

# Attachment D2: Asset Management Strategy

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## Version Control

Version	Date	Description	Changed by
2.0	7 Jan 2013	Description of Implementation of AMS	Tim Anderson
2.1	14 Jan 2013	Guidelines for Augmentation Plans Update on Regulatory Requirements by J Worony Quality control for Asset Management Plans	Mike Schulzer
2.2	14 Feb 2013		Tim Anderson
2.3	27 Mar 2013	Insert Maintenance Categories	Mike Schulzer
2.4	5 Jun	Replace AMC with IAM scope diag	Mike Schulzer
		Updated asset mgnt framework	Mike Schulzer
		Added Maintenance flow diagram	Mike Schulzer
2.5	26 Aug 2013	Changes to keep document up-to-date	Tim Anderson
2.6	17 Sep 2013	Sect 4 Document alignment 6.4 Risk management objectives	Mike Schulzer
2.7	9 Oct 2013	6.3 Remove dates 10.1 Remove	Mike Schulzer
2.8	28 Oct 2013	Various changes a result of review by Senior Regulatory Advisor	Mike Schulzer
2.9	27 Mar 2014	6.2 Add "available and" before appropriate	Mike Schulzer
2.10	10 Apr  6 May	6.2 Added points 4 & 5 Optimising between life cycle stages Added points 11.2, 11.3, 11.4 6.3 Additional objectives Asset management & renewal planning, clauses and changed framework diagram Added page numbers	Mike Schulzer

2.11	23 May	<p>5.1 Added reference to communications plan, updated zone sub count, included 66kV operating Volts,</p> <p>5.2 Included reference to ISO 5500X</p> <p>5.3 Updated customer count</p> <p>7 Updated reference to Electrical Data Manual, updated steps taken to PAS 55 compliance</p> <p>8.1.1 Included requirement to comply with PAS 55 under ACT Utilities Act</p> <p>8.1.2 Added security requirements to Secondary systems &amp; metering</p> <p>8.1.4 Referenced SAIDI &amp; SAIFI target sources</p>	Mike Schulzer
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# 1 Purpose

This document forms the Asset Management Strategy for ActewAGL Distribution. It is intended to define the strategic objectives and approach to the management of the relevant physical assets within the organisation, in a manner which:

- Is optimised and sustainable in terms of whole-life, whole-system cost over the long-term; considered by ActewAGL to be 10 years for the purposes of appropriate network planning;
- Assists in the delivery of the company's overall Vision, Organisational Strategic Plan and Objectives;
- Appropriately considers how the organisation will establish and achieve current and future demand via the management of the condition and performance of the asset base;
- Appropriately considers the necessary current and future Asset Management capabilities of the organisation, in terms of people, processes, systems, equipment and data to achieve the identified outputs and objectives.

This document and the Asset Management approach captured within it are derived from and consistent with the overall ActewAGL Distribution Asset Management Policy (Doc. Ref.), which in turn is consistent with the overall ActewAGL Distribution Organisation Strategic Plan.

It is a live document, meaning it is periodically updated to reflect changes in the strategy and to effect improvements in the document. This document defines how the ActewAGL Asset Management Policy is to be implemented and achieved and provides the necessary framework and guidance to all relevant stakeholders.

It is intended to define what ActewAGL intends to achieve from its Asset Management activities and by when, including both:

- The current and future demand on, and condition and performance requirements of, the Electricity Distribution Network assets and ActewAGL's approach to assuring the delivery of these future requirements.
- The current and future Asset Management capabilities of ActewAGL, i.e. its processes, information, systems, people, tools, resources etc. and how we intend to develop our future capabilities to a level of maturity necessary to deliver our organisational goals.

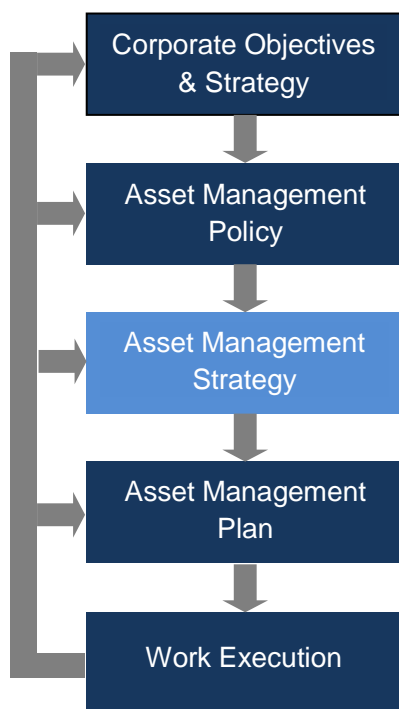
## 2 Good Practice Alignment

This document has been developed based on good practice guidance from internationally recognised sources, including the Global Forum on Maintenance and Asset Management (GFMAM) and the Institute of Asset Management (IAM). It has been

developed to comply with the relevant clauses of BSI PAS 55:2008 (specifically clause 4.3) and the emerging requirements of the ISO55000 series of standards.

### 3 Corporate Alignment

This Asset Management Strategy forms a key role within the overall ActewAGL Asset Management Framework and in ensuring a clear ‘line-of-sight’ between the company’s activities on the ground, including asset interventions, and the overall Energy Networks Organisation Strategic Plan. The generic steps in this line of sight, as defined by PAS55, are shown in the diagram below.



