Gas Industry Co Guidelines for determining regional critical contingencies

Date issued: 28 February 2014

GAS INDUSTRY COMPANY LIMITED

189309.4

Regional critical contingency guidelines

1. Getting the incentives right

The CCM Regulations include arrangements for settling "inadvertent trades" among shippers and welded parties (regulations 67-r82). These inadvertent trades occur because the order of curtailment is largely determined by customer size; i.e., the order of curtailment does not take into account whether a customer's supplier has gas available or not.

As a result, there will be situations where end-users are curtailed but their supplier had nominated gas to meet their customers' needs and that gas is still flowing (the supplier is "long" on gas in the system). Similarly, there will also be situations where a gas supplier no longer has access to gas (e.g. the production station has failed) but a number of its customers continue to consume gas as they are in bands that have not been directed to curtail (the supplier is "short" on gas in the system).

If a supplier that is long on gas were to correct that situation by reducing its nominations of gas into the system, then that would reduce gas supply into the system, which would have the effect of making the critical contingency worse. A critical contingency arises because demand exceeds supply. What such situations require is a means to incentivise those who are long on gas to maintain —or even increase — supply where such actions are possible. This is done in the CCM Regulations through provisions for contingency imbalances and the contingency price. After the critical contingency is over, those who are long/short on gas (holding positive/negative contingency imbalances) stand to receive/pay money for their contingency imbalances at the contingency price.

The contingency imbalance arrangements thus provide a means of incentivising suppliers who are long to maintain their nominations. Absent that incentive, such parties would have no reason to continue supplying gas into the system (for their own customers that have been curtailed), which would worsen a critical contingency.

2. The purpose of regional critical contingencies

In most critical contingencies, the existence of the contingency imbalance provisions provides the right incentives for parties injecting gas into the transmission system. However, there are circumstances where the contingency imbalance provisions do not serve any useful purpose. Those circumstances are regional critical contingencies.

Regional critical contingencies, generally speaking, are those in which it is not possible to increase the amount of gas flowing into the affected transmission area. The most obvious example of a regional critical contingency is one where a transmission pipeline has been damaged, the mainline valves surrounding the damaged section have slammed shut and the portion of the transmission system downstream of the break has no gas coming in. Under those circumstances, there will be no gas coming into the affected section of the pipeline. It follows that the contingency imbalance

arrangements would have no purpose in such instances, as there is nothing any producer or shipper can do to increase the volume of gas in the affected section of pipeline. Therefore, contingency imbalance arrangements do not apply in such circumstances.

The CCM Regulations define a regional critical contingency (r45(1)) as:

> …a critical contingency characterised by—
>
> (a) a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system; and
>
> (b) complete or partial isolation of that part of the transmission system from any significant source of gas supply.

Regulation 82 specifies that the regulations to calculate, set a price for, and settle contingency imbalances do not apply to a regional critical contingency.

