides for supplementary regulation making powers in relation to gas governance regulations, including for processes and procedures in relation to any regulations.

Gas Industry Co considers that the Minister is empowered to recommend that the Governor General make the proposed amendments of the CCM Regulations contained in this recommendation under sections 43F(2)(e) and 43S of the Gas Act.

2.2 Requirements when recommending regulations

Section 43L(1) of the Act requires the body recommending gas governance regulations to the Minister to:

1. undertake an assessment under section 43N of the Act; and
2. consult with persons that the recommending body thinks are representative of the interests of persons likely to be substantially affected by the proposed regulations; and
3. give those persons the opportunity to make submissions;
4. consider those submissions.

Section 43N(1) of the Act requires that, before making a recommendation to the Minister, Gas Industry Co must:

1. seek to identify all reasonably practicable options for achieving the objective of the regulation;
2. assess those options by considering—
   (a) the benefits and costs of each option
   (b) the extent to which the objective would be promoted or achieved by each option
   (c) any other matters that the industry body considers relevant;

3. ensure that the objective of the regulation is unlikely to be satisfactorily achieved by any reasonably practicable means other than the making of the regulation (for example, by education, information, or voluntary compliance);
4. prepare a statement of the proposal for the purpose of consultation under section 43L(1).

Section 43N(2) requires that the statement of proposal referred to in section 43N(1)(d) must contain:

1. a detailed statement of the proposal;
2. a statement of the reasons for the proposal;
3. an assessment of the reasonably practicable options, including the proposal;
4. other information that the industry body or the Commission considers relevant.

In relation to the amendments to Schedule 1 of the CCM Regulations that were made in reliance on the urgent recommendation process in section 43P of the Act, Gas Industry Co must, within 6 months of the regulation being made, comply with the assessment and consultation requirements of sections 43L and 43N of the Gas Act that apply to a recommendation for gas governance regulations and make a recommendation on whether the urgent regulations should be revoked, replaced or amended. The urgent regulation change to remove the Taupo and Broadlands gas gates was made on 19 February 2024 and became effective on 8 March 2024.

Gas Industry Co considers that it has complied with the requirements of sections 43L and 43N of the Act for all recommended changes.

2.3 Rules or regulations

Section 43Q of the Act empowers the Minister to make a rule for all or any of the purposes for which a gas governance regulation may be made. In deciding whether to make a rule rather than a regulation, the Minister must have regard to:

1. the importance of the rule, including whether the rule has a material effect on the rights and interests of individuals;
2. the subject matter of the rule, including whether the rule contains detailed or technical matters rather than matters of general principle;
3. the application of the rule, including whether the rule applies principally to a particular group (e.g. industry participants) rather than the general public;
4. the expertise and rule-making procedures of the recommending body.

Gas Industry Co considers that the proposed changes should be best made by amendment to the CCM Regulations, an existing gas governance regulation.

3. Assessment

3.1 Regulatory objective and achieving the objective

The purpose of the CCM Regulations is to achieve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply[4].

Gas Industry Co considers the objective of the proposed amendments to be as stated in the purpose of the CCM Regulations:

> *"The purpose of these regulations is to achieve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply" (regulation 3)*

Section 43N of the Gas Act requires Gas Industry Co to identify and assess all reasonably practicable options for achieving the objective of the regulation. Before making the recommendation to the Minister, Gas Industry Co must assess:

1. the costs and benefits of each reasonably practicable option, including the proposal;
2. the extent to which the regulatory objective ('to achieve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply') would be promoted or achieved by each option;
3. any other matters which Gas Industry Co considers relevant.

The recommended amendments refine the existing CCM Regulations. Given that the regulatory framework is already in place, stakeholders generally agreed that there are no other reasonably practicable options, or that the regulatory objective can be better achieved by a means other than an amendment to the existing CCM Regulations.

3.2 Consultation and stakeholder feedback

Gas Industry Company released its consultation paper *Statement of Proposal for amending the Critical Contingency Management Regulations* in May 2020. In July 2020, at the end of our consultation period, we received eleven submissions. There was broad agreement on many of the proposals, however, the submissions did raise areas that we considered warranted further analysis.

We carried out this analysis, engaged external consultants where required, and released a *Summary of Submissions and Next Steps for Amending the Critical Contingency Management Regulations* in August 2021.

The process to release a final SOP was delayed by Firstgas's request to further change the pressure threshold limits in Schedule 1, which required time for; additional risk assessment, Firstgas to engage with its customers and third-party expert advice.

[4] The "Recommendation to the Minister for Energy on Arrangements for the Effective Management of Critical Contingencies" and the "Statement of Proposal – Gas Outage and Contingency Management Arrangements" are available at: https://www.gasindustry.co.nz/our-work/work-programmes/critical-contingency-management/#background

In February 2024, we released the final SOP, including the post consultation on the urgent Regulation change to remove the Taupo/Broadlands gas gates from Schedule 1 to enable the injection of biogas.

We received seven submissions on the final SOP, with broad agreement on many of the proposals, however, submitters raised some concern on some proposals. We considered participants' feedback and updated the proposal accordingly where appropriate. A list of all submitters is attached as **Appendix A**.

The main areas we received feedback on were:

General changes

These changes mainly update the wording, remove ambiguity or refine processes. Changes also include redesigning the curtailment bands by volume to provide the CCO with more flexibility to curtail larger loads, but less consumers, first. Changes also provide the industry expert with more flexibility to set a critical contingency price for curtailment bands 0, 1 and 2 and the industry is generally supportive of this approach. In this context concerns were raised regarding the setting of a predictable floor. Most producers understood why we decided not to pursue a price floor and calculation methodology at this stage but would like Gas Industry Co to work with MBIE on potential solutions to set a predictable price to incentivise production in case of a critical contingency event. We will include this work in a future work program.

Critical contingency pressure thresholds limits

Firstgas's proposed changes to Schedule 1 to provide a broader range of pressure thresholds so that the point at which a critical contingency is declared can be aligned with changes to the operation of the transmission system. Operational changes are expected because of significant changes in policy settings, the gas supply/demand balance, injection of renewable gases and projected customer demand for natural gas.

Principally, parties agreed that there is a need to operate the transmission system more efficiently which requires changes to the pressure threshold limits in Schedule 1. Large consumers are concerned that expected operational changes might affect their businesses. However, we consider that any change to the threshold limits in the CCMP will require approval of an expert advisor and Gas Industry Co. These changes do not necessarily affect how Firstgas intends to operate the transmission system. A key requirement is that the change of the CCMP trigger thresholds give effect to the purpose of the CCM Regulations. It is our expectation that any change to the CCMP will be supported by detailed analysis of the impact of the specific pressure threshold change at the relevant location, which will take operational scenarios into consideration.

Gas Industry Co also considered Firstgas's request to exclude gas gates supplied by pressure <20 bar g. Gas. A blanket rule that gas gates operated below 20 bar g should be excluded from Schedule 1 does not consider other important factors like location on the transmission system, nature of the event, actual operating pressure, or the nature of the consumer load on that section of the transmission system that may impact timeframe to loss of supply.

Therefore, we were concerned that this type of exclusion may result in situation where line pack could be rationed through curtailment directions to preserve supply to downstream networks but there is no longer an ability to curtail demand under the Regulations to preserve that line pack. Our recommended Schedule 1 is attached as **Appendix C**.

All submitters, apart from Firstgas, agreed that an assessment should be on a case-by-case basis.

3.3 Cost and benefits

Section 43N requires Gas Industry Co to consider the costs and benefits of each recommendation compared to the status quo when recommending regulations to the Minister.

The final SOP contained an assessment of costs and benefits that compared the (then) status quo with the recommended amendments. The full CBA is attached as **Appendix B**.

We engaged Sapere Research Group (Sapere) to conduct the cost-benefit analysis.

Sapere concluded that there is on balance, a net economic benefit.

The recommended amendments

- facilitate the management of critical contingency events, thus achieving the objectives of the CCM Regulations;
- lower the risk of domestic consumers and small businesses being curtailed the reconnection of whom would give rise to high costs; and
- lower the number of consumers having to curtail, especially when those consumers who are in higher bands are thought to place a higher value on the use of gas than those in lower bands.