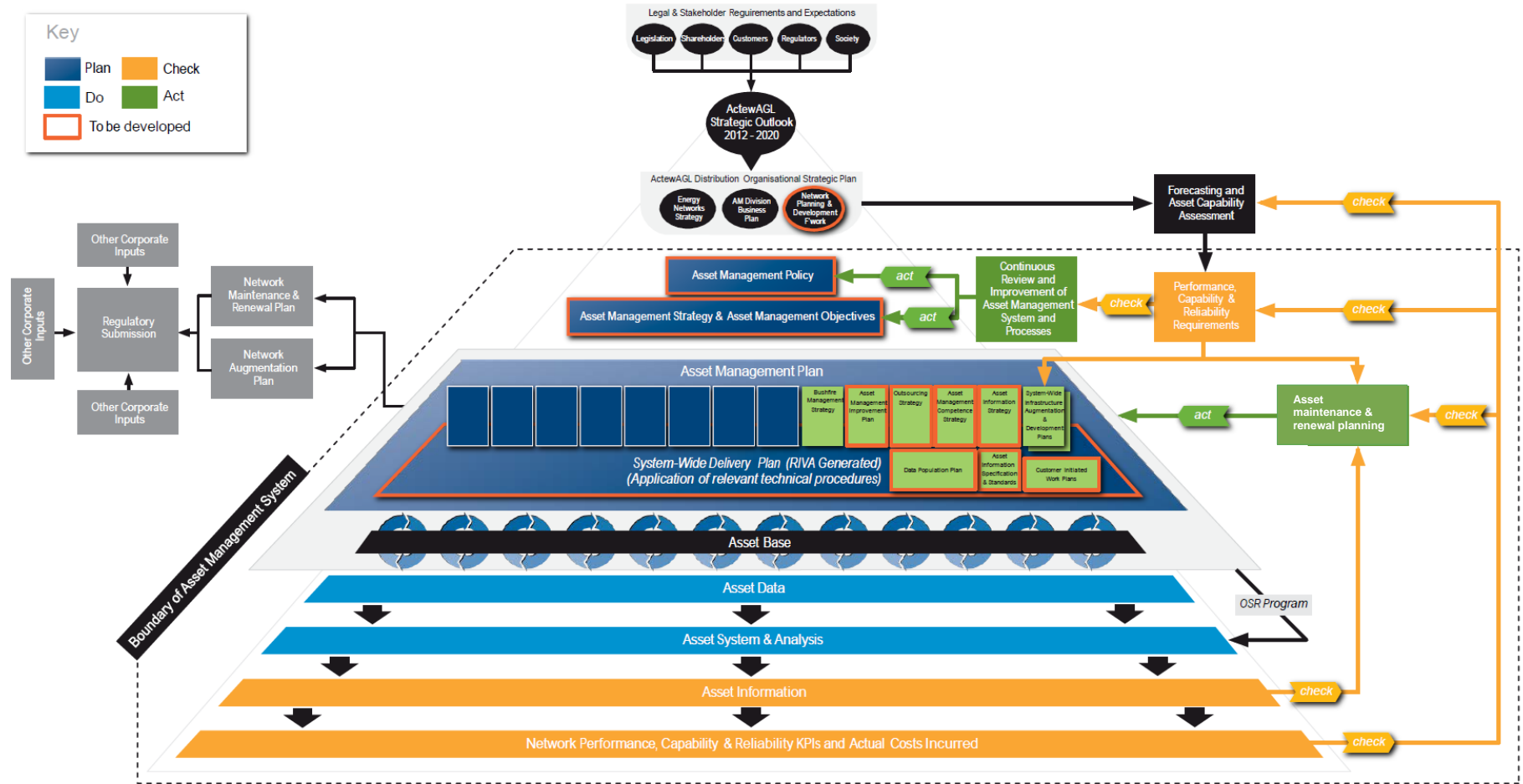
This Asset Management Strategy is considered ActewAGL’s second level of dissemination and definition of the organisation’s Asset Management ‘line of sight’, which is initiated by our Asset Management Policy and fully aligned with the overall ActewAGL Distribution Organisation Strategic Plan.

This document’s role within the overall ‘Plan, Do, Check, Act’ based ActewAGL Distribution Asset Management Framework for the Electricity Distribution Network is shown overleaf. ActewAGL has proactively incorporated the organisation’s Asset Management Objectives within this Asset Management Strategy as we consider the two

elements to be inherently linked and to ensure integration between the objectives and the strategy itself.



# Asset Management Framework



## 4 Document Alignment

This document is informed by the Asset Management Policy, which in turn is informed by corporate level policy objectives. The purpose of this document is to provide high level strategic directions on how the asset management policies will be implemented. These directions will include the scope of assets covered by the asset management system, the standards which will determine the structure, implementation and operation of the asset management system, and the geographical boundary of assets covered.

This document in turn, informs each of the asset specific plans and strategies and augmentation plans within the system wide asset management plan. The strategies contained in each of the asset or issue based strategy documents at the asset management plan level will be an extension of, and provide additional details to this document. The asset management strategy will also provide the framework for asset specific and augmentation plans generated within the asset management plan.

The asset management plan also includes a summary document which includes salient details from all asset specific, augmentation, customer initiated and demand response plans. The summary document, asset specific plans, augmentation, customer initiated and demand response plans together form the asset management plan.

## 5 Scope

### 5.1 Scope of Assets Covered

The scope of this Asset Management Strategy is consistent with the Asset Management Policy and applies to the provision, operation and maintenance of all networks, equipment and facilities relating to the following asset groups:

- Zone Sub-stations;
- Transmission System;
- Distribution System;
- Secondary Systems (SCADA/Protection);
- Operational Technology Systems;
- Asset information systems
- Revenue Metering;
- ActewAGL Distribution (ADD) Property; and
- Fleet.

Communications is covered in a separate document “ActewAGL Asset Management Communications Plan vX.X”

The relative scale of key elements of the asset base includes:

- Coverage area - 2358 square km
- Customers connected - approximately 170,000
- Overhead lines - 3100km
- Underground cables - 4400km
- Power poles - 53,000
- Zone substations – 12 with 1 proposed
- Switching Stations – 2
- Distribution substations > 4400 (ground pad-mounts, pole and chambers)
- Operating voltages 132/66/22/11kV and 415/240v

Further details of the assets within each asset group can be found in the relevant Asset Specific Plan

## 5.2 Scope of Asset Management System in PAS 55/ISO 5500X

**PAS 55 - Optimal management of physical assets** is a Publicly Available Specification published by the British Standards Institution.

This PAS gives guidance and a 28-point requirements checklist of good practices in physical asset management; typically this is relevant to gas, electricity and water utilities, road, air and rail transport systems, public facilities, process, manufacturing and natural resource industries. It is equally applicable to public and private sector, regulated or non-regulated environments. The standard is split into two parts:

- Part 1 - Specification for the optimised management of physical infrastructure assets
- Part 2 - Guidelines for the application of PAS 55-1

The International Standards Organisation (ISO) has accepted PAS 55 as the basis for development of the new ISO 5500X series of international standards.

