10 May 2022

s9(2)(a)

Dear s9(2)(a)

I refer to your request, received on 17 March 2022, for the following information under the Official Information Act 1982 (the Act):

- Any correspondence including confirmation of decisions and outcomes regarding the audit dispute referred to in your letter of 17 March 2022 to the Electricity Authority Compliance Committee.

On 14 April 2022, the Electricity Authority (Authority) released eight documents within the scope of your request. The Authority notified you of an extension to 17 May 2022 which was necessary to consult with other parties regarding some documents which are within the scope of your request.

The consultation with other parties is complete and we are releasing 11 items within the scope of your request. These documents include emails and email attachments. These are attached to this letter. Some information is being withheld under section 9(2)(a) of the Act to protect the privacy of natural persons.

A draft version of the Electricity Industry Participation Code Metering Equipment Provider Audit Report (16 July 2019) is attached. The final version has been published on our website and is available here: https://www.ea.govt.nz/assets/dms-assets/25/25588Legacy-Metering-Group-LMG-Limited-Metering-Equipment-Provider-2019-07-16-RD.pdf.

I am satisfied, in terms of section 9(1) of the Act, that the need to withhold the information referred to above is not outweighed by other considerations that render it desirable, in the public interest, to make the information available.

The Authority has searched the mailbox of a previous employee and has not found any additional material within the scope of your request.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

This request and its response will be published on the Electricity Authority website.

If you wish to discuss this decision with us, please feel free to contact us by emailing oia@ea.govt.nz.

Yours sincerely

Sarah Gillies
GM Legal, Monitoring, and Compliance

From: s9(2)(a)
Sent: Wednesday, 13 March 2019 3:46 pm
To: Alex Ehlert; Ron Beatty
Cc: s9(2)(a)
Subject: Authority Meeting 25/2/2019
Attachments: LMGL DELTA Paper Stat Sample Mar 2019.docx

Hi Alex and Ron,
Please find attached for your preliminary review our (Delta and LMGL) responses to the issues raised as from the meeting in February.

In short:
Project 1 – we still believe that the population should be held "intact"
Three phase analysis included

Project 2 – yes, we accept that 116 (not 100) meters should be included
0.5lag analysis included (as only 2 x 3p meters tested in sample)

Inspections – *mea culpa*! Explanation of how we are addressing this

We have also included a short discussion / proposal re 3 x multiplier sites fyi.

Feel free to suggest any changes. We'd be keen to discuss this prior to us submitting to the wider group (if you feel that would be appropriate and helpful).

Regards,
s9(2)(a)

s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

P. O. Box 16 185 | 16/35 Riccarton Road | Christchurch
DDI: s9(2)(a)
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LEGACY METERING GROUP

From: s9(2)(a)
Sent: Wednesday, 27 February 2019 10:55 am
To: Jonathon Staite; s9(2)(a) s9(2)(a)
Cc: Grant Benvenuti; Ron Beatty; Alex Ehlert; Rob Mitchell
Subject: RE: Actions from meeting with Veritek / Legacy Metering / Delta

Thanks Jonathon,
These are the steps I have noted from the meeting too.

Regards,
s9(2)(a)

Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: Jonathon Staite s9(2)(a)
Sent: Wednesday, 27 February 2019 10:45 AM
To: s9(2)(a)
Cc: Grant Benvenuti s9(2)(a) ; Ron Beatty <s9(2)(a) >; Alex Ehlert s9(2)(a) ; Rob Mitchell s9(2)(a)
Subject: Actions from meeting with Veritek / Legacy Metering / Delta

Hello

Thank you for taking the time to meet to discuss the Legacy Metering Groups projects to recertify its metering stock via statistical sampling and AS/NZS 1284 standard.

From the discussion the following actions were taken away:

Project 1 Statistical sampling recertification for a population that included both Contact Energy MEP and LMGL MEP meters (at the time the sampling was conducted).
Next Steps: LMGL to analyse the statistics as to how many meters from each MEP were sampled to determine if the Contact Energy or the LMGL population of meters can be recertified. This can be used to inform an alternative to 1284 certification.

Project 2: 116 meters were sampled but only the first 100 were used to recertify the population. To avoid making the certification process potentially statistically invalid (as only taking the 'first' can introduce selection bias) all of the meters selected and returned need to be used in the sample.
Next Steps: LMGL / Delta to re-evaluate the certification based on the full sample of 116 meters returned and tested.

Inspections: There was a lack of clarity regarding sample size selection for inspections and if this can be done outside of 1 Jan – 31 Dec window.
Next Steps: LMGL to provide an inspection report to Grant Benvenuti by 1 April 2019

Please let me know if there is any actions I have missed or if any of the actions need to change.

Thank you and kind regards

Jonathon Staite
Adviser Market Operations

DDI: s9(2)(a)
Email: s9(2)(a)

Electricity Authority - Te Mana Hiko
Level 7, Harbour Tower, 2 Hunter Street
PO Box 10041
Wellington 6143
New Zealand
www.ea.govt.nz

From: Ron Beatty
Sent: Tuesday, 2 July 2019 5:24 pm
To: Jonathon Staite
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi Jonathon, I have been pondering this one for some time, as you know, so apologies again for the delay. It is not an easy and straight forward case, it was appropriate for the auditor to raise a query and to query LMGL/DELT on the process.

1) On the negative side -
   a) LMGL will benefit from using a sample size reduced from 116 to 100
   b) Most ATHs will select a greater number than required for stat sampling as there will be properties where the customer refuses access, or a replacement meter cannot be fitted for any one of a variety of reasons. In that case, the ATH carrying out the replacement just moves on to the next metering installation and stops when they have reached the end of the sample size, and not stop once the minimum number required was attained
   c) There is an appearance that the stat sample was not random, as the last 16 of 116 meters tested had a significantly higher failure rate. Inclusion of these last 16 meters in the results change the outcome of the sampling and testing process significantly
   d) We do not know what % of the total meter population were comprised of the worst failing meters. We would expect for a random sample that the Sangamo S200 meters would have comprised about 44% or thereabouts of the total installed meters.

2) On the positive side
   a) The ATH, and not the MEP, is the participant that has the obligation to select a random sample size for stat sampling recertification (Clause 16(2) of Schedule 10.7)
   b) If the stat sampling had stopped at 100, without testing the additional 16 meters, no one would have been any the wiser
   c) Meters do not get sent for testing in the same 'randomised' order they were selected by the Test House when it generated the sample. There are variances in all metering stat sampling processes caused by the amount of time it takes the
      a. ATH to make staff available within certain areas (some areas will be dealt with before others)
      b. retailer to respond to a SR
      c. customer to respond to a request for access
      d. ATH carrying out the replacement certifications to batch up and send the replaced meters for testing
   d) It is likely that rural meters may perform better under test than urban meters. This is because the amount of electricity conveyed by a rural meter may be less than conveyed by an urban meter. As general rule of thumb
   e) The worst failing meters of the additional 16 tested were the S200's. However the sample size of 100 tested comprised 44% of S200 meters, it would be good to know how this compares to the total
   f) The testing ATH provided documentation stating that the results were in testing order, and had not been re-ordered.

3) On balance, I think that
   a) the test results indicate significant problems with the S200 brand of meter and given what is now known, there should be priority given to S200 replacement. A longer certification period may not achieve this objective.
   b) we need advice from someone with good stats knowledge on the methodology to determine if the sample and the process followed was representative
   c) we also need advice on how sampling is applied in other areas using this methodology, ie are all items selected for sample actually tested, or does the sampling stop when the required minimum sample size is reached. Ray Kaplan at AEMO may be able to give advice on how it is treated in Australia. I think you met Ray Kaplan?

If the answer to 3b) and 3c) is affirmative, then we need to let the sample results of 100 stand. If not of course then the sample results of 116 must be used.

Thanks

Ron Beatty
Principal Adviser Market Services
DDI s9(2)(a)

From: Jonathon Staite
Sent: Monday, 24 June 2019 10:09 AM
To: Ron Beatty
Subject: FW: LMGL Action Points - Meeting 25 Feb

Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Friday, 21 June 2019 2:09 PM
To: Jonathon Staite; Grant Benvenuti; Alex Ehlert; Ron Beatty; Rob Mitchell
Cc: s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi Jonathan

Further to the below, we have been in touch with the Delta Testhouse following our updates last week and worked through the email trail with them.

In addition, Delta advised that their auditor s9(2)(a), Veritek) has been onsite recently to undertake their MEP audit, but enquired of the Testhouse the processes followed in relation to stat sampling for another MEP. Delta advised that when questioned in relation to the processes around the LMGL stat sampling, that nothing different from the approved process had been followed.

Delta have reiterated the previous information they have provided. They are wondering what other documents and processes over and above have been provided and viewed on site by the EA Auditor you may be referring to help with any further review.

With regard to the information provided to date, Delta confirmed;

1. One population of combined meter types and phases was then 'randomly selected' following their normal processes and use of random selection tools:
- Testing occurring in the sequence stated, and they stand by the statement made by way of confirmation
- Delta had sought and received confirmation that the population of could be created from a number of different meter types and phases (also described in the audit report)

2. The population of returned meters were analysed relative to the model breakdown of those meter models tested:
- They were confident that the models tested were representative of the population and they stand by the statement made by way of confirmation
- Delta observed that the representativeness of the models returned was consistent with that seen in stat sample programmes for other MEPs

Regards,
s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: s9(2)(a)
Sent: Friday, 14 June 2019 12:03 PM
To: Jonathon Staite s9(2)(a) Grant Benvenuti s9(2)(a) ; Alex Ehlert s9(2)(a) ; Ron Beatty s9(2)(a) ; Rob Mitchell s9(2)(a)
Cc: s9(2)(a)
Subject: FW: LMGL Action Points - Meeting 25 Feb

Thanks Jonathon,

Thanks for following up and your comments below.

We have contacted the Testhouse to ask if they have any further documentation as described below – we haven't yet received anything as yet, but we'll follow up today.

I note that both of their statements (attached) appear to cover the issues that you are querying – namely representativeness of the samples and the order in which the testing was undertaken and reported. The commentary seems clear that the Testhouse has analysed the mixture of returned meters and tested meters as compared also to what is known about the overall population

I have also attached the Audit Document of Delta Testhouse in relation to Statistical Sampling methodology. The audit seems clear that the Delta processes and documentation are compliant and that the Cat1 meters can be all considered as one population. (ref audit commentary p.52 and 53). We had no indication that the Delta methodology of selection and certification was anything other than compliant.

We selected Delta primarily on the basis of their demonstrated compliance and experience.

Regarding the finalised audit report, our concern is that as these become "public" documents and we have a fundamental issue with the findings in relation to the statistical sampling results we are reluctant to have these published (unless of course these sections can be redacted)

Regards,
s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: Jonathon Staite s9(2)(a)
Sent: Tuesday, 11 June 2019 11:30 AM
To: s9(2)(a)
Cc: Grant Benvenuti s9(2)(a) ; Ron Beatty s9(2)(a) ; Alex Ehlert s9(2)(a) ; Mike Bickers s9(2)(a) ; Rob Mitchell s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Thanks for working with us on this one s9(2)(a) it looks like there is a difference of view in if a sample can be both representative and random.

Use of techniques such as stratification can ensure that the sample is both representative and random.
Taking the first 100 results from a larger sample does not mean the sample will be random or representative

We would expect the documentation provided by the ATH to show how AS/NZS 1284 is being met, including how the random sample is representative of the population (paragraph 8.4 in the standard).
Do you know when this information will be available?
It is possible that the information from the ATH will be sufficient to address the sticking point of "is the random sample representative of the population".

If we get this information we can make a better informed decision on if this issue needs to be escalated further.

Also do you have an ETA on when a finalised audit report from LMGL will be provided?

Kind regards
Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Friday, 7 June 2019 11:56 AM
To: Jonathon Staite
Cc: Grant Benvenuti; Ron Beatty; Alex Ehlert; s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi Jonathan

See my notes in amongst yours as highlighted.

I previously provided the raw information of returned meters vs the tested meters for their relative 'percentage tested' to overall 'returned population' to be considered. Which was one of the key parts of the reason why the Test Lab was happy to issue the certification and the statements.

Overall we are confident that we have complied with the wording of the AS1284 Code and more importantly the ATH has complied

Regards

s9(2)(a)

Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: Jonathon Staite <s9(2)(a) [redacted]>
Sent: Tuesday, 4 June 2019 1:58 PM
To: s9(2)(a) [redacted]
Cc: Grant Benvenuti s9(2)(a) [redacted]; Ron Beatty s9(2)(a) [redacted]; Alex Ehlert <s9(2)(a) [redacted]>; s9(2)(a) [redacted]
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi s9(2)(a) [redacted],

Thanks for your quick reply and for improving some of the readability and grammar of your response below.

I have taken a look and I think there may be some misunderstandings that need to be clea ed up.

Specifically:

1. **Sample Size** – Advice has always been given to treat the sample size as the minimum sample size, and to increase the sample size to account for UTIs. If Legacy Metering Group were to use the results of the 'first 100' installations, this would not be random and would not be representative of the population.
   LMG: As advised by the Authority, we have understood that the wording of 'The Code' holds precedence. We cannot find reference in the Code that indicates that the numbers in AS1284 are "minimums", nor does there appear to be anything in AS1284 that suggests that these numbers are minimums.
2. **Date Return Bias** – We were asking this to help improve our understanding of the data. There was no inference or thought that Legacy Metering Group or Delta were attempting to hide or alter the results.
   LMG: That is good to hear but you can probably understand that the ongoing nature of the enquiries over time (being raised only subsequent to a previous question or perceived issue being determined by yourself or the Auditor, rather than all at once) gives the impression that there is a continual search for something to determine the results invalid. Rather than accepting the process followed by the Test Lab and Test House is in keeping with previous stat sample programmes.
3. **Test Lab Statements** – The test lab has made statements about how the data is random and representative of the population. We would be keen to see the documentation to support these statements.
   LMG: Produced, as stated having reviewed the results relative to the entire population and what they know of results for other programmes they have performed. We will though ask for the documentation in question

This is covered in more detail below.

Sample Size

In terms of the sample size it would be disappointing to find that Legacy Metering Group has decided to recertify a population of meters by taking the first 100 of the 116 results available.
AS/NZS 1284 requires each meter in the sample to be tested, and we expect this will be done regardless of if the same is grea er than the sample size set in AS/NZS 1284.
LMG: We have followed the wording of the code and used the first 100 as 100 is required as the sample number to be tested. We assume that there are a number of technicians in the lab doing the testing and updating the overall registers. The Test Lab supervisor no doubt realised that the last run or so did not need to be done nearer the end

Consistent with previous guidance (https://ea.govt.nz/operations/retail/metering/metering-events/approved-test-house-forum-28aug14/) we have set expectations that the sample size is a minimum and the number of installations selected should exceed the required sample size to allow for damaged meters and no access.
We expect all MEPs to be following this guidance and requirements of the Code.
LMG: Memo and comments at forum are not the Code. This powerpoint presentation of 2014 doesn't appear to be prescriptive, nor does it describe the number above the minimum that is to be used. Rather it suggests that we "may" consider some factors is determining the sample size. If the numbers in AS1284 aren't to be used (other than

as a minimum), what numbers are to be used? It is clearly stated in AS1284, Clause 8.3 what the sample sizes have to be:

> **8.3 Sample size and pass/fail criteria (Step 2)**
>
> Sample size and pass/fail criteria shall be in accordance with Tables 1, 2 or 6.

AS/NZS 1284 has been written on the expectation that the only reason for not testing a meter is because it is damaged. It relies of the sample being random, and for all meters within the sample to be tested (except for damaged meters).
Other issues such as UTI are not considered valid reasons and no leeway is given in the standard to account for this.
LMG: For the population size, AS1284 requires that 100 meters are tested. Per 8.3 above.

Applying your logic below, if Legacy Metering Group only consider the first 100 meters (of 116 tested) for the sample have then this means they have not been randomly selected, and do not represent the population of meters being tested (8.4 below).
This is because there will be selection bias. Those meters which are easier to get back to the lab will be tested first and influence the results.
LMG: The meters were randomly selected. My point was that the standards use of 'allowing for breakages' is surely about making sure you select more sites in case some of the meters returned (if you had only just used the values in the tables) are not able to be used for testing, and therefore you would be faced with having to go out for more. To repeat my point, we (as with all MEPs) make sure we select far more than the tables values so that it allows for breakages as well as UTIs. It would be silly not to as the programmes would take even longer to complete if you progressively just did it as you found you were still short. BUT the underlying 'test sample' point of all this is that only the number in the tables need to be tested….and by association used as the determinant of the broader populations compliance with the standard.
There is no selection bias so far as we can determine. The test lab and ATH has applied its (audited) processes to our population and determined that the population passed

For example: For a minimum sample size of 100 meters, an MEP randomly selects 150 meters to be tested. [LMG" The MEP does not select the sample. The MEP and ATH agree 'the population' . But the ATH 'selects the sample'.] 75 of these are in the same city the test lab and test house are located (urban), and the remaining 75 are scattered across NZ, including rural locations (rural). (Let's assume this also accurately represents the split of meters in the population).
The test house (which is keen to commence the testing while the lab is available) retrieves 70 of the 75 urban meters and tests them within 1 month of the process starting. It then takes another 2 months to get back 70 of the 75 rural meters for testing.
Rather than having the 50/50 split that the random sampling had selected, there is now a 70 / 30 split, with a strong bias for the installations that were in urban locations.
This means that the rural meters are underrepresented, and assuming there is diversity in the meters by location (as you have suggested is the case below) the results of the 'first 100' meters tested do not represent the accuracy of the population.
LMG: We understand the point about "representativeness" of a sample from a 'population', but this is quite different from "randomness".

The meters are selected at random and there are EA Auditor approved methods that the ATH uses to generate the random selection. In a sample chosen at random – each member of the larger population has an equal chance of being chosen.

A "representative" sample is not a random sample; this is a key point of difference in our communications to date. A representative sample is highly targeted and is chosen from the larger population according to specified characteristics. A representative sample is a small subset group that seeks to proportionally reflect specified characteristics exemplified in a target population.

For example if the population of 200 meters was 100 x Q1 meters and 100 x E89 meters:
- A representative sample of 10 would be 5 x Q1 meters and 5 x E89 meters; whereas
- A random sample could be any combination of 10 meters (including 10 x Q1 meters only)

To say that the random sample is not representative is correct.
However to deem that the random sample is not valid because some items have not been included is incorrect, because that is the is the nature of randomness.

AS1284 requires the sample to be selected randomly from the larger population and tested.
The sample is tested from the random selection. The randomly selected and tested sample meets the criteria as determined by AS1284.

I can an issue when AS/NZS 1284 sets absolute thresholds for failures, so if a test exceeds the minimum sample size this will make it more likely these absolute thresholds will be exceeded.
When there are absolute thresholds for failures the sampling process should include mechanisms for ensuring that the sample remains random and representative of the population. This may include randomly selecting meters from within the full sample of meters tested to meet the sample size and ensuring there are records of every site selected being visited (and meter returned) prior to completion of the recertification programme.

Date of return bias

I am sorry if you feel that we are inferring that Legacy Metering or Delta have been less than above board. This was not the case and we appreciate the level of engagement you have had. You have been open with us and willing to provide this information and help us understand the process outside of any formal investigation or audit process.
In order to better understand the results we engaged a statistician in our market monitoring team. They noted that a significant proportion of the failures were at the tail of the dataset, and anecdotally we understand the meters were reported in the order they were tested. To better understand the influence the time between removal and testing may have on the results, they were keen to perform a "survival test". This test involves adding 'time' (how long it took to test the meter) as an additional variable in the analysis.
We were asking to help our understanding of the situation and data provided. We are happy to take 'no' for an answer if Legacy Metering Group does not want to provide this information.
LMG: Refer our comments above

Test Lab Statements

In the closing remarks you describe how the test lab has provided statements that they are comfortable with their findings and processes.
As requested previously we would be keen to get the ATH's records documenting the factors considered in the design of the statistical sample and how it is representative of the population.
Additionally it sounds like the Test Lab (and by implication the ATH responsible for the recertification activities) may have processes that mean the sampling and results are not truly random and representative of the population being sampled.
We would expect MEPs to be managing their ATH, and for the ATH to be meeting the requirements of the Code.
LMG: Please note earlier comments – randomness and representativeness are two different sampling approaches. Is there anything over and above the standard Code requirement (Sched 10.7; 16(3)) for documentation that you are seeking from the testhouse?
And Yes – as MEP we actively engage with the ATH and also reviewed the audit reports that described their processes as compliant for stat sampling. We were happy with them and it appears their auditor was too

Kind regards

Jonathon Staite
Adviser Market Operations

From: s9(2)(a) [redacted]
Sent: Tuesday, 21 May 2019 2:54 PM
To: Jonathon Staite; Alex Ehlert; Ron Beatty; s9(2)(a) [redacted]; Grant Benvenuti
Subject: RE: LMGL Action Points - Meeting 25 Feb

…I have just re-read this improved the readability as grammar and other exist in the below. where appropriate I have struck out the original wording so you can see differences and changed the font colour of any new wording. The changes are minor but important.

Regards

s9(2)(a)

[redacted]
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: s9(2)(a)
Sent: Tuesday, 21 May 2019 12:41 PM
To: Jonathon Staite s9(2)(a) 'Alex Ehlert' s9(2)(a) >; Ron Beatty s9(2)(a) >; Grant Benvenuti s9(2)(a) >
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi Jonathan

s9(2)(a) had raised a concern that he thought the tested meters (the percentage of models tested) may not have been representative of the population. He then made comments to this effect in one of his versions of his audit report. He asked for the model breakdown so this could be investigated.

When this was finally received we sent him the attached email showing the tables in question vs the meters returned. So you could see the:

1. models as a percentage of the total meters tested, compared to
2. the models of meters returned as a total of returned meters

He then, by the new version of his Audit report, seemed happy that those tested were representative of the percentages concerned.

Now grouping your comments in to categories:

The 'Under Review' Comments

This is because we understand that Ron has said that he is looking at it all now. Ie: he was going to look at the direct wording of the code and the information we have provided. This is why we had not responded to your last email. We had hoped that Ron was going to reply on the email trail that he was looking in to it all now.

Sample Size

It is Table 2 that sets the sample size. Yes there is a recommendation to grab more only for reasons of replacement (see the screenshot below) should (obviously having been removed) it is found that any of the meters are damaged and can be substituted for those (100 in our case) that are needed for testing of the Table 2 Sample number. (for our population).

If you think about it, all MEPs *select* far more than their Table 1 or Table 2 (Test) Sample size as they need to allow for more than just 'damage'. UTIs being the biggest reason.
We know for a fact that all MEPs have selected far more than the 10% to allow for damage and UTIs. Overall the rationale here is illogical if it is for substitution reasons. The standard requires just the Table 1 and 2 totals to be tested.

Supporting information to the points raised above:

Sample sizes are determined by Table 2. Table 2 does not state 'the number plus 10%.'

> **7.1.2** *Sampling accuracy by variables*
>
> Each meter in a sample shall be tested for accuracy in accordance with Clause 8.4. Sample sizes and pass and fail levels shall be in accordance with Table 2 or in accordance with

Side point:
There is no mention of the words:

1. 'minimum'
2. 'at least'
3. 'no less than'

Or any other wording that suggests that the Table 1 and Table 2 amounts are just the least that should be tested

8.4 that is referred to contains the word 'recommended' .....but, as replacements only. Not for additional testing.

> **8.4 Selection of samples (Step 3)**
>
> Samples shall be randomly selected to be representative of the selected meter population.
>
> Meters should be assessed for signs of tampering or damage. Meters that have been tampered with or damaged may be omitted from a population.
>
> It is recommended that the number of meters selected should be 10% more than the required sample size to allow for the replacements if some meters are damaged.

Even in the standards own example (Example 2, Page 8 – 6.2.2 for 'Inservice Compliance Test Results of existing populations') it says that Sample sizes are determined by using Table 2

> **AS/NZS 1284.13:2002** 8
>
> *Example 2*
>
> This Standard is implemented in 2002.
>
> A population of general purpose meters was manufactured in 1990.
>
> Because these meters are existing at the time of implementation of this Standard, the population is deemed to have a compliance period of 15 years. Therefore the meters are deemed to comply until 2005.
>
> The meter population must be tested in 2006 to ensure ongoing compliance.
>
> **6.2.2** *New meters*
>
> The population of any new pattern or type (or variant of an existing pattern or type) of meter placed into service shall undergo compliance testing within one to three years of being placed into service. Applying the results of this testing to Table 4 will determine the compliance period for that meter population. This period is known as the Initial In-Service Compliance Period.
>
> In-service compliance test results of existing meter populations should be applied to Table 5 (Ongoing In-Service Compliance Period) to determine the compliance period.
>
> In brief, the steps to be followed for compliance testing are:
>
> (a) Grouping the meters into representative populations.
>
> (b) Testing a sample of a meter population for accuracy. The sample number of meters (size) will be determined using either the attributes or variables sampling Tables (Tables 1 or 2).

