

From: s9(2)(a)@nzx.com>
Sent: Friday, 22 March 2024 12:11 pm
To: Grant Benvenuti
Cc: Saki Hannah; Sara Mateparae; Nicole Gagnon; Matt Carnihan
Subject: RE: Decisions and next steps from today's meeting - 9 August 2021 settlement

Hi Grant

We are progressing well. We've performed analysis on what needs to happen, dependencies, controls and costs. I am working through, as BAU allows, creating the proper documentation and after that I will need to run past our PMO / management team to get to you early / mid next week.

Cheers

s9(2)(a)

From: Grant Benvenuti s9(2)(a)
Sent: Thursday, March 21, 2024 1:53 PM
To: s9(2)(a)@nzx.com>; murray.henderson s9(2)(a)@transpower.co.nz>; s9(2)(a)@ems.co.nz>
Cc: Saki.Hannah s9(2)(a); Sara Mateparae s9(2)(a); Nicole Gagnon s9(2)(a); Matt Carnihan s9(2)(a)
Subject: RE: Decisions and next steps from today's meeting - 9 August 2021 settlement

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Hi All,

How is progress on your planning? When do you think we will get your responses and indicative costs (thanks to the one response I have already received)?

Cheers

GB

Grant Benvenuti
Principal Advisor
Electricity Authority

s9(2)(a)

From: Grant Benvenuti
Sent: Wednesday, March 13, 2024 8:52 AM
To: s9(2)(a)@nzx.com>; Murray Henderson s9(2)(a)@ems.co.nz>

Cc: Saki Hannah s9(2)(a); Nicole Gagnon s9(2)(a); Matt Carnihan s9(2)(a)

Subject: RE: Decisions and next steps from today's meeting - 9 August 2021 settlement

Hi all, a change of plan. WRT number three in the next steps below, please do NOT start any chargeable work until all CR/Tass are agreed AND signed.

Many thanks

GB

Grant Benvenuti
Principal Advisor
Electricity Authority

s9(2)(a)

From: Grant Benvenuti

Sent: Tuesday, March 12, 2024 4:25 PM

To: s9(2)(a) @nzx.com>; Murray Henderson

s9(2)(a) @transpower.co.nz>; s9(2)(a) @ems.co.nz>

Cc: Saki Hannah s9(2)(a); Nicole Gagnon s9(2)(a); Matt Carnihan s9(2)(a)

Subject: Decisions and next steps from today's meeting - 9 August 2021 settlement

H s9(2)(a) Murray, s9(2)(a) can you please pass this email onto the other members of your team as necessary.

Thanks for you and your team attending the planning meeting today (12 March 2024). A summary of the decisions needed for you to progress your planning:

- 1) When settling the six trading periods (and all the processes that flow from that) please use the R0 submission volumes. This is the initial settlement for these periods, so the standard Code process should be followed for transparency, which means using the R0 volumes, and all the associated processes such as HSA, FTR rentals and settlement, ancillary services allocations, con on/off, LCE (and any I have missed). Once finalised, the processes can be rerun using the standard washup processes for R1, R3, R7 and R14. The washup processes can be consolidated but the resulting invoice needs to detail the changes for each of the washup volumes
- 2) No independent audit is required. The bulk of the processing will be using the standard BAU processes and software, albeit with a some manual intervention . All your BAU processes have the usual checks and balances, and formal controls to ensure the outputs are reasonable and in line with expectations. This should provide enough oversight to ensure the outcomes are robust
- 3) The process of settling R0 should exclude any interest accrued in the clearing manager's accounts. The settling of the R1, R3, R7 and R14 should include the normal interest calculations as required under the Code, and also exclude any interest accrued in the clearing manager's accounts. Disbursement of accrued interest is managed by a separate Code required process. All interest is disbursed to generators based on market share. Generators are the main out of pocket participants as a result of delayed settlement of 9-August as they haven't yet been paid, so disbursed interest is in principle generally going to the right participants.

The above is what I got from the meeting, are any other decisions or directions required from the Authority? Please let me know if you have any concerns with the above, and why.

Next steps:

Clearing manager, system operator and FTR manager:

- 1) Write up their implementation plan, including timing, dependencies and completion/publishing/payment dates. Please send to Saki and me, and cc in Nicole and Matt (as applicable)
- 2) Start the CR/TAS process if there are any additional costs – these will be managed by Matt/Nicole as the lead, with support from Saki/me. Please send to Nicole and Matt (as applicable), and cc in Saki and me
- 3) ~~You can start any of the processes before a CR/TAS is agreed, and the Authority will act in good faith and ensure the parties are kept whole~~
- 4) Once settlement is complete and payment of residual LCE has been made to the grid owner, the grid owner will follow their standard process for disbursing residual LCE to connected parties.

Please note: once we agree on the date the invoices will be published, and the date of settlement, then we will be publishing these in Market Brief to keep participants informed

Cheers

GB

Grant Benvenuti
Principal Advisor

s9(2)(a)

**ELECTRICITY
AUTHORITY**
TE MANA HIKO 

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www.ea.govt.nz



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From: Grant Benvenuti
Sent: Friday, 12 April 2024 4:09 pm
To: s9(2)(a)
Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

Yes, the story has been updated, but no 'correction' was separately published. The revised story is [Clearing manager told to focus on 9 Aug | Energy News](#)

Grant Benvenuti
Principal Advisor
Electricity Authority

s9(2)(a)

From: s9(2)(a)@nzx.com>
Sent: Thursday, April 11, 2024 8:15 AM
To: Grant Benvenuti s9(2)(a)
Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

Thanks Grant.

Did the Authority get anything back from Energy News? I got an acknowledgment of my email, but nothing useful. There is a loose assumption in the market that the clearing manager (NZX) is going to settle in July. I'm happy to chase them, or perhaps we wait until your Board has made a decision and send formal comms when we know?

Our stance, when asked, is still that we're working through it with the Authority and Service providers.

Can discuss later today...

Cheers

■

From: Grant Benvenuti s9(2)(a)
Sent: Wednesday, April 10, 2024 12:24 PM
To: s9(2)(a)@nzx.com>; Matt Carnihan s9(2)(a)
Cc: Saki.Hannah s9(2)(a)@nzx.com>; s9(2)(a)@nzx.com>
Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

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Thanks [REDACTED], this has what I need.

Next steps is for the Authority to make a decision on how and when we proceed, likely at the April Board meeting (on 30 April). This means you won't receive a decision from us until early May, so two full calendar months means settlement in the August invoices.

