



Asset Management Strategy

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1. Introduction

ElectraNet's Network 2035 Vision sets out a future vision of safe, secure and reliable transmission services delivered to customers at lowest long-run cost in a way that supports South Australia's economic development and contributes to reducing carbon emissions.

As the owner of South Australia's transmission network, ElectraNet operates and maintains 88 substations and approximately 5,600 circuit kilometres of high voltage transmission lines, covering a service area of over 200,000 square kilometres.

The efficient and effective management of ElectraNet's assets is critical to managing risk and optimising the balance of lowest whole-of-life cost against net long term benefits, in order to deliver reliable and efficient transmission services to the South Australian community.

This Strategy sets out the asset management framework over the medium to long term for substation, transmission line and telecommunication assets. It sets out specific plans addressing four key strategic drivers, namely:

- **Asset Data** – data and management system integrity to support high quality and timely decision making
- **Maintenance Management** – policy and plans to minimise unit cost while providing the longest efficient asset life
- **Condition Assessment** – understanding the lifecycle of each asset in order to provide the basis for effective life cycle decision making
- **Risk Management** – response to asset deterioration, based on a sound understanding of risk and failure consequence.

Delivering on this Asset Management Strategy will require a range of investments spanning further improvements to data and information management, the continuation of established strategies for routine, corrective and refurbishment maintenance and asset replacement as well as initiatives to improve transmission asset capability.

2. Strategic Context

There is increasing community and political sensitivity to rising electricity prices, driving an ever stronger focus on efficient asset management and delivery of lowest long-run cost solutions. Growing expectations of the existing transmission network are driving a stronger ongoing focus on extending asset life, increasing asset utilisation and maximising network performance.

This requires a risk-based approach to asset management to achieve an efficient balance between maintaining safety, security and reliability of supply at the lowest sustainable long-run cost.

This section outlines the context for the asset management strategy, including the characteristics of the network, the framework for asset management, regulatory requirements and long-term trends and influences.

2.1 Physical characteristics

The South Australian electricity transmission network has a number of distinguishing features, which present challenges for the management of efficient costs in delivering transmission services:

- **Size** – the overall scale of the network and smaller population limit the scope for economies of scale in service delivery relative to larger networks
- **Topology** – given the dispersion of load, the network has a relatively large number of substations that must be maintained for its size relative to comparable networks, and includes a range of smaller voltage assets more typically found in distribution systems, increasing the cost of transmission
- **Customer density** – South Australia faces comparably low energy density, reflecting the small population and large geographical size, increasing the amount of network that must be maintained to supply each customer
- **Load factor** – South Australia has the lowest load factor in the NEM, as measured by maximum demand relative to average consumption, increasing the level of capacity to be maintained to deliver each unit of energy, pushing up unit costs

The overall age, and more particularly the asset condition, of the transmission network in South Australia also affect the costs of service delivery.

A range of South Australia’s transmission network assets are now approaching the end of their service life. As below, approximately 32% of ElectraNet’s transformer assets and 42% of its transmission line assets will exceed their nominal lives (45 years and 55 years respectively) by the end of the 2013-2018 regulatory period.

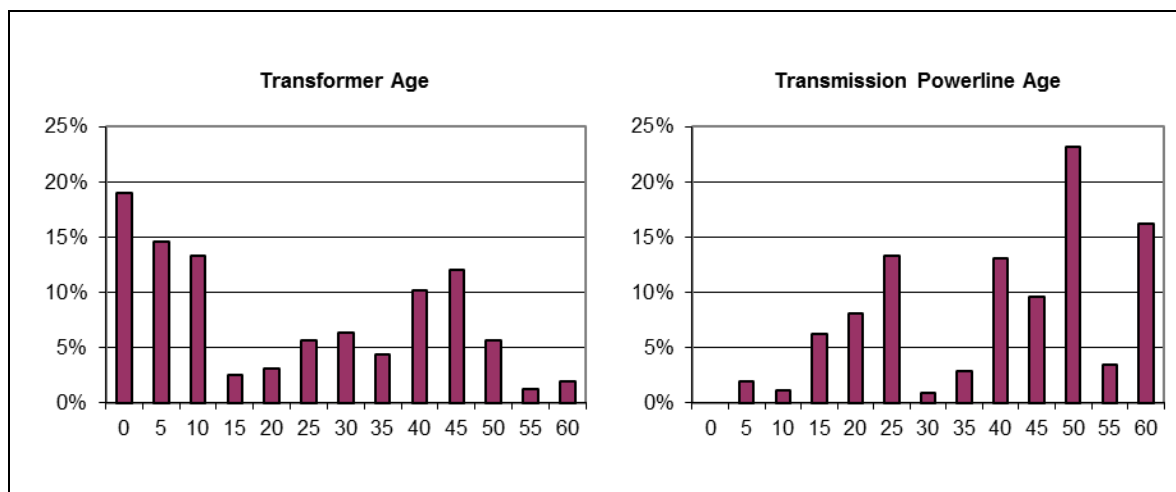


Figure 1: Transmission network assets approaching end of service life

However, while age is a useful indicator, asset condition and performance are the primary drivers for asset replacement and maintenance. Wherever possible, ElectraNet seeks to extend the life of its assets and manage risks so as to minimise life cycle costs.

2.2 Regulatory regime

The business is subject to revenue regulation by the Australian Energy Regulator (AER) under the National Electricity Rules (NER). ElectraNet must also meet the reliability standards established by the Essential Services Commission of South Australia (ESCOSA) under the Electricity Transmission Code (ETC) and safety and technical requirements of the Electricity Act (SA).

The National Electricity Objective, as stated in the National Electricity Law is:

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –

1. *Price, quality, safety, reliability, and security of supply of electricity; and*
2. *Reliability, safety and security of the national electricity system.*

These reliability standards and other specific requirements shape the asset management practices of the business, and provide a clear focus for the risks which must be managed.

