

ACTION LIST

The following are actions to be completed after meeting number 27 on Thursday, 20 June 2019.

Action #	Meeting created	Action	Date for completion	Status
1	17	The secretariat is to keep the SRC updated with the progress of Transpower's major capital project for voltage stability issues in the upper North Island. Updates of milestones should be provided until the investment decision is made.	As needed until investment decision made	On hold. Several updates already given. There is material for an update, but for logistical reasons this has been scheduled for the 24 October 2019 meeting.
2	26	Secretariat to prepare a paper that explains what the grid reliability standards are and how they were derived, how they are used, how n-security outages are decided upon and planned for, and includes any available data on the uses of n-security and any related lessons learned.	24 October 2019	On hold.
3	27	Secretariat to recirculate to the members the earlier paper about critical contingency arrangements.	8 August 2019	Complete. Appended to this action/updates item.
4	27	Secretariat to seek an update from the Gas Industry Company to the SRC about information disclosure.	24 October 2019	On hold.
5	27	Chair and secretariat to identify and sort the actions from the annual members' survey for discussion at the next SRC meeting.	8 August 2019	Complete. Included in agenda item #9
6	27	Secretariat to prepare a list of top industry risks (categorised by timeframe in which they can manifest) for the 24 October 2019 meeting.	24 October 2019	On hold.
7	27	Secretariat to compare the outputs of the SRC's 20 June 2019 environment scan with the risk management framework.	8 August 2019	Complete. Included in agenda item #10.

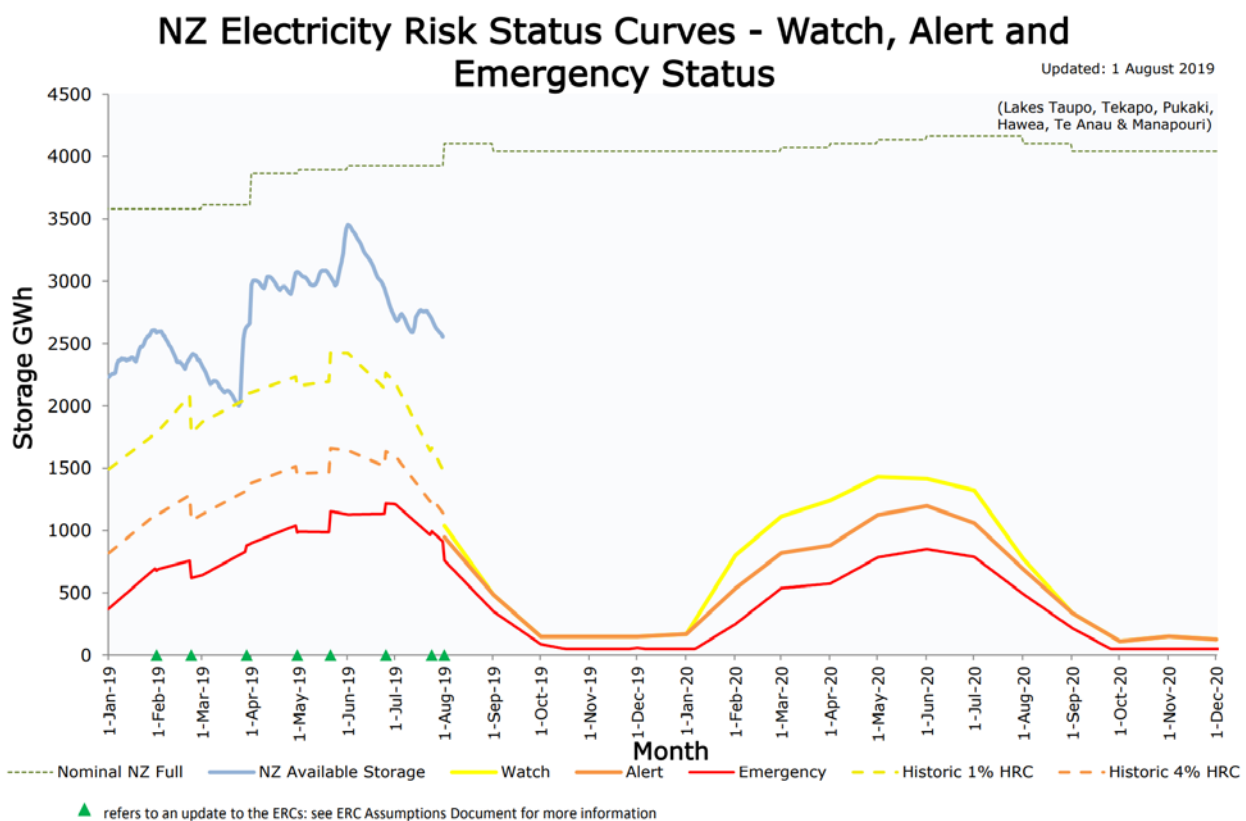
1. Updates

- 1.1. This section provides information on matters that don't warrant a dedicated agenda item, such as updates on matters that have previously been discussed by the SRC.