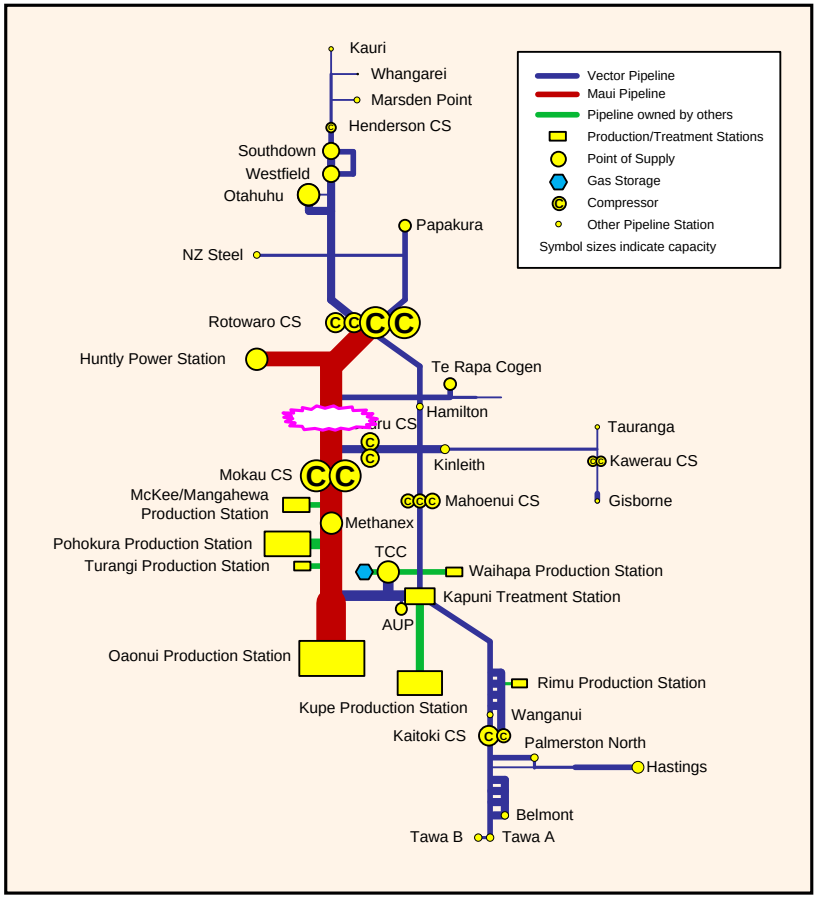
Thus, the purpose of defining a regional critical contingency is to ensure that the contingency imbalance arrangements are not operative in circumstances where they are not needed. It follows that, in circumstances where it is not immediately clear whether one or both legs of r45(1) are satisfied, it will help to consider whether contingency imbalance arrangements would assist. If the contingency imbalance arrangements do not appear to help with managing the situation, then that may indicate that it is a regional critical contingency.

3. Guideline scenarios

The scenarios and their conclusions are intended to provide guidance to the CCO in making its determination, in a live critical contingency, on whether a regional critical contingency exists.

Three of the scenarios focus on situations that involve a loss of transmission capacity, and the fourth considers a situation involving a natural disaster that interrupts supply from two major production stations.

Scenario 1: Maui pipeline damaged north of Mokau compressor



Features.

- The damaged portion of the Maui pipeline is isolated to allow repairs to be effected.
- No gas is being injected into the pipeline north of the isolated section and pressures in that northern section are falling rapidly
- Given the time needed to effect repairs, extensive curtailment will be required.
- Gas continues to flow in the Maui pipeline south of the isolated section. This will mean that the valve on the Vector pipeline at Temple View (near Hamilton) that is normally closed could be opened to allow some gas to flow north to Hamilton and Auckland.

Analysis

Option 1: the valve at Temple View remains closed

If the valve at Temple View remains closed

Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	Yes: the transmission system north of the damage experiences a total loss of supply
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	Yes

Clearly, under this option, scenario 1 is a **regional** critical contingency.

Option 2: opening the valve at Temple View allows gas to flow north

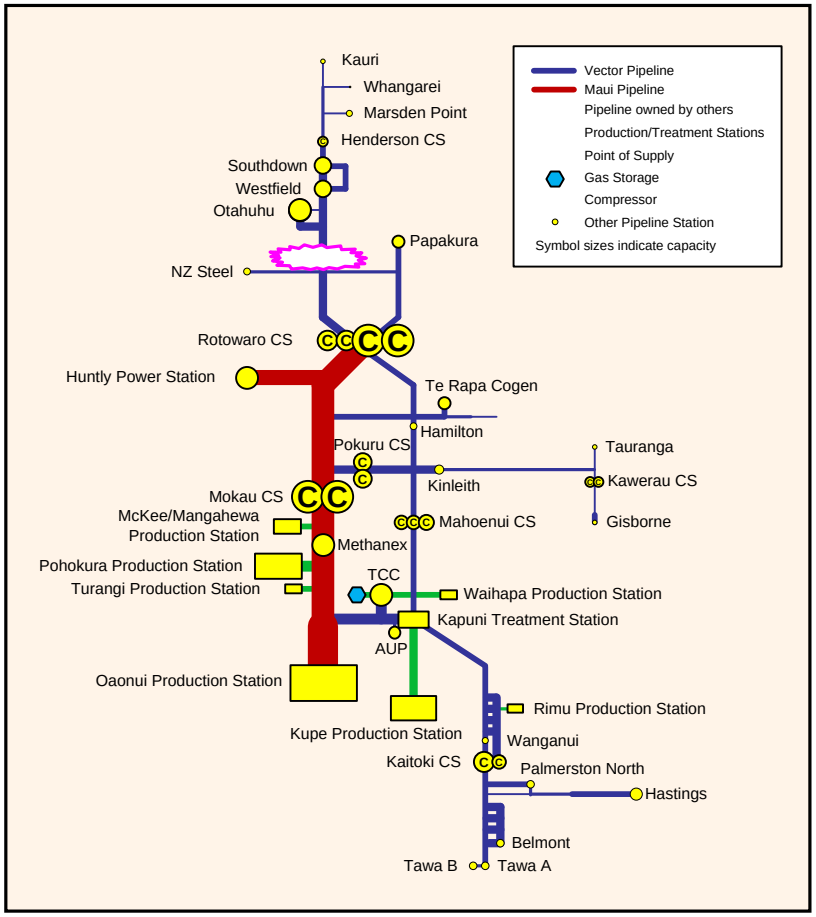
By opening the valve at Temple View, gas is able to flow north to Auckland via the Vector 200 pipeline. That means there is some supply north of the break in the Maui pipeline but that supply is very limited as the 200 pipeline can supply only a fraction of the normal deliveries from the Maui pipeline (in the order of 15%).

Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	Yes
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	Yes – the 200 line cannot be considered significant relative to the capacity of the Maui pipeline

Thus, scenario 1 is a **regional** critical contingency under this option as well.

Scenario 2: Vector North pipeline damaged north of NZ Steel offtake

The schematic below shows that the damage to the North pipeline is located in South Auckland.



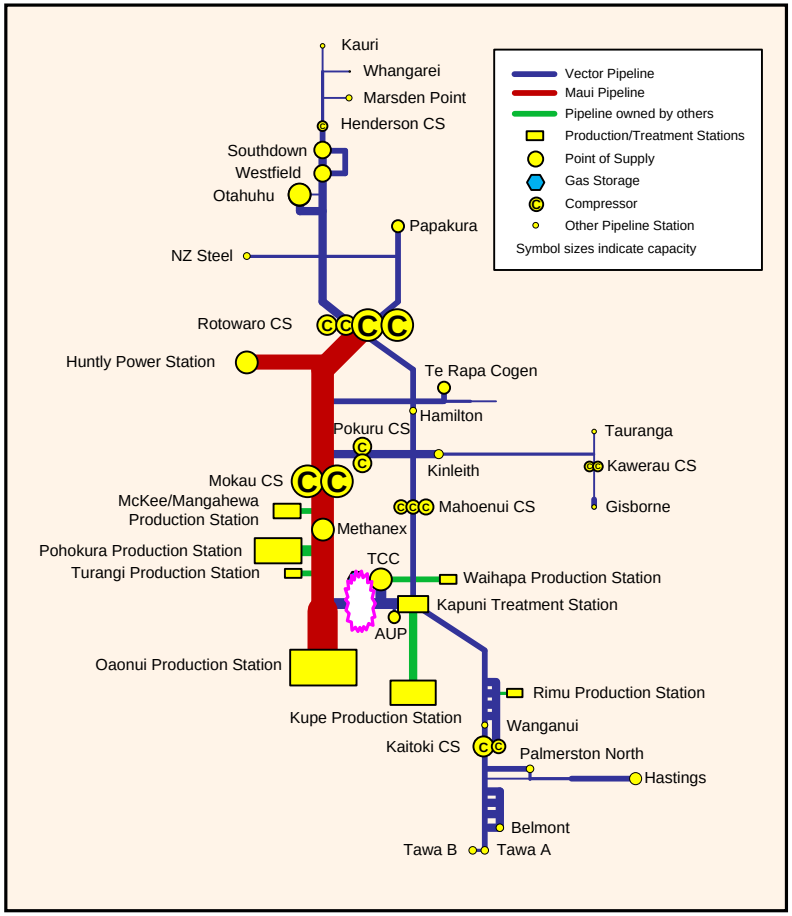
As can be seen from the schematic, there are no pipelines that bypass the damaged and isolated section. As a result, and due to the small amount of linepack in the north system, very rapid curtailment would be required so as to ensure that the distribution networks in Auckland and points north did not become depressurised.

Analysis

Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	Yes
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	Yes

Scenario 2 is clearly a **regional** critical contingency.