2.3 Asset management framework

Asset Management is based on understanding and managing the lifecycle of each of the transmission network assets in order to maintain acceptable levels of risk and performance at the lowest possible long run cost, consistent with ElectraNet’s service obligations and statutory requirements.

The lifecycle of each asset is simply illustrated in Figure 2 below. It highlights that as assets move through their lifecycle the relative effectiveness of maintenance on the asset changes. While at the start of an asset’s useful life asset management focuses on routine maintenance, this focus transitions to refurbishment and replacement as the asset condition deteriorates. Notably, the condition of asset changes over time depending on a wide range of factors including environment, maintenance history, design and the skills available to maintain those assets (not simply age).

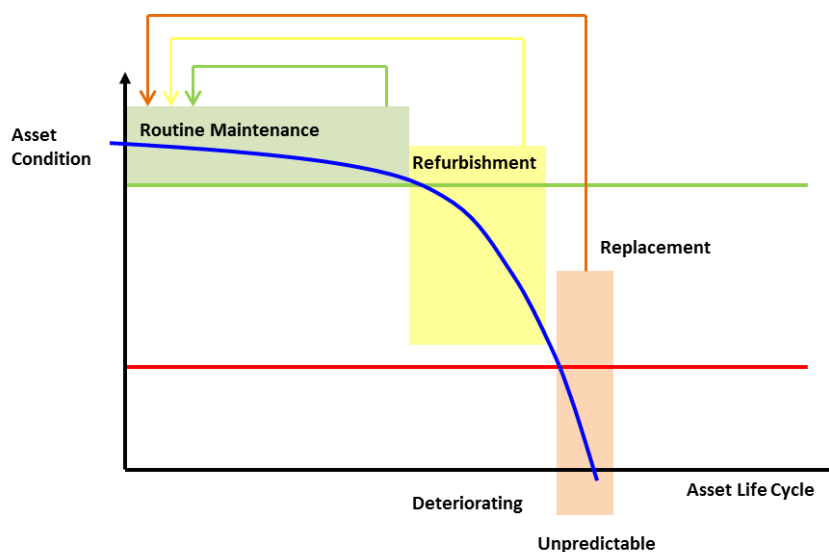


Figure 2: Asset management actions

2.4 Network 2025 Vision and Guiding Principles

The Network 2025 Vision and guiding principles have provided the guiding framework for development of the Asset Management Strategy and detailed Asset Management Plan. The key guiding principles as they relate to asset management are listed in Appendix A.

The external environment study and an associated risk analysis undertaken in the development of this Vision have also indicated a need to improve data and information management systems supporting the following aspects of asset management:

- Operating Manual (process safety);
- Device configuration and security management;
- Training and competency assessment;
- Outage management;
- Transmission line rating;
- Transmission line asset inspection; and
- Telecommunications network performance.

2.5 Bushfire risk

There is a potential risk that a fire start may be caused by an ElectraNet transmission line asset failure. While analysis of current transmission line asset inspection and maintenance history provides some data to predict how and when failures on the network will occur, prediction of potential failures could be improved by having a full set of inspection data, which is collected over relevant maintenance cycles.

Prior to this regulatory period, aerial and climbing inspections have been primarily focused on corrective maintenance rather than undertaking programs of systematic inspection and verification of asset condition, which would provide a fuller set of data.

Currently, a key element of managing bushfire risk involves taking lines out of service when very adverse weather conditions arise. This approach results in the effective management of risk but results in lower service levels to affected electricity consumers.

An improved risk-based approach is based on an inspection plan that maximises the likelihood of proactively discovering potential functional failures before they occur. This includes full implementation of modern/ contemporary condition-based inspection programs.

Based on the above, the following initiatives have been implemented in the current regulatory period in relation to fire start risk:

- The aerial inspection program has increased to include a full inspection and verification of the condition of all insulator strings (annually in all bushfire risk areas prior to bushfire season);
- Increased aerial inspection programs will continue to be undertaken until inspection and defect data indicates that potential failure of critical asset components is adequately addressed; and
- Tower inspection procedures have been amended to now require the maintenance provider to systematically inspect, verify and record the condition of critical asset components.

2.6 Asset management priorities 2008-09 to 2012-13

ElectraNet has established a long-term maintenance strategy which is being progressively implemented over time. ElectraNet's revenue proposal for the 2007-08 to 2012-13 regulatory period identified an emerging network reliability risk and that the prevailing asset maintenance regime was no longer adequate for an ageing asset base.

The resulting strategic priorities for asset management in the current regulatory period and associated outcomes are set out in Table 1 below.

3. Strategic Implications

Considering the above context, ElectraNet's Asset Management Strategy is based on:

- application of a risk-based approach to asset management decision making;
- a structured analysis of asset data and information provided by the Asset Management System (SAP);
- systematic demonstration of the asset life cycle, evaluation of risk and an appropriate response to that risk;
- for substation assets, further review and optimisation of routine maintenance (given that condition, performance and risk are now well understood and managed);
- for transmission line assets, increased corrective maintenance effort based on life cycle profiles and risk assessment of current defect information (full and detailed condition assessment data and analysis will not be available until into the next regulatory period); and .
- improvement of asset data and information management integration and development of supporting systems to continue to mitigate emerging data quality and volume risks.