Date of Return Bias

As has been explained before, meters do not get returned in the same 'randomised' order they were selected by the Test House. Certainly, the first allotment is issued first as 'SR requests' to the Retailer (ie: that they ultimately send LMGL a Service Request or other 'go' request) but timing of when an actual field Service Request is sent out for the change is ultimately determined by [*in this order*]:

1. Retailer
    a. Starting the process
    b. Communicating with the Customer
    c. Sending us the 'go' signal that it is ok to issue the Service Request
2. Field
    a. When the techs can make an appointment
    b. Access (in all its various forms and definitions)
3. Logistics
    a. The sending from the field tech to the 'collection' party (individually or in bulk, tagged accordingly)
    b. The work by the ATH logistics managers to group, treat and deliver to the Test Lab (in bulk lots over time)
    c. Receipt inwards by the Lab
4. Lab
    a. When enough arrive to perform test runs

Inference being taken by LMGL re Date Variable

It is once again being inferred, by these new questions about return dates of meters, that LMGL or Delta or both, have been less than above board in the Stat Sample process. In this latest 'date variable' you are obviously looking to see whether meters of ~~or~~ certain models were being 'waited for' until there was enough that a pass could be more easily obtained for the full 100. If you look closely at the table of meter models (in the email attachment) vs those returned you will see that the s200 appears as 44% of those meters tested. As shown to Alex and Ron in our Christchurch office when I analysed all Stat Sample programmes performed by Vircom-EMS and Delta, which was 10,886 meters, the S200 was **the model** that performed the worst in respect of passes and failures.

If we were trying to manipulate the results ~~that~~ then we would have "waited" until they represented a far smaller percentage of the 100 tested. [Note the particular nature of the population and the returned meters shows that for the networks concerned and the population in question that there are a large number of s200s as this was the meter of choice for a few of the networks in question. It was a point in time when NZ was ordering this meter type in bulk; just like in more modern times the Actaris SMO, Q1s and Holly meters were the predominant meter of choice in the years leading up to smart meters]

In supporting all of the above are the two statements from the Test Lab that they are comfortable with the findings and their process; and importantly that neither they or their Test Lab have changed their process or approach. Ie: it is the same as for previous programmes for other MEPs.

Regards

s9(2)(a)

[redacted]
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: Jonathon Staite <s9(2)(a) >
Sent: Tuesday, 21 May 2019 11:08 AM
To: s9(2)(a) Ron Beatty s9(2)(a) ; Grant Benvenuti s9(2)(a)
Cc: Alex Ehlert s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi s9(2)(a)

Following up on last week's e-mail can you please send through the ATH's records documenting the factors considered in the design of the statistical sample and how it is representative of the population.

We are also performing some statistical analysis on the results for the 116 meters in 'project 2'.
Can you please also provide the records of when each meter was removed and when it was tested. We are keen to see if there is any time-variable that may be biasing the results.

In terms of your comments in the document:

GN1: The conditions for cancellation have either been met, or the installation remains certified. It is not clear how this is still 'under review'.

GN2: Can you please clarify how this is still 'under review'. The information in the audit is not sufficient to understand which issue this relates to. If this relates to the CTCT / LMGL grouping multiple MEPs into one population, then the meters are not certified and the auditors statement is correct. If the issues relates to the statistical inspection of meters, then certification may not be cancelled. This is because the wording of the Code is considered ambiguous.

Clause 45(1) of Schedule 10.7 can be interpreted two ways:

1. ***The selection and inspection must be performed within the 12 month period*** *– this is the interpretation that has been taken historically*

2. ***The 12 month period is a discrete period, and the selection of a sample and the resultant inspections can happen at any time as long as they relate to that 12 month period****. – this is an alternative interpretation that fits with the wording of the Code and makes it difficult to enforce the interpretation (1) above.*

The intention of the Clause was to ensure the inspections were completed within the 12 month window, and there is a proposed Code amendment to address this.

In this can certification is not cancelled, as long as the inspections are being completed.

GN3: This appears to be a discussion between yourself and the auditor.

GN4: As per previous comment. I am not aware of anything that is still under review.

GN5: As discussed in the meeting earlier this year and covered in earlier e-mails. The full sample (116 meters) needs to be considered. AS/NZS 1284 specifies a minimum sample size, but the full sample must be used if larger than the minimum sample size. We are still waiting on LMGL to provide the factors considered in the design of the statistical sample and how it is representative of the population, particularly given the number of 'under-represented' strata in the sample.

Kind regards
Jonathon Staite
Adviser Market Operations

From: Jonathon Staite
Sent: Tuesday, 14 May 2019 3:53 PM
To: s9(2)(a) [redacted]; Ron Beatty; Grant Benvenuti
Cc: Alex Ehlert
Subject: RE: LMGL Action Points - Meeting 25 Feb

Thanks s9(2)(a) [redacted],

I can see that a key issue here is the question of if the sample taken is representative of the population. Before we get into the detail of this can you please send through the ATH's records documenting the factors it considered when forming the view that the sample was representative of the population.

I would expect this documentation to cover both the types (make and model) of meters as well as the functionality (3 phase vs 1 phase) and how the diversity in the sample is sufficient to form a statistically robust conclusion about the accuracy of the population the sample was taken from.

Kind regards
Jonathon Staite
Adviser Market Operations

From: s9(2)(a) [redacted]
Sent: Tuesday, 14 May 2019 3:40 PM
To: Jonathon Staite; s9(2)(a) [redacted]; Ron Beatty; Grant Benvenuti
Cc: Alex Ehlert
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi Jonathon,

The audit has been undertaken and we have commented on the points and completed the compliance plan portion too.

We have a couple of concerns, however, in relation to some of the issues raised as we have been informed that the Stat Sample Compliance Projects are still under review (although the auditor states that certification is cancelled) therefore to a reader they would think that a formal determination has already been made by the Electricity Authority.

We are therefore seeking further review and describe in the document the basis of that review and consequently are concerned it will be misleading to the market when it becomes public upon lodgement.

I have attached the document (draft) for your review. I have also attached the statements from the Delta Testhouse in relation to Project 2.

Regards,
s9(2)(a) [redacted]

[redacted]
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a) [redacted]
Mobile: s9(2)(a) [redacted]

From: Jonathon Staite s9(2)(a)
Sent: Friday, 10 May 2019 2:34 PM
To: s9(2)(a) ; Ron Beatty s9(2)(a) ; Grant Benvenuti s9(2)(a)
Cc: Alex Ehlert s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi s9(2)(a) ,

Just following up on the finalisation of the LMGL MEP audit. Do you know when it will be uploaded to the audit portal?

Kind regards
Jonathon Staite
Adviser Market Operations

From: Jonathon Staite
Sent: Tuesday, 23 April 2019 2:14 PM
To: s9(2)(a) Ron Beatty; Grant Benvenuti
Cc: Alex Ehlert
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hello Mike,

Thank you for your update. Some of the actions don't quite align with what was agreed at the 25 February 2019 meeting.

Project 1: Statistical sampling recertification for a population that included both Contact Energy MEP and LMGL MEP meters (at the time the sampling was conducted).
Next Steps: LMGL to analyse the statistics as to how many meters from each MEP were sampled to determine if the Contact Energy or the LMGL population of meters can be recertified. This can be used to inform an alternative to 1284 certification.

Update: LMGL have requested the Authority considers the group of CTCT and LMGL MEP meters as one population. LMGL have not analysed how many meters from each MEP were sampled to determine if either population can be recertified.
The Code allows for the transfer of metering assets (MEO) without the agreement of the trader, however Contact Energy (the MEP) cannot contract out of the MEP obligations.

Clarification: The statistical sampling is invalid as it is one population for two different MEPs. No information has been provided to support an alternative to AS/NZS 1284 to recertify these installations.
Action: Legacy Metering Group need to update the registry to record that all of their meters are not certified and LMGL need to arrange for recertification to occur.

Project 2: 116 meters were sampled but only the first 100 were used to recertify the population. To avoid making the certification process potentially statistically invalid (as only taking the 'first' can introduce selection bias) all of the meters selected and returned need to be used in the sample.
Next Steps: LMGL / Delta to re-evaluate the certification based on the full sample of 116 meters returned and tested.

Update: LMGL have performed some analysis and believe that the correct certification period if 2 years.
Taking a quick look at the results we note there are two 'outliers' (SN#41910031 and SN#40912025, 5 full load 'failures' and 3 light load 'failures'. The AQL for full load is 4% (4 out of the 114 remaining meters, once outliers are excluded), so the AQL at full load may not have been met.

There is also some uncertainty regarding the results due to the inclusion of 3-phase meters in the population. It appears there are two 3-phase meters, both of which appear to have failed at least one test. This may make certification invalid and LMGL may need to split the population into 3-phase meters and single phase meters. If LMGL does not have sufficient records to know which meters are 3-phase, the distributor should be able to help identify 3-phase connections to its network.

Additionally the sampling assumes there is a homogenous population. Looking at the serial numbers of the two 'outliers' (both with approx. 7-8% error), both appear to be similar and may be the same make and model of meter. No other meters with a similar serial number have been sampled and it may be that there are specific types of meters that have errors that could be materially affecting consumers.

Action: We recommend that LGML ensures that this recertification of 2 years is reviewed by your auditor to confirm this certification period is correct.

Inspections: There was a lack of clarity regarding sample size selection for inspections and if this can be done outside of 1 Jan – 31 Dec window.
Next Steps: LMGL to provide an inspection report to Grant Benvenuti by 1 April 2019

Update: LMGL has completed some additional inspections. This approach has been 'stratified', with 51 ICPs inspected from a population of 467 10yr+ old meters. A further 67 meters have been inspection from a population of 619 7-10yr old meters. There are 17 outstanding service requests.
LMGL requests that this stratified approach be accepted by the Authority
Stratification of sampling is a valid approach (assuming they have randomly selected a number of ICPs from each strata that is representative of the population).
Based on my reading of the Code, I believe this random stratified approach is permitted.

Clause 45(1) of Schedule 10.7 can be interpreted two ways:

1. ***The selection and inspection must be performed within the 12 month period*** – this is the interpretation that has been taken historically

2. ***The 12 month period is a discrete period, and the selection of a sample and the resultant inspections can happen at any time as long as they relate to that 12 month period***. – this is an alternative interpretation that fits with the wording of the Code and makes it difficult to enforce the interpretation (1) above.

The intention of the Clause was to ensure the inspections were completed within the 12 month window, and there is a proposed Code amendment to address this.

Action: We recommend LMGL ensures that these inspections are reviewed by your auditor and included in the audit report.

In addition to the above agreed actions, Legacy Metering Group has provided some technical results of testing, particularly around the use of a 1 phase meter on sites that require a 3-phase supply.
The meter board is not the only place a meter can be installed (and there is no obligation under the Code to install the meter on the meter board if it is not practical to do so). The LMGL proposal would require a Code amendment.
Action: We recommend LMGL arranges for accurate metering to be installed. LMGL may also wish to propose a Code amendment similar to what has been proposed in the paper, this can be considered by the Authority though LMGL must still continue to meet its Code obligations.

I hope this clears up the outstanding actions so LMGL can finalise and submit its audit. I will be passing a copy of this e-mail (without attachments) to your auditor to keep them in the loop.

Kind regards

Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Wednesday, 20 March 2019 11:42 AM
To: Grant Benvenuti; Alex Ehlert
Subject: LMGL Action Points - Meeting 25 Feb

Hi Grant,
Apologies for taking a bit longer to get back to you on this – we wanted to get some more testing done and gather more information to make our answers as complete as we possibly can.

The attached paper responds to the three issues that came out of our meeting on 25/2. Namely:

- Proj 1 numbers (incl 3phase)
- Proj 2 116 results (incl 0.5lag)
- 2018 Inspection discussion

We've also reflected the x 3 multiplier discussion for your review too.

We are trying our very best to get everything right, and believed that we had been doing so. We're keen to discuss this before we go any further. We'll give you a call this afternoon.

Regards,
s9(2)(a)

Legacy Metering Group (LMG) Limited

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take any action in reliance upon this transmission."

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take any action in reliance upon this transmission."

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take any action in reliance upon this transmission."

From: Jonathon Staite
Sent: Thursday, 21 March 2019 10:26 am
To: Grant Benvenuti
Cc: Ron Beatty; Alex Ehlert
Subject: RE: LMGL Action Points - Meeting 25 Feb
Attachments: RE: Actions from meeting with Veritek / Legacy Metering / Delta; FINAL PAPER LMGL Meeting 25022019.docx

Hi Grant / Ron

I have had a read-through of the LMGL action points and they do not align to the agreed actions (attached).

Project 1: Statistical sampling recertification for a population that included both Contact Energy MEP and LMGL MEP meters (at the time the sampling was conducted).
Next Steps: LMGL to analyse the statistics as to how many meters from each MEP were sampled to determine if the Contact Energy or the LMGL population of meters can be recertified. This can be used to inform an alternative to 1284 certification.

Update: LMGL have requested the Authority considers the group of CTCT and LMGL MEP meters as one population.
LMGL have not analysed how many meters from each MEP were sampled to determine if either population can be recertified.
The Code allows for the transfer of metering assets (MEO) without the agreement of the trader, however Contact Energy (the MEP) cannot contract out of the MEP obligations.
I believe the statistical sampling remains invalid (as it is not for one MEP)

Project 2: 116 meters were sampled but only the first 100 were used to recertify the population. To avoid making the certification process potentially statistically invalid (as only taking the 'first' can introduce selection bias) all of the meters selected and returned need to be used in the sample.
Next Steps: LMGL / Delta to re-evaluate the certification based on the full sample of 116 meters returned and tested.

Update: LMGL have performed some analysis and believe that the correct certification period if 2 years.
Ron: Can you review these results (Appendix 4), as there are some meters with very high low load error that are sitting in the "pass" column.

Inspections: There was a lack of clarity regarding sample size selection for inspections and if this can be done outside of 1 Jan – 31 Dec window.
Next Steps: LMGL to provide an inspection report to Grant Benvenuti by 1 April 2019

Update: LMGL has completed some additional inspections. This approach has been 'stratified', with 51 ICPs inspected from a population of 467 10yr+ old meters. A further 67 meters have been inspection from a population of 619 7-10yr old meters. There are 17 outstanding service requests.
LMGL requests that this stratified approach be accepted by the Authority.
Talking to Julia Hall (who has a statistics background), stratification of sampling is valid and is still a random approach (assuming they have selected a number of ICPs from each strata that is representative of the population).
Based on my reading of the Code, I believe this random stratified approach is permitted.

However internal discussions with legal have found no record of any opinion or view that inspections can go outside of the calendar year window.
I remain of the view that inspections need to be conducted within the 12 month window, which has led to automatic cancellation of certification.

LMGL has also provided some technical information on the results of testing, particularly around the use of a 1 phase meter on sites that require a 3-phase supply.
I believe that the meter board is not the only place a meter can be installed (and there is no obligation under the Code to install the meter on the meter board if it is not practical to do so), and the LMGL proposals would require Code amendments.

Ron: Can you please look at the technical aspects of the attached paper to confirm if the analysis and conclusions are correct.

Thanks

Jonathon Staite
Adviser Market Operations

From: Grant Benvenuti
Sent: Thursday, 21 March 2019 9:46 AM
To: Jonathon Staite
Subject: FW: LMGL Action Points - Meeting 25 Feb

Grant Benvenuti
Manager Market Operations
Mob: s9(2)(a)
DDI: s9(2)(a)

From: s9(2)(a)
Sent: Wednesday, 20 March 2019 11:42 AM
To: Grant Benvenuti; Alex Ehlert
Subject: LMGL Action Points - Meeting 25 Feb

Hi Grant,
Apologies for taking a bit longer to get back to you on this – we wanted to get some more testing done and gather more information to make our answers as complete as we possibly can.

The attached paper responds to the three issues that came out of our meeting on 25/2. Namely:

- Proj 1 numbers (incl 3phase)
- Proj 2 116 results (incl 0.5lag)
- 2018 Inspection discussion

We've also reflected the x 3 multiplier discussion for your review too.

We are trying our very best to get everything right, and believed that we had been doing so. We're keen to discuss this before we go any further. We'll give you a call this afternoon.

Regards,

s9(2)(a)

Legacy Metering Group (LMG) Limited

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s9(2)(a)

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LEGACY METERING GROUP

From: s9(2)(a)
Sent: Tuesday, 23 April 2019 3:56 pm
To: Alex Ehlert; s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb
Attachments: FINAL PAPER LMGL Meeting 25022019.docx; Contact-Energy-Metering-Equipment-Provider-2018-10-05-RD.pdf; Contact-Energy-Metering-Equipment-Provider-05-10-17-RD.pdf

Hi Alex

Thanks for taking the call just now.

Page 3 of the submission we made mentions the Contact Energy as MEP Audit conducted by Steve whereby of course the ICPs in question still in their name but with LMGL were discussed.

The 2017 and 2018 Contact Energy MEP audit reports are also attached. 2017 notes that LMGL is doing the Stat Sample for these and the Audit. There is also the note in 2018 that it has been concluded and will be transitioned to LMGL.

In our various Auditor reports Steve makes comments that he knows about the other ICPs that TRUS had not nominated us for but that they are all in the same single population programme.

To now raise this post our work when the Authority knew at the very moment we started out and all along about the situation (as did the auditor) leaves us feeling more than just a little frustrated. Why now?

We could argue for some time on Project 2 but are willing to work with the EA.

Can you please read all of the below and the rest of our word document attached that we submitted. Also important to read 10.21.

Regards

s9(2)(a)

[redacted]
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: s9(2)(a)
Sent: Wednesday, 24 April 2019 10:44 am
To: Alex Ehlert; Ron Beatty; s9(2)(a)
Subject: FW: LMGL Action Points - Meeting 25 Feb
Attachments: Delta Test House Statement.pdf; FINAL PAPER LMGL Meeting 25022019.docx

Hi Alex and Ron,
Please find attached the response to s9(2)(a) in relation to his request for the information.

Regards,
s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: s9(2)(a)
Sent: Wednesday, 24 April 2019 10:43 AM
To: s9(2)(a) >
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hi s9(2)(a),
Please find below the breakdown of the metering in P2 compared to the meters returned. As you can see there's also a little bit of variability in the description of the returned devices.

A couple of points to note:

- As stated in the paper Project 2 was not a typical population. It was a 1ph population, hence we would expect only 1ph meters to appear
- The successful change out (rate of removal) from different areas meant that due to the predominance of those meter types in those areas that there was greater proportion of that type of meter over the others when the lab staff went out to grab meters for testing (remember discussions relating to v v high UTI rates and logistics failures from Vircom vs those from other installers)
- There was timing pressure from the EA and Retailers and of course ourselves being placed on the Delta Test House and Lab and once they saw from the returns they had enough returned they began the lab testing process. As discussed before this may not be congruent with the exact order of the selection. The earliest Service Requests should though have seen the earlier list entries being returned before the later ones. This is in keeping with the approach of the ATHs for all other random sample processes. Ie: they have not done anything different for LMG over and above for the other programmes they have run for others. Artificial manipulation of this approach introduces delays and potentially interferes with the randomness of the sample.
- The testhouse has also advised, that taking all the above in to account and the percentage of those tested vs returned that they are happy with the "representativeness" of the meters tested as it relates to the population. This note is also attached as well as included in the paper

I have attached the paper we prepared for Grant and Jonathon.

In so far as P1 goes, I did provide the analysis Jonathon was after – specifically 16% of the metering was the TRUS_CTCT sites – this equates to 24 meters in the tested population. Breaking the two subsets out means that 126 meters were tested from the LMGL only subset.

Project 2 Models as Tested vs Returned Meters

Model Types	Returned meters	Number tested	% tested
S200	33.0%	56	44%
S29	11.6%	12	14%
E89	11.1%	20	17%
F2K	10.8%	0	0%
5 Dial 1 reg MUN021	4.0%	9	8%
CL27-2	4.0%	1	1%
iph2w	3.3%	0	0%
C11B2	3.0%	5	4%
B31B	2.6%	5	4%
S200-7	1.9%	1	1%
FNE12Q	1.4%	3	3%
fm	1.2%	0	0%
fnn2q	1.1%	2	2%
GE24	1.1%	1	1%
Unknown	1.0%	1	1%
CE	0.8%		
s3	0.8%		
FL	0.7%		
iph	0.6%		
M3i	0.6%		
CL147	0.4%		
CL27	0.3%		
f4k100	0.3%		
fna	0.3%		
FNAA	0.3%		
fnaa34	0.3%		
fnab34q	0.3%		
fnea340	0.3%		
fnea34q	0.3%		
j19	0.3%		
K320NXEP	0.3%		
k33	0.3%		
K420INS	0.3%		
M4F5	0.3%		
S301.1	0.3%		
zfb	0.3%		
C11B3A	0.1%		
CM143xf6	0.1%		
e43	0.1%		
FMM	0.1%		
M2XL4	0.1%		
Grand Total	100.0%		100%

s9(2)(a)
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: s9(2)(a)
Sent: Tuesday, 23 April 2019 4:36 PM
To: s9(2)(a)
Subject: FW: LMGL Action Points - Meeting 25 Feb

Hi s9(2)(a)

Could you please send me the attachments referred to by Jonathon so I can finalise the draft report?

I also need the meter make and model for the 116 meters in the project 2 sample.

Thanks and regards

s9(2)(a)
Managing Director
Veritek Ltd
Ph: s9(2)(a)
Mob: s9(2)(a)
Email: s9(2)(a)
Postal: PO Box 8143, Cherrywood, Tauranga, 3245

From: Jonathon Staite s9(2)(a)
Sent: Tuesday, 23 April 2019 2:14 PM
To: s9(2)(a) Gary Nightingale s9(2)(a) s9(2)(a) ; Ron Beatty s9(2)(a) >; Grant Benvenuti s9(2)(a)
Cc: Alex Ehlert s9(2)(a)
Subject: RE: LMGL Action Points Meeting 25 Feb

Hello s9(2)(a)

Thank you for your update. Some of the actions don't quite align with what was agreed at the 25 February 2019 meeting.

Project 1: Statistical sampling recertification for a population that included both Contact Energy MEP and LMGL MEP meters (at the time the sampling was conducted).
Next Steps: LMGL to analyse the statistics as to how many meters from each MEP were sampled to determine if the Contact Energy or the LMGL population of meters can be recertified. This can be used to inform an alternative to 1284 certification.

Update: LMGL have requested the Authority considers the group of CTCT and LMGL MEP meters as one population. LMGL have not analysed how many meters from each MEP were sampled to determine if either population can be recertified.
The Code allows for the transfer of metering assets (MEO) without the agreement of the trader, however Contact Energy (the MEP) cannot contract out of the MEP obligations.

Clarification: The statistical sampling is invalid as it is one population for two different MEPs. No information has been provided to support an alternative to AS/NZS 1284 to recertify these installations.
Action: Legacy Metering Group need to update the registry to record that all of their meters are not certified and LMGL need to arrange for recertification to occur.

Project 2: 116 meters were sampled but only the first 100 were used to recertify the population. To avoid making the certification process potentially statistically invalid (as only taking the 'first' can introduce selection bias) all of the meters selected and returned need to be used in the sample.
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Taking a quick look at the results we note there are two 'outliers' (SN#41910031 and SN#40912025, 5 full load 'failures' and 3 light load 'failures'. The AQL for full load is 4% (4 out of the 114 remaining meters, once outliers are excluded), so the AQL at full load may not have been met.

There is also some uncertainty regarding the results due to the inclusion of 3-phase meters in the population. It appears there are two 3-phase meters, both of which appear to have failed at least one test. This may make certification invalid and LMGL may need to split the population into 3-phase meters and single phase meters. If LMGL does not have sufficient records to know which meters are 3-phase, the distributor should be able to help identify 3-phase connections to its network.

Additionally the sampling assumes there is a homogenous population. Looking at the serial numbers of the two 'outliers' (both with approx. 7-8% error), both appear to be similar and may be the same make and model of meter. No other meters with a similar serial number have been sampled and it may be that there are specific types of meters that have errors that could be materially affecting consumers.

Action: We recommend that LGML ensures that this recertification of 2 years is reviewed by your auditor to confirm this certification period is correct.

Inspections: There was a lack of clarity regarding sample size selection for inspections and if this can be done outside of 1 Jan – 31 Dec window.
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1) ***The selection and inspection must be performed within the 12 month period*** – this is the interpretation that has been taken historically

2) ***The 12 month period is a discrete period, and the selection of a sample and the resultant inspections can happen at any time as long as they relate to that 12 month period***. – this is an alternative interpretation that fits with the wording of the Code and makes it difficult to enforce the interpretation (1) above.

The intention of the Clause was to ensure the inspections were completed within the 12 month window, and there is a proposed Code amendment to address this.

Action: We recommend LMGL ensures that these inspections are reviewed by your auditor and included in the audit report.

In addition to the above agreed actions, Legacy Metering Group has provided some technical results of testing, particularly around the use of a 1 phase meter on sites that require a 3-phase supply.
The meter board is not the only place a meter can be installed (and there is no obligation under the Code to install the meter on the meter board if it is not practical to do so). The LMGL proposal would require a Code amendment.
Action: We recommend LMGL arranges for accurate metering to be installed. LMGL may also wish to propose a Code amendment similar to what has been proposed in the paper, this can be considered by the Authority though LMGL must still continue to meet its Code obligations.