Sapere concluded that there may be curtailment that is inconsistent with other theoretical merit orders, but changes in lower bands would not outweigh the advantages of the overall structure. Individual cases for organisations are dealt though the critical processing designation mechanism.

The potential removal of gas gates from Schedule 1 should be assessed against cost and benefits on a case-by-case basis as conducted for the removal of the Taupo and Broadlands gas gates.

The other proposals achieve greater clarity and certainty for participants which will improve the effectiveness of the CCM Regulations.

Sapere considered that the proposed amendments to the Regulations would not create any new or significant additional compliance and enforcement costs.

3.4 Safety

The changes to the CCM regulations proposed in this recommendation do not impact on asset or consumer safety.

The CCM Regulations do have an underlying safety element. If the pressure in a gas distribution network falls, then there may not be enough gas to operate consumers' gas appliances. Repressurising the distribution network could lead to gas appliances inadvertently left on or those with unlit pilot lights to allow gas to escape indoors, causing a potentially hazardous situation. In such situations, gas supply can only be restored safely by the network owner individually disconnecting each consumer, repressurising the distribution system, and then individually reconnecting each consumer. This could be a time consuming and costly process and one that the CCM Regulations are attempting to avoid. Distributors do have processes to safely repressurise distribution networks.

3.5 Security of Supply

The proposed changes will impact consumers' security of supply in different ways. However, the overall impact is to improve security of supply for smaller consumers and essential services.

Restructuring the curtailment bands put larger loads, but fewer consumers in the first curtailment bands. These consumers will be curtailed first to prevent a depressurisation of distribution networks, which would be considered as a catastrophic event. Some of these changes will not benefit some large consumers with designations, because some designations will be able to be curtailed earlier, such as those with shut-down profiles to prevent depressurisation of distribution networks.

However, the changes will benefit other types of designated critical care consumers on distribution networks such as hospitals and age care facilities as there is more load that can be curtailed before they receive a curtailment direction.

4. Recommended changes to the CCM Regulations

4.1 Introduction

As noted above, Gas Industry Co considers that the regulatory objective is likely to be satisfactorily achieved through amendments to the CCM Regulations.

This recommendation incorporates feedback Gas Industry Co received from stakeholders during the consultation process. The table below provides further detail on the recommended changes.

4.2 Overview on the recommended changes

General changes

These changes mainly update the wording, remove ambiguity, or refine processes. Changes also include redesigning the curtailment bands by volume to provide the CCO with more flexibility to curtail larger loads, but less consumers, first. Changes also provide the industry expert with more flexibility to set a critical contingency price for curtailment bands 0, 1 and 2.

Change to Schedule 1 (Appendix C)

Firstgas's proposed changes to Schedule 1 provide a broader pressure threshold range so that the point at which a critical contingency is declared can be aligned with changes to the operation of the transmission system. Operational changes are expected because of significant changes in policy settings, the gas supply/demand balance, injection of renewable gases and projected customer demand for natural gas.

The recommended changes modify the requested changes by Firstgas:

(a) Gas Industry Co considers that the exclusion clause regarding pipelines operated <20 bar g requested by Firstgas would create a blanket rule without taking the actual impact of removing the pressure threshold into consideration. Therefore, this exclusion clause is not part of the recommendation.
(b) The proposed pressure threshold limits for Westfield (Central (North)) and Waitangirua (South) gas gates would be outside of the current critical contingency thresholds stated in the CCMP. This would automatically trigger a CCMP amendment process, even without any operational change. Therefore, we decided, in agreement with Firstgas, to adjust the upper bound of the proposal for these two gas gates so that the existing pressure thresholds fall within the Schedule 1 changes.

Post-consultation for the urgent Regulation changes related to the removal of the Broadlands and Taupo gas gates (Schedule 1)

The urgent Regulation change removed the pressure threshold limits for the Broadlands and Taupo gas gates from Schedule 1 to enable alignment with operation of the transmission system. Firstgas has reduced the pipeline operating pressure at these gas gates associated with the injection of biomethane into the First Gas transmission pipeline at Broadlands. With the reduced operating pressure, the ability to issue curtailment directions at these gas gates is unlikely to add any material benefit in terms of the purpose of the CCM Regulations. The urgent amendment came into effect on 8 March 2024 and

removed the Taupo and Broadlands gas gates from Schedule 1. Firstgas has subsequently amended its Critical Contingency Management Plan to remove the Broadlands and Taupo gas gates as points of measurement for declaring a critical contingency event. The Gas Act required an ex-post consultation process, which was undertaken through the final SOP.

4.3 Summary of the proposed amendments to the CCM Regulations

The table below provides a brief overview of all proposals and the reasons for the recommended amendments:

Recommendation	Regulation	Reason for change
Setting a critical contingency price		
Remove the restriction to only base price on wholesale electricity prices for events where only bands 0-2 are curtailed.	71(3)(a)	Considering wholesale market for electricity when setting a contingency price for band 0-2 curtailment is too restrictive and not suitable to respond to the changing market dynamic when setting a critical contingency price.
Curtailment band definitions		
Amend the definition of band 2 to consumers who consume greater than 15 TJ per day but less than 100 TJ and band 1 as consumers who use greater than 100 TJ per day.	Schedule 3	Re-defining of bands 1 and 2 puts greater load in band 1 and provides greater load reduction availability to the CCO and increases the chance of curtailing demand in band 1 without curtailing band 2 to avoid over curtailment. Bands should be based on volume, not on use or alternative fuel availability.
Split the current band 3 into 3A and 3 using 300 TJ per year as the lower threshold for 3A and upper threshold for band 3.	Schedule 3	A new band 3A provides the CCO with another band that represents a relatively large volume but contains relatively few consumers that can respond quickly to a curtailment direction.
Define all annual threshold volumes by taking the average consumption over the previous three years.	Schedule 3	Removes ambiguity of how annual consumer consumption is measured in the curtailment band definitions.
Define the daily threshold volumes by using the previous three years to determine consumption.	Schedule 3	Removes ambiguity of how daily consumer consumption is measured in the curtailment band definitions. This change needs a clarification of what “daily” means. “Daily” or “per day” means a customer who over the last three years has met the daily usage threshold from time to time, or in the case of new customers, is expected to meet the daily usage threshold from time to time. This definition ensures that consumers are allocated to the correct bands.
Amend definition of “consumer installation” to include a gas installation with multiple	5	Clarify curtailment order for connected consumers that have multiple points of connection at one site to a distribution system or transmission system.

Recommendation	Regulation	Reason for change
points of connection to a distribution system or transmission system.		This ensures that consumers with one site with two connections are treated as one consumer during the curtailment process.
Curtailment Instructions		
Clarify that: a) directions for partial curtailment must be made with regard to consumption rates at the time a critical contingency is declared; b) designated shutdown profiles apply to consumption rates at the time a critical contingency is declared, except for consumers with designated shutdown profiles who require their full shutdown profile to safely shutdown.	53(2), Schedule 2	Removes ambiguity with respect to partial curtailment. Clarifies, that when partial curtailment is instructed, or shutdown profiles commence, the consumption rates apply from the time the critical contingency is declared, not from a consumer's maximum capacity, or maximum in a shutdown profile. Designated shutdown profiles can be different for different levels of consumption rates.
Require all customers with approved shutdown profiles to curtail fully before band 4 is directed to curtail.	53(2), Schedule 2, Schedule 3	Retains a balance between the value of critical processing designations and inefficient curtailment. This might require the creation of an extra band for critical processing designations. The consumption required by all approved shutdown profiles is considerably greater than that of all 6,000 consumers within curtailment band 4.
Information provided to the CCO		
Amend Schedule 4 of the CCM Regulations to update the types of transmission system information the TSO is required to provide the CCO and update regulation 10 to reflect that the "Commencement Date" is irrelevant. Additional information requested by the CCO: • Critical contingency thresholds on the map • engineering drawings in paper and electronic format instead of a diagram • pipe wall thickness • operating pressure • flow control valves, system isolating valves and non-return valves • pipeline route maps in paper and electronic format.	10, Schedule 4,	The CCO requires additional technical and geographical information from the TSO to manage critical contingency events and suggested to add specific changes to Schedule 4. The "Commencement Date" regulation 10 is no longer relevant.
Provide the CCO with the ability to request from the industry body (Gas Industry Co) numbers of ICPs by curtailment band and by gas gate, as recorded in the gas registry.	39	Information can be used by the CCO to validate retailers' consumer information.

