

ASSET HEALTH PILOT REPORT

OUR PROPOSAL FOR ALTERNATIVE ASSET HEALTH GRID OUTPUT MEASURES TO PILOT DURING RCP2

Transpower New Zealand Limited

July 2017

Keeping the energy flowing



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1 Introduction

This chapter introduces our proposal to report on asset health and reasons for proposing our asset health grid output measures. It also covers our current IPP reporting obligations, including the current measures, and the reasons for changing our pilot reporting output measures.

1.1 Purpose

This report provides the Commerce Commission (the Commission) with information relating to our obligations in the current Individual Price Path (IPP) to report on pilot asset health grid output measures. We have committed to providing the Commission with alternative asset health output measures to a suitable level for inclusion in the IPP for compliance reporting in October 2017.

1.2 Our current reporting obligations on asset health

Our current IPP sets our maximum allowable revenue (price path) and grid output measures (quality standards) for RCP2 (2015-2020). Section 28.1 of the IPP requires us to provide the Commission with information about pilot asset health grid output measures. The measures are based on average remaining life for three asset classes: tower coating of transmission towers; outdoor circuit breakers; and power transformers. Our current asset health grid output measures are attached in Appendix A.1.

The output measures have related targets that are the difference between the average remaining life that existed at the end of the relevant disclosure year and that which existed at the end of the preceding disclosure year.

Appendix A.2 contains our proposed pilot asset health output measures (with current asset health data only).

1.3 Conditional exemption from reporting on asset health output measures

In September 2016, we requested and received an exemption from reporting on the pilot asset health measures. The exemption was granted on the condition that we develop an alternative method of reporting on asset health grid output measures to replace the current measures in the IPP.

Our reasons for seeking an exemption were:

- A target based on average remaining life does not reflect how we model for asset health. We have developed our asset health framework during RCP2 which has led to more mature asset health models. These models express asset health as an index rather than as estimated remaining life. This is a more meaningful measure of the condition of our assets.

- We do not think the current asset health output target would be suitable to include in the incentive regime for RCP3. An incentive regime needs to avoid perverse outcomes. An incentive linked directly to an average remaining life target would not be appropriate because asset health is not the only factor in determining when to invest in an asset. A fixed target would also not account for developments in our asset health models which may change our view of the condition of the asset and thus the appropriate time to invest. At worst, an incentive regime could distort our analysis of asset health.

We have been developing alternative asset health measures as part of our asset health improvement initiative. The improvement initiative aims to develop our asset health models, data and processes¹ that use asset health as an input in our asset planning decisions. We first developed asset health models in RCP1, and used them to help develop our refurbishment and replacement plans for the current IPP. Our understanding of how to model and use asset health continues to grow and develop.

We have made several improvements to the way we use asset health including: improvements in modelling such as automating models and developing more mature models for certain asset classes; improving the way we collect and assess asset condition data; and increasing the coverage of assets that we have health models for.

The output measures have been developed so that they can be included in the RCP3 proposal as revenue linked output measures.

¹ March 2016 Initiatives Plan Update: <https://www.transpower.co.nz/sites/default/files/plain-page/attachments/Regulatory%20Initiatives%20Plan%20-%20March%202016%20Update.pdf>

2 Our Pilot Asset Health Report

This chapter includes our proposed alternative AHGOMs (Asset Health Grid Output Measures) that we will include in the October 2017 IPP Compliance Report. We briefly explain how the measures were created, what the targets will be and what they indicate, as well as, the asset classes we intend to include in the report.

We also propose to report on the asset health of additional asset classes, however we do not propose to set targets (e.g. forecasts) for these asset classes.

2.1 Our asset health pilot report

Our asset health pilot report consists of:

- Asset health grid output measures based on our Asset Health Index (AHI).
- Asset health grid output targets based on forecast asset health scores for the years 2018-2020 (the end of RCP2).
- The five asset classes to be included in the pilot report. In October 2017, we will provide asset health forecasts (our targets) for these asset classes.

