



## Program Business Need Identification

Power and Water Corporation

**CONTROLLED DOCUMENT**

**NMSC4**

### SCADA and Communications Networks Technical Code Compliance

---

Proposed:

A handwritten signature in black ink, appearing to read "Cameron McKay", written over a horizontal line.

Cameron McKay  
Asset Manager - SCADA  
Power Networks  
Date: 7/1/2018

Approved:

A handwritten signature in black ink, appearing to read "Jim McKay", written over a horizontal line.

Jim McKay  
A/Executive General Manager  
Power Networks  
Power and Water Corporation  
Date: 7/1/2018

A handwritten signature in black ink, appearing to read "Stuart Eassie", written over a horizontal line.

Stuart Eassie  
Senior Manager Network  
Assets  
Power Networks  
Date: 7/1/2018



1 Project Summary ..... 3

2 Recommendation ..... 3

3 Description of Issues..... 3

4 Potential Solution ..... 4

5 Strategic Alignment ..... 5

6 Timing Constraints..... 5

7 Expected Benefits ..... 5

8 Milestones (mm/yyyy)..... 6

9 Key Stakeholders ..... 7

10 Resource Requirements ..... 7

11 Delivery Risk ..... 7

12 Financial Impacts ..... 7

    12.1 Capex Profile ..... 8

    12.2 Opex Implications ..... 8

    12.3 Variance ..... 8

13 References ..... 8

    13.1 Legislation and Regulatory Obligations ..... 8

Appendix A..... 9

    1 Forecast Expenditure by Expenditure Category..... 9

    2 Forecast Expenditure by RAB Category..... 9

    3 Forecast Expenditure by CA RIN Category ..... 11

    4 Forecast Asset Disposals by RAB Category..... 11

    5 Forecast Capital Contributions by RAB Category (if required)..... 12



## 1 Project Summary

<b>Project Name:</b>	SCADA and Communications Networks Technical Code Compliance Program		
<b>Project No:</b>		<b>SAP Ref:</b>	
<b>Financial Commencement:</b>	<b>Year</b>	2019/2020	
<b>Business Unit:</b>	Power Networks		
<b>Program Owner (GM):</b>	Djuna Pollard	<b>Phone No:</b>	08 8985 8431
<b>Contact Officer:</b>	Cameron McKay	<b>Phone No:</b>	08 8985 7150
<b>Date of Submission:</b>		<b>File Ref No:</b>	
<b>Submission Number:</b>		<b>Priority Score:</b>	
<b>Primary Driver:</b>	Compliance	<b>Secondary Driver:</b>	Service Improvement
<b>Program Classification:</b>	Capital Program of Works		

## 2 Recommendation

### MINOR PROJECTS UP TO \$1M NOT COVERED BY AN EXISTING BNI

It is recommended that the Executive General Manager Power Networks note the proposed five year SCADA and Communications Networks Technical Code Compliance Program for an estimated budget of \$0.73 million, and approve the inclusion of this Program into the SCI for this amount, with a corresponding completion date of June 2024.

Note that individual projects within the program will be documented in Business Case Category C to be approved by the Executive General Manager Power Networks.

Note that this project is forecast to occur outside of the current SCI period and in the next regulatory period of FY20 to FY24.

## 3 Description of Issues

This BNI describes the needs identified on the network related to compliance with Technical Code requirements.



### 3.1 Technical Code Compliance

Power Networks (PN) Technical Code and Network Planning Criteria Section 2.9.2 requires diverse protection systems for primary assets with operating voltages of 66kV or above. To meet this criterion with the protection schemes, as used within Power and Water Corporation (Power and Water), diverse communications paths to these sites are required. The following zone substation (ZSS) sites have been identified as not complying with this requirement: [REDACTED]

### 3.2 Project Needs

<b>a. Compliance</b>
<p>Clause 2.9.2 of the Network Technical Code requires Power and Water to provide two fully independent protection schemes for the network.</p> <p>To meet these obligations, it is necessary for Power and Water to provide two independent communications services into each zone substation.</p>
<b>b. Reliability</b>
<p>The Supervisory Control and Data Acquisition (SCADA) and Communications network is critical to ensure the reliable operation of the network. It is required for operators at System Control to:</p> <ul style="list-style-type: none"> <li>• monitor the state of the network at all times;</li> <li>• operate the network in a timely and efficient manner without the need to send a technician to site;</li> <li>• react to network events to ensure the network remains in a safe configuration; and</li> <li>• switch the network to restore supply.</li> </ul>

## 4 Potential Solution

Three options have been identified to resolve the issues:

#### Option 1 - Do nothing

Doing nothing will expose Power and Water to potential breaches of the PN Technical Code as well as a greater risk of networks outages.