As previously advised, please do not start any work until we confirm.

Cheers

GB

Grant Benvenuti
Principal Advisor
Electricity Authority

[REDACTED]
[REDACTED]

From: [REDACTED] <[REDACTED]@nzx.com>

Sent: Monday, April 8, 2024 7:56 AM

To: Grant Benvenuti [REDACTED]; Matt Carnihan [REDACTED]

Cc: Saki Hannah [REDACTED] <[REDACTED]@nzx.com>; [REDACTED] <[REDACTED]@nzx.com>

Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

Hi Grant

I attach the revised SoW with the added 3 options you have stipulated below.

You should note the following.

- I've added the provision of the 3 options and have changed the tone and references of the document to accommodate the additional Appendix's.
- As previously discussed, option 3 is not viable and so we have not performed detailed cost analysis as we have done with option 1 & 2. Hopefully, I have illustrated this sufficiently in 4.1c if not I'm happy to arrange a more technical meeting to discuss this option. I'm not saying we can't do it, I'm just saying it is not the most efficient and cost effective method.
- The third option did not include reference to what volume revision(s) were necessary. Should the Authority want to pursue this option further, we would need to understand this to accommodate perhaps two additional estimates.
- The second option is a significant decrease in effort required and therefore I do not consider reduced rates to be applicable. As such I have priced these at the standard upgrade and Improvement rates.
- In terms of timing, nothing has changed, and I have articulated this in section 6. For the R0 revision we require 2 complete calendar months prior to the issuance of invoices and the

subsequent settlement. Should additional revisions be necessary we'll need 1 consecutive month after the R0 revision to deliver. Considering it is now 8 April – two full months = May and June and so will be able to settle in July. From an informal conversation with Murray Henderson, I understand these timings are also acceptable to Transpower.

Happy to discuss, as necessary.

Thanks

s9(2)(a)

[REDACTED]

[REDACTED]

NZX Limited

Level 1, NZX Centre, 11 Cable Street, Wellington 6011
PO Box 2959, Wellington 6140, New Zealand

s9(2)(a)

[REDACTED]



From: Grant Benvenut s9(2)(a)

Sent: Thursday, April 4, 2024 1:58 PM

To: s9(2)(a) @nzx.com>; Matt Carnihan s9(2)(a) >

Cc: Saki.Hannah s9(2)(a)

Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thanks,

Cheers

GB

Grant Benvenuti
Principal Advisor
Electricity Authority

s9(2)(a)

From: s9(2)(a) <[redacted]@nzx.com>

Sent: Thursday, April 4, 2024 1:33 PM

To: Grant Benvenuti s9(2)(a); Matt Carnihan <s9(2)(a)>

Cc: Saki Hannah s9(2)(a)

Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

Thanks Grant

This makes sense and I can work through the detail and provide options or explanations with associated costings where appropriate.

The missing section 4.2 is a numbering issue. I have used the SoW Template for the previous ATC and removed unnecessary sections.

Will come back to you when I am able.

s9(2)(a)

From: Grant Benvenuti s9(2)(a)

Sent: Thursday, April 4, 2024 9:57 AM

To: s9(2)(a) <[redacted]@nzx.com>; Matt Carnihan s9(2)(a)

Cc: Saki.Hannah s9(2)(a)

Subject: RE: Statement of Work for August 9 2021, Excluded trading Period Settlement.

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thanks s9(2)(a) as discussed, we are surprised at the total cost as it was higher than we initially expected, so would like the SOW to include a couple of additional options:

- 1) In section 4.1 can you change it to something like:

The Provider must complete the August 2021 settlement requirements with the inclusion of trading periods 37-42 in a process the Authority selects from the three options below.

Option 1: Use a process as close to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R0 or initial submission volume on the outset, and to calculate the amounts in relation to the FTR settlement.
- B. Once finalised, standard washup process should then apply for trading periods 37-42 to ensure volume for R1, R3, R7 and R14 is applied to the necessary settlement process.

- C. There should be no provision of interest applied to the settlement of R0, however normal interest should be applied to the difference between revisions as outlined in 14.38 for washups.
- D. The Authority has indicated that no independent audit is required for this piece of work,

Option 2: Use a process similar to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R14 volumes, for energy and reserves, and to calculate the amounts in relation to the FTR settlement.
- B. There should be no provision of interest applied to the settlement.
- D. The Authority has indicated that no independent audit is required for this piece of work,

Option 3: Use a process similar to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below

- A. Using a copy of CHASM, change the prices for the six trading periods to the correct prices and rerun full settlement process for the full month, with as little manual intervention as possible, to generate invoices including FTR, LCE and HSAs.
- B. Calculate the difference between the original invoices settled on 20 September 2021 and the newly generated invoices, and create a final invoice (or statement) for these differences
- C. There should be no provision of interest applied to the settlement
- D. The Authority has indicated that no independent audit is required for this piece of work,

- 2) In section 4.3, can you add a subsection for each of the two new options. If any of the options are not viable, then please describe why the option is not viable
- 3) I note there is no section 4.2. Is this a numbering error, or has section 4.2 been accidentally omitted?
- 4) Change the heading of Appendix 1 to Appendix 1A, and add an Appendix 1B and 1C with a high level analysis for the other two options. If an option is not viable (as described in the new section 4.3) then do not create an appendix for that option
- 5) Change the heading of Appendix 2 to Appendix 2A, and add an Appendix 2B and 2C for the pricing and payment schedule for the other two options. If an option is not viable (as described in the new section 4.3) then do not create an appendix for that option
- 6) Change the heading of Appendix 3 to Appendix 3A, and add an Appendix 3B and 3C for the cost analysis for the other two options. If an option is not viable (as described in the new section 4.3) then do not create an appendix for that option

Once we have the details and costs of all the options, I will need to escalate to our SLT for a decision on how to proceed. I acknowledge this additional analysis could possibly delay the final settlement, so you may need to think about what the actual invoicing and subsequent settlement dates would be for sections 5 and 6 of the SOW. A non-binding indication of final settlement date(s) would be appreciated as this may aid our decision on selection of option.

Happy to discuss further if needed.

Grant Benvenuti
Principal Advisor
Electricity Authority

s9(2)(a)

From: s9(2)(a) <[REDACTED]@nzx.com>

Sent: Tuesday, March 26, 2024 3:32 PM

To: Grant Benvenuti <[REDACTED]>; Matt Carnihan <[REDACTED]>

Cc: s9(2)(a) <[REDACTED]@nzx.com>; s9(2)(a) <[REDACTED]@nzx.com>

Subject: Statement of Work for August 9 2021, Excluded trading Period Settlement.