The current security of supply situation

- 1.2. As at 1 August 2019, New Zealand and South Island controlled storage is above average. The risk meters for the New Zealand and the South Island are set to normal.
- 1.3. An update to the Security of Supply Forecasting and Information Policy came into effect on 1 August 2019. The system operator has updated its methodology and reporting accordingly.

Figure 1: New Zealand-wide electricity risk curves as at 1 August 2019



HVDC and Pohokura outages in March 2020

- 1.4. On 9 July 2019, subscription-content provider Energy News reported that Transpower was examining the viability of moving four bipole HVDC outages during January-April 2020 to instead be held on weekends. This was prompted by analysis from the system operator in their New Zealand Generation Balance report.¹
- 1.5. On 26 July 2019, Energy News reported that those bipole HVDC outages had been moved to weekends, with the new outage dates including 10 and 23 March 2020.²

¹ Source: <https://www.energynews.co.nz/news-story/transmission/43518/hvdc-work-reviewed-tight-supply-margins>

² Source: <https://www.energynews.co.nz/news-story/electricity-transmission/43731/hvdc-outages-rescheduled>

- 1.6. On 30 July 2019, Energy News reported that OMV have announced a complete shutdown of the Pohokura gas production facilities from 11 to 24 March 2020.³
- 1.7. This combination of outages may stress the capacity of the North Island power system to meet peak demand on Saturday 23 March 2020. If hydrology is low in March 2020, the 14 day Pohokura outage may limit the gas-fired generation fleet's ability to mitigate declines in hydro-electric lake levels.

Critical contingency arrangements

- 1.8. Action #3, from the last SRC meeting of 20 June 2019, is for the "Secretariat to recirculate to the members the earlier paper about critical contingency arrangements". That paper is attached overleaf.
- 1.9. That paper is **optional reading** for SRC members. Most members will have already read it and remember the associated presentation from the Gas Industry Company at the 22 June 2018 meeting.
- 1.10. There is no substantive time allocated to discuss the attached paper.

³

Source: <https://www.energynews.co.nz/news-story/maintenance/43763/pohokura-shutdown-scheduled-march>

Meeting Date: 22 June 2018

MANAGEMENT OF CRITICAL CONTINGENCIES IN THE GAS NETWORK

SECURITY AND RELIABILITY COUNCIL

There is over 1700 MW of gas-fired generation in New Zealand, producing ~15% of our annual electricity needs. When the gas network is unavailable, there can be severe flow-on effects to the electricity industry. This paper seeks to promote understanding of the risks and lessons to the electricity industry arising from the gas industry's management of emergency situations.

Note: This paper has been prepared for the purpose of the Security and Reliability Council (SRC). Content should not be interpreted as representing the views or policy of the Electricity Authority.

Management of gas critical contingencies

The Gas Industry Company will present on the management of gas critical contingencies

At its last meeting, the SRC received presentations from:

- John Kidd of Woodward Partners about future gas supply
- First Gas about the management of gas transmission network security and reliability.

A representative from the Gas Industry Company (GIC) will present to the SRC (see attached) about the management of gas critical contingencies. The purpose of the presentation is to enhance the SRC's understanding of the nature of the risks to reliable electricity supply given the dependencies on gas industry arrangements. The GIC have also identified lessons from their experience that may have some application in the electricity sector.

The SRC's secretariat asked the GIC to design the attached slides so they are comprehensive and information-rich. The actual presentation and discussion time on 22 June 2018 will not cover all of the slides and information provided.

Large gas-fired electricity generators

Gas is critically important to New Zealand's electricity industry. It fuels approximately 1,700 MW of large gas-fired North Island generation (or ~40 per cent of North Island peak demand¹) which generated approximately 15 per cent of grid-supplied electricity in 2017².

There are currently three owners of nine large gas-fired generators. They are:

- Genesis Energy, which owns:
 - o Huntly Rankine units (2x250 MW)³ that can also be fuelled by coal
 - o Huntly Unit 5 (403 MW)
 - o Huntly Unit 6 (51 MW)
- Contact Energy, which owns:
 - o Taranaki Combined Cycle (377 MW)
 - o Stratford Peakers (2x100 MW)
- Nova Energy, which owns:
 - o McKee (100 MW)
 - o Whareroa (68 MW)⁴

¹ Assuming: (a) 'large' is a capacity greater than 50 MW; and (b) North Island peak demand was 4,237 MW for 2017. This was sourced from table 14 on page 44 of the system operator's 2018 annual assessment of security of supply.

