

18 August 2020

Submissions  
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## **Consultation on Undesirable Trading Situation (UTS) Preliminary Decision**

### *Introduction*

1. Contact welcomes the opportunity to submit on the Electricity Authority's (the Authority) preliminary decision on the Undesirable Trading Situation (UTS). Contact was surprised that a UTS claim was lodged, does not agree with the claim, and disagrees with the allegations.
2. The UTS claim covers a period when significant flooding occurred in the lower South Island. Contact manages New Zealand's largest run of river system, a highly volatile catchment with limited ability to store water.
3. Safety of our dams, people, plant and local communities is Contact's paramount concern. During such times, Contact must balance safe and sensible generation in real-time with the safety of our plant, people, downstream communities we operate in, our consents, and managing the health of the river.
4. At all times during this event, Contact's focus was to prudently manage these risks. For that reason, we believe that our actions did not threaten confidence in, or the integrity of, the wholesale market.
5. Contact supports the Authority's detailed analysis which identifies that Contact was unable to maximise generation, spilling water was necessary to manage flood conditions, and that Contact's Quantity Weighted Offer Prices (QWOP) reduced over time, consistent with the Authority's expectations. We are pleased the Authority has recognised the paramouncy of safety of people and communities in its decision. At all times, but particularly in flood circumstances, this extends to limiting stress on key safety equipment in plant, such as automated spill gates.

### **Managing Clutha hydro generation during flood conditions**

6. Contact's generation capacity was necessarily reduced during the UTS period. This resulted in spill to manage the flooding situation. We agree with the Authority's analysis (set out in pp. 60 – 67 of the preliminary decision) which identified the necessary actions Contact took to manage:
  - **Excess flows** – Clutha flows exceeded maximum generation capacity. Our maximum generation is exceeded when inflows are greater than 920-980 cumecs at Clyde or 825-

900 cumecs at Roxburgh. During the flood, the Clutha flow was between 1190 – 1760 cumecs;

- **Outages** – capacity was reduced as a result of planned outages, forced outages, and screen cleaning; and
- **Regulatory consent requirements** - required flushing and table discharge.

Further detail is set out in Annex One.

7. The preliminary decision identifies that Contact offered high priced tranches during the flood, resulting in significant spill overnight.

*“...although QWOP fell, Contact offered high priced tranches throughout the flood. Contact’s offers meant it was dispatched at lower levels overnight, meaning this is when most spill occurred. These higher priced offer tranches are not consistent with what we would expect from a spilling hydro generator, and the high overnight offers are inconsistent with the screen cleaning and gate operations...”<sup>1</sup>*

*“At Clyde and Roxburgh offers were structured so that less generation was dispatched overnight. Because of the Clutha Flood rules settling the total river flow, this means more spill was happening overnight. This action would have contributed to spot prices not falling to low levels overnight. This appears to be independent of the screen cleaning and gate operation issues set out above.”<sup>2</sup>*

8. The Authority appears to be concerned with the price outcomes arising from Contact’s offer strategies. As we will further explain, these actions during extreme weather events were necessary to reduce the marginal operation of generation assets overnight to maintain stable lake levels and ensure steady flows.
9. Given consent requirements to maintain stable flows, and the negative impact for operating generators on the margin, we believe these high priced offer tranches are consistent with a hydro generator that is operating a run of river hydro scheme during a flood.
10. Our goal to maintain stable river flows is directly linked to minimising marginal running and reducing automated spill gate operation. Contact’s overnight offers were consistent with the flood rule requirements and gate operation issues that the Authority identified in their preliminary decision.

#### *Avoiding marginal operation during flood conditions*

11. Contact minimises operating at the margin with Clyde and Roxburgh hydro generation during flood conditions to maintain stable flows in the Clutha catchment under Contact’s Flood Rules agreed with the Otago Regional Council, minimise damage to plant, particularly our equipment that is paramount to dam safety; and to ensure the safety of people and the communities that we operate in.

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<sup>1</sup> Electricity Authority, *The Authority’s preliminary decision on claim of an undesirable trading situation*, 30 June 2020, p.72.

<sup>2</sup> *ibid*, para 12.52.

