ASSET MANAGEMENT STRATEGY

Approved

Keeping the energy flowing
# Table of Contents

1. INTRODUCTION ........................................................................................................... 4
   1.1 Purpose .................................................................................................................. 4
   1.2 Scope ..................................................................................................................... 4
   1.3 Strategic Alignment ................................................................................................. 4
   1.4 Document Structure .............................................................................................. 5
2. CONTEXT .......................................................................................................................... 6
3. ASSET MANAGEMENT POLICY ..................................................................................... 8
4. ASSET MANAGEMENT OBJECTIVES ............................................................................ 9
   4.1 Safety ..................................................................................................................... 9
   4.2 Service Performance to Customers and Consumers .................................................. 11
   4.3 Cost Performance .................................................................................................. 12
   4.4 New Zealand Communities .................................................................................... 13
5. ASSET MANAGEMENT CAPABILITY .......................................................................... 15
   5.1 Asset Management Framework .............................................................................. 15
   5.2 Risk Management ................................................................................................ 16
   5.3 Asset Knowledge ................................................................................................... 17
   5.4 Asset Management Competence ........................................................................... 18
   5.5 Continual Improvement ......................................................................................... 19
APPENDIX A: 'LINE OF SIGHT' ..................................................................................... 23
   Objective hierarchy ...................................................................................................... 23
   Asset lifecycle .............................................................................................................. 24
   Lifecycle strategies ..................................................................................................... 24
   Fleet strategies and plans ............................................................................................ 24
   Site strategies .............................................................................................................. 25
1 INTRODUCTION

1.1 Purpose

Our Asset Management Strategy defines our strategic objectives and approach for managing the assets that make up the New Zealand transmission system (Grid).

As such, it:

- focuses on our core business as a service-orientated transmission company
- seeks to deliver the best value solutions for New Zealand
- drives us to deliver value through high standards of service, communication and visibility.

With this in mind, our vision is to provide a Grid that safely delivers transmission services at a quality and cost that meet our customers’ expectations.

To achieve this, we will need to seek continuous improvement in all that we do, and this document describes the objectives and strategies we will employ to realise our vision by 2020.

The Asset Management Strategy applies to the period 2015-2020 and aligns with our Regulatory Control Period 2 (RCP2). We have a number of current strategic objectives in RCP1 which apply to the period 2012-2015. Our progress against these objectives is described in section 6.

1.2 Scope

The scope of the Asset Management Strategy includes physical assets, systems and processes that are required for the efficient provision of transmission services.

1.3 Strategic Alignment

To deliver transmission as a service there must be clear ‘line of sight’ of connectivity between the high-level organisation policy, strategic plan and objectives, and the daily activities of managing our assets.

This document forms part of that ‘line of sight’ by setting out the asset management strategy in support of our asset management policy. It informs the more detailed objectives contained in the lifecycle, capability and fleet strategies.
Figure 1 shows this connectivity.

1.4 Document Structure

The rest of this document is structured as follows.

- Chapter 2 sets the context for transmission services in New Zealand.
- Chapter 3 sets out our Asset Management Vision statement and Policy.
- Chapter 4 outlines the asset management objectives and strategies relating to safety, service performance, cost and communities.
- Chapter 5 outlines the asset management objectives and strategies relating to asset management capability.
- Chapter 6 describes and illustrates the alignment of objectives within the asset management system.
2 CONTEXT

The Grid is the network of electricity transmission lines and substations that connect generation schemes to load centres across New Zealand. It stretches the length and breadth of the country, transporting large quantities of high-voltage electricity and interconnects the participants in the electricity market. It includes the HVDC link between the North Island and South Island.

Transpower's role

In meeting the expectations of consumers for a safe, reliable and cost-effective electricity supply, we have two main roles that are central to the operation and development of the New Zealand power system. We own and manage the transmission Grid assets and we are also the System Operator. Ensuring that these Grid assets are delivering the service expected by customers is dependent upon good asset information, robust systems, processes and a highly competent workforce. The effective combination of these elements is essential to ensuring the reliable supply of electricity, and is fundamental to the health of New Zealand’s economy.

Regulatory framework

The Commerce Commission approves transmission investment proposals and regulates the quality and cost of the transmission service on behalf of consumers.

The Electricity Authority governs the codes that enable the operation of the electricity market, including the Grid reliability standards and transmission pricing methodologies.