Recommendation	Regulation	Reason for change
Update regulation 39 so that instead of referencing gas gates where retailers' trade, it will reference gas gates where retailer's consumers are connected.	39	Removes ambiguity and includes upstream gas trades.
Clarify that approved shutdown profiles are to be provided by the industry along with notice of an approved designation to the parties listed in regulation 46K.	46K(2)	Removes ambiguity and specifically includes approved consumer shutdown profiles.
Critical contingency plans		
Amend the CCM Regulations to clarify that a reference to an authoritative data source is an acceptable means of including contact details in a CCMP and that CCMPs must outline the process by which a TSO will manage and maintain contact details.	Potentially 25 and 33	Improves communication processes and contact management
Provide the industry body with three options for when CCMP amendments are submitted for approval: (a) Approve, for proposals that it agrees are immaterial and appropriate; (b) Send a proposed amendment back to the TSO, for proposals that it does not agree are immaterial, or where it feels that industry input is warranted; or (c) Follow the current expert adviser process, for proposals that it deems require the scrutiny of the standard approval process.	27; 33(4); 34(6) and 65(3)	Introduces a simplified process for minor, immaterial changes to the critical contingency management plan. Any proposed amendments related to safety cannot be considered as being immaterial.
Specifically allow for a go-live date for a proposed amended CCMP.	25	Clarifies that a CCMP can reference a future event or date to meet future new regulatory requirements.
Require retailers to provide their retailer curtailment plans including the primary contact for the CCO to the industry body and to the CCO by 1 March of each year.	43	Enhances quality of retailer curtailment plans and the curtailment process.
Require that annual test exercises incorporate retailer curtailment plans.	34	Ensures that retailer curtailment plans work in case of a critical contingency event.
Require retailers to participate in annual test exercises.	New obligation	Ensures that retailer curtailment plans work in case of a critical contingency event.
Include communications that occur in monitoring the system prior to a critical	35	Clarifies communication processes/protocols in a CCMP before declaration of a critical contingency event.

Recommendation	Regulation	Reason for change
contingency and in declaring a critical contingency in the communications plan.		
Critical care and essential services designations		
Reduce the consumption criterion for essential service designations to above 250 GJ per year.	46B	Aligns consumption criterion with lower bound of curtailment band 4.
Remove the requirement for critical care and essential services consumers to have a time-of-use meter.	46K	Many small essential services do not have a time-of-use meter and the cost of installation would be significant.
Allow the declaration form for critical care providers and essential service providers to be signed by a chief executive or equivalent position.	46K	Simplifies the requirements for statutory declarations as it is sometimes difficult to get a director's signature.
Recommended other matters		
Amend definition of "retailer" to clarify that retailer means any person who supplies gas to another person, or other persons, for any purpose other than resupply by the other person, or persons, as long as that gas is transported through the transmission system.	5	The new definition should remove ambiguity but also ensure that the spot market, and the TSO carrying out unrelated obligations under the transmission codes (for example balancing and cash-outs), are excluded from the definition.
Amend the CCM Regulations to allow for short-term transient breaches of a pressure threshold without requiring a critical contingency declaration.	Potentially a new provision/regulation 48	Allows the TSO/CCO to manage transient threshold breaches without triggering the critical contingency process.
Amend the CCM Regulations to allow for planned outages to not trigger a critical contingency declaration.	Potentially a new provision/regulation 48	Allows the TSO/COO to manage transient threshold breaches without triggering the critical contingency process.
Amend regulation 54A to include unexpected interruptions to asset operation.	54A, Schedule 5	Clarifies disclosure obligations of unexpected interruptions to asset operation due to external events (i.e. power loss to a gas processing facility due to a lightning strike to a power station or transformer).
To forward compliance data, retailers and large consumers are required to use a form specified in the Critical Contingency Management Plan.	55 and 56	Streamlines the data collection process for the TSO during a critical contingency event.
Amend the CCM Regulations to clarify that: a) the CCO has 20 business days after the termination of a critical contingency to produce a draft performance report;	65	Improves process for the CCO to prepare a performance report.

Recommendation	Regulation	Reason for change
b) stakeholders have a minimum of 5 business days to make a submission; and c) the CCO must prepare a final performance report no later than 10 business days following receipt of submissions and to specify that the CCO must have regard to the submissions on its draft report when preparing the final report.		
Amend the definition of business day to exclude Matariki.	5	Recognises Matariki as a public holiday
Recommended update amendments		
affected party, in relation to any part of the transmission system affected by a critical contingency, means – (~~a) if the part of the transmission system is governed by MPOC, an interconnected party that has a contingency imbalance; and~~ ~~(~~b) for all other parts of the transmission ~~system,~~ an interconnected party or shipper that has a contingency imbalance	5	Update to reflect any transmission arrangements.
gas producer has the same meaning as in section 2(1) ~~43D(1)~~ of the Act~~, but in respect of Maui gas means the Crown~~	5	Update to reflect current ownership and updating the reference to the correct section in the Gas Act.
OATIS means the online interactive open access transmission information system, or any other replacement information system, that is used to facilitate information exchange in respect of the open access regime under a transmission system code ~~MPOC and VTC~~	5	Change to reflect any transmission arrangements and correcting the reference.
Delete definitions of MPOC and VTC	5	Obsolete references
~~MPOC, VTC, and a~~Any ~~other~~ transmission system code must be read subject to these regulations.	13(2)	Change to reflect any transmission arrangements.
A proposed critical contingency management plan must be consistent with ~~MPOC, VTC, or~~ any ~~other~~ transmission system code except to the extent necessary to comply with these regulations.	25(2)	Change to reflect any transmission arrangements.

Recommendation	Regulation	Reason for change
A payment made under these regulations in relation to a contingency imbalance discharges in full any payment obligation or liability under ~~MPOC, VTC, or~~ any ~~other~~ transmission system code in respect of the same contingency imbalance.	81(1)	Change to reflect any transmission arrangements.
The critical contingency operator's role under these regulations is distinct and independent from any other role or capacity, including as a transmission system owner or system operator, that the critical contingency operator may have under ~~the MPOC, VTC (or other~~ any transmission system code~~),~~ or any contractual agreement.	85	Change to reflect any transmission arrangements.
Recommended minor amendments		
~~"As soon as practicable after the publication of those estimated critical contingency ongoing costs, the industry body must notify every person to whom regulation 17(3) applies of the estimated critical contingency ongoing costs, and that ongoing fees will be payable by that person in that year or part year in accordance with~~ In calculating ongoing costs, the industry body must use the following formula…"	18(5)	Delete redundant drafting
"…a equals the critical contingency ongoing costs estimated in accordance with ~~subclause (4)~~ subclause (6)…"	18(5)	Correct the cross reference
"On the first business day of each month ~~following the notification in subclause (5)~~ the industry body must invoice…"	18(7)	Wording referred to go-live provision that has since been revoked
"Each large consumer must, as required by subclause (2), provide a notice to the critical contingency operator setting out, for the consumer installation, the total annual consumption, maximum daily consumption, curtailment band, and any ~~critical processing~~ designation."	40(1)	The notification to the CCO should include any designation applicable to the ICP, not just critical processing designations.
"the date on which the allocation agent receives the data from allocation participants or on which the transmission system owner	66A(2)(a)	Correct a drafting error

Recommendation	Regulation	Reason for change
receives the data ~~from~~ on large consumers (as applicable); and		
Critical contingency threshold limits		
Update Schedule 1 of the CCM Regulations with broader pressure threshold ranges. Updates of naming conventions to align with current practice.	Schedule 1	Provide a broader pressure threshold range so that the point at which a critical contingency is declared can be aligned with changes to the operation of the transmission system. The recommendation does not include the exclusion of gas gates operated at <20 bar g as requested by Firstgas and modifies the upper bound of the Westfield and Waitangirua gas gates so that they include the pressure threshold of the current CCMP (as per Appendix C).
Recommendation not to revoke, replace or amend the urgent Regulation change related to the removal of the Taupo/Broadlands gas gates from the critical contingency threshold limits.	Schedule 1	The Gas Act required a post-consultation following the urgent regulation change. All consulted parties agreed that this change should be kept in place.