The ISO 55000 series comprises three standards:

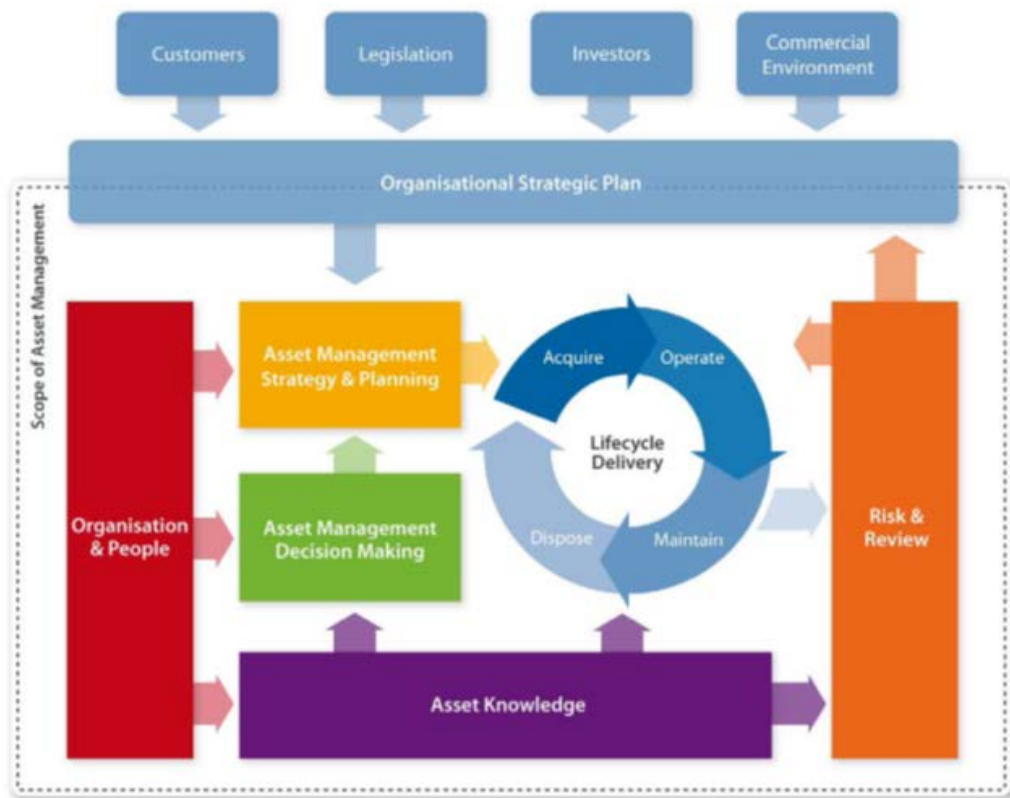
- ISO 55000 provides an overview of the subject of asset management and the standard terms and definitions to be used.
- ISO 55001 is the requirements specification for an integrated, effective management system for asset management. This standard defines requirements for a management system, in the same way as ISO 9001 specifies a quality management system, and ISO 14001 covers an environmental management system. ISO 55001 is not, therefore, a specification for an asset information management system (sometimes called "enterprise asset management" system).

Such software systems are, however, recognised to be useful aids ('enablers') for good asset management.

- ISO 55002 provides guidance for the implementation of such a system.

ActewAGL's strategic objective is to achieve compliance, with PAS 55, and later, compliance and accreditation with ISO 5500X.

The following diagram provides a schematic overview of the scope of asset management according to PAS 55. This is the basis of ActewAGL's Asset Management System.

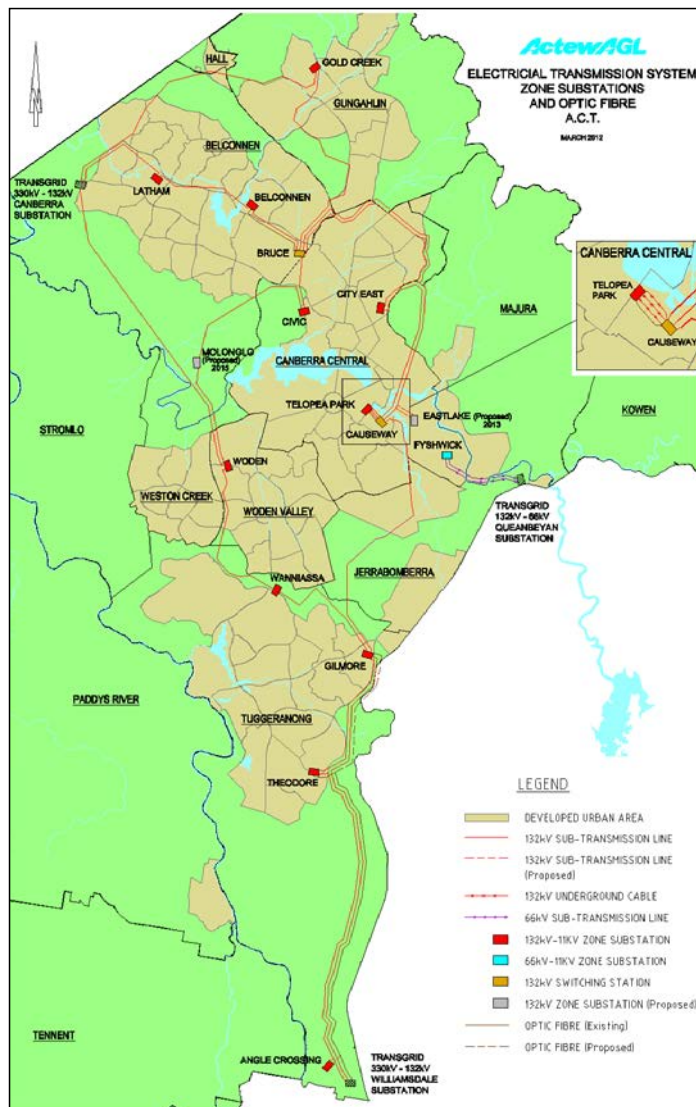


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### 5.3 Geographical Scope

ActewAGL owns and operates the electricity network in the ACT that provides supply to high voltage and low voltage customers in the region, and its neighbouring regions of New South Wales. It serves approximately 177,256 customers (ActewAGL Annual Report 2012/13). ActewAGL electricity transmission and distribution network comprises 2 supply points from TransGrid, 12 zone substations, two switching stations, approximately 2,300km of overhead and underground HV mains (including 132kV, 66kV, 22kV, and 11kV), and over 2,200km of LV mains, and 4,500 distribution substations.

The geographical area of the asset base considered in this Asset Management Strategy is shown in the diagram below.