Transmission in New Zealand

The physical arrangement of the Grid reflects New Zealand’s unique geography, and includes assets located across almost the entire length of the country. There are around 12,000 route kilometres of overhead lines and 178 substations.

Electricity is transported over relatively long distances between generation and load centres. The system is long and ‘stringy’, with relatively little meshing compared to transmission networks in other developed countries. This requires a focus on ensuring resilience to meet consumer expectations, through additional assets and an ability to recover quickly after system events.

The New Zealand transmission Grid has key characteristics that differentiate it from most other transmission networks elsewhere. Two of these characteristics are noted below.

- The AC transmission network conveys electricity at system voltages of 220 kV, 110 kV, 66 kV and 50 kV, while transmission networks in other countries – for instance Australia – typically exclude lines that operate at voltages below 132 kV.

- We have a large number of points of connection with 29 distribution companies and a small number of other directly connected customers, often at feeder voltage levels (11 kV, 22 kV and 33 kV). Transpower could be considered to be a transmission company and a sub-transmission company when compared with Australian electricity network companies.
As a consequence of the wide range of network voltages, substation assets are highly diverse, typically with only small volumes of each asset type or model in service.

Climate

The New Zealand climate varies greatly by region, but most areas exhibit a temperate, moist, maritime climate. There are frequent strong winds, often from the sea, leading to heavy salt deposition and relatively rapid onset of corrosion of ferrous metals in steel lattice structures, fixtures, fittings, and substation equipment tanks and enclosures. This leads to higher maintenance costs, asset replacement and performance issues than would occur in a dry climate.
3 ASSET MANAGEMENT POLICY

To align our asset management activities as a service-orientated company to our corporate objectives, we have defined an asset management vision statement and asset management policy. Our asset management vision is to:

- provide a Grid that safely delivers transmission services at a quality and cost that meets our customers’ expectations.

Our asset management policy states that when managing our assets to ensure we meet consumer long-term Grid performance expectations we will:

- embed a strong safety culture and capability, striving for zero harm to employees and members of the public
- provide an enduring, reliable and efficient transmission network to meet New Zealand’s present and future needs
- maximise performance of our assets over their life, taking into account the trade-off required between cost and risk
- make asset management decisions based on complete, accurate and timely information
- ensure that the right mix of talented, competent and motivated people are developed and retained to improve our asset management capability
- build effective relationships with all New Zealanders affected by our asset-related activities
- comply with all applicable statutory and regulatory requirements.
4 ASSET MANAGEMENT OBJECTIVES

Using our Asset Management Policy to ensure, as a service orientated company, we have a clear ‘line of sight’ to our Corporate objectives and have identified five priority areas.

1. **Safety** will remain our foremost priority and we will ensure that our safety performance continues to improve.

2. **Service performance** will be improved at ‘high priority’ and ‘important’ points of service, while maintaining at least the current performance to consumers at the remaining points of service.

3. **Cost performance** will be improved through efficiency improvements and prioritisation, allowing us to deliver our service targets to consumers at lower operating expenditure (Opex) and capital expenditure (Capex)\(^1\) costs (in real terms).

4. We will strengthen our relationships with **New Zealand’s communities** and landowners to ensure we maintain our ‘licence’ to operate cost-effectively on private and public land.

5. We will continue to develop our **asset management** capability to support our service performance and efficiency improvements.

The first four objectives relate to aspects of our performance and are detailed in this chapter. The fifth asset management capability objective relates specifically to our asset management capability, which provides the foundation for achieving the other objectives, and is described in chapter 5.

4.1 Safety

Safety is our foremost organisational value. We believe that all incidents are preventable and that no other objective should override the safety of our employees, contractors or the public. Our asset management policy states that we will embed a strong safety culture and strive for zero harm. We will do this by promoting the importance of safety throughout the organisation, taking all steps to provide our employees and service providers with safe working conditions. Reducing safety incidents will also improve our service performance as these incidents can also result in outages.

We have achieved substantial improvements\(^2\) in safety performance during the last 10 years but we have further to go.

4.1.1 Employee Safety

The provision of transmission services presents significant potential hazards, some of which cannot be eliminated. However, through effective management, we can ensure a safe and healthy working environment.

---

1 The lumpy nature of some Capex means that cost efficiency measures are to be based on underlying Capex by excluding the impact of major Enhancement and Development projects and large re-conductoring projects.