I hope this clears up the outstanding actions so LMGL can finalise and submit its audit. I will be passing a copy of this e-mail (without attachments) to your auditor to keep them in the loop.

Kind regards

Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Wednesday, 20 March 2019 11:42 AM
To: Grant Benvenuti; Alex Ehlert
Subject: LMGL Action Points - Meeting 25 Feb

Hi Grant,
Apologies for taking a bit longer to get back to you on this – we wanted to get some more testing done and gather more information to make our answers as complete as we possibly can.

The attached paper responds to the three issues that came out of our meeting on 25/2. Namely:

- Proj 1 numbers (incl 3phase)
- Proj 2 116 results (incl 0.5lag)
- 2018 Inspection discussion

We've also reflected the x 3 multiplier discussion for your review too.

We are trying our very best to get everything right, and believed that we had been doing so. We're keen to discuss this before we go any further. We'll give you a call this afternoon.

Regards,

s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

P. O. Box 16 185 | 16/35 Riccarton Road | Christchurch
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LEGACY METERING GROUP

From: Jonathon Staite
Sent: Tuesday, 4 June 2019 1:58 pm
To: s9(2)(a)
Cc: Grant Benvenuti; Ron Beatty; Alex Ehlert; s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb
Attachments: RE: Actions from meeting with Veritek / Legacy Metering / Delta

Hi s9(2)(a)

Thanks for your quick reply and for improving some of the readability and grammar of your response below.

I have taken a look and I think there may be some misunderstandings that need to be cleared up

Specifically:

1. **Sample Size** – Advice has always been given to treat the sample size as the min mum sample size, and to increase the sample size to account for UTIs. If Legacy Metering Group were to use the results of the 'first 100' installations, this would not be random and would not be representative of the population.

2. **Date Return Bias** – We were asking this to help improve our understanding of the data. There was no inference or thought that Legacy Metering Group or Delta were attempting to hide or alter the results.

3. **Test Lab Statements** – The test lab has made statements about how the data is random and representative of the population. We would be keen to see the documentation to support these statements.

This is covered in more detail below.

Sample Size

In terms of the sample size it would be disappointing to find that Legacy Metering Group has decided to recertify a population of meters by taking the first 100 of the 116 results available.
AS/NZS 1284 requires each meter in the sample to be tested, and we expect this will be done regardless of if the same is greater than the sample size set in AS/NZS 1284.

Consistent with previous guidance (https://ea.govt.nz/operations/retail/metering/metering-events/approved-test-house-forum-28aug14/) we have set expectations that the sample size is a minimum and the number of installations selected should exceed the required sample size to allow for damaged meters and no access.
We expect all MEPs to be following this guidance and requirements of the Code.

AS/NZS 1284 has been written on the expectation that the only reason for not testing a meter is because it is damaged. It relies of the sample being random, and for all meters within the sample to be tested (except for damaged meters).
Other issues such as UTI are not considered valid reasons and no leeway is given in the standard to account for this.

Applying your logic below, if Legacy Metering Group only consider the first 100 meters (of 116 tested) for the sample have then this means they have not been randomly selected, and do not represent the population of meters being tested (8.4 below).
This is because there will be selection bias. Those meters which are easier to get back to the lab will be tested first and influence the results.

For example: For a minimum sample size of 100 meters, an MEP randomly selects 150 meters to be tested. 75 of these are in the same city the test lab and test house are located (urban), and the remaining 75 are scattered across NZ, including rural locations (rural). (Let's assume this also accurately represents the split of meters in the population).

The test house (which is keen to commence the testing while the lab is available) retrieves 70 of the 75 urban meters and tests them within 1 month of the process starting. It then takes another 2 months to get back 70 of the 75 rural meters for testing.
Rather than having the 50/50 split that the random sampling had selected, there is now a 70 / 30 split, with a strong bias for the installations that were in urban locations.
This means that the rural meters are underrepresented, and assuming there is diversity in the meters by location (as you have suggested is the case below) the results of the 'first 100' meters tested do not represent the accuracy of the population.

I can an issue when AS/NZS 1284 sets absolute thresholds for failures, so if a test exceeds the minimum sample size this will make it more likely these absolute thresholds will be exceeded.
When there are absolute thresholds for failures the sampling process should include mechanisms for ensuring that the sample remains random and representative of the population. This may include randomly selecting meters from within the full sample of meters tested to meet the sample size and ensuring there are records of every site selected being visited (and meter returned) prior to completion of the recertification programme.

Date of return bias

I am sorry if you feel that we are inferring that Legacy Metering or Delta have been less than above board. This was not the case and we appreciate the level of engagement you have had. You have been open with us and willing to provide this information and help us understand the process outside of any formal investigation or audit process.
In order to better understand the results we engaged a statistician in our market monitoring team. They noted that a significant proportion of the failures were at the tail of the dataset, and anecdotally we understand the meters were reported in the order they were tested. To better understand the influence the time between removal and testing may have on the results, they were keen to perform a "survival test". This test involves adding 'time' (how long it took to test the meter) as an additional variable in the analysis.
We were asking to help our understanding of the situation and data provided. We are happy to take 'no' for an answer if Legacy Metering Group does not want to provide this information.

Test Lab Statements

In the closing remarks you describe how the test lab has provided statements that they are comfortable with their findings and processes.
As requested previously we would be keen to get the ATH's records documenting the factors considered in the design of the statistical sample and how it is representative of the population.
Additionally it sounds like the Test Lab (and by implication the ATH responsible for the recertification activities) may have processes that mean the sampling and results are not truly random and representative of the population being sampled.
We would expect MEPs to be managing their ATH, and for the ATH to be meeting the requirements of the Code.

Kind regards

Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Monday, 15 July 2019 2:06 pm
To: Jonathon Staite; Alex Ehlert; Ron Beatty; Grant Benvenuti; Rob Mitchell; s9(2)(a)
Subject: FW: LMGL Action Points - Meeting 25 Feb
Attachments: LMG 2019 Audit - FINAL.docx

Hi Jonathan,

Thanks for this.

Yes – LMGL has finalised the report and sent it to Veritek for review. I have attached the copy we have sent to Veritek. Pretty much unchanged from the version we sent through a couple of weeks ago.

Please note (with regard to your comment about LMGL choosing to use 100) – LMGL has not chosen to use the 100. This "choice" (or decision) is by the ATH. We do not have an ATH (unlike other MEPs) and rely solely on the 3rd Party analysis, experience, and advice. We understand that the ATH's "choice" is based on the rules, codes and standards and the ATH has assessed the results also on the basis of its observation and experience, as evidenced by their statements that they have provided. Just to re-iterate – this is not LMGL choosing the results – this is the reported results from the Testhouse. For clarity, LMGL has no financial or other association with the ATH (in this case, Delta) other than a commercial, contractual relationship.

We note your advice regarding the audit report below, thank you. As noted above, we will submit the audit report as is.

Regarding your questions in relation to the dynamics of the project – I have provided summary detail below. This was particularly challenging due to the active rollouts happening in the networks concurrently.

In the initial phase of the project, there were very low numbers were returned to Delta from the field. There were three main causes of this

a. High UTI rates
b. Techs not returning meters to the designated return points in a timely manner
c. Third party logistic failures

Consequently we needed to issue more ICPs to the Retailers than was ideal just so that we could increase the chances of getting the required number of meters returned in a timely fashion.

We have provided a table below of the meters returned vs those tested. We understand that it was from this analysis that the Test House prepared the statement as to their contentment that both the returned meters and the tested meters reflected the nature of the population:

Project 2 Models as Tested vs Returned Meters

Model Types	Returned meters	Number tested	% tested
S200	33.0%	56	44%
S29	11.6%	12	14%
E89	11.1%	20	17%
F2K	10.8%	0	0%
5 Dial 1 reg MUN021	4.0%	9	8%
CL27-2	4.0%	1	1%
iph2w	3.3%	0	0%
C11B2	3.0%	5	4%

B31B	2.6%	5	4%
S200-7	1.9%	1	1%
FNE12Q	1.4%	3	3%
fm	1.2%	0	0%
fnn2q	1.1%	2	2%
GE24	1.1%	1	1%
Unknown	1.0%	1	1%
CE	0.8%		
s3	0.8%		
FL	0.7%		
iph	0.6%		
M3i	0.6%		
CL147	0.4%		
CL27	0.3%		
f4k100	0.3%		
fna	0.3%		
FNAA	0.3%		
fnaa34	0.3%		
fnab34q	0.3%		
fnea340	0.3%		
fnea34q	0.3%		
j19	0.3%		
K320NXEP	0.3%		
k33	0.3%		
K420INS	0.3%		
M4F5	0.3%		
S301.1	0.3%		
zfb	0.3%		
C11B3A	0.1%		
CM143xf6	0.1%		
e43	0.1%		
FMM	0.1%		
M2XL4	0.1%		
Grand Total	100.0%		100%

We have passed your request for other documentation back to the testhouse although we understand that Veritek has already reviewed documentat on both from us and at Delta? We have been advised by the Testhouse that Veritek has recently reviewed Test House documentation in relation to the LMGL Stat Sample Project during a recent visit to Delta for another purpose. We been advised that both Godfrey (Testhouse Manager) and Harrison Orme are currently away from the office – on leave and on a training programme respectively. Hopefully we'll hear back soon.

In brief answer to your list of questions:

how many installations were in the sample	325 installation made up the original sample to co
was the sample extended (if so by how much and how many times)	Extended twice. First by 89 sites, then by another 4
how many were visited	434 sites were visited in total
how many were returned from the field	318 sites eventually returned meters from the field
how many were unable to be accessed	116 sites couldn't be accessed (27% UTI's)
how many were not visited	24 sites were not visited

Regards,

s9(2)(a)

s9(2)(a)
Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
Mobile: s9(2)(a)

From: Jonathon Staite s9(2)(a)
Sent: Wednesday, 3 July 2019 10:00 AM
To: s9(2)(a) Grant Benvenuti s9(2)(a) Alex Ehlert s9(2)(a) ; Ron Beatty s9(2)(a) ; Rob Mitchell s9(2)(a)
Cc: s9(2)(a)
Subject: RE: LMGL Action Points - Meeting 25 Feb

Hello s9(2)(a) ,

Thank you for this information.

More information needed to understand if sampling was random and representative of the population
We are still stuck on the LMGL decision to use the first 100 installations sampled rather than the 116 installations tested. This appears to materially affect the outcome of the certification process.

The Authority would like copies of the documents and processes, including the analysis the test house performed to conclude that the results (used to certify the population) were both random and representative of the population. We are also keen to get a breakdown of the sampling process.

- how many installations were in the sample
- was the sample extended (if so by how much and how many times)
- how many were visited
- how many were returned from the field
- how many were unable to be accessed
- how many were not visited

In terms of the Delta ATH audit, you will want to talk to your auditor about how relevant the assessment is to your specific circumstance. I suspect the auditor has looked at the "testing by attributes" approach in AS/NZS 1284 and these statements may not hold true for the "testing by variables" approach.

Delivery of final audit report should not be delayed further due to this review
I don't see any benefit in delaying the delivery of the final audit report. I think it is best if this issue is transparent in the audit and it is clear that the Authority is aware of the issue and is looking into it.

With regards to the final audit report, if there is something that Legacy Metering Group does not want to see in the audit report there are several options:

1. **Request the information be withed because not withholding this information would (a) would disclose a trade secret; or (b) would be likely unreasonably to prejudice the commercial position of the person who supplied or is the subject of the information.**
   We follow the same guidelines as the Official Information Act (OIA) when assessing if something should be withheld from publication.

The guidelines can be found here:
http://www.ombudsman.parliament.nz/system/paperclip/document_files/document_files/1265/original/part_2c__other_reasons_for_refusing_official_information_-_commercial_information.pdf?1450331887

This guideline should help you provide the information we require in order to make an informed decision regarding redacting information for the audit report.

We would need you to provide information to help us understand why not withholding this information (a) would disclose a trade secret; or (b) would be likely unreasonably to prejudice the commercial position of the person who supplied or is the subject of the information. This is a legal decision and we would get our legal team involved in ensuring the OIA test is met and decision is robust.

2. **Convince the auditor to amend the audit report**
If the information is related to specific issues, but not to compliance of the participant then it is possible the auditor can word it in a way that addresses the issue. For example if an audit identified ICPs with incorrect information, it is possible to report that the ICPs exist but not report the ICP numbers in the audit report. If the issue is that you do not want an alleged non-compliance reported then you would need to convince the auditor that the non-compliance does not exist. Auditors are expected to be independent from the organisation they are auditing and to audit to the wording and requirements of the Code.

3. **Get another audit**
If you do not agree with the auditors findings, you can always arrange for a different auditor to perform the audit (at your own cost).

Kind regards

Jonathon Staite
Adviser Market Operations

From: s9(2)(a)
Sent: Tuesday, 16 July 2019 10:28 am
To: s9(2)(a); Jonathon Staite; Alex Ehlert; Ron Beatty; Grant Benvenuti; Rob Mitchell
Subject: RE: LMGL Action Points - Meeting 25 Feb
Attachments: Audit received

Hi All

The completed audit documents have been received by Veritek in PDF form and I have loaded them to the portal. The confirmation automatic email is attached.

The only difference to the Word document that was with the email below is that the side comments have been deleted prior to receipt by return from Veritek.

Regards

s9(2)(a)

Legacy Metering Group (LMG) Limited

DDI: s9(2)(a)
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Response to Electricity Authority

Meeting 25/2/2019

Contents

Background

The Electricity Authority, Legacy Metering Group (LMGL) Limited (as MEP), Delta Utility Services Ltd (as ATH) and Veritek (as Auditor) met in Wellington on 25 February to discuss questions concerning the two statistical sampling projects undertaken by Delta on behalf of LMG in 2017 – 2018.

Three main issues arose as follows:

- **Project 1**: Statistical sampling recertification for a population that included both Contact Energy MEP and LMGL MEP meters (at the time the sampling was conducted).
- **Project 2**: 116 meters were sampled but only the first 100 were used to recertify the population. To avoid making the certification process potentially statistically invalid (as only taking the 'first' can introduce selection bias) all of the meters selected and returned need to be used in the sample.
- **Inspections**: There was a lack of clarity regarding sample size selection for inspections and if this can be done outside of 1 Jan – 31 Dec window.

Each of these three issues are addressed in the following paper.

There are other issues, raised during the meeting discussed at the end of the paper for review and consideration. Namely:

- 3x Multiplier Sites

Project 1 Statistical Sampling

Population Determination

LMGL purchased (approximately) 63,000 interim certified meters across 34,000 ICPs.

		Feb-17	Sep-18	Feb-19
ICP Count	LMGL Interim	27578	20724	
	CTCT_TRUS	7039	5072	
	Subtotal	34617	25796	25710
Meter Count	LMGL Interim	50358	38728	
	CTCT_TRUS	13404	9612	
	Subtotal	63762	48340	48127

LMGL contracted with Contact Energy to undertake all MEP obligations of the "in scope" metering (i.e. those meters that were purchased as part of the sale and purchase agreement dated 20 May 2016).

Trustpower, however, declined to nominate LMGL as MEP on the registry although LMGL had purchase the metering and Contact Energy was exiting as MEP for those sites.

LMGL commenced a statistical sampling programme for all of the metering that it had purchased based on Table 2 of AS1284.13. That is, selection of 150 meters to cover a population of 35,000 – 150,000.

LMGL discussed the approach with the Authority during a compliance fact-finding investigation in 2016. The non-nomination by Trustpower was understood to be an administrative issue (or similar) as the meters had been purchased and obligations transferred from Contact Energy in 2016 and the parties understood that 10.21(2) would be applicable in this special case.

The uncertified devices were identified separately in the Contact Energy MEP audits in 2017 and 2018. Contact Energy responded in these audits that:

> Issue 1: 6,409 interim certified installations not re-certified, these assets have been sold to LMGL (which was inferred we could do as per our EA settlement agreement conditions) but a retailer has refused to make the update to the registry to nominate LMGL as the new MEP. LMGL have taken on all rights as the MEP (contractually with CTCT) and CTCT remains the MEP on the registry in name only.

The ATH and the MEP agreed that these meters represented a population as they were all subject to the sale and purchase transaction.

LMGL requested the selection of the meters be undertaken by Delta ATH and this was provided in Feb 2017. The recovery of the metering assets to be tested commenced at the end of the month.

Of the total number of SR's issued 16% were to Trustpower, the remainder to other retailers. Trustpower regularly issued SR and customer contact details in support of the statistical sampling programme.

LMGL respectfully requests that this selection be considered as a population for reasons of:

1. All of these meters were subject to the sale and purchase agreement
    a. Through an administrative roadblock between Contact Energy and Trustpower, the sites purchased by LMGL were not nominated at the time
2. LMGL was recorded MEO on the registry for all of those sites
3. LMGL had been contracted to undertake all MEP obligations in relation to all sites under the sale and purchase agreement
4. Both LMGL and Contact Energy had discussed the issue through audit processes and fact-finding reviews with the Authority since 2016.
5. The lack of nomination to LMGL was an administrative issue as the metering, responsibilities and costs of maintenance and replacement were all borne by LMGL.

Three Phase

There were 14 x 3phase meters tested as part of the sample.

All of these meters were tested at 100% load at 0.5lag.

Although the 0.5lag is not included in the variables analysis (only the uncty results are assessed) a separate analysis of the 0.5lag indicates that these results also pass the normality tests and pass/fail criteria such that these meters would (notionally) achieve 7-year certification if they were a discrete population sample.

14 meters of 150 meter is ~9.3% of the sample.

The ATH advises that it is confident with the representativeness and suitability of the results to include in the analysis.

Please refer results - Appendix 1

Project 2

There are two issues arising from Project 2, namely:

- Inclusion of all meters tested (116 rather than 100)
- Representativeness of the population (three phase, meters types etc)

Inclusion of all meters tested.

The ATH agrees with the Authority that all 116 meters shall be included in the analysis. The revised 116 result is attached as Appendix 3. This gives a revised Category 3 pass (2 years); previously Category 1 pass (7 years).

Representativeness

Meter Types

The population for this project was the remaining Alpine Energy sites plus the (newly purchased) Contact Energy sites. Both of these populations were substantially single-phase populations.

Alpine Energy confirmed that it had a policy of purchasing and installing single-phase meters due to cost. These meters were routinely installed on three phase sites, one meter recording each phase.

The ex-Contact Energy population (purchased in May 2017)* was intended to be all single-phase installations. Although the accuracy of records in relation to the installed metering types is known to be questionable, especially in these older populations, there were no three-phase meters recovered from this population subset.

In relation to both of these population subsets, the meter types (and programmes) installed to replace those removed have borne out this observation.

The ATH is satisfied that the recovered and 116 tested samples are representative of the population. Refer Appendix 4.

*Of interest, those sites purchased were uncertified at the time. Trustpower did not withhold any MEP nominations.

Three Phase

The inclusion of three phase is problematic because the numbers are low (only 2) – analyzing the 0.5lag as proposed above (Project 1) cannot be undertaken as no average or standard deviation can be meaningfully established. Application of an "Attribute" pass/fail cannot be mixed with a "Variables" analysis methodology so a pass/fail on the basis of 0.5lag performance cannot be applied.

The MEP and ATH have proposed (and undertaken) the retesting of a number (11; i.e. 10% of the population) of single-phase meters at 0.5 lag so that a 0.5 lag performance can be determined by the Variables method to include with the 3-phase test results at 0.5lag. This gives a *notional* Category 1 pass (7 years).

This approach may be applied in future sampling but only where insufficient three phase results were undertaken to allow for statically relevant analysis. These results and analysis are included separately (Appendix 2)

Annual Inspections

The Inspection sample was selected erroneously based on the 10yr/100% criteria. This resulted in meters selected 50 ICPs for inspection based on a population of 467 meters (Sample size based on Table 1 AS1284).

58 service requests were issued, and 51 results were successfully obtained with no systemic issues likely to compromise accuracy were reported.

The auditor highlighted that the selection criteria was incorrect and all meter installations prior to 84 months should have been considered as the population. The auditor advised that an exemption may be appropriate in this case.

LMGL contacted the Authority with a draft exemption document for review and was advised that:

> The current Code wording does not require the actual inspections to be completed within the calendar year. This means that as long as you select and perform the additional requires inspections before the report is due in April then the report will show that all the required inspections have been completed and certification will not lapse
>
> Please note that the part 10 review consultation has proposed a change to require the inspections to be completed in the calendar year that they relate to. We haven't reviewed the submissions yet and so haven't made a final decision on amending the Code.

Consequently, LMGL immediately enacted a second inspection programme to address the remaining population. A second selection was made. This selection excluded the population initially selected, and resulted in a total population of 1086 ICPs, requiring a minimum sample size of 80 being selected.

94 Service requests were issued and (so far) 67 have been successfully returned with 17 remaining open at the time of writing.

LMGL has undertaken to provide the completed report by 1 April 2019 as is confident that it will do so.

This has resulted in a combined minimum sample size of 130 inspection, whereas if the original selection was undertaken correctly 125 sites would have been required.

LMGL requests that this stratified selection by accepted (assuming no systemic accuracy issues are discovered) and has corrected its selection criteria for all future periods.

X3 Multiplier Sites

Background

In a number of networks across the country there have been single-phase meters installed on three-phase sites. The single-phase meter is recording consumption on one phase on the basis that the other two phases are the same (balanced load). The consumption on the measured phase is multiplied by three by the retailer in order to determine the total consumption for the three-phase load.

Many of these meters have been installed to conserve space on the meterboard and are typically rural (e.g. irrigation pump) in their application.

Subsequent changes to the Code have meant that this type of metering is no longer permitted.

The sites that remain installed have proven to be "impossible" to rectify due to the considerable work(s) required to make room, rewire and generally rectify the installation so that the three-phase meter can be installed, and all three phases are measured.

It is important to note that the installation of the "appropriate" metering (i.e. three-phase) is reliant on the retailer to get the customer to make the required changes to the meterboard and wiring, so that the MEP is able to install the metering. LMGL has advised the all of retailers with X3 sites but had no concrete responses.

LMGL has 157 x3 sites, predominantly in Network Tasman. LMGL is currently in discussion with Network Tasman about options which could result in rectification of some sites.

Network	Count
Eastland	23
Unison (HB)	1
Mainpower (KE)	1
Network Tasman	132
Grand Total	**157**

Proposal for Addressing

LMGL and Network Tasman have been working for some time reviewing and visiting these sites. There have also been a number of site visits as attempted AMI deployments undertaken on these sites.

A summary of the access / turndown / site visit responses is shown in the table below.

Turndown Reason	Count
Asbestos	2
Board unsafe	3
Cancelled	3
Customer rejection	11
No access	11
No SR Issued	57
No visit	6
Possible OK	1
Unknown	12
x3	45
x3 and Board issue	5
x3 Space	1
Grand Total	**157**

The cost of rectification sits with the retailer/customer and in most cases is considerable. It is proposed, therefore, that where a x3 site cannot be rectified through reason of space for the meter, or because there is no wiring to support the metering of all three phases, that a single-phase meter be installed once a tech has established that there are no unbalanced or single phase loads connected to the unmetered phases. The site is certified for the 15 years and there is a requirement for 100% inspection after 7 years.

Recommendation

Where wiring or space issues preclude the installation of a three-phase meter on a x3 site:

- Install 1-phase meter as multiplier = 3 (where no other loads connected).
- Certify site for 15 years
- 100% inspection regime at 7 years
- Inspection to include visual confirmation that no single phase load has been added to unmetered phases

Discussion

Whilst this does not address the accuracy concerns per se, it is reasonable to surmise that the loads are largely balanced due to the predominant load types.

By replacing the metering and recertifying the sites, they can have the assets updated and bought into the certified management programme including inspection.

Currently, as these sites cannot be certified, there is no inspection of these sites and no ability for the MEP or ATH to update, repair or manage the metering.

Appendix 1 Project 1, 3-phase 0.5 lag Results (Variable Method)

#N/A

Meter Test Results Analysis

Print Results

Meters were tested in accodance with the requirements of AS/NZS 1284.13 2002.

