Lifecycle Strategy
DELIVERY

Document TP.TG.01.04
07/11/2013

Keeping the energy flowing
# Table of Contents

EXECUTIVE SUMMARY .................................................................................................................. 1

1 INTRODUCTION .......................................................................................................................... 3

1.1 Purpose ..................................................................................................................................... 3

1.2 Scope ......................................................................................................................................... 3

1.3 Strategic Alignment .................................................................................................................. 4

1.4 Document Structure ................................................................................................................ 4

2 CONTEXT ....................................................................................................................................... 5

2.1 Interaction with other Lifecycle Stages .................................................................................... 5

3 CURRENT DELIVERY APPROACH ............................................................................................... 7

3.1 Introduction ............................................................................................................................... 7

3.2 Plan and Design ......................................................................................................................... 10

3.3 Execution and Construction ...................................................................................................... 12

3.4 Commissioning and Close Out ................................................................................................. 12

3.5 Key Elements of Delivery Approach ....................................................................................... 13

4 DELIVERY OBJECTIVES AND STRATEGIES .......................................................................... 17

4.1 Safety ......................................................................................................................................... 17

4.2 Service Performance .................................................................................................................. 18

4.3 Cost Performance ..................................................................................................................... 19

4.4 New Zealand Communities .................................................................................................... 20

4.5 Asset Management Capability ................................................................................................. 21
EXECUTIVE SUMMARY

Role of delivery

The role of delivery is to safely and cost-effectively deliver new and refurbished assets. It covers all capital build on the New Zealand electricity transmission system (Grid). Our challenge is to consistently apply and improve our project planning, project management, stakeholder engagement, procurement and construction skills to improve the quality and reliability of the assets while reducing costs.

Delivery approach

There are three different types of capital build on the Grid, replacement and refurbishment of assets, capital works that lead to new grid build, and new work to meet the requirements specified by customers. Our project delivery approach to these three types depends on the size and complexity of projects. We categorise the projects as either Grid capital projects or Maintenance capital projects.

The delivery process involves three main stages.

- **Plan and Design**: This stage converts early work completed in planning into sufficient detail to tender and control the delivery works.
- **Execution and construction**: This is the stage where we award tenders, procure materials, mobilise work teams and oversee construction.
- **Commissioning and close out**: This is the stage where we plan safe connection, testing, livening and hand over the asset to our Operation and Maintenance teams.

Delivery is predominantly an outsourced activity. We rely on specialist design consultancies for our engineering design work and on long-term relationships with our service providers for construction work. Safety management is of paramount importance, for us and our suppliers. This is a key aspect of our relationship with our service providers.

Delivery depends on some important activities such as procurement, skills and competency development, costs management, environmental assessment and property rights, access and landowner relationships.

Objectives and Strategies

To achieve our asset management vision and deliver on our commitment to stakeholders, we have set out our asset management objectives in five main areas: safety, service performance, cost performance, New Zealand communities, and asset management capability.

We have developed the objectives to reflect where we want to be by 2020. The strategies describe how we will achieve the objectives and we will use a number of improvement indicators to track our progress. Table 1 summarises the delivery objectives.
<table>
<thead>
<tr>
<th>Area</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Design new assets so they contribute to minimising the risk of injury to our workforce and the public through application of Safety by Design, by ensuring that safety is embedded in our design, planning, supplier contracts and safety planning processes.</td>
</tr>
<tr>
<td></td>
<td>We undertake systematic root cause analysis of incidents leading to corrective actions that eliminate the chance of a repeat event.</td>
</tr>
<tr>
<td>Service Performance</td>
<td>Coordinate work with sufficient accuracy to provide certainty and minimise negative impacts on performance.</td>
</tr>
<tr>
<td></td>
<td>Deliver efficiencies in work process through the application of technology and innovation.</td>
</tr>
<tr>
<td>Cost Performance</td>
<td>Standardise project and construction processes and improve construction quality to support efficient operation and maintenance.</td>
</tr>
<tr>
<td></td>
<td>Reduce time and cost through the standardisation of key commercial and operational systems.</td>
</tr>
<tr>
<td>New Zealand Communities</td>
<td>Build effective relationships with all stakeholders</td>
</tr>
<tr>
<td>Asset Management Capability</td>
<td>Have in place the tools and approaches to support the core competencies required to support the Delivery Lifecycle.</td>
</tr>
<tr>
<td></td>
<td>Ensure and enable competent construction workforce.</td>
</tr>
</tbody>
</table>

Table 1: Delivery Objectives
1 INTRODUCTION

Chapter 1 sets out the purpose, scope and strategic alignment of Transpower’s Delivery Lifecycle Strategy.