2 Our historic performance in terms of LTIFR (Lost Time Injury Frequency Rate) suggests that there has been an improvement in performance in recent years; this rate peaked at 14.5 in 2002/03, and it has been reduced substantially since then to an average rate of 2.4 over the past 5 years.
Given that our field activities are almost entirely carried out by service providers, it is essential that we include all service providers and subcontractors in our safety performance metrics.

4.1.2 Public Safety

The management of risk to public safety is one of the key elements of our asset risk management activities. Ensuring public safety requires a systematic approach to identifying and managing all risks. Any residual risks are mitigated through effective communication with the public, and by securing our installations appropriately.

4.1.3 Safety Objectives

We are committed to achieving an injury-free workplace for our employees and service providers, and to minimising public safety risks. We need to ensure the Grid is fundamentally safe and poses no avoidable risks.

In relation to our workforce, our objective is to ensure:

1. zero fatalities
2. zero injuries causing permanent disability
3. a sustained, declining trend in medical treatment injuries.

In relation to public safety, our objective is to:

4. take all practicable steps to ensure Grid assets do not present a risk of serious harm to any member of the public.

4.1.4 Safety Strategies

To support these objectives, we are pursuing or planning the following strategies: public safety management system, safety certification, increased resources, safety surveys, and improved reporting.

- **Public Safety Management System:** This was implemented in 2012 to drive further improvements in safety performance and to ensure compliance with statutory requirements.

- **Safety certification:** We have begun a project to prepare for certification to BS OHSAS 18001. We intend to achieve certification by June 2014.

- **Increased resources:** Our new service provider contracts include safety requirements supported by dedicated resources, for the specific purpose of improving safety performance.

- **Safety surveys:** We have recently undertaken an external safety assessment and an internal survey to assess our progress in fostering an appropriate safety culture, and will continue these.

- **Improved reporting:** We have implemented improvements in incident reporting, including changes to improve incident analysis.

---

3 BS OHSAS 18001:2007 sets out minimum requirements for occupational health and safety management practice.
• **Safety training:** we have expanded and improved our training programme while refining our competency requirements for safety-critical roles.

### 4.2 Service Performance to Customers and Consumers

To provide a clear service orientation, we have developed a set of customer-facing service performance measures and targets to reflect the long-term performance expectations of consumers. The measures have been developed with input from and the support of our customers and other stakeholders.

The targets are differentiated, based on the criticality of the point of service to our connected customers, and signal that service in the form of the long-term reliability performance that they and end consumers can expect.

These service performance targets are described fully in the document ‘Service Performance Measures – Grid Output Measures, Targets and Incentive Regime’. The service performance objectives are listed in the subsections below.

#### 4.2.1 Service Performance Objectives

Our service performance objectives include:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Category</th>
<th>Number of sites</th>
<th>Historic rate 1</th>
<th>Long term target</th>
<th>RCP2 target</th>
<th>RCP2 target divided by Historic rate</th>
<th>Cap</th>
<th>Collar</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP1: Number of interruptions (per annum)</td>
<td>High Priority</td>
<td>23.0</td>
<td>7.4</td>
<td>2.3</td>
<td>5.0</td>
<td>0 %</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Important</td>
<td>43.0</td>
<td>13.3</td>
<td>8.6</td>
<td>11.0</td>
<td>6</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>78.0</td>
<td>33.0</td>
<td>39.0</td>
<td>33.0</td>
<td>16</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Generator</td>
<td>40.0</td>
<td>11.4</td>
<td>20.0</td>
<td>11.0</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-security</td>
<td>46.0</td>
<td>69.3</td>
<td>63.1</td>
<td>67.0</td>
<td>55</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>GP2: Average duration of interruptions (min)</td>
<td>High Priority</td>
<td>43.0</td>
<td>160.9</td>
<td>30.0</td>
<td>100.0</td>
<td>65</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Important</td>
<td>78.0</td>
<td>71.9</td>
<td>60.0</td>
<td>65.0</td>
<td>30</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>40.0</td>
<td>177.3</td>
<td>60.0</td>
<td>130.0</td>
<td>80</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-security</td>
<td>46.0</td>
<td>93.0</td>
<td>60.0</td>
<td>80.0</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>GP3: p90 Longest durations (min)</td>
<td>High Priority</td>
<td>23.0</td>
<td>137.4</td>
<td>60.0</td>
<td>100.0</td>
<td>40</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Important</td>
<td>43.0</td>
<td>341.3</td>
<td>90.0</td>
<td>240.0</td>
<td>170</td>
<td>310</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>78.0</td>
<td>131.4</td>
<td>240.0</td>
<td>130.0</td>
<td>50</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Generator</td>
<td>40.0</td>
<td>436.1</td>
<td>240.0</td>
<td>350.0</td>
<td>200</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-security</td>
<td>46.0</td>
<td>215.4</td>
<td>240.0</td>
<td>215.0</td>
<td>90</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>Availability (%)</td>
<td>AP1: HVDC</td>
<td>97</td>
<td>98.50</td>
<td>98.50</td>
<td>99.50</td>
<td>99.50</td>
<td>97.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AP2: HVAC</td>
<td>99</td>
<td>99.60</td>
<td>99.60</td>
<td>100.00</td>
<td>100.00</td>
<td>99.20</td>
<td></td>
</tr>
</tbody>
</table>

