



A Report for
Transpower
from
Asset Management Consulting
Limited (AMCL)

Version 1.1
18th December 2013

**Commerce Commission
Information Disclosure
Review of Regulatory AM
Practices**

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Executive Summary

Regulators around the world are seeking to find the most appropriate way to regulate and incentivise Asset Management to ensure the long-term interests of customers and stakeholders are protected, as well as ensuring funding requirements are robust and justified. Understanding organisations' Asset Management capabilities is a key input to providing this assurance.

This report was commissioned by Transpower to review the current approaches for regulating Asset Management in Australia and the United Kingdom in the electricity and other asset intensive sectors to help inform the response to the Commerce Commission on information disclosure. We have examined how the regulatory landscape has changed over the last decade as both the regulators and the regulated companies have matured in their Asset Management approaches and how the Commerce Commission's draft information disclosure requirements compare to other regulatory disclosure requirements.

It should be recognised that although regulators do communicate and network with each other, in our experience they have each followed a path that serves their individual interests and needs. Our conclusions are therefore our interpretation of the regulatory landscape as it has evolved and not necessarily a path that the regulators are all actively following. These conclusion are as follows:

- 1) Regulation of major utility businesses has evolved over the last 15 years through three main phases:
 - i. Regulation of prices and key output measures where little attention was paid to long-term cost or risk implications of Asset Management decision-making;
 - ii. A move to more intrusive regulation to try to address the longer-term cost and risks by demanding very detailed information on the regulated companies' assets and the work undertaken on those assets;
 - iii. A more balanced regime of regulating outputs and Asset Management capability where Asset Management capability has replaced the need for the intrusive regulation of very detailed asset information.
- 2) Regulators in phases ii and iii are typically using 'annual returns' for annual information disclosure but this information is closely tied to monitoring the regulatory outputs that were agreed at the periodic review.
- 3) Regulators in the UK are in the third of the above phases and are all assessing Asset Management capability, but doing so using different methodologies.

- 4) Regulators in Australia are between the second and third phases and are moving towards the assessment of Asset Management capability.
- 5) The Commerce Commission's information requirements appear to be quite detailed compared to other regulators which would suggest alignment with the second of the above phases. There is an opportunity for the Commerce Commission to move rapidly to phase three and place more reliance on Transpower's Asset Management capability rather than the detailed information requested.
- 6) There is also an opportunity to more closely integrate the proposed information disclosure requirements with the existing IPP regulatory requirements and the regulatory outcomes agreed at the Regulatory Control Period agreements to more closely align with the international practice of 'annual returns' seen in the UK and Australia.
- 7) The method proposed by the Commerce Commission to assess Asset Management capability (AMMAT) may be appropriate for the smaller distribution businesses but does not, in our opinion, represent industry good practice for assessing Transpower's Asset Management capabilities as it is only a sub-set (31 out of 121 questions) of the IAM's PAS 55 assessment methodology. An alternative approach would be to replace this with a requirement for the regulated company to make available any assessments that have been undertaken by an independent organisation against PAS 55, ISO 550001 or a recognised Asset Management maturity model.

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1 Introduction

The Commerce Commission (the Commission) is currently developing information disclosure requirements for Transpower. This is required under Part 4 of the Commerce Act 1986 (the Act). As part of this process, the Commission has released for consultation on information disclosure requirements for electricity lines services supplied by Transpower. This report outlines the current approaches for regulating Asset Management in Australia and the United Kingdom in the electricity and other asset intensive sectors and how this compares to the Commission's information disclosure requirements.

It is recognised that Transpower is also subject to individual price-quality path (IPP) regulation which already requires the company to regularly make information about its business available to people outside the organisation.

There is a growing need to identify how essential services can be delivered in ways than are economically, socially and environmentally sustainable. Better regulation of asset management can help to incentivise sustainable asset management practices that are in the long-term interests of all stakeholders. In many cases, assets for essential services such as energy, rail, water, roads, healthcare, or education are managed by monopoly, often publicly owned, service providers. For these services, regulators are charged with incentivising a sustainable level of investment to ensure the long-term availability of services at the lowest lifecycle cost.

Regulators were first introduced in the UK when the major utility providers were privatised in the late 1980s. Regulators tended to target output measures and short-term (up to 5 year) efficiencies. This was successful in achieving thee short-term efficiencies but resulted in some unintended incentives. Examples of these include deferring investment, diluting efficiencies in capital costs over operating costs, and substituting capital costs for operating costs. This resulted in the regulatory regimes in the UK evolving to better consider these long-term risks and implications whilst still trying to incentivise short to medium-term efficiencies. In Australia, the regulatory regimes in the energy sector have tended to mirror that of the UK, albeit several years later. These different regulatory regimes are discussed in the next section.