## 6 Asset Management Objectives

Line-of-sight is the transparent linkage of the intended and actual operations throughout different levels of the organisation. This aligns the “top down” aspirations of the organization with the “bottom up” realities and opportunities of the assets.

The line-of-sight between organizational strategic direction and the day-to-day activities of managing assets is a vital component of the asset management system.

To assure line-of-sight between the ActewAGL Distribution Organisation Strategic Plan and the Asset Management Objectives incorporated within this Asset Management Strategy, the following sections provide a summary of the key objectives identified at each level of the ActewAGL Distribution Asset Management System. Each section is aligned with the previous section and ultimately the ActewAGL Distribution Organisation Specific Asset Plan for each asset group noted in 4.1.

### 6.1 Corporate Objectives

The key organisational objectives defined by the ActewAGL Distribution Organisation Strategic Plan are to:

1. Embed an effective safety culture throughout the Energy networks business.
2. Implement an effective workforce strategy to develop employee skills, leadership and accountability and to increase the readiness and ability of staff to adapt to change throughout the Energy Networks business.
3. Obtain and implement a replacement of legacy network operational systems.

The prime objective of the Asset Management element of the ActewAGL Distribution Strategy (2012 to 2015) is:

*“...to develop and implement a strategic asset management plan (based on the PAS 55 methodology) that is aligned with a risk based reliability centred maintenance (RCM) approach in order to control costs while meeting customer / community network reliability expectations.”*

### 6.2 Core Asset Management Principles

In order to deliver these policy statements, ActewAGL Distribution shall apply an Asset Management approach that encompasses the following principles:

1. The appropriate balance between stakeholder expectations regarding system reliability, risk and cost will be determined.
2. All Asset Management interventions will be justified by robust engineering analysis underpinned by available and appropriate asset information.
3. Future projects will be prioritised based on the lifecycle costs and impact on customers in accordance with Board directives.

4. The development of asset management plan(s) and life cycle activities will include consideration of the impact of actions in one life cycle phase upon the activities necessary in other life cycle phases.
5. Asset specific plans will be jointly optimized and prioritized, taking into account overall value, resource requirements, interdependencies, risks and performance impact.
6. Modern equivalent technology will be adopted but only where that technology has already been proven in a similar utility business environment.
7. The preventative maintenance program will be improved through implementation of a risk-based approach to determining maintenance requirements that deliver required levels of reliability.
8. The utilisation of internal and contracted labour resources will be improved;
9. The Asset Management capabilities of the organisation will be developed to an appropriate level to deliver efficient outcomes for customers and stakeholders.
10. Asset management activities will take into account the output and recommendations from consumer engagement initiatives to emphasis the partnership between ActewAGL and it's customers.

### 6.3 Asset Management Implementation Objectives

The overall aim of this Asset Management Strategy is to continue and build upon a well planned and executed infrastructure replacement program based on a PAS55 compliant methodology and Reliability Centred Maintenance (RCM) that controls costs while meeting customer and community expected reliability goals.

The specific and integrated Asset Management Objectives are:

1. Draft, finalise and implement a governance procedure to regulate changes and impose appropriate authorisations within the asset management system.
2. Include a reliability centred maintenance framework within each asset type.
3. Integrate RIVA with other operating system applications.
4. Establish the criticality of assets, based on a systematic analysis process considering cost, risk and performance, across the entire asset base.
5. Capital investment programmes will be considered and prioritised on an asset criticality basis, including appropriate whole-life cost modelling (cost/benefit analysis).
6. Develop decision support tools to support the above analysis.
7. Optimised maintenance interventions for all assets will be established, on a fully quantified cost/risk basis/criticality.
8. Manage, rectify and record faults based on the failure mode analysis undertaken as part of the above maintenance optimisation processes.
9. The Asset Management Improvement Plan will be fully implemented.
10. Establish appropriate Asset Management maturity capability requirements for ActewAGL across the Asset Management System.



## 6.4 Risk Management Objectives

The objective of risk management is to identify and to manage the uncertainties that attend a business enterprise. This is accomplished within the framework of asset management by taking the following steps:

1. Actively find and manage risks and develop comprehensive controls and treatment strategies.
2. Implement continuous improvement in risk management. Set asset performance targets and measures. Review and modify processes as required. Review and modify systems, resources and capability/skills to ensure continuous improvement.
3. Individuals responsible for asset management should be appropriately skilled, have adequate resources to check and improve controls, monitor risks, and the ability to communicate effectively with all stakeholders.
4. Decision making should include consideration of risks and the application of the risk management process as appropriate.
5. Risk management performance should be transparent and reported. This reporting is inherent in the “line of sight principle”.

## 7 Implementation of Asset Management System

An asset specific plan has been developed for each class of assets. These asset specific plans are managed using Riva DS software and are built up from the actions that need to be carried out on each individual asset. The asset specific plans also describe the databases that are used to store data about each type of asset.

In order to determine if new or augmented assets are required, it is necessary to carry out a demand forecast to test if the existing assets will have the capacity to provide the service required for the duration of the forecast period.

Demand forecasts and a comparison of the forecast to the asset capability of zone substations and HV feeders are documented in Zone Development Reports. These reports are saved in DM5.

A gap analysis will determine if the existing have the capability to meet forecast demands. The asset capability assessment (or ratings) are recorded in the Electrical Data Manual (Network Asset Strategy & Planning SharePoint site).

The following steps have been taken to ensure the implementation of a PAS 55 compliant Asset Management System which is in alignment with Corporate Vision, Policies and Strategies.