Table 1: Asset management strategic priorities 2008-09 to 2012-13

1. Focus on managing substation asset risk	
Responses:	<p>Manage asset risk to limit further increase in maintenance effort and associated reliability risk, replacing substation assets where unacceptable levels of asset safety or defect performance are identified</p> <p>Implement substation routine maintenance plans based on industry best practice and undertake planned maintenance on asset types not previously covered by the maintenance plan for substation plant</p> <p>Improve overall network functionality by replacing substation secondary systems with digital control and protection schemes and deployment of OPSWAN</p> <p>Meet the requirements of the SA Electricity Transmission Code</p>
Outcomes:	<p>The increases to planned maintenance and replacement of poorly performing assets in this program produced a clear understanding of substation asset performance and future asset risk.</p> <p>This in turn provides the basis for future risk mitigation work:</p> <ul style="list-style-type: none"> • corrective maintenance • opex refurbishment • asset replacement
2. Transition from defect inspection to condition-based maintenance of lines	
Responses:	<p>Develop and implement condition-based maintenance plans for transmission lines based on industry best practice</p> <p>Undertake condition assessment of high risk lines</p> <p>Improve understanding of transmission line asset life cycle analysis</p>
Outcomes:	<p>This program revealed an increasing requirement for transmission line refurbishment projects.</p> <p>Due to long inspection cycles the full extent of transmission line risk and associated mitigating strategies will be fully understood until the 2013-18 regulatory period.</p>
3. Drive improvements to quality of asset data, life cycle assessment and risk	
Responses:	<p>SAP Asset Data Improvement – including improving quality of asset condition data and information through tools, policies and procedures</p> <p>Improved Risk Management – including documenting risk frameworks and verifying line ratings and easement vegetation profiles</p> <p>Improved Condition Assessment – including developing and implementing condition assessment guides and component condition assessment and testing</p> <p>Transmission Asset Life Cycle Analysis – including assessing overall condition of transmission assets during the asset life cycle</p>
Outcomes:	<p>A significant improvement to the quality and availability of SAP asset condition and defect data has been achieved.</p> <p>Data collection, analysis and reporting tools have been developed to assess asset life cycle, asset failure modes, consequence of failure and to identify the appropriate risk based response.</p>

4. Strategic Priorities

The asset management process develops a medium (5 year) to long term (20 year) strategy and supporting plan for managing the transmission network assets, guided by the objectives and guiding principles of the Network 2035 Vision.

This framework is based on the key attributes of effective asset management. These include asset data, maintenance management, condition assessment and risk management. Figure 3 sets out the strategic priorities for asset management against the objectives of the Network 2035 Vision.

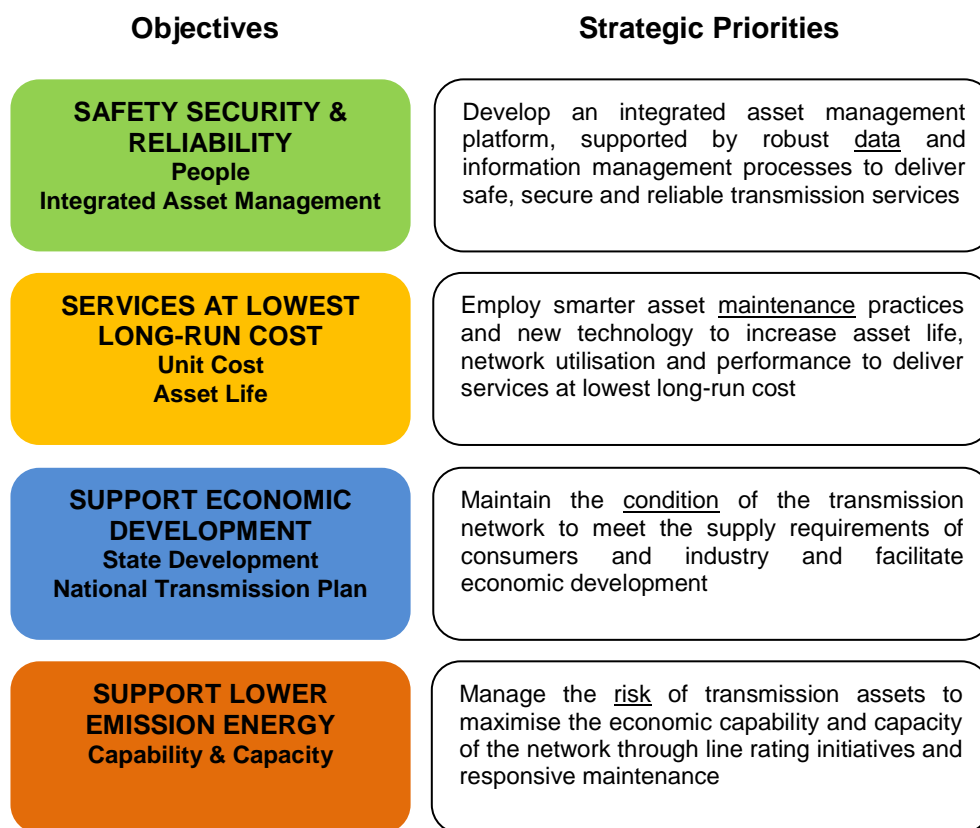


Figure 3: Asset management strategic priorities 2013-14 to 2017-18

The progressive implementation of these strategic priorities over time is set out below in Figure 4.

A more detailed explanation of the strategic priorities is provided in the sections that follow.