5. Recommendations

Gas Industry Company Limited ("Gas Industry Co") approved as the industry body by Order in Council under section 43ZL of the Gas Act 1992 ("the Act") **recommends** to the Minister for Energy that:

i. the Gas Governance (Critical Contingency Management) Regulations 2008 be amended pursuant to section 43F(2)(e) and 43S of the Gas Act 1992, and in accordance with sections 43J to 43P of that Act, as set out in section 3 of this recommendations paper; and

ii. the Gas Governance (Critical Contingency Management) Amendment Regulations, made 19 February 2024 and which urgently amended Schedule 1 of the Gas Governance (Critical Contingency Management) Regulations 2008, should not be revoked, replaced or amended.

Appendix A – List of consulted stakeholders

Submission on initial and final SOP:

Major Energy Users Group (MEUG)

Firstgas Limited

Greymouth Gas New Zealand Limited

OMV New Zealand Limited

Nova Energy Limited

Fonterra Co-operative Group Limited

Submission on final SOP

Powerco Limited

Submission on initial SOP only

Transpower NZ Limited

Vector Limited

emsTradepoint Limited

Haast Energy Trading Limited

Methanex New Zealand Limited

Appendix B – Cost-Benefit-Analysis

Cost benefit analysis of Gas Industry Co statement of proposal for critical contingency management

Report to Gas Industry Co

Toby Stevenson, Ashley Milkop

13 February 2024

Contents

1. Our understanding

Gas Industry Company requires a cost benefit analysis (CBA) to support a statement of proposal relating to amendments to the Gas Governance (Critical Contingency Management) Regulations 2008 (CCM Regulations) for setting the critical contingency price, curtailment bands and pressure thresholds.

A requirement of section 43N of the Gas Act is to assess the costs and benefits of each option intended to achieve the objective of regulation. CBA is the tool we use to evaluate whether the SOP delivers value to the economy over the intended operating period of the new regulations. This is the analytical tool that is best suited to delivering a view on value creation.

This analysis is a complex piece of work given the magnitude of the value in play. A consultation has already taken place in an initial SOP on most of the key features of this SOP with overall support for the measures, but with some reservations around curtailment order and what an effective curtailment price would look like. We note, indeed, that Gas Industry Co has decided in the interim not to proceed with one of the earlier recommendations for a price floor in the event of a critical contingency. However, this does not affect the overall analysis.

2. Description of the method

We use a whole of economy approach to this analysis. We are not concerned about wealth transfers or benefits to the gas industry itself. We are interested in whether the proposals are wealth creating for the country.

We assume that the regulatory process is the right approach in these circumstances. This question has already been more or less settled, and we do not intend to revisit it.

There are particular difficulties in quantifying over a future period of time as the probability of future events cannot be constructed into a repeatable statistical analysis.

The approach to a CBA should follow a series of steps that produce a result that indicates a preferred option or options that produce economic value. These steps would usually include:

- Definition of the problem and the objective sought
- Identification of the beneficiaries and those on whom a cost burden might lie
- Identification of any constraints (e.g. budgetary, physical possibilities, time)
- Identification of alternative options for achieving the objective, which would normally include the status quo
- Description, and, if possible, quantification of the costs and benefits of each option; analysis of non-tangible costs and benefits
- Description of the risks associated with each option and choice of a discount rate
- Valuation of the costs and benefits using net present value
- Sensitivity analysis, where appropriate
- Reporting and discussion of the results

We have undertaken several interviews with participants to try to establish a sufficient understanding of the issues to follow the above path and arrive at our conclusions.

3. Background

The CCM Regulations have the stated purpose of:

[achieving] the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply.[1]

In practice the CCM Regulations achieve their purpose through and by directing and facilitating a number of actions and responses including:

1. Incentivising and facilitating early action to prevent a critical contingency arising
2. Maintaining linepack in the transmission system and distribution networks
3. Supplying small commercial and domestic consumers
4. Supplying consumers with an essential services designation
5. Allowing orderly shutdown to large consumers with a critical processing designation
6. Ensuring the continued connection of as many customers as possible while taking into account (to a limited extent) the costs of the parties through consideration of a party's access to a different fuel type

3.1 Costs of gas interruption

Interruption to gas supplies has divergent effects on participants. For some participants it is possible to halt some processes for a period and recover the production backlog once supplies resume.

Some participants have access to alternative supplies (e.g. their own gas storage) or can use an alternative fuel such as coal to resume producing within a certain crossover period.

Other participants have obtained critical processing designations within the Regulations which take into account the potential for damage to machinery if gas is curtailed too quickly.

For some processes (e.g. dairy factories) there can be times of year when the costs of shutdown can be significant because capacity to move inputs around to other sites is limited. There is the potential to have to dump inputs, which can come at an environmental and financial cost.

Essential services like healthcare need a continuous supply of energy to continue to provide their services. If they are interrupted, then there are significant costs to users of their services.

Most importantly costs escalate when line pack pressure is lost. The CCM Regulations have to deal with all circumstances including where the event is addressed within a few hours through to low probability events where line pack may be lost.

Work undertaken by NZIER[2] in 2012 showed that the value added of gas tends to increase with the curtailment bands. Noting this finding, Treasury's 2013 Regulatory Impact Statement[3] assessing

[1] Gas Governance (Critical Contingency Management) Regulations 2008

[3] https://www.treasury.govt.nz/sites/default/files/2014-12/ris-mbie-agc-aug13.pdf

proposed changes to the Regulations affirmed "that curtailing in order of size of consumer will result in the highest net benefit" and that such an approach was also "operationally" efficient.

Smaller gas users (commercial and domestic) that are interrupted will need to be visited by trained technicians to reconnect because of the safety risks. Site reconnection comes at a significant cost and the critical contingency operator (CCO), who is the party designated in the CCM Regulations to coordinate and direct the response, works hard to avoid these costs having to be incurred.

And finally, if gas is curtailed to domestic consumers there are substantial costs to householders who have to find alternative ways to cook food, and heat water and space. Across the 250 thousand households that use gas, these costs are significant. Some domestic consumers would probably need to spend on capital items such as electrification options or bottle supply if interruption to their connection went on for a longer period.

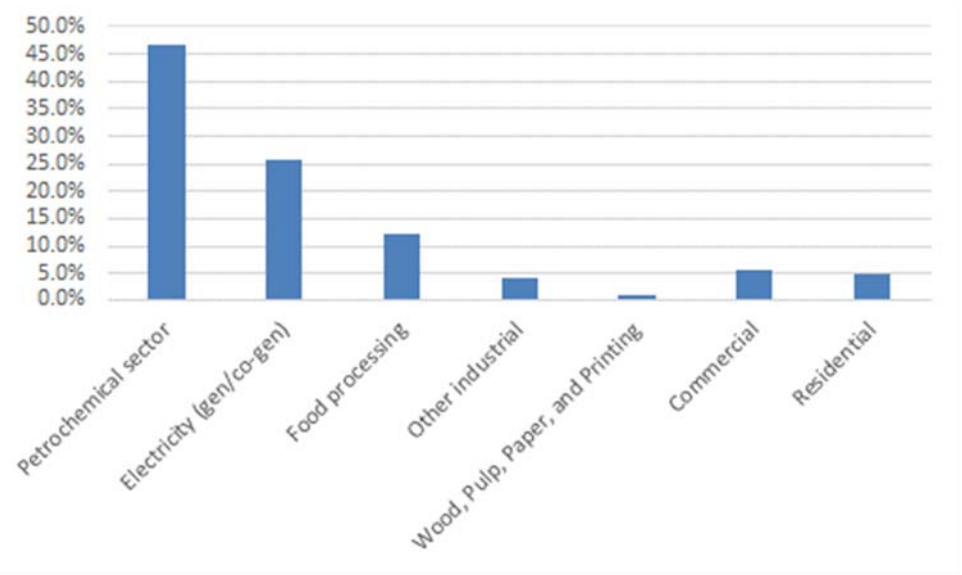
Accordingly a goal of maintaining linepack in the transmission system and distribution networks has an important effect on outcomes and assessment of costs and benefits. We take account of the point that the cost of an event rises exponentially if line pack is lost to a large number of consumers even if those consumers are small.