#### 4.2.2 Service Performance Strategies

To support these objectives and our customer service orientation, we are pursuing or planning the following service performance strategies: consultation process, risk management, targeting interventions, corrective action, and outage planning.

- **Consultation process:** we have undertaken a series of consultation rounds with customers and the wider industry to understand their and consumer needs, preferences and expectations.
- **Risk management:** we are continuing to develop asset health and criticality measures.

- **Targeting interventions:** we have used the new performance measures and failure-mode analysis to identify poorly performing assets that will impact on the service delivered. This will be further developed over the next few years as we move away from a fleet-centric view of replacement and refurbishment to a whole-of-system view.\(^4\)

- **Corrective action:** we continue to enhance our investigation, root cause analysis and corrective action processes to reduce the risk of forced and fault outage events to consumers.

- **Outage planning:** we continue to make improvements in works scheduling that allow optimisation of outage planning, leading to a number of planned outages to minimise the potential for interruptions to consumers and higher market costs for generators and retailers.

### 4.3 Cost Performance

In delivering the transmission service it is essential that we provide the service expected at an efficient cost to consumers. To achieve this, we need to maintain downward pressure on our cost base, including asset-related Opex and Capex.

#### 4.3.1 Cost Performance Objectives

While delivering our service performance targets, we will achieve two cost objectives.

1. **Capex:** through improving prioritisation and asset use, we will continue to optimise our capital investments throughout the next seven years. We expect this to reduce average annual base Capex by 10% compared to RCP1 (in real terms and excluding Enhancement and Development (E & D) projects).

2. **Opex:**
   a) Grid Opex: using enhanced work management processes and increased reliability focused maintenance, we expect to reduce annual Grid Opex by 8% (in real terms) by the end of 2020
   b) Departmental Opex: the ongoing development of staff competency and systems capability to support asset management improvements will be achieved while holding Departmental Opex constant (in real terms) through to 2020.

#### 4.3.2 Cost Performance Strategies

Reflecting the above objectives, we are pursuing or planning the following six strategies to improve overall cost performance to consumers.

- **Maintenance improvements:** our Grid Opex is being optimised through targeted reductions in maintenance expenditure.

---

\(^4\) See the Planning Lifecycle Strategy for specific objectives.
• **Divestment programme:** we have reduced overall costs to end consumers by divesting non-core assets to distribution businesses that are better placed to manage low-voltage assets.

• **Improved cost estimation:** we have used feedback from completed projects to improve the cost estimation systems used to evaluate options and manage delivery costs.

• **Improved procurement:** we have put in place improved, long-term period supply contracts for our primary assets.

• **Targeted investments:** we have used our new performance targets and asset health analysis to prioritise spending during RCP2.

• **Improved asset management capability:** our objectives and strategies for improving our asset management capabilities are detailed in chapter Error! Reference source not found..

### 4.4 New Zealand Communities

We have developed objectives centred on building effective relationships with communities. Communities can be significantly impacted by transmission projects and our asset management activities. A key objective for us is to manage our relationships with landowners and communities to mitigate these impacts. Their cooperation and support is essential for maintaining our ability to operate cost-effectively.