1.1 Purpose

This Delivery Lifecycle Strategy describes the context for our delivery work, our current approach to delivering transmission projects and our objectives and strategies for the regulatory period from 2015 to 2020 (RCP2). It has been developed based on good practice guidance from internationally recognised sources, including the relevant clauses of BSI PAS 55:2008.

More detailed plans for delivery are set out in a complementary document, the ‘Grid Projects Business Plan’.

1.2 Scope

Delivery covers all capital build projects for the New Zealand transmission system (Grid). This includes all construction projects, whether for new or refurbished assets, for HVDC and high-voltage alternating current transmission line and substation assets, excluding telecommunications assets.¹

The delivery activities cover all stages of the projects from the acceptance of approved work from planning to the point assets are handed over to operations. They include detailed design, procurement, construction and commissioning of the work, as well as the overall planning required for delivery.

¹ Delivery of communication assets is described in the IT Portfolio Plan – ICT Network Services – IT Communication Services.
1.3 Strategic Alignment

This Delivery Lifecycle Strategy sits within our suite of core asset management documents shown in Figure 1. It supports the ‘line of sight’ from the asset management policy through to the asset management plans.

Figure 1: Position of this Strategy within the Transpower Asset Management Hierarchy

1.4 Document Structure

The rest of this document is structured as follows.

Chapter 2 discusses the context within which we undertake our delivery lifecycle activities.

Chapter 3 describes our current delivery approach.

Chapter 4 sets out how delivery contributes to the asset management objectives, the delivery specific objectives that reflect where we want to be by 2020, and the strategies that support them.
2 \hspace{1cm} \textbf{CONTEXT}

Effective asset management relies on the links between Delivery and the other lifecycle activities: planning, maintenance, operations and disposal. Chapter 2 outlines the interaction between Delivery and the other lifecycle activities.

2.1 \hspace{1cm} \textbf{Interaction with other Lifecycle Stages}

2.1.1 \hspace{1cm} \textbf{Planning}

Planning ensures that we select the right projects, define the scope and estimate the costs appropriately and that we can implement the projects within the required timeframe. There is a close feedback loop between planning and delivery to ensure that actual costs and lead times, lessons learned, construction issues and stakeholder feedback inform our planning processes.

The planning considerations described in the Planning Lifecycle Strategy remain important for the Delivery lifecycle. In particular:

- some parts of the transmission system do not have a high resilience to faults and outages due to a relatively low level of redundancy
- some parts of the transmission system are susceptible to voltage stability issues
- outages for maintenance and project work can be difficult to arrange due to network security considerations
- outage durations often must be very limited, and can be cancelled at short notice for reasons of system security.

These issues have an impact on our delivery planning activities, and need to be considered for every project.

2.1.2 \hspace{1cm} \textbf{Operations}

Delivery considers operational requirements as part of the design and commissioning activities of our capital projects. When an asset is commissioned or decommissioned, we need to ensure that the associated spares are held or removed from stock, key drawings (such as single line diagrams) are updated, and the operational plans and market systems, including the Supervisory Control and Data Acquisition (SCADA) and Energy Market Data (EMS) are updated.

Planning and coordinating outages is a critical activity for both delivery and operations. The introduction of Financial Transmission Rights in 2013 has reinforced a 24-month ahead planning horizon and drives discipline in all scheduled work on assets, not just Delivery. We have refined our outage planning processes, both short and long term, to take account of the new requirements.

2.1.3 \hspace{1cm} \textbf{Maintenance}

The construction phase of Delivery relies heavily on the skills and resources of our service providers. These service providers deliver the routine and project work for maintenance teams.
At the completion of delivery, all equipment records are entered into the maintenance management systems (MAXIMO and Grid Drawings) in a timely and complete manner to enable ongoing operation and maintenance.

Delivery is responsible, especially in the case of new assets or the upgrade of existing works, for obtaining access and easement rights for project construction and ongoing maintenance.

2.1.4 Disposal

There is a close link between the Delivery and Disposal lifecycles where we have made a planning decision to decommission and dispose of an asset. Planning takes into account the required disposal activities (immediate and future) and makes the decision as to whether the activity needs to take place in the delivery phase for a particular project.
3 CURRENT DELIVERY APPROACH

Chapter 3 provides an overview of our capital project delivery approach. It also provides the backdrop for the improvement programme that is described in Chapter 4.

3.1 Introduction

3.1.1 The Role of Delivery

Our asset management vision is to provide a Grid that safely delivers transmission services at a quality and cost that meets our customers’ expectations. Delivery contributes to this by safely and cost-effectively building new and refurbished assets to meet quality requirements. This stage of the asset lifecycle is highly visible to all our stakeholders and has a significant influence on their perception of our service.