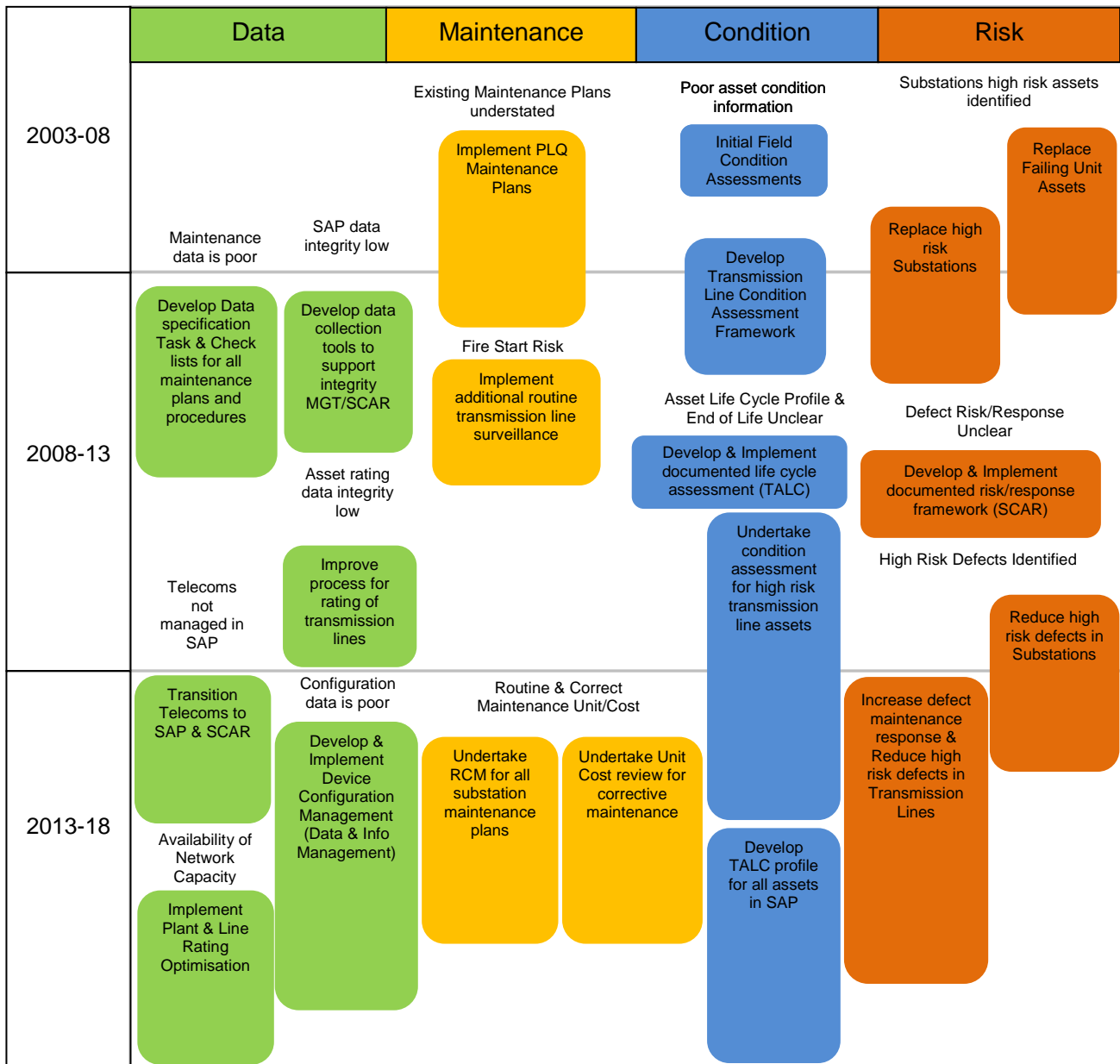
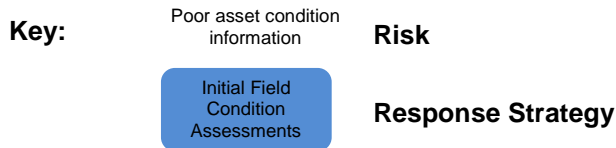


Figure 4: Implementation of strategic priorities over time

The strategic priorities for asset management in the next regulatory period are summarised functionally as follows:

- Data and Information Management – increase focus on improving data and information management systems;
- Network Management – improve line rating and system automation through network optimisation projects;
- Substations Asset Management – maintain the scope of routine maintenance, refurbishment, corrective maintenance and asset replacement programs;
- Transmission Line Asset Management – maintain the scope of routine maintenance and refurbishment programs, but increase the scope of corrective maintenance and asset replacement; and
- Telecommunications Asset Management – increase the scope of routine maintenance and asset replacement programs while maintaining the scope of corrective maintenance and refurbishment programs.

The following sections detail the response strategies for the full range of strategic priorities, including those listed above.

4.1 Data and Information Management

The accurate management of data and information requires a single, integrated asset management system platform (SAP) to achieve and maintain data and information integrity.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Develop and maintain data specifications for maintenance providers to define data consistency and quality, support good decision making, and ensure all maintenance data is provided to SAP in the required format;
- Develop and maintain a field tool to simplify data entry and support consistency, structure, risk management and decision making as early as possible;
- Improve line rating analysis methodology, and provide accurate and complete line survey data to identify full capability of line assets and optimise line utilisation;
- Develop a framework for line rating optimisation and plan for deployment of supporting infrastructure to realise full capability of line assets;
- Develop and implement device configuration & security management platform (Data and Information Management Plan) to ensure accurate device configuration and improve network performance; and
- Transition all telecommunications asset management to SAP to achieve a common asset management system and improve maintenance integrity.

4.2 Maintenance Management

Maintenance management is based on demonstrating maintenance policy and associated maintenance plans are managed in order to minimise unit cost while providing the longest possible asset life.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Implement and maintain recognised maintenance plans for substations, transmission lines and telecommunication assets to ensure industry best practice maintenance and improved asset life outcomes;
- Identify all high risk asset components and implement maintenance plans that verify asset condition within the P-F Interval to minimise the risk of fire start;
- Undertake reliability centred maintenance review of all substation maintenance plans (as one maintenance cycle has now been completed) to ensure maintenance plans are optimised; and
- Undertake unit cost review of substation and transmission line corrective maintenance to ensure efficient costs.