2.1.1 Our reporting approach

In this report, we have only provided a snapshot² of asset health scores based on current condition data and modelling. In the IPP report due in October 2017, we will provide the forecast targets for the selected asset classes for every remaining year until 2020.

In subsequent reporting years (2018-2020), we will provide an updated snapshot of asset health scores to compare against our 2017 forecasts. The next section discusses the assessment framework we propose is used to determine whether our targets have been met.

2.2 Developing the output measures

2.2.1 Developing an asset health index

Our asset health output measures are based on the way that we measure and report on asset condition in our business. This is done by creating an AHI for each asset class using asset health modelling and condition data to reflect the current state of our grid asset fleet.

An AHI is an indicator that represents an asset's proximity to the end of its useful life. The end of useful life is the period of an asset's life when it will need replacement or major refurbishment to extend its life. When combined with other information and

² We use the term 'snapshot' rather than 'actuals' to refer to the latest available information on current asset health. This reflects that there is a lag in gathering and processing asset condition information.

decision frameworks, an AHI can inform the optimal time for various asset interventions when combined with engineering judgement.

The AHI is used for medium to long range planning. It looks at the current health and predicts how the asset health will change in the future to inform the medium to long term investment plan. The AHI will be interrogated between 6 to 12 months to update investment decisions and introduce the most up-to-date asset condition data.

We collect asset condition data for different assets at different frequencies. Our AHI will include the most up-to-date condition data for each asset class, however different assets will have older or newer condition data depending on when the assessment was conducted. Our approach to modelling and forecasting AHI is evolving and will continue to improve over time.

Table 1: Our asset health models with current asset health scores³

Coverage of Asset Health models		Population Mar 2017	Assets not scored	Current Asset Health Score							
Asset Group	Asset Class			1-4	>4-5	>5-6	>6-7	>7-8	>8-9	>9-9.5	>9.5
				Good			Fair		Poor		Very poor
Lines	Conductors (cct km)	16526	0.05%	49.6%	7.8%	17.0%	11.9%	11.5%	1.6%	0.3%	0.2%
	Tower foundations - other	12783	0.00%	95.8%	1.7%	0.6%	0.1%	1.5%	0.1%	0.0%	0.2%
	Tower foundations - grillage	10697	0.00%	16.7%	16.5%	29.4%	8.3%	3.9%	18.9%	1.1%	5.3%
	Tower Protective Coating	23729	0.72%	49.3%	18.5%	18.9%	7.7%	3.0%	0.9%	0.3%	0.7%
	Insulators	54873	4.35%	46.8%	16.8%	15.0%	10.0%	4.6%	1.0%	0.5%	0.9%
	Pole structures	14627	0.01%	62.3%	7.2%	12.1%	8.9%	6.0%	2.0%	0.2%	1.2%
Stations	Instrument transformers	5871	0.15%	84.6%	3.8%	3.9%	2.2%	2.7%	0.7%	0.1%	1.9%
	Outdoor Circuit Breakers	1514	0.00%	64.0%	4.5%	16.6%	9.2%	4.0%	1.6%	0.1%	0.1%
	Power transformers	439	1.14%	43.7%	3.9%	23.5%	20.0%	3.9%	2.1%	0.2%	1.6%
Sec. Systems	Battery Banks	651	0.00%	35.2%	5.4%	15.4%	18.6%	12.0%	5.1%	0.0%	8.4%

Note: Further calibration and latest condition data will be available for October 2017 report. Health models for other asset classes are underway.

2.2.2 Developing asset health output targets

To provide forecast asset health targets for RCP2, we need to take the current asset health and apply:

- The estimated deterioration rate for the assets; and
- The forecast investment plan (replacement and refurbishment).

The asset health targets we will include in the October 2017 Compliance Report will be for assets that have been assessed as having a forecast asset health score of poor to very poor health. This corresponds to a score of 8 or above on the AHI.

The asset health targets are based on an estimated rate of deterioration, a forecast replacement and refurbishment plan and the current asset health scores for selected assets. The targets will therefore indicate the desired outcome or profile for our assets in terms of asset health that we intend to have for our assets once deterioration and investment have been accounted for.