12. Contact's spill and sluice gates cannot respond as quickly as other generators can when they are marginal. Marginal running can exacerbate changes in lake levels and river flow. During this flood event, the spill-gates at Clyde operated over 13,000 times, exceeding the engineering design of these spill gates. To reduce the number of set point changes on both the generators and sluice gates, it was necessary to reduce marginal running.
13. With lower demand overnight in the lower South Island, and limited ability to export power out of the region, there was a very high probability that Clutha generation would be dispatched on the margin for the majority of trading periods if offer prices were too low. The lower volumes dispatched are consistent with limited marginal operation.

*Transmission constraints exacerbate marginal operation risk*

14. In flood conditions, the Clutha assets are in a transmission constrained region for exporting power. Uncertainty of future spot market conditions limit an operator's ability to absolutely maximise generation without putting the plant on the margin. This uncertainty is driven by demand forecast errors, wind generation forecast errors, uncertain competitor behaviour and dynamic transmission constraint equations. Running an ex post market solve with perfect foresight ignores the reality of dealing with flood conditions in real time.
15. The ability to export generation from the lower South Island (LSI) to the rest of the South Island is restricted due to the limited export capacity of transmission lines. Contact has worked with Transpower over the last seven years to increase this capacity by approximately 120 MW through instigation of two special protection schemes. However export limitations remain, particularly in summer months when constraints on the transmission system are greater.
16. In an unconstrained market, a dispatch trader can avoid having plant on the margin by offering all available fuelled capacity at a very low price ensuring that a higher priced generator will be the marginal generator.
17. This is not the case for the Clutha assets during a flood event due to the total available generation in the LSI being greater than total demand (including the ability to export power out of the LSI). If Contact had offered all Clutha generation at a low price, it is likely the Clutha assets would have been the marginal generator within the LSI for the vast majority of trading periods over this period.
18. Forecasting in any given trading period when or if the LSI transmission limit will bind is difficult due to errors in forecasting other generators offers, variable wind output, variable demand, inclement weather conditions (such as lightning strikes) and variable transmission constraint equations. In these circumstances the dispatch trader seeks to maximise generation whilst avoiding operating on the margin.

*Meeting High Standards of Trading Conduct*

19. The only other option to increasing spot prices to limit marginal running would be removing capacity from the offer. This risks inconsistency with the High Standard of Trading Conduct (HSOTC) rules under section 13.5 of the Code:

*13.5B(1) A generator complies with clause 13.5A if - (a) the generator makes offers in respect of all of its generating capacity that is able to operate in a trading period.*

20. Contact has met the HSOTC during this period by offering all available capacity, changing offers in a timely manner, and providing consistent offer behaviour.
21. For these reasons, higher priced offers were necessary to prevent the marginal operation of Contact's Clutha generation assets, and are consistent with other operational requirements such as screen cleaning, flushing and gate operations.

### **Regulatory Consistency and Certainty**

22. The Authority preliminarily concludes that the price outcomes in the period from 3 to 18 December 2019 threaten or could threaten confidence in the spot market and more generally in the hedge market and therefore constitutes a UTS. In its preliminary decision, the Authority defined the period where a UTS occurred as when Meridian had no storage capacity at Pukaki or Tekapo but made the decision to spill rather than lower prices.
23. In reaching its preliminary decision that a UTS had occurred, the Authority was particularly influenced by Meridian's offering in such a way to ensure that the HVDC was not constrained, which prevented price separation between the North and South Islands. In the period in question, offers were higher than expected as there was no storage available: reservoirs were full and all South Island generators at different times were spilling. This suggests that the fuel value for hydro-generation was very low, if not zero.
24. However, wholesale spot prices did not reflect these demand and supply conditions:

*when all South Island hydro stations are spilling, we would expect low South Island offer prices and separation as transmission becomes constrained. This should lead to lower prices in the South Island than the North Island, along with material intra-island and inter-island separation.<sup>3</sup>*
25. In May 2017, Meridian adopted a similar offer strategy and this was not found to be a UTS:

*There is evidence that a similar approach is also used by other industry participants to manage the risk of financial loss when faced with similar scenarios of basis (or locational) price risk. That this type of offer behaviour has occurred regularly in the past, without creating a UTS, suggested that the behaviour alone was not sufficient to warrant a UTS finding.*
26. Similarly Meridian's offer behaviour in 2017 was not referred to the Rulings Panel for investigation under the HSOTC provisions of the Code. The Authority acknowledged that the trading rules were not clear, and as a consequence the Market Development Advisory Group (MDAG) was tasked with reviewing the Code in this area. That work is ongoing.
27. As part of its research, the MDAG commissioned a report from Concept Consulting<sup>4</sup> which highlighted the degree to which industry participants engage in the behaviour now found to

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<sup>3</sup> *ibid*, para iv.