The challenge for delivery is to consistently apply and improve our project planning, project management, stakeholder engagement, procurement and construction management skills so as to improve the quality and reliability of the assets we deliver while reducing costs.

The volume and nature of the capital build projects we deliver has fluctuated hugely over the last few years. A decade ago, the delivery function was limited to minor upgrade works and the replacement of end-of-life assets. In a very short period it evolved to deliver some of the largest infrastructure projects in the country, such as the North Island Grid Upgrade (NIGUP), the HVDC upgrade and the North Auckland and Northland (NAaN) project.

We are now adapting to the next wave of work. This work is different in volume and scale, and we are working in a different economic environment with lower energy demand forecasts and fewer generator investments.

This next phase places tighter restraints on our planning assumptions and project management disciplines. We need to think closely about every dollar spent and the value to our customers. We need to consider every outage or reduction in service and consider the impact these have on our customers.

3.1.2 Types of Delivery Work

There are three different types of capital build on the Grid.

- **Replacement and Refurbishment (R & R):** works that are either like-for-like replacements, or refurbishments that extend the life of existing assets. The majority of this work is delivered within the Maintenance lifecycle.\(^2\)

- **Enhancement and Development (E & D):** capital works that lead to new Grid build to provide additional capacity and capability.

- **Customer investments:** new work to meet requirements specified by a customer.

Our project Delivery approach to these three types depends on the size and complexity of the Grid and Maintenance capital projects.

- **Grid capital projects:** work resulting from a formal investigation\(^3\) is subject to full project management disciplines\(^4\) These works are delivered either as:

---

\(^2\) Section 3.4 of the Maintenance Lifecycle Strategy.

---
3.1.3 Overview of Delivery

Delivery process

Delivery involves the capital build projects that are identified during the planning process. The planning process identifies a rolling 10-year plan of required work, including timing, cost, quality and scope. It also details the individual projects in business cases. During this planning phase there are interactions between Delivery and Planning to ensure that experience we gain during delivery is taken into account in selecting preferred options and setting time lines, and that we identify options for integrating work.

Once these business cases are approved, the delivery process begins.

Figure 2 illustrates our delivery approach.

Our delivery process has three main stages.

- **Plan and design:** This stage converts early work completed in Planning (which focuses on defining scope, timelines and budget) into sufficient detail to tender and control the delivery works. It starts once the business case is handed over from
Planning. The first steps are to prepare the Project Management Plan and Procurement Plan. Once these are signed off, we undertake detailed design.

- **Execution and construction:** This is the stage where we award tenders, procure materials, mobilise work teams and oversee construction. In some cases these activities start during the planning stage, especially where we need to place orders for long lead items like transformers.

- **Commissioning and close out:** This is the process of planning safe connection, testing, livening and handing over the asset to our operation and maintenance teams.

The three stages are subject to our **asset management governance processes.** We use a series of challenge and review processes in planning⁶, which we continue through delivery to ensure the project delivers the approved objectives. We have a formal business case change process for management and change approval.

**Outsourced design and service providers**

Delivery is a predominantly outsourced activity.

We use a panel of preferred engineering design consultancies (EDCs) for detailed design who are familiar with our standards and are experts in aspects of high-voltage power system engineering.

We also have a long-term relationship with our service provider organisations. These are the groups that we rely on for construction.⁷

To achieve a stable workload, we indicate likely forward workloads for each service provider arising from our R & R projects. This work is released as ‘Yours to Lose’ (YTL) and enables service providers to resource and plan. The service providers submit a price for this work on a selective source basis. If they fail to complete planned work, have quality or safety issues, or their prices are higher than our estimates, we reserve the right to open tender work to other providers. A component of work in each region is withheld and open-tendered to provide a competitive check on prices.

We also provide an indicative view on what E & D and customer initiated work will be open tendered.

This procurement model provides stability for the specialist construction and maintenance workforce and enables us and the industry to invest in improving quality and safety. We have made significant progress in ensuring we have the resource to meet our needs by maintaining this forward work plan and sharing it with the industry. We are committed to making ongoing improvements especially in cost and safety, as set out in Chapter 4.

**Safety management**

Safety is of paramount importance, especially during the delivery process, as significant number of safety events may occur as a result of our activities.

Our service providers have their own safety focus, but we take a leadership role in setting and monitoring safety standards and expect anybody working on our projects to conform to our safety expectations. This includes ensuring that the suppliers’ facilities have appropriate

---

⁶ See section 3.6 of the Planning Lifecycle Strategy.
⁷ For further information, see section 3.5.2 of the Maintenance Lifecycle Strategy.
safety practices and processes. Delivery teams will stop work immediately where an unsafe work practice is observed.