³ The asset health data illustrated in the current asset health score was inputted into the models in December 2016. The asset models we present the Commission in October 2017 will be updated using information inputted into the model as of June 2017.

Generally, we will prioritise the replacement or refurbishment of assets with a score of poor to very poor as it means the asset is near the end of its useful life. Although, in some instances, we may run an asset to failure or to a very poor state. This could be because the asset has a low criticality, which means the impact of failure is low and it is economic to run the asset to failure. Criticality is another key factor that we consider when making decisions about asset replacement and refurbishment.

It should not be interpreted that our asset health targets should be set to 0%. It is appropriate to have some proportion of assets nearing the end of their useful life, with the appropriate portion varying by asset class and depending on target risk levels and other considerations.

Table 2: Example of our forecast asset health scores (targets) for the RCP2 pilot using sample data

Asset Health Incentives		Population Mar 2017	Assets not scored	Portion of population in poor and very poor health >AHI 8							
Asset Group	Asset Class			Actual	Actual	Forecast	Actual	Forecast	Actual	Forecast	Deadband
				2017	2018	2018	2019	2019	2020	2020	+ / -
Lines	Tower foundations - other	12783	0.00%	0.3%		0.3%		0.3%		0.3%	0.05%
	Tower foundations - grillage	10697	0.00%	25.3%		23.0%		23.0%		20.0%	3.00%
	Tower Protective Coating	23729	0.72%	1.9%		1.9%		2.0%		2.1%	0.32%
	Insulators	54873	4.35%	2.4%		2.4%		2.4%		2.4%	0.36%
Stations	Outdoor Circuit Breakers	1514	0.00%	2.7%		2.7%		2.8%		2.8%	0.42%
	Power transformers	439	1.14%	1.7%		1.7%		1.7%		1.7%	0.26%

Table 2 provides a draft example of the asset health report that we will provide the Commission for use in the annual IPP compliance report. It includes the asset classes that we intend to use for the pilot reporting and the form the report will take. We have used sample data in this example, however our pilot report in October 2017 will include real forecasts.

2.3 Rationale for including selected asset classes in pilot

Table 2 identifies the asset classes that we propose to report on in the asset health pilot. We are including 5 asset classes in the asset health output measures pilot. The inclusion of these asset classes is based on several factors including: maturity of the asset health model and data inputs, the importance of asset health as an investment driver, size of asset classes by expenditure and asset population; and the coverage of different portfolios. It is important to note that our asset health models have different degrees of maturity.

We have aimed to present a diverse range of asset classes in the pilot based on the factors mentioned above. This will allow Transpower and the Commission to test which asset classes and asset health models are best suited for inclusion in the incentive regime for RCP3. The proposed asset classes for the pilot do not necessarily reflect the asset classes we will put forward as revenue linked output measures for RCP3. We will consider the appropriate coverage of the asset health incentive as we develop our proposal and gain experience through the pilot, and will engage with the Commission and other stakeholders as part of this process.

We have considered some assets unsuitable for inclusion in the pilot reporting. For example, we have not included the conductor asset class. This is due to the uncertainty of the investment case for conductors and high sensitivity to change in investment as a single project has large implications on health (and is often funded as major capex).

3 Developing Asset Health Output Measures for RCP3

This chapter outlines our proposed approach for assessing the asset health output targets in RCP2. The assessment is based on whether the variation between the target (forecast asset health score) and snapshot asset health score is justified or not. The chapter outlines some scenarios that we would deem as justified or unjustified variations from the asset health output targets.

The chapter also presents some design choices for RCP3 including the incentive rate, reporting framework, and materiality tests.

We are proposing an alternative assessment framework to the current grid output adjustment process in the Capex Input Methodology. Our proposed approach is based on the UK RIIO⁴ non-mechanistic approach. The assessment of whether we meet our targets would consider whether the deviations from the asset health scores are justified or unjustified.

The features of the assessment framework explained below are for the RCP2 pilot reporting obligations under the current IPP. We propose a similar assessment framework if the proposed asset health grid output measures are linked to revenue incentives for RCP3.