4.3 Condition Assessment

Condition assessment is based on developing a documented framework for assessing and scoring asset condition (health) in order to be able to demonstrate a clear understanding of asset life cycle and to define end of asset technical life.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Conduct initial field condition assessment to establish baseline condition assessment data;
- Develop criteria for transmission line condition assessment (both routine and accelerated inspections) to provide quality condition assessment data to support efficient replacement/refurbishment decisions;
- Develop and implement documented life cycle assessment criteria for substation and transmission line assets;
- Undertake accelerated condition assessment of high risk transmission line assets to develop end of technical asset life criteria to support clear decision making; and
- Develop and implement a framework for maintaining a transmission asset life cycle profile for all asset types (and association with each asset) within SAP.

4.4 Risk Management

Risk management is based on developing a documented framework for assessing asset failure modes, risk and appropriate response times and cost.

To achieve this, ElectraNet is progressively implementing the following response strategies:

- Develop and maintain a plan and justification for asset unit replacement as appropriate to ensure timely and efficient asset replacement;
- Develop and implement framework for defect risk assessment and response;
- Apply additional effort to addressing identified substation defects based on defect rate analysis, to reduce accumulated maintenance work, particularly for assets with a high risk condition assessment; and
- Apply additional effort to addressing identified transmission line defects, based on defect rate analysis – aim to reduce accumulated maintenance work, particularly for assets with a high risk condition assessment.

5. Delivering on the Strategic Priorities

In order to deliver on the strategic priorities, a comprehensive Asset Management Plan has been developed. The Asset Management Plan is structured to address the following areas:

- Data management;
- Network optimisation and risk management;
- Substation asset management;
- Transmission line asset management; and
- Telecommunications asset management.

The sections which follow discuss the asset management process, and outline the key components of the Asset Management Plan.

5.1 Asset Management Process

ElectraNet has a formal asset management process that involves a series of planning, action and analysis steps, each associated with understanding and managing each of the assets that make up the transmission network. The process is guided by the ElectraNet Network 2035 Vision and includes the ElectraNet Asset Management Plan.

The Asset Management Plan is based on understanding the asset condition and defining a coordinated response for the future management of the asset by applying a risk-based approach. It considers a range of factors for each asset including:

- **Asset Profile** – assessment of plant/equipment profiles to confirm life cycle performance/cost (TALC – Equipment Profiles);
- **Maintenance Plan** – review of routine maintenance plans in order to optimise routine maintenance (Reliability Centred Maintenance analysis);
- **Refurbishment Plan** – review of plant/equipment defect profiles in order to identify problems common to groups of plant and whether it is cost effective to reset asset condition for ongoing routine maintenance (System Condition & Risk – Defect Analysis); and

- **Replacement Plan** – identification of assets approaching end of technical life where refurbishment is no longer cost effective and where unpredictable behaviour is unacceptable (TALC – Life cycle assessment).

The Asset Management Plan also takes into account the need to provide:

- **Asset Data** – required to understand and manage asset performance, such as plant and line ratings, configuration management and condition analysis; and
- **Network Optimisation** – to provide assets, systems, data and information that improve performance of the network and reduce long run marginal cost.

On that basis, the asset management process further involves specific maintenance plans which are executed and assessed for cost and performance as well as risk.

The figure below illustrates the asset management process.



Figure 5: Asset management process

5.2 Data Management

When the Network 2035 Vision and guiding principles were recently reviewed, the need for an additional guiding principle *Information Management & Decision Support* was identified in response to rapidly increasing volumes of data and information associated with new technology and asset management systems. This guiding principle reflects the need to improve a number of key data and information processes that underpin good asset management.

A Data and Information Plan has been prepared (separate to the Asset Management Plan) outlining a number of initiatives required to support asset management, these are:

- Network Outage Management Optimisation;

- Device Configuration & Security Management;
- Communications Network Performance Reporting;
- Maximising Transmission Line Capability;
- Improving Transmission Line Inspection;
- Training & Competency Assessment; and
- Process Safety.

5.3 Network Optimisation and Risk Management

A number of projects have been identified to improve the capability of the network. While these projects relate to improved asset management of network assets they are grouped under the heading of network optimisation and risk management.

For the purpose of the Asset Management Plan, network optimisation and risk management is defined as:

Those assets, asset information systems or asset management practices required to improve the capability of the transmission network in relation to power flows, asset utilisation or asset management.

High priority projects for the forthcoming period include:

- Improvement in the management of network power flows by improving automation of voltage control schemes;
- Improvement in network asset utilisation by improving automation of transformer dynamic ratings and carrying out minor primary plant and secondary systems (protection) works to remove 'bottlenecks', thereby releasing additional capacity and deferring the need for capital investment; and
- Improvements in transmission line asset utilisation by improving the static/ dynamic line rating process and addressing line rating non-compliance issues using a risk-based approach on high impact assets, in order to improve available capacity and defer large capital investments.

Once the above high priority tasks are addressed in the forthcoming period, it is envisaged that ongoing network optimisation and risk-management activity will be relatively minor in nature, and fully incorporated into business-as-usual processes.

This is a new category of expenditure in the forecast period.

5.4 Routine Maintenance

Each of substation, transmission line and telecommunication asset management involves routine maintenance. The routine maintenance framework is designed to provide appropriate levels of inspection and maintenance in order to maintain acceptable levels of asset safety, reliability and performance.

Based on the adopted Powerlink maintenance policy, the following routine maintenance frameworks are in place:

- Primary Plant – Routine maintenance plan based on reliability centred maintenance analysis;
- Secondary Systems – Routine testing of protection schemes where the test regime is based on the scheme technology and reliability-centred maintenance analysis;
- Transmission Lines – Condition assessment based on routine inspection of transmission line components, with inspection and test of selected components based on condition and performance; and
- Communications – Routine maintenance of communication systems based on reliability centred maintenance, where the maintenance regime is based on system technology.