This spread sheet is desiged to determine sample compliance for Class 2 in-service meters in accordance with Table 5 of AS/NZS 1284.13

List Number	LMG Pro 1
Manfacturer	Mixed Population
Meter Type	Assorted 3 Phase Only
Test Date	24-Aug-15
Population Size	40196
Sample Size	14

Outliers Removed: 0

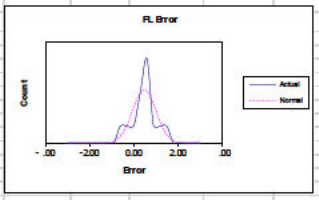
	Full Load FL	Low Load LL
K	1.300	1.09
Mean	0.325	0.50
Std Dev	0.524	0.75
Upper Error	1.006	1.323
Lower Error	-0.356	-0.316
Cal 1 Pass/Fail	PASS	PASS
Cal 2 Pass/Fail	PASS	PASS
Cal 3 Pass/Fail	PASS	PASS
Normality	PASS	PASS

Register	
Req Fail	0
Req Pass	14
Sample	PASS

Creep	
Failed	0
Passed	14
Sample	PASS

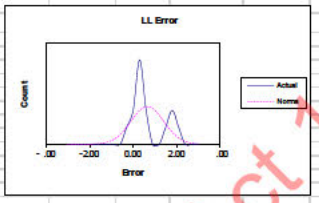
Normality Test

Full Load Test Data



Max FL Error	1.367	Chi Test	0.9999		
Min FL Error	-0.758	Normality Test	PASS		
Bin Range	3				
Bin Step	0.3				

Light Load Test Data



Max LL Error	1.88	Chi Test	0.0000		
Min LL Error	-0.41	Normality Test	PASS		
Bin Range	3				
Bin Step	0.3				

	Serial Number	Customer Ref No.(Gentrack)	FL 0.5 Lag Error	LL Error	Register	Creep
1	7608955	0	-0.76	1.61	P	P
2	U95857	0	-0.32	1.86	P	P
3	D082999	0	-0.14	-0.22	P	P
4	5550353	0	0.19	1.28	P	P
5	72404035	0	0.23	0.13	P	P
6	68389214	0	0.25	0.00	P	P
7	18002341	0	0.32	0.32	P	P
8	8344910	0	0.36	1.58	P	P
9	72717233	0	0.39	0.09	P	P
10	27144374	0	0.39	0.01	P	P
11	8251418	0	0.56	0.49	P	P
12	48167008	0	0.82	0.07	P	P
13	AP10434	0	0.90	0.21	P	P
14	9316611	0	1.37	-0.41	P	P
15	0	0	0.00	0.00	0	0
16	0	0	0.00	0.00	0	0
17	0	0	0.00	0.00	0	0
18	0	0	0.00	0.00	0	0
19	0	0	0.00	0.00	0	0
20	0	0	0.00	0.00	0	0
21	0	0	0.00	0.00	0	0
22	0	0	0.00	0.00	0	0
23	0	0	0.00	0.00	0	0

Bin No.	FL Bin	FL Actual Distribution	FL Normal Cumulative	FL Expected Distribution
1	-3.00	0	0.00	0.00
2	-2.70	0	0.00	0.00
3	-2.40	0	0.00	0.00
4	-2.10	0	0.00	0.00
5	-1.80	0	0.00	0.00
6	-1.50	0	0.00	0.00
7	-1.20	0	0.03	0.02
8	-0.90	0	0.14	0.11
9	-0.60	1	0.54	0.41
10	-0.30	1	1.63	1.0
11	0.00	1	3.74	2
12	0.30	3	6.73	2.99
13	0.60	5	9.80	3.07
14	0.90	1	12.09	2.2
15	1.20	1	13.33	1.4
16	1.50	1	13.83	0.49
17	1.80	0	13.9	0.14
18	2.10	0	14.00	0.03
19	2.40	0	14.00	0.00
20	2.70	0	14.00	0.00
21	3.00	0	14.00	0.00
		0		

	LL Bin	LL tual	LL Normal Cumulative	LL Expected Distribution
	-3.0	0	0.00	0.00
	-2.70	0	0.00	0.00
	-2.40	0	0.00	0.00
	-2.10	0	0.00	0.00
	-1.80	0	0.02	0.01
	-1.50	0	0.05	0.04
	-1.20	0	0.16	0.11
	-0.90	0	0.43	0.27
	-0.60	0	1.00	0.56
	-0.30	1	2.00	1.00
	0.00	2	3.52	1.53
	0.30	5	5.51	1.99
	0.60	2	7.72	2.21
	0.90	0	9.82	2.10
	1.20	0	11.52	1.71
	1.50	1	12.71	1.18
	1.80	2	13.41	0.70
	2.10	1	13.76	0.36
	2.40	0	13.92	0.15
	2.70	0	13.98	0.06
	3.00	0	13.99	0.02
		0		

Appendix 2 Project 2, 0.5 lag additional tests Results (Variable Method)

#N/A

Meter Test Results Analysis

Print Results

Meters were tested in accodance with the requirements of AS/NZS 1284.13 2002.
This spread sheet is designed to determine sample compliance for Class 2 in-service meters in accordance with Table 5 of AS/NZS 1284.13

List Number	LMG Pro 2
Manfacturer	Mixed population
Meter Type	Assorted
Test Date	1-Aug-18
Population Size	20942
Sample Size	13

Outliers Removed: 0

	Full Load FL	Low Load LL
K	1.300	1.09
Mean	0.680	0.39
Std Dev	1.407	1.44
Upper Error	2.509	1.958
Lower Error	-1.149	-1.171
Cat 1 Pass/Fail	FAIL	FAIL
Cat 2 Pass/Fail	FAIL	PASS
Cat 3 Pass/Fail	PASS	PASS
Normality	PASS	PASS

Register	
Req Fail	0
Req Pass	13
Sample	PASS

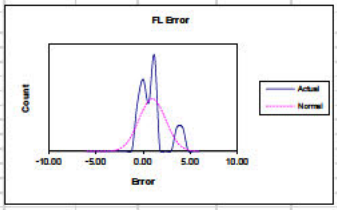
Creep	
Failed	0
Passed	13
Sample	PASS

	Serial Number	Customer Ref No.(Gentrack)	FL Error	LL Error	Register	Creep
1	AN58833	37273	0.92	0.40	P	P
2	AS13849	40955	-0.06	-0.04	P	P
3	AL71339	35562	1.08	0.38	P	P
4	AD52863	23460	0.51	0.31	P	P
5	6002309	21043	-0.45	0.40	P	P
6	S5679	15249	-0.87	1.04	P	P
7	T12379	16135	1.17	-0.77	P	P
8	U77030	18050	0.76	-0.28	P	P
9	20680803	Ref 9	-0.43	-0.83	P	P
10	37330	Ref 10	-0.85	-0.97	P	P
11	8729817	49305	0.24	-1.10	P	P
12	M646281	0	3.78	3.41	P	P
13	15401786	0	3.05	3.15	P	P
14	0	0	0.00	0.00	0	0
15	0	0	0.00	0.00	0	0
16	0	0	0.00	0.00	0	0
17	0	0	0.00	0.00	0	0
18	0	0	0.00	0.00	0	0
19	0	0	0.00	0.00	0	0
20	0	0	0.00	0.00	0	0
21	0	0	0.00	0.00	0	0
22	0	0	0.00	0.00	0	0

#N/A

Normality Test

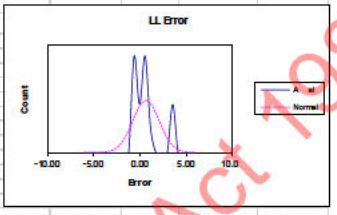
Full Load Test Data



Max FL Error	3.783	Chi Test	0.8600
Min FL Error	-0.870	Normality Test	PASS
Bin Range	6		
Bin Step	0.6		

Bin No.	FL Bin	FL Actual Distribution	FL Normal Cumulative	FL Expected Distribution
1	-6.00	0	0.00	0.00
2	-5.40	0	0.00	0.00
3	-4.80	0	0.00	0.00
4	-4.20	0	0.00	0.00
5	-3.60	0	0.02	0.01
6	-3.00	0	0.06	0.04
7	-2.40	0	0.19	0.13
8	-1.80	0	0.51	0.32
9	-1.20	0	1.18	0.67
10	-0.60	2	2.36	1.18
11	0.00	3	4.09	1.73
12	0.60	2	6.20	2.12
13	1.20	4	8	2.17
14	1.80	0	9.23	1.86
15	2.40	0	10.56	1.33
16	3.00	0	12.36	0.80
17	3.60	1	12.75	0.40
18	4.20	1	12.92	0.17
19	4.80	0	12.98	0.06
20	5.40	0	12.99	0.02
21	6.00	0	13.00	0.00
		0		

Light Load Test Data



Max LL Error	3.41	Chi Test	1.0000
Min LL Error	-1.10	Normality Test	PASS
Bin Range	6		
Bin Step	0.6		

LL Bin	LL Actual	LL Normal Cumulative	LL Expected Distribution
-6.00	0	0.00	0.00
-5.40	0	0.00	0.00
-4.80	0	0.00	0.00
-4.20	0	0.01	0.01
-3.60	0	0.04	0.03
-3.00	0	0.12	0.08
-2.40	0	0.34	0.22
-1.80	0	0.82	0.49
-1.20	0	1.74	0.91
-0.60	4	3.18	1.44
0.00	2	5.10	1.92
0.60	4	7.24	2.15
1.20	1	9.27	2.02
1.80	0	10.87	1.61
2.40	0	11.95	1.07
3.00	0	12.55	0.60
3.60	2	12.83	0.29
4.20	0	12.95	0.11
4.80	0	12.99	0.04
5.40	0	13.00	0.01
6.00	0	13.00	0.00
	0		

Appendix 3 Project 2: 116 Tests

#N/A

Meter Test Results Analysis

Print Results

Meters were tested in accodance with the requirements of AS/NZS 1284.13 2002.

This spread sheet is designed to determine sample compliance for Class 2 in-service meters in accordance with Table 5 of AS/NZS 1284.13

List Number	LMG Pro 2
Manfacturer	Mixed population
Meter Type	Assorted
Test Date	1-Aug-18
Population Size	20942
Sample Size	116

Outliers Removed: 2

	Full Load FL	Low Load LL
K	1.480	1.24
Mean	0.157	-0.18
Std Dev	1.280	2.05
Upper Error	2.082	2.357
Lower Error	-1.738	-2.722
Cat 1 Pass/Fail	FAIL	FAIL
Cat 2 Pass/Fail	PASS	FAIL
Cat 3 Pass/Fail	PASS	PASS
Normality	PASS	PASS

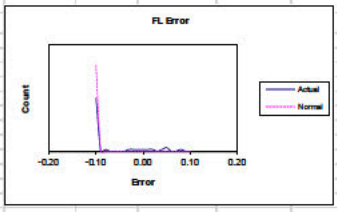
Register	
Reg Fail	0
Reg Pass	114
Sample	PASS

Creep	
Failed	0
Passed	114
Sample	PASS

	Serial Number	Customer Ref No.(Gentrack)	FL Error	LL Error	Register	Creep
1	T 7096	15781	1.26	0.16	P	Pass
2	T 98732	16968	1.15	1.77	P	Pass
3	11983	16353	0.69	-0.93	P	Pass
4	T 46053	16839	0.23	0.36	P	Pass
5	S 25931	14511	0.77	-0.47	P	Pass
6	T 30551	16463	-0.34	-1.02	P	Pass
7	T 12379	16135	0.30	-0.77	P	Pass
8	U 77030	18050	0.21	-0.28	P	Pass
9	U 37511	17599	0.30	0.12	P	Pass
10	S 5679	15249	0.49	1.04	P	Pass
11	19532357	28254	0.64	1.02	P	Pass
12	19846285	29729	-0.25	-0.04	P	Pass
13	19525217	28856	0.83	-2.29	P	Pass
14	20680803	917318	-0.51	-0.83	P	Pass
15	11263444	916025	0.25	-0.51	P	Pass
16	S 6278	15121	0.54	1.08	P	Pass
17	S 5679	15249	0.32	1.47	P	Pass
18	8729817	49305	-0.01	-1.10	P	Pass
19	8726494	49038	0.11	-0.73	P	Pass
20	AP 79178	39890	-0.22	-0.22	P	Pass
21	AU 85974	45904	-0.77	-0.80	P	Pass
22	AS 45557	42399	0.33	0.50	P	Pass
23	AU 86314	46044	0.23	0.34	P	Pass
24	AP 86936	911672	0.31	0.81	P	Pass
25	AS 45511	42353	-0.02	0.40	P	Pass
26	AS 87314	44661	-0.74	-0.38	P	Pass
27	AW 54688	46371	0.87	0.86	P	Pass
28	AP 14163	38683	-0.10	0.48	P	Pass
29	AW 52105	917119	0.42	1.14	P	Pass
30	AS 25509	41458	-0.19	0.23	P	Pass
31	AS 053775	40435	-0.52	-0.55	P	Pass
32	AN 33491	37025	-0.17	-0.87	P	Pass
33	AL 29064	915152	-0.43	0.30	P	Pass
34	AU 61176	45244	-0.36	-0.36	P	Pass
35	AL 71042	35505	0.62	1.36	P	Pass
36	AS 50277	42625	0.05	0.48	P	Pass
37	AX 22101	47832	0.31	0.74	P	Pass
38	AS 27980	41619	-0.64	0.02	P	Pass
39	AU 95119	45703	-0.11	-0.37	P	Pass
40	AP 22967	39022	-0.36	-0.32	P	Pass
41	AL 68362	35320	0.00	-1.05	P	Pass
42	AU 04904	43627	0.16	0.14	P	Pass
43	AS 15413	41205	-0.15	-0.02	P	Pass
44	AP 14189	38709	-0.24	0.56	P	Pass
45	AU 60794	44822	-0.59	0.06	P	Pass
46	AL 71339	35562	0.56	0.38	P	Pass
47	AP 35730	39478	0.16	0.7	P	Pass
48	AL 71031	35494	0.11	-0.06	P	Pass
49	AL 28958	33118	0.17	0.04	P	Pass
50	AS 87897	43174	0.0	0.44	P	Pass
51	AN 58833	37273	0.04	0.40	P	Pass
52	AS 13849	40955	12	-0.04	P	Pass
53	AL 56711	56395	0.	-0.16	P	Pass
54	AC 92789	22931	1.31	1.40	P	Pass
55	AJ 99545	29423	0.65	0.37	P	Pass
56	AE 47430	24999	0.16	-0.44	P	Pass
57	AF 83385	25514	0.62	0.36	P	Pass
58	AE 81678	2580	0.13	-0.40	P	Pass
59	AC 17301	22504	0.31	0.03	P	Pass
60	AK 82469	3 370	0.91	0.99	P	Pass
61	AC 17316	2533	1.11	1.10	P	Pass
62	AH 49473	2 094	0.55	-0.17	P	Pass
63	AH 5 141	26928	0.94	0.10	P	Pass
64	AD 52663	23460	0.38	0.31	P	Pass
65	AJ 84 4	30640	0.63	0.45	P	Pass
66	AJ 22 32	27520	0.71	0.09	P	Pass
67	AC 34835	22658	1.17	1.52	P	Pass
68	AL 11269	31903	0.65	-0.42	P	Pass
69	AK 22860	30122	0.75	0.74	P	Pass
0	AJ 82232	30566	0.81	0.46	P	Pass
71	AJ 22721	27509	0.41	0.88	P	Pass
72	AJ 82219	30560	0.91	0.57	P	Pass
73	AJ 28654	27802	0.40	0.19	P	Pass
74	AF 98974	25136	-0.08	-0.15	P	Pass
75	AH 49475	27096	0.28	0.02	P	Pass
76	AF 81669	25798	0.16	-0.13	P	Pass
77	W 70970	19731	-0.23	0.27	P	Pass
78	AX 06024	46934	0.36	0.23	P	Pass
79	16923590	53534	-0.83	-0.23	P	Pass

Normality Test

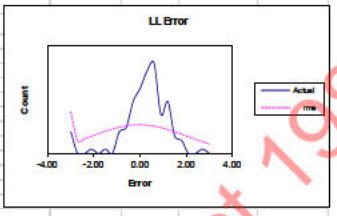
Full Load Test Data



Max FL Error	3.793	Chi Test	0.0957
Min FL Error	-8.137	Normality Test	PASS
Bin Range	0.1		
Bin Step	0.01		

Bin No.	FL Bin	FL Actual Distribution	FL Normal Cumulative	FL Expected Distribution
1	-0.10	30	47.93	47.93
2	-0.09	0	48.28	0.35
3	-0.08	1	48.63	0.35
4	-0.07	0	48.98	0.35
5	-0.06	0	49.33	0.35
6	-0.05	0	49.68	0.35
7	-0.04	0	50.03	0.35
8	-0.03	1	50.38	0.35
9	-0.02	1	50.73	0.3
10	-0.01	1	51.08	0.35
11	0.00	1	51.44	0.35
12	0.01	1	51.79	0.35
13	0.02	1	52.14	0.35
14	0.03	0	52.5	0.35
15	0.04	1	52.85	0.35
16	0.05	2	53.21	0.35
17	0.06	0	53.56	0.35
18	0.07	0	53.91	0.35
19	0.08	1	54.27	0.35
20	0.09	0	54.62	0.35
21	0.10	0	54.97	0.35
		43		

Light Load Test Data



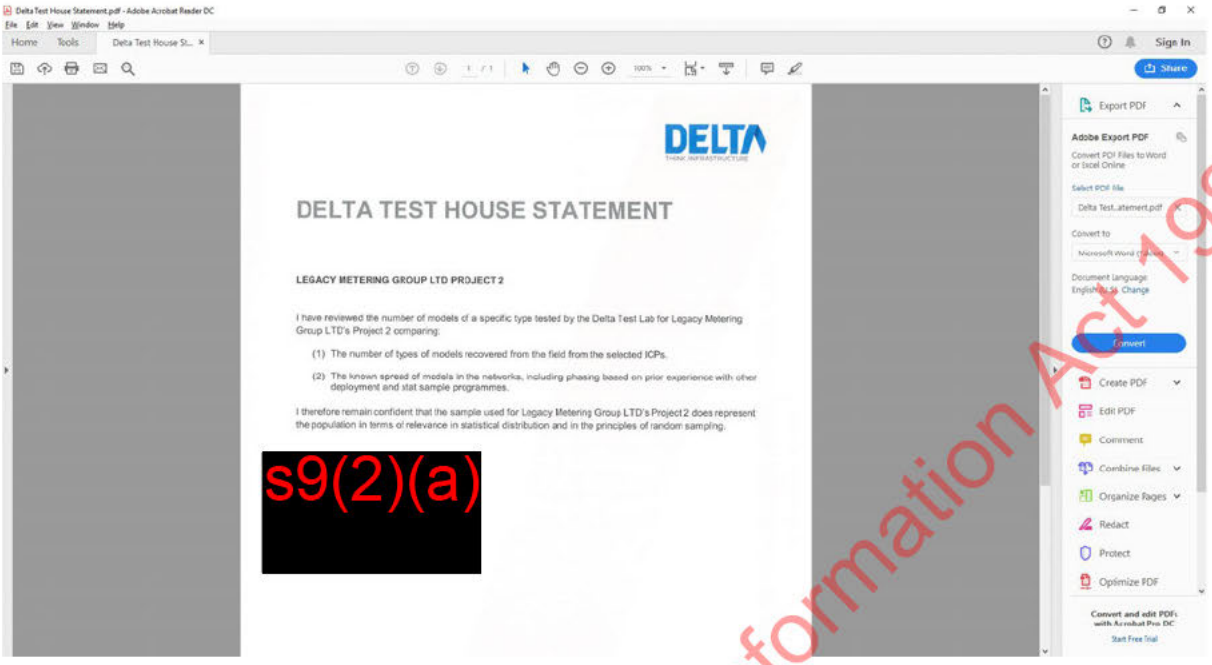
Max LL Error	2.69	Chi Test	0.4318
Min LL Error	-12.7	Normality Test	PASS
Bin Range	3		
Bin Step	0.3		

LL Bin	LL Actual	LL Normal Cumulative	LL Expected Distribution
-3.00	5	9.63	9.63
-2.70	0	12.48	2.85
-2.40	0	15.90	3.42
-2.10	1	19.90	4.00
-1.80	0	24.49	4.59
-1.50	1	29.64	5.15
-1.20	0	35.30	5.66
-0.90	5	41.39	6.09
-0.60	6	47.79	6.41
-0.30	12	54.39	6.60
0.00	15	61.05	6.66
0.30	19	67.62	6.57
0.60	21	73.97	6.35
0.90	9	79.97	6.00
1.20	12	85.52	5.56
1.50	4	90.56	5.03
1.80	3	95.02	4.46
2.10	0	98.89	3.87
2.40	0	102.19	3.29
2.70	1	104.92	2.74
3.00	0	107.15	2.23
	0		

80	19100497	55277	-0.10	0.23	P	Pass
81	24781745	58235	0.28	0.54	P	Pass
82	27037244	59238	0.23	0.65	P	Pass
83	19852478	56529	0.96	1.15	P	Pass
84	27037285	59279	0.83	0.80	P	Pass
85	28510634	60302	0.36	0.86	P	Pass
86	19355165	55386	0.81	1.04	P	Pass
87	27037094	59086	0.23	0.19	P	Pass
88	16226296	52692	-0.84	-1.66	P	Pass
89	16866106		0.43	0.51	P	Pass
90	16094687	52483	-0.03	0.09	P	Pass
91	15576826	52123	0.66	1.12	P	Pass
92	19355682	55503	0.89	1.55	P	Pass
93	28510873	60541	-0.27	-0.52	P	Pass
94	27870594	60083	0.03	-0.08	P	Pass
95	22871591	57749	0.02	-0.26	P	Pass
96	12941840	51977	0.70	1.32	P	Pass
97	16366893	52949	1.76	2.69	P	Pass
98	32426271	61243	0.29	0.14	P	Pass
99	8616688	48393	0.37	-0.02	P	Pass
100	9345548	54005	-0.25	-0.67	P	Pass
101	8624439	48666	0.61	0.66	P	Pass
102	38345750	916835	-0.27	-0.54	P	Pass
103	41910031	903763	-8.14	-8.86	P	Pass
104	40912025	917730	-7.54	-8.12	P	Pass
105	6119961	21599	0.72	1.09	P	Pass
106	6200670	22316	-0.41	-0.22	P	Pass
107	6119868	21554	1.43	1.03	P	Pass
108	4911860	5683	0.08	-7.59	P	Pass
109	4901417	909089	3.08	0.97	P	Pass
110	M 241023	9705	3.79	-6.80	P	Pass
111	2758082	11237	-0.02	-12.78	P	Pass
112	37330	50064	-2.28	-0.97	P	Pass
113	6002309	21043	-0.46	0.40	P	Pass
114	336752	900353	0.52	0.31	P	Pass
115	M646281	2802	3.33	3.41	P	Pass
116	15401786	6786	2.52	3.15	P	Pass

Appendix 4: ATH Statement Regarding Project 2

Received 13 March 2019



DELTA

DELTA TEST HOUSE STATEMENT

LEGACY METERING GROUP LTD PROJECT 2

I have reviewed the number of models of a specific type tested by the Delta Test Lab for Legacy Metering Group LTD's Project 2 comparing:

(1) The number of types of models recovered from the field from the selected ICPs.

(2) The known spread of models in the networks, including phasing based on prior experience with other deployment and stat sample programmes.

I therefore remain confident that the sample used for Legacy Metering Group LTD's Project 2 does represent the population in terms of relevance in statistical distribution and in the principles of random sampling.

s9(2)(a)

ELECTRICITY INDUSTRY PARTICIPATION CODE
METERING EQUIPMENT PROVIDER AUDIT REPORT

For

LEGACY METERING GROUP

Prepared by: s9(2)(a) – Veritek Limited

Date audit commenced: 11 February 2019

Date audit report completed: ~~21 February 2019~~24 April 2019

Audit report due date: 28-Feb-19

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Commented [GN1]: Need some commentary i here that the absolute wording needs to change; ie: that cancellation is under review.

Legacy Metering Group Limited (LMGL) is a Metering Equipment Provider (MEP) and is required to undergo an audit by 28 February 2019, in accordance with clause 1(1)(b) of schedule 10.5.

The audit identified nine non-compliances.

The main issue found is that the statistical sampling processes for two populations of meters at 29,353 ICPs do not comply with the Code or with AS/NZS 1284.13. This audit concludes that certification for these metering installations is not valid. ~~Three issues were found, which are listed below~~The issue has three main points as follows:

1. Populations with different MEPs were combined into one population.
2. The additional three phase test point was originally excluded from the pass/fail calculation.
3. 16 of a sample of 116 meters were excluded from the pass/fail calculation. Seven of the 16 meters excluded had errors greater than 3%. The last two meters on the list were three phase and both had errors greater than 3%.

Additional information was provided by the Authority on 23/04/19 and LMGL on 24/04/19. This information was considered and further comment is included in Sections 6.4 7.13 and 8.1. There are minor changes to some findings but the main issues are still present particularly in relation to non-compliant statistical sampling processes.

Several issues were found with certification practices, as follows:

1. Some certification reports did not have prevailing load or register advance results recorded.
2. Some Category 2 installations were certified using the comparative method, but the uncertainty calculations did not take temperature into account.
3. Some Category 2 installations were certified without low burden being addressed.