<sup>4</sup> Concept Consulting, *Review of impact of trading conduct enforcement action on spot prices*, August 2019

have undermined confidence in the spot and hedge markets. The Concept report said that instances of inter-island price separation have not changed substantially since the Authority's decision in May 2017.

28. This raises a question as to whether the current conduct is outside the normal operation of the wholesale market, as required for a UTS.

*Changes in competitive pressure is not necessarily a UTS*

29. Over the period in question, competitive pressure in the spot market remained. All parties were competing to trade off volume and price. However the competitive dynamics that would ordinarily occur differed, as a result of South Island hydro generators managing the flooding event. Contact does not consider that the event, in and of itself, would meet the threshold of a UTS as defined in the Code. Under clause 5.5 of the Code, if a UTS is found the Authority must attempt to correct the UTS and restore the normal operation of the market as soon as possible.
30. Normal operation resumed in the current circumstances without any intervention by the Authority. This raises a question of whether the higher than expected prices in a flood event is a UTS.
31. Contact is concerned that finding a reduction of competitive pressure [high price event] as a ground for a UTS will:
- create incentives from those exposed to the spot market to lodge UTS claims whenever high price events occur;
  - not compensate those who have obtained hedges; and
  - not provide compensation for generators who are otherwise exposed to low price events for prolonged periods.

*UTS is not the mechanism to change rules*

32. To the extent that the Authority considers that any policy change is required to address the concerns raised in its preliminary decision, Contact does not consider that this should occur through a UTS compliance process.
33. We agree with the Authority's previous statement that *'the Commission considers that the Part 3 UTS regime is not directed at the process where, in general terms, improvements may be made to Rules over time.'*<sup>5</sup>
34. The Authority is running separate workstreams to consider the claim under both UTS and HSOTC provisions. Given previous UTS and HSOTC investigations, there is likely to be significant overlap between the decisions and any actions arising from them. Regulatory certainty and consistent application of regulation is essential. However the timetable to consider this event under the two provisions are different, with the Authority only recently having appointed an investigator to further consider the HSOTC claim. Contact would welcome further guidance from the Authority on the interaction between the two processes.

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<sup>5</sup> Dr John Small, *Review of Electricity Authority Preliminary Decision on UTS Claim*, June 2020

### *Confidence in the Hedge Market*

35. The preliminary decision notes there is no evidence that prices or participation in the forward market were affected by the events in the spot market. However, the Authority believes that confidence may also have been affected in this market due to its close link with the spot market.
36. The evidence in the futures market does not support this assertion. Similarly, the Concept Economics report<sup>6</sup> said that instances of inter-island price separation has not changed substantially since the Authority's decision in May 2017.

### **Managing Transmission Constraints**

37. The Authority's preliminary conclusion is that a UTS occurred as a result of commercial decisions made by Meridian to manage constraints to avoid transmission binding. The preliminary decision notes that "pricing in such a way to avoid transmission constraints binding may contribute to threatening confidence in the wholesale market".
38. Managing transmission constraints to avoid price separation can be consistent with efficient market operation in a competitive market. Contact is concerned with the Authority's preliminary analysis in the UTS, which appears to ignore a fundamental dynamic that spot prices are volatile in the short term, but over time reflect long run marginal cost in workably competitive markets.
39. This broader question is being considered as part of the MDAG's review of HSOTC rules. Contact is continuing to work through these broader issues and competitive impact if generators in a competitive market are prevented from making economically rational choices in the national generation market.
40. We are happy to discuss any aspects of our submission. Please do not hesitate to contact us if you have any queries