² Assuming: (a) GWh measured at Huntly (HLY2201), Stratford (SFD2201) and McKee (MKE1101). As such, this includes any coal-fuelled output from the Huntly Rankine units and excludes Whareroa. (b) Final-priced grid generation of 40,560 GWh for 2017. This was sourced from www.emi.ea.govt.nz/r/u5gki

³ Of Huntly Units 1-4, one was completely decommissioned in 2012 and another was put into long-term storage in 2015.

Electricity supply and demand during a gas supply outage

Taranaki is home to 100% of gas production and 44% of gas-fired electricity generation capacity. This means that if the gas transmission network is damaged at a location north of Taranaki, the region south of the damage will usually be unaffected and continue to produce gas and generate electricity.

In the event the entire gas transmission network is unavailable:

- Contact Energy can supply either of its generators with gas directly from the Ahuroa gas storage facility
- Nova Energy's McKee generation is unaffected as its gas is supplied directly from production fields
- The Huntly Rankine units can be run on coal, though Genesis Energy advised the market of its intention to completely phase out the use of coal by 2030.⁵

In the event of gas supply unavailability, it seems reasonable to expect that electricity demand will usually decline.

- While some gas users may be able to substitute gas use with electricity demand, a handful of large users of both gas and electricity (such as the Glenbrook steel mill) would likely need to cease all large-scale operations during a gas supply outage.
- If a gas supply outage forced the electricity co-generation at Whareroa to shut down, the large-scale operations at Whareroa would also cease with a resultant decrease in electricity usage onsite.

Questions for the SRC to consider

The SRC may wish to consider the following questions.

- Q1.** Is the SRC interested in having research completed to better understand electricity demand during gas critical contingencies?

Q2. What further information, if any, does the SRC wish to have provided to it by the secretariat?

Q3. What advice, if any, does the SRC wish to provide to the Authority?

⁴ This is jointly owned with Fonterra.

⁵ The announcement also pledged to phase out coal usage under normal market circumstances by 2025. Gas supply unavailability would clearly be abnormal. Refer <https://www.genesisenergy.co.nz/about/media/news/genesis-establishes-a-pathway-to-a-coal-free-elect>



GAS CRITICAL CONTINGENCY MANAGEMENT: PRESENTATION FOR SECURITY AND RELIABILITY COUNCIL

DATE:

22 June 2018



Agenda

1. Overview of critical contingency management
2. Interface with the electricity system
3. Lessons

Gas Governance (Critical Contingency Management) Regulations 2008 are designed to protect the gas system

- Gas is different from electricity:
 - It can be stored (via linepack); but
 - Consumers can't be remotely disconnected
- For gas to flow in pipelines requires sufficient pressure to “push” it along
- If pressure drops below safe threshold, gas will not flow
 - Consumer sites effectively decommissioned
 - Remedy is to purge networks and recommission customer sites – would take months
- Imperative to keep safe pressures in the networks
- Purpose of Regulations:
to achieve the effective management of critical gas outages and other security of supply contingencies without compromising long-term security of supply

The Critical Contingency Operator (CCO) manages (most) contingency events

The CCO:

- Monitors pipeline conditions
- Declares a critical contingency if pipeline parameters fall below specified thresholds
- Issues directions for demand curtailment
Cascade of directions: CCO to transmission system owner to large users & retailers, then retailers to their consumers
- Gives directions to restore demand once pipeline pressures are stable