Registry information accuracy and timeliness of updates has a high level of compliance~~, along with the~~.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The table below provides some guidance on this matter and recommends an audit frequency of three months. I recommend the Authority considers a longer period of six months to allow sufficient time to resolve the issues surrounding statistical sampling and Category 2 installations where recertification may be required.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Provision of accurate information	2.5	11.2 and Clause 10.6	Invalid certification for two ICPs due to uncertainty being greater than 0.6% certification not corrected since the last audit	Moderate	Low	2	
Registry updates	3.2	2 of Schedule 11.4	185 registry updates later than 15 business days.	Moderate	Low	2	
Metering Installation Design & Accuracy	4.3	4(1) of Schedule 10.7	Delta ATH not calculating uncertainty in accordance with the Code. Total uncertainty greater than 0.6% for ICPs 0000004050DE261 and 0000004057DEFAB.	Weak	Low	3	
Changes to registry records	4.10	3 of Schedule 11.4	Some records updated on the registry later th 1 business d y.	Strong	Low	1	
Provision of Registry Information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some reg stry records incomp e e or ncorrec .	Strong	Low	1	
Cancellation of certification	6.4	20 of Schedu e 10.7	Certification cancelled for following ICPs and the registry was not updated within 10 business days: 5 ICPs with low burden 29,353 ICPs with incorrect statistical sampling certification applied ~~1,105 ICPs whe e suff c e t sa ple~~	Weak	Medium	6	

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			~~nspect ons were conducted~~				
Certification of metering installations	7.1	10.38 (a), clause 1 and clause 15 of Schedule 10.7	Certification expired or cancelled for ~~30,482~~29 358 ICPs	Weak	Medium	6	
Certification tests	7.2	10.38(b) and clause 9 of Schedule 10.6	Register advance and prevailing load tests not conducted for four installations	Moderate	Low	2	
Inspections	8.1	45 of Schedule 10.7	Incorrect Category 1 sample ~~spect o s ze~~selection	Moderate	Low	2	
					Future Risk Rating	25	
					Indicative Audit Frequency	3 months	

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Future risk rating	1-2	3-6	7-9	10-19	20-24	25+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation	Description
Statistical sampling	7.13	Regarding Clauses 16(1) and (5) of Schedule 10.7	Ensure future statistical sampling separates single and three phase meters into separate populations.

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ISSUES

Subject	Section	Recommendation	Description
		Nil	

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1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply With Code (Section 11)

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

I checked the Electricity Authority website and I confirm there are no exemptions in place.

Audit commentary

I checked the Electricity Authority website and I confirm there are no exemptions in place.

1.2. Structure of Organisation

LMGL is operated by the two directors, s9(2)(a)

1.3. Persons involved in this audit

Auditor: s9(2)(a)

Veritek Limited

Electricity Authority Approved Auditor

LMGL personnel assisting in this audit were:

Name	Title
s9(2)(a)	Director
s9(2)(a)	Director

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1.4. Use of Agents (Clause 10.3)

Code reference

Clause 10.3

Code related audit information

A participant who uses a contractor

- *remains responsible for the contractor's fulfillment of the participants Code obligations*
- *cannot assert that it is not responsible or liable for the obligation due to the action of a contractor*
- *must ensure that the contractor has at least the specified level of skill, expertise, experience, or qualification that the participant would be required to have if it were performing the obligation itself.*

Audit observation

LMGL engages with ATHs to conduct certification activities. LMGL relies on these ATHs to act as agents for the management and storage of certification records. I requested certification reports for 50 ICPs to confirm their compliance and availability.

Audit commentary

Complete certification records were provided for all 50 installations

1.5. Hardware and Software

LMGL has a spreadsheet which is used as the master list containing all re evant metering fields.

They also have a workflow system. Backup is in accordance with standard industry protocols.

1.6. Breaches or Breach Allegations

LMGL confirmed there are no breach allegations related to the scope of this audit.

1.7. ICP Data

Metering Category	Number of ICPs
1	37,220
2	307
3	6
4	0
5	0
9	3

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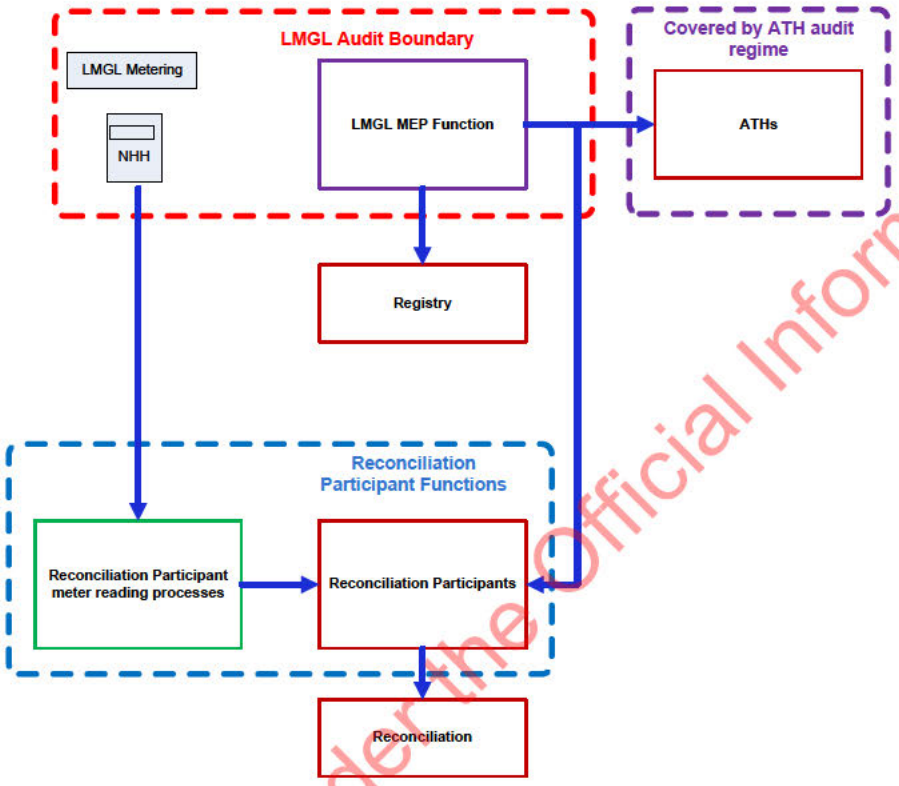
1.8. Authorisation Received

A letter f authorisation was not required or requested.

1.9. Scope of Audit

This audit was conducted in accordance with the Guideline for Metering Equipment Provider Audits V2 2, which was published by the Electricity Authority.

The boundaries of this audit are shown below for greater clarity.



1.10. Summary of previous audit

The previous audit was conducted in July 2018 by Steve Woods of Veritek Limited. The table below shows the status of the issues raised.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Provision of accurate information	2.5	11.2 and Clause 10.6	Invalid alternative certification not corrected since the last audit.	Cleared
Registry updates	3.2	2 of Schedule 11.4	145 registry updates later than 15 business days.	Still existing
Metering Installation Design & Accuracy	4.3	4(1) of Schedule 10.7	Delta ATH not calculating uncertainty in accordance with the Code. Total uncertainty greater than 0 % for ICPs 0000004050DE261 and 0000004057DEFAB.	Still existing
Changes to registry records	4.10	3 of Schedule 11.4	Some records updated on the registry later than 10 business days.	Still existing
Notification of decommissioning	4.12	11.18B(3)	Trader not notified to carry out a final interrogation for three ICPs.	N/A
Provision of Registry Information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some registry records incomplete or incorrect.	Still existing
Registry validation	6.3	6 of Schedule 11.4	Registry records not compared to LMGL's records.	Cleared
Cancellation of certification	6.4	20 of Schedule 10.7	Certification cancelled for six ICPs and the registry was not updated within 10 business days.	Still existing
Certification of metering installations	7.1	10.38 (a), clause 1 and clause 15 of Schedule 10.7	Certification expired for 23,226 ICPs	Still existing for a smaller number

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Commented [GN2]: Not correct. Still under review by the Electricity Authority.

Subject	Section	Clause	Non-compliance	Status
Insufficient load	7.7	14(3) and (4) of Schedule 10.7	ICP 0000130696ENB89 certified for insufficient load but monitoring not conducted.	Cleared
Alternative certification	7.9	32(2), (3) and (4) of Schedule 10.7	Invalid alternative certification applied.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
			Nil	

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1.11. Audit approach

This audit involved considerable discussion and debate about whether compliance had been achieved or not in relation to a number of clauses in the Code. Most of this discussion centered around the statistical sampling regime, where the report records non-compliance.

In this section I have clarified the responsibilities on auditors to audit in accordance with the wording of the Code regardless of information available from other sources. The Terms and Conditions for approval as an auditor has the following clause:

Duty of care

3. You acknowledge that the Authority relies on the reports you produce to determine the compliance of the relevant electricity industry participant (Participant) with its obligations under the Code.

4. In conducting the audits and preparing audit reports you must:

(a) maintain a detailed knowledge of the relevant clauses in the Code and any relevant changes to the Code;

(b) act honestly, fairly, independently and objectively;

(c) exercise a standard of skill, care and diligence that would be reasonably expected of a person who is skilled and who has experience in the provision of services of a similar nature to those you are providing; and

(d) comply with the relevant clauses of the Code concerning an audit at the time of the audit.

5. The Authority may publish material (including guidelines for auditors) to assist auditors

from time to time. You acknowledge that any such material is intended to be for guidance only and does not relieve you from your obligation to comply with the Code.

6. You will conduct audits in accordance with any guidelines (e.g. in relation to the form of audit report) set by the Authority. However, in the event of inconsistency between the Code and any guidelines or other material the Code will prevail.

Auditors are required to comply with the "Auditor Protocol". The auditor protocol contains a section on professional and ethical requirements. The details are as follows:

3 Professional and ethical requirements

Fundamental principles of audit best practice

3.1 Auditors must comply with the following five fundamental principles of audit best practice:

(a) integrity: to be straightforward and honest

(b) objectivity: to not allow bias, conflict of interest, or undue influence override professional judgement

(c) professional competence and due care: to maintain knowledge and skill at a level necessary to competently undertake the relevant audit

(d) confidentiality: to respect confidentiality of information acquired in the course of audits and not disclose such information to third parties without proper authority (unless there is a legal/regulatory reason to do so)

(e) professional behaviour: to be compliant with relevant laws and regulations and not act in a manner that discredits the auditor's profession.

Point "b" is important in the context of this audit. The audit findings are based on my professional judgement and the other information available has been considered but has not affected objectivity.

2. OPERATIONAL INFRASTRUCTURE

2.1. MEP responsibility for services access interface (Clause 10.9(2))

Code reference

Clause 10.9(2)

Code related audit information

The MEP is responsible for providing and maintaining the services access interface.

Audit observation

I checked certification records for 50 metering installations, covering all relevant ATHs.

Audit commentary

The Code places responsibility for maintaining the services access interface on the MEP and places responsibility for determining and recording it with ATHs. I checked the certification records for all relevant ATHs and the services access interface was recorded correctly in all cases.

Audit outcome

Compliant

2.2. Dispute Resolution (Clause 10.50(1) to (3))

Code reference

Clause 10.50(1) to (3)

Code related audit information

Participants must in good faith use its best endeavours to resolve any disputes related to Part 10 of the Code.

Disputes that are unable to be resolved may be referred to the Authority for determination.

Complaints that are not resolved by the parties or the Au hority may be referred to the Rulings Panel by the Authority or participant.

Audit observation

I checked whether any disputes had been dealt with during the audit period.

Audit commentary

LMGL has not been required to resolve any disputes in accordance with this clause.

Audit outcome

Compliant

2.3. MEP Identifier (Clause 7(1) of Schedule 10.6)

Code reference

Clause 7(1) of Schedule 10.6

Code related audit information

The MEP must ensure it has a unique participant identifier and must use this participant identifier (if required) to correctly identify its information.

Audit observation

I checked the registry data to ensure the correct MEP identifier was used.

Audit commentary

LMGL uses the LMGL identifier in all cases.

Audit outcome

Compliant

2.4. Communication Equipment Compatibility (Clause 40 Schedule 10.7)

Code reference

Clause 40 Schedule 10.7

Code related audit information

The MEP must ensure that the use of its communication equipment complies with the compatibility and connection requirements of any communication network operator the MEP has equipment connected to.

Audit observation

I checked whether there were any installations where communication equipment was present and whether the type test reports confirmed compliance.

Audit commentary

LMGL is the MEP for some metering installation where communication equipment is present, and this equipment complies with the telecommunications requirements.

Audit outcome

Compliant

2.5. Participants to Provide Accurate Information (Clause 11.2 and Clause 10.6)

Code reference

Clause 11.2 and Clause 10.6

Code related audit information

The MEP must take all practicable steps to ensure that information that the MEP is required to provide to any person under Parts 10 and 11 is complete and accurate, not misleading or deceptive and not likely to mislead or deceive.

If the MEP becomes aware that in providing information under Parts 10 and 11, the MEP has not complied with that obligation, the MEP must, as soon as practicable, provide such further information as is necessary to ensure that the MEP does comply.

Audit observation

The content of this audit report was reviewed to determine whether all practicable steps had been taken to provide accurate information.

Audit commentary

The content of this audit report indicates that LMGL has taken all practicable steps to ensure that information is complete and accurate in most instances, except for the matter raised in **Section 6.4**, where two metering installations were incorrectly certified, and recertification has not yet occurred, and the registry has not been updated.

Audit outcome

Non-compliant

Non-compliance	Descrip ion
Audit Ref: 2.5 With: Clause 11.2 and Clause 10.6 From: 12-Jun-18 To: 30-Jan-19	Invalid certification for two ICPs due to unce tainty being greater than 0.6% certification not corrected since the last dit. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Modera Breach risk ra ng 2
Audit risk rating	**Rationale for audit risk rating**
Low	The co rols are recorded as moderate because they mitigate risk most of the time but t ere is room for improvement. T e two installations in question had total errors within the allowable 2 5%. I have recorded the impact as minor and the audit risk rating as low.

Ac ions taken to resolve the issue	Completion date	Remedial action status
Our adv ce from the ATH was that the certification still stands. Othe notes below on this point. The data provided to the regis ry (so far as we continue to be advised) is that it is correct.	1/3/2019	Choose an item.
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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The MEP will continue to monitor data received to the best of its technical knowledge and follow up directly with ATHs if there is anything that looks incorrect. The MEP will also undertake desktop audits (documentation, photographs etc) to ensure to the best of its technical ability that the data received is robust.	1/3/2019	

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3. PROCESS FOR A CHANGE OF MEP

3.1. Payment of Costs to Losing MEP (Clause 10.22)

Code reference

Clause 10.22

Code related audit information

The MEP for a metering installation may change only if the responsible participant enters into an arrangement with another person to become the MEP for the metering installation and if certain notification requirements are met (in relation to the registry and the reconciliation manager)

The gaining MEP must pay the losing MEP a proportion of the costs within 20 business days of assuming responsibility.

The costs are those directly and solely attributable to the certification and calibration tests of the metering installation or its components from the date of switch until the end of the current certification period.

Audit observation

LMGL has not sent or received any invoices in relation to this clause.

Audit commentary

LMGL has not sent or received any invoices in relation to this clause.

Audit outcome

Compliant

3.2. Registry Notification of Metering Records (Clause 2 of Schedule 11.4)

Code reference

Clause 2 of Schedule 11.4

Code related audit information

The gaining MEP must advise the registry of the registry metering records for the metering installation within 15 days of becoming the MEP for the metering installation.

Audit observation

I checked the event detail for the period 01/08/18 to 01/12/18 for all records where LMGL became the MEP to evaluate the timeliness of updates.

Audit commentary

The table below shows there were 185 late updates to the registry out of 459 events. All but three of the late updates were due to late nomination by traders.

During the previous audit, I recorded that many of the late nominations were due to late notification by LMGL to the relevant traders that a nomination was required. This was for ICPs where there was a trader change from Trustpower to another trader. Contact Energy was still the MEP for some ICPs where LMGL is the meter owner and once the switch occurred, LMGL notified the gaining trader that a nomination was required. This process occurred approximately every two months. I recommended it occurred more frequently to allow both the trader and LMGL to achieve compliance. LMGL is now the MEP for all of the ICPs where they were previously the meter owner but not the MEP.

Year	Total	Over 15 days	% compliance	Average	Late nomination
Dec 2016	10,501	843	92%		323
Oct 2017	4,928	345	93%	4 9	326
June 2018	548	145	74%	20	145
Feb 2019	**459**	**185**	**60%**	**27**	**182**

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Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 2 of Schedule 11.4 From: 01-Aug-18 To: 01-Dec-18	185 registry updates later than 15 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are in place to ensure the timeliness of updates, but LMGL is often prevented from updating the registry due to late nomination or late field notification. The impact on other participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Reminders to Retailers as per previous Audit reports has little impact. Usually the offenders are only a couple of Retailers.	Ongoing	Choose an item.
Preventative actions taken to ensure no further issues will occur	Completion date	
LMG will continue to monitor and update all metering data as soon as it has access to the nominations and metering information. Reminders and follow-ups in place with retailers and ATHs. Routine reports from all ATHs in place.	1/3/2019	

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3.3. Provision of Metering Records to Gaining MEP (Clause 5 of Schedule 10.6)

Code reference

Clause 5 of Schedule 10.6

Code related audit information

During an MEP switch, a gaining MEP may request access to the losing MEP's metering records.

On receipt of a request from the gaining MEP, the losing MEP has 10 business days to provide the gaining MEP with the metering records or the facilities to enable the gaining MEP to access the metering records.

The losing MEP must ensure that the metering records are only received by the gaining MEP or its contractor, the security of the metering records is maintained, and only the specific metering records required for the purposes of the gaining MEP exercising its rights and performing its obligations are provided.

Audit observation

I checked with LMGL to confirm whether there had been any requests from other MEPs.

Audit commentary

There have not been any requests in relation to this clause during the audit period.

Audit outcome

Compliant

3.4. Termination of MEP Responsibility (Clause 10.23)

Code reference

Clause 10.23

Code related audit information

Even if the MEP ceases to be responsible for an installation, the MEP must either comply with its continuing obligations; or before its continuing obligations terminate, enter into an arrangement with a participant to assume those obligations.

The MEP is responsible if it:

- *is identified in the registry as the primary metering LMGL or*
- *is the participant who owns the meter for the POC or to the grid or*
- *has accepted responsibility under clause 1(1)(a)(ii) of schedule 11.4 or*
- *has contracted with a participant responsible for providing the metering installation.*

MEPs obligations come into effect on the date recorded in the registry as being the date on which the metering installation equipment is installed or, for an NSP the effective date set out in the NSP table on the Authority's website.

An MEPs obligations terminate only when;

- *the ICP changes under clause 10.22(1)(a);*
- *the NSP changes under clause 10.22(1)(b), in which case the MEPs obligations terminate from the date on which the gaining MEP assumes responsibility;*
- *the metering installation is no longer required for the purposes of Part 15; or*
- *the load associated with an ICP is converted to be used solely for unmetered load.*

Audit observation

I confirmed that LMGL has ceased to be responsible for some metering installations by checking the event detail report.

Audit commentary

LMGL continues with their responsibilities, mainly in relation to the storage of records, which are kept indefinitely. I requested the records for five installations where LMGL had ceased to be responsible and these were all available and checked.

Audit outcome

Compliant

4. INSTALLATION AND MODIFICATION OF METERING INSTALLATIONS

4.1. Design Reports for Metering Installations (Clause 2 of Schedule 10.7)

Code reference

Clause 2 of Schedule 10.7

Code related audit information

The MEP must obtain a design report for each proposed new metering installation or a modification to an existing metering installation, before it installs the new metering installation or before the modification commences.

Clause 2(2) and (3)—The design report must be prepared by a person with the appropriate level of skills, expertise, experience and qualifications and must include a schematic drawing, details of the configuration scheme that programmable metering components are to include, confirmation that the configuration scheme has been approved by an approved test laboratory, maximum interrogation cycle, any compensation factor arrangements, method of certification required, and name and signature of the person who prepared the report and the date it was signed.

Clause 2(4)—The MEP must provide the design report to the certifying ATH before the ATH installs or modifies the metering installation (or a metering component in the metering installation)

Audit observation

LMGL has engaged several ATHs for certification activities. All ATHs have provided design reports for this work which I have checked.

Audit commentary

The design reports used by ATHs include all relevant details required by the Code. The design report was not recorded by Delta for two ICPs, which is raised as non-compliance in Section 4.3.

Audit outcome

Compliant

4.2. Contracting with ATH (Clause 9 of Schedule 10.6)

Code reference

Clause 9 of Schedule 10.6

Code related audit information

The MEP must, when contracting with an ATH in relation to the certification of a metering installation, ensure that the ATH has the appropriate scope of approval for the required certification activities.

Audit observation

I confirmed that LMGL has used the VEMS, Delta, Vector, Wells, Accucal, Metrix and IndeServe ATHs during the audit period. These were then checked against the Authority's website for scope of approval.

Audit commentary

I have checked the Authority's website and confirm that all ATHs have current and appropriate scopes of approval.

Audit outcome

Compliant

4.3. Metering Installation Design & Accuracy (Clause 4(1) of Schedule 10.7)

Code reference

Clause 4(1) of Schedule 10.7

Code related audit information

The MEP must ensure:

- *that the sum of the measured error and uncertainty does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of the metering installation*
- *the design of the metering installation (including data storage device and interrogation system) will ensure the sum of the measured error and the smallest possible increment of the energy value of the raw meter data does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of installation*
- *the metering installation complies with the design report and the requirements of Part 10.*

Audit observation

I checked the processes used by LMGL to ensure compliance with the design and with the error thresholds stipulated in Table 1. I also checked the certification records for 29 CT metered metering installat ons.

Audit commentary

For Category 2 comparative certification, Delta's error and uncertainty calculation does not consider the temperature coefficient of the working standard. This matter has been present for several years. Delta certified one metering installation at ICP 0000004099DEBDF during the audit period. The temperature was 22° Celsius so the uncertainty is likely to remain within 0.6%. During the previous audit, I requested copies of certification records for six metering installations. Uncertainty calculations were not conducted in a compliant manner for any of the six. Two of the installations will have uncertainty figures greater than 0.6% when temperature is taken into consideration. Certification is therefore cancelled. The ICPs are 0000004050DE261 and 0000004057DEFAB. Certification is not yet cancelled on the registry, which is recorded as non-compliance in Section 6.4.

With regard to the design of the installation (including data storage device and interrogation system), LMGL ensures the sum of the measured error and the smallest possible increment of the energy value of the raw meter data does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of installation. There are no components installed where "coarse" rounding is in place for the data, or where meters with a low pulse rate are connected to separate data storage devices.

LMGL has a process to ensure the me ering installation complies with the design report and the requirements of Part 10 by requiring ATH s to confirm the installations match the design, or by requiring updates to be provided if the installation does not match the design.

I checked 50 recent certification records and found that the design report was populated in 48 cases but there were two Delta certificates here the design report was not recorded.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.3 With: Clause 4(1) of Schedule 10.7 From: 01-Aug-18 To: 30-Jan-19	Delta ATH not calculating uncertainty in accordance with the Code. Total uncertainty greater than 0.6% for ICPs 0000004050DE261 and 0000004057DEFAB. Two design reports no recorded Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the control effectiveness as weak because this matter has been present and not resolved for several years. The impact is minor; therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
The main point is that the ATH has advised that their calculations are correct. MEPs (like LMG) rely on technical advice of the ATH and the certificates they issue. The controls are strong as we review the certification and records provided by the ATH. *IF* there is a breach – this is consequential.	Complete	Choose an item.
Preventative actions taken to ensure no further issues will occur	Completion date	
The MEP will continue to monitor data received to the best of its technical knowledge and follow up directly with ATH if there is anything that looks incorrect. The MEP will also undertake desktop audits (documentation, photographs etc) to ensure to the best of its technical ability that the data received is robust.	1/3/2019	

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4.4. Subtractive Metering (Clause 4(2)(a) of Schedule 10.7)

Code reference

Clause 4(2)(a) of Schedule 10.7

Code related audit information

For metering installations for ICPs that are not also NSPs, the MEP must ensure that the metering installation does not use subtraction to determine submission information used for the purposes of Part 15.

Audit observation

I asked LMGL to confirm whether subtraction was used for any metering installations where they were the MEP.

Audit commentary

LMGL does not have any metering installations where subtractive metering is used.

Audit outcome

Not applicable

4.5. HHR Metering (Clause 4(2)(b) of Schedule 10.7)

Code reference

Clause 4(2)(b) of Schedule 10.7

Code related audit information

For metering installations for ICPs that are not also NSPs, the MEP must ensure that all category 3 or higher metering installations must be half-hour metering installations.

Audit observation

LMGL is the MEP for six metering installations above Category 2. I checked the registry fields to confirm compliance.

Audit commentary

All six installations have HHR metering.

Audit outcome

Compliant

4.6. NSP Metering (Clause 4(3) of Schedule 10.7)

Code reference

Clause 4(3) of Schedule 10.7

Code related audit information

The MEP must ensure that the metering installation for each NSP that is not connected to the grid does not use subtraction to determine submission information used for the purposes of Part 15 and is a half-hour metering installation.

Audit observation

LMGL is not the MEP for any NSP metering installations.

Audit commentary

LMGL is not responsible for any NSP metering.

Audit outcome

Not applicable

4.7. Responsibility for Metering Installations (Clause 10.26(10))

Code reference

Clause 10.26(10)

Code related audit information

The MEP must ensure that each point of connection to the grid for which there is a metering installation that it is responsible for has a half hour metering installation.

Audit observation

LMGL is not responsible for any grid metering.

Audit commentary

LMGL is not responsible for any grid metering.