Our safety initiatives include Safety by Design, consistent construction specifications, and safety awareness.

- **Safety by Design**: This initiative is key to removing hazards before they can occur. We have developed standard designs for substation equipment to incorporate Safety by Design. Our delivery project teams play a vital role in the continual update of these standard designs, with lessons learned either from incidents to minimise the risk of that type of event recurring or from practical experience on how to do it better.

- **Construction specifications**: We have developed construction specifications for transmission lines and civil works that are driven by safety considerations. These are the standards our service providers must adhere to and are updated as a result of experience.

- **Safety awareness**: We are focused on promoting safe behaviours and raising awareness of safety issues through a number of initiatives such as Keys to Life, Safety Alerts, and Safety First. We have rolled out ‘hands on training’ to all delivery teams, as hands are most frequently injured.\(^8\)

We have made significant progress in relation to safety, but we are committed to making ongoing improvements.

### Key elements of delivery approach

Delivery depends on some important activities:

- procurement
- skills and competency development
- cost management
- environmental and consenting assessment
- property rights, access and landowner relationships.

The rest of this chapter steps through the stages in the delivery process, considering the different approaches for Grid capital projects and maintenance capital projects.\(^9\) The chapter then provides an overview of the key elements of our Delivery approach.

### 3.2 Plan and Design

The two main activities in this stage are project establishment and detailed design, although delivery planning starts in parallel with the development of the business case and the integration cycle in the planning stage.\(^10\) The purpose of delivery planning is to ensure the feasibility of delivery projects and to help optimise the outages, costs and resources required for all work on Grid assets.

---

\(^8\) These injuries appear to be decreasing, but more time is required to validate if this is a sustainable trend.

\(^9\) The Maintenance Lifecycle Strategy provides some more detail on our approach to maintenance activities. The fleet strategies provide details of Maintenance Capital Projects.

\(^10\) See section 3.5 of the Planning Lifecycle Strategy.
3.2.1 Project Establishment

Grid capital projects
At this stage, we hand over the Grid capital projects from planning to delivery. Although this is the formal handover, the delivery teams are involved right at the start of the planning process through activities like SCORED workshops\(^{11}\) to ensure that delivery requirements are addressed. Ownership of the project transfers from the planning process ‘development project manager’ to the ‘delivery project manager’.

During this stage we prepare the Project Management Plan and the Procurement Management Plan.

The Project Management Plan describes the approach, timescales, budget breakdown and management controls to be used during the project. The Procurement Management Plan describes the procurement strategy for services and materials for the project or programme.

Maintenance capital projects
Typically, the designs of maintenance capital projects are comparatively simple and dominated by practical construction activities. Our approach is to package the design and construction activities together to be completed by our service providers. To achieve this, we approve these projects at least 12 months prior to construction.

3.2.2 Detailed Design

Grid capital projects
Detailed design builds on the pre-design work (known as the Solution Study Report (SSR)) which is completed in the planning stage. The SSR focuses on developing a conceptual solution so a business case can be developed.

The detailed design process develops the design concepts. The output of this stage is a completed detailed design for the works, with a full budget breakdown, tender drawings, and a system project overview (SPO) that identifies how we will undertake the build to minimise risks to system reliability.

To ensure a consistent approach to design, we have developed the Transpower Design Lifecycle (reference TP.DG 10.01)\(^{12}\) and we have a suite of standard designs and design standards for many of our assets.

The Transpower Design Lifecycle includes some critical activities such as the SCORED workshops. The workshops are held at the start of pre-design, and after handover to delivery before detailed design starts. They focus attention on areas such as safety, reliability, constructability, operability and any outage requirements. The workshops allow the project teams to identify and address specific project risks, and ensure any recent knowledge and experience from similar projects are incorporated at an early stage.

\(^{11}\) SCORED Workshop – ‘Scope, Constructability, Operability, Risk, Environment and Design’. A SCORED workshop is a collaborative session held with key stakeholders/influencers to brainstorm, review, discuss and record any risks, constraints, issues or concerns associated with a project.

\(^{12}\) The purpose of the document is to offer guidance to the individuals tasked with managing the development of our designs, and to enable the programme and project managers to specify the appropriate level of design input by the right people at the right time, to ensure a complete, reliable and consistently high-quality design outcome.
Maintenance capital projects
As described in section 3.2.1, as the design for maintenance capital projects is comparatively simpler than Grid capital projects and focused on installation, it is within the expertise of the service providers. If the service providers need specialist design input, they can obtain this from our preferred EDCs.