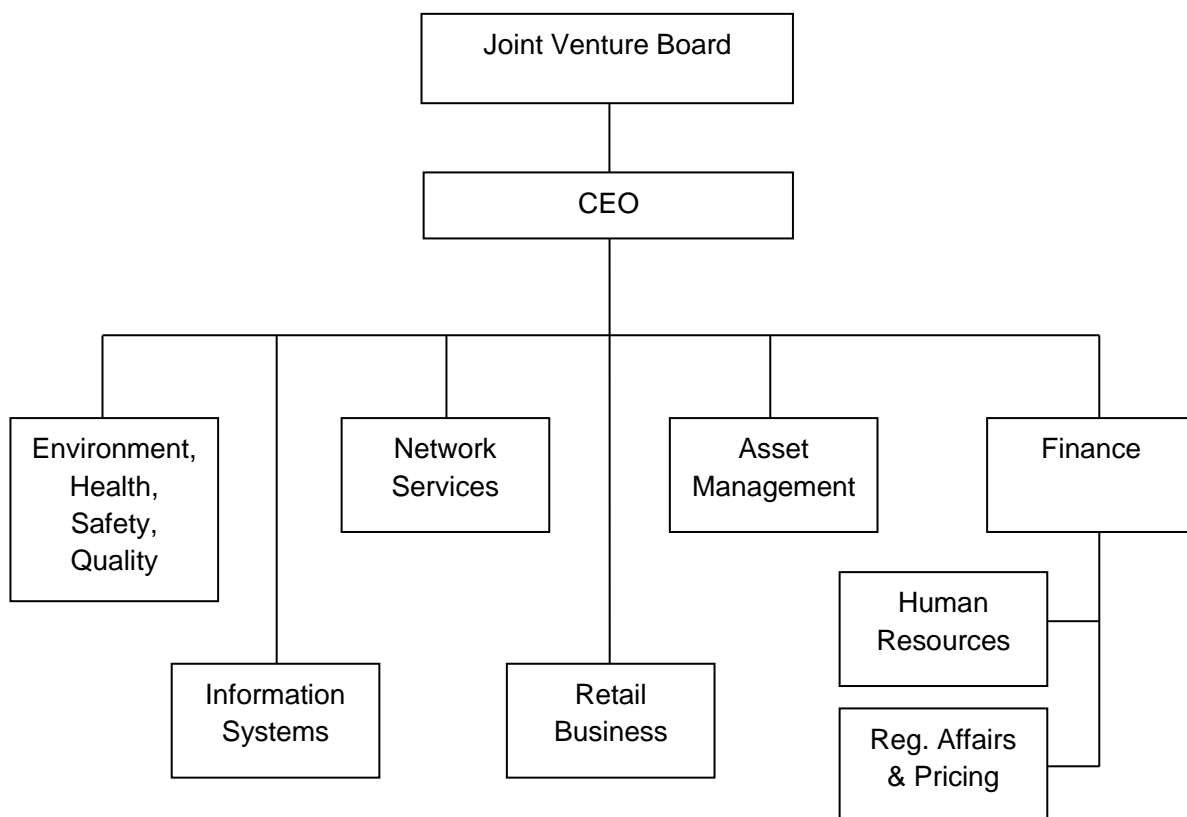
1. Undertake PAS 55 Training for key staff (completed).
2. Conduct an extensive PAS 55 Gap analysis (completed).



3. Undertake a PAS 55 Alignment workshop(completed).
4. Identify staff resource gaps and recruitment of key staff (completed).
5. Develop Asset Management Policy in line with Corporate Policies (completed).
6. Develop Asset Management Objectives/Strategy (this document) based on the Policy
7. Develop Asset Management framework & Document Hierarchy
8. Develop Template for Asset Specific Plans
9. Establish and embed communications plan and capabilities audit to ensure team approach within the Asset Management System
10. Identify and record network constraints and capture performance monitoring information streams
11. Develop Asset specific plans for all asset classes
12. Compile and prepare the final plan

The range of Asset Management activities considered within the scope of the Asset Management System are shown in the diagram of the Organisational Strategic Plan, on the following page.

To ensure delivery of the Asset Management activities defined above, ActewAGL has implemented the following organisational structure with clear definition and accountability for Asset Management activities.



## 8 Current Asset Status

### 8.1 Current Requirements

ActewAGL current requirements are based on meeting corporate objectives, the Asset Management Policy, and specific asset management plans of each asset group. Requirements of the specific asset groups are listed in the Asset Specific Plans, however the overall strategic objectives are as follows:

#### 8.1.1 Legislative, Regulatory and Statutory compliance

ActewAGL Distribution owns, operates and maintenance electricity distribution network supplying customers in the ACT and around one hundred customers located in NSW. This section provides an overview of main obligations.

ActewAGL Distribution is subject to a broad range of Commonwealth and territory-specific laws, as well as a number of Codes and procedures established by the relevant regulators. These obligations fall under the following broad categories.

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*Industry obligations*—these are mainly associated with the characteristics of ActewAGL Distribution as a network service provider and metering service provider. These include many of the obligations under the *Utilities Act 2000 (ACT)*, *Utilities (Network Facilities) Tax Act 2006 (ACT)*, *Electricity Feed-in (renewable Energy Premium) Act 2008*, *Territory-owned Corporations Act 1990 (ACT)*, Utility Services Licence, *Consumer Protection Code*, and *Ring-fencing guidelines*.

*Technical obligations*—these are associated with the technical requirements involved in owning, managing and operating electricity network assets. These obligations include aspects of the *Utilities Act 2000 (ACT)* and codes established under that Act such as the *Management of Electricity Network Assets Code*, and a variety of relevant Australian Standards. The *Utilities Act 2000 (ACT)* specifically requires compliance with PAS 55 and ISO 5500X. Compliance with ActewAGL Distribution and Industry Procedures developed in accordance with these Acts also create regulatory obligations. Technical and operational obligations are also covered by the National Electricity Rules, Australian Standards and electricity industry codes and guidelines.

*Safety*—these are associated with the safety risks involved in owning an electricity network, and the procedures and processes required to operate, maintain and build network assets and ensure employee and community safety. Relevant instruments include the *Occupational Health and Safety Act 2011 (ACT)*, the *Electrical Safety Act 1971 (ACT)*, *Utility Network (Public Safety) Regulation 2001*, the *Building Act 2004 (ACT)*, the *Construction (Occupation) Licensing Act 2004 (ACT)*, the *Scaffolding and Lifts Act 1912 (ACT)*, the *Dangerous Substances Act 2004 (ACT)*, the *Crimes Act 2000 (ACT)*, the *Utilities Act 2000 (ACT)*, and regulations, codes and procedures under these Acts.