Hi Grant, Matt

Attached is the DRAFT Statement of Work detailing the approach, effort and cost associated with the settlement of trading periods 37 – 42 from August 9 2021.

I have left this as DRAFT as the date and completion fields need to be populated, and I would like to agree on the approach and pricing component.

Happy to discuss.

Thanks

s9(2)(a)
[REDACTED]

NZX Limited

Level 1, NZX Centre, 11 Cable Street, Wellington 6011
PO Box 2959, Wellington 6140, New Zealand

s9(2)(a)
[REDACTED]



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August 9 2021 Settlement of Excluded Trading Periods

Statement of Work

PARTIES

The Electricity Authority, (the "Authority")

AND

NZX Limited, having registration number 1266120 and having its registered offices at Level 1, NZX Centre, 11 Cable Street, Wellington, 6011, New Zealand (the "Provider").

BACKGROUND

- A. The Authority and the Provider are parties to the Master System Delivery Agreement dated 10 July 2020 ("Master Agreement") under which they may from time to time enter SOWs for the delivery of System Enhancements or provide additional services in relation to those Systems operated by the Provider in its role as Market Operator System Provider under the Code.
- B. On August 9, 2021, the pricing manager triggered a scarcity pricing situation based on the receipt of an Island Shortage Situation Notice (ISS) from Transpower. A subsequent Pricing Error Claim (PEC) and Undesirable Trading Situation (UTS), raised by market participants prompted the Authority to hold as interim trading periods 37 to 42 under clause 13.184 of the Electricity Industry Participants Code 2010. This was to allow the Authority time to properly consider the UTS and to assess the implications for pricing to ensure any decision on the UTS could be implemented smoothly.
- C. In September 2021 the clearing manager settled the August consumption month, excluding trading periods 37-42 and held the settlement of the FTR market and distribution of the Loss and Constraints Excess funds. As agreed with the Authority the LCE funds were held in an operating account.
- D. The PEC and UTS were not upheld by the Authority, however both were appealed by a market participant to the High Court later in 2022. The High Court upheld the appeal for the PEC on Friday 16 February 2024 and the Authority informed NZX on Friday 23 February 2024 that a PEC does exist, however, to keep prices as interim under 13.184 until further notice.
- E. The Authority directed NZX in its role as clearing manager (in place of the disestablished pricing manager) to finalise trading periods 37 to 42 with non-scarcity pricing, and to complete the August 2021 settlement in conjunction with other market service providers. Prices were finalised on 4th March and this SOW sets out the high-level action and cost requirements to complete the settlement.

1. MASTER AGREEMENT

This document is a SOW for the purposes of the Master Agreement.

The Master Agreement applies to and governs this SOW as if set out in full herein in its entirety.

Terms used but not defined in this SOW have the meanings given to them in the Master Agreement.

References in this SOW to sections are to sections in this SOW and references to clauses are to clauses in the Master Agreement.

2. TERM OF THIS SOW

Statement of Work Start Date: The date this SOW is signed by both Parties.

Statement of Work Term: This SOW commences on the Statement of Work Start Date, and unless terminated earlier in accordance with the provisions of the Master Agreement, will continue until completion of the Services.

3. PROJECT MANAGERS AND AUTHORISED REPRESENTATIVES (clause 9.1)

The initial Project Managers for each Party for the purposes of this SOW are as set out below.

The Authority: Grant Benvenuti

Provider: s9(2)(a)

The Parties' Authorised Representatives are specified in the Master Agreement or otherwise as notified by a party in writing from time to time in accordance with clause 9.2(b) of the Master Agreement.

4. SERVICES AND DELIVERABLES (clause 5.1)

4.1 Requirements

The Services must meet the Requirements set out in this section 4.1.

The Provider must complete the August 2021 settlement requirements with the inclusion of trading periods 37-42 in a process as close to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R0 or initial submission volume on the outset, and to calculate the amounts in relation to the FTR settlement.
- B. Once finalised, standard washup process should then apply for trading periods 37-42 to ensure volume for R1, R3, R7 and R14 is applied to the necessary settlement process.
- C. There should be no provision of interest applied to the settlement of R0, however normal interest should be applied to the difference between revisions as outlined in 14.38 for washups.
- D. The Authority has indicated that no independent audit is required for this piece of work,

4.3 Description of Services and Deliverables

Description of approach to provision of Services and Deliverables

In September 2021, the clearing manager settled the August 2021 consumption month excluding trading periods 37 – 42. There were complexities in doing this, including removing all con on/off calculations, hedge information and ancillary service grid constraint amounts, and the general wholesale electricity purchase/generation modules. It was also necessary to remove the entire FTR settlement and distribution of Loss and Constraints excess from the invoicing module as this requires a full consumption period of final prices.

Prices were published in WITS from trading periods 1-36 and 43 – 48 which caused downstream issues in CHASM, requiring \$0.00 prices to be substituted to ensure process continuation.

The CHASM system is designed to run a series of automated process modules throughout an entire consumption month, without intervention. Manual intervention to the invoicing process requires manipulation of existing code or the creation of bespoke code to be integrated into the production system to perform partial month calculations.

Any change to existing or addition of new functionality which involves critical calculations is to be peer reviewed and thoroughly tested to ensure they perform as intended and there are no downstream impacts to other modules which could adversely impact market participants.

For a process as invasive as this, our preference would be to have an independent review of the approach and results undertaken. This is a consistent approach across previous SOWs and the change control process. Whilst the Authority has deemed an independent review unnecessary, the Provider will employ the services of Maria Sydor of Craftware Computing, who currently performs audit services for NZX across all energy software platforms, to perform the end point testing at critical control points throughout the process. These services are in place of normal planned testing activity, charged at Test manager rates and is of no additional cost to the Authority - had internal test resource be used. It is intended that these services will provide assurance to the entire settlement process.

As noted in 4.1 of this SOW, the Authority has directed the Provider to use R0 volumes for an initial settlement of these trading periods, with non-scarcity pricing, and then to subsequently washup each revision (R1, R3, R7, R14) with the associated washup volume provided by the reconciliation manager. The Intention being to maintain as much consistency with the invoice process set out in the Code as possible.