3.2 What is happening in the gas market

It is also important to look at what is happening in the gas market environment to help understand the background to the changes that are being proposed.

Figure 1 below shows gas consumption by major sectors. For those familiar with the electricity market there is an immediate observation that can be made: whereas in the electricity market total consumption by domestic and commercial consumers amounts to around 60 percent of total consumption, the corresponding figure for the gas market is around 11 percent for the most recent data available. This underscores that gas in New Zealand is used primarily by a small number of large scale operators. This distribution of consumer size influences the cost of an objective to maintain linepack if a critical contingency event occurs.

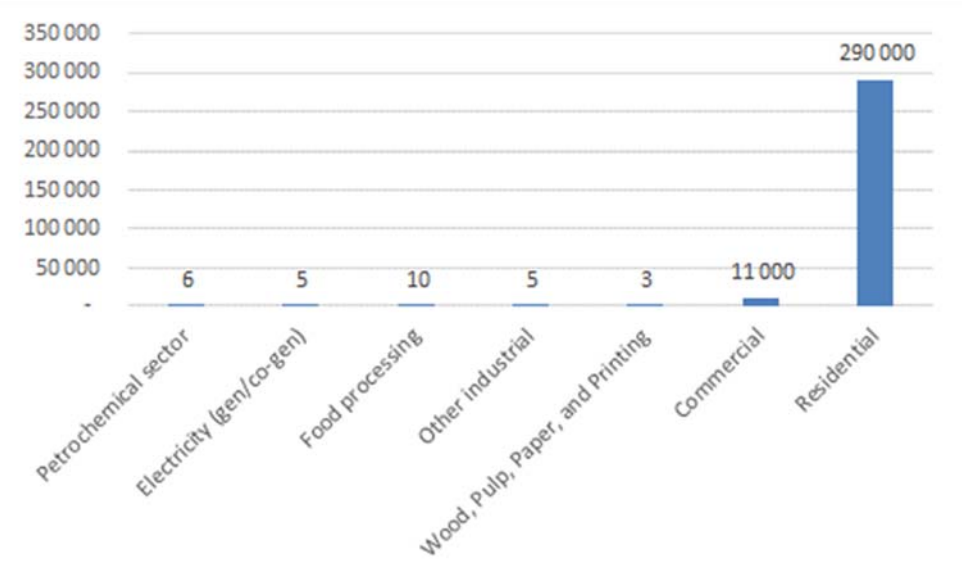
Figure 1 - Gas consumption by sector – year to June 2023



Source: MBIE data, Sapere analysis

Figure 2 shows the corresponding number of ICPs for each sector. Unsurprisingly, when looking at the number of ICPs for each sector, there are very few individual large users and many small users. The consistency of the two figures is explained through the low average consumption of small users and the high average consumption of large users.

Figure 2 - Number of gas ICPs by sector, 2023



Source: MBIE, Gas Industry Co, Sapere analysis

We are also interested in what is happening in over time in the New Zealand gas market.

First, in the electricity generation sector there have been several major changes. The following gas powered stations are now no longer operating or are likely to cease operations in the near future:

- Southdown (decommissioned in 2015)
- New Plymouth (decommissioned in 2019)
- Otahuhu B (decommissioned in 2015)
- Taranaki Combined Cycle (likely decommissioning in 2024)

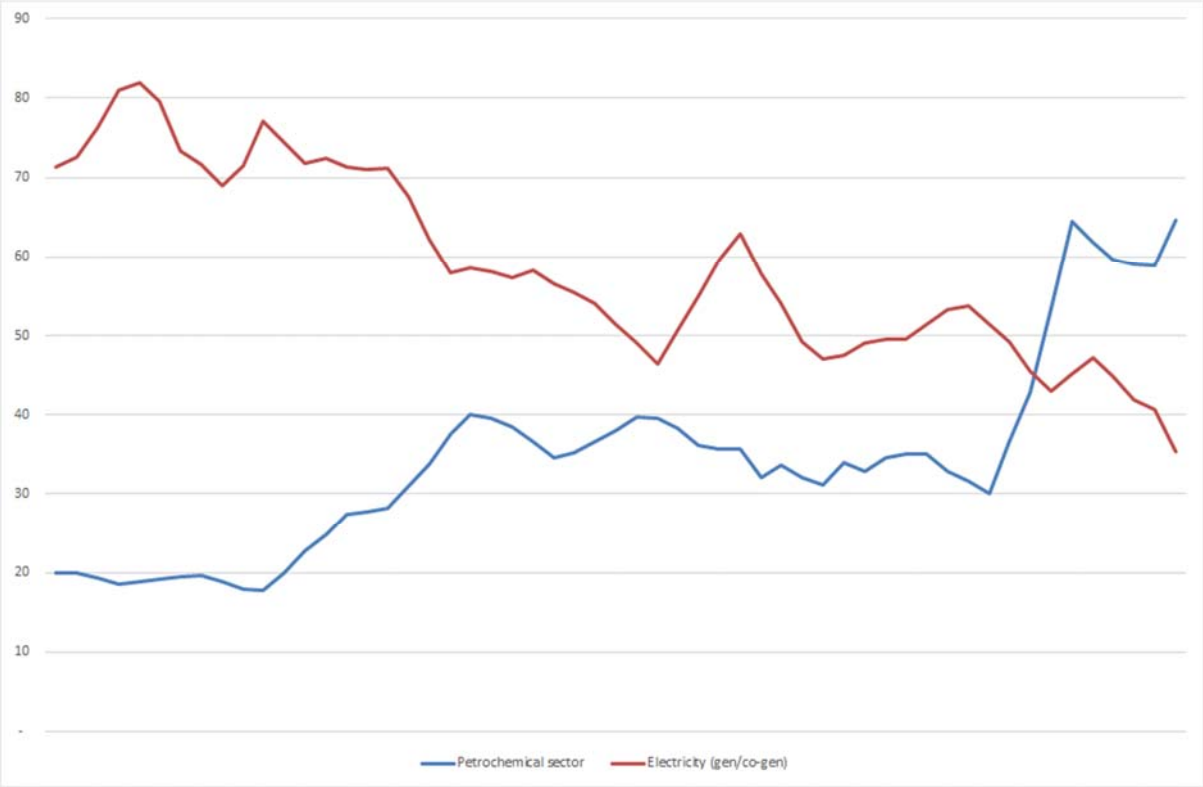
Over a similar period several new gas stations have been commissioned:

- Stratford peakers (commissioned in 2011)
- McKee peakers (commissioned in 2012)
- Junction Road peakers (commissioned in 2020)

The existing portfolio of gas generation also includes E3P, P40, and the Rankine units at Huntly. In addition there is the Te Rapa co-generation facility.

Since 2010 there has been a clear trend down in electricity produced using gas while at the same time there has been a marked increase by Methanex as a response to continued high global oil prices as shown in Figure 3.