#### 4.4.1 Landowners

Our ability to maintain transmission line assets is dependent on a network of transmission corridors and access ways which, for the most part, are not supported by formal easements. We are reliant on the support and permission of landowners to access these lines. Landowners rightfully expect us to undertake our work in a safe and efficient way, as will the general public where they are affected by maintenance activities. We are committed to working openly and constructively with landowners, occupiers and the public at large when planning, building, operating, maintaining and upgrading the Grid.

#### 4.4.2 Communities

We aim to work in partnership with communities to plan, deliver, and operate infrastructure to limit the social and environmental impacts of our activities. In particular, we consult with communities at an early stage during planning to better understand potential impacts.

Communities are also concerned about potential environmental impacts or damage, such as leaking oil from power transformers or the release of sulphur hexafluoride (SF6) gas from circuit breakers. We are committed to protecting New Zealand’s natural environment by reducing activities that have adverse environmental impacts and to minimising the use of harmful materials.

---

5 SF6 is a potent ‘greenhouse’ gas. Emissions of SF6 are currently the largest contributor to our greenhouse gas emissions.
4.4.3 Landowner and Community Objectives

We are committed to respecting the interests of landowners and communities who are impacted by our activities. To achieve this, we have developed the four objectives set out below.

1. **Environmental**: improve environmental performance and ensure 90% compliance with environmental authorisations. Control annual (SF₆) gas emissions to no more than 0.8% of total stock and set targets for reducing air travel emissions.

2. **Access arrangements**: facilitate adopting appropriate corridor provisions into Territorial Authorities district plans.

3. **Landowners**: build fair and respectful long-term relationships with landowners, measured through surveys and feedback from them.

4. **Community engagement**: continue to deliver our community and environmental partnership programmes (Community Care Fund and Greenline).

4.4.4 Community Strategies

To support these objectives, we are pursuing or planning the following five strategies.

- **Greenline projects**: we are continuing our programme of community-led environmental projects.

- **Community Care Fund**: during 2012 we undertook 56 community-based projects and will continue this programme in the future.

- **Greenhouse gas emissions**: we have developed programmes to identify and remove leak prone SF₆ circuit breakers.

- **Landowner surveys**: undertake regular surveys to capture landowner’s perceptions and feedback on our interactions.

- **Monitoring and reporting**: improved environmental reporting and processes to reduce the risk of adverse environmental impact from our activities.
5 ASSET MANAGEMENT CAPABILITY

A key to delivering transmission as a service through our Corporate Objectives Values and Vision, including the asset management objectives defined in chapter 4, is in improving our asset management capability.

In 2012 we undertook an assessment of our asset management capability against the internationally recognised asset management standard PAS 55. This assessment also defined future asset management maturity levels to aspire to over the next few years.

The assessment demonstrated our strengths were in contingency planning, implementing our asset management plans and the way we communicate with our employees and stakeholders.

The areas requiring improvement included the ‘line of sight’ between our corporate objectives and our asset management plans, a formal definition of our asset management framework, and our information and risk management practices.

5.1 Asset Management Framework

Effective asset management is critical to meeting the long-term service performance expectations of customers efficiently. One finding from the review was the need to develop an asset management framework to provide clear ‘line of sight’ between our corporate objectives and our day-to-day asset management activities. This framework has now been developed and used for this submission. It consists of one high-level policy, one high-level strategy, and sets of related strategies.

- **Asset Management Policy**: aligns our asset management approach with our corporate objectives to deliver the transmission service.
- **Asset Management Strategy**: translates the asset management policy into drivers and high-level objectives.
- **Lifecycle Strategies**: reflect our asset lifecycle model and apply the high-level objectives to relevant processes and activities.
- **Fleet Strategies**: relate our objectives to our individual asset fleets, setting out detailed intervention strategies to address asset-related risk.

The review also recommended that further clarity was needed as to how we periodically review and audit our asset management framework, manage change, and who is accountable and responsible for different components of the framework. We accepted that this clarity was required and have implemented the recommendations.
Asset Management Framework Objectives

1. **Certification**: we will achieve accreditation of the asset management framework to PAS 55/ISO55000 by June 2014.

### 5.1.1 Asset Management Framework Strategies

To support these objectives, we are pursuing or planning the following strategy.

- Continue to embed and enhance the remediation activities identified in the 2012 PAS 55 gap analysis.