Scenario 3: Frankley Road pipeline damaged



This scenario assumes that the flow from Kupe was northward prior to the incident (since Kupe's production volumes are larger than the load south of Kupe). The entire system would be affected: the loss of Kupe gas to points on the Maui pipeline and north would pose a significant loss of supply to those parts of the transmission system; and the transmission system south of the damage would lose supply from Oaonui, Pohokura, and the other production stations north of the break.

It is likely that such a scenario would not lead to a critical contingency, as actions by large consumers and/or MDL's Commercial Operator would be likely to prevent the decline in pressure needed for a critical contingency to be declared.

However, there is still a chance that a scenario like this would result in a critical contingency, so it is useful to consider how it would be classified.

Analysis

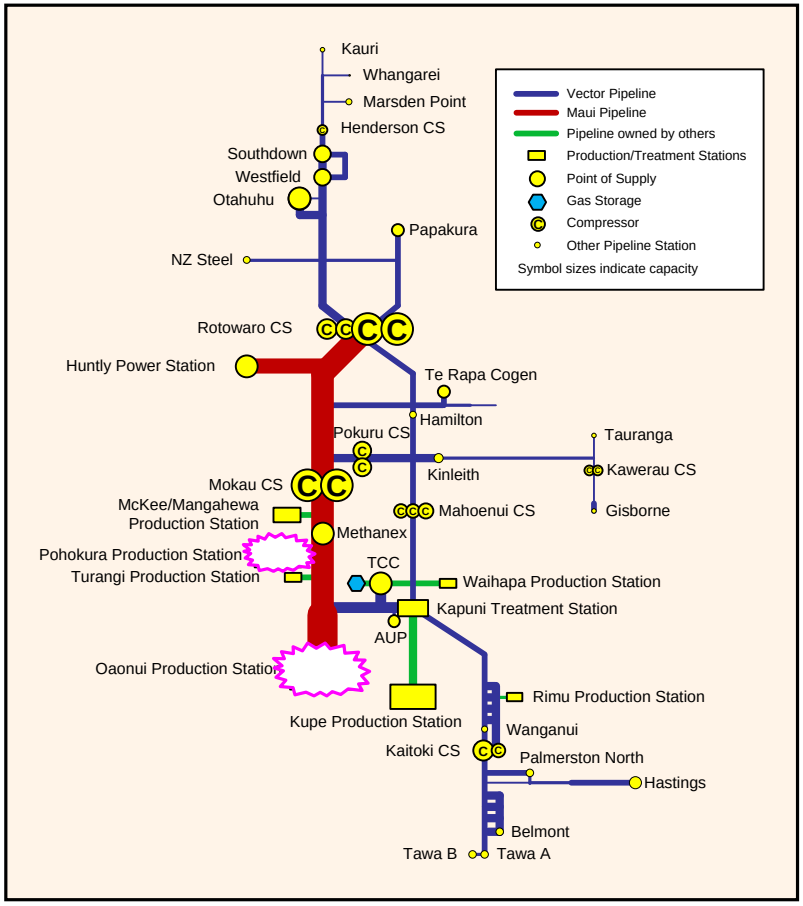
Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	No. The entire system would be affected.
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	No: Oaonui and Pohokura production stations, as well as smaller fields, would still be able to supply the north part of the transmission system; Kupe and Kapuni can supply the south

Additionally, it is useful to consider whether the use of contingency imbalances would be useful in this situation. If a critical contingency were declared, it would be helpful for Oaonui, Pohokura, and the other production stations north of the break to continue supplying gas, even if their customers were south of the break. Similarly, it would be helpful for Kupe to continue supplying (at least some) gas to the transmission pipeline south of the break, even though its customers might be north of the pipeline break. Contingency imbalances in this situation would incentivise the producers (or their contracted customers) to keep supplying gas and would serve as a means to settle the resulting inadvertent trades between producers/wholesalers and shippers.

Scenario 3 is **not** a regional critical contingency.

Scenario 4: Earthquake affecting gas production

This scenario assumes that a major earthquake has interrupted the supply of Maui and Pohokura gas but the integrity of the transmission system is not affected.



Gas from Pohokura and Maui accounts for about 60% of receipts into the transmission system. As a result, losing both of those sources will leave a significant shortfall and precipitate a critical contingency.