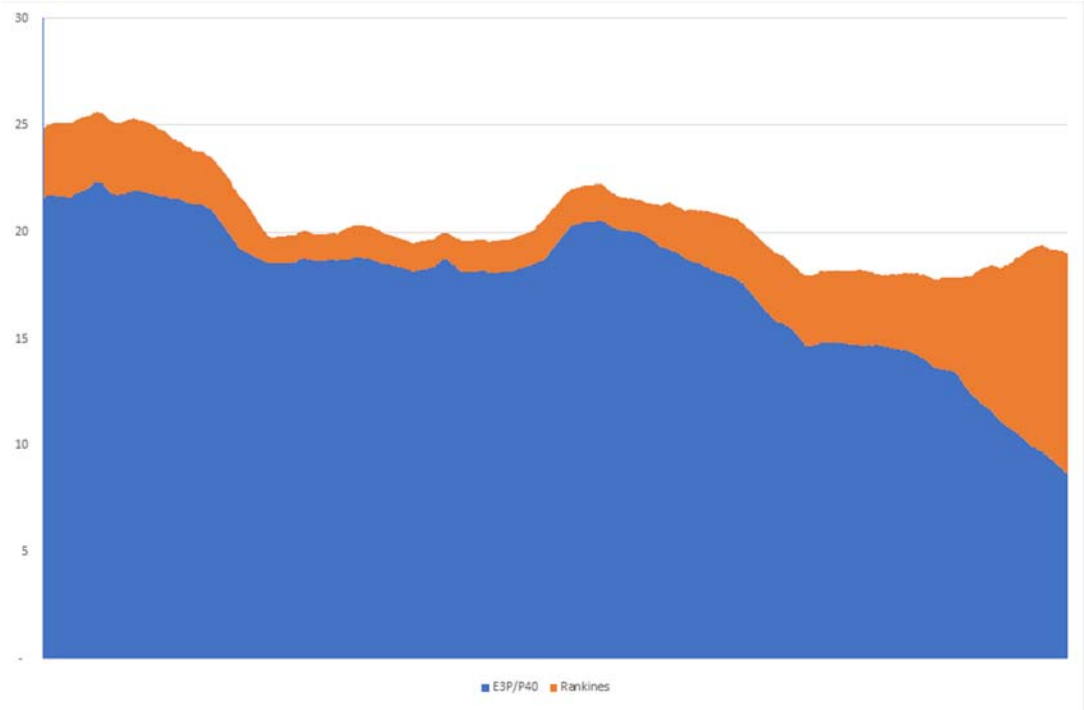
Figure 3 – Annual gas use (PJ, rolling 12 months) since 2010 for electricity and petrochemical production



Source: MBIE data, Sapere analysis

Looking at electricity generation since 2019 at Huntly we observe that total gas consumption has trended down over the period. Gas use in the Rankine units has been sporadic on the whole with the exception of past few months in 2023.

Figure 4 – Total gas use at Huntly 2020-2023 rolling 12 months (PJ)



3.3 What Critical contingency events have taken place and how they have been managed

Since the 2008 CCM Regulations went into effect there have been six occasions on which the CCO has considered the declaration of a critical contingency event (CC event). These occasions are summarised in Table 1 over the next page. We note also that since the 1970s there have been other interruptions to supply prior to the Regulations being in force. The WorleyParsons report[4] notes in addition to the events detailed below four major events, all pipeline related, between 1977 and 2010.

[4] WorleyParsons – Gas Disruption Study Report on the Potential Impacts on the New Zealand Gas Market – January 2014

Table 1 - Critical contingency events and near-events since 2008

Date(s)	**13/07/2010**	**25 to 30/10/2011**	**3/03/2012**	**15/04/2015**	**24/05/2016**	**23/05/2017**
Cause	Pohokura production station outage	Maui Pipeline outage	Pohokura production station outage	"Potential critical contingency" following observed pressure drop	Pohokura production station unplanned outage	System imbalance event
Actions by CCO	Discussions with Transpower; early warning to participants;	Discussions with Transpower; early warning to participants; some parties changed to band 5	Discussions with Transpower; early warning to participants;	Assessment of situation requires no declaration of CC event	Discussions with Transpower and Methanex; early warning to participants;	Own analysis indicates possibility of event; discussions with Transpower
Actions of parties prior to CC being declared	None noted	Genesis prepares to curtail prior to CC event being called	None noted	None noted	Self curtailment of Methanex and Ahuroa injections; local MPOC curtailment actions	Additional injection from PPS
Duration of CC event (hours)	2:58	130.58	10.85	CC event not ordered	4.50	7.42
Curtailment ordered	None	Up to band 6	Bands 1a and 1b	None	None	None
CC price $/GJ	15	Regional event, no price	11.1	No CC event	6.66	10.62

Source: Gas Industry Co, CCO

These events help us to summarise the actions of the CCO prior to, during and after a CC event.

We note the following observations that are pertinent to our analysis:

- In a number of events, the participants themselves will take actions to avoid a CC being declared. Based on our discussions with participants the main incentive for these actions relates to the desire to avoid a CC event and forced curtailment.
- Prior to an event being declared the CCO engages in early discussions with parties able to affect the overall situation.
- Once an event is declared the CCO must follow the curtailment order in accordance with the CCMP. The total amount curtailed will be supported by ongoing monitoring and analysis of the situation.

4. Outlining of the proposals

The SOP is shaped around what can be considered discrete initiatives. We have grouped these initiatives as follows:

- Setting a contingency price (section 4.1)
- Curtailment band definitions (section 4.2)
- Curtailment instructions (section 4.3)
- Critical contingency threshold limits (section 4.4)
- Other matters (e.g. form of instructions and how information is provided) (section 4.5)

To be clear we are considering only the proposal as it stands rather than previous iterations of proposals. Thus we are not looking specifically at the previous proposal for a price floor since, following further evaluation from Gas Industry Co, this proposal has been shelved.

We will consider each of the options on its own merits, acknowledging that the final outcome could be to proceed with none of the options, with one option but not the others. In practice given that the options can be treated independently we consider each of the options against the status quo.

4.1 Setting a critical contingency price

The existing Regulations specify that where only customers in curtailment bands 0-2 (that is large consumers) are curtailed then the contingency price is to be set based on the wholesale electricity price at the time. Gas Industry Co proposes to relax this condition on the basis that the interaction between the gas market and the electricity market has evolved recently given the reduction of gas generators who provide CCGT (combined cycle gas turbine) baseload to the grid.

The composition of the bands (current and proposed) is shown in Table 2.

Table 2 - Bands 1 and 2 - current and proposed

	Current	**Proposed**
Band 1	Genesis, NZ Refining (no longer in operation)	Methanex, Huntly
Band 2	TCC, Stratford peakers, Junction Road, Contact (Te Rapa), Methanex, Ballance Kapuni	Junction Road (Todd), TCC, Stratford Ballance Kapuni, Kinleith, Te Rapa,

A previous proposal for a price floor has been put to one side and is not the subject of this CBA.

4.2 Curtailment bands

In the existing Regulations there are eight curtailment bands (numbered 0 through 7), the first being 0 which is for participants who supply gas storage facilities. The curtailment order effectively describes the priority for curtailment, with band 1 curtailed first followed by the next bands all the way down to 7. The higher bands are curtailed only as a last resort as they encompass certain designated

consumers and consumers whose share of consumption is minuscule, but whose reconnection would be very costly if the distribution network were depressurised.

Table 3 – List of curtailment bands and proposed bands

	Original (2008)	**Existing**	**Proposed**
Band 0	Storage		
Band 1	More than 15TJ per day and with an alternative fuel supply	More than 15TJ per day and with an alternative fuel supply	More than 100TJ per day (threshold met from "time to time")
Band 1b	More than 15TJ per day and with **no** alternative fuel supply	*Not applicable*	
Band 2	More than 10TJ per annum and up to 15TJ per day and with an alternative fuel supply	More than 15TJ per day and with **no** alternative fuel supply	More than 15TJ per day and less than 100TJ per day (threshold met from "time to time")
Band 3A	*Not applicable*		More than 300TJ per annum and up to 15TJ per day
Band 3	More than 10TJ per annum and up to 15TJ per day and with **no** alternative fuel supply	More than 10TJ per annum and up to 15TJ per day	Up to 300TJ per annum and up to 15TJ per day
Band 4	More than 250 GJ per annum and up to 10 TJ per annum		
Band 5	More than 2 TJ per annum (but with an essential services designation)		
Band 6	2TJ or less per annum	250 GJ or less per annum	
Band 7	Not applicable	Any other if a critical care designation applies	

Gas Industry Co proposes two significant changes to the curtailment bands.

The first of these affects bands 1 and 2, removing the distinction between those participants with an alternative source of fuel and instituting instead a volume distinction. Gas Industry Co's rationale is that removing the distinction brings consistency to the band definitions and provides more load to band 1 thereby reducing the possibility of band 2 being called on.

The second change adds a new band, 3A, which would be curtailed before band 3. This initiative essentially means that there would now be nine bands instead of eight (if we include band 0). It was thought that it was simpler to divide band 3 into two bands rather than rename all the bands above band 3 in the curtailment order. Like for the first initiative, there would be less likelihood of the current band 3 participants being called on in their entirety and more granularity in the curtailment order.