Yours sincerely



James Kilty  
**Deputy Chief Executive Officer**

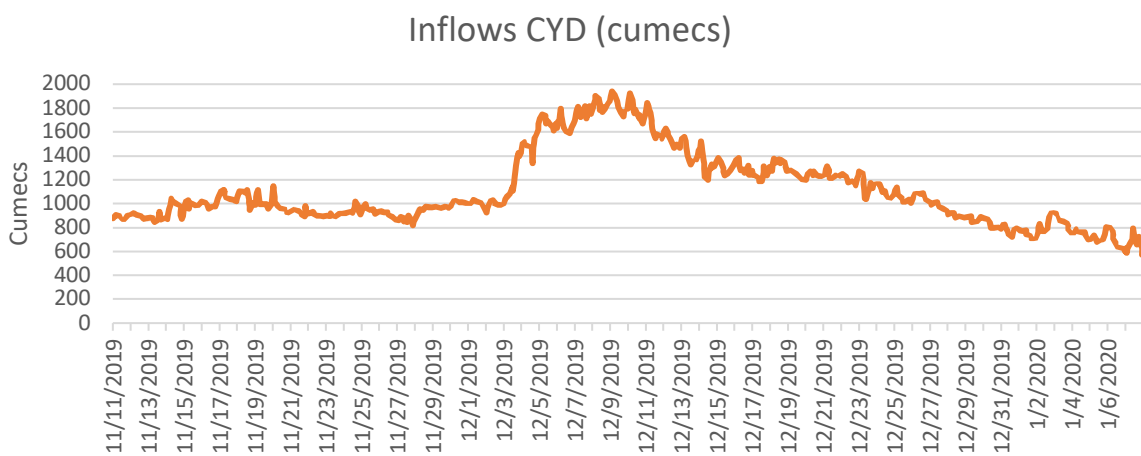
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<sup>6</sup> Concept Consulting, *Review of impact of trading conduct enforcement action on spot prices*, August 2019

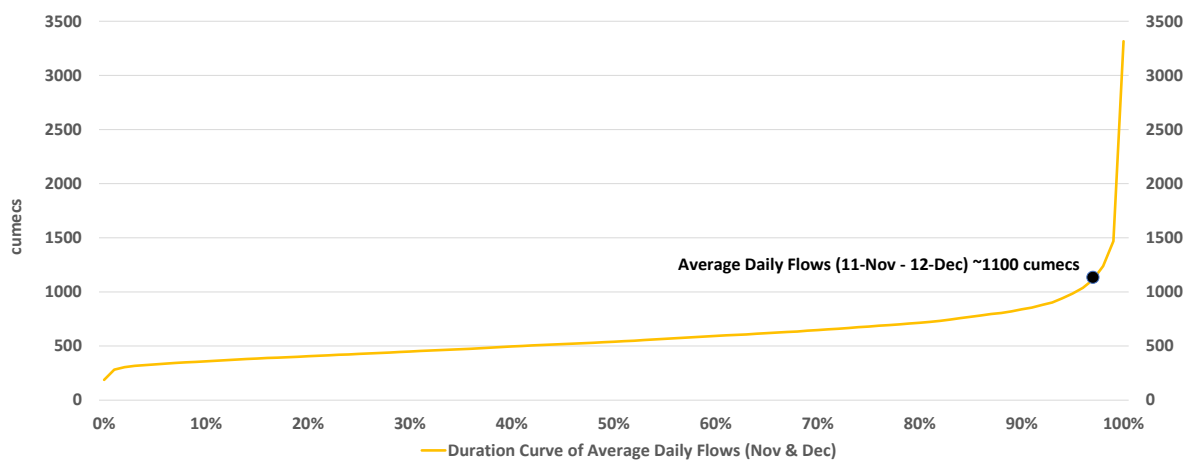
# Annex One: Managing Contact Energy’s Clutha Assets

## 1. Managing Contact’s assets

- I. Contact manages the Clyde and Roxburgh Power Stations on the Clutha River, collectively referred to in this document as the “Clutha assets”. The Clutha assets operate in a highly volatile catchment which is largely ‘run of river’ with very little ability to store water.
- II. Throughout the period 11 November – 31 December 2019, natural flows were significantly elevated and well above the historical average for that time of year. Total flows in the Clutha River averaged approximately 1150 cumecs, including the minimum consented releases out of Lake Hawea of 10 cumecs.

