Information Technology Strategy

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1. Introduction

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

Safe, secure and reliable electricity transmission services depend critically on IT infrastructure to provide accurate, reliable and detailed information on the condition of assets and status of the network to support real time operational decision making and long-term investment and asset management planning.

The information technology (IT) environment in which ElectraNet operates presents a range of challenges and opportunities for the attainment of that vision. These include introduction of new technologies, increasing risk of cyber-attacks, increasing flexibility among the workforce requiring more flexible IT services and greater demands on the performance and usability of IT assets.

This Strategy responds to those shifts and enables the achievement of the Network 2035 Vision by focusing on the following objectives:

- Ensure safe, secure, reliable supply
- Deliver transmission services at lowest long-run cost

To that end, the Strategy identifies nine strategic priorities which support these Network 2035 objectives:

- Ensure safe, secure, reliable supply
  - Reduce network configuration change management risks.
  - Reduce Transmission System Operator "information overload".
  - Enable safe, secure, reliable transmission system operation.
  - Ensure availability and security of IT assets.
- Deliver transmission services at lowest long-run cost
  - Enable remote configuration and control of network assets.
  - Enable remote access at any time.
  - Improve the quality and accessibility of operational and corporate information.
  - Improve the way in which systems streamline business processes.
  - Minimise whole of life costs and risks.

Delivering on the strategic priorities will require a range of IT investments spanning the security/compliance, replacement and augmentation investment categories. The capital investment required to execute this strategy totals approximately $80m over the 2013-18 regulatory period.

As a mature user of technology, ElectraNet seeks to be neither "leading edge" nor "bleeding edge" in its implementation of IT solutions, and strives to achieve an efficient balance between innovation and timely replacement.

The scope of this Strategy is to identify and describe the strategic responses in relation to IT that arise from the service delivery obligations of the business, operating within the changing external and internal environment.

This Strategy encapsulates both network and non-network IT as well as security/ compliance related IT. Network IT is defined as any information technology or operational technology that is directly related to planning, designing, constructing, monitoring, controlling and maintaining the transmission network. Non-network IT is defined as information technology that is related to the enablement of corporate functions.

Telecommunications is outside the scope of this IT Strategy and is detailed in the Network Development Strategy and Asset Management Strategy.

Execution of this IT Strategy and associated capital expenditure program will provide a range of tangible benefits for customers:

- Ensure safe, secure, reliable supply by:
  - Enabling network planning and operating decisions to be made based on high-quality, holistic information about the network and the assets.
- Deliver transmission services at lowest long-run cost by:
  - Enabling existing assets to be fully utilised and efficiently operated and maintained.
  - Ensuring new or replacement assets are commissioned as and when needed, in the most efficient manner.
  - Improving the efficiency of core and support business operations.

2. Strategic Context

2.1 External drivers

A review of the external environment confirms a small number of high impact trends, as follows:

Service Requirements

- Ever increasing customer demands for more efficient network performance, anchored in the security and reliability requirements of the National Electricity Rules and reliability obligations of the Electricity Transmission Code.
- Greater demand for real-time management of the network to optimise network operation and performance.
- Increasing complexity and risk due to the age, condition and spread of the transmission network and the resultant diversity of technologies.

Increasing IP Connectivity

- Information Technology and Operational Technology (e.g. SCADA, Secondary Systems, etc.) are converging; with transmission network equipment increasingly able to be connected to IP-based computer networks and consequently configured, monitored, diagnosed and controlled remotely.

- The increasing amount of Operational Technology that is connected to IP-based computer networks means that data volumes are increasing rapidly. Data generated through asset management activities such as laser surveying, digital photography, digital videography, etc. is compounding this growth rapidly.

Security Threats

- Computer networks and computer systems are under increasing attack from terrorist, criminal and ideological groups with operational risks amplified by the increasing amount of Operational Technology that is connected to IP-based computer networks.
- The frequency and severity of natural disaster events such as floods, earthquakes and storms is increasing, placing even more pressure on the robustness and recoverability of business processes and supporting information technology.

Service Maturity

- Data and software integration standards (e.g. CIM) and technologies (e.g. SOA) have matured sufficiently to enable reliable and transparent exchange of data between disparate systems in near real time to present an Integrated Information Environment.
- Cloud computing (i.e. data storage and software provided through the Internet) is now a viable option for delivery of business computing needs, although concerns about data sovereignty, security and availability remain.

User Trends

- More and more work is being done outside of work places and work hours resulting in increasing demand for information and supporting systems to be available 24 hours a day, 7 days a week from remote locations, including from mobile devices such as mobile telephones and tablet computers.
- User expectations with respect to convenience and ease of use are being shaped by their experiences with consumer technology such as smart phones and devices with these expectations impacting on productivity of employees and contractors, attraction and retention of employees.