### 5.2 Risk Management

Many of our assets are older than those of our peers. A key focus for us is to manage the associated asset risk effectively to achieve our service and cost performance objectives. We will target and prioritise our expenditure to safely deliver our targets through improved prioritisation and innovative asset management approaches in meeting consumer expectations.⁶

We do not yet have a fully quantified risk assessment framework. As an interim measure, we have sought to reflect the main determinants of risk (that is, likelihood and consequence) through an integrated framework using asset health and asset criticality as inputs, as discussed below.

#### 5.2.1 Asset Criticality

Asset criticality is used in our risk framework as a proxy for the consequence of asset failure, as part of identifying when we need to intervene to ensure we meet consumer expectations of our performance. The asset criticality model enables a systematic approach towards setting performance targets, and adopting asset management strategies that are differentiated based on the consequences of failure of the asset.

After consulting with customers, we developed a criticality model for our Grid connection points. We have extended this work to establish the criticality of the network assets that influence the reliability of service at each point of connection. The work is at an early stage, but is being used to prioritise fleet replacement expenditure programmes. The overall model is described in the Planning Lifecycle Strategy.

#### 5.2.2 Asset Health

Asset health reflects the remaining expected useful life of an asset, and is a proxy for the probability of failure as part of identifying when we need to intervene to ensure we meet expectations for the performance of our assets. We have prepared asset health indices (AHI) for three classes of primary assets. AHI is used to prioritise asset interventions. AHI can also be used to forecast the condition and performance impact of investment scenarios.

The design and implementation of AHI is described in the Planning Lifecycle Strategy.

---

⁶ As an example, we will seek to use modern fast-acting protection schemes on older primary plant so that we can safely and efficiently increase use.
5.2.3 Prioritised Investment

In combination, asset health and asset criticality can be used to assign an overall risk to our assets. This enables us to prioritise and optimise the timing of asset interventions to meet overall service expectations. A further application is their use in optimising the level of investment between portfolios. This framework has resulted in improvements in the way we quantify, communicate and use asset risk to inform our investment decisions. We plan to expand the use of asset health and criticality to cover at least 80% of our assets (by value) and embed this information in our asset management systems by the end of RCP1. In addition to managing asset risk, we have used the performance measures to target and prioritise our expenditure to balance costs and risk to consumers.

5.2.4 Operational Risk Management

Finally, we have also enhanced the way we manage our operational risk. These improvements include greater alignment with service performance expectations including; enhanced processes for risk identification, risk assessment and risk mitigation, revised operational risk registers, and increased awareness and engagement of operational risk in the completion of our day-to-day tasks.

Risk Management Objectives

1. **Risk management**: we will implement an integrated asset risk management framework that will include qualitative and quantitative risk assessment techniques by 2015.

2. **Asset health and condition**: we will continue to set service-based targets for asset fleets to balance the risk of asset failure and the associated reliability impacts with cost.

5.2.5 Risk Management Strategies

To support these objectives, we are pursuing or planning strategies to:

- further develop the asset criticality and health frameworks to become a standard asset management tool for all main asset fleets in meeting service expectations

- continue to develop and implement processes for capturing, registering, assessing, and tracking asset relating risks and associated risk controls and treatments to improve service performance.

5.3 Asset Knowledge

Effective asset management to meet the long-term expectations of consumers requires information that is meaningful, timely and of appropriate quality to support decisions across the full lifecycle, such as on the timing and type of asset interventions to deliver the service required. The scope of information relevant to Grid performance is broad and includes asset characteristics, performance, age and condition. It should also include more dynamic information including incident reports, work histories, and historic expenditure.
Our approach to asset information is outlined in our Information Services Strategic Plan (ISSP). Under the ISSP, improving asset management practices and achieving greater alignment and collaboration across Transpower are key business drivers for our approach to information management.

Further, the ISSP recognises that the PAS 55 initiative has highlighted the need for our business to own information, and the need for a company-wide definition of how Grid performance is described and defined. See the ISSP for more detail.

**Asset Knowledge Objectives**

1. **Asset knowledge**: we can demonstrate that the quality of our information is improving year on year and enabling more effective risk-based Grid performance management decision making.