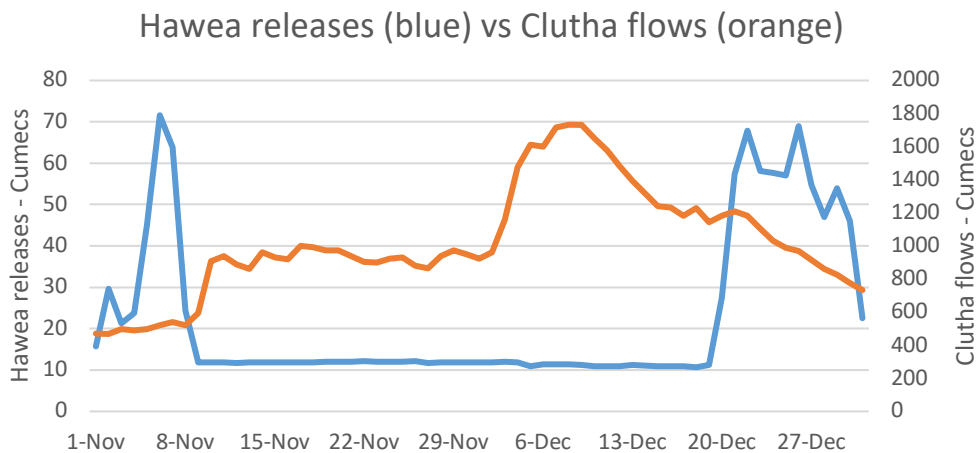


- III. The duration curve for average daily natural flows is presented below for the months of November and December 2019 and compared against 1100 cumecs, which corresponds to approximately the 97th percentile.



## 2. Water Storage

- IV. Contact's only storage on the Clutha scheme is at Lake Hawea which accounts for around 10% of the volume generated by the Clutha assets. Over the period of elevated Clutha flows, Contact reduced releases to the minimum consented level (10 cumecs) until the lake was full and endeavoured to store as much water as possible over this period.