2.2 Network 2035 Vision

In response to these drivers, ElectraNet's Network 2035 Vision sets out four key objectives to ensure the network meets South Australia's needs in an increasingly dynamic and changing environment. Two of these objectives directly influence IT strategy and execution, as follows:

- Ensure safe, secure, reliable supply – requiring secure digital systems that allow the network to be configured and operated remotely.
- Deliver transmission services at lowest long-run cost – requiring digital systems that enable existing assets to be fully utilised and that ensure assets are maintained, replaced and added at the optimal time and in the most efficient manner.

2.3 Internal drivers

ElectraNet has established the following corporate objectives which impact directly on IT service requirements, with the overriding goal of lifting the efficiency of capital expenditure and operating expenditure activities through smarter business processes supported by tightly integrated IT systems:

- Have integrated systems and processes to assist efficient operations and quality outcomes.
- Adapt and apply efficient new technologies in the network and in the business, integrating new technologies into work methods.
- Deliver key processes that are automated and capable of providing timely online status of their health.
- Demonstrate that all processes are efficient and effective with acceptable risk and produce repeatable quality outcomes.
- Prove that we value innovation and creativity as a learning organisation through continuous process improvement.
- Incorporate “smarter network” principles in Asset, Engineering, Telecommunications and Information Technology strategies.
- Improve effectiveness and efficiency of enterprise and other business systems and knowledge management practices.

2.4 International best practice

A range of Australian and International Standards influence ElectraNet’s IT Strategy. The most significant of these are:

- IEC 61850 – a standard for the design of electrical substation automation
- HB 221:2004 – a Standards Australia handbook for Business Continuity Management
- ISO 27001 – Information Security Management System standard

Complementing these standards is a number of best-practice frameworks, methodologies and approaches that have been adopted as de facto standards both in Australia and globally, including:

- ITIL – the Information Technology Infrastructure Library; a framework for service management that has been proven to maximise the effectiveness and efficiency of IT service delivery
- COBIT – a framework for business governance and control of IT that ensures alignment of IT strategy and execution with business needs
- PMBOK – the Project Management Institute’s Project Management Body of Knowledge and the basis for ElectraNet’s network and IT project management methodologies

- Virtualisation – whereby multiple virtual computers can be hosted on a single physical computer thereby reducing space, energy and cooling requirements

These requirements guide the framework within which IT assets are planned, delivered, operated and maintained by the business.

3. Strategic Implications

3.1 SWOT analysis

The strengths, weaknesses, opportunities and threats related to ElectraNet's IT capability are assessed on an annual basis. The current SWOT below reflects the steadily improving maturity of ElectraNet's IT capability.

STRENGTHS	WEAKNESSES
• Modern and supported technology platform • Skilled and committed staff • Effective external partnerships • Access to capital funding • Improving business ownership of projects • Ability to attract, develop and retain talent	• Complex system landscape with insufficient integration and low data quality in some areas • Extraction of some information can be difficult and time consuming • Interaction of end users with systems is suboptimal , and some processes are not straight-forward
THREATS	**OPPORTUNITIES**
• Increasing digitisation and connectivity increases exposure to cyber attacks • Loss of skilled resources from the mining boom, National Broadband Network, etc. • Increasing scale, complexity, risk profile and management effort of IT assets (systems, infrastructure)	• Delivery of an "Integrated Information Environment" to improve access to information for decision making, and reliability of the information • Incorporate "smarter network" principles in Asset, Engineering, Telecommunications and IT strategies • Continue to leverage SAP, consolidating where practical and complementing where necessary • Risk mitigation and efficiency opportunities through alternative models (e.g. "cloud") • Continued adopted of appropriate standards (e.g. CIM, SOA) • Consolidate platforms, vendors and partners

3.2 Implications for future IT strategy

From the above analysis, it is clear that the IT Strategy can support the Network 2035 guiding principles by supporting safe, secure and reliable supply, and delivering value for money. In particular, the IT strategy can address a number of key challenges and opportunities.

Network 2035 Vision Guiding Principle	Challenges and Opportunities
Our Network – Technology	Convergence of operational technology and IT presents opportunities for fully utilising the capacity of the existing network by combining information about the condition, configuration, performance and loading of the assets.
Our Network - Security	The increasingly "IP-connected" nature of electrical assets combined with the ever-increasing incidence of cyber-attacks means that the digital security of the network is now as critical as the physical security of the assets.
Our Assets – Operate	The remote monitoring and management of the network is completely dependent on secure digital systems that are able to be accessed remotely by authorised parties.
Our Assets - Maintain	Remote monitoring and management of the network minimises requirements to work on site.

4. Strategic Priorities

The strategic priorities of the IT strategy are grouped under the Network 2035 objectives which they support.