3.1 Features of our proposed assessment framework

- Transpower provides forecast asset health scores and reports annually on updated snapshots. The report will include reasons for any variations between the snapshot and forecast asset health scores.
- Assessment occurs annually during the RCP2 pilot (for revenue linked incentives in RCP3, we propose the assessment occurs at the end of the control period).
- The Commission compares our forecast asset health targets set at 2017 with updated snapshot asset health scores for each remaining year of RCP2.
- The Commission assesses whether we met our targets based on whether the deviations from the asset health scores are justified or unjustified.
- In RCP3, this would be the process to determine our revenue adjustments at the end of the control period. We are proposing the Commission assesses our snapshot and forecast asset health each remaining year of RCP2, however, for RCP3 it would be suitable for the incentive adjustment to occur at the end of the control period.

⁴ RIIO stands for Revenue = Incentives + Innovation + Outputs

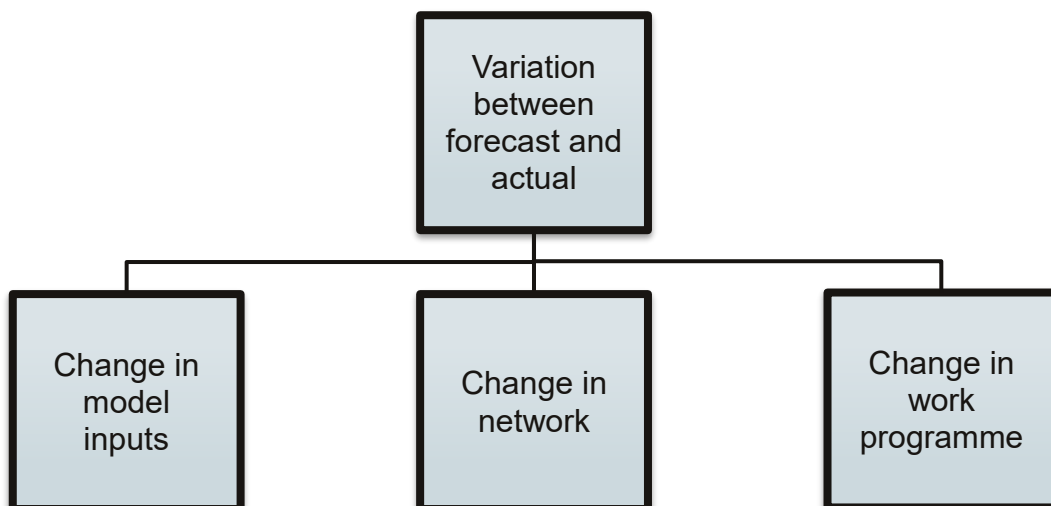
3.2 Scenarios for testing the incentive and justification process

We propose to use the RCP2 pilot asset health reporting to test an assessment framework for including AHGOMs in an incentive regime. Our preferred approach to asset health reporting is a non-mechanistic approach where we agree with the Commission, up front, a set of asset health outcomes and an understanding of the likely factors that would constitute justification for departures from forecast outcomes. This is our preferred approach for both an asset health pilot reporting regime (for compliance and information reporting under the IPP) as well as an asset health reporting regime with revenue-linked output measures from RCP3 onwards.

We agree in the value of reporting against and setting asset health targets. However, the methodology or mechanism for assessing whether a target has been met (or whether an incentive should be attached) should allow for variations between the actual and forecast asset health scores where there are justified reasons for the change.

An incentive regime should encourage and reinforce a regulated supplier to undertake behaviours and actions in the interest of consumers (i.e. it should reinforce doing the right thing). Applying this principle, we have considered scenarios where variations between our targets and actual asset health scores would be justified on the basis that doing so is in the interest of current and future consumers. Figure 2 illustrates possible scenarios for variations between forecast and actual asset health forecasts.