Processing a selection of trading periods brings complexity, and as mentioned above, requires integrated coding to CHASM to deliver the outcome. From a high-level basis this involves removing already published data for trading periods outside of 37-42 and calculating the differences between the multiple invoice modules within these trading periods - by revision. Then manually calculating the interest component for the difference for each participant per revision. CHASM has no existing functionality to perform these calculations for a partial month and so must be created from scratch – and additionally peer reviewed and tested.

In contrast to the proposed method, should one volume revision only be required, the effort and cost involved would be greatly reduced. The complexity and manual interventions come largely from processing the individual revisions. Its also worth noting that, had the prices been finalised in 2021, and washed up now, the effort would also have been greatly reduced.

It is intended that the Provider process the R0 revision first in conjunction with an existing settlement month. This means to advise amounts owing or payable to participants (Subpart 4) and for market settlement to take place on the 20th (or next business day) of the month (Subpart 5). Subsequent revisions will be processed in the following consecutive months with consistent timings.

Following the above approach, the Provider will perform the Services and provide the Deliverables as detailed further in the High-Level settlement and washup analysis set out in Appendix 1.

5. DEPENDENCIES (clause 5.2)

Name	Related Deliverable / Milestone	Authority Dependency	Completion date (approximate)
Authority	Plan/Schedule	Authority to review, discuss and approve schedule and costs	March 2024
Authority	Urgent Code Exemption for 14.34(4)	ECHL will need to reprioritise achieving the required automation for interest distribution post this new clause from CRP05	March 2024 (Achieved 22/03)
Grid Owner	Ancillary Services data	Post provision of the Con on/Off data from the clearing manager the GO will need to provide the Ancillary Services data	TBD
FTR Manager	FTR Rentals Data	Post provision of DSP initial margins, the FTR Mgr. will need to send the rentals data.	TBD

6. MILESTONES (CLAUSE 5.1(B)(II))

The Provider will commence performing the Services on the Statement of Work Start Date. Completion of the Services will require approximately two calendar months, and therefore the date for completion of the Services is [xxx] (or as otherwise agreed between the Parties in writing).

7. ACCEPTANCE CRITERIA (CLAUSE 11)

Due to the limited timeframe a test plan will not be delivered as part of this SOW, however all system changes will be unit tested, system tested and appropriately documented. Upon completion of the final R14 washup revision, the Authority shall confirm completion of the services provided within this SOW.

8. FEES, EXPENSES AND INVOICING

8.1 Fees (clause 19.1)

The basis for pricing under this SOW is capped time and materials calculated in accordance with the reduced rates set out in the agreed Rate Card. The Fees payable by the Authority are displayed in the Pricing and Payment Schedule set out in Appendix 2 to this SOW, and further illustrated in the Cost Analysis in Appendix 3.

8.2 Invoicing (clause 19.5)

See Appendix 2.

9. MEETINGS AND REPORTING

In the interests of reducing time, effort and cost, progress meetings will only be held if specifically requested. Otherwise, progress will be reported in the standard monthly MOSP meetings or otherwise agreed between parties. Progress meetings will be non-chargeable.

10. KEY PERSONNEL (clause 6)

The Key Personnel for the purposes of this SOW are:

Provider Key Personnel:

Role	Name
Project Manager	s9(2)(a)
Lead Developer – Clearing systems	s9(2)(a)
Test Manager	s9(2)(a)
Test Analyst	s9(2)(a)
Product Manager	s9(2)(a)

Authority Key Personnel:

Role	Name
Project Manager	Grant Benvenuti
Contracts Manager	Matt Carnahan

SIGNATURE

SIGNED for and on behalf of the **Authority** by the person named below, being a person duly authorised to enter obligations on behalf of the Authority:

Signature

Name:

Title:

Date:

SIGNED for and on behalf of the **Provider** by the person named below, being a person duly authorised to enter obligations on behalf of the Provider:

Signature

Name:

Title:

Date:

DRAFT
Released under the Official Information Act 1982

Appendix 1: High Level Analysis

9th August 2021 PEC (High Level Analysis)

R0 Invoicing

Aggregating offers

- Adjust offers data 'a' to 'c'
- Backup and delete existing aggregate offers data of 09th Aug 2021
- Manual run (through a script): script writing, verification, execution and data verification
- Testing documentations.

Constrained Amounts on/off

- Modify the existing package to calculate metered quantity for R0 volumes only.
- Validate that the scheduled quantity calculated correctly for TPs 37 – 42 of 9th Aug and others for Aug 2021 have not been changed.
- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing Documentations.

Reserve Constrained Amounts

- Backup and delete existing reserve dispatch log process of 8th, 9th and 10th Aug 2021
- Reset reserve offers, reserve bids, and reserve dispatch logs data of 9th Aug 2021
- Reprocess manually (through scripts) reserve dispatch logs of 9th Aug 2021
- Run reserve constrained amounts for Aug 2021
- Validate all steps and calculations for TPs 37 – 42 of 9th Aug and others for 9th Aug 2021 have not been changed.
- Testing documentations.

Ancillary Services

Send R0 grid and reserve constrained amounts to Transpower.

- Receive and upload updated ancillary service files
- Modify the existing code to calculate the "Frequency Keeping – Charges" with R0 volumes
- Validate all changes and verify all data.
- Testing documentations.

Hedges

- Backup the posted hedge transactions
- Re-run daily settlement prices of hedges
- Email new hedge changes to participants (manual intervention of hedge invoicing)
- Re-post the differences to difference (manual scripting)
- Testing documentations.

FTR Settlement Prices

- Create and publish FTR settlement prices (manual intervention and scripts)
- Testing documentation

Invoicing (including FTR Settlement)

- Modify existing package to consider FTRs and hedges.
- Modify existing package to consider R0 volumes when calculating SPOT amounts.

- Modify existing package to consider R0 invoiced amounts for all transactions and take the differences.
- Remove any interest calculated.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

R1 Washup

Constrained Amounts on/off

Modify the existing package to calculate metered quantity for R1 volumes only.

- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing documentation.

Ancillary Services

Modify the existing code to calculate the “Frequency Keeping – Charges” with R1 volumes.

- Validate all changes and verify all data.
- Testing documentation.

Invoicing

- Modify existing package to consider R1 volumes when calculating SPOT amounts.
- Modify existing package to consider R1 invoiced amounts for all transactions and take the differences.
- Modify existing package to calculate R1 interest based on the dates of original R1 washup.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

Washups R3, R7 & R14

Constrained Amounts on/off

Modify the existing package to calculate metered quantity for R3 volumes only.

- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing documentations.

Ancillary Services

Modify the existing code to calculate the “Frequency Keeping – Charges” with R3 volumes.

- Validate all changes and verify all data.
- Testing documentations.

Invoicing

- Modify existing package to consider R3 volumes when calculating SPOT amounts.

- Modify existing package to consider R3 invoiced amounts for all transactions and take the differences.
- Modify existing package to calculate R3 interest based on the dates of original R3 washup.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

Settlement

- Modify existing scaling package to prepare for a scaling event.
- Testing documentations

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Appendix 2: Pricing and Payment Schedule

1. The Fee for the Services and Deliverables for the SOW's activities is on a capped time and materials basis as set out in Table A and in Appendix 3.
2. The Fee for the Services and Deliverables for this SOW has been calculated based on the rates as set out in clause 5.3 of Schedule 1 to the Reconciliation Manager Market Operator Service Provider Agreement between the parties dated 30 October 2015, subject to any increase in accordance with paragraph 4.1 of that Schedule.
3. As this constitutes a major project, reduced rates have been applied to the pricing schedule.
4. The fees in no way include any time already spent on the August 9, 2021, settlement situation. The original omission of trading periods in September 2021 are not intended to be recovered, nor any meetings NZX has attended to discuss this outcome.
5. The Fees for this SOW as described in this Appendix 1 will be invoiced to the Authority monthly in arrears. The applicable Fees for this SOW will be invoiced on a time and materials basis each month in accordance with the NZX / Authority regular billing process.
6. The Fees for this SOW as described in this Appendix are exclusive of GST.

Table A – Fees and Hours

A.1 Delivery Estimate:

Role	Hours Estimate	Rate	Total
1. Senior Developer	s9(2)(b)(ii)		\$98,221.31
2. Test Manager			\$70,188.65
3. Test Analyst			\$49,827.27
Sub Total:			\$218,237.23
Risk Contingency			\$10,911.86
Total			\$229,149.10

Appendix 3: Cost Analysis

August 9 Settlement Correction Effort and Cost								
Revision	Description	Effort Hours			Cost			Total
		Senior Developer	Test Manager	Test Analyst	Senior Developer	Test Manager	Test Analyst	
R0 Invoicing	Aggregating offers	s9(2)(b)(ii)						
	Constrained Amounts on/off							
	Reserve Constrained Amount							
	Ancillary Services							
	Hedges							
	FTR Settlement Prices							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$104,168.24
R1 Washup	Constrained Amounts on/off	s9(2)(b)(ii)						
	Ancillary Services							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$ 29,719.70
R3 Washup	Constrained Amounts on/off	s9(2)(b)(ii)						
	Ancillary Services							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$ 22,016.07
R7 Washup	Constrained Amounts on/off	s9(2)(b)(ii)						
	Ancillary Services							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$ 22,016.07
R14 Washup	Constrained Amounts on/off	s9(2)(b)(ii)						
	Ancillary Services							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$ 22,016.07
Default	Scaling simulation							\$ 14,021.31
Project Management	Process and Cost Analysis							\$ 4,279.80
	Totals							\$218,237.23
Risk Contingency	5% Contingency if Capped or Fixed Price							\$ 10,911.86
								\$229,149.10

s9(2)(b)(ii)

Released Under the Official Information Act 1982

August 9 2021 Settlement of Excluded Trading Periods

Statement of Work

PARTIES

The Electricity Authority, (the "Authority")

AND

NZX Limited, having registration number 1266120 and having its registered offices at Level 1, NZX Centre, 11 Cable Street, Wellington, 6011, New Zealand (the "Provider").

BACKGROUND

- A. The Authority and the Provider are parties to the Master System Delivery Agreement dated 10 July 2020 ("Master Agreement") under which they may from time to time enter SOWs for the delivery of System Enhancements or provide additional services in relation to those Systems operated by the Provider in its role as Market Operator System Provider under the Code.
- B. On August 9, 2021, the pricing manager triggered a scarcity pricing situation based on the receipt of an Island Shortage Situation Notice (ISS) from Transpower. A subsequent Pricing Error Claim (PEC) and Undesirable Trading Situation (UTS), raised by market participants prompted the Authority to hold as interim trading periods 37 to 42 under clause 13.184 of the Electricity Industry Participants Code 2010. This was to allow the Authority time to properly consider the UTS and to assess the implications for pricing to ensure any decision on the UTS could be implemented smoothly.
- C. In September 2021 the clearing manager settled the August consumption month, excluding trading periods 37-42 and excluded the settlement of the FTR market and distribution of the Loss and Constraints Excess funds. As agreed with the Authority the LCE funds were held in an operating account.
- D. The PEC and UTS were not upheld by the Authority, however both were appealed by a market participant to the High Court later in 2022. The High Court upheld the appeal for the PEC on Friday 16 February 2024 and the Authority informed NZX on Friday 23 February 2024 that a PEC does exist, however, to keep prices as interim under 13.184 until further notice.
- E. The Authority directed NZX in its role as clearing manager (in place of the disestablished pricing manager) to finalise trading periods 37 to 42 with non-scarcity pricing, and to complete the August 2021 settlement in conjunction with other market service providers. Prices were finalised on 4th March and this SOW sets out the high-level action and cost requirements to complete the settlement.

1. MASTER AGREEMENT

This document is a SOW for the purposes of the Master Agreement.

The Master Agreement applies to and governs this SOW as if set out in full herein in its entirety.

Terms used but not defined in this SOW have the meanings given to them in the Master Agreement.

References in this SOW to sections are to sections in this SOW and references to clauses are to clauses in the Master Agreement.

2. TERM OF THIS SOW

Statement of Work Start Date: The date this SOW is the date in which both Parties have signed it.

Statement of Work Term: This SOW commences on the Statement of Work Start Date, and unless terminated earlier in accordance with the provisions of the Master Agreement, will continue until completion of the Services.

3. PROJECT MANAGERS AND AUTHORISED REPRESENTATIVES (clause 9.1)

The initial Project Managers for each Party for the purposes of this SOW are as set out below.

The Authority: Grant Benvenuti

Provider: Tim Chadwick

The Parties' Authorised Representatives are specified in the Master Agreement or otherwise as notified by a party in writing from time to time in accordance with clause 9.2(b) of the Master Agreement.