2 Overview of Regulatory Approaches

2.1 UK

2.1.1 Department of Business Innovation & Skills

The Better Regulation Executive within the Department of Business Innovation & Skills (BIS) has developed five key principles of regulation, which are now a cornerstone of the better regulation strategy and implementation. These state that any regulation should be:

1. transparent
2. accountable
3. proportionate
4. consistent
5. targeted

All UK regulators are moving towards regulatory regimes that reflect these principles.

Price Reviews are used by regulators in all asset intensive industries. Table 1 below gives a comparison between industries.

Industry	Regulator	Price Review Cycles	Review Frequency
Rail	ORR	PR (Periodic Review)	5 Years
Water	OFWAT	AMP (Asset Management Plan)	5 Years
Energy	OFGEM	RIIO (Revenue=Incentives+Innovation+Outputs)	8 Years

Table 1: Comparison of UK regulators

Within these price reviews, the importance of Asset Management has evolved over the last 15 years and the approach that the regulators have adopted to assess the companies' Asset Management capabilities has also evolved.

2.1.2 Energy

In the early 2000s, Ofgem's technical directorate became concerned that long-term costs and risks were not being adequately addressed by the existing regulatory regime. In 2002 Ofgem initiated an Asset Risk Management Survey to try to rank the maturity of the different energy network businesses' approaches to the management of these costs and risks. This had some limited success but was felt to be insufficient in depth to adequately assess the Asset Management process and capabilities of the energy network businesses.

In 2004, the Institute of Asset Management (IAM) developed a standard for the management of physical assets that was published by the British Standards Institute as BSI PAS 55. In 2006, after extensive consultation Ofgem formally recognised BSI PAS 55 as a framework that could help to demonstrate that the network businesses had appropriate Asset Management frameworks in place to ensure whole life considerations of costs and risks were being addressed. Furthermore, all transmission and distribution energy network businesses were encouraged to achieve certification, which they all did by early 2008. This development effectively superseded the Asset Risk Management survey approach.

Ofgem's recognition that BSI PAS 55 provides a common basis for developing an Asset Management framework provided a clear focus for the network businesses to achieve certification and demonstrate a minimum level of Asset Management capability to Ofgem. It would appear that, although there was not widespread support for these proposals initially, all the network businesses that are now certified against PAS 55 have reported the achievement of certification as being a beneficial process to their business.

More recently, Ofgem has put less focus on the Asset Management capability of the network businesses. Instead, through the various price control reviews, Ofgem is looking to make greater use of appropriate output measures to gain increased certainty that the allowed expenditures will deliver the required benefits and that risk profiles are being managed. These measures are still being developed but Ofgem is seeking to identify lead indicators that would provide an early indication if an organisation is not investing appropriately in the asset base. At this stage there is no evidence that monitoring only output measures and not the underlying approach, process and skills as well, is a sufficient or suitable approach to regulating Asset Management and ensuring long term value for money to customers and stakeholders. The achievement of PAS 55 certification has identified a baseline level of maturity for Ofgem but not a framework for achieving continuous improvement.

In the current Electricity Distribution Price Control Review, Ofgem is also seeking to encourage certain behaviours from the distribution network businesses with regard to how they invest in and manage their networks assets such that the network companies do not focus on output measures alone. The behaviours that Ofgem has defined underpin the form of price control settlement and the associated incentives that may allow network businesses to earn greater returns.

2.1.3 Water

Within the water sector, Ofwat has developed a structured approach to regularise and review regulatory submissions for expenditure on Asset Management activities called the Common Framework. The Common Framework was developed by UK Water Industry Research (UKWIR) in 2002 and was first used in Ofwat's periodic review in 2004 (PR04). Although specific to the water sector, the Common Framework specifies an Asset Management process to determine capital maintenance requirements in a consistent way across the companies. This has allowed Ofwat to evaluate regulatory submissions and compare these submissions across a range of companies.

In the 2009 regulatory price review (PR09), Ofwat required the water companies to produce 25 year forward plans. Ofwat is also making use of the Asset Management Planning Assessment Process (AMPAP) developed by the industry to assess these plans. AMPAP was used to assess the level of maturity of the processes and data used to determine the capital maintenance requirements within this 25 year plan using a basic Asset Management maturity approach. The focus of both the common framework and AMPAP is primarily on the capital maintenance planning processes and does not examine the wider Asset Management capabilities of the water companies. It does not, for example, assess the suitability, or assure the value for money, of operational and delivery processes.

The price reviews work in conjunction with 5-year AMP (Asset Management Plan) cycles. We are currently towards the end of AMP5 (2010-15), with plans already being developed for AMP6 starting in 2015. During these cycles, Ofwat monitors the water companies across a range of categories, including network capability and environmental compliances, with company performance dictating whether an increase in charges is permitted.