*Environment, emergency and heritage obligations*—these relate to the operation of ActewAGL Distribution in the ACT environment, its responsibilities to prepare for, and in the event of, an emergency, as well as heritage issues. Obligations arise from the

*Environment Protection Act 1997 (ACT), the Litter Act 2004 (ACT), the Planning and Development Act 2007 (ACT), the Tree Protection Act 2005 (ACT), the Nature Conservation Act 1980 (ACT) the Emergencies Act 2004 (ACT), Heritage Act 2004 (ACT) and the Native Title Act 1993 (Cwth).*

*Market obligations*—these relate to the roles of ActewAGL Distribution as a distribution network service provider in the National Electricity Market (NEM). These obligations include compliance with the *National Electricity Law, National Electricity Retail Law and National Electricity Rules*, and policies and procedures developed by the Australian Energy Market Operator, *National Metrology Procedure*, including business-to-business (B2B) obligations and procedures, and other rules and directions. National Electricity Rules cover also a range of technical and operational obligations.

*Corporate obligations*—these are associated with running a large and complex business in Australia, which has significant economic, environmental, employment, and safety impacts in the community. These obligations relate to finance and taxation, intellectual property, human resources, terrorism and criminal matters, and ensuring appropriate compliance systems, internal auditing and due diligence procedures are in place. 2009–14 Relevant acts include *the Annual Reports (Government Agencies) Act 2004 (ACT), Taxation (Government Business Enterprises) Act 2003 (ACT), Corporations Act 2001 (Cwth) and the Privacy Act 1988 (Cwth).*

ActewAGL Distribution supplies electricity to a small number of customers who are located in NSW and are connected to ActewAGL's network. ActewAGL Distribution is exempt from a requirement to hold a network service provider licence in NSW. Nevertheless ActewAGL distribution has obligations to comply with a number of NSW legal and technical requirements relating to asset management which are specific to NSW. In particular most of the network related construction work is contestable in NSW, in addition for specific application specific NSW requirements relating to safety, technical standards, environmental management may apply.

### Network Asset Management and Operations

ActewAGL Distribution holds a licence under the *Utilities Act 2000 (ACT)* to provide electricity distribution and connection services. ActewAGL Distribution is also registered with the Australian Energy Market Operator as:

- *Distribution Network Service Provider (DNSP)*
- *Transmission Service Network Provider (TNSP)*
- *Metering Service Provider (MSP)*
- *Metering Data Provider (MDP)*

As summarized above, there is a broad range of legislative, statutory and technical requirements which are relevant to the operation and maintenance of the electricity network. The references which warrant special mention, and are key to asset management, are:

- *Utilities Act 2000 (ACT)*
- *Utility Network (Public Safety) Regulation 2001*
- *National Electricity Rules*
- *Occupational Health and Safety Act 2011 (ACT)*
- *Management of Electricity Network Assets Code*
- *Electricity Distribution Supply Standards Code*
- *Selected technical standards*
- *Selected industry guidelines*

### **8.1.2 Asset Capacity**

The strategic intent for asset management is to ensure that all assets must be of sufficient capacity to meet expected peak demands.

For the electricity network, this means the Zone sub-stations, Transmission and Distribution networks must, at all times, be adequately rated to ensure customers are not interrupted because of peak demand requirements.

This strategy also requires that Secondary Systems, such as communication, protection and SCADA, will have the capacity to function to requirements during periods when those systems are under stress and have adequate physical security to ensure against intrusion and mal-operation.

Similarly the Operational Technology and Metering shall have sufficient capacity and security to meet expected demands, and privacy requirements.

Buildings and structures containing distribution assets shall be adequately sized, secure and designed to contain and protect assets.

All fleet plant shall have the capacity to carry out intended duties, and the fleet size shall be sufficient to meet reasonably foreseeable demands.

### **8.1.3 Capability**

The Transmission network and Zone substations shall have the capability to continue to operate and serve customers in the event of a single contingency failure for at least 99% of the time.

Distribution systems must be capable of being restored within an acceptable time period, depending on the nature of the interruption, and of being supplied from an alternative source where reasonable.

Secondary systems, metering and operational technology shall be robust, modern, and have the capacity to meet normal operating requirements and reasonable levels of stress and overload.

Building and fleet shall be capable of supporting network requirements under normal operating requirements and during reasonable levels of stress and overload.

#### 8.1.4 Availability and Reliability

The AEMC has completed the final review of the national framework for distribution reliability in September. The intention is to introduce Australia wide standards for distribution network reliability, and ActewAGL needs to align it's reliability strategy with those emerging standards. To quote from the executive summary of the final review:

*Reliability refers to the extent to which customers have a continuous supply of electricity. Distribution networks facilitate the supply of electricity to end use customers within each jurisdiction of the National Electricity Market (NEM). The level of reliability that distribution networks are required to provide affects the level of investment that networks undertake. This ultimately feeds through to the electricity prices paid by customers.*

*As it would not be cost effective or feasible to remove all potential supply interruptions faced by customers, determining the appropriate level of reliability involves a trade-off between the cost of building and maintaining the networks and the value placed on reliability by customers.*

*As monopoly services, the price charged for distribution services is regulated. Regulation of reliability complements this price regulation to guard against any incentive for networks to reduce reliability levels in order to increase their profits.*

#### SAIDI SAIFI and other targets

The **System Average Interruption Duration Index (SAIDI)** is a non-availability indicator used by ActewAGL. SAIDI is the average outage duration for each customer served, and is calculated as:

$$\text{SAIDI} = \frac{\sum U_i N_i}{\sum N_i}$$

where  $N_i$  is the number of customers and  $U_i$  is the annual outage time for location  $i$ . In other words,

$$\text{SAIDI} = \frac{\text{sum of all customer interruption durations}}{\text{total number of customers served}}$$

The annual target for unplanned SAIDI is 40 minutes / customer (Environment and Sustainable Development Directorate, Selected jurisdictional urban SAIDI and SAIFI standards, 2013).

The **System Average Interruption Frequency Index (SAIFI)** is a reliability indicator used by ActewAGL. SAIFI is the average number of interruptions that a customer would experience, and is calculated as

$$SAIFI = \frac{\sum \lambda_i N_i}{\sum N_i}$$

where  $\lambda_i$  is the failure rate and  $N_i$  is the number of customers for location  $i$ . In other words,

$$SAIFI = \frac{\text{total number of customer interruptions}}{\text{total number of customers served}}$$

SAIFI is measured in units of interruptions per customer.

The annual target for SAIFI is 1.20 outages / customer (Environment and Sustainable Development Directorate, Selected jurisdictional urban SAIDI and SAIFI standards, 2013).

### 8.1.5 Definition of Maintenance Categories

AAD's maintenance activities include condition monitoring, planned maintenance and unplanned maintenance. These are explained in more detail below.