3.3 Execution and Construction
This stage covers the build phase of the work involving the tender or other procurement processes for construction, site mobilisation, any civil works needed and all other activities associated with the construction of the project.

As we set out in section 3.1.3 we have a long-term relationship with our service provider organisations that we rely on for construction.

Each service provider has a geographical area within which they are allocated R & R capital Project work (and also operational expenditure work) on a YTL basis, which provides them a core level of work in that region.

Customer initiated and E & D Grid project work is excluded from the YTL list, and is instead tendered on a case-by-case basis in line with the requirements of the specific project or programme.

3.3.1 Construction

Grid capital projects
As with design, where we have a standard suite of standard designs and design standards we also have construction specifications for transmission lines, civil works and switchrooms. These are the specifications that our service providers must follow, and form part of the tender documents.

Maintenance capital projects
As discussed in section 3.2.1, this component of the annual construction work does not require the full project management discipline. It is completed under our long-term contracts with our service providers who are each pre-qualified through a full tender procedure.

3.4 Commissioning and Close Out

3.4.1 Commissioning and operational handover
This is the process of commissioning planning, testing, livening and handing over the asset to our operation and maintenance teams. It includes:

- conducting pre-commissioning tests
- confirming the pre-commissioning tests have been successfully completed
- conducting a pre-commissioning inspection
- creating a ready-for-livening notice
• entering all equipment records into our asset management information system (MAXIMO) in a timely and complete manner to enable ongoing operation and maintenance
• handing the asset over to Operation, which is formalised with the Operational and Maintenance Acceptance Certificate (OMAC).

The key activities that Delivery is either responsible for completing, or responsible for ensuring are completed by the relevant parties, are detailed in the Commissioning/Decommissioning – Service Requirements.\(^\text{13}\)

Where appropriate, we prepare a commissioning plan to ensure all these activities are completed and the System Operator’s requirements are met.

### 3.4.2 Project Close Out

We often commission projects with further activities scheduled to be completed. These include activities like dismantling and removing old assets, the survey and registration of all property rights and completion of landscaping and site tidying that occur after commissioning.

Once all works are complete, we undertake a number of project close-out activities, including final capitalisation of the project within the financial systems,\(^\text{14}\) confirming that the asset management information systems have been updated, archiving relevant documentation, and a review of ‘lessons learnt’ including a review of health and safety performance.

We capture any lessons learnt as they occur, but we perform a formal review as part of the project closure. This review is usually a workshop involving procurement, project manager, planning engineer, site maintenance manager and contractors. The workshop captures the success, deficiencies and issues for the current project and the recommended improvements. We feed these lessons back into the project support and services office to consider. It is the role of the construction managers to identify common trends and issues, resolve, and embed solutions within the appropriate processes and systems.

### 3.5 Key Elements of Delivery Approach

#### 3.5.1 Cost Management

Managing costs in delivery is a fundamental part of the Delivery lifecycle.

We estimate the cost of a project in the planning stage.\(^\text{15}\) The project manager is then responsible for financial management activities such as monthly monitoring and reporting on financial status, updating the budget, contract payment cycles and maintaining an audit trail throughout the project.

With support from our procurement teams, the project manager will endeavor to gain cost efficiencies through robust planning and procurement plans that identify the most appropriate procurement method to drive efficiencies and quality. During the project, and formally at project close, we report back to our cost estimation team so they can understand our actual delivery costs and improve estimation.

---

\(^{13}\) See TP.SS.07.31.

\(^{14}\) See the Accounting Guidance Notes for Revenue and Capital Expenditure dated October 2013.

\(^{15}\) See section 3.7 of the Planning Lifecycle Strategy.
Until recently we allocated a financial contingency of approximately 10% to all projects. We have now introduced a risk-based approach that involves assessing and pricing project risks. This includes estimating when each risk is likely to expire. We prepare progress reports at the time of risk expiry, identifying whether the risk has occurred and whether the risk funding was adequate. The cost estimation team can then update their estimations.

Where we encounter changes to scope, time or cost, we follow the formal Business Case Adjustment process.

We have made progress in managing costs, but we are committed to making ongoing improvements, especially in the area of cost efficiency.

3.5.2 Skills and Competency Development

Project delivery is dependent on skilled and specialised personnel, particularly in our project management, programme management and procurement roles.

We have developed the ‘Project Management Competency framework’, which is used to assess gaps and identify education methods needed to close gaps in our project management expertise. We have adopted the Project Management Institute (PMI)’s Project Management standard and our project managers are certified and maintain their accreditation.

We encourage procurement staff to develop skills through Chartered Institute of Purchasing and Supply (CIPS) qualifications and through All of Government procurement competency initiatives.

