Firstgas

Proposed Changes to Critical Contingency Pressure Threshold Ranges



Background & Purpose of Presentation



- In 2019-2020 Firstgas reviewed the critical contingency thresholds limits and locations and recommended to the Gas Industry Company (GIC) that Schedule 1 of the (Critical Contingency Management) Regulations 2008 (CCM Regulations) be updated.
- Those recommended changes were endorsed by GIC and incorporated into the draft Statement of Proposal (SoP) released later in 2020 by GIC for industry consultation.
- Since our original review, we have seen significant changes in Government policy settings, gas supply/demand balance, and the energy landscape generally in NZ.
- We now consider the changes to Schedule 1 we recommended ~3-years ago will no longer be suitable, and greater flexibility is required to enable Firstgas and the industry to respond more efficiently and effectively to the rapidly evolving energy environment.
- The purpose of this presentation is to provide stakeholders with an overview of:
 - our requested changes to Schedule 1;
 - why we think they are necessary;
 - o any potential impacts of our proposed changes to customers.



- Critical Contingencies (CCs) occur when there is a shortage of gas supply relative to demand due to damage or failure of assets that make up Firstgas' transmission system or connected upstream assets, including gas producers.
- The pressure on the transmission system can fall to a point where intervention is required by the Critical Contingency Operator (CCO) to ensure that enough gas is maintained in the transmission system to supply distribution networks and domestic consumers.
- It's expensive and time consuming to reinstate gas distribution networks if the pressure drops too low.
- The CCM Regulations state that Firstgas, as a Transmission System Owner (TSO), must set CC pressure thresholds at various locations on the Transmission System and record them in Firstgas' Critical Contingency Management Plan (CCMP)
- When a CC pressure threshold is breached, the CCO is required to declare a CC and work to restore pressure back above the CC threshold, primarily through the curtailment of gas consumers (excluding domestic users).

What are Critical Contingency Thresholds?



- Critical Contingency thresholds must be set by Firstgas within the ranges (lower and upper limits) set out in Schedule 1 of the CCM Regulations.
- These ranges / limits were established in 2008 as part of the original development of the CCM Regulations. These have not been revised since.
- Schedule 1 of the CCM Regulations specifies two key ranges:
 - Minimum Operating Pressure (Pmin) the range of pressures at which point a network failure is considered to possibly to occur
 - Time to Pmin an range of appropriate amounts of time to allow the CCO to take actions to mitigate a potential network failure.
- Firstgas' CCMP must specify the value for the minimum operating pressure and time to minimum pressure within the ranges established in Schedule 1.
- The specific pressure thresholds that Firstgas select are subject to the independent CCMP review and approval process required by the CCM Regulations (discussed later)
- Firstgas seeks to set CC thresholds that balance the risk of unnecessary declarations against the risk of leaving action too late to avoid system failure.

Current Critical Contingency threshold ranges

Firstgas

Pipeline Mayi nineline	Maximum time before minimum operating pressure is reached	Minimum time before minimum operating pressure is reached	Minimum operating pressure range	Point of measurement*
Rotowaro	5 hours	2 hours	32 (±2.5) bar g	Rotowaro Compressor Station
Vector pipeline	1/15/168128-1		al de la ser d'al de Ba	
South	10 hours	3 hours	35 (±2.5) bar g	Waitangirua WTG06910
Hawkes Bay lateral	6 hours	3 hours	30 (±2.5) 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) bar g	Gisborne GIS07810
Bay of Plenty	6 hours	3 hours	30 (±2.5) bar g	Taupo TAU07001
Bay of Plenty	6 hours	3 hours	30 (±2.5) bar g	Tauranga TRG07701
Bay of Plenty	6 hours	3 hours	30 (±2.5) bar g	Whakatane WHK32101
Morrinsville lateral	6 hours	3 hours	30 (±2.5) bar g	Cambridge CAM17201
Central (North)	6 hours	3 hours	40 (±2.5) bar g	Westfield WST03610
North	6 hours	3 hours	25 (±2.5) bar g	Whangarei WHG07501
For any other gas gate on	6 hours	3 hours	30 (±2.5) bar g	Gas gate not specified elsewhere
the Maui or Vector pipeline	Time to P	min	Pmin	Location

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

- We consider that Schedule 1 is outdated and requires revision
- Greater flexibility needs to be introduced into the CC threshold ranges to ensure that important opportunities can proceed and to enable Firstgas and the gas industry to respond more efficiently and effectively to the rapidly evolving energy environment.