4. SERVICES AND DELIVERABLES (clause 5.1)

4.1 Requirements

The Provider must complete the August 2021 settlement requirements with the inclusion of trading periods 37-42 in a process the Authority selects from the three options following, but not those that are described by the provider as "not viable".

4.1a Option 1: Use a process as close to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R0 or initial submission volume on the outset, and to calculate the amounts in relation to the FTR settlement.
- B. Once finalised, standard washup process should then apply for trading periods 37-42 to ensure volume for R1, R3, R7 and R14 is applied to the necessary settlement process.
- C. There should be no provision of interest applied to the settlement of R0, however normal interest should be applied to the difference between revisions as outlined in 14.38 for washups.
- D. The Authority has indicated that no independent audit is required for this piece of work.

Option 1 = viable.

High level analysis found in Appendix 1A, Pricing and Payment Summary in Appendix 2A and Cost Analysis in Appendix 3A.

4.1b Option 2: Use a process similar to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R14 volumes, for energy and reserves, and to calculate the amounts in relation to the FTR settlement.
- B. There should be no provision of interest applied to the settlement.
- D. The Authority has indicated that no independent audit is required for this piece of work.

Option 2 = viable

High level analysis found in Appendix 1B, Pricing and Payment Summary in Appendix 2B and Cost Analysis in Appendix 3B.

4.1c Option 3: Use a process similar to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. Using a copy of CHASM, change the prices for the six trading periods to the correct prices and rerun full settlement process for the full month, with as little manual intervention as possible, to generate invoices including FTR, LCE and HSAs.
- B. Calculate the difference between the original invoices settled on 20 September 2021 and the newly generated invoices and create a final invoice (or statement) for these differences.
- C. There should be no provision of interest applied to the settlement.
- D. The Authority has indicated that no independent audit is required for this piece of work.

Option 3 = not-viable

This option has **not** been offered by the provider as viable, due to the complexity and unfavourable cost vs benefit comparison. The prices for the six trading periods have already been populated in the production environment, however CHASM does not allow the rerunning of an already published consumption month and so a full manual reversal of all the billing components - HSA's, wholesale electricity, con on/off, and ancillary services would be necessary.

This would also involve the manual reversal of all subsequent washup processes that have been run for August 2021, across all of the necessary revisions – R1, R3, R7 and R14, taking into account all of the billing components mentioned above. Only then would the invoice process be able to be run, the differences observed and then incorporated into an individual billing run. The testing and necessary downstream analysis to ensure the correct outcome would not be cost effective and due to the complexity, an independent review would be strongly advised.

The provider has not provided the cost analysis to perform this process as it would far exceed the costs of option 1 or 2 and would also depend on the Authority's preference for washup revisions (all revisions or just R14) which are not stipulated within the option provided. This option is not considered to be in the best interests of either the Authority or the provider due to the costs and risk associated with it.

4.2 Description of Services and Deliverables

Description of approach to provision of Services and Deliverables

In September 2021, the clearing manager settled the August 2021 consumption month excluding trading periods 37 – 42. There were complexities in doing this, including removing all con on/off calculations, hedge information, ancillary service grid constraint amounts, and the general wholesale electricity purchase/generation modules. It was also necessary to remove the entire FTR settlement and distribution of Loss and Constraints Excess (LCE) from the invoicing module as this requires a full consumption period of final prices.

Prices were published in WITS from trading periods 1-36 and 43 – 48 which caused downstream issues in CHASM, requiring \$0.00 prices to be substituted to ensure process continuation.

The CHASM system is designed to run a series of automated process modules throughout an entire consumption month, without intervention. Manual intervention to the invoicing process requires manipulation of existing code or the creation of bespoke code to be integrated into the production system to perform partial month calculations.

Any change to existing or addition of new functionality which involves critical calculations is to be peer reviewed and thoroughly tested to ensure they perform as intended and there are no downstream impacts to other modules which could adversely impact market participants.

For a process as invasive as this, our preference would be to have an independent review of the approach and results undertaken. This is a consistent approach across previous SOWs and the change control process. Whilst the Authority has deemed an independent review unnecessary, the Provider will employ the services of Maria Sydor of Craftware Computing, who currently performs audit services for NZX across all energy software platforms, to perform the end point testing at critical control points throughout the process. These services are in place of normal planned testing activity, charged at Test Manager rates and is of no additional cost to the Authority had internal test resource be used. It is intended that these services will provide assurance to the entire settlement process.

As noted in 4.1 of this SOW, the Authority has requested the provider to consider 3 options and to provide viability and high level cost and process information across each. Each option directs the provider to invoice the excluded trading periods using non-scarcity pricing (with Virtual Provider).

Processing a selection of trading periods brings complexity, and as mentioned above, requires integrated coding to CHASM to deliver the outcome. From a high-level basis this involves removing already published data for trading periods outside of 37-42 and calculating the differences between the multiple invoice

modules within these trading periods. CHASM has no existing functionality to perform many of these calculations for a partial month and so must be created from scratch – and additionally peer reviewed and tested.

5. DEPENDENCIES (clause 5.2)

Name	Related Deliverable / Milestone	Authority Dependency	Completion date (approximate)
Authority	Plan/Schedule	Authority to review, discuss and approve schedule and costs	April 2024
Authority	Urgent Code Exemption for 14.34(4)	ECHL will need to reprioritise achieving the required automation for interest distribution post this new clause from CRP05	March 2024 (Achieved 22/03)
Grid Owner	Ancillary Services data	Post provision of the Con on/Off data from the clearing manager the GO will need to provide the Ancillary Services data	TBD
FTR Manager	FTR Rentals Data	Post provision of DSP initial margins, the FTR Mgr. will need to send the rentals data.	TBD

6. MILESTONES / TIMINGS (CLAUSE 5.1(B)(II))

The Provider will commence performing the Services on the Statement of Work Start Date. Completion of the Services will require two complete calendar months prior to the start of the calendar month in which amounts owing (Subpart 4) will be advised and later settled (Subpart 5) on the 20th (or next business day) of the month. These timings are assuming third parties also adhere to their individual dependencies. Should revisions be necessary they will be processed in the following consecutive months with consistent timings.

7. ACCEPTANCE CRITERIA (CLAUSE 11)

Due to the limited timeframe a test plan will not be delivered as part of this SOW, however all system changes will be unit tested, system tested and appropriately documented. Upon completion, the Authority shall confirm completion of the services provided within this SOW.