Audit outcome

Not applicable

4.8. Suitability of Metering Installations (Clause 4(4) of Schedule 10.7)

Code reference

Clause 4(4) of Schedule 10.7

Code related audit information

The MEP must, for each metering installation for which it is responsible, ensure that it is appropriate having regard to the physical and electrical characteristics of the POC

Audit observation

I checked the ATH processes for the management of this area

Audit commentary

The VEMS design report contains reference to workmanship; ensuring access cannot be gained to live conductors; earthing arrangements and compliance with AS/NZS 3000. I have checked the Delta process and confirmed that the MR-002 quality manual/operating instructions ensure compliance with relevant electrical legislation. Indeserve has appropriate instructions regarding this matter. The other ATHs also have appropriate instructions and processes to achieve compliance with this clause.

Audit outcome

Compliant

4.9. Installation & Modification of Metering Installations (Clauses 10.34(2), (2A) and (3))

Code reference

Clauses 10.34(2), (2A) and (3)

Code related audit information

If a metering installation is proposed to be installed or modified at a POC, other than a POC to the grid, the MEP must consult with and use its best endeavours, to agree with the distributor and the trader for that POC, before the design is finalised, on the metering installations:

- *required functionality*
- *terms of use*
- *required interface format*
- *integration of the ripple receiver and the meter*
- *functionality for controllable load.*

Each participant involved in the consultations must use its best endeavours to reach agreement and act reasonably and in good faith.

Audit observation

The Authority determined that MEPs are not required to consult with distributors and traders unless the design of an installation is altered. Some ICPs had design changes from NHH to HHR during the audit period, which is a change of design. I checked whether agreement was sought fr m the relevant participants.

Audit commentary

LMGL notified all relevant participants with a blanket communication notifying of design intentions, therefore compliance is achieved.

Audit outcome

Compliant

4.10. Changes to Registry Records (Clause 3 of Schedule 11.4)

Code reference

Clause 3 of Schedule 11.4

Code related audit information

The MEP must advise the registry of the registry metering records or any change to the registry metering records for a metering installation for which it is responsible, no later than 10 business days following:

a) the electrical connection of an ICP that is not also an NSP
b) any subsequent change in any matter covered by the metering records.

Audit observation

I checked the event detail report for the period 01/08/18 to 01/12/18 to evaluate the timeliness of registry updates.

Audit commentary

The table below shows that 89% of new connection updates and 96% of corrections were within 10 bus ness days. 14 of the 23 late new connection updates were caused by late nomination by the trader. The other main issue was late field notification.

Event	Year	Total ICPs	ICPs Notified Within 10 Days	ICPs Notified Greater Than 10 Days	Average Notification Days	Percentage Compliant
New Connection	2016	436	351	85	8.7	80%
	2017	535	493	42	5 3	92%
	2018	**452**	**418**	**34**	**5.3**	**93%**
	2019	**214**	**23**	**191**	**6**	**89%**
Updates	2016	32,112	31,178	934	1.7	97%
	2017	18,200	17,599	601	10.5	97%
	2018	**4,501**	**4,154**	**347**	**12.8**	**92%**
	2019	**2,231**	**2,132**	**99**	**9.9**	**96%**

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Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.10 With: Clause 3 of Schedule 11.4 From: 01-Aug-18 To: 30-Jan-19	Some records updated on the registry later t an 10 business days. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded he controls as strong in this area. The late new co nection updates have a minor impact on participants, customers and set lement, therefore the audit risk rating is low.

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Actions taken to resolve the issue	Completion date	Remedial action status
So far as is known any outstanding updates have been completed	Completed	Choose an item.
Preventative acti ns taken to ensure no further issues will occur	Completion date	
LMG will continue to monitor and update all metering data as soon as it has access to the nominations and metering information. Reminders and follow-ups in place with retailers and ATHs. Routine reports from all ATHs in place.	1/3/2019	

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4.11. Metering Infrastructure (Clause 10.39(1))

Code reference

Clause 10.39(1)

Code related audit information

The MEP must ensure that for each metering installation:

- *an appropriately designed metering infrastructure is in place*
- *each metering component is compatible with, and will not interfere with any other component in the installation*
- *collectively, all metering components integrate to provide a functioning system*
- *each metering installation is correctly and accurately integrated within the associated metering infrastructure.*

Audit observation

LMGL has some HHR metering. I checked the meter type to confirm whether the type test report recorded compatibility with regard to telecommunication standards and whether the overall infrastructure operated as intended.

Audit commentary

Type test reports confirm compatibility and the output to host test confirms the appropriate functionality of the system.

Audit outcome

Compliant

4.12. Responsibility for Metering at ICP (Clause 10.23A)

Code reference

Clause 10.23A

Code related audit information

If a metering installation at an ICP is to be decommissioned, but the ICP is not being decommissioned, the metering equipment provider that is responsible for decommissioning the metering installation must,—

(a) if the metering equipment provider is responsible for interrogating the metering installation—

(i) arrange for a final interrogation to take place before the metering installation is decommissioned; and

(ii) provide the raw meter data from the interrogation to the trader that is recorded in the registry as being responsible for the ICP; or

(b) if another participant is responsible for interrogating the metering installation, advise the other participant not l ss than three business days before the decommissioning—

(i) of the date and time of the decommissioning; and

(ii) that the participant must carry out a final interrogation.

(2) To avoid doubt, if a metering installation at an ICP is to be decommissioned because the ICP is being decommissioned—

(a) the metering equipment provider is not responsible for arranging a final interrogation of the metering installation; and

(b) the trader that is recorded in the registry as being responsible for the ICP must arrange for a final interrogation of the metering installation under clause 11.18(3).

Audit observation

I checked whether LMGL was the MEP at any decommissioned metering installations and whether notification had been provided to relevant traders.

Audit commentary

There were no examples of decommissioned metering installations where the ICP was not decommissioned.

Audit outcome

Compliant

4.13. Measuring Transformer Burden and Compensation Requirements (Clause 31(4) and (5) of Schedule 10.7)

Code reference

Clause 31(4) and (5) of Schedule 10.7

Code related audit information

The MEP must, before approving the addition of, or change to, the burden or compensation factor of a measuring transformer in a metering installation, consult with the ATH who certified the metering installation.

If the MEP approves the addition of, or change to, the burden or compensation factor, it must ensure the metering installation is recertified by an ATH before the addition or change becomes effective.

Audit observation

I asked LMGL whether they had approved any burden changes during the audit period.

Audit commentary

LMGL's processes show that any action leading to a change in burden results in recertification. A check of certification records confirmed compliance

Audit outcome

Compliant

4.14. Changes to Software ROM or Firmware (Clause 39(1) and 39(2) of Schedule 10.7)

Code reference

Clause 39(1) and 39(2) of Schedule 10.7

Code related audit information

The MEP must, if it proposes to change the software, ROM or firmware of a data storage device installed in a metering installation, ensure that, before the change is carried out, an approved test laboratory:

- *tests and confirms that the integrity of the measurement and logging of the data storage device would be unaffected*
- *documents the methodology and conditions necessary to implement the change*
- *advises the ATH that certified the metering installation of any change that might affect the accuracy of the data storage device.*

The MEP must, when implementing a change to the software, ROM or firmware of a data storage device installed in a metering installation:

- *carry out the change in accordance with the methodology and conditions identified by the approved test laboratory under clause 39(1)(b)*
- *keep a list of the data storage devices that were changed*
- *update the metering records for each installation affected with the details of the change and the methodology used.*

Audit observation

LMGL is not the MEP for any installations where changes to ROM, software or f rmware have occurred.

Audit commentary

LMGL is not the MEP for any installations where changes to ROM software or firmware have occurred.

Audit outcome

Not applicable

4.15. Temporary Electrical connection (Clause 10.28(6))

Code reference

Clause 10.28(6)

Code related audit information

An MEP must not request the temporary electrical connection of a new POC unless authorised to do so by the reconciliation participant responsible for that POC and has an arrangement with that reconciliation participant to provide metering services.

Audit observation

I checked whether there were any examples of temporary electrical connection.

Audit commentary

No examples of temporary electrical connection were identified.

Audit outcome

Not applicable

5. METERING RECORDS

5.1. Accurate and Complete Records (Clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4)

Code reference

Clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4

Code related audit information

The MEP must, for each metering installation for which it is responsible, keep accurate and complete records of the attributes set out in Table 1 of Schedule 11.4. These include:

- *a) the certification expiry date of each metering component in the metering installation*
- *b) all equipment used in relation to the metering installation, including serial numbers and details of the equipment's manufacturer*
- *c) the manufacturer's or (if different) most recent test certificate for each metering component in the metering installation*
- *d) the metering installation category and any metering installations certified at a lower category*
- *e) all certification reports and calibration reports showing dates tested, tests carried out and test results for all metering components in the metering installation*
- *f) the contractor who installed each metering component in the metering installation*
- *g) the certification sticker, or equivalent details, for each metering component that is certified under Schedule 10.8 in the metering installation:*
- *h) any variations or use of the 'alternate certification' process*
- *i) seal identification information*
- *j) any applicable compensation factors*
- *k) the owner of each metering component within the metering installation*
- *l) any applications installed within each metering component*
- *m) the signed inspection report confirming that the metering installation complies with the requirements of Part 10.*

Audit observation

I requested certification records for 50 metering installations to evaluate compliance with this clause.

Audit commentary

LMGL engages with several ATHs to conduct certification activities. LMGL relies on these ATHs to act as agents for the management and storage of certification records.

I checked LMGL's records and I confirm that all the records listed above are available. I requested certification records for 50 installations to confirm they were available and all 50 were provided.

Audit outcome

Compliant

5.2. Inspection Reports (Clause 4(2) of Schedule 10.6)

Code reference

Clause 4(2) of Schedule 10.6

Code related audit information

The MEP must, within 10 business days of receiving a request from a participant for a signed inspection report prepared under clause 44 of Schedule 10.7, make a copy of the report available to the participant.

Audit observation

I asked LMGL whether any requests had been made for copies of inspection reports.

Audit commentary

LMGL has not been requested to supply any inspection reports, but these are available and can be supplied on request.

Audit outcome

Compliant

5.3. Retention of Metering Records (Clause 4(3) of Schedule 10.6)

Code reference

Clause 4(3) of Schedule 10.6

Code related audit information

The MEP must keep metering installation records for 48 months after any metering component is removed, or any metering installation is decommissioned.

Audit observation

I checked LMGL's processes in relation to this clause.

Audit commentary

LMGL relies on ATHs to store certification records and their audit reports confirm compliance. The registry is used as the main database and it contains an appropriate audit trail with all history.

Audit outcome

Compliant

5.4. Provision of Records to ATH (Clause 6 Schedule 10.6)

Code reference

Clause 6 Schedule 10.6

Code related audit information

If the MEP contracts with an ATH to recertify a metering installation and the ATH did not previously certify the metering installation, the MEP must provide the ATH with a copy of all relevant metering records not later than 10 business days after the contract comes into effect.

Audit observation

LMGL has provided information to ATH's in the past and this may occur in future. There are no current examples to examine.

Audit commentary

LMGL has provided information to ATH's in the past and this may occur in future. There are no current examples to examine.

Audit outcome

Not applicable

6. MAINTENANCE OF REGISTRY INFORMATION

6.1. MEP Response to Switch Notification (Clause 1(1) of Schedule 11.4)

Code reference

Clause 1(1) of Schedule 11.4

Code related audit information

Within 10 business days of being advised by the registry that it is the gaining MEP for the metering installation for the ICP, the MEP must enter into an arrangement with the trader and advise the registry it accepts responsibility for the ICP and of the proposed date on which it will assume responsibility.

Audit observation

I checked the switch breach history detail report to confirm whether all responses were within 10 business days.

Audit commentary

All MN files were sent within 10 business days.

Audit outcome

Compliant

6.2. Provision of Registry Information (Clause 7 (1), (2) and (3) of Schedule 11.4)

Code reference

Clause 7 (1), (2) and (3) of Schedule 11.4

Code related audit information

The MEP must provide the information indicated as being 'required' in Table 1 of clause 7 of Schedule 11.4 to the registry, in the prescribed form for each metering installation for which the MEP is responsible.

From 1 April 2015, a MEP is required to ensure that all the registry metering records of its category 1 metering installations are complete, accurate, not misleading or deceptive, and not likely to mislead or deceive.

The information the MEP provides to the registry must derive from the metering equipment provider's records or the metering records contained within the current trader's system.

Audit observation

I checked the list file for 100% of records and I checked the Category 1 inspection records to identify discrepancies.

Audit commentary

I examined the records for 58 metering installations where LMGL had conducted inspections during 2018. The only data related issues were where the on-site certification date for three installations was unreadable because the sticker was faded, unreadable or missing.

I checked all of LMGL's records to identify discrepancies with their data. The table below shows the results.

Date of analysis				Issue	Resolved
Dec 2018	May 2018	October 2017	Dec 2016		
0	0	0	82	Blank metering records on the registry.	N/A
0	5	0	0	Category 2 on the registry but with interim certification.	N/A
0	1	11	0	Incorrect certification duration.	N/A
0	0	2	2	Category 2 installations without CTs recorded on the registry.	N/A
8	423	2,067	53	ICPs with controlled load and no load control device recorded on the registry.	
0	59	1,318	3	IN register content code but no control device on the registry.	N/A
0	8	9	16	ICPs with a register content code of CN only and a residential ANZSIC code	N/A
0	0	2	2	Day without night.	N/A
4	10	20	16	Night without day.	
49	75	701	1,061	Controlled profiles without certified control device. Note that some of these may be controlled by pilot, which does not have a registry field.	
232	248	259	311	Compensation factor of 3 All were certified after August 2013. Certification is now cancelled	Yes
0	0	0	0	HHR submission, Install is NHH	N/A
0	0	57	37	IN24	N/A
0	0	1	2	UN not 24	N/A
7	1	3	3	Incorrect certification dates	
0	1	48	3,311	Incorrect maximum interrogation cycle of zero	N/A
0	511	840	-	Certification and expiry dates 01/04/00	N/A
0		3	-	Incorrect ATH recorded	N/A
75	128	148	-	UN only with load control device	
0	1	0	0	Compensation factor on Cat 1	N/A

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0	0	0	0	Active no metering	
16	-	-	-	Metering installations incorrectly recorded as AMI	Yes

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.2 With: Clause 7 (1), (2) and (3) of Schedule 11.4 From: 01-Oct-17 To: 31-May-18	Some registry records incomplete or incorrect. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as strong in this area. LMGL is identifying errors and investigating them as soon as practicable. Very few of the discrepancies have an impact on participants, customers or settlement. The only relevant ones in this regard are tariff related and there were only a small number. The audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Ongoing process of follow ups with retailer (esp) and ATHs to determine the veracity of the data.	Now	Choose an item.
Preventative actions taken to ensure no further issues will occur	Completion date	
Ongoing process of follow ups with retailer (esp) and ATHs to determine the veracity of the data.	Ongoing	

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6.3. Correction of Errors in Registry (Clause 6 of Schedule 11.4)

Code reference

Clause 6 of Schedule 11.4

Code related audit information

By 0900 hours on the 13th business day of each reconciliation period, the MEP must obtain from the registry:

- *a list of ICPs for the metering installations the MEP is responsible for*
- *the registry metering records for each ICP on that list.*

No later than five business days following collection of data from the registry, the MEP must compare the information obtained from the registry with the MEP's own records.

Within five business days of becoming aware of any discrepancy between the MEP's records and the information obtained from the registry, the MEP must correct the records that are in error and advise the registry of any necessary changes to the registry metering records.

Audit observation

I checked LMGL's registry validation processes and reporting by conducting a walkthrough.

Audit commentary

LMGL compares their master spreadsheet of metering fields against the registry in accordance with this clause. Errors are resolved immediately upon identification.

Audit outcome

Compliant

6.4. Cancellation of Certification (Clause 20 of Schedule 10.7)

Code reference

Clause 20 of Schedule 10.7

Code related audit information

The certification of a metering installation is automatically cancelled on the date on which one of the following events takes place:

a) the metering installation is modified otherwise than under sub clause 19(3) or 19(6)
b) the metering installation is classed as outside the applicable accuracy tolerances set out in Table 1 of Schedule 10.1, defective or not fit for purpose under this Part or any audit
c) an ATH advises the metering equipment provider responsible for the metering installation of a reference standard or working standard used to certify the metering installation not being compliant with this Part at the time it was used to certify the metering installation, or the failure of a group of meters in the statistical sampling recertification process for the metering installation or the failure of a certification test for the metering installation
d) the manufacturer of a metering component in the metering installation determines that the metering component does not comply with the standards to which the metering component was tested
e) an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part

f) *if the metering installation has been determined to be a lower category under clause 6 and the maximum current conveyed through the metering installation at any time exceeds the current rating of its metering installation category as set out in Table 1 of Schedule 10.1*
g) *the metering installation is certified under clause 14 and sufficient load is available for full certification testing and has not been retested under clause 14(4)*
h) *a control device in the metering installation certification is, and remains for a period of at least 10 business days, bridged out under clause 35(1)*
i) *the metering equipment provider responsible for the metering installation is advised by an ATH under clause 48(6)(b) that a seal has been removed or broken and the accuracy and continued integrity of the metering installation has been affected.*

A metering equipment provider must, within 10 business days of becoming aware that one of the events above has occurred in relation to a metering installation for which it is responsible, update the metering installation's certification expiry date in the registry.

Audit observation

I checked for examples of all of the points listed above, and checked whether certification had been cancelled, and whether the registry had been updated within 10 business days.

Audit commentary

I checked for examples of bridged control devices and I confirmed that they were resolved within 10 business days for a sample of ten.

During the previous audit, I recorded that ICP 0001501996ENB0C has 1200/5 CTs and was certified as Category 2 on 12/05/17. There was no information confirming that protection is rated at 500A or less and it has a 500kVA transformer. Monitoring had not occurred; therefore, certification was cancelled from the date the first monitoring report was not obtained, which was June 2017. The registry has been updated with the correct certification expiry. Recertification has not yet occurred.

During the previous audit, I recorded that two ICPs were certified b Delta using the comparative method and the temperature coefficient of the working standard was not considered in the uncertainty calculations. With the coefficient included the uncertainty will be greater than the allowable 0.6%, therefore certification is cancelled. The registry was not updated within 10 business days and has still not been updated.

During the previous audit, I recorded that alternative certification had been applied to ICPs 0000100223UN118 and 0103992006LCF3F but both had comparative certification conducted and alternative certification was applied. Comparative certification reports have since been produced by VEMS, but ICP 0103992006LCF3F has low burden and there is no evidence burden resistors were installed, therefore certification is cancelled, and the registry has not been updated within 10 business days.

During the previous audit I recorded that ICP 0000130696ENB89 was certified in accordance with the insufficient load provisions of the Code, but the installation is NHH and monitoring had therefore not been conducted, therefore certification is cancelled. This installation has been correctly recertified.

There are 264 installations incorrectly certified by the statistical sampling method since 29/08/13, which are also three phase with one phase metered. Certification has been cancelled because the installations are not fit for purpose and not all electricity conveyed is quantified in accordance with the Code. LMGL updated the registry within 10 business days of becoming aware of this issue.

LMGL's process for selecting a ~~Category 1 inspection~~ sample has been approved but the process does not stipulate how the population will be determined. The methodology for selecting the population is not compliant because it selects ICPs based on a date range of 114 to 126 months since certification rather than by including all ICPs other than those certified or physically inspected in the last 84 months.

Commented [GN3]: Why has this been deleted? This was to do with Inspections. Deleting it leaves the reader to think this relates to the Stat Sample Population determination as well. For the inspections our inspection sample number choosing process was previously approved and yet not for the most recent Audit. LMGL has now amended its method for future inspection samples.

Using the registry data from July 2018, the population would be 1,603 and if the population was identified in December 2018 the population would be 1,105, therefore the population as at January 2018 would have been over 500 and possibly over 1,200, so the sample size should have been 80 or 125, not 50. ~~The~~

LMGL provided an update on 24/04/19, confirming that additional sample was drawn from the population of meters with a date range of 84 to 114 months since certification. Inspections were conducted of a sample of this population and a report was provided to the Authority by 01/04/19. Whilst the original sample was incorrectly selected, it appears this matter is now resolved because the Authority has agreed that stratification of sampling is a valid approach.

I originally reported that the Code is clear that certification is cancelled for the population due for sample inspection. That quantity ~~is currently~~was 1,105 ICPs. My finding was based on the following wording of the Code:

"…for each 12 month period commencing 1 January and ending 31 December, a sample, selected under subclause (2), of the category 1 metering installations for which it is responsible has been inspected by an ATH within the period set out in Table 1 of Schedule 10.1 starting from the date of the earliest certification date of a metering installation in the group."

Clause 20(1) of Schedule 10.7 goes on to say:

"The certification of a metering installation is automatically cancelled on the date on which any 1 of the following events takes place … an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part."

On 23/04/19 the Authority provided clarification that: *"The Code requirements for inspections of category 1 metering installations undertaken using statistical sampling are insufficiently clear as to when and how the sample inspections must be performed and completed."* Which means that certification is not cancelled even though the inspections were not completed within the period 01/01/18 to 31/12/18.

The next issue relates to low burden on CT metered installations. The Authority provided a memo on 04/04/16 clarifying that:

> The Electricity Industry Participation Code 2010 (Code) requires an ATH to ensure that an approved calibration laboratory or a class A ATH has confirmed that all measuring transformers comply with the standards in Table 5 of Schedule 10.1 (clause 3(b) of Schedule 10.8). If the errors are within the limits set by the standards, the transformer has passed the test and may be certified as accurate within that range of burden (clause 3 of Schedule 10.8 and Table 5 of Schedule 10.1).
>
> If a measuring transformer is installed in a metering installation with the burden lower than the lowest test point used in the measuring transformer's calibration, then burdening resistors must be used to ensure that the measuring transformer operates within its calibration range.[1]

The memo also states:

> If an ATH certifies a metering installation with under-burdened measuring transformers, and it has not complied with clause 31(7) of Schedule 10.7 of the Code, then:
>
> 1. The ATH will breach clause 31(7) of Schedule 10.7 and also clause 43 of Schedule 10.7 by failing to grant certification in accordance with Part 10
> 2. The metering installation may be classed outside the applicable accuracy tolerances specified in Table 1 of Schedule 10.1, or not be fit for purpose, and if so, the metering installation certification is cancelled (clause 20(1)(b) of Schedule 10.7)
> 3. In certifying the metering installation, the ATH may breach clause 21 of Schedule 10.7 by certifying a metering installation that exceeds that maximum permitted error set out in Table 1 of Schedule 10.1.

The Authority confirmed on 01/03/18 that certification is cancelled for installations where low burden is not addressed.

Analysis of the certification records for 29 Category 2 metering installations found that four had been certified with burden lower than the lowest test point, without a Class A ATH confirming that the measuring transformers will not be adversely affected. Therefore, in accordance with the Authority's memo, these metering installations are considered "not fit for purpose". This means certification is cancelled. The ICPs are 0000101086EN7AE, 0000551859HBDBA, 0001812940HB92C and 0005001070CNA16.

As recorded in Section 7.13, the statistical sampling methodology is non-compliant for 4,826 ICPs in Project 1 and 24,527 ICPs in project 2, therefore certification is cancelled.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.4 With: Clause 20 of Schedule 10.7 From: 15-Jun-17 To: 13-Feb-19	Certification cancelled for following ICPs and the registry was not updated within 10 business days: 5 ICPs with low burden 29,353 ICPs with incorrect statistical sampling certification applied ~~1,105 ICPs where insufficient sample inspections were conducted~~ Potential impact: High Actual impact: Medium Audit history: Twice Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	I have recorded the controls as weak because some issues identified in the last audit have not been addressed and more issues have arisen. The impact could be significant, particularly the ICPs certified for ~~5~~7 years where the results show the population is not accurate when the entire sample is considered. Certified metering can end up with a lower priority for replacement than uncertified metering. The audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
This is disputed and MGL does not accept that the certification is cancelled. • Statistical sampling has been undertaken correctly. (As advised by the ATH's and certification and further documentation has been supplied • There is no requirement in the Code to burden CTs (as advised by the ATH's)	Now	Choose an item.

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Preventative actions taken to ensure no further issues will occur	Completion date	
[Participant comment]	Proposed or actual date	

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6.5. Registry Metering Records (Clause 11.8A)

Code reference

Clause 11.8A

Code related audit information

The MEP must provide the registry with the required metering information for each metering installation the MEP is responsible for and update the registry metering records in accordance with Schedule 11.4.

Audit observation

This clause refers to schedule 11.4 which is discussed in **Section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of LMGL not using the prescribed form.

Audit commentary

This clause refers to schedule 11.4 which is discussed in **Section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of LMGL not using the pre cribed form and did not find any examples.

Audit outcome

Compliant

7. CERTIFICATION OF METERING INSTALLATIONS

7.1. Certification and Maintenance (Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7)

Code reference

Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7

Code related audit information

The MEP must obtain and maintain certification for all installations and metering components for which it is responsible. The MEP must ensure it:

- *performs regular maintenance, battery replacement, repair/replacement of components of the metering installations*
- *updates the metering records at the time of the maintenance*
- *has a recertification programme that will ensure that all installations are recertified prior to expiry.*

Audit observation

I conducted the following checks to identify metering installations with expired, cancelled or late certification:

- the registry PR255 report was checked to identify ICPs with expired certification
- the new connections process was checked by using the event detail report, PR255 and the list file to identify ICPs where the certification was not conducted within five business days of energisation
- I checked ICPs where certification was cancelled to ensure the registry was updated accordingly.