3.5.3 Procurement

Procurement is fundamental to driving cost efficiency and quality of asset delivery. It is one of the most significant inputs into detailed design. How the contracts are written, awarded and managed is critical to the successful delivery of an asset on time, to quality and budget.

Materials and equipment

We depend on local and offshore companies to provide us with equipment, materials and services to build our assets. Although a large company by New Zealand standards, we are a small player in the global market. We procure assets from companies and factories throughout the world, increasingly from Asian markets.

Procurement is not just about what we buy; it is also how we buy. Product and procurement strategies in each major asset category enable us to be planned in our approach to managing our supplier partnerships to secure the supply chain, improve product quality and manage costs to achieve value for money.

We have made progress in the way we manage the interdependencies between long lead time equipment (for example transformers) and completion of detailed design, but we are planning further improvements, as set out in Chapter 4.

As a State Owned Enterprise we have our own procurement policy that takes into consideration the ‘New Government Rules of Sourcing’ and ensures Transpower’s procurement processes continue to be best procurement practice.

---

16 We have standard interface (compensation plates) between the transformer and the pad that allows design to proceed in parallel until the final transformer drawing is received.
Services

We have implemented a partnership framework with our design consultants with specialist expertise, from which we can select for specific jobs as detailed in individual statements of work.

Three benefits of this framework include: (1) enabling us to focus on the quality of service; (2) enabling us to identify and foster innovations that lead to long-term sustainable cost reductions and efficiencies; and (3) ensuring that appropriate resources are available to meet our requirements for specialist services efficiently.

To support this framework, we have developed a rigorous tender and contract award process with guidelines that stipulate which procurement process and contracts can be used. For purchases over $500,000, we must complete a procurement plan in line with our procurement policy. The plan details scope and evaluation criteria and standard methodologies used for reviewing tenders. Project managers use specialist internal resource to make this simple and consistent.

Quality management

Experience of equipment failures indicates that, in many cases, deficiencies in design and manufacture is a key factor. In some cases the failure event could have been mitigated at the time of procurement. We aim to reduce the risk of failure of procured items with a quality systems approach to procurement.

We use a range of interventions in the procurement process, including:

- careful selection of vendors, often including a pre-qualification process
- specification of certain quality requirements in the design/manufacturing process (lessons-learnt information from the installation and operating experience of equipment is fed back into specification)
- factory inspections and specific inspections of manufacturing in process
- factory acceptance tests.

3.5.4 Environmental Assessment and Approvals

The environmental workstream starts in the Planning lifecycle with an assessment of the environmental requirements and continues throughout all Delivery stages. Environmental approvals are fundamental precursors to delivery works.

We ensure the project undertakes all the necessary environmental assessments and obtains all necessary approvals required under the Resource Management Act 1991 and other environmental legislation. In particular, this includes compliance with the district and regional plans, and the National Environmental Standard (NES) for Electricity Transmission, which provides a national framework of rules to manage the environmental effects of our existing transmission lines (as of 14/01/10), the NES for contaminated soil and the Historic Places Act 1993.

\[17\] The New Government Rules of Sourcing came into effect on 1 October 2013.
Varying levels of engineering detail are required to determine the consenting requirements for works. An assessment of environmental effects (AEEs) is needed on the works where resource consent or designation is required.

In the case of ‘greenfield’ development, we have developed a robust site/route selection process known as the ACRE\(^{18}\) process to identify and secure the most suitable location for new transmission infrastructure (such as lines, substations and switching stations).\(^ {19}\) The model is a decision-making tool that involves progressively detailed investigation of information to identify, select and confirm a final location for transmission assets and integrates information from across a range of disciplines (engineering, environmental planning and property).

### 3.5.5 Property Rights, Access and Landowner Relationships

The property and landowner workstream starts in the Planning Lifecycle phase with an assessment of access and property rights requirements (and estimated costs), and traverses all Delivery stages. Property and access rights are fundamental precursors to delivery works.

We ensure the project identifies and acquires all necessary property rights and establishes landowner liaison sufficient to enable access as required to deliver planned works and maintain positive landowner relations.

It is imperative that the property access, easements and other rights are resolved by the time construction starts on any project. We include a reasonable amount of time in our schedules to negotiate easements or environmental authorisations, or to work around access constraints.

Prior to 1988, our transmission line assets were authorised and built without formal easements and we rely on access through our statutory rights under the Electricity Act 1992. Where we undertake greenfield projects or activities on our existing lines that exceed our statutory rights, we are required to gain sufficient property rights to undertake the works. The acquisition of easement rights through negotiation with landowners (rather than outright land purchase) is our preferred outcome. As a last resort we may pursue a process of compulsory acquisition under the Public Works Act 1981.\(^ {20}\)

Where we are undertaking works that require easements and environmental authorisations and designations, we must take into account the time needed for statutory consultation and landowner negotiation. For such projects, property rights acquisition must follow obtaining necessary resource consents or designation.