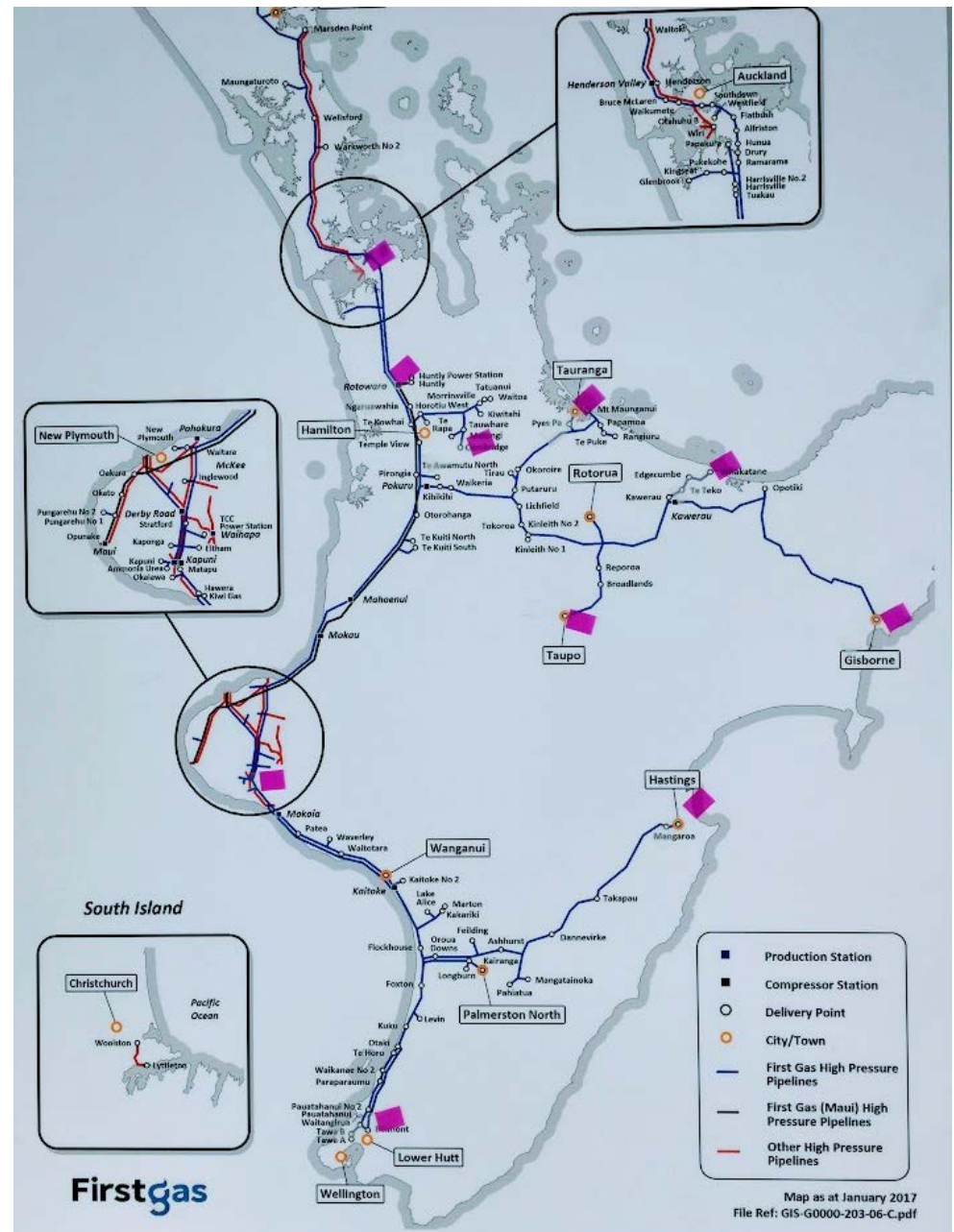
The Civil Defence Emergency Management Act 2002 overrides the CCM Regulations

Pipeline thresholds are specified in terms of minimum pressure and time ...

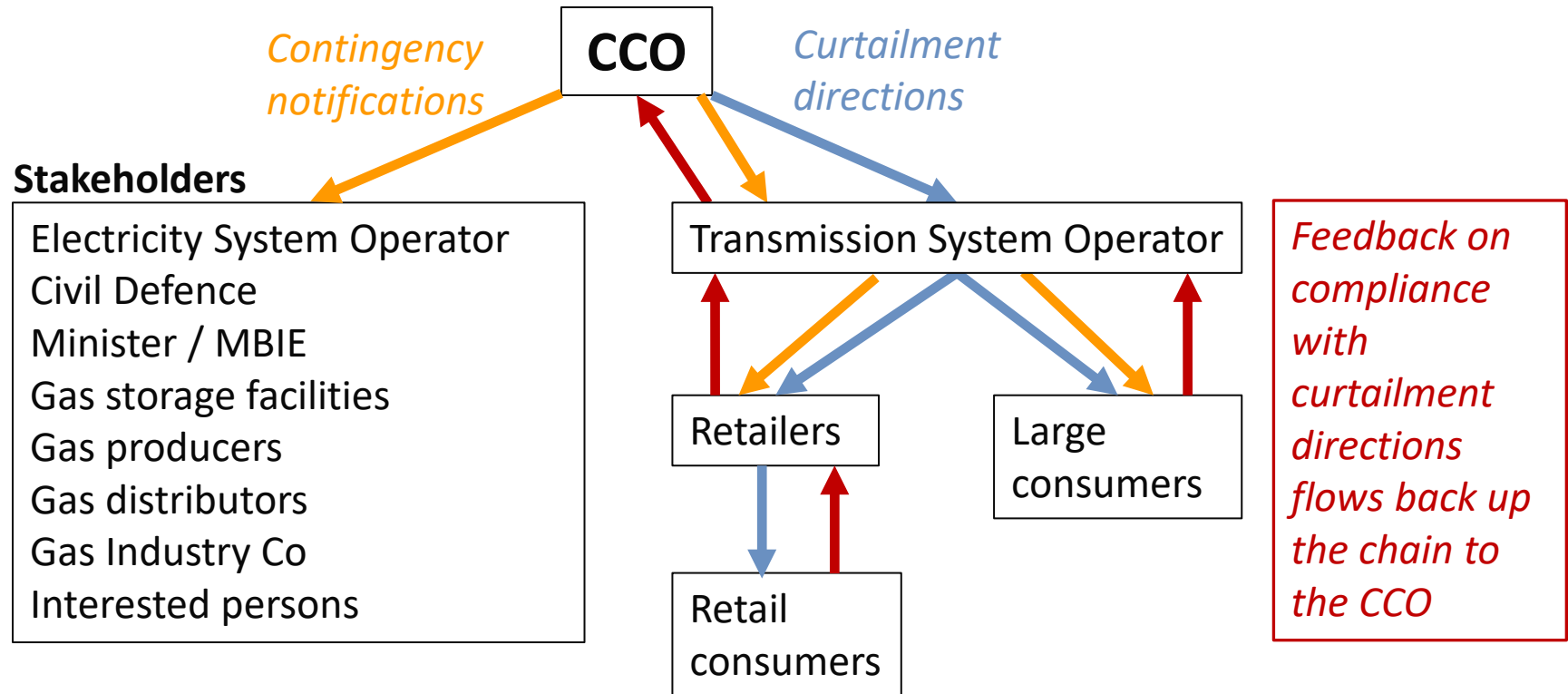
Point of Measurement	Minimum pressure ($P_{\min}$) (barg)	Threshold time (hours to reach $P_{\min}$)
Rotowaro	32.0	3
Any other Maui gas gate	30.0	3
Waitangirua	37.0	10
Hastings	32.0	5
KGTP	37.5	3
Gisborne	30.0	5
Taupo	30.0	5
Tauranga	30.0	6
Whakatane	30.0	5
Cambridge	32.0	5
Westfield	42.0	3
Whangarei	25.0	5
Any other non-Maui gas gate	30.0	5