There are, however, a number of fields that could continue to produce and supply gas into the transmission system.

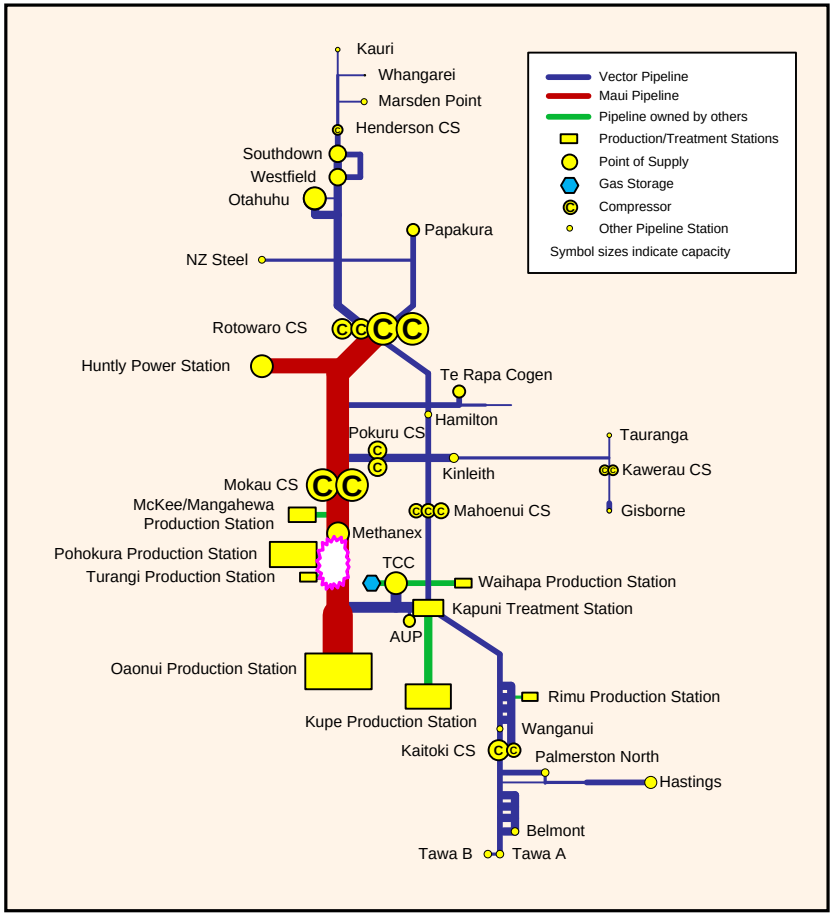
Analysis

Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	No: the entire system would be affected
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	No. the transmission system will continue to receive gas into the pipelines.

Scenario 4 is **not** a regional critical contingency.

This conclusion is consistent with the fact that in such a scenario, the contingency imbalance regime would serve a useful purpose: the parties with contracts with the remaining fields supplying gas into the system are not necessarily the same set of parties whose customers have not been curtailed. Thus, there will be a need for a system to wash-up the inadvertent trades that will occur.

Scenario 5: Pipeline damage at Tikorangi



Features

- Pohokura, Kowhai, Turangi unable to supply gas into the pipeline
- No gas injection north of the break
- South of the break, Oaonui, Kupe, and Kapuni are able to keep operating.
- Demand curtailment would be required in the north
- The transmission system south of the break would also be affected, as it will have lost the supply from Pohokura and other fields, but curtailment probably won't be required.

Analysis

Has there been a substantial reduction to, or total loss of, the supply of gas to a part of the transmission system? (r45(1)(a))	No. The entire system would be affected.
Is there complete or partial isolation of that part of the transmission system from any significant source of gas supply? (r45(1)(b))?	No: Oaonui, Kapuni, and Kupe are still able to supply the system south of the pipeline break.

In this situation, it is likely that there would be some consumers south of the pipeline break who normally would receive their gas from Pohokura. Although these customers may not be curtailed in this scenario, their continued consumption would effectively be supplied through producers that they – or their retailers – would not have a contractual relationship with. Therefore, the use of contingency imbalances would serve as a mechanism for settling these inadvertent trades.

Scenario 5 is **not** a regional critical contingency.