Annual expenditure requirements to deliver on these objectives are forecast through a detailed routine maintenance model. Specific priorities in the implementation of the routine maintenance program in the forthcoming period include:

- Continued rollout of the established maintenance regime for primary plant and secondary systems and the extension of these to new substation assets commissioned in the current period;
- Progressive implementation of the maintenance regime for transmission lines, including new ground and aerial based inspection and testing procedures, and maintenance tasks for new cable assets;
- Consolidation of vegetation clearance activities following the introduction of increased regulatory requirements in the current period; and
- Progressive implementation of a best practice maintenance program for communication assets.

These priorities result in an incremental increase in forecast expenditure in the forthcoming period driven by asset growth in the current period and ongoing implementation of the maintenance program.

5.5 Corrective Maintenance

In general, all assets exhibit asset life behaviours that form the basis for corrective management decisions, these are:

- **Potential Failure** – Condition of the asset changes (slow deterioration) to a point where resistance to failure is compromised (a potential failure); and
- **Functional Failure** – Condition of the asset continues to change following a potential failure (the rate of change is dependent on a wide range of internal and external factors) to a point where failure occurs (functional failure).

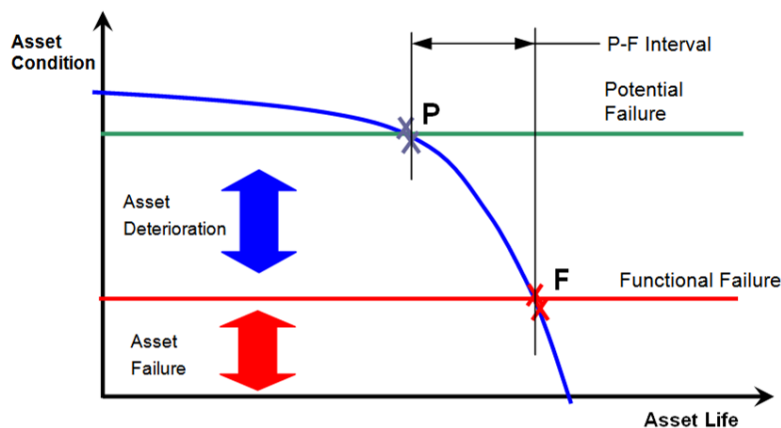


Figure 6: Asset life cycle condition curve

The corrective maintenance response is based on understanding the P-F interval of each asset and the associated failure consequences:

- A risk assessment of all reasonably expected failure modes for all substation and transmission line assets has been developed and documented. The risk assessment includes estimates of P-F intervals based on historical performance and industry knowledge; and
- Based on the P-F interval and failure consequence, a response time for each failure mode has been identified (the basis of this response is to provide a maintenance intervention before reaching functional failure unless the functional failure can be tolerated).

Generally, corrective maintenance response is driven by short P-F interval failure modes associated with safety, environmental and operational risk.

Annual expenditure requirements to deliver on these objectives are forecast through a corrective maintenance model.

An increased level of required corrective maintenance effort on transmission lines has been identified. This is based on a systematic condition assessment program for all transmission line assets (at component level). As a result of the implementation of that program, line components with developing potential failures are being systematically identified with response priority based on safety, operational and asset risk.

Although a complete inspection cycle for the network has not yet been completed, analysis of the risk and associated priority of defects indicates a higher level of maintenance response than has previously been applied is required.

Priority corrective maintenance to be managed in the forthcoming period includes:

- Detection and correction of asset defects (such as broken insulator assemblies that could drop a conductor to the ground);
- Detection and correction of high risk defects, such as third party unauthorised building or temporary structures or objects close to transmission line assets that may

breach safety clearances to high voltage conductors, or deteriorated aviation safety markers;

- Detection and correction of assets or components that have been functionally impaired; e.g. where corrosion has perforated tower or pole structural members, broken conductor or earth wire components, structure foundation cracking, and missing or loose structure bolts; and
- Detection and correction of assets or components at material risk of failure due to factors such as tower corrosion, structure foundation erosion/deterioration, and wear and tear of line hardware that supports the conductor.

A significant increase in corrective maintenance expenditure is forecast to be required in the forthcoming period, particularly related to transmission line assets.

5.6 Asset Refurbishment

Substation, transmission line and telecommunication assets each require refurbishment. The risk/response framework developed for corrective maintenance also identifies asset deterioration with longer P-F intervals. This information is grouped by asset type, and used to identify those assets requiring maintenance in addition to routine maintenance in order to maintain acceptable levels of safety, reliability and performance. The approach taken is to limit the refurbishment effort to high risk assets by:

- Classifying low risk/uncertain deterioration as 'monitor and review' (no maintenance action is taken at this stage other than continued inspection and review of condition over time);
- Group minor refurbishment with scheduled maintenance, where possible;
- Group common asset refurbishment work into packages in order to reduce the unit cost of refurbishment;
- Identifying those assets that will be replaced by capital projects within the P-F interval; and
- The required maintenance projects to deliver on these objectives and associated expenditure requirements are identified in the Asset Management Plan.

Major priorities in the coming period include:

- Condition assessment – prioritised assessments of the detailed asset condition of transmission lines through aerial and ground based assessments;
- Refurbishment and replacement projects – prioritised works to address risks on high risk plant including disconnector refurbishment, transformer oil containment and line tower, footing and insulator refurbishments;
- Asset overhauls – one-off major activities typically undertaken mid-life to ensure asset performance to end of technical life, including gas insulation switchgear refurbishment, remedial civil and drainage works at substation sites and substation building rectification works;
- Asset decommissioning – removal of high risk de-energised and surplus equipment, including disused transmission lines in urban areas and oil filled cables; and

- Network risk mitigation – works to address network management risks, including review of aerial line hazard marker identification against Australian standards to ensure mandated safety of aerial inspection tasks.