8. FEES, EXPENSES AND INVOICING

8.1 Fees (clause 19.1)

The basis for pricing under this SOW is capped time and materials calculated in accordance with the rates set out in the agreed Rate Card. The fees payable by the Authority are displayed in the Pricing and Payment Schedule set out in Appendix 2 to this SOW, and further illustrated in the Cost Analysis in Appendix 3.

8.2 Invoicing (clause 19.5)

See Appendix 2.

9. MEETINGS AND REPORTING

In the interests of reducing time, effort and cost, progress meetings will only be held if specifically requested. Otherwise, progress will be reported in the standard monthly MOSP meetings or otherwise reasonably agreed between parties. Progress meetings will be non-chargeable.

10. KEY PERSONNEL (clause 6)

The Key Personnel for the purposes of this SOW are:

Provider Key Personnel:

Role	Name
Project Manager	s9(2)(a)
Lead Developer – Clearing systems	s9(2)(a)
Test Manager	s9(2)(a)
Test Analyst	s9(2)(a)
Product Manager	s9(2)(a)

Authority Key Personnel:

Role	Name
Project Manager	Grant Benvenuti
Contracts Manager	Matt Carnahan

SIGNATURE

SIGNED for and on behalf of the **Authority** by the person named below, being a person duly authorised to enter obligations on behalf of the Authority:

Signature

Name:

Title:

Date:

SIGNED for and on behalf of the **Provider** by the person named below, being a person duly authorised to enter obligations on behalf of the Provider:

Signature

Name:

Title:

Date:

Appendix 1A: High Level Analysis (Option 1)

Option 1: Use a process as close to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R0 or initial submission volume on the outset, and to calculate the amounts in relation to the FTR settlement.
- B. Once finalised, standard washup process should then apply for trading periods 37-42 to ensure volume for R1, R3, R7 and R14 is applied to the necessary settlement process.
- C. There should be no provision of interest applied to the settlement of R0, however normal interest should be applied to the difference between revisions as outlined in 14.38 for washups.
- D. The Authority has indicated that no independent audit is required for this piece of work,

Aggregating offers

- Adjust offers data 'a' to 'c'
- Backup and delete existing aggregate offers data of 09th Aug 2021
- Manual run (through a script): script writing, verification, execution and data verification
- Testing documentations.

Constrained Amounts on/off

- Modify the existing package to calculate metered quantity for R0 volumes only.
- Validate that the scheduled quantity calculated correctly for TPs 37 – 42 of 9th Aug and others for Aug 2021 have not been changed.
- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing Documentations.

Reserve Constrained Amounts

- Backup and delete existing reserve dispatch log process of 8th, 9th and 10th Aug 2021
- Reset reserve offers, reserve bids, and reserve dispatch logs data of 9th Aug 2021
- Reprocess manually (through scripts) reserve dispatch logs of 9th Aug 2021
- Run reserve constrained amounts for Aug 2021
- Validate all steps and calculations for TPs 37 – 42 of 9th Aug and others for 9th Aug 2021 have not been changed.
- Testing documentations.

Ancillary Services

Send R0 grid and reserve constrained amounts to Transpower.

- Receive and upload updated ancillary service files
- Modify the existing code to calculate the "Frequency Keeping – Charges" with R0 volumes
- Validate all changes and verify all data.
- Testing documentations.

Hedges

- Backup the posted hedge transactions
- Re-run daily settlement prices of hedges
- Email new hedge changes to participants (manual intervention of hedge invoicing)
- Re-post the differences to difference (manual scripting)
- Testing documentations.

FTR Settlement Prices

- Create and publish FTR settlement prices (manual intervention and scripts)
- Testing documentation

Invoicing (including FTR Settlement)

- Modify existing package to consider FTRs and hedges.
- Modify existing package to consider R0 volumes when calculating SPOT amounts.
- Modify existing package to consider R0 invoiced amounts for all transactions and take the differences.
- Remove any interest calculated.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

R1 Washup

Constrained Amounts on/off

Modify the existing package to calculate metered quantity for R1 volumes only.

- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing documentation.

Ancillary Services

Modify the existing code to calculate the "Frequency Keeping – Charges" with R1 volumes.

- Validate all changes and verify all data.
- Testing documentation.

Invoicing

- Modify existing package to consider R1 volumes when calculating SPOT amounts.
- Modify existing package to consider R1 invoiced amounts for all transactions and take the differences.
- Modify existing package to calculate R1 interest based on the dates of original R1 washup.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

Washups R3, R7 & R14

Constrained Amounts on/off

Modify the existing package to calculate metered quantity for R3 volumes only.

- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing documentations.

Ancillary Services

Modify the existing code to calculate the "Frequency Keeping – Charges" with R3 volumes.

- Validate all changes and verify all data.
- Testing documentations.

Invoicing

- Modify existing package to consider R3 volumes when calculating SPOT amounts.
- Modify existing package to consider R3 invoiced amounts for all transactions and take the differences.
- Modify existing package to calculate R3 interest based on the dates of original R3 washup.
- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments

- Transfer the invoiced amount of this special calculation to prudential.

Settlement

- Modify existing scaling package to prepare for a scaling event.
- Testing documentations

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Appendix 1B: High Level Analysis (Option 2)

Option 2: Use a process similar to that outlined in Part 14 Clearing and Settlement, Subpart 3 of the Electricity Industry Participant Code 2010, with certain provisions detailed by the Authority outlined below.

- A. When settling the six trading periods (and all the processes that flow from that) the clearing manager is to use the R14 volumes, for energy and reserves, and to calculate the amounts in relation to the FTR settlement.*
- B. There should be no provision of interest applied to the settlement.*
- D. The Authority has indicated that no independent audit is required for this piece of work.*

Aggregating offers

- Adjust offers data 'a' to 'c'
- Backup and delete existing aggregate offer data of 09th Aug 2021
- Manual run (through a script): script writing, verification, execution and data verification
- Testing documentations.

Constrained Amounts on/off

- Validate that the scheduled quantity calculated correctly for TPs 37 – 42 of 9th Aug and others for Aug 2021 have not been changed.
- Run constrained on/off calculation for Aug 2021
- Validate the calculations for TPs 37 – 42 of 9th Aug (especially schedule quantity and metered quantity) for BDG, SDG, and single station.
- Testing Documentations.