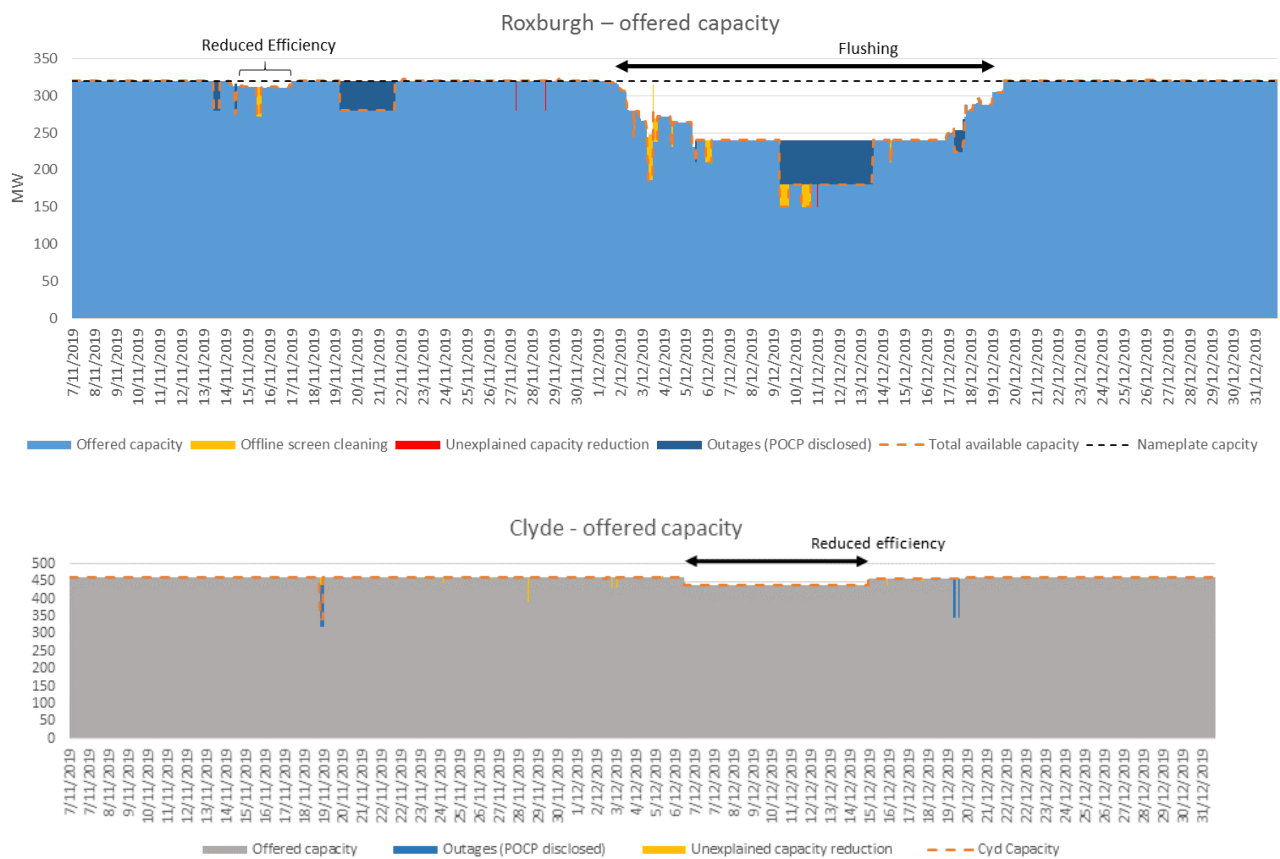
## 3. Spill

- V. In a flood situation on the Clutha River not all of the flow is put through the turbines to generate power. A volume of water is spilt as explained below:
- A. High Flow**
- VI. When flows exceed around 920-980 cumecs at Clyde or 825-900 cumecs at Roxburgh over sustained periods we are unable to utilise all water for generation and a volume of water is spilt.
- B. Capacity reductions**
- VII. Generation capacity is only offered from the Clutha Assets where the MW offered are capable of meeting a dispatch instruction during the following trading period
- VIII. The reductions to the generation capacity offered were as a result of:
- Planned and forced outages – units being removed from service for maintenance.
  - Screen Cleaning - A flood event of this magnitude on the Clutha River brings significant amounts of debris (weed and driftwood) through the catchment. This debris causes significant operational issues with our intake screens, particularly at our Roxburgh Power station. To manage this build up, we are required to undertake cleaning of all of our Roxburgh generator's intakes. Screen cleaning is sometimes done whilst the units remain online and the trader will price this volume up so it is less likely to be dispatched but still available if the market requires it. At other times the units need to be taken offline to complete this work. The build-up of debris is unpredictable and difficult to monitor.



Decisions to undertake offline screen cleaning are made on the day with the work occurring on that day.

IX. The following charts show the total capacity of generation available at Roxburgh and Clyde over the relevant period:



### C. Regulatory consent requirements

X. During a flood event Contact manages the operation of the Clutha assets in accordance with the Clutha Flood Rules that have been agreed to by the Otago Regional Council under Contact’s consents. Contact may undertake flushing and must maintain table discharge.

- Flushing - As part of our resource consent we are required to lower Lake Roxburgh during high flow events to remove sediment that builds up over time. Flushing the silt downstream reduces the risk of flooding to Alexandra and so this activity is important for the safe and prudent management of the scheme. We also reduce the level of the head-pond lake of the Clyde Dam, Lake Dunstan. As the lake levels are reduced, the efficiency of the Clyde and Roxburgh units, and the power that can actually be generated by them, reduces. Below is a timeline of our flushing activities:

- Sunday 1 December 5pm: we decided to reduce Lake Roxburgh
- Monday 2 December 3am: Lake Roxburgh had reached <126.00masl (flushing level)
- Monday 16 December noon: we decided to stop flushing at Lake Roxburgh
- Monday 16 December 5pm: we started to raise Lake Roxburgh

- Wednesday 18 December 3pm: Lake Roxburgh reached >130.15masl (normal operating level)
- Thursday 19 December noon: after an engineering assessment and review we started to offer full machine capacity from Roxburgh.

XI. The duration of flushing events is determined by the weather so a return to normal operations is not accurately predictable.

- Table Discharge: In a run of river catchment such as the Clutha the requirement to meet “table discharge” necessitates the matching of outflows from our power stations to the corresponding inflows in close to real time (steady flows).