**5.3.1 Asset Knowledge Strategies**

To support these objectives, we are pursuing or planning five strategies. These strategies are to:

- clarify and document governance for all key data required for asset management decision making, including specific accountability for data stewardship
- develop an information strategy that defines the required level of accuracy and quality of key Grid performance information
- establish priorities for improving data quality, and implement an improvement programmes
- establish audits for key Grid performance data quality
- ensure effective cross-functional governance of Grid performance management information systems.

**5.4 Asset Management Competence**

As a service-based transmission company that must provide an essential service safely and effectively, we must have ready and continued access to a sufficient pool of competent people who can undertake key activities. These people include a diverse workforce of highly skilled employees and service providers.

We are the only large employer in New Zealand for many specialist skills required for the asset management, construction and maintenance of the Grid and our framework for training and competence development is of vital importance.

In our People and Capability Strategy, we recognise the importance of asset management competence. To further develop this competence, we have developed an asset management competence framework and 3-year roadmap.

**Asset Management Competence Objectives**

1. **Competence framework**: a framework for asset management competence will be
5.4.1 Asset Management Competence Strategies

To support these objectives, we are pursuing or planning to:

- develop a roadmap to deploy the competence framework
- use the framework to identify skill gaps and inform training requirements.

5.5 Continual Improvement

We seek to improve performance through a systematic approach to incident feedback, corrective and preventive action, and the effective use of innovation to improve the delivery of the transmission service to consumers.

5.5.1 Corrective and Preventive Action

The purpose of corrective action is to address the root cause of identified non-conformances, problems or incidents, to prevent or reduce the likelihood of recurrence. Preventive actions are proactive steps taken to address the root cause of potential problems before they occur.

Our approach to corrective and preventive action is not currently well integrated across all asset management activities. Opportunities exist to improve this integration, such as using a more systematic approach to learning from incidents, identifying root causes, and following through with initiatives to prevent recurrence.

5.5.2 Innovation

Our long-term strategy for the Grid includes lifting performance by adopting approaches that are innovative or use new technology.

Adopting innovations and new technology can lead to significant benefits, but may also bring risks. We may choose to be either a leader or a follower of innovations, based on the benefit/risk trade-off of these innovations to consumers when applied to the New Zealand Grid.

Where the expected benefits for customers are large, such as the use of power electronics devices to defer capacity investments, we may choose to be an early adopter. However, in cases where the potential benefits are only modest, and the risks appear high, we take a more cautious approach, and defer developing and deploying new technology until our international peers have evidence that its use is a success.

Continual Improvement Objectives

1. Continuous improvement: We can demonstrate that there is sustained improvement in delivering the transmission service as a result of incorporating learnings into our asset management practices and approach.

5.5.3 Continual Improvement Strategies

To support these objectives, we are pursuing or planning to:
• implement a formal and systematic approach to the identification and resolution of problems affecting the delivery of the transmission service

• implement a formal benefits and risk assessment for managing innovation projects

• invest up to $2m a year in innovation opportunities that will create efficiencies for our customers by reducing costs and/or improving performance.
6 RCP1 PROGRESS

This chapter summarises our progress in delivering our strategic improvement initiatives through RCP1 (2012-2015).

Prior to RCP1 we recognised that a number of our processes and systems needed refinement to support the delivery of our objectives. To make the required improvements, we established a programme of initiatives focused on core areas of our business, including: safety management; asset risk management; performance targets; and cost estimation. The initiatives were formalised in our RCP1 Proposal.

To date we have completed the majority of our targets and have used the resulting improvements in preparing the RCP2 Submission. As a result, our submission includes:

- improved safety processes and management systems;
- service performance targets based on the expectations of our customers;
- an improved approach to the identification, assessment and management of asset risk;
- asset criticality and health frameworks; and
- improved line of sight from our strategic plan to our asset management activities.

6.1.1 Overview of Initiatives

The initiatives and their current status against our milestones for RCP1 are set out in the following table. The ongoing initiatives will all be completed during RCP1.