4.1 Ensure safe, secure, reliable supply

- Reduce SCADA and secondary systems configuration change management risks.
- Reduce Transmission System Operator "information overload".
- Enable safe, secure, reliable transmission system operation.
- Ensure the availability, accessibility, security and recoverability of data, systems and infrastructure is aligned to business and operational needs.

4.2 Deliver transmission services at lowest long-run cost

- Enable the remote configuration, monitoring, diagnosis and control of network assets.
- Enable remote access to information and systems by authorised parties at any time.
- Improve the quality and accessibility of operational and corporate information to optimise decision making.
- Improve the way in which systems streamline business processes to deliver cost efficiencies and mitigate operational risks.
- Minimise the whole of life costs and risks associated with operating and maintaining IT assets.

5. Delivering on the Strategic Priorities

Delivering on the strategic priorities will require a range of IT investments spanning security/compliance, replacement and augmentation. This section describes the initiatives required to deliver on the strategic priorities.

All IT investments are subject to a rigorous business case assessment that considers quantitative and qualitative outcomes to ensure alignment to business objectives and realisable net benefits.

5.1 Ensure safe, secure, reliable supply

5.1.1 Reducing configuration change management risks

In order to reduce configuration change management risks ElectraNet needs to:

- Establish a network device configuration management system that is secure, available, vendor-supported and continually enhanced to meet operational needs.
- Establish an engineering drawing management system that is secure, available, vendor-supported and continually enhanced to meet operational needs.

5.1.2 Reducing transmission system operator information overload

In order to reduce transmission system operator information overload ElectraNet needs to:

- Maintain operational logging and fault investigation tools that deliver the information that is needed, in the timeframes in which it is needed, in a format that enables transmission system operators to quickly make high-quality decisions.
- Continually enhance operational control systems in line with good industry practice and evolving operational needs to ensure that transmission system operators are presented with timely, relevant and holistic information upon which they can quickly make high-quality decisions.
- Continually enhance substation alarm systems to filter out less relevant information and spurious alarms, allowing transmission system operators to quickly identify situations requiring their attention.
- Consider opportunities to utilise geo-referenced information including asset information, laser survey data and digital imagery to enable transmission system operators to tailor the types and volumes of information presented to them depending on the situation.

5.1.3 Ensuring availability and security

In order to ensure availability and security of operational and business systems ElectraNet needs to:

- Ensure the security of substation, SCADA and business networks by maintaining and strengthening digital security systems, infrastructure and practices.

- Maintain IT assets (both hardware and software) at model/version levels that deliver the performance, reliability, security and recoverability required by the processes which they support.
- Maintain backup and recovery systems and practices that deliver recovery point and recovery time objectives as determined by operational and business needs.
- Continue to employ an ElectraNet-owned, “on-premise” model for both production and disaster recovery data centre facilities.
- Expand IT data centre facilities to address growth in capacity requirements driven by projected increases in the number of users, an increase in the processing and storage requirements of users and the increasing penetration of IT into operational and business processes.
- Continue to implement processing and data storage virtualisation technologies to maximise the resilience and flexibility of the IT infrastructure.

5.1.4 Enabling safe, secure, reliable transmission system operation

In order to enable safe, secure and reliable transmission system operation ElectraNet needs to:

- Maintain an energy management system that is secure, available, vendor-supported and continually enhanced to meet operational needs.
- Take full advantage of the opportunities presented by the convergence of information technology and operational technology to provide network planners, market operators, transmission system operators and asset management planners with comprehensive and timely information about the performance, condition and history of network assets.
- Implement solutions that reflect good industry practice including dynamic constraint systems, operational logging and fault investigation tools, switching planning and management tools, outage planning and management tools, substation automation and alarm systems.

5.2 Deliver transmission services at lowest long-run cost

5.2.1 Enabling remote configuration and management of network assets

In order to enable remote configuration and management of network assets ElectraNet needs to:

- Implement an Operations Wide Area Network (OPSWAN) that allows interrogation of substation equipment without the need to travel to site.
- Implement a network device configuration management system that allows configuration information to be delivered to devices remotely under strict change control.

5.2.2 Enabling remote access at any time

In order to enable remote access to information and systems at any time ElectraNet needs to:

- Maintain IT assets (both hardware and software) at model/version levels that deliver the performance, reliability, security and recoverability required by the processes which they support.
- Continue to implement selected operational and business systems in a manner that allows them to be accessed by suitably authorised users via the Internet using a range of devices including personal computers, tablet computers and smart phones.