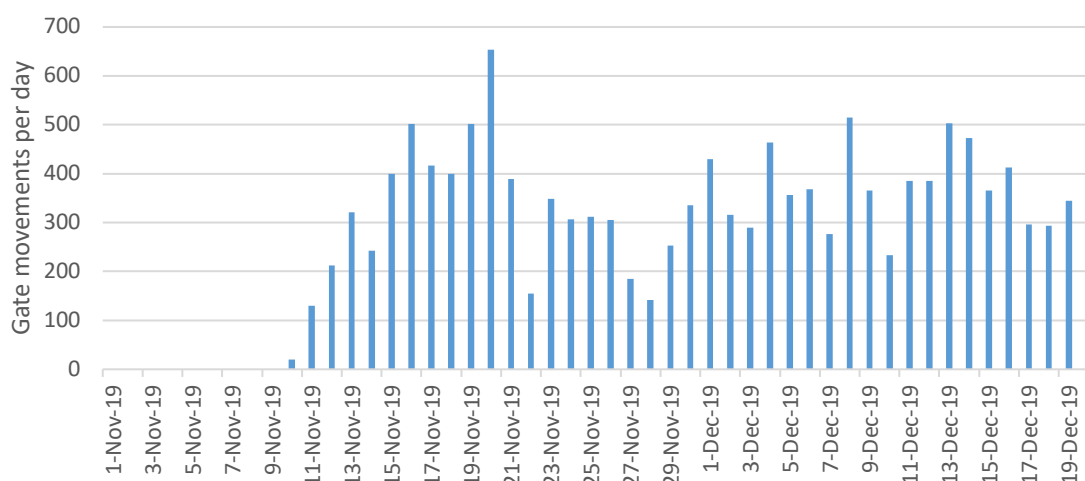
During a flood, steady flows are achieved by continually monitoring the inflow and outflow of the facility to ensure they are close to equal. If the MW dispatch alters, then a new set point is calculated and entered for the units. Following this action a new flow set point for the spill & sluice gate is also required. Due to various mechanical systems, the time it takes to receive a new dispatch instruction and complete a new flow on the spill & sluice gates can take up to 5mins.

Generation is dispatched on a half hour by half hour basis. The last generator to be dispatched to meet demand is known as the marginal generator. Given that demand over a half hour period will fluctuate, the marginal generator will receive multiple dispatch instructions over the half hour period increasing or reducing the number of set point changes required. Being the marginal generator during a flood forces changes in output from the unit every five minutes making it extremely difficult to maintain table discharge (steady flows). This results in:

- Plant set point changes putting pressure on operating equipment;
- The management / clearance of debris during screen cleaning operations becomes problematic;
- Downstream users see significant deviation in the rate of flows and lake/river levels leading to issues with managing their own pumps and assets;
- Flushing optimization is impacted due to rising and lowering the lake level at Roxburgh.
- Communication with the ORC Flood manager becomes complicated

XII. During this flood event the Clyde spill-gates operated over 13,000 times, exceeding the original design of the spill gates. In order to reduce the number of set point changes on both the generators and sluice gates, Contact’s operators tried to minimise marginal running. In normal market conditions this is a reasonably straight forward process, but the transmission constraints in the lower South Island make this process far more involved.

### Total Gate Movements - Clyde



- XIII. The ability to export generation from the lower South Island (LSI) to the rest of the South Island is restricted due to limited export capacity of transmission lines. Contact has worked with Transpower over the last 7 years to increase this capacity by approximately 120 MW through instigation of two special protection schemes. However export limitations remain, particularly in summer months when limitations are lower. In addition, Contact has recently paid \$5m to Transpower to commence work to upgrade transmission lines with the specific purpose to ensure export capability is future proofed.
- XIV. In a non-constrained market, a dispatch trader can avoid having plant on the margin by offering all available fuelled capacity at a very low price ensuring that a higher priced generator will be the marginal generator.
- XV. This is not the case for the Clutha assets during a flood event due to the total available generation in the lower South Island (LSI) being greater than total demand (including the ability to export power out of the lower South Island). If Contact had offered all Clutha generation at a low price, it is likely the Clutha assets would have been the marginal generator within the LSI for the vast majority of trading periods over this period.
- XVI. Forecasting in any given trading period when or if the LSI transmission limit will bind is difficult due to error in forecasting other generators offers, variable wind output, variable demand, inclement weather conditions (lightning strikes) and variable transmission constraint equations. In these circumstances the dispatch trader seeks to maximise generation whilst avoiding operating on the margin.
- XVII. It should also be noted that over the relevant period transmission line outages further restricted export capacity.