... and are located at the extremities of the transmission system

- Monitored locations at ends of transmission pipelines –
- – plus Kapuni Gas Treatment Plant, which is the start of the South system
- Regulations provide no room for discretion: CCO must declare a contingency if a threshold is breached or is unavoidable



Contingency notices and curtailment directions cascade from CCO to TSO to retailers



Objectives of the curtailment arrangements

- Ensure gas is supplied in a safe, efficient, and reliable manner
- Minimise net public cost
- Prioritise the supply of gas for essential services and critical care
- Allow for gas to be used to complete critical processing
- Allow for gas to be used to fuel certain electricity generating units
- Ensure efficient utilisation of gas in storage facilities
- Ensure effective operational management of a critical contingency

(as laid out in section 1 of Schedule 2)

Consumers are classified into curtailment bands by consumption volume; largest consumers are curtailed first

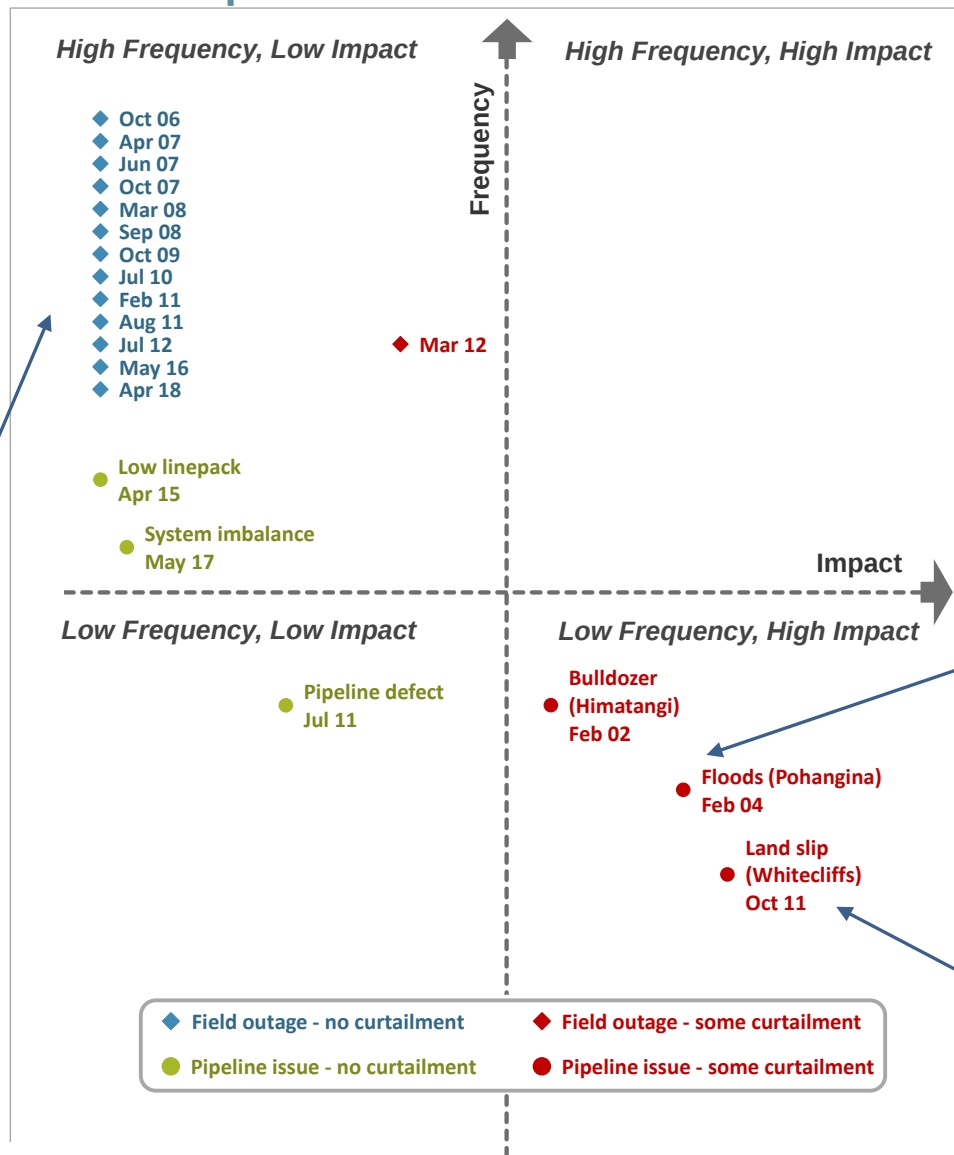
Curtailment Band	Consumption	Description	Customer Numbers
0		Gas storage	1
1	>15TJ/day	Consumers with alternative fuel capability. Huntly Power Station (Rankine units)	1
2	>15TJ/day	Consumers without an alternative fuel capability. Petrochemicals and other thermal generators: TCC, Te Rapa, Stratford peaker, Huntly e3p and P40	8
3	>10TJ/annum	Industrial and commercial consumers Eg: steel, timber, oil refining, dairy, meat, etc	350
4	250 GJ – 10 TJ	Smaller industrial and commercial consumers	5,000
5	> 2TJ	Essential service providers Eg: mortuary services, sewage processing, emergency services	5
6	<250 GJ	Small commercial consumers	11,300
7	Any	Critical care providers Eg: hospitals, residential care facilities	200
DOM		Can only be asked to conserve	267,000