The above projects result in a significant increase in expenditure over current levels to address these issues.

5.7 Asset Replacement

Where assets have been assessed as reaching the end of their technical lives, and the aggregate effect of those assets is likely to cause a material impact on safety, reliability or performance and network and asset refurbishment is not cost effective, asset replacement projects are identified based on:

- The overall maintenance effort associated with asset life cycle;
- The functionality or health of the asset; and
- Major asset replacement projects are associated with substation replacement. The required replacement projects to deliver on these objectives and associated expenditure requirements are identified in the Asset Management Plan.

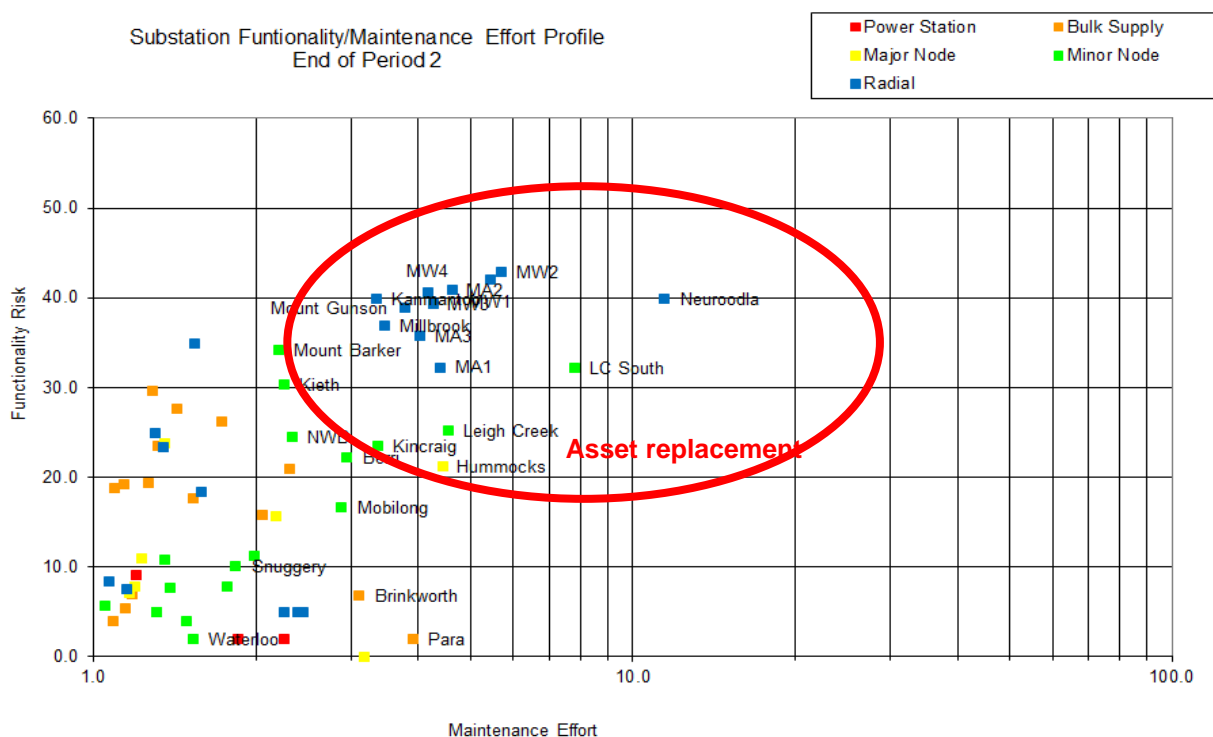


Figure 7: Substation asset replacement

Major priorities in the forthcoming period include:

- Substations identified for replacement as shown in Figure 7 above, focusing on high risk water pumping station loads and small radial substation sites;

- Other high priority substation component replacement works, including individual primary plant components and metering asset replacements;
- A continuation of substation and secondary system replacement projects from the current period, based on the reprioritised capital program; and
- An increase in telecommunication replacement projects, driven by asset end of life criteria and service level requirements.

The above replacement requirements result in a substantial increase in forecast expenditure over the current period.

6. Capital and Operating Investment Overview

The proposed asset management program for assets by type is summarised in Table 2 below. Appendix B provides further information on the progressive implementation of these asset management strategies over time.

Table 2: Proposed asset management program

Element	Indicative 2013-18 Expenditure (\$2012-13m)			Comment
	Subs	Lines	Telecoms	
Routine maintenance	44	28	8	Slight increase in expenditure driven by ongoing implementation of maintenance program to growing asset base
Corrective maintenance	27	40	1	Significant increase in line maintenance expenditure based on revealed asset risk
Operating refurbishment projects	35	30	1	Significant increase in expenditure over current levels to address areas of major risk including asset overhauls, asset decommissioning and network risk mitigation over and above ongoing condition assessment and refurbishment
Network Optimisation Projects	2	10	Nil	New expenditure driven by the objective to improve the capability of the transmission network in relation to power flows, asset utilisation and asset management
Capital refurbishment projects	Nil	55	Nil	New expenditure driven by line asset condition and risk to address identified hazards and extend asset life, efficiently deferring full replacement costs
Capital replacement projects	360	Nil	40	Increased expenditure driven by high risk substation replacements (pumping stations and radial sites), increased telecommunications replacements and completion of current substation and secondary system projects

7. Benefits for Customers

Execution of this Asset Management Strategy and the associated expenditure programs will provide the following benefits for customers based on the efficient management of risk – linked to the Network 2035 Vision objectives:

Safety, reliability and security of supply

The Asset Management Strategy underpins the delivery of safety, reliability and security of supply to customers through integrated long-term asset management planning, supported by robust data and information management processes; and investing in maintenance and capital replacement programs in order to manage risk and meet customer requirements in the provision of transmission services.