One of the key challenges that Ofwat expects the water companies to address is to examine their customers' willingness to pay, in particular where enhancements to the asset base are being proposed. This is undertaken through interviews with customers on their opinions and

willingness to pay for different levels of service. The feedback from customers is a consideration in the cost benefit analysis within the regulatory submissions.

In 2010, the Service Incentive Mechanism (SIM) was introduced as an incentive for customer service. This is currently under consultation for AMP6 in 2015, and comprises:

- a quantitative component consisting of six customer handling metrics – number of calls abandoned or engaged, unwanted phone contacts, written complaints, and escalated complaints within the company and to the Consumer Council for Water (CCWater); and
- a qualitative component based on the results of customer satisfaction surveys with a recent resolved contact (by any media for any reason).

Also under consultation for AMP6 is the Future Price Limits (FPL) statement, which proposes significant changes to the way Ofwat treats costs as follows:

- Use of a total expenditure (Totex) approach to cost assessment (the Common Framework is currently being updated to accommodate this).
- Use of company proposals for the proportion of expenditure to be recovered over the long term through its regulatory capital value (RCV). Companies' proposals will be challenged where required through a risk-based review of business plans.

2.1.4 Rail

In rail, the Office of Rail Regulation (ORR) became increasingly interested in Network Rail's approach to Asset Management during the previous current Control Period (CP3), in particular how Network Rail's Asset Management policies and procedures are used to determine the future funding requirements for the enhancement, renewal and maintenance of the railway infrastructure network.

Over the last seven years, the ORR has used an assessment of the maturity of Network Rail's Asset Management capabilities as one of the key inputs to the periodic review process to identify areas of relative strength and weaknesses in Network Rail's Strategic Business Plan. This assessment is periodically undertaken by the Independent Reporter for Asset Management, which is a tri-partite contract between the Reporter, ORR and Network Rail.

Targets for improving Network Rail's maturity of its Asset Management capabilities during the current control period (2009 to 2014) were agreed between the ORR and Network Rail and Network Rail is regularly assessed against these, although these are not formal regulatory

measures for Control Period 4. These target improvements are focused on the highest cost and risk areas of Asset Management activity and, in many cases, exceed the maturity level necessary to achieve BSI PAS 55 certification. In addition to the assessment of Asset Management maturity, the ORR has for many years now, defined a set of output measures that it uses to assess Network Rail's performance.

The ORR has defined a series of regulated outputs for CP5 in its PR13 determination for Network Rail which include the following Asset Management measures:

- Asset management capability with a target for 'excellence' achieved at the end of CP5.
- Asset data quality standards for all asset types.
- Milestones for the "ORBIS" data improvement project.

This is the first time that Asset Management capability has been included as a formal regulatory measure rather than monitoring and regulating on output measures (such as broken rails, signalling failures, etc.) or volumes as had been adopted in previous control periods. The tool chosen by the ORR for assessing capability in CP5 is AMCL's Asset Management Excellence Model™. In addition, the ORR is monitoring the quality of the data Network Rail uses in its Asset Management processes, and the Offering Rail Better Information Services (ORBIS) programme that helps deliver them.

2.2 Australia

Australia, there is a much more complex regulatory regime, in part due to the separate state and federal regulators. Within the energy sector, economic regulation is undertaken by the Australian Energy Regulator (AER) in all states except Western Australia and by the Economic Regulation Authority (ERA) in Western Australia. There are various state regulators in place for other aspects of regulation in the energy sector and in other sectors, New South Wales and Victoria have been examined as examples of the State regularity regimes.

A considerable number of other companies from different sectors across Australia have benchmarked their Asset Management capabilities against good practice and other businesses. Interestingly, this is largely not being driven by the regulators but by the companies themselves in order to improve their Asset Management capabilities and become more efficient and effective.

Examples of the different regulatory approaches are discussed below.

2.2.1 AER

The AER's key responsibilities include:

- setting the prices charged for using energy networks (electricity poles and wires and gas pipelines) to transport energy to customers in all states except Western Australia;
- monitoring wholesale electricity and gas markets to ensure suppliers comply with the legislation and rules, and taking enforcement action where necessary;
- regulating retail energy markets in the ACT, South Australia, Tasmania (electricity only) and New South Wales;

In order to exercise these responsibilities, the AER employs consultants to review the regulatory submissions of the companies to assess the level of confidence in the planning processes and asset information used to develop their Asset Management Plans.

In terms of establishing and implementing a method of assessing Asset Management maturity, the AER is still considering its approach. Some discussions were held in 2013 between the AER and a number of the regulated companies about how certification to PAS 55 or ISO 55001 could be used as evidence to underpin regulatory submissions, thereby reducing the level of analysis that the AER would need to undertake to gain a level of assurance that the companies' Asset Management Plans are robust and hence reduce the detail of the information necessary to disclose.