5.2.3 Improving the quality and accessibility of information

In order to improve the quality and accessibility of information ElectraNet needs to:

- Maintain all operational and business systems at version levels that maximise compatibility with other systems and allow a standards-based approach to data exchange and interoperability.
- Transition core operational and business processes (e.g. transmission billing) away from reliance on manual intervention and end-user solutions (e.g. Microsoft Excel) towards integrated enterprise systems.
- Take advantage of emerging industry standards such as the Common Information Model to standardise and streamline data definition and exchange.
- Enhance systems that support operational and business processes to provide users with streamlined user-interfaces that encourage the capture of accurate information, once, at the point it is generated and allow users to experience an “integrated information environment” where all information relevant to the activity they are performing is presented to them seamlessly.
- Implement tools, processes and governance structures that enforce data quality and foster a culture of information ownership.
- Rationalise the number of database management systems being used to store structured data.
- Maintain systems being used to store unstructured data (e.g. documents and drawings) at version levels that maximise compatibility with other systems.

5.2.4 Improving the way in which systems streamline business processes

In order to improve the way in which systems streamline business processes ElectraNet needs to:

- Embrace a “process-centric” view of issues and opportunities and utilise ElectraNet’s growing database of process maps as the guiding framework for any process improvement initiatives.
- Maintain operational and business systems at version levels that allow ElectraNet to take advantage of standard, built-in functionality that implements contemporary best-practice in business process automation.

- Continually enhance operational and business systems in line with good industry practice and evolving needs, ensuring rigorous business case assessment of both quantitative and qualitative benefits and clear organisational responsibility for achieving these.
- Remove manual intervention and opportunities for human error from processes wherever possible.

5.2.5 Minimising whole of life costs and risks

In order to minimise the whole of life costs and risks associated with acquiring, operating and maintaining hardware and software IT assets ElectraNet needs to:

- Implement systems to monitor the performance, condition and reliability of IT assets.
- Replace IT assets once their performance, condition or reliability is no longer sufficient to meet operational and business needs.
- Maintain IT assets at model/version levels that ensure cost-effective vendor support and maintenance arrangements.
- Maintain IT assets at model/version levels that maximise compatibility and minimise interoperability issues.
- Assess emerging technologies, standards and practices – implementing these as and when appropriate to provide a modern, effective and efficient information technology environment.
- Maintain an engaged and motivated IT workforce that is suitably skilled and experienced, supported by key partnerships with external providers.

6. Capital Investment Overview

This section presents a summary of the capital investment required to execute the IT Strategy, broken down into the following categories:

- Network – directly relating to planning, designing, constructing, monitoring, controlling and maintaining the transmission network;
- Non-network – related to support of corporate functions.

Individual projects are listed in the ICT Management Plan.

6.1 Network

Network		
Security/Compliance		
Need:	Mitigate risks associated with higher level of digitisation of network, increased incidence of attacks and compliance with legislative obligations	$3m
Investment:	Implement/upgrade digital security equipment and software to protect IT and OT systems from attack	
Cust Benefit:	Ensure safe, secure, reliable supply	
Replacement		
Need:	Mitigate risks associated with software/equipment that is at end-of-technical life or obsolete	$12m
Investment:	Replace/upgrade various end-of-life operational planning, monitoring and control systems	
Cust Benefit:	Ensures safe, secure, reliable supply and avoids significant ongoing cost and risk increases resulting from maintaining obsolete software/equipment	
Augmentation		
Need:	Ensure secure transmission system operation and enhance remote monitoring and control	$15m
Investment:	Implement new/enhance existing operational planning, monitoring and control systems	
Cust Benefit:	Enable safe, secure operation of the network Optimise asset utilisation and maintenance	
Total		**$30m**

6.2 Non-Network

Non-Network		
Replacement		
Need: Investment: Cust Benefit:	Mitigate risks associated with equipment that is at end-of-technical life or obsolete Replace/upgrade end-of-life equipment including servers, desktops, laptops, storage, backup/restore and IP network equipment Avoids significant ongoing cost and risk increases resulting from maintaining obsolete equipment	$12m
Need: Investment: Cust Benefit:	Mitigate security, compatibility and supportability risks Replace/upgrade end-of-life software including applications, database management systems and operating systems Avoids significant ongoing cost and risk increases resulting from maintaining obsolete software	$20m
Augmentation		
Need: Investment: Cust Benefit:	Ensure business support systems are effective and efficient, providing high-quality, integrated information for decision-making Implement new/enhance existing business support systems Avoids cost increases resulting from manual/inefficient business processes	$15m
Total		**$47m**

7. Benefits for Customers

Execution of this IT strategy and associated capital expenditure program will provide the following benefits for customers:

- Ensure safe, secure, reliable supply by:
  - Enabling network planning and operating decisions to be made based on high quality, holistic information about the network and assets.
- Deliver transmission services at lowest long-run cost by:
  - Enabling existing assets to be fully utilised and efficiently operated and maintained;
  - Ensuring new or replacement assets are commissioned as and when needed, in the most efficient manner;
  - Improving the efficiency of core and support business operations.