Figure 1: Illustration of factors that may affect asset health outcomes



These scenarios represent our initial view of justified and unjustified interventions to the asset health models. The purpose of the pilot would be to test these scenarios and to continue to develop the methodology with the Commission.

3.2.1 Change in model inputs

We continue to update and develop our asset health models over time. This can include making improvements on the modelling and techniques used to assess the condition of our assets, as well as, the accuracy of our predictive deterioration rates.

It can also include introducing new asset data into the models that reveal the asset's condition that is different from the expected rate of deterioration. We manage assets with populations in the tens of thousands that span multiple geographic regions throughout the country with unique environmental factors. Modelling the rate of deterioration for all these assets is challenging and comes with a degree of uncertainty.

We frequently conduct condition assessments on our grid assets. The type of assessment, including the frequency, depends on the type of asset. This can be an expensive exercise and we weigh-up the cost of conducting condition assessments against the value of better information. Changes to the collection process can lead to more or improved information about our assets.

All these interventions can lead to changes in the asset health scores for individual assets as well as the proportion of assets within each category. Variations from these interventions should be justified as they give us a more accurate assessment of the condition of our assets. This in turn allows us to make better decisions about intervening and ensuring the least whole-of-life cost for our assets. We should not be dis-incentivised from getting better data and improving our modelling.

3.2.2 Change in network

During a control period, we can make significant changes to the grid in the form of enhancement and development (E&D) projects and asset divestments. E&D projects expand the capability of the grid. Generally, this introduces a new set of assets into the Regulatory Asset Base (RAB) (it can include replacing an already existing asset such as increasing the capacity of a conductor).

Introducing new assets into the population affects the proportion of assets within each category of the AHI. This would lead to a reduction in the proportion of assets in all categories except assets with an asset health score of 1 (e.g. new assets).

Asset divestments are when we decommission an asset and remove it from the RAB. It no longer performs its function and we no longer account for it in the asset health models. Undertaking asset divestments are a necessary activity and can affect the proportion of asset health scores among an asset population.

We can track and account for these additions to the models. These are necessary changes to the models and would reflect a justified reason for diverging from a forecast asset health score.

3.2.3 Change in work program

A change in the work program can affect an asset health score by changing the rate of asset replacement and/or refurbishment. Our view is that there can be justified and unjustified reasons for diverging from the work program.

A change in work program can result from the non-delivery of the workplan. This can be either unintentionally (i.e. delivery failure) or intentionally for a range of possible reasons. For example, we could make a deliberate choice to increase the level of risk associated with an asset class and defer replacing the asset because of this change in strategy. These scenarios represent an unjustified reason for diverging from the work program and should result in an incentive penalty.

There are also scenarios where we could see a change in the work program is justified and should not attract an incentive penalty. We should not be penalised for making changes to the workplan when it leads to better outcomes for consumers. Some examples of justified changes from the workplan include:

- Where the work is found to be unnecessary.
- Where we find better solutions that achieve the same risk outcome (e.g. an opex intervention or innovative solution).
- Where it would be more optimal overall (in terms of risk and long term costs) to defer, or cancel replacement.

3.3 Incentive rates and revenue at risk

We have discussed a non-mechanistic methodology for determining how an incentive could be applied. We need to determine with the Commission several design choices for the revenue adjustment process, including:

- How to quantify the value of the incentive.
- Whether there should be materiality thresholds (dead bands).

3.3.1 How to quantify the value of the incentive

Our view is that the strength of the incentive should be proportional in some way to the overall cost of each asset portfolio, with an incentive rate set so that it acts in opposition to the base capex expenditure incentive. It will not be possible to exactly match the base capex incentive, because whilst there is some correlation between the work done and the change in asset health score, that correlation is not perfect and becomes more volatile for portfolios with fewer assets. To reduce the risk of perverse incentives, particularly while the regime matures during RCP3, it may be desirable to have an incentive strength that is lower than the base capex incentive. This would provide an arrangement that reinforces good outcomes without becoming a disproportionately strong driver of outcomes. This is also appropriate given that asset health is only one aspect of our asset management objectives and not an end into itself.