The AER has a 'better regulation' workstream which was due to publish a series of guidelines by 29 November 2013 but these do not yet appear to have been published. These will set out the AER's approach to regulation under the new rules including how they assess expenditure proposals, calculate the allowed return on assets, allocate costs and engage with consumers. It is not clear whether or not these will include any guidelines on the assessment of Asset Management capability.

2.2.2 ERA (Western Australia)

In its regulatory role, the ERA assesses the terms and conditions, including prices, offered by owners of monopoly infrastructure to third parties in the gas, electricity and rail industries. It also licenses providers of gas, electricity and water services and monitors compliance with licensing conditions. The ERA also has a range of responsibilities in gas retailing and surveillance of the State's wholesale electricity market.

The ERA undertakes a series of audits across the electricity, water and gas industries as defined in *Audit Guidelines, Electricity, Gas and Water Licences, dated July 2009*. One of these audits is an Asset Management System Audit which examines the following aspects of the regulated companies Asset Management capabilities:

- asset planning
- asset creation/acquisition
- asset disposal
- environmental analysis
- asset operations
- asset maintenance
- asset management information system
- risk management
- contingency planning
- financial planning
- capital expenditure planning
- review of the asset management system

The guidelines provide effectiveness criteria on what should be expected for each of the above aspects of Asset Management. Asset Management System audits are undertaken at frequencies of between 2 and 4 years, depending on the findings from the audits.

2.2.3 New South Wales

The regulatory regimes for transport and the water in New South Wales (NSW) are similar in that the State regulation for technical and safety regulation is separate from economic regulation which is undertaken by the Treasury department of the NSW State government.

In rail, the technical and safety regulation is undertaken by the Independent Transport Safety and Reliability Regulator (ITSRR) for New South Wales but since January 2013, this became part of the new National Rail Safety Regulator. ITSRR is still responsible for producing annual safety and reliability reports for all transport bodies that receive funding from the NSW Government. These reports are primarily an assessment of the output measures defined in the New South Wales Rail Performance Agreement, for example on time running, temporary speed restrictions and number of passengers.

ITSRR also reviews the annual Asset Management Plans (AMPs) and assesses work delivered against the plan at the end of each year. The ITSRR recognises the importance of adopting good practice Asset Management but, other than the review of the AMP and the annual safety and reliability reports, it does not formally assess Asset Management capabilities.

In the water sector, the technical and safety regulation is undertaken by the State Government's Department for Water & Energy (DWE). The DWE performs a similar role to the ITSRR in that it is responsible for ensuring the companies comply with the licence condition and relevant technical and safety standards. The DWE has an interest in the underlying Asset Management capabilities of the companies that it regulates but has no formal processes for assessing these.

2.2.4 Victoria

Energy Safe Victoria (ESV) is the regulator for technical and safety issues within the energy sector in the state of Victoria. The ESV performs a similar role to that of ITSRR and DWE in New South Wales in that it reports on the technical and safety compliance of the energy companies and is involved in assessing their Asset Management Plans. The ESV is also in a similar position to the DWE in that it recognises the importance of Asset Management and is encouraging the energy companies to adopt appropriate good practice including BSI PAS 55.

In 2008, one of the energy companies within Victoria, SP AusNet, obtained certification to BSI PAS 55 for its transmission business and in 2011, obtained certification to PAS 55 for its electricity and gas transmission businesses. A number of other energy companies in Victoria are aligning their Asset Management capabilities with the requirements of PAS 55 and some of these intend to seek certification during 2014.

3 Assessment of the Commerce Commission's Proposed Metrics

We have used two examples of good industry practice documents and compared them with the Commerce Commission's Information Disclosure Schedule:

- OFGEM's Asset Health Reporting Requirements (see Appendix A)
- Ofwat's "June Return" is a regulatory data collection template
- ORR's Annual Return 2013 (see Appendix B)

Our comments on selected Grid, Asset Management and Quality measures are captured in table 2. For further reference, Appendix C outlines a Regulatory Framework Model developed by AMCL that captures our experience of good industry practice from multiple regulatory environments.