There are also some initiatives that involve how to calculate the threshold volumes for categorisation of participants into curtailment bands. These initiatives are, in our view, of less significance.

As for the contingency price, the alternative to these options is to stick with the status quo.

4.3 Curtailment order

There is one significant change to the curtailment order. Under the proposed arrangements bands 1 to 3 (including any critical processing designations) must fully curtail before band 4. The rationale for this change is that there is relatively little load in this curtailment band and that the disruption to customers in band 4, while doing little to help stabilise the system, would impose a significant cost on those participants for little gain.

Table 4 - Curtailment order

Current	**Proposed**
Band 0	Band 0
Band 1, Band 1 critical begins process	Band 1, Band 1 critical begins process
Band 2, Band 2 critical begins process	Band 2, Band 2 critical begins process
Band 3, Band 3 critical begins process	Band 3A, Band 3A critical begins process
	Band 3, Band 3 critical begins process
	Bands 1-3 critical fully curtail
Band 4, Band 4 critical begins process, Bands 1-3 critical fully curtail	Band 4, Band 4 critical begins process
Band 5	Band 5
Band 6, Band 4 critical fully curtail	Band 6
	Band 4 critical
Band 7	Band 7

4.4 Pressure thresholds

Firstgas has proposed some specific changes to pressure thresholds which are under active consideration. We do not propose to provide additional analysis of these proposals which are the subject of separate analysis. However, we do want to consider one specific aspect which has the potential to affect in the future the way that the CCO is able to manage the gas system.

Firstgas has requested these changes in anticipation of reducing operational costs by lowering the operational gas pressure across the transmission network. If these operational changes are made, the CCM pressure thresholds need to be adjusted to the operation of the system. Apart from the

Taupo/Broadlands gas gates Gas Industry Co has little information about how Firstgas intends to operate the system. Gas Industry Co has no jurisdiction over operational matters but has an obligation to ensure that the system is safe and efficient. The CBA required under the Gas Act for regulation changes only relates to the specific regulatory tool, not to any economic CBAs Firstgas has done to calculate its cost savings.

The adjustment of the pressure thresholds is to provide greater flexibility for the point at which a critical contingency is declared under the critical contingency management plan to align with the operation of the transmission system. The threshold changes provide for a tool to respond to operational changes rather than being a regulatory intervention resulting in additional costs.

The specific proposal is to expand the threshold limits for existing gas gates and exclude from Schedule 1 of the Regulations any gas gate where the operating distribution pressure is less than 20bar g. These changes will allow greater flexibility in the pressure thresholds to align with operation of the network. There are trade-offs to consider in relation to the Taupo/Broadlands proposed modifications:

- Injection of green gases is consistent with decarbonisation initiatives that have wider economic considerations for the country
- Depending on the quantity of gas injected there is an alternative supply of gas to domestic consumers that could present a benefit
- Operating at lower pressures means that there is less gas in the pipeline system for when an interruption happens which could lead to a more rapid disconnection for consumers than might otherwise be the case
- The CCO would no longer have jurisdiction over the gas gates concerned which may require different and specific measures to deal with incidents at those gas gates

4.5 Other measures

The other measures, which we have grouped for our purposes as a package include:

- How curtailment instructions are conveyed
- How information is provided to the CCO
- The nature of critical contingency plans
- Critical care and essential services designations

Our view of these measure is that these constitute a tidy up exercise. These measures have been well signalled in the initial SOP and we do not intend to consider these in detail. We do note specifically the proposal in 5.2.3 of the SOP to account for "consumption rates at the time a critical contingency is declared" in relation to partial curtailment which addresses a definite issue and takes account of the actual circumstances at the time of a CC event.

5. Benefits framework

Benefit category	Description of claim	How benefit can be measured
Contingency pricing	Removing the restriction on linking price to wholesale electricity market when curtailment hits only bands 0-2 for determination or price results in better price signal - Superior price signal - Price closer to marginal price	Better allocation of gas sees greater consumer surplus from gas use
Curtailment bands	Less over curtailment from more granular curtailment bands	Greater consumer surplus; less risk of flow-on costs to participants from shutting down
Curtailment bands	Less inefficient investment from participants over-investing in alternative fuels	Lower costs to economy
Curtailment bands	Easier to communicate to fewer and larger gas users	Lower management costs of critical contingency; higher likelihood of compliance; reduction in risk of catastrophic depressurisation and costly reconnection
Threshold limits	Greater flexibility for operating transmission system lowers costs	See Firstgas submission

6. How to measure the impacts

6.1 The implementation costs are not significant

In our view the implementation costs of the initiatives are minor. Costs incurred will relate to the need to update procedures and to ensure that operational staff are brought up to speed with the changes. In our view these costs will be absorbed into normal operational requirements, requiring no additional staff or external costs to be incurred. Larger organisations, which are the ones most affected by the changes and which have regulatory teams, will have negligible additional work to undertake given that CCM Regulations are already in place.

Other costs need to be considered in the context of net benefits. As stipulated at the beginning of this paper we have ignored wealth transfers. We acknowledge that some participants may find that their personal circumstances are less fortunate than the current arrangements. In some cases wealth transfers can undermine the functioning of a market if instability is the consequence.

6.2 Benefits are harder to quantify

Before we start looking at specific benefits we need to look at the likely operating environment. We consider the relevant period of analysis, the possible events that might lead to a contingency or the possibility of a contingency, and a possible discount rate.

We consider that a suitable period of analysis would be a 20-year horizon. These regulations are open-ended are expected to provide certainty for gas market participants over a long-term timeframe.

The hardest aspects to consider when quantifying the benefits of a CBA are the likelihood, length and impact of CCM events. Since 2008 we have observed six events or near-events in addition to five major events in the twenty years prior to the implementation of the Regulations. It is not easy to derive from this dataset a statistical profile of future events given several unknowns. It would be possible to look at some specific risks in a statistical analysis such as earthquakes, floods and landslides, and volcanic activity but this only gets us so far and would present an incomplete picture. The difficulties include:

- Interpreting each natural cause for our purposes would require also that we estimate the scale of disruption and the length of disruption which presents significant hurdles
- Human error, for example operator error, is difficult to predict. Furthermore, ongoing improvements to procedures and lessons learned from other events should diminish the probability of future events occurring

Human error can be manifested in unmaintained equipment (e.g. the Varanus Island incident) or equipment that will fail at some point. Again there is insufficient data to enable us to derive a useful pattern, and the probability of such events will continue to change given continuous improvement strategies.

Moreover there is always the possibility of something happening that cannot be conceived of at this moment.

For these reasons we are reluctant to try to outline a particular distribution of future events where we estimate the frequency, duration, and scale.

It should be observed that were we even to try to set out a range of possibilities then it is entirely possible that we would be forecasting a range of between no impacts and millions of dollars of impacts which would be of little use to decisions markers.

The question, therefore, of discount rates falls away as we do not propose to address the question of benefits in the manner of future events occurring with a certain probability at a particular time and a particular scale.

6.2.1 The "four event" model

To assist us in our analysis we have constructed a framework that tries to capture the scale of various types of incidents. This framework helps us to think about how the proposed changes to the Regulations affect different parties. By looking at the trade-offs we can come to a view about the net overall impact of the changes. The range goes from an event that is signalled but curtailment is not required all the way through to an incident where the CCO must consider curtailing all the way up to band 6. We note that as we move from left to right on the table while the scale of the event increases the probability decreases.

Figure 5 - Four event model

	Scenario one: minor event	**Scenario two: short event**	**Scenario three: major event**	**Scenario four: severe/ catastrophic event**
Description	CCO communicates risk of CC event but does not elevate to full event	CC event announced	CC event announced	CC event announced
Duration	6 hours	24 hours	1 week	4 weeks
Curtailment bands affected	None	Band 1	Up to band 3	Up to band 6

Thinking about these scenarios helps us to consider and illustrate the proposals in the SOP.

6.2.2 Scenario one considerations

In scenario one there is no actual curtailment but the participants are aware that a CC event may arise and will therefore consider voluntary actions to avert the announcement of an event. The likely price that would be set and applied to imbalances may incentivise helpful actions that are taken prior to an event which may decrease the likelihood of an event being called.