Condition Monitoring – planned inspections, tests, measurements, surveys

Examples: Pole inspections, Transformer Oil Analysis, Monthly Zone Substation Inspections.

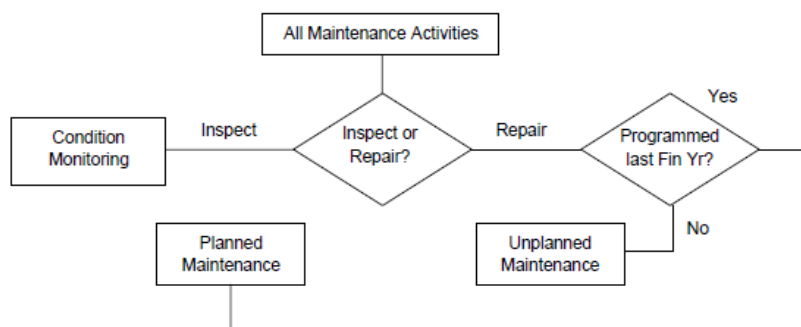
Planned Maintenance – Maintenance specifically identified before the Fin year commences on a business as usual basis

Examples: Planned replacement of silica gel breathers, replace air break switch XXXX with Gas insulated switch YYYY on pole ZZZZ

Unplanned maintenance – Emergency repairs, response to failures, work resulting from short term planning resulting from emergencies or failures and works resulting from a condition monitoring activity and the works on the asset wasn't previously identified as a planned activity.

Examples: Repair replacement of failed equipment, even if this work required a few days planning to execute

The type of maintenance activity undertaken will often depend on the outcome of condition monitoring, as depicted in the following diagram.



## 8.2 Performance Monitoring

Asset performance is measured against Key Performance Indicators (KPIs) and relevant targets. Areas of continual improvement, alignment with stakeholder requirements, and defined responsibility and processes for measurement, recording and reporting are also included where relevant.

KPIs for each asset class are identified in the Asset Specific Plans.

The Asset Management Improvement Plan (AMIP) identifies a number of improvement initiatives and timescales in this area.

# 9 Future Asset Status

## 9.1 Stakeholder Engagement

In order to assure appropriate understanding of needs and demand on the Electricity Distribution Network, ActewAGL routinely engages and communicates with stakeholders via the following key channels:

- National or state policy and legislation;
- AER;
- TransGrid
- Customer surveys;
- Employee surveys;



- Publication and consultation of proposals and plans;
- ACT Government;
- Publication of comparator and benchmarking analysis;
- Triple bottom-line accounting;

The list of stakeholders includes, but is not necessarily restricted to:

- Customers
- Legislators and regulators
- Planning Authorities
- Commercial Developers ,
- Suppliers, including energy suppliers
- Owners and the board
- Employees and management
- The public and environment

## 9.2 Future Requirements

The stakeholder engagement is combined with our internal demand analysis processes, including 'Forecasting and Asset Capability Assessment' and the current 'Network Ten Year Augmentation Plan' (Ref. 2008-2009 - all-in-one 20080530) to identify the following key network demand targets.

Future electricity demand requirements are detailed in the Zone Reports

Augmentations for future requirements will also need to incorporate AER consumer engagement guidelines.

### 9.2.1 Legislative, regulatory and statutory compliance

The existing legislative, regulatory and statutory requirements relate to the way ActewAGL Distribution designs, contracts, operates and maintains electricity supply network.

These are covered in the key references documents such as:

- *Utilities Act 2000 (ACT)*
- *Utility Network (Public Safety) Regulation 2001*
- *National Electricity Rules*
- *Occupational Health and Safety Act 2011 (ACT)*
- *Management of Electricity Network Assets Code*
- *Electricity Distribution Supply Standards Code*
- *Selected technical standards*
- *Selected industry guidelines*

The key technical requirements relate to the quality (e.g. voltage levels, harmonics, voltage dips and fluctuations) and reliability ( customer minutes of supply, number of interruptions of electrical supply as specified in *and Management of Electricity Network*

*Assets Code.* The following reliability targets for planned and unplanned outages have been set by the Regulators and published in the Electricity *Supply Technical Standards Code*:

- SAIDI 91.0 minutes
- CAIDI 74.6 minutes
- SAIFI 1.2

ActewAGL Distribution's general obligations in relation to reliability of electricity supply are also covered in the National Electricity Rules and are based on management of the network asset in a way consistent with "good industry practice".

From the next regulatory period (2014-2019) network reliability performance will be subject to financial penalties and incentives under Service Target Performance Incentive Scheme (STPIS) which is administered by the Australian Energy Regulator (AER) consistently STPIS guidelines were published by AER in 2009.

Australian Energy Market Commission announced commencement of new requirements under an umbrella of Network Planning and Expansion Framework which imposes on ActewAGL new obligations in relation to:

- Consistent application of regulatory investment test for transmission and distribution (AER's RIT-D Guidelines were published in August 2013)
- Annual planning review and publication of network planning reports (publication date subject to jurisdictional approximately June 2013 – December 2013)
- Coordination of planning process with other networks
- Development and implementation of Demand Side Management Strategy

Detailed requirements are covered in the amendments to National Electricity Rules in particular chapter 5. The above implementation deadlines are "indicative" only or "expected" dates only.

### **9.2.2 Capacity**

Asset capacity requirements will be impacted by load growth, which in turn will be driven by population growth and changes in technology, society, and economics.

Technical capacity will be defined and updated in the Electrical Data Manual, (Network Asset Strategy & Planning SharePoint site)

Network assets shall be utilised at an efficient level, taking into account careful and detailed forecasts of energy demand.

Demand management incentives shall be included in the management of network capacity.

Our tariff strategy is currently being reviewed, and tariffs amended to better reflect the cost of supplying network capacity to each customer. Tariffs shall be based on a bottom up approach, according to the costs to connect each class of customers

This may include identifying customers where we can maximise the value of smart meters.

### **AEMC Smart Meter Cost Recovery Review**

On 1 January 2010, changes to the National Electricity Law came into effect allowing energy ministers in participating jurisdictions to make a ministerial determination which requires electricity distributors to:

- Roll-out smart meters for customers in their jurisdiction; and/or
- Conduct pilots and trials of smart meters and other related technologies, including direct load control. The framework for electricity distributors in the National Electricity Market to recover their costs is set out in Chapter 6 of the National Electricity Rules.