Metric	Description	Comments
AM1. Asset Health	Data entry for 'Asset Health' and / or 'Remaining Life by Five Year Age Brackets'. The level of detail is, for example, per 'Transformer', 'Reactor', 'Breaker', 'Capacitor' etc.	<p>The reporting of Asset Health (at an appropriate level of detail) is considered to represent good industry practice as this is key indicator of the stewardship of the asset base over a period of time.</p> <p>The granularity of information requested by the Commerce Commission however is highly detailed, requiring the collection of multiple data points per asset over a number of years. There seems to be no weighting towards assets based on their criticality.</p> <p>Ofgem and Ofwat require this type of information but typically at a higher level (e.g. circuit breaker, transformer, underground cable etc) and in the case of Ofgem by criticality rather than by detailed asset type.</p> <p>Consideration should be given to reporting this information at a less granular level and in a way that reflects the criticality of the different asset fleets.</p>

Metric	Description	Comments
AM 2/3. Asset Management Maturity Assessment Tool	A self-assessment requiring scoring from 1 - 4 against a number of maturity questions. An example is: policy, training, IM, Lifecycle and Continual Improvement.	<p>Such an assessment demonstrates a logical approach to assessing maturity. However, selecting a sub-set of questions from the IAM's PAS 55 Assessment Methodology is an unusual approach which could lead to important aspects of Asset Management not being addressed.</p> <p>An alternative approach would be to replace AM 2/3 with a requirement for the regulated company to make available any assessments that have been undertaken by an independent organisation against PAS 55, ISO 550001 or a recognised Asset Management maturity model. If this is not available, then the organisation would be required to provide the AMMAT information.</p> <p>This would more closely align the practice used by other regulators.</p>
CG1. Asset Age and Value	Data entry for 'Asset Age' and 'Asset Value'. The level of detail is, for example, per 'Transformer', 'Reactor', 'Breaker', 'Capacitor' etc.	<p>The reporting of Asset Age and Value (at an appropriate level of detail) is considered to represent good industry practice as this is key indicator of the stewardship of the asset base over a period of time</p> <p>The Commerce Commission's metrics are much more detailed, comprising granularity at asset level compared with Ofwat's "Infrastructure Assets", "Operational Assets" and "Other Tangible Assets".</p> <p>Consideration should be given to reporting this information at a less granular level and in a way that reflects the criticality of the different asset fleets.</p>

Metric	Description	Comments
CG2. Network Changes	Data entry for changes to the network that have occurred through replacement, additions or disposals.	<p>The Commerce Commission's metrics are much more detailed, comprising granularity at an assets level compared with Ofwat's "Infrastructure Assets", "Operational Assets" and "Other Tangible Assets".</p> <p>Consideration should be given to reporting this information at a less granular level and in a way that reflects the criticality of the different asset fleets.</p>
CG3. Circuits	Data entry for the key characteristics of the network.	This collects asset register information which is comparable with Table 11 from Ofwat's June Return schedule. This indicates that it represents good industry practice.
Q1/2. Quality Grid Outputs	Data entry for grid output and performance measures.	This collects asset register information with is comparable with Table DG2 and DG3 from Ofwat's June Return schedule. This indicates that it represents good industry practice.

4 Key Conclusions

This report has documented the findings of a study to review the approaches to regulating Asset Management in different sectors and in the UK and Australia. This has been used as the basis for reviewing the information disclosure requirements from the Commerce Commission. It should be recognised that although regulators do communicate and network with each other, in our experience they have each followed a path that serves their individual interests and needs. Our conclusions are therefore our interpretation of the regulatory landscape as it has evolved and not necessarily a path that the regulators are all actively following. These conclusion are as follows:

- 1) Regulation of major utility businesses has evolved over the last 15 years through three main phases:
 - i. Regulation of prices and key output measures where little attention was paid to long-term cost or risk implications of Asset Management decision-making;
 - ii. A move to more intrusive regulation to try to address the longer-term cost and risks by demanding very detailed information on the regulated companies' assets and the work undertaken on those assets;
 - iii. A more balanced regime of regulating outputs and Asset Management capability where Asset Management capability has replaced the need for the intrusive regulation of very detailed asset information.
- 2) Regulators in phases ii and iii are typically using 'annual returns' for annual information disclosure but this information is closely tied to monitoring the regulatory outputs that were agreed at the periodic review.
- 3) Regulators in the UK are in the third of the above phases and are all assessing Asset Management capability, but doing so using different methodologies.
- 4) Regulators in Australia are between the second and third phases and are moving towards the assessment of Asset Management capability.
- 5) The Commerce Commission's information requirements appear to be quite detailed compared to other regulators which would suggest alignment with the second of the above phases. There is an opportunity for the Commerce Commission to move rapidly to phase three and place more reliance on Transpower's Asset Management capability rather than the detailed information requested.
- 6) There is also an opportunity to more closely integrate the proposed information disclosure requirements with the existing IIP regulatory requirements and the regulatory outcomes

agreed at the Regulatory Control Period agreements to more closely align with the international practice of 'annual returns' seen in the UK and Australia.

- 7) The method proposed by the Commerce Commission to assess Asset Management capability (AMMAT) may be appropriate for the smaller distribution businesses but does not, in our opinion, represent industry good practice for assessing Transpower's Asset Management capabilities as it is only a sub-set (31 out of 121 questions) of the IAM's PAS 55 assessment methodology. An alternative approach would be to replace this with a requirement for the regulated company to make available any assessments that have been undertaken by an independent organisation against PAS 55, ISO 550001 or a recognised Asset Management maturity model.