The Delivery phase provides an opportunity to form strong enduring relationships with landowners. We do this through:

- the manner in which we acquire new property rights and through our working relationships with landowners
- minimising the impact of our activities on landowners’ properties
- dedicated Landowner Liaison Officers to foster and maintain a good working relationship with property owners.

---

\(^{18}\) Area, Corridor, Route and Easement

\(^{19}\) This process is scalable but applies to all greenfield projects

\(^{20}\) While the compulsory acquisition of property rights is a last resort approach (due to long lead time and poor landowner relationship outcomes), we initiated the process on several occasions over the past 10 years although in all cases to-date a negotiated settlement was achieved before the compulsory acquisition process was completed.
4 DELIVERY OBJECTIVES AND STRATEGIES

To achieve its asset management vision and deliver on its commitment to stakeholders, Transpower has set out its asset management objectives in five main areas. The first four relate to aspects of Transpower’s performance that can be directly observed by external stakeholders. The fifth area relates to Transpower’s internal asset management processes and capability.

1. Safety
2. Service Performance
3. Cost Performance
4. New Zealand Communities
5. Asset Management Capability

Chapter 4 explains how Delivery contributes to the asset management objectives and sets out maintenance objectives, strategies and improvement indicators.

The Delivery objectives articulate where maintenance should be to achieve the asset management objectives. The strategies explain what we will do, and the improvement indicators will track our progress.

4.1 Safety

Delivery activities, which are primarily undertaken by our outsourced workforce, can involve a number of significant safety risks. Our approach to ensuring an emphasis on safety during delivery activities is to ensure our service providers have established and robust safety systems in place to manage safety risks, maintain a skilled workforce and have a zero tolerance for unsafe acts and behaviours. The objectives and strategies below support our asset management safety objectives and show our commitment to integrating safety into our activities.

**Safety Objective 1**

Our designs for new assets contribute to minimising the risk of injury to our workforce and the public through application of Safety by Design, by ensuring that safety is embedded in our design, planning, supplier contracts and safety planning processes.

**Strategy**

To meet our safety objective, we will continually improve our approach to, and application of, Safety by Design when delivering new and replacement assets.

Safety by Design will be emphasised in the detailed design phase when making decisions about design, plant and material selection, and methods of construction. This will ensure we can construct, maintain and operate assets as safely as possible throughout their life.

**Improvement Indicator 1**

At least three SCORED (Safety, Constructability, Operability, Risk, Environmental, Design) workshops are held for all projects over $5m throughout the design phase.
Improvement Indicator 2
Safety provisions are embedded in asset supplier contracts in regards to suppliers informing us of safety issues and supplier safety practices, and enabling innovative safety practices.

Safety Objective 2
We undertake systematic root cause analysis of incidents leading to corrective actions that eliminate the chance of a repeat event

Strategy
We understand what is causing safety incidents and rapidly address root causes.

Improvement Indicator 1
By 2015, we will have implemented systematic and quantitative process (risk sliders) for safety risk assessment.

Improvement Indicator 2
A trending year-on-year reduction in preventable injuries for all staff engaged in delivery activities for Transpower, where the same root cause was present.

4.2 Service Performance
Service performance in Delivery is about improving the delivered asset quality and timeliness while maximising system reliability.

Service Performance Objective 1
Coordinate work with sufficient accuracy to provide certainty and minimise negative impacts on performance.

Strategy
By 2015 we will have a stable forward work plan and be able to clearly demonstrate how we have been able to use this plan to drive cost savings and realise increased system performance by improved outage planning.

Improvement Indicator 1
By 2016, we will have completed the strategic inventory review and have in place clear policies and processes to enable the right spare to be delivered at the right time and cost.

Improvement Indicator 2
Documented rationalisation for all non-standard procurement to ensure decisions regarding the standardisation (or the non-standardisation) of assets are informed from a cost/risk/time and quality perspective.
To drive customer value, we need to demonstrate that we are getting the most out of our projects and construction processes. This will require us to consider new innovative approaches when building new assets, or replacing/refurbishing existing ones.

**Service Performance Objective 2**
Deliver efficiencies in work process through the application of technology and innovation.

**Strategy**
Our current approach to technology adoption includes focusing on new technologies used elsewhere in the world or by other industries.

Innovation through the application of technology will allow us to:

- lower delivery cost, which lowers lifecycle costs while still meeting customer expectations
- deliver on our commitment to safety and to reducing environmental impacts.