Audit commentary

The table below summarises ICPs with expired or cancelled certification.

Quantity 2019	Quantity 2018	Quantity 2017	De ails
1	19,445	21,943	P eviously interim certified Category 1
3	2,929	3,305	Expired statistical certification
2	334	259	Expired full certification Category 1
11	8	20	Expired full certification Category 2
0	510	840	Cert date and cert expiry dates of 01/04/00
7	-	-	Cancelled Category 2, registry not updated
29,353	-	-	Cancelled due to non-compliant statistical sampling
~~1,105~~	-	-	~~Cancelled because of nsuff c ent Cat 1 nspect ons~~
~~30,48~~229,377	23,226	26,367	Total uncertified

Certification had expired for 11 Category 2 metering installations at the time the analysis was conducted. The status of the 11 is shown in the table below.

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Commented [GN4]: Refer earlier comments. Leaving this in here misleads whilst this is still being reviewed.

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ICP	Category	Cert date	Expiry date	Comments
0000202088DE02F	2	18-05-07	13-11-15	Inability to gain access due to asbestos.
0001050786AL8A8	2	18-03-08	18-03-18	Another MEP was nominated on 06/03/18.
0001501996ENB0C	2	12-05-17	12-05-17	Certification as a lower category is cancelled because monitoring was not conducted.
0004975515AL42A	2	06-05-08	06-05-18	Another MEP was nominated on 06/03/18.
0005711392AL2DB	2	20-05-08	20-05-18	The trader has not arranged access with the customer.
0000016893NTE65	2	10/09/2018	10/09/2018	Asbestos present
0000017151NT1A6	2	30/01/2018	30/01/2018	In progress
0000273829HB761	2	24/01/2018	24/01/2018	NGCM nominated as MEP
0000566890HB148	2	31/10/2018	31/10/2018	NGCM nominated as MEP
0007519774HBF0E	2	1/04/2015	1/04/2015	Only has one CT. Access not available because it is in a transformer enclosure. 3 phases with one phase metered.
0007600630ALF1B	2	24/03/2009	5/09/2018	It is intended that SMCO will be nominated as MEP

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Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.1 With: Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7 From: 01-Oct-17 To: 13-Feb-19	Certification expired or cancelled for 30,482 ICPs. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	Whilst a considerable amount of effort has gone into the certification program the statistical sampling process has some non-compliant steps, therefore I have recorded the control effectiveness as weak in this area. There are also some expired Category 2 installations where the non-compliant practices have been present for several years. The accuracy of the 4,826 installations cancelled due to incorrect statistical sampling is poor based on the sample results. This has an impact on settlement accuracy. There is also a settlement impact from those ICPs where low burden is present and not addressed. There is further impact on participants whenever one of these ICPs is reconnected; because the trader is then non compliant for not ensuring certification occurs within five days of electrical connection.

Actions taken to resolve the issue	Completion date	Remedial action status
Project 1: This is across two MEP identifiers in the registry. See later comments. Project 2: 100 meters tested as required. Refer later notes.	Done	Choose an item.
Preventative actions taken to ensure no further issues will occur	Completion date	
Cat 2 sites are regularly monitored and SR's issued and updated proactively. Non completions are monitored and reissued if appropriate.	Ongoing from 2017	

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7.2. Certification Tests (Clause 10.38(b) and clause 9 of Schedule 10.6)

Code reference

Clause 10.38(b) and clause 9 of Schedule 10.6

Code related audit information

For each metering component and metering installation an MEP is responsible for, the MEP must ensure that:

- *an ATH performs the appropriate certification and recertification tests*
- *the ATH has the appropriate scope of approval to certify and recertify the metering installation.*

Audit observation

I checked the Authority's website to confirm ATH approvals.

I checked the certification records for 50 metering installations to confirm compliance.

Audit commentary

All ATHs have appropriate scopes of approval.

There are four Category 2 installations where the Landis + Gyr EM3050 meter register does not have decimal places, therefore the register advance and prevailing load tests have not been conducted. One certification record states that load tests have not been conducted and others do n t have the results recorded, therefore certification should not have been applied.

The ICPs are 0000101517EN109, 0000551859HBDBA, 0001812940HB92C and 0060059625HB21B. The results of one of the reports is shown below.

It's possible testing was conducted but not recorded; however I only have the certification reports to work with.

Main meter is on a 6 dial and has no decimal point for load check unable to do comparison with check meter

Prevailing Load Test

Prevailing Load Test is required to certify all CT sites

	NZ STD Time	Main Meter	Working Std	D A
Test Finish Time	11·50		00060·861	Site DA
Test Start Time	11·20	000000	00060·454	Administrator
Difference Between Start and Finish			0·407	Date Called
Site Multiplier		40	40	Time Called
Calculated KWh			16·28 KWh	DA Result
% difference of Working Std *vs Main Meter*			% difference of Working Std *vs DA Reading*	

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.2 With: Clause 10.38(b) and clause 9 of Schedule 10.6 From: 07-Aug-18 To: 30-Jan-19	Register advance and prevailing load tests not conducted for four installations. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
The ATH advises that the certification for 0000101517EN109 is still valid. ICP: 0060059625HB21B (revisited and completed 10/4/2019) and 0001812940HB92C (revisited and completed 4/4/2019)	Complete	Choose an item.
Preventative actions taken to ensure no further issues will occur	**Comple ion date**	
MEP continues to monitor certificates and query ATH where unsure of any information received.	Ongoing	

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7.3. Active and Reactive Capability (Clause 10.37(1) and 10.37(2)(a))

Code reference

Clause 10.37(1) and 10.37(2)(a)

Code related audit information

For any category 2 or higher half-hour metering installation that is certified after 29 August 2013, the MEP must ensure that the installation has active and reactive measuring and recording capability.

Consumption only installations that is a category 3 metering installation or above must measure and separately record:

a) import active energy
b) import reactive energy
c) export reactive energy.

Consumption only installations that are a category 2 metering installation must measure and separately record import active energy.

All other installations must measure and separately record:

a) *import active energy*
b) *export active energy*
c) *import reactive energy*
d) *export reactive energy.*

All grid connected POCs with metering installations which are certified after 29 August 2013 should measure and separately record:

a) *import active energy*
b) *export active energy*
c) *import reactive energy*
d) *export reactive energy*

Audit observation

I checked the meter types on HHR installations to confirm compliance.

Audit commentary

All relevant metering components are compliant with this clause.

Audit outcome

Compliant

7.4. Local Service Metering (Clause 10.37(2)(b))

Code reference

Clause 10.37(2)(b)

Code related audit information

The accuracy of each local service metering installation in gri substations must be within the tolerances set out in Table 1 of Schedule 10.1.

Audit observation

This clause relates to Transpower as an MEP.

Audit commentary

This clause relates to Transpower as an MEP.

Audit outcome

Not applicable

7.5. Measuring Transformer Burden (Clause 30(1) and 31(2) of Schedule 10.7)

Code reference

Clause 30(1) and 31(2) of Schedule 10.7

Code related audit information

The MEP must not permit a measuring transformer to be connected to equipment used for a purpose other than metering, unless it is not practical for the equipment to have a separate measuring transformer.

The MEP must ensure that a change to, or addition of, a measuring transformer burden or a compensation factor related to a measuring transformer is carried out only by:

a) the ATH who most recently certified the metering installation
b) for a POC to the grid, by a suitably qualified person approved by both the MEP and the ATH who most recently certified the metering installation.

Audit observation

I asked LMGL if there were any examples of burden changes or the addition of non-metering equ pment being connected to metering CTs.

Audit commentary

There are no examples of burden changes having occurred.

Audit outcome

Not applicable

7.6. Certification as a Lower Category (Clauses 6(1)(b) and (d), and 6(2)(b) of Schedule 10.7)

Code reference

Clauses 6(1)(b) and (d), and 6(2)(b) of Schedule 10.7

Code related audit information

A category 2 or higher metering installation may be certified by an ATH at a lower category than would be indicated solely on the primary rating of the current if the MEP, based on historical metering data, reasonably believes that:

- *the maximum current will at all times during the intended certification period be lower than the current setting of the protection device for the category for which the metering installation is certified, or is required to be certified by the Code; or*
- *the metering installation will use less than 0.5 GWh in any 12-month period.*

If a metering installation is categorised under clause 6(1)(b), the ATH may, if it considers appropriate, and, at the MEP's request, determine the metering installation's category according to the metering installation's expected maximum current.

If a meter is certified in this manner:

- *the MEP must, each month, obtain a report from the participant interrogating the metering instal at on, which details the maximum current from raw meter data from the metering installation by either calculation from the kVA by trading period, if available, or from a maximum current indicator if fitted in the metering installation conveyed through the point of connection for the prior month; and*

- *if the MEP does not receive a report, or the report demonstrates that the maximum current conveyed through the POC was higher than permitted for the metering installation category it is certified for, then the certification for the metering installation is automatically cancelled.*

Audit observation

I checked all ICPs for examples where the CT ratio was above the threshold to confirm that protection was appropriate or that monitoring was in place.

Audit commentary

ICP 0001501996ENB0C has 1200/5 CTs and was certified as Category 2 on 12/05/17. There is no information confirming that protection is rated at 500A or less and it has a 500kVA transformer. Monitoring has not occurred; therefore, certification is cancelled from the date the first monitoring report was not obtained, which is June 2017. The registry has been updated with the correct certification expiry. This is the second time this installation has had cancelled certification for lack of monitoring, it was cancelled for the previous MEP. This installation has not yet been recertified.

There are three other examples where compensation factors are over 100, all of these have protection devices limiting current to under 500 amps.

Audit outcome

Compliant

7.7. Insufficient Load for Certification Tests (Clauses 14(3) and (4) of Schedule 10.7)

Code reference

Clauses 14(3) and (4) of Schedule 10.7

Code related audit information

If there is insufficient electricity conveyed through a POC to a low the ATH to complete a prevailing load test for a metering installation that is being certified as a half hour meter and the ATH certifies the metering installation the MEP must:

- *obtain and monitor raw meter data from the metering installation at least once each calendar month to determine if load during the month is sufficient for a prevailing load test to be completed:*
- *if there is sufficient load, arrange for an ATH to complete the tests (within 20 business days).*

Audit observation

I checked if there were any examples of insufficient load certifications.

Audit commentary

During the previous audit ICP 0000130696ENB89 was certified in accordance with the insufficient load provisions of the Code, but the installation is NHH and monitoring had therefore not been conducted. Certification is cancelled because monitoring was not conducted. This installation has been recertified.

There were no other examples of insufficient load certification.

Audit outcome

Compliant

7.8. Insufficient Load for Certification – Cancellation of Certification (Clause 14(6) of Schedule 10.7)

Code reference

Clause 14(6) of Schedule 10.7

Code related audit information

If the tests conducted under clause 14(4) of Schedule 10.7 demonstrate that the metering installation is not within the relevant maximum permitted error:

- *the metering installation certification is automatically revoked:*
- *the certifying ATH must advise the MEP of the cancellation within one business day:*
- *the MEP must follow the procedure for handling faulty metering installations (clause 10.43 - 10.48).*

Audit observation

There were no examples of insufficient load certification.

Audit commentary

There were no examples of insufficient load certification.

Audit outcome

Compliant

7.9. Alternative Certification Requirements (Clauses 32(2), (3) and (4) of Schedule 10.7)

Code reference

Clauses 32(2), (3) and (4) of Schedule 10.7

Code related audit information

If an ATH cannot comply with the requirements to certify a metering installation due to measuring transformer access issues, and therefore certifies the me ering installation in accordance with clause 32(1) of Schedule 10.7, the MEP must:

- *advise the market administrator, by no later than 10 business days after the date of certification of the metering installation, of the details in clause 32(2)(a) of Schedule 10.7*
- *respond, within five business days to any requests from the market administrator for additional information*
- *ensure that all of the details are recorded in the metering installation certification report*
- *take all steps to ensure that the metering installation is certified before the certification expiry date.*

If the market administrator determines the ATH could have obtained access the metering installation is deemed to be defective and the MEP must follow the process of handling faults metering installations in clauses 10.43 to 10 48.

Audit observation

I checked the registry records to confirm whether alternative certification had been applied and I checked the records for all three installations.

Audit commentary

Du ing the previous audit, alternative certification had been applied to three installations. The metering for ICP 0006593950RN692 is located up a pole and access could not be gained to the CTs to conduct certification testing. This is now recertified.

ICPs 0000100223UN118 and 0103992006LCF3F both had comparative certification conducted but alternative certification was applied. These are both now recertified.

There were no additional examples of alternative certification.

Audit outcome

Compliant

7.10. Timekeeping Requirements (Clause 23 of Schedule 10.7)

Code reference

Clause 23 of Schedule 10.7

Code related audit information

If a time keeping device that is not remotely monitored and corrected controls the switching of a meter register in a metering installation, the MEP must ensure that the time keeping device:

a) has a time keeping error of not greater than an average of two seconds per day over a period of 12 months
b) is monitored and corrected at least once every 12 months.

Audit observation

I asked LMGL whether there were any metering installations with timeclocks.

Audit commentary

LMGL confirmed there are no installations with timeclocks.

Audit outcome

Not applicable

7.11. Control Device Bridged Out (Clause 35 of Schedule 10.7)

Code reference

Clause 35 of Schedule 10.7

Code related audit information

The participant must, within 10 busines days of bridging out a control device or becoming aware of a control device being bridged out, notify the following parties:

- *the relevant reconciliation participant*
- *the relevant metering equipment provider.*

If the control device is used for reconciliation, the metering installation is considered defective in accordance with 10.43

Audit observation

I checked the process for the management of bridged control devices, and I checked whether any notifications were required to other parties.

Audit commentary

LMGL has a process for dealing with control devices which have been bridged out. If any are bridged out for more than 10 business days, they notify as required by this clause. I checked the most recent ten examples and the appropriate notification was provided.

Audit outcome

Compliant

7.12. Control Device Reliability Requirements (Clause 34(5) of Schedule 10.7)

Code reference

Clause 34(5) of Schedule 10.7

Code related audit information

If the MEP is advised by an ATH that the likelihood of a control device not receiving signals would affect the accuracy or completeness of the information for the purposes of Part 15, the MEP must, within three business days inform the following parties of the ATH's determination (including all relevant details):

a) the reconciliation participant for the POC for the metering installation
b) the control signal provider.

Audit observation

I checked the steps LMGL had taken to identify regions with signal propagation issues.

Audit commentary

LMGL has not been advised of any areas by the ATHs.

Audit outcome

Compliant

7.13. Statistical Sampling (Clauses 16(1) and (5) of Schedule 10.7)

Code reference

Clauses 16(1) and (5) of Schedule 10.7

Code related audit information

The MEP may arrange for an ATH to recertify a group of category 1 metering installations for which the MEP is responsible using a statistical sampling process.

The MEP must update the registry in accordance with Part 11 on the advice of an ATH as to whether the group meets the recertification requirements.

Audit observation

LMGL engaged the Delta ATH to conduct two statistical sampling projects. Project 1 was for 40,196 meters and Project 2 was for 20,942 meters. I checked the process and results to determine compliance.

Audit commentary

Project 1 was conducted using the "relative light load" accuracy rather than actual light load accuracy. Clause 8.5 of AS/NZS 1284.13 allows this to occur and states the following:

"The accuracy at light load may be taken as either the measured value or the relative value. Relative light load accuracy is calculated as the measured accuracy at light load minus the measured accuracy at full load."

The justification for using relative light load accuracy is that light load errors have a lower impact on total measured kWh than the full load errors.

Project 1 achieved a 5-year certification period.

I originally reported the following in relation to Project 1:

The sample contained eight three phase meters, which require testing at an additional test point. Testing was conducted at the additional test point; however, the results have not been used in the overall pass/fail calculation. The ATH stated the three phase meters were excluded from the calculation because they were accurate. The standard does not appear to allow these results to be excluded. The standard states that all test points have equal weight, therefore the 0.5 power factor test point must be considered. The extract from the standard is shown below.

> For in-service compliance, the Standard requires testing for errors at 2 points for direct-connected single-phase meters, 3 points for direct-connected polyphase meters and 4 points for CT-operated meters. The errors measured at these points are not averaged (each has equal weight); accordingly there is a greater chance of rejecting a meter sample (and ultimately the population that it represents) at one point of the 2 (3 or 4) test points even though the sample might conform at the other test points. This is consistent with the fact that the rate of consumption will vary in individual installations, both between installations and over time.

Furthermore, I question whether it's appropriate to combine single and three phase results when using the "variables" method. The analysis process should have two full load calculations (power factor of 1.0 and power factor of 0.5) and one light load calculation. This means three phase meters should be in a separate population for testing by variables. Due to the fact that the additional three phase test point has not been used in the calculation, I believe the certification is invalid. The wording of the clause is that the MEP "...may arrange for for an ATH to recertify a group of category 1 metering installations for which the metering equipment provider is responsible using a statistical sampling process set out in subclause (2)". The process does not comply with subclause (2), therefore the ATH is non-compliant but LMGL cannot be non-compliant with this clause. However, certification is not valid, which means certification is cancelled, which is recorded in Section 6.4.

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On 24/04/19 LMGL provided results including the additional three phase test point which indicated a pass. I still strongly recommend three phase and single phase meters be dealt with as separate populations in future statistical sampling exercises.

Recommendation	Description	Audited party comment	Remedial action

Regarding Clauses 16(1) and (5) of Schedule 10.7	Ensure future statistical sampling separates single and three phase meters into separate populations.	Stat Sampling – Project 1: This is across two "MEP" identifiers as shown in the registry. As known, LMG purchased one population of meters from Contact Energy and commenced as MEP at that point. Trustpower failed / refused to update LMGL as MEP at that point despite requests from LMGL and Contact Energy to do so. LMG requests a determination that either: a. This was an administrative oversite and the Authority can determine that LMGL was the MEP in fact under 10 21 or that b. Trustpower failed to update the registry with the correct information at the time and therefore breached 11.2 So far as three-phase meters a concerned. The test points were undertaken as per the requirements. They simply weren't included in the in tial calculation as there is no methodology described in AS1284 for the inclusion of 0.5lag testpoints in the calculation of var ables. Subsequent, separate, calculation have demonstrated hat should these meters be analysed separately, they would pass variables criteria with a seven-year category pass. The ATH advises that the testing is robust and valid. Project 2 The testhouse has provided documentation that the representativeness of the population is acceptable and have confirmed that the order of reporting in the analysis is the same as the order in which the meters were tested – there has not been any alteration of the order of testing.	[auditor comment]

		The ATH advises that the certification as originally issued should stand. Suggesting that the observation of errors in the next 16 is an indication of an issue is not consistent with AS1284. The Test House needed the 1st 100 in order to comply with the Standard and that they considered the appropriateness of the sample when issuing the certification.	

LMGL included meters in ~~their~~the Project 1 population where Contact Energy was the MEP. LMGL was the MEO but not the MEP at the time. They are now the MEP from the date certification was applied but were not the MEP when the sampling was conducted. The Code wording is shown below and does not seem to allow a population to be made up of metering installations from more than one MEP. There are approx. 5,400 ICPs included in the population where LMGL was not the MEP.

*A **metering equipment provider** may arrange for an **ATH** to **recertify** a group of **category 1 metering installations** for which the **metering equipment provider** is responsible using a statistical sampling process.*

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There has been some discussion about whether LMGL or Contact was the MEP for the period prior to LMGL being recorded in the registry as the MEP. The clauses below clarify that Contact was the MEP for the period they were recorded as the MEP in the registry. Although LMGL was the meter equipment owner, the responsibility for compliance was with the MEP. Clause 10.22 clarifies that it is the trader who decides who the MEP is. Clause 10.22 states:

10.22 Change of metering equipment provider

*(1) The **metering equipment provider** for a **metering installation** may change only if the **participant** responsible for ensuring there is a **metering installation** under clause 10.24, 10.25, or 10.26 enters into an arrangement with another person to become the **metering equipment provider** for the **metering installation** and—*

*(a) in the case of a **metering installation** for an **ICP** that is not also an **NSP**—*

*(i) the **trader** for the **metering installation** records the name of the **gaining metering equipment provider** in the **registry** in accordance with Part 11; and*

*(ii) the **gaining metering equipment provider** records in the **registry** that it accepts becoming the **metering equipment provider** (including the effective date from which the **gaining metering equipment provider** assumes its responsibility as **metering equipment provider** for the **metering installation**) in accordance with Part 11.*

I originally reported the following in relation to Project 2:

Project 2 was conducted using actual light load accuracy and a certification period of 7 years was applied. The Project 2 results do not fully comply with AS/NZS 1284.13. The required sample size is 100, but the actual sample was 116. Only 100 results were considered. AS/NZS 1284.13 contains the following information indicating that all 116 results should be considered.

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Section 8.4 (Selection of samples) states: *"It is recommended that the number of meters selected should be 10% more than the required sample size to allow for the replacements if some meters are damaged."*

Section 7.1.2 (Sampling accuracy by variables) states: *"Each meter in a sample shall be tested for accuracy in accordance with Clause 8.4."*

The graph below shows that the "cutoff" point of 100 excludes a high proportion of inaccurate meters. Clause 8.4 of AS/NZS 1284.13 requires the sample to be *"randomly selected to be representative of the selected meter population."* The graph below shows that the sample is not representative of the meter population.

An additional point to note is that ~~the "order" of 1 to 116 is not a randomly selected order, it is the order that meters were tested. It appears that the first 80 meters tested were Sangamo S200 and the next 20 were Iskra E89. It appears that the remaining 16 meters (not considered in the results) were from seven different makes/models, including two three phase meters. This means only two of nine meter types were considered in the pass/fail calculation.~~there were two three phase meters amongst the 16 not tested. The two three phase meters both had errors over 3% at the 0.5 power factor test point which could mean the entire population fails just on that issue. The standard states that all test points have equal weight, therefore the 0.5 power factor test point must be considered. The extract from the standard is shown below.

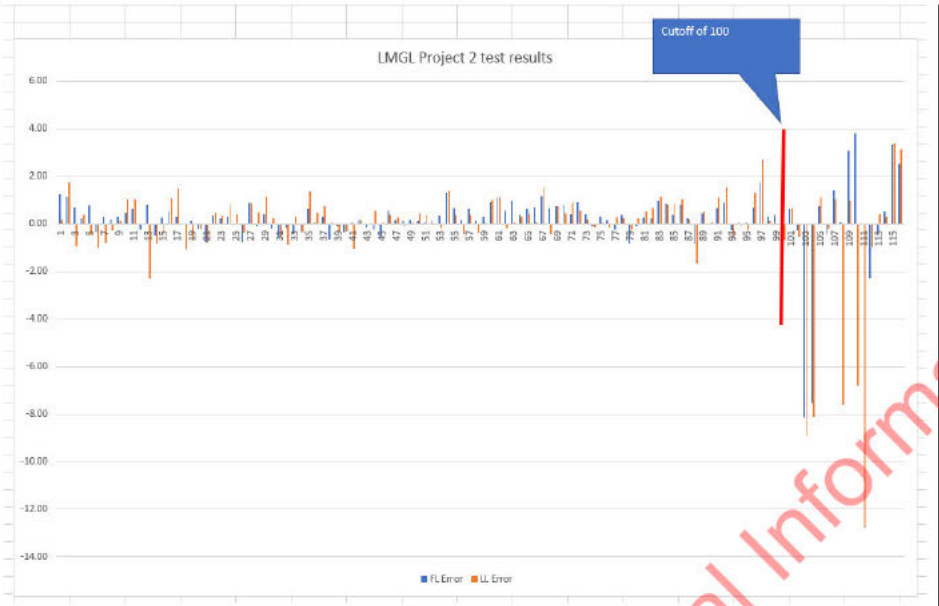
> For in-service compliance, the Standard requires testing for errors at 2 points for direct-connected single-phase meters, 3 points for direct-connected polyphase meters and 4 points for CT-operated meters. The errors measured at these points are not averaged (each has equal weight); accordingly there is a greater chance of rejecting a meter sample (and ultimately the population that it represents) at one point of the 2 (3 or 4) test points even though the sample might conform at the other test points. This is consistent with the fact that the rate of consumption will vary in individual installations, both between installations and over time.

The Authority's memo on statistical sampling reinforces this point by stating:

"As the integrity of the statistical sampling process depends on the meter sample being representative of the group, the ATH must satisfy itself that the meter sample properly represents the group. The ATH should keep auditable records to document the factors it considers in forming this view"

Commented [GN5]: Those 16 meters are not in the test results and not to be considered. The Test House was happy that the principles of Statistics and the AS1284 standards have been upheld.

Also, suggesting that the failures found in the next 16 have relevance is a large assumption as this regression to mean suggestion on such a limited number does not hold weight in Statistics. That is, the rate of failure of a sequence does not suggest that more results of the same kind will occur at all or to the same percentage of finding rate. This point is especially pertinent in the eyes of the Test Lab and Test House who considered both the meters in question, their results and the nature of the population concerned that they related to.