Appendix A OFGEM Asset Health Reporting Requirements

6.15.1 Network Output Measures - Asset Health and Criticality											
NOMs Definitions											
Asset Health Index			Criticality		Additional granularity for Asset Health Index for NGET only (as defined in the NOMs Methodology)						
AH1	New or as new		C4	Low	Circuit breaker	AH4a	Some evidence exists of developing family problems, giving rise to uncertainty regarding long-term health. These circuit breakers would be expected to deteriorate to Priority 1 within 10 years.				
AH2	Good or serviceable condition		C3	Medium		AH4b	Conclusive evidence exists of developing family problems, giving rise to uncertainty regarding medium-term health. These circuit breakers would be expected to deteriorate to Replacement Priority 1 within 5 years.				
AH3	Deterioration, requires assessment or monitoring		C2	High	Transformer	AH4a (2c)	Some evidence exists of problems giving rise to uncertainty regarding long-term health, but the problems are not expected to develop. This includes cases where the development of the problem has been slowed or stopped by changes to operational practices rather than cured by corrective actions.				
AH4	Material deterioration, intervention requires consideration		C1	Very High		AH4a (2b)	Some evidence exists of developing problems giving rise to uncertainty regarding long-term health. These transformers would be expected to deteriorate to an AH1 of 5 within 5-10 years.				
AH5	End of serviceable life, intervention required					AH4b	Some evidence exists of developing problems giving rise to uncertainty regarding long-term health. These transformers would be expected to deteriorate to an AH1 of 5 within 5 years.				
With NLR Investment Only											
With NLR investment only											
Asset Categories		Criticality	Units	Actuals (Reporting Year End)						Total	
				Asset Health Index							
				AH1	AH2	AH3	AH4a (NGET only)	AH4 (SHET & SPTL) AH4b (NGET only)	AH5		
400kV Network											
1	Circuit Breaker	Low	No.							-	
		Medium	No.							-	
		High	No.							-	
		Very High	No.							-	
2	Transformer	Low	No.							-	
		Medium	No.							-	
		High	No.							-	
		Very High	No.							-	
3	Reactor	Low	No.							-	
		Medium	No.							-	
		High	No.							-	
		Very High	No.							-	
4	Underground Cable	Low	circuit km							-	
		Medium	circuit km							-	
		High	circuit km							-	
		Very High	circuit km							-	
5	OHL Conductor	Low	circuit km							-	
		Medium	circuit km							-	
		High	circuit km							-	
		Very High	circuit km							-	
6	OHL Fittings	Low	circuit km							-	
		Medium	circuit km							-	
		High	circuit km							-	
		Very High	circuit km							-	
7	OHL TOWER (SHET & SPTL)	Low	No.							-	
		Medium	No.							-	
		High	No.							-	
		Very High	No.							-	
With NLR investment only											
Asset Cat's		Forecast (31 March 2021)									
		Asset Health Index									
		AH1	AH2	AH3	AH4a (NGET only)	AH4 (SHET & SPTL) AH4b (NGET only)	AH5				
400kV Network											
1											
2											
3											
4											
5											
6											
7											

Appendix B Network Rail Annual Return 2013

AM1. Asset Health

Typical Asset Health indices from Network Rail:

Table 3.49: Earthwork condition results per five chains for 2012/13 by operating route					
		Poor	Marginal	Serviceable	Total
Anglia	Embankment	319	2,511	3,519	6,349
	Soil Cutting	105	1,860	2,155	4,120
	Rock Cutting	4	5	14	23
	Total	428	4,376	5,688	10,492
East Midlands	Embankment	295	2,269	2,970	5,534
	Soil Cutting	106	1,435	1,593	3,134
	Rock Cutting	21	93	83	197
	Total	422	3,797	4,646	8,865
Kent	Embankment	231	1,345	2,428	4,004
	Soil Cutting	160	1,312	1,450	2,922
	Rock Cutting	89	340	351	780
	Total	480	2,997	4,229	7,706
London North Eastern	Embankment	806	9,823	8,847	19,476
	Soil Cutting	228	5,381	5,868	11,477
	Rock Cutting	77	809	669	1,555
	Total	1,111	16,013	15,384	32,508
London North Western	Embankment	986	7,326	6,835	15,147
	Soil Cutting	825	6,572	6,435	13,832
	Rock Cutting	96	638	652	1,386
	Total	1,907	14,536	13,922	30,365

Similar condition banding:

Table 3.50: England & Wales – tunnel bore minor element scores – 2011/12*			Table 3.51: England & Wales – tunnel portal minor element scores – 2011/12**		
Condition Band	No. Of Minor Elements	Percentage of Population	Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	13	0.013	0 - 10	7	0.313
10 - 20	68	0.068	10 - 20	8	0.358
20 - 30	191	0.191	20 - 30	12	0.537
30 - 40	519	0.518	30 - 40	29	1.299
40 - 50	1,161	1.159	40 - 50	37	1.657
50 - 60	2,715	2.710	50 - 60	53	2.373
60 - 70	5,884	5.874	60 - 70	67	3.000
70 - 80	10,414	10.396	70 - 80	112	5.016
80 - 90	19,815	19.781	80 - 90	236	10.569
90 - 100	59,393	59.290	90 - 100	1,672	74.877

AM 2/3. Asset Management Maturity Assessment Tool

Network Rail now reports on the latest AMCL AMEM scores:

Table 3.4: Evaluated asset management capability level at January 2013 by each of the 6 Groups				
Group	2009	2011 IIP	2013 SBP	2013 Forecast
Strategy & planning	56.25	61.25	65.75	64.75
Whole life cost justification	47.33	52.00	58.67	59.67
Lifecycle delivery	64.83	66.33	69.17	70.67
Asset knowledge	51.67	55.00	60.67	63.33
Organisation & people	63.00	64.00	67.33	71.00
Risk & review	49.50	59.50	60.75	58.00

AM 4. Grid Demand and Injection

Table 1.5: Network-wide Network Rail-attributed delays to passenger train services

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Delay minutes	7,695,360	7,208,574	6,700,700	7,400,705	6,997,245	7,408,507
Train km	442,271,678	454,798,388	470,714,609	475,060,899	492,317,818	492,537,511
Delay per 100 train km	1.74	1.59	1.42	1.56	1.42	1.51
Notes: <ul style="list-style-type: none"> The delay minutes totals are based on all PFI (Process for Performance Improvement) delays, affecting applicable main scheduled passenger operators (franchised operators plus three open access operators Heathrow Express, Grand Central, and First Hull Trains). Wrexham & Shropshire figures are included until they ceased network operations during 2010/11. Note: prior to 2009/10 figures included delays and mileage for NEXUS Metro and Eurostar services; in 2008/09 these accounted for 12,059 minutes of delay. Train km run are for trains of applicable operators, excluding empty coaching stock movements and locomotives running "light", as recorded in PALADIN. Delays per 100 train km are based on all PFI delay minutes, divided by the train kilometres run, multiplied by 100. 						

CG1. Asset Age and Value

Typical Network Rail Asset Age measures are given in terms of the remaining life in the asset, such as the SICA score (which has a 'years remaining' equivalence) for a signalling interlocking.

Table 3.64: Total number of interlocking areas with a SICA assessment at end of each financial year

Condition	Observed nominal	2008/09	2009/10	2010/11	2011/12	2012/13
1	>20	9	89	68	83	102
2	10 to 20	1,030	935	876	863	842
3	3 to 10	546	590	673	664	653
4	<3	24	24	21	15	15
5	At end of life	13	22	8	5	4
Average condition grade		2.39	2.37	2.41	2.38	2.37
Total number graded		1,622	1,660	1,646	1,630	1,616

CG2. Network Changes

Network Rail publishes both a summary and more detailed description of network changes.

Table 2.20: Number of short-term Network changes

	Expiring by the end of March in each year						
	Total	2013	2014	2015	2016	2017	2018
Anglia	3	1	1	0	0	1	0
EM / LNE	10	1	1	2	4	2	0
Kent	9	0	7	1	1	0	0
LNW	5	1	3	0	0	1	0
Scotland	52	24	11	16	1	0	0
Sussex	7	1	4	0	0	2	0
Wales	1	0	0	0	1	0	0
Wessex	5	3	1	0	0	1	0
Western	3	0	3	0	0	0	0
Network Total	95	31	31	19	7	7	0