Reserve Constrained Amounts

- Backup and delete existing reserve dispatch log process of 8th, 9th and 10th Aug 2021
- Reset reserve offers, reserve bids, and reserve dispatch logs data of 9th Aug 2021
- Reprocess manually (through scripts) reserve dispatch logs of 9th Aug 2021
- Run reserve constrained amounts for Aug 2021
- Validate all steps and calculations for TPs 37 – 42 of 9th Aug and others for 9th Aug 2021 have not been changed.
- Testing documentations.

Ancillary Services

- Send R14 grid and reserve constrained amounts to Transpower.
- Receive and upload updated ancillary service files
- Validate all changes and verify all data.
- Testing documentations.

Hedges

- Backup the posted hedge transactions
- Re-run daily settlement prices of hedges
- Email new hedge changes to participants (manual intervention of hedge invoicing)
- Re-post the differences to difference (manual scripting)
- Testing documentations.

FTR Settlement Prices

- Create and publish FTR settlement prices (manual intervention and scripts)
- Testing documentation

Invoicing (including FTR Settlement)

- Modify existing package to consider FTRs and hedges.
- Remove any interest calculated and readjust the invoicing and statement amounts (for the invoicing month)

- Validate and verify all code and data changes.
- Testing documentations.

Prudential Adjustments (1 hour per day from publishing to settlement)

- Transfer the invoiced amount of this special calculation to prudential.

Settlement

- Modify existing scaling package to prepare for a scaling event.
- Testing documentations

DRAFT

Released under the Official Information Act 1982

Appendix 2A: Pricing and Payment Schedule

1. The Fee for the Services and Deliverables for the SOW's activities is on a capped time and materials basis as set out in Table A and in Appendix 3.
2. The Fee for the Services and Deliverables for this SOW has been calculated based on the rates as set out in clause 5.3 of Schedule 1 to the Reconciliation Manager Market Operator Service Provider Agreement between the parties dated 30 October 2015, subject to any increase in accordance with paragraph 4.1 of that Schedule.
3. As this constitutes a major project, reduced rates have been applied to the pricing schedule.
4. The fees in no way include any time already spent on the August 9, 2021, settlement situation. The original omission of trading periods in September 2021 are not intended to be recovered, nor any meetings NZX has attended to discuss this outcome.
5. The Fees for this SOW as described in this Appendix 1 will be invoiced to the Authority monthly in arrears. The applicable Fees for this SOW will be invoiced on a time and materials basis each month in accordance with the NZX / Authority regular billing process.
6. The Fees for this SOW as described in this Appendix are exclusive of GST.

Table A – Fees and Hours- Option 1.

Delivery Estimate:

Role	Hours Estimate	Rate	Total
1. Senior Developer	[REDACTED]	[REDACTED]	\$98,221.31
2. Test Manager			\$70,188.65
3. Test Analyst			\$49,827.27
Sub Total:			\$218,237.23
Risk Contingency		5%	\$10,911.86
Total			\$229,149.10

Appendix 2B: Pricing and Payment Schedule

1. The Fee for the Services and Deliverables for the SOW's activities is on a capped time and materials basis as set out in Table A and in Appendix 3.
2. The Fee for the Services and Deliverables for this SOW has been calculated based on the rates as set out in clause 5.3 of Schedule 1 to the Reconciliation Manager Market Operator Service Provider Agreement between the parties dated 30 October 2015, subject to any increase in accordance with paragraph 4.1 of that Schedule.
3. The fees in no way include any time already spent on the August 9, 2021, settlement situation. The original omission of trading periods in September 2021 are not intended to be recovered, nor any meetings NZX has attended to discuss this outcome.
4. The Fees for this SOW as described in this Appendix 1 will be invoiced to the Authority monthly in arrears. The applicable Fees for this SOW will be invoiced on a time and materials basis each month in accordance with the NZX / Authority regular billing process.
5. The Fees for this SOW as described in this Appendix are exclusive of GST.

Table B – Fees and Hours Option 2

Delivery Estimate:

Role	Hours Estimate	Rate	Total
6. Senior Developer	s9(2)(b)(ii)		\$57,540.86
7. Test Manager			\$38,667.46
8. Test Analyst			\$19,399.04
Sub Total:			\$115,607.36
Risk Contingency		5%	\$5,780.37
Total			\$121,387.73

Appendix 3A: Cost Analysis – Option 1

August 9 Settlement Correction Effort and Cost							
Revision	Description	Effort Hours			Cost		
		Senior Developer	Test Manager	Test Analyst	Senior Developer	Test Manager	Test Analyst
R0 Invoicing	Aggregating offers						
	Constrained Amounts on/off						
	Reserve Constrained Amount						
	Ancillary Services						
	Hedges						
	FTR Settlement Prices						
	Invoicing						
	Prudential Adjustments						
	Subtotal						\$104,168.24
R1 Washup	Constrained Amounts on/off						
	Ancillary Services						
	Invoicing						
	Prudential Adjustments						
	Subtotal						\$ 29,719.70
R3 Washup	Constrained Amounts on/off						
	Ancillary Services						
	Invoicing						
	Prudential Adjustments						
	Subtotal						\$ 22,016.07
R7 Washup	Constrained Amounts on/off						
	Ancillary Services						
	Invoicing						
	Prudential Adjustments						
	Subtotal						\$ 22,016.07
R14 Washup	Constrained Amounts on/off						
	Ancillary Services						
	Invoicing						
	Prudential Adjustments						
	Subtotal						\$ 22,016.07
Default	Scaling simulation						\$ 14,021.31
Project Management	Process and Cost Analysis						\$ 4,279.80
	Totals						\$218,237.23
Risk Contingency	5% Contingency if Capped or Fixed Price						\$ 10,911.86
							\$229,149.10

s9(2)(b)(ii)

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Appendix 3B: Cost Analysis Option 2

August 9 Settlement Correction Effort and Cost								
Revision	Description	Effort Hours			Cost			Total
		Senior Developer	Test Manager	Test Analyst	Senior Developer	Test Manager	Test Analyst	
R14 Invoicing	Aggregating offers	s9(2)(b)(ii)						
	Constrained Amounts on/off							
	Reserve Constrained Amounts							
	Ancillary Services							
	Hedges							
	FTR Settlement Prices							
	Invoicing							
	Prudential Adjustments							
	Subtotal							\$ 97,240.94
Default	Scaling simulation							\$ 14,913.97
Project Management	Process and Cost Analysis							\$ 3,452.45
	Totals							\$115,607.36
Risk Contingency	5% Contingency If Capped or Fixed Price							\$ 5,780.37
								\$121,387.73

s9(2)(b)(ii)

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