Clause 16(1) of Schedule 10.7 allows the MEP to arrange for an ATH to conduct statistical sampling in accordance with AS/NZS 1284. The information provided above shows that the sample was not selected in accordance with AS/NZS 1284 because the it is not representative of the meter population.

The wording of the clause is that the MEP "...may arrange for for an ATH to recertify a group of category 1 metering installations for which the metering equipment prov der is responsible using a statistical sampling process set out in subclause (2)". The process does not comply with subclause (2), therefore the ATH is non-compliant but LMGL cannot be non-compliant with this clause. However, certification is not valid, which means certification is cancelled, which is recorded in Section 6.4

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On 24/04/19 LMGL provided the following information:

The inclusion of three phase is problematic because the numbers are low (only 2) – analyzing the 0.5lag as proposed above (Project 1) cannot be undertaken as no average or standard deviation can be meaningfully established. Application of an "Att ibute" pass/fail cannot be mixed with a "Variables" analysis methodology so a pass/fail on the basis of 0.5lag performance cannot be applied.

The MEP and ATH have proposed (and undertaken) the retesting of a number (11; i.e. 10% of the population) of single-phase meters at 0.5 lag so that a 0.5 lag performance can be determined by the Variables method to include with the 3-phase test results at 0.5lag. This gives a notional Category 1 pass (7 years).

This approach may be applied in future sampling but only where insufficient three phase results were undertaken to allow for statically relevant analysis. These results and analysis are included separately (Appendix 2)

The approach above of creating a sample of 11 single phase and the two three phase meters is not compliant. As mentioned above, each test point has equal weight, therefore the sample fails at the 0.5 power factor test point and the population cannot be certified. The errors for the two three phase meters at a power factor of 0.5 lagging are 3.78% and 3.05%.

Audit outcome

Compliant

7.14. Compensation Factors (Clause 24(3) of Schedule 10.7)

Code reference

Clause 24(3) of Schedule 10.7

Code related audit information

If a compensation factor must be applied to a metering installation that is an NSP, the MEP must advise the reconciliation participant responsible for the metering installation of the compensation factor within 10 days of certification of the installation.

In all other cases the MEP must advise the registry of the compensation factor.

Audit observation

I checked the records for 29 Category 2 metering installations to confirm that compensation factors were correctly recorded on the registry.

Audit commentary

The compensation factors were correct for all metering installations.

Audit outcome

Compliant

7.15. Metering Installations Incorporating a Meter (Clause 26(1) of Schedule 10.7)

Code reference

Clause 26(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each meter in a metering installation it is responsible for is certified.

Audit observation

I checked the certification records for 50 metering installations to confirm compliance.

Audit commentary

Meters were certified for all 50 metering installations.

Audit outcome

Compliant

7.16. Metering Installations Incorporating a Measuring Transformer (Clause 28(1) of Schedule 10.7)

Code reference

Clause 28(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each measuring transformer in a metering installation it is responsible for is certified.

Audit observation

I checked the certification records for 29 metering installations to confirm compliance.

Audit commentary

Measuring transformer certification records were provided for all metering installations.

Audit outcome

Compliant

7.17. Metering Installations Incorporating a Data Storage Device (Clause 36(1) of Schedule 10.7)

Code reference

Clause 36(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each data storage device in a metering installation it is responsible for is certified.

Audit observation

I checked the certification records for 50 metering installations to confirm compliance.

Audit commentary

Data storage devices were certified for all relevant metering installations.

Audit outcome

Compliant

7.18. Notification of ATH Approval (Clause 7 (3) Schedule 10.3)

Code reference

Clause 7 (3) Schedule 10.3

Code related audit information

If the MEP is notified by the Authority that an ATH's approval has expired, been cancelled or been revised, the MEP must treat all metering installations certified by the ATH during the period where the ATH was not approved to perform the activities as being defective and follow the procedures set out in 10.43 to 10.48.

Audit observation

I checked the ATH register to confirm compliance.

Audit commentary

All relevant ATHs have appropriate approval.

Audit outcome

Compliant

7.19. Interim Certification (Clause 18 of Schedule 10.7)

Code reference

Clause 18 of Schedule 10.7

Code related audit information

The MEP must ensure that each interim certified metering installation on 28 August 2013 is certified by no later than 1 April 2015.

Audit observation

I checked the registry records to identify previously interim certified installations.

Audit commentary

LMGL was not the MEP when the installations expired so I have not recorded non-compliance with this specific clause.

Audit outcome

Not applicable

8. INSPECTION OF METERING INSTALLATIONS

8.1. Category 1 Inspections (Clause 45 of Schedule 10.7)

Code reference

Clause 45 of Schedule 10.7

Code related audit information

The MEP must ensure that category 1 metering installations (other than interim certified metering installations):

- *have been inspected by an ATH within 120 months from the date of the metering installation's most recent certification or*
- *for each 12-month period, commencing 1 January and ending 31 December, a sample of the category 1 metering installations selected under clause 45(2) of Schedule 10.7 has been inspected by an ATH.*

Before a sample inspection process can be carried out, the MEP must submit a documented process for selecting the sample to the Electricity Authority, at least two months prior to first date on which the inspections are to be carried out, for approval (and promptly provide any other information the Au hority may request).

The MEP must not inspect a sample unless the Authority has approved the documented process.

The MEP must, for each inspection conducted under clause 45(1)(b), keep records detailing:

- *any defects identified that have affected the accuracy or integrity of the raw meter data recorded by the metering installation*
- *any discrepancies identified under clause 44(5)(b)*
- *relevant characteristics, sufficient to enable reporting of correlations or relationships between inaccuracy and characteristics*
- *the procedure used, and the lists generated, to select the sample under clause 45(2).*

The MEP must, if it believes a metering installation that has been inspected is or could be inaccurate, defective or not fit for purpose:

- *comply with clause 10.43*
- *arrange for an ATH to recertify the metering installation if the metering is found to be inaccurate under Table 1 of Schedule 10.1, or defective or not fit for purpose.*

The MEP must by 1 April in each year, pro ide the Authority with a report that states whether the MEP has, for the previous 1 January to 31 December period, arranged for an ATH to inspect each category 1 metering installation for which it is responsible under clause 45(1)(a) or 45(1)(b).

This report must include the matters specified in clauses 45(8)(a) and (b).

If the MEP is advised by the Authority that the tests do not meet the requirements under clause 45(9) of Schedule 10.7, the MEP must select the additional sample under that clause, carry out the required inspections, and report to the Authority, within 40 business days of being advised by the Authority.

Audit observation

I checked the process, and the results for the Category 1 inspection regime to confirm compliance.

Audit commentary

LMGL's process for selecting a sample has been approved but the process does not stipulate how the popu ation will be determined. The methodology for selecting the population is not compliant because it

selects ICPs based on a date range of 114 to 126 months since certification rather than by including all ICPs other than those certified or physically inspected in the last 84 months.

Using the registry data from July 2018, the population would be 1,603 and if the population was identified in December 2018 the population would be 1,105, therefore the population as at January 2018 would have been over 500 and possibly over 1,200, so the sample size should have been 80 or 125, not 50. ~~The Code is clear that certification is cancelled for the population due for sample inspection. That quantity is currently 1,105 ICPs.~~

LMGL provided an update on 24/04/19 confirming that additional sample was drawn from the population of meters with a date range of 84 to 114 months since certification. Inspections were conducted of a sample of this population and a report was provided to the Authority by 01/04/19. Whilst the original sample was incorrectly selected, it appears this matter is now resolved because the Authority has agreed that stratification of sampling is a valid approach.

I originally reported that the Code is clear that certification is cancelled for the population due for sample inspection. That quantity was 1 105 ICPs. My finding was based on the following wording of the Code

"...for each 12 month period commencing 1 January and ending 31 December, a sample, selected under subclause (2), of the category 1 metering installations for which it is responsible has been inspected by an ATH within the period set out in Table 1 of Schedule 10.1 starting from the date of the earliest certification date of a metering installation in the group."

Clause 20(1) of Schedule 10.7 goes on to say:

"The certification of a metering installation is automatically cancelled on the date on which any 1 of the following events takes place ... an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part."

On 23/04/19 the Authority provided clarification that: *"The Code requirements for inspections of category 1 metering installations undertaken using statistical sampling are insufficiently clear as to when and how the sample inspections must be performed and completed."* Which means that certification is not cancelled even though the inspections were not completed within the period 01/01/18 to 31/12/18.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 8.1 With: Clause 45 of Schedule 10.7 From: 01-Jan-18 To: 31-Dec-18	Incorrect Category 1 sample ~~inspection selection~~ Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore the audit risk rating is low.
Actions taken to resolve the issue	**Completion date** / **Remedial action status**

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Additional inspections were undertaken to bring a second population inspected up to the required number and the report was lodged with the Authority as required. Our understanding is that the inspection for 2018 is compliant.	Completed	Choose an item.
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Selection methodology now corrected.	2019 Programme	

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8.2. Category 2 to 5 Inspections (Clause 46(1) of Schedule 10.7)

Code reference

Clause 46(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each category 2 or higher metering installation is inspected by an ATH at least once within the applicable period. The applicable period begins from the date of the metering installation's most recent certification and extends to:

- *120 months for Category 2*
- *60 months for Category 3*
- *30 months for Category 4*
- *18 months for Category 5.*

Audit observation

I checked the registry information to confirm which ICPs were due for inspection. There were no category 2 or 3 metering installations due for inspection.

Audit commentary

I checked the registry information to confirm which ICPs were due for inspection. There were no category 2 or 3 metering installations due for inspection.

Audit outcome

Not applicable

8.3. Inspection Reports (Clause 44(5) of Schedule 10.7)

Code reference

Clause 44(5) of Schedule 10.7

Code related audit information

The MEP must, within 20 business days of receiving an inspection report from an ATH:

- *undertake a comparison of the information received with its own records*
- *investigate and correct any discrepancies*
- *update the metering records in the registry.*

Audit observation

I checked the process and results from inspection regimes to ensure any incorrect records were updated.

Audit commentary

LMGL checked the relevant details during inspections and I observed evidence that updates had occurred where discrepancies were found.

Audit outcome

Compliant

8.4. Broken or removed seals (Clause 48(4) and (5) of Schedule 10.7)

Code reference

Clause 48(4) and (5) of Schedule 10.7

Code related audit information

If the MEP is advised of a broken or removed seal it must use reasonable endeavours to determine

a) who removed or broke the seal
b) the reason for the removal or breakage

and arrange for an ATH to carry out an inspection of the removal or breakage and determine any work required to remedy the removal or breakage.

The MEP must make the above arrangements within

a) three business days, if the metering installation is category 3 or higher
b) 10 business days if the metering installation is category 2
c) 20 business days if the metering installation is category 1.

Audit observation

I checked all examples of notification of missing seals, which were all as a result of inspection processes or notification by field technicians.

Audit commentary

I checked 20 examples of seals found missing. Appropriate notification was p ovided in all cases.

Audit outcome

Compliant

9. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

9.1. Investigation of Faulty Metering Installations (Clause 10.43(4) and (5))

Code reference

Clause 10.43(4) and (5)

Code related audit information

If the MEP is advised or becomes aware that a metering installation may be inaccurate, defective, or not fit for purpose, it must investigate and report on the situation to all affected participants as soon as reasonably practicable after becoming aware of the information, but no later than;

a) 20 business days for Category 1,
b) 10 business days for Category 2 and
c) 5 business days for Category 3 or higher.

Audit observation

I checked ten examples where LMGL had become aware of faulty metering installations.

Audit commentary

The notification occurred within the allowable timeframes in all cases.

Audit outcome

Compliant

9.2. Testing of Faulty Metering Installations (Clause 10.44)

Code reference

Clause 10.44

Code related audit information

If a report prepared under clause 10.43(4)(c) demonstrates that a metering installation is inaccurate, defective, or not fit for purpose, the MEP must arrange for an ATH to test the metering installation and provide a 'statement of situation'.

If the MEP is advised by a participant under clause 10.44(2)(a) that the participant disagrees with the report that demonstrates that the metering installation is accurate, not defective and fit for purpose, the MEP must arrange for an ATH to:

a) test the metering installation
b) provide the MEP with a statement of situation within five business days of:
c) becoming aware that the metering installation may be inaccurate, defective or not fit for purpose; or
d) reaching an agreement with the participant.

The MEP is responsible for ensuring the ATH carries out testing as soon as practicable and provides a statement of situation.

Audit observation

I checked ten examples where LMGL had become aware of faulty metering installations.

Audit commentary

The notification occurred within the allowable timeframes in all cases.

Audit outcome

Compliant

9.3. Statement of Situation (Clause10.46(2))

Code reference

Clause 10.46(2)

Code related audit information

Within three business days of receiving the statement from the ATH, the MEP must provide copies of the statement to:

- *the relevant affected participants*
- *the market administrator (for all category 3 and above metering installations and any category 1 and category 2 metering installations) on request.*

Audit observation

I checked ten examples where LMGL had become aware of faulty metering installations.

Audit commentary

The statements of situation were provided within the allowable thresholds.

Audit outcome

Compliant

10. ACCESS TO AND PROVISION OF RAW METER DATA AND METERING INSTALLATIONS

10.1. Access to Raw Meter Data (Clause 1 of Schedule 10.6)

Code reference

Clause 1 of Schedule 10.6

Code related audit information

The MEP must give authorised parties access to raw meter data within 10 business days of receiving the authorised party making a request.

The MEP must only give access to raw meter data to a trader or person, if that trader or person has entered into a contract to collect, obtain, and use the raw meter data with the end customer.

The MEP must provide the following when giving a party access to information:

a) the raw meter data; or
b) the means (codes, keys etc.) to enable the party to access the raw meter data.

The MEP must, when providing raw meter data or access to an authorised person use appropriate procedures to ensure that:

- *the raw meter data is received only by that authorised person or a contractor to the person*
- *the security of the raw meter data and the metering installation is maintained*
- *access to the raw meter data is limited to only the specific raw meter data under clause 1(7)(c) of Schedule 10.6.*

Audit observation

I checked whether any parties had requested access to raw meter data

Audit commentary

No requests have been received, but LMGL advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.2. Restrictions on Use of Raw Meter Data (Clause 2 of Schedule 10.6)

Code reference

Clause 2 of Schedule 10.6

Code related audit information

The MEP must not give an authorised person access to raw meter data if to do so would breach clause 2(1) of Schedule 10.6.

Audit observation

I checked whether any parties had requested access to raw meter data.

Audit commentary

No requests have been received, but LMGL advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.3. Access to Metering Installations (Clause 3(1), (3) and (4) of Schedule 10.6)

Code reference

Clause 3(1), (3) and (4) of Schedule 10.6

Code related audit information

The MEP must within 10 business days of receiving a request from one of the following parties, arrange physical access to each component in a metering installation:

- *a relevant reconciliation participant with whom it has an arrangement (other than a trader)*
- *the Authority*
- *an ATH*
- *an auditor*
- *a gaining MEP.*

This access must include all necessary means to enable the party to access the metering components

When providing access, the MEP must ensure that the security of the metering installation is maintained, and physical access is limited to only the access required for the purposes of the Code, regulations in connection with the party's administration, audit and testing functions.

Audit observation

I checked whether any parties had requested access to metering installations.

Audit commentary

No requests have been received, but LMGL advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.4. Urgent Access to Metering Installations (Clause 3(5) of Schedule 10.6)

Code reference

Clause 3(5) of Schedule 10.6

Code related audit information

If the party requires urgent physical access to a metering installation, the MEP must use its best endeavours to arrange physical access

Audit observation

I checked whether any parties had requested access to metering installations.

Audit commentary

No requests have been received, but LMGL advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.5. Electronic Interrogation of Metering Installations (Clause 8 of Schedule 10.6)

Code reference

Clause 8 of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from an MEP's back office, the MEP must

- *ensure that the interrogation cycle does not exceed the maximum interrogation cycle shown in the registry*
- *interrogate the metering installation at least once within each maximum interrogation cycle.*

When raw meter data can only be obtained from an MEP's back office, the MEP must ensure that the internal clock is accurate, to within ±5 seconds of:

- *New Zealand standard time; or*
- *New Zealand daylight time.*

When raw meter data can only be obtained from an MEP's back office, the MEP must record in the interrogation and processing system logs, the time, the date, and the extent of any change in the internal clock setting in the metering installation.

When raw meter data can only be obtained from an MEP's back office, the MEP must ensure that a data storage device in a metering installation does not exceed the maximum time error set out in Table 1 of clause 8(5) of Schedule 10.6.

The MEP must compare the time on the internal clock of the data storage device with the time on the interrogation and processing system clock, calculate and correct (if required by this provision) any time error, and advise the affected reconciliation participant.

When raw meter data can only be obtained from an MEP's back office, the MEP must, when interrogating a metering installation, download the event log, check the event log for evidence of malfunctioning or tampering, and if this is detected, carry out the appropriate requirements of Part 10.

The MEP must ensure that all raw meter data that can only be obtained from the MEPs back office, that is downloaded as part of an interrogation, and that is used for submitting information for the purpose of Part 15 is archived:

- *for no less than 48 months after the interrogation date*
- *in a form that cannot be modified without creating an audit trail*
- *in a form that is secure and prevents access by any unauthorised person*

in a form that is accessible to authorised personnel.

Audit observation

LMGL is not the MEP for AMI metering installations and does not conduct data collection as an MEP.

Audit commentary

LMGL is not the MEP for AMI metering installations and does not conduct data collection as an MEP.

Audit outcome

Not applicable

10.6. Security of Metering Data (Clause 10.15(2))

Code reference

Clause 10.15(2)

Code related audit information

The MEP must take reasonable security measures to prevent loss or unauthorised access, use, modification or disclosure of the metering data.

Audit observation

I checked the security and storage of data by looking at examples of data more than 48 months old.

Audit commentary

All data is secure, and any transmission is via FTP.

Audit outcome

Compliant

10.7. Time Errors for Metering Installations (Clause 8(4) of Schedule 10.6)

Code reference

Clause 8(4) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEPs back office, the MEP must ensure that the data storage device it interrogates does not exceed the maximum time error set out in Table 1 of clause 8(5) of Schedule 10.6.

Audit observation

LMGL is not the MEP for AMI metering installations.

Audit commentary

LMGL is not the MEP for AMI metering installations.

Audit outcome

Not applicable

10.8. Event Logs (Clause 8(7) of Schedule 10.6)

Code reference

Clause 8(7) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEP's back office, the MEP must, when interrogating a metering installation:

- *a) ensure an interrogation log is generated*
- *b) review the event log and:*
  - *i. take appropriate action*
  - *ii. pass the relevant entries to the reconciliation participant.*
- *c) ensure the log forms part of an audit trail which includes:*
  - *i. the date and*

ii. *time of the interrogation*
iii. *operator (where available)*
iv. *unique ID of the data storage device*
v. *any clock errors outside specified limits*
vi. *method of interrogation*
vii. *identifier of the reading device used (if applicable).*

Audit observation

LMGL is not the MEP for AMI metering installations.

Audit commentary

LMGL is not the MEP for AMI metering installations.

Audit outcome

Not applicable

10.9. Comparison of HHR Data with Register Data (Clause 8(9) of Schedule 10.6)

Code reference

Clause 8(9) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEP's back office, the MEP must ensure that each electronic interrogation that retrieves half-hour metering information compares the information against the increment of the metering installations accumulating meter registers

Audit observation

LMGL is not the MEP for AMI HHR metering installations.

Audit commentary

LMGL is not the MEP for AMI HHR metering installations.

Audit outcome

Not applicable

10.10. Correction of Raw Meter Data (Clause 10.48(2),(3))

Code reference

Clause 10.48(2),(3)

Code related audit information

If the MEP is notified of a question or request for clarification in accordance with clause 10.48(1), the MEP must, within 10 business days:

- *respond in detail to the questions or requests for clarification*
- *advise the reconciliation participant responsible for providing submission information for the POC of the correction factors to apply and period the factors should apply to.*

Audit observation

MGL has not received any requests in relation to this clause.

Audit commentary

LMGL has not received any requests in relation to this clause.

Audit outcome

Not applicable

CONCLUSION

The audit identified nine non-compliances.

The main issue found is that the statistical sampling processes for two populations of meters at 29,353 ICPs do not comply with the Code or with AS/NZS 1284.13. This audit concludes that certification for these metering installations is not valid. ~~Three issues were found, which are listed below~~The issue has three main points, as follows:

4. Populations with different MEPs were combined into one population.
5. The additional three phase test point was originally excluded from the pass/fail calculation.
6. 16 of a sample of 116 meters were excluded from the pass/fail calculation. Seven of the 16 meters excluded had errors greater than 3%. The last two meters on the list were three phase and both had errors greater than 3%.

Additional information was provided by the Authority on 23/04/19 and LMGL on 24/04/19. This information was considered and further comment is included in Sections 6.4 7.13 and 8.1. There are minor changes to some findings, but the main issues are still present, particularly in relation to non-compliant statistical sampling processes.

Several issues were found with certification practices, as follows:

4. Some certification reports did not have prevailing load or register advance results recorded.
5. Some Category 2 installations were certified using the comparative method, but the uncertainty calculations did not take temperature into account.
6. Some Category 2 installations were certified without low burden being addressed.

Registry information accuracy and timeliness of updates has a high level of compliance~~, along with the~~ .

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The table below provides some guidance on this matter and recommends an audit frequency of three months. I recommend the Authority considers a longer period of six months to allow sufficient time to resolve the issues surrounding statistical sampling and Category 2 installations where recertification may be required.

PARTICIPANT RESPONSE

The main issues coming from the audit are the completion of the two statistical sampling projects as undertaken by the ATH.

As described earlier in the paper:

Project 1:

Trustpower was aware of the sale of one population of assets to LMGL by Contact in 2016. Both Contact Energy and LMGL requested Trustpower to nominate LMGL as the MEP. Trustpower, however, did not update the registry with the correct information as requested.

The issue of non nomination of the LMGL sites had been signaled to the auditor and the authority in earlier MEP audits and conversations. LMGL and Delta had commenced the statistical sampling programme in early 2017.

If this was not an administrative issue under which the Authority could determine that LMGL was *in fact* the MEP (per 10.21) then this must be a breach of 11.2 (Requirement to provide complete and accurate information) by Trustpower. The consequence of which is that LMG and Delta undertook a population

selection across two different MEPs as shown in the registry and an unintended consequential breach has therefore occurred.

The inclusion of three phase metering was advised as acceptable by the ATH on the basis of advice received by an auditor. Three phase metering was tested at all testpoints as required by AS1284, however, as there is no prescribed methodology for the assessment of the 0.5 lag testpoint for variables in AS1284, these test point results were not included in the original analysis submitted.

Project 2:

The implication of the analysis shown is that the order of results was manipulated by the ATH so as to give a "good" result. This is not the case and the testhouse has confirmed in writing that the order of analysis was the order in which the results were received (the order in which the meters were tested). The testhouse has also separately confirmed that they are satisfied with the representativeness of the sample as tested. These statements are provided as documents separate to this audit document.

Statistical Sampling in General

LMGL contracted Delta's Class-A test lab to follow the approved processes Delta have used for other MEPs' sample programmes for population determination, Test Lab processes and Accuracy and Certification determination. The Test House issues the certification.

Delta Test House concluded from the individual results, the combined population, their own experience with the programmes and the meters concerned, that the conditions were acceptable to both them and complied with AS1284.

As described above, LMGL seeks a determination that it is and was the MEP of the population for Project 1 either because:

- The non-nomination by Trustpower was an administrative oversight (10.21) after being requested by Contact Energy and LMGL to nominate or tha ;
- The non-nomination was a result of incorrect information supplied to the registry and was a breach of clause 11.2 (not necessarily intentionally)

In either case, the population was sold to LMGL as ne population by Contact Energy (not differentiated by retailer). LMGL operated functionally as the MEP for these sites where all operational issues relating to the meters were directed to LMGL (including maintenance and BAU changes).

CT Burdening

The ongoing issue of CT Burdening s raised in this audit. The ATHs advise (as per the detail in the document) that they consider that the Code does not require CT burdening to be undertaken upon comparative recertification of the Cat2 sites in question. Whilst there is a subsequent memo, this does not appear to clarify an apparent intention for CT burdening to take place for comparative recertification.

General Compliance

As an example, with 0001501996ENB0C, LMGL is trying to resolve this site although the retailer has expressed an intention to replace metering with AMI or TOU metering once we are able to fix this. This has involved a considerable number of emails and phone calls to the networks, three field service providers, the customer and the Retailer. The retailer has now recently changed, and investigations have revealed that there is a settable fuse (although this is considered unacceptable by the network), the MDI has been found and this has shown a maximum demand of no more than 400A and actions are underway no w th the new retailer to achieve some resolution.

LMGL is striving to achieve compliance in all aspects of its operation and continues to work closely with ATHs and retailers to ensure that the operations and the data is compliant and correct.

As an MEP, LMGL relies on the certification and information that is it provided by the testhouses and expends considerable energy in ensuring that the material that it is provided is as robust and as correct as possible, to its knowledge.