**Improvement Indicator 1**
By 2016, have introduced at least three new construction techniques that clearly demonstrate a reduction in time or cost on projects.

### 4.3 Cost Performance

Delivery has a large impact on our total costs. We are able to understand the drivers of cost in constructing our assets and see efficiencies and sustainable cost reductions.

**Cost Performance Objective 1**
Standardise project and construction processes and improve construction quality to support efficient operation and maintenance.

**Strategy**
Our future workload is dominated by streams of similar jobs over time. There may be small savings on each job, but these will be magnified by the number of similar jobs to make a significant saving possible.

To drive this we will improve our analysis of project costs and develop and deploy programme management skills that will release savings across multiple jobs.

We will also improve feedback on actual construction costs into the decision-making processes. As a result, our cost libraries will be maintained with current and up-to-date cost information.

**Improvement Indicator 1**
By 2016, we will have a clearly trending reduction in construction costs on assets in programmes.

**Improvement Indicator 1**
By 2016, we will have streamlined our project management practices to enhance project performance.
Practices that are consistent within and across an organisation allow for greater continuity from project manager to project manager, project to project and team to team.

**Cost Performance Objective 2**

Reduce time and cost through the standardisation of key commercial and operational systems.

**Strategy**

We will identify, from experience and trend analysis, where increased standardisation will add value. We will also develop relationships with other transmission companies to enable a shared best practice approach to procurement.

**Improvement Indicator 1**

By 2015, we will have developed procurement and commercial toolboxes and made them available across Transpower. Trend analysis proves that this is working and creating consistency in our contracting and procurement.

**Improvement Indicator 2**

By 2016, we will have developed procurement strategies and product plans for all asset categories over $1m in annual spend.

**Improvement Indicator 3**

Contract lifecycle management is in place to consistently manage contracts throughout their lifecycle to ensure that claims, defects and insurance obligations are dealt with appropriately.

### 4.4 New Zealand Communities

We are committed to engaging with our communities, including stakeholders and landowners, throughout the delivery process and to demonstrating a sense of social responsibility by having regard to the interests of the communities in which we operate. Relationships with landowners and connected customers are important as building, replacing or refurbishing assets have significant effects on these parties. We may have a number of assets on one property and the landowners may have any number of interactions with Transpower over the life of those assets.

**New Zealand Communities Objective 1**

Build effective relationships with all stakeholders.

**Strategy**

We will provide a similar stakeholder experience, whether it is maintenance work or upgrades, or new assets being built on a landowner’s property or neighbouring properties within the wider community.

**Improvement Indicator 1**

Trending increase in positive landowner and community feedback.
4.5 Asset Management Capability

We are embarking on a programme to transform asset management and to gain PAS 55 accreditation. Our objective is to submit its asset management documentation for accreditation to PAS 55 by June 2014.

We will continue to develop tools and approaches to support robust decision making supported by access to asset management information. Ensuring our people have the requisite asset management competences is critical to success. Our objectives around developing this capability flow from the broader asset management objectives in this area.

To effectively deliver the Delivery Lifecycle Strategy, we need to build our capability in the ‘group 1’ competences. As detailed in the Asset Management Strategy, group 1 consists of those people who will deliver and embed the integrated, organisation-wide business processes and data that underpin the systematic plan-do-check-act improvement cycle. We must be capable of consistent, risk-based decision making informed by a whole-of-life cost perspective on the asset portfolio and the customer needs we serve.

Asset Management Capability Objective 1
Have in place the tools and approaches to support the core competencies required to support the Delivery Lifecycle.

Strategy
Lifting our asset management delivery capability is a process of continuous improvement and, to this end, we have developed a 3-year roadmap that seeks to develop our asset management competences.

Improvement Indicator 1
By 2017, we will be able to demonstrate that we have embedded the Asset Management Competence Framework in our delivery activity and that the competence of our people has been raised from where it is today.

Transpower and the industry have an existing competency framework that addresses competencies associated with work on high-voltage assets. It does not cover other common activities that generally occur in construction, nor does it cover competencies that are assumed to be trained in the wider workforce.

We have analysed some recent safety events and identified a general reduction in the competency of the workforce to undertake some standard construction tasks.

Asset Management Capability Objective 2
Ensure and enable a competent construction workforce.

Strategy
By 2018, we will have developed a means of assessing competencies and experience across a broader range of activities that affect safe delivery.

Improvement Indicator 1
By 2015, we will have identified key construction activities not covered by existing competency frameworks.
Improvement Indicator 2

By 2017, we will have developed and implemented a method of ensuring adequate training and experience to undertake the top five safety construction activities.