Deliver transmission services at lowest long-run cost

The Asset Management Strategy supports the delivery of network services to customers at lowest long-run cost, through the use of optimised asset maintenance practices and efficient asset replacement programs, aligned where possible with augmentation projects. Use of innovative solutions and new technology also assist in extending asset life, improving network utilisation and performance to deliver transmission services at lowest long-run cost.

Support economic development and community prosperity

The Asset Management Strategy facilitates economic development and community prosperity by maintaining the condition of the transmission network to meet the supply requirements of consumers and industry and delivering efficient and reliable electricity transmission services.

Supports development of lower emission energy sources

The Asset Management Strategy supports development of a lower emission energy future by managing asset risk in order to maximise the economic capacity and capability of the network through responsive maintenance and innovative asset management practices and initiatives.

Appendix A Network 2035 Vision

The Network 2035 Vision is for ElectraNet to own and operate a modern network which:

- Has the optimised balance of lowest whole of life cost against net long term benefits;
- Has an optimum network topology whilst leveraging current voltage levels;
- Is capable of handling dynamically changing power flow directions;
- Comprises assets that are flexible, modular & plug in/plug out;
- Can operate all primary assets to thermal limits;
- Has full remote monitoring and control of all assets;
- Requires minimal maintenance;
- Achieves continual quality of supply improvements;
- Minimises environmental impact; and
- Is not reliant on any particular maintenance, construction or equipment provider.

Appendix B Asset Management Profile Summary

The progressive implementation of the long-run asset management strategies by asset type and program is summarised in the figure below.

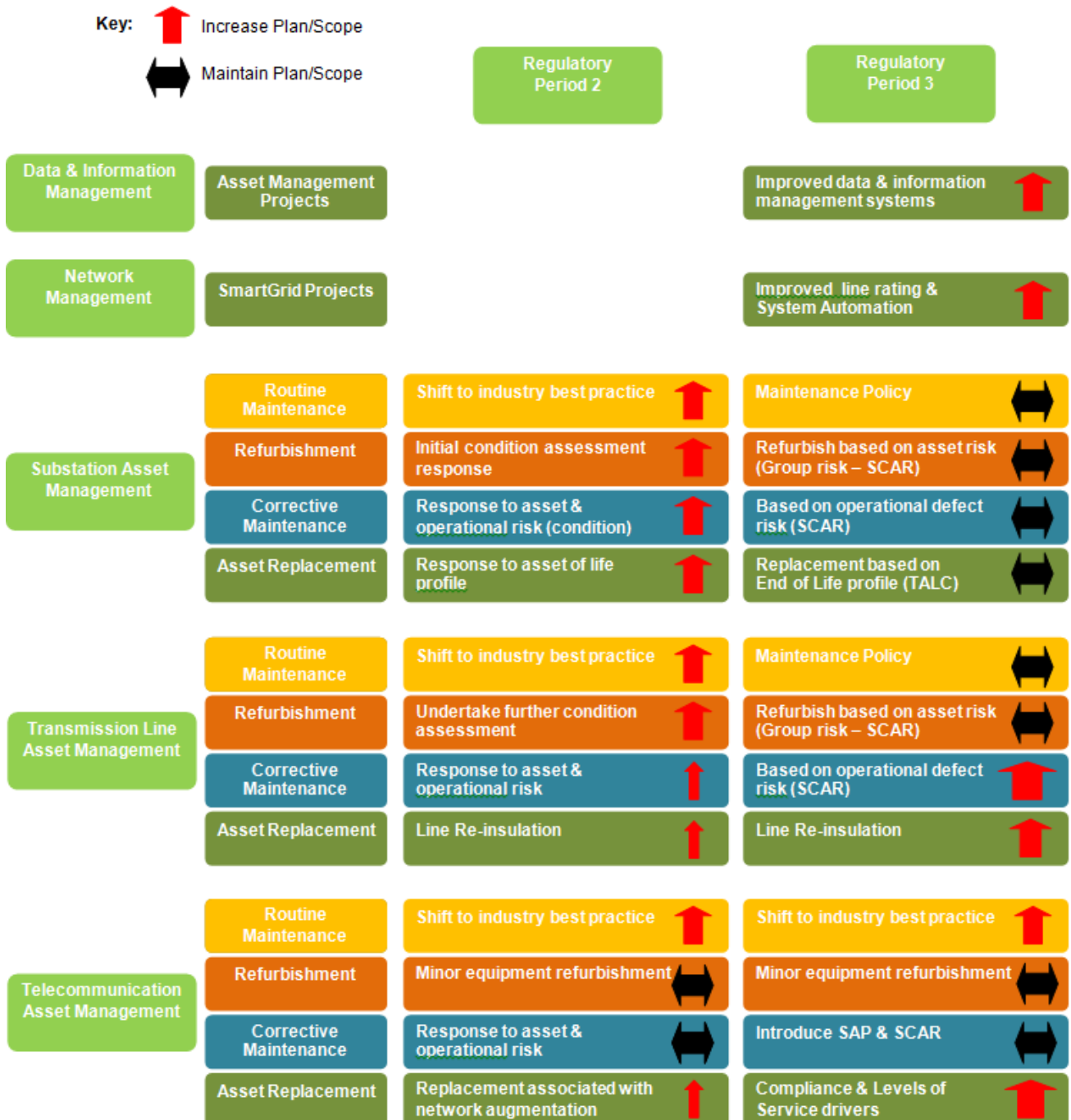


Figure 8: Summary of long-run asset management strategies