We might also consider the actions of the participants in the first curtailment band to be called, which may have a particular incentive not to see the situation escalated.

6.2.3 Scenario two considerations

Now that a critical contingency has been announced the critical contingency price is properly in play and will incentivise actions by some participants.

Compared to the status quo we are also interested in the costs to the arise to the parties from a different curtailment order.

6.2.4 Scenario three considerations

This scenario puts into perspective the curtailment order in respect of critical processing designations in bands 1 to 3 versus the band 4 customers.

6.2.5 Scenario four considerations

Finally, the main issue in scenario four is whether the CCO is successful in maintaining linepack and in so doing ensuring that domestic consumers and small businesses are protected from curtailment with the potentially very high costs that such a curtailment would result in.

6.3 Analysis

Table 5 Summary of effects.

	Minor outage; CC event announced as possibility	Short outage, CC event announced, curtailment band 1	Major outage, curtailment to band 3	Severe/catastrophic outage, curtailment to band 6	Overall assessment
Economic impact	Low economic impact →			Very high economic impact	
Frequency	More frequent →			Very infrequent	
Duration	6 hours	24 hours	1 week	4 weeks	
Total TJ effect	<50TJ	200TJ	2500TJ	>10,000TJ	
Cost	No effect	Possible curtailment out of merit order	Potential costs of critical plant shut down but with low probability	No effect	
Benefit	No effect	Some avoided costs through early action taken	Impact on fewer participants	Reduce probabilty of depressurisation with a cost running into hundreds of millions of dollars	
Effect one: setting critical contingency price	Unlikely to make difference	Positive, incentivises early action	Positive, incentivises early action	Positive, incentivises early action	Positive
Effect two: curtailment band redefinitions	Event dependent	Event dependent	Unlikely to make difference	Positive, lowers probability of accessing higher bands	Positive, on balance
Effect three: curtailment order	Unlikely to make difference	Unlikely to make difference	Event dependent	Positive, lower cost of disruption	Positive, on balance
Effect four: threshold limits	Event dependent	Event dependent	Event dependent	Event dependent	Event dependent

6.3.1 Explanation of table

We have looked at each of the four relevant proposals in the context of outage types and consider whether there is a net benefit from that proposal in those circumstances.We have not assessed any of the proposals as unambiguously negative.

The model helps clarify where the focus of the analysis should be. The outcome of more frequent, but (relatively) low impact events can be contested vigorously as to whether the curtailment order was economically efficient. It is possible that a large gas consumer in one of the first curtailment bands may place a higher value on their use of gas than a consumer in a non-curtailed band. However, when considering a less frequent but high impact event, the costs of depressurisation of the network overwhelm the analysis. In the absence of a market mechanism which clearly identifies the highest value use of gas, it is necessary to focus solely on what particular curtailment order achieves the objective of reducing the probability of depressurisation, and as a secondary objective, reducing the number of participants affected. Working through the proposals we find the following:

Proposal one (setting of the critical contingency price) is likely to incentivise early action for voluntary curtailment or to make alternative gas supplies available. We accept the rationale that the electricity market may be less likely to be the key factor in setting the price and that the independent industry expert should be free to take into account other factors when setting the price. Having reviewed previous price reports we have formed the view that large participants will have the technical skills to predict accurately the likely price and to take action accordingly.

Proposal two (changing the definition of bands one and two) has mostly a positive impact. There is some ambiguity in a short outage in that participants in band 1 may place a higher value on gas than participants in band 2 or that the cost of disruption is greater to the band 1 participants. We have no evidence to determine whether that is the case but acknowledge the possibility. In our view, however, the advantage to be gained from having the largest participant involved first in the curtailment discussions is sensible and could marginally reduce the probability of curtailment to domestic consumers and small businesses, where the costs would be very high. The addition of band 3A ultimately has a similar advantage in that there is the possibility of fewer participants being called on to curtail.

Proposal three (changing the curtailment order) is somewhat nuanced given the unknowns about costs of curtailment of critical processing bands. We find that the likelihood of accessing band 4 gas averting any critical processing curtailment in bands 1, 2 and 3 is minute and therefore that the advantages of curtailing fewer participants is supported.

Proposal four (expanding discretion regarding the pressure thresholds) is a balanced consideration and will be highly dependent on the actual pressure threshold, the characteristics of the gas gates concerned if it is to be removed from Schedule 1 and how it is managed. The consideration is to balance the inclusion and visibility of the gas gate within the CCO purview with the advantages of flexibility in pipeline management. It will be important too what sort of interruptible load exists at the gas gate. An additional matter is to allow greater operating range for gas gates that remain in Schedule 1. Again, our view is that this needs to be considered on a case-by-case basis. Expanding the allowable range of pressure thresholds

needs to be weighed against the reduction in linepack available to supply downstream of interruptions, but also in light of any additional investment that might be needed to maintain pressures at the current thresholds.

7. Conclusion

In our view proposal one, proposal two and proposal three show, on balance, a net economic benefit in that they:

- Facilitate the management of CC events thus achieving the objectives of the CCM Regulations
- Lower the risk of domestic consumers and small businesses being curtailed the reconnection of whom would give rise to high costs
- Lower the number of customers having to curtail, especially when those customers who are in higher bands are thought to place a higher value on the use of gas than those in lower bands

Although we acknowledge that there may be curtailment which is inconsistent with other theoretical merit orders we do not find that changes in lower bands would outweigh the advantages of the overall structure. Individual cases for organisations are dealt though the critical processing designation mechanism.

Proposal four, relating to pressure thresholds and the potential for removing a gas gate from Schedule 1 should be assessed against cost and benefits on a case-by-case basis.

The other proposals achieve greater clarity and certainty for participants which will improve the effectiveness of the CCM Regulations.

About Sapere

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Schedule 1

Critical contingency threshold

r 25

In accordance with regulation 25(1)(a), the permissible limits for the thresholds specified in a critical contingency management plan that apply to the following parts of the transmission system (as identified on the map published in accordance with regulation 10) are:

Pipeline	Maximum time before minimum operating pressure is reached	Minimum time before minimum operating pressure is reached	Minimum operating pressure range	Point of measurement*
~~***Maui pipeline***~~				
~~Rotowaro~~ Maui	5 hours	2 hours	~~32 (±2.5)~~ 30 (±5) bar g	Rotowaro Compressor Station
~~***Vector pipeline***~~				
South	10 hours	3 hours	~~35 (±2.5)~~ 27.5 (-7.5; +9.5) bar g	Waitangirua WTG06910
Hawkes Bay lateral	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Hastings HST05210
Frankley Rd to Kapuni	6 hours	3 hours	35 (±2.5) bar g	Kapuni (GTP) KAP09612
Bay of Plenty	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Gisborne GIS07810
Bay of Plenty	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Tauranga TRG07701
Bay of Plenty	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Whakatāne WHK32101
Morrinsville lateral	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Cambridge CAM17201
Central (North)	6 hours	3 hours	~~40 (±2.5)~~ 27.5 (-7.5; +10) bar g	Westfield WST03610

Pipeline	Maximum time before minimum operating pressure is reached	Minimum time before minimum operating pressure is reached	Minimum operating pressure range	Point of measurement*
North	6 hours	3 hours	25 (~~±2.~~5) bar g	Whangārei WHG07501
For any other gas gate on the Maui or Vector pipeline, excluding Taupō TAU07001 and Broadlands BRO36301	6 hours	3 hours	~~30 (±2.5)~~ 25 (±5) bar g	Gas gate not specified elsewhere

*The codes specified in the first and fifth columns of this table refer to the gas gate codes determined under the Gas (Switching Arrangements) Rules 2008.

About Gas Industry Co

Gas Industry Co is the gas industry body and co-regulator under the Gas Act. Its role is to:

- Develop arrangements, including regulations where appropriate, which improve:
  - the operation of gas markets;
  - access to infrastructure; and
  - consumer outcomes;
- Develop these arrangements with the principal objective to ensure that gas is delivered to existing and new customers in a safe, efficient, reliable, fair and environmentally sustainable manner; and
- Oversee compliance with, and review such arrangements.

Gas Industry Co is required to have regard to the Government's policy objectives for the gas sector, and to report on the achievement of those objectives and on the state of the New Zealand gas industry.

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