The purpose of the Smart Meter Cost Recovery Review was to provide advice on whether the existing framework for cost recovery in Chapter 6 of the N E Rules is appropriate for costs relating to smart meters and other related technology which has been installed as a result of a ministerial determination. In the review these technologies were referred to as 'mandated smart metering infrastructure'.

#### **9.2.3 Capability**

Asset capability shall be managed to provide services required by customers, at a least cost, whole of life, whole of system approach. The extent of services required will be updated to meet stakeholder expectation.

#### **9.2.4 Availability and Reliability**

The following strategic issues shall be taken into account when managing network assets in regard to availability and reliability:

- Regulatory requirements
- Stakeholder expectations
- The N-1 principle
- The value that customers assign to lost load (VoLL) when setting future reliability targets.

#### **9.2.5 Condition or remaining life of assets**

The condition and remaining life of all network assets shall be monitored. Decisions to maintain, refurbish, or replace assets shall be based on a risk management process. The overall risk shall be determined by the condition of the asset, the consequences of failure, and the likelihood of detection and intervention prior to failure.

### 9.2.6 Guidelines for Greenfield and Augmentation Planning

Greenfield development and augmentation of the Distribution Network is essential to keep up with forecast growth, customer requirements, legislative and regulatory requirements, and technological requirements. The process is initiated by a perceived future need, either from stakeholder requirements, of a forecast derived from historical trends. This future requirement is matched against the capabilities of the existing assets to derive a quantitative, time based measure of the anticipated capacity shortfall.

Solutions are proposed to meet the shortfall, and they may range from a single proposal where the solution is obvious with no practical alternatives, to a range of alternatives, including non-network solutions. The Net Present Value of each of the proposed solutions should be calculated, and the most suitable option recommended based on NPV and other relevant factors.

This entire process shall be documented as a project, before entering into the Asset Management Plan, and augmentation project documents will be audited against a check sheet. Details entered into the document may vary with the nature, size and complexity of the project, but the check sheet shall be annotated to reflect the contents of the project document, and reasons for not including items.

## 10 Asset Management Capabilities

This section describes ActewAGL's Asset Management capabilities and its strategy to develop these to an appropriate level of maturity. ActewAGL is developing its Asset Management capabilities to align with the requirements of BSI PAS 55.

A Gap Analysis of ActewAGL's capabilities against the requirements of PAS 55 has been undertaken which has resulted in the development of an Asset Management Improvement Plan. This plan summarises the improvement activities that ActewAGL intends to undertake in order to become compliant with the requirements of PAS 55.

ActewAGL also intends to acquire and operate modern and cost effective facilities which enable surveillance and condition monitoring of high value or critical assets. This capability will assist in minimising whole of life, whole of system costs by facilitating timely and effective interventions.

## 11 Asset Maintenance and Renewal Planning

This is an activity that is centrally embedded in the Asset Management System Framework, and has feedback links from the asset information system, network performance and costs, and performance, capability and reliability requirements. The purpose of this activity is to take into account the information from the different feedback

links, and synthesise it into actions required in the asset management plan. This planning activity is conducted by asset managers, expert in the field of assets under their management.

## 12 Asset Specific Strategies

### 12.1 Asset Specific Plans

At an asset specific group level, ActewAGL Distribution's approach to Asset Management Optimisation varies, due to either differences in the asset types included within the group or because of the relative criticality or maturity of that asset group when compared to others within the same organisation.

Full details of the specific Asset Management approach for each asset group is included in the relevant Asset Specific Plan (ASP). These Asset Specific Plans contain complete asset logistic and health details and will also determine the all future activities, (maintenance, refurbishment, replacement or disposal), of the assets within the plan. It is essential to populate and maintain very high quality data within the ASPs, to maintain a high level of confidence and quality performance from the Asset Management System.

A standard approved checklist will be applied to set up and maintain data quality within the ASP. The checklist applies to the quality of narratives and primary quantitative data, as well as derived programs and cash flow. Asset managers are responsible for checking the quality of data in ASPs referring to assets under their control. Approval & Accountability

### 12.2 Criteria for the prioritisation or optimisation of plans

Prioritisation and optimisation of asset specific plans will be based on the following criteria:

- Risk of injury to public or employees
- Risk to environment
- Risk of damage to assets, particularly critical assets
- Risk of service interruption, particularly critical customers, numerous customers, or of long duration.
- Cost/Benefit evaluation of the project.
- Reputational risk.

### 12.3 Consideration of asset criticality

The criticality of an asset will be a determining factor in formulating its strategies and plans. The asset strategy consists of the life cycle activities planned for that asset, and the nature, frequency and priority of these activities will depend on the extent to which the assets are exposed to the risks listed in 12.2.

### 12.4 Consideration of stakeholder requirements

Stakeholder requirements, including safety, environmental issues, continuity of supply, reputation and cost/benefit considerations will be taken into account when determining the asset criticality in 12.3.

Ensuring that assets will meet the forward view of demand requirements is a key issue in managing the risk of loss of continuity of supply. This risk must be managed in the asset specific strategies, and plans. Section 7 provides an explanation of how this requirement will be met.

## 13 Accountability and Responsibility

This document has been authorised by the ActewAGL General Manager – Asset Management.

The Senior Branch Manager – Asset Strategy and Planning, is fully accountable for this Asset Management Strategy, its communication, implementation, continual development and its on-going authorisation by the by the ActewAGL General Manager – Asset Management.

## 14 Publication & Communication

An original approved copy of the current version of this Asset Management Strategy is retained in formal company records at all times. Communication to relevant internal and external stakeholders, service providers and other relevant parties who require knowledge of the Asset Management Strategy is via the following mechanisms:

- Intranet publication,
- Internet publication;
- Standard company briefing processes;
- Training courses; and
- Contractual requirements;

Details on communications senders, recipients, content and media are presented in the Asset Management Communications Plan.

## 15 Continuous Review & Improvement

Accountability for the continuous review and improvement of this Asset Management Strategy sits with the ActewAGL Senior Branch Manager – Asset Strategy and Planning. They shall be accountable for arranging its review at least once every year.

Each review shall include due consideration:

- That the document remains relevant, suitable, consistent and appropriate for the implementation of the Asset Management Policy.
- Of opportunities for continual improvement in terms of Asset Management activities;
- Of opportunities for improvements in the format, communication and implementation of the Asset Management Strategy itself