As at May 2018

Severity of a critical contingency – and need for curtailments – depend on the cause



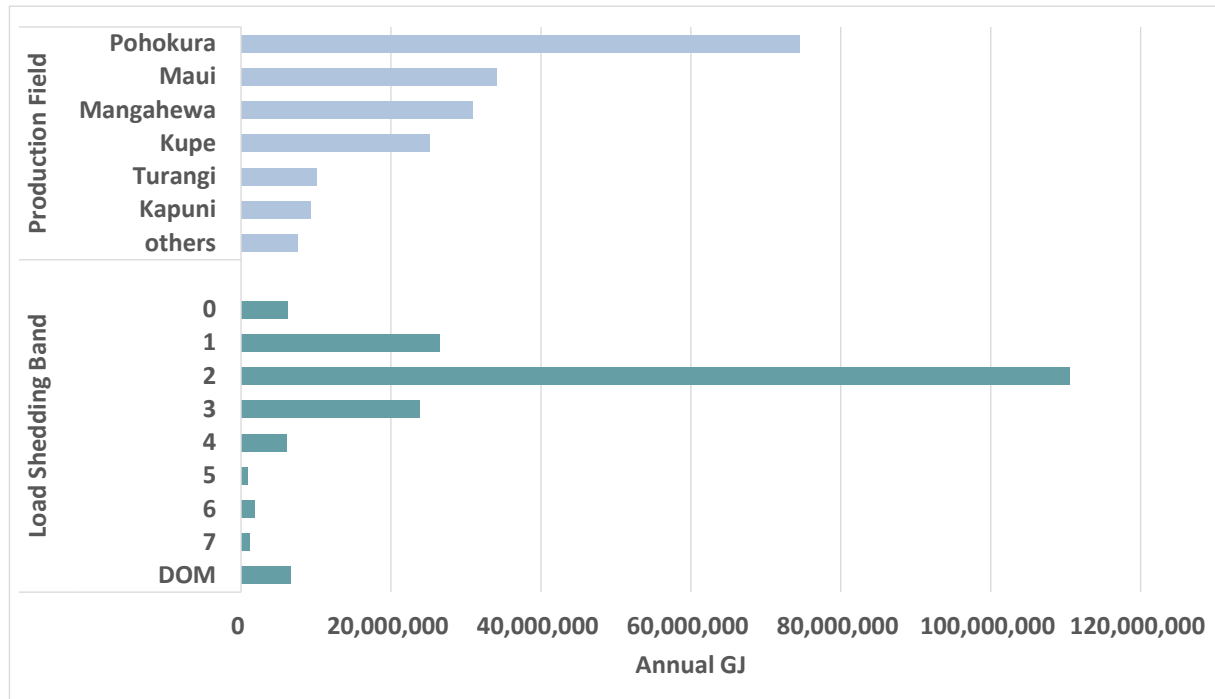
Production station outages affect the whole system; curtailment may not be needed (or just the largest consumers)