Why change the CC threshold ranges?



 To optimise the operation of the transmission system and maximise reliability for gas users, CC thresholds should not be overly conservative

Optimise System & Reliability

- High CC thresholds require higher operating pressures, increasing costs to run, maintain and certify the transmission system
- Higher operating pressures contribute to higher emissions as a result of more frequent operation of compressors at higher pressures

Increased Safety

- Firstgas would like to have the ability to potentially reduce the pressure in some sections of transmission pipeline if required for safety reasons, while still maintaining security of supply
- Reducing the maximum allowable pressure in the pipeline means there is a greater margin to absorb defects, damage, external loads etc.

Why change the CC threshold ranges?



Enable Alternate Solutions

 Existing critical contingency threshold parameters create an artificial barrier to progressing both current and future energy initiatives, which are important in New Zealand's transition towards a zero-carbon future

 Such emerging initiatives include Biomethane production and Hydrogen (located outside of Taranaki) which require, or will benefit from, lower operating pressures

Reduce Early CC / Curtailment Risk

- The current lower end limits of the threshold ranges are significantly higher the actual failure pressures in much of the transmission system
- Reduction in system pressure could result in CC declarations and curtailment occurring earlier than required or even unnecessarily
- Explained more in the following examples at a variety of system locations

Example shows a CC Declaration occurring significantly before it is required



Graph shows the decline of pressure at Waitangirua in the event of a complete compression failure

Firstgas

Blue line is the current threshold, yellow is a conservative assumption of regulator failure pressure.

Red vertical line is the point a CC declaration would be made based on current threshold settings, The grey is the proposed point in the future

Example 2 – Westfield



Example shows a CC Declaration where it is not required



Example 3 – Tauranga



Another example of early declaration – such examples are numerous across the system



Example 4 – Taupo



Example shows where some points no longer are likely critical failure points



What changes to ranges does Firstgas recommend?

Pipeline Name	Point of Measurement	Pmin (barg)	
Maui	Rotowaro	30 +/- 5	
South	Waitangirua	27.5 +/- 7.5	
Hawkes Bay Lateral	Hastings	25 +/- 5	
Frankley Road to KGTP	KGTP	35 +/- 2.5	
Bay of Plenty	Gisborne	25 +/- 5	
Bay of Plenty	Taupo	(Removed)	
Bay of Plenty	Tauranga	25 +/- 5	
Bay of Plenty	Whakatane	25 +/- 5	
Morrinsville Lateral	Cambridge	25 +/- 5	
Central (North)	Westfield	27.5 +/- 7.5	
North	Whangarei	25 +/- 5	
First Gas and Maui Pipeline	Any other gas gate*	25 +/- 5	

Firstgas proposes the following amendments to Schedule 1:

*Excluding gas gates supplied by pipelines operated at distribution pressures (<20barg)

- These have been selected based primarily on approximately the current estimated failure pressures, with the tolerances expanded to cover the existing CCMP thresholds where possible.
- No proposed changes to time to failure

Firstgas

How will the proposed changes impact customers?

- Reduced likelihood of premature CC declaration
- Reduced likelihood of curtailment due to artificially high-pressure bands
- No anticipated increase of costs to customers
- Greater network flexibility

Firstgas

Robust CCMP Review and Approval Process



- Firstgas sets a specific CC pressure threshold (within the prescribed ranges) at various locations on the Transmission System and records them in the Firstgas CCMP
- The steps required by the CCM Regulations in updating the CCMP ensure that any threshold change is subject to robust independent scrutiny before being implemented
- All material changes to a CCMP require industry consultation and review and approval by a GIC-appointed "Expert Advisor". CCO also reviews and provides report to Advisor
- Schedule 1 only sets the boundaries in which a CCMP value may be proposed. It does
 not set the failure pressures or time to failures values themselves, as this is only ever
 set by the CCMP process.



Recap of benefits of greater flexibility in setting Critical Contingency thresholds





Customers will benefit from reduced risk and cost

Firstgas

Questions?