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Overview</th>
<th>RCP1 Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Enhance awareness of safety, work practice reviews and safety in design</td>
<td>Complete</td>
</tr>
<tr>
<td>Asset Management</td>
<td>Define a framework and principles for asset management and achieve PAS 55 compliance</td>
<td>Complete</td>
</tr>
<tr>
<td>Asset Management Information System</td>
<td>Replace the maintenance management system to support works management and information access</td>
<td>Complete</td>
</tr>
<tr>
<td>Asset Risk Management</td>
<td>Introduce a framework for identifying and assessing asset risk and implement control measures</td>
<td>Complete</td>
</tr>
<tr>
<td>Asset Health Indices</td>
<td>Establish asset health indices for three fleets to enhance our Capex decision making</td>
<td>Complete</td>
</tr>
<tr>
<td>Asset Criticality Framework</td>
<td>Introduce an asset criticality framework based on the consequences of asset failures</td>
<td>Complete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Overview</th>
<th>RCP1 Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network Performance Measures</strong></td>
<td>Set long-term performance measures, including targets, caps, collars and incentive rates for RCP2</td>
<td>Complete</td>
</tr>
<tr>
<td>Maintenance Management</td>
<td>Align contracted service deliverables with our objectives and move towards condition-based risk maintenance</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>Integrated Works Planning</strong></td>
<td>Improve policies and processes for managing, monitoring and prioritising expenditure</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>Cost Estimation</strong></td>
<td>Enhance cost estimating practices across the business</td>
<td>Complete</td>
</tr>
<tr>
<td><strong>Procurement</strong></td>
<td>Deliver a continuous improvement plan and implement a new contract management system</td>
<td>Complete</td>
</tr>
<tr>
<td><strong>Grid Operating Centres</strong></td>
<td>Bring operations function in-house to improve capability and its integration with maintenance</td>
<td>Complete</td>
</tr>
</tbody>
</table>
APPENDIX A: ‘LINE OF SIGHT’

This appendix provides further background and explanation of our asset management document suite and explains how the documents reflect the ‘line of sight’ between overall corporate objectives and day-to-day asset management activities.

Objective hierarchy

As introduced in section 1.3, we have developed our asset management document suite to strengthen the ‘line of sight’ between overall corporate objectives and our day-to-day asset management activities. This approach results in objectives being described at three levels.

**Asset Management Strategy** distils corporate objectives through our Asset Management Policy and expresses these as a number of high-level objectives in five categories.

**Lifecycle Strategies** expand the high-level objectives (by category) and provide context relevant to the processes and activities in each stage.

**Fleet Strategies** express the objectives (high-level and lifecycle) in terms of the individual assets. As an example, the transformer fleet strategy will specify in detail how planning strategies (such as ‘reflect asset criticality’) are to be applied to transformer assets. These levels and interrelationships are represented in Figure 2.

Figure 2: Asset Management Strategic Objective Hierarchy
Asset lifecycle

Our approach to asset management is also based on lifecycle management. We identify five lifecycle stages as reflected in Figure 3.

![Figure 3: Transpower’s Asset Lifecycle](image)

**Lifecycle strategies**

Each phase of the lifecycle has a corresponding lifecycle strategy, which describes our approach to the particular activities in that stage, objectives relevant to that stage, and strategies for improving performance. The five lifecycle strategies (Planning, Delivery, Maintenance, Operations, and Disposal) are summarised below.

- **Planning Lifecycle** covers Capex planning, from need identification, evaluation and approval, through to handover to delivery for implementation.
- **Delivery Lifecycle** covers implementing capital works (including detailed design, procurement, installation, and commissioning) and the dismantling and decommissioning of Grid assets.
- **Maintenance Lifecycle** covers our approach to maintaining Grid assets, including the types of maintenance employed and a discussion of how the work is managed.
- **Operations Lifecycle** covers operation of the Grid assets, including real-time operational control, situational awareness, outage coordination, and contingency planning.
- **Disposal Lifecycle** covers activities relating to the disposal and divestment of Grid assets and the disposal of waste material.

**Fleet strategies and plans**

The majority of our asset management activities are managed at a fleet level. There are 25 Grid asset fleets, each including a defined asset class. In some cases a number of fleets that have common characteristics and functions have been grouped into a single fleet.

---

9 Grid asset fleets are referred to as asset portfolios in Transpower’s regulatory material.
strategy document. As a result, there are 14 fleet strategy documents defined within our asset management document suite.

Supporting each fleet strategy is a Fleet Plan. This is simply a summary of activities and costs for the particular fleet over a set period – in this case out to 2020.

**Site strategies**

To complement the fleet based approach to asset management, we have developed a suite of site strategies. These are used to integrate and optimise fleet-based activities at particular substations and to assist in developing long-term development plans for each site. These documents act as formal sources of information for planning decisions and discussions with stakeholders.