Pipeline damage events are localised; generally require deep cuts to gas consumption



Most production station outages can be managed by curtailing large industrial consumers only



- Chart shows annual volumes as a proxy for average daily volumes
- Generally, an outage of any single production station can be managed by curtailing bands 0 to 2
- Multiple outages would require deeper cuts

Agenda

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Electricity supply designation can modify curtailment arrangements

An electricity supply designation can be approved if the consumer requires a specified amount of gas for a specified period of time to:

- Provide fuel to synchronise a generating unit and meet obligations under an ancillary service arrangement
- Start up a generating unit so that it can switch to an alternate fuel
- Allow time for a generating unit already running on gas to switch to an alternate fuel

CCO is required to liaise with the Electricity System Operator

In the event that a curtailment direction is or may be given in respect of curtailment band 1 (Rankine units) or band 2 (remainder of thermal generation), the CCO must:

- Consult the electricity system operator on any need for an electricity supply designated consumer* to use gas
- Have regard to the objectives of the curtailment arrangements (listed above in slide [8](#))
- Determine whether to allow such gas usage

If they would otherwise be curtailed, electricity supply designated consumers may use gas only in accordance with:

- o their designation profile; and
- o a determination by the CCO

* Note that designations must be secured ahead of time; they cannot be granted during an event

Band 1: If a serious contingency, Huntly will be one of the first curtailed

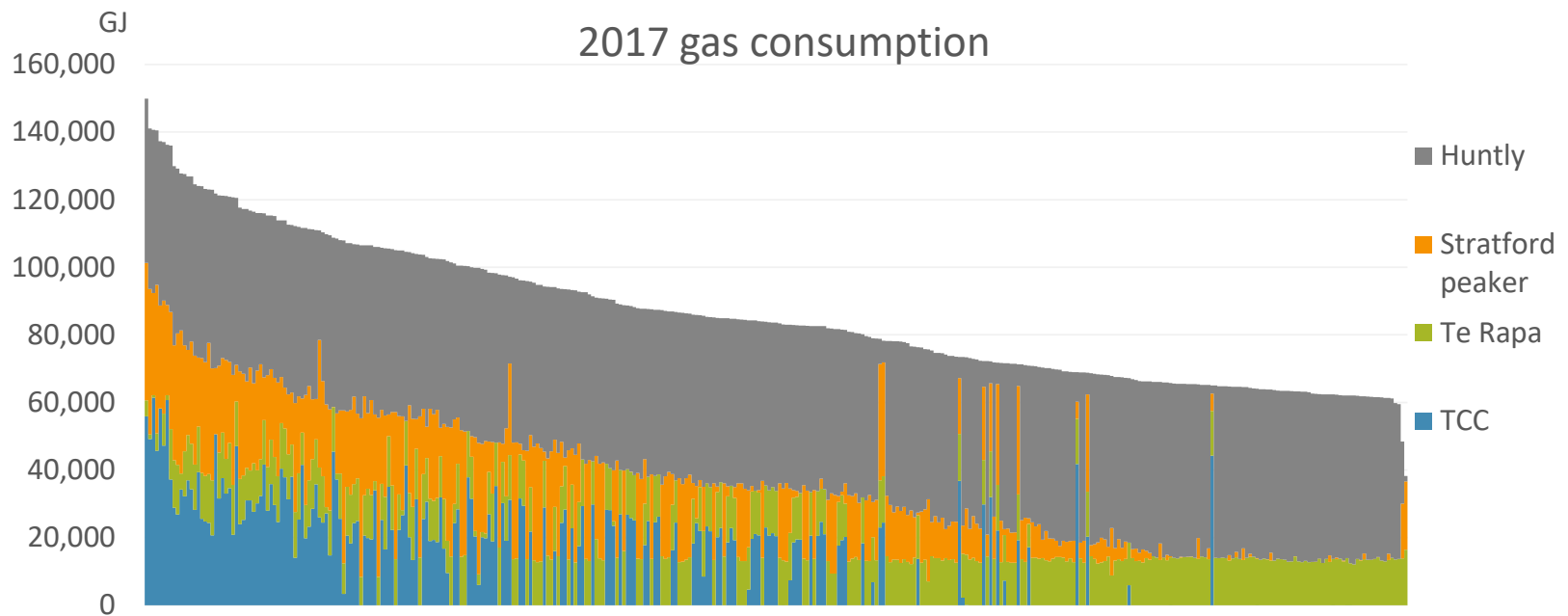
- Huntly Rankine units are in Band 1, with an Electricity Supply Designation
- Designation covers the Rankine units under different scenarios:

Scenario	Maximum gas needed	Duration
Already running, high load	2,000 GJ	1 hour
Already running, low load	685 GJ	1 hour
Hot start	1,000 GJ	3 hours
Cold start	1,200 GJ	12 hours

- Expiration date of designation: 16 December 2018; can be renewed if no material changes

Band 2: other thermal generators

- Huntly units 5 and 6 (e3p and P40)
- Te Rapa cogen
- Taranaki Combined Cycle (TCC)
- Stratford peakers



Some generation not subject to curtailment by the CCO, because not fed by transmission system

McKee: Todd Energy's 2 x 50MW peakers

- Gas for this plant comes directly from McKee/Mangahewa, does not travel through transmission system

Contact's TCC (385 MW) and Stratford peakers (2 x 100 MW)
(when fuelled by offtakes from Ahuroa gas storage)

- (combined generation limited by Ahuroa's withdrawal rates; can only run one at a time)

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What we've learned along the way

- Regulations trump voluntary agreements
- Limiting discretion in required actions can provide certainty
- Separate roles for crisis management and asset management ensure each gets the focus it needs
- Good communication is key; in particular:
 - Front the media and tell a consistent story
 - Make sure the Minister and officials are well briefed
- Preparation and practice
 - Pre-prepared templates for notices, reporting, media releases
 - Liaison meetings (CCO and TSO must work together efficiently)
 - Annual exercises

Backup slides

Where to find information

- OATIS
oatis.co.nz
No login needed

Firstgas
MAUI

OATIS

Open Access Transmission Information System

Tuesday, 4 April 2017 12:34 p.m.

Login to OATIS

Username *

Password *

Login Change Password

Forgotten your password? Please call OATIS Support on 09 913 7780

Public Information Exchange

To open the Public Domain Information Exchange (including public notices), click on the buttons below.

Public Websites

To access the individual Maui, First Gas or Critical Contingency Operator (CCO) websites, click on the links below.
For MAUI visit (<http://www.mauipipeline.co.nz>)
For First Gas visit (<http://www.firstgas.co.nz>)
For Critical Contingency Operator (CCO) visit (<http://www.cco.org.nz>)

- OATIS
oatis.co.nz
No login needed

maui **OATIS** Open Access Transmission Information System
Tuesday, 4 April 2017 11:54 a.m.

Home Publications Contact Us Terms Of Use Site Map Help Login

Maui Home - Daily Operational Information
Tuesday, 4 April 2017

Critical Notices Notice Search

Other Notices Notice Search

[Data Incorrect: Total Calculated Linepack: Intraday 1: Tuesday 4th April 2017 is 305,300 GJ](#)
[AEOL / Section 12 Settlement Notice](#)
[AEOL / Section 12 Settlement Notice](#)
[AEOL / Section 12 Settlement Notice](#)
[Monthly Reminder - Please Review Contact Details](#)

Current Pipeline Conditions

Pipeline Name	Pipeline Condition
Maui	Normal

Pipeline Operational Information
Transmission Day : 4/04/2017

Calculated Taranaki Target Pressure (BarG)	36.7
Indicative Pipeline Capacity North of Mokau (GJ)	330000
Daily Contingency Volume (GJ)	45000
Real Time Contingency Volume	94046

Fees And Tariffs

Negative Mismatch Price	4.068500
Positive Mismatch Price	3.831500
Tariff One	0.001578
Tariff Two	0.072061

Details Page Links
Click the title to open the graph and details page

- [Linepack Graph and Details Page](#)
- [Hourly Pressure Graph and Details Page](#)
- [Station Metering Graph and Details Page](#)
- [Gas Composition Details Page](#)

Nomination Cycle Indicators

	Week Prior - Before set time below on the last business day of each week	Day Prior - Before set time below on the day before Transmission Day	Intra Day 1 - Before set time below on the day before Transmission Day	Intra Day 2 - Before set time below on Transmission Day	Intra Day 3 - Before set time below on Transmission Day	Intra Day 4 - Before set time below on Transmission Day
	Provisional	Changed Provisional	Intra Day 1	Intra Day 2	Intra Day 3	Intra Day 4
Nominations due	16:00	16:00	22:00	10:00	14:00	18:00
Confirmation due	17:00	16:30	22:30	10:30	14:30	18:30
Approved due	18:00	17:00	23:00	11:00	15:00	19:00

Exit

Need more information?

Resources available on cco.org.nz

Under Publications tab	
CCO Information Guide	How CCO will communicate with stakeholders during a critical contingency
CCO Communications Plan	How CCO will communicate with transmission system owner during a critical contingency
First Gas Critical Contingency Management Plan	Sets out transmission system parameters, actions First Gas may take in a critical contingency, and how First Gas will communicate with CCO in a critical contingency
Transmission system map	Includes threshold pressures
CCM Regulations	
Under Historical Events tab	
Notices and reports from previous critical contingencies and annual exercises	