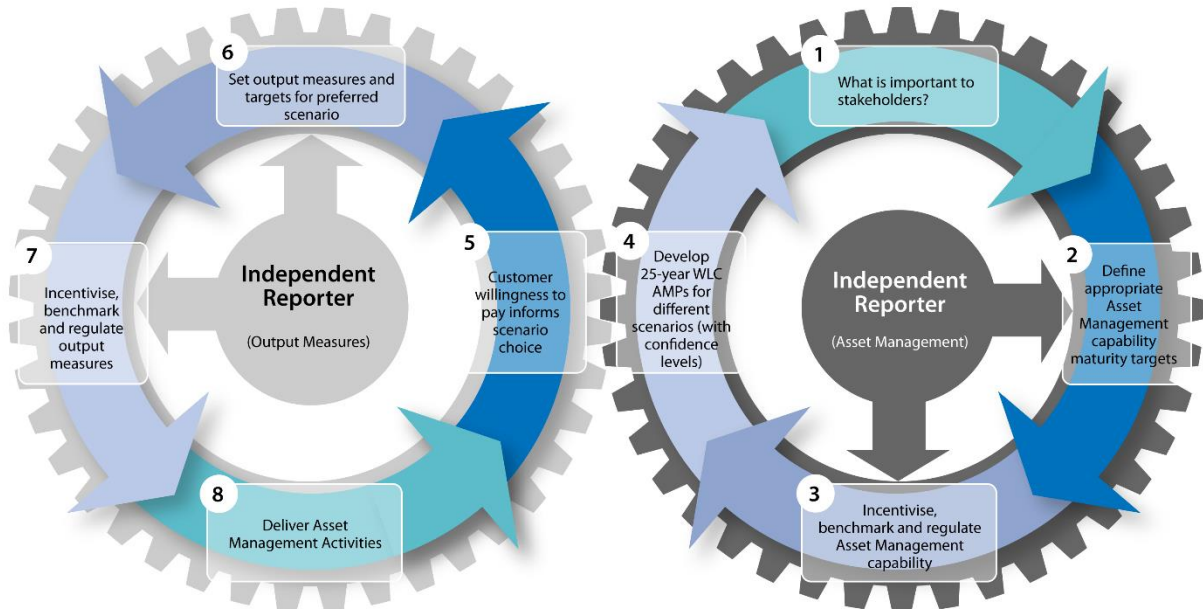
CG3. Circuits

Typical comparable capability statements are line speed (also electrification, gauge, etc.). These are provided by a capability band and at a network and route level

Operating Route	Speed Band (mph)	2008/09	2009/10	2010/11	2011/12	2012/13
Anglia	0 - 35	265	253	251	240	247
	40 - 75	1,397	1,396	1,394	1,403	1,403
	80 - 105	626	626	626	626	626
	110 - 125	0	0	0	0	0
	over 125	0	0	0	0	0
East Midlands	0 - 35	195	189	186	180	180
	40 - 75	709	711	697	700	701
	80 - 105	528	538	554	554	554
	110 - 125	316	316	313	313	313
	over 125	0	0	0	0	0
Kent	0 - 35	196	192	192	186	187
	40 - 75	1,036	1,030	1,029	1,032	1,033
	80 - 105	534	533	533	525	525
	110 - 125	0	0	0	0	0
	over 125	0	0	0	0	0

Appendix C Regulatory Framework Model

This section describes a regulatory framework model for Asset Management, developed by AMCL, which takes account of our findings from regulatory research.



The loop on the right-hand side relates to prioritisation, incentivisation and regulation of an appropriate level of Asset Management maturity that reflects stakeholder priorities and results in the development of strategic plans for different scenarios with defined levels of confidence. Independent Reporters are used to assess the maturity of the Asset Management framework, processes and information that are used to develop these strategic plans. Customer engagement is then used to assess the expected costs and service levels relating to each scenario which leads to a preferred scenario.

The loop on the left-hand side relates to the regulatory process to ensure the expected activities and their associated costs and outcomes are delivered. Independent Reporters are used to both to assess the maturity of the Asset Management processes used to deliver the strategic plan and also to assess the outputs and to compare these to the expected outcomes defined in the strategic plan.

This framework is explained in more detail below.

- 1) What's important to stakeholders? – ensure that both the regulator and regulated company are focused on the requirements and priorities of customers and other stakeholders
- 2) Define appropriate Asset Management capability maturity targets based on company and stakeholder objectives, current maturity and available best practice.
- 3) Incentivise, benchmark and regulate these Asset Management capability maturity targets to achieve appropriate good practice Asset Management maturity.
- 4) Develop strategic plans for different planning scenarios. The maturity of the Asset Management processes used to develop each of the scenarios is used to inform the level of confidence in these plans and scenarios.
- 5) Customer 'willingness to pay' – consult customers on the selection of the preferred scenario based on timing of costs, risks and service levels.
- 6) Define output measures and targets for the preferred scenario including expected work volumes, costs, risks and service levels. Output measures should be prioritised on cost, risk and those factors that have the greatest impact on the strategic plan and the associated confidence levels.
- 7) Incentivise, benchmark and regulate the output measures and targets monitor, to ensure expected outcomes are delivered.
- 8) Deliver Asset Management activities – monitor the delivery of the work and review the work volumes, costs, risks and service levels against the plan.

This regulatory framework has been developed to work within the single asset steward and regulator context, and shows the relationship between the two parties and the Independent Reporters utilised.

Many aspects of this regulatory framework are already undertaken by UK regulators. The key opportunity in adopting this framework would be to align the regulatory activities currently undertaken in the manner described above to ensure a fully integrated approach to the regulation of Asset Management and the regulation of output measures.