Our starting proposal for the calculation of the incentive adjustment would be to calculate an incentive rate for each portfolio by dividing the cost of the proposed work in RCP3 by the forecast change in the asset health score (compared to the 'no investment' scenario) and then multiplying that by an incentive strength factor (e.g. 20%).

When we come to calculate the incentive revenue adjustment we would first isolate the component of the variance from the target that is attributable to 'non-justified' difference – in most cases this will simply amount to the variance attributable to delivery or scope of work done. The non-justified difference multiplied by the incentive rate would be the revenue adjustment.

Take as an example a portfolio whose AHI>8 percentage is improved by an absolute 2% as a result of spending \$16m over RCP3 with an incentive strength of 20%. The incentive rate would be equal to $0.2 \times (\$16m / 2\%)$, or \$1.6m per 1% change in the AHI>8 score.

At the end of RCP3 we might find that the asset health score is 0.2% worse than forecast and all of this is attributable to non-justified reasons (e.g. non-delivery). The revenue adjustment in relation to that portfolio would be 0.2% multiplied by the incentive rate, or $0.2\% \times \$1.6m$ per %. That equates to a \$320k revenue deduction.

Crucially, the step in which we calculate the non-justified difference will enable us to ensure that the incentive mechanism does not act on differences that arise for justified reasons, such as changes to the asset health model and its inputs or for 'doing the right thing'. It would also enable us to agree with the Commission an appropriate number to be applied to the incentive mechanism to take account of variances from target that are complex in nature, for example not entirely justified or non-justified, and that would result in a revenue adjustment that would be too large if left unmodified.

3.3.2 Whether we need materiality thresholds (dead bands)

Given the slightly volatile nature of changes in the asset health score relative to changes in the plan or the mix of assets replaced, we suggest that asset portfolios should be treated as being 'on target' if they are within a threshold or dead band around the target.

We suggest this will save on the administration costs associated with small differences between the target and actual outcomes, when the resulting revenue adjustments would be small and the asset health outcome can reasonably be said to have been achieved.

We do not believe that such dead bands would in any way reduce the effectiveness of the regime to drive improvements in asset health. We propose to include dead bands in the pilot asset health output measures.

4 Next Steps

This chapter describes the next steps for meeting our reporting obligations under the IPP and developing incentive linked output measures for RCP3.

This report has provided the Commission with the design features of the alternative asset health grid output measures as per the exemption letter dated 11 October 2016. We have also provided an example of the output targets using sample data.

We are currently developing the asset health grid output targets that will be included in the October 2017 Compliance Report to meet our reporting requirements. We have developed these alternative measures so that they can be implemented as revenue linked output measures for RCP3. As mentioned in chapter 3, the grid output adjustment mechanism in the capex IM is not suitable for making revenue adjustments for our proposed output measures. We are proposing an alternative assessment framework that accounts for variations between targets and snapshot asset health scores depending on whether the variation was justified, i.e. in the consumer's best interest.

We aim to continue to constructively work with the Commission to develop and test this framework. We will do this in 2 main ways:

1. Continue to proactively engage with the Commission on its review of Transpower's Capex Input Methodology to design an appropriate grid output adjustment mechanism for our proposed AHGOMs.
2. Use the pilot reporting of our alternative asset health grid output measures to test their suitability as revenue linked incentives in RCP3.

We are working on a sensitivity report to test how our proposed measures will react within an incentive regime. The sensitivity report will identify the factors that may affect forecast asset health outcomes including changes in the amount of investment in the grid. The sensitivity report will also attempt to show how variations between forecast and actual asset health would affect incentive revenue adjustments.

A.1 Asset health pilot reporting requirements in Transpower's IPP

Our current asset health pilot reporting requirements are defined in section 28.1 of our Individual Price Path determination⁵.

Regarding Transpower's asset health pilot reporting and models, Transpower is required to:

28.1 No later than the Friday of the third complete week in October after the end of each disclosure year, Transpower must provide to the Commission the following information about pilot asset health grid output measures AH1RL, AH4RL and AH5RL:

28.1.1 the average remaining life (years, rounded to three decimal places) that existed at the end of the relevant disclosure year for:

- (a) AH1RL: tower coating of transmission towers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the tower painting asset health model supplied by Transpower to the Commission on 27 June 2014;
- (b) AH4RL: outdoor circuit breakers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the circuit breaker asset health model supplied by Transpower to the Commission on 27 June 2014; and
- (c) AH5RL: power transformers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the transformer asset health model supplied by Transpower to the Commission on 27 June 2014;

⁵ Commerce Commission. 2014. Transpower Individual Price-Quality Path Determination 2015. URL: <http://www.comcom.govt.nz/dmsdocument/12769>.

28.1.2 The difference between the average remaining life (years, rounded to three decimal places) that existed at the end of the relevant disclosure year and that which existed at the end of the preceding disclosure year for:

- (a) AH1RL: tower coating of transmission towers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the tower painting asset health model supplied by Transpower to the Commission on 27 June 2014;
- (b) AH4RL: outdoor circuit breakers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the circuit breaker asset health model supplied by Transpower to the Commission on 27 June 2014; and
- (c) AH5RL: power transformers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the transformer asset health model supplied by Transpower to the Commission on 27 June 2014;

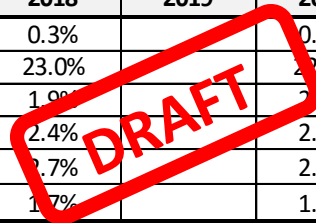
28.1.3 the difference between the average remaining life (years, rounded to three decimal places) that existed at the end of the relevant disclosure year and that which existed at the end of the preceding disclosure year for:

- (a) AH1RL: tower coating of transmission towers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the tower painting asset health live model;
- (b) AH4RL: outdoor circuit breakers within Transpower's asset replacement and asset refurbishment programme, calculated in accordance with the circuit breaker asset health live model; and
- (c) AH5RL: power transformers within Transpower's asset replacement and asset refurbishment programme calculated in accordance with the transformer asset health live model;

A.2 Our proposed Asset health output measures

Forecast Asset Health Incentive

Asset Health Incentives		Population Mar 2017	Assets not scored	Portion of population in poor and very poor health >AHI 8							
Asset Group	Asset Class			Actual 2017	Actual 2018	Forecast 2018	Actual 2019	Forecast 2019	Actual 2020	Forecast 2020	Deadband +/-
Lines	Tower foundations - other	12783	0.00%	0.3%		0.3%		0.3%		0.3%	0.05%
	Tower foundations - grillage	10697	0.00%	25.3%		23.0%		23.0%		20.0%	3.00%
	Tower Protective Coating	23729	0.72%	1.9%		1.9%		2.0%		2.1%	0.32%
	Insulators	54873	4.35%	2.4%		2.4%		2.4%		2.4%	0.36%
Stations	Outdoor Circuit Breakers	1514	0.00%	2.7%		2.7%		2.8%		2.8%	0.42%
	Power transformers	439	1.14%	1.7%		1.7%		1.7%		1.7%	0.26%



Current Asset Health - March 2017

Coverage of Asset Health models		Population Mar 2017	Assets not scored	Current Asset Health Score							
Asset Group	Asset Class			1-4	>4-5	>5-6	>6-7	>7-8	>8-9	>9-9.5	>9.5
				Good			Fair		Poor		Very poor
Lines	Conductors (cct km)	16526	0.05%	49.6%	7.8%	17.0%	11.9%	11.5%	1.6%	0.3%	0.2%
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	Pole structures	14627	0.01%	62.3%	7.2%	12.1%	8.9%	6.0%	2.0%	0.2%	1.2%
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	Power transformers	439	1.14%	43.7%	3.9%	23.5%	20.0%	3.9%	2.1%	0.2%	1.6%
Sec. Systems	Battery Banks	651	0.00%	35.2%	5.4%	15.4%	18.6%	12.0%	5.1%	0.0%	8.4%

Note: Further calibration and latest condition data will be available for October 2017 report. Health models for other asset classes are underway.