#### Option 2 - Complete the proposed program of works

Undertaking the program of works will allow Power and Water to meet its obligations within the PN Technical Code. Currently, the identified zone substations have both communications paths provided by a single fibre or microwave radio link. Loss of the single fibre or microwave link will result in the loss of both protection services between the zone substations which could result in the requirement to take the power line out of service until the protection services are fully restored. Adding an additional communications path will provide two fully independent protection services for the plant at each zone substation.

#### Option 3 - Reduced scope – only complete the compliance items



Undertaking a reduced scope will not allow full compliance with the PN Technical Code.

#### 4.1 Preferred Option

The preferred solution is option 2 to undertake the complete program of works. This will provide compliance with the PN Technical Code and make the protection schemes more resilient to a failure of a communications bearer.

The forecast capex required for this project is shown in Table 1 below.

Program	FY20	FY21	FY22	FY23	FY24	Total
Compliance	\$0.00	\$0.00	\$0.39	\$0.12	\$0.22	\$0.73
<b>Total</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.39</b>	<b>\$0.12</b>	<b>\$0.22</b>	<b>\$0.73</b>

Table 1 Forecast capex

## 5 Strategic Alignment

This project aligns with the Strategic Asset Management Plan (SAMP), Asset (Class) Management Plans (AMP) and is contributing to the achievement of the Key Strategy (as per the Board’s Strategic Directions Paper) of safety and reliability by enabling Power and Water and System Control to maintain control of the network to ensure it remains in a safe condition and any faults or incidents can be addressed in a timely manner.

## 6 Timing Constraints

The timing of this program is designed to bring Power and Water into compliance with the PN Technical Code during the 5 years from July 2019 to June 2024. Until the works are completed Power and Water will carry the risk of the non-compliance.

## 7 Expected Benefits

As far as the project provides capacity to Power and Water’s SCADA and Communications network, this project provides benefits to the network as listed in the table below.

Driver	Benefit	Measure
Compliance	<p>Clause 2.92 of the PN Technical Code requires Power Water to maintain a communications network with two fully independent protection schemes.</p> <p>To meet these obligations, it is necessary for Power and Water to provide two independent communications services to each zone substation.</p>	Compliant with PN Technical Code.



Driver	Benefit	Measure
Service Improvement	<p>The SCADA and Communications network is critical to ensure the reliable operation of the network. It is required for operators at System Control to:</p> <ul style="list-style-type: none"> <li>• Monitor the state of the network at all times</li> <li>• operate the network in a timely and efficient manner without the need to send a technician to site</li> <li>• react to network events to ensure the network remains in a safe configuration</li> <li>• switch the network to restore supply</li> </ul> <p>Having two independent communications path to each zone substation increases the network availability by removing a single point of failure in the communications network.</p>	<p>Availability of the SCADA and Communications services. Availability metric to be developed.</p>

## 8 Milestones (mm/yyyy)

Investment Planning	Project Development	Project Commitment	Project Delivery	Review
01/2018	NA	01/2019	06/2024	09/2024

The program delivery is scheduled to run over 5 years from July 2019 to June 2024. A program review will be held at the end of the 5 year program as well as interim reviews at the end of each Financial Year.



## 9 Key Stakeholders

Stakeholder	Responsibility
Internal governance stakeholders	Executive General Manager Power Networks
	Group Manager Service Delivery
	Chief Engineer
	Senior Manager Asset Management
Internal Design Stakeholders	Manager Protection
	Manager Test & Protection Services
	General Manager System Control
	Manager SCADA and Communication Services
External – Unions and public	Electrical Trades Union (ETU)
External regulators	Utilities Commission
	Australian Energy Regulator

## 10 Resource Requirements

Not applicable. Resourcing requirements for this program are considered Business as Usual and will be incorporated into the development of Category C Business Cases for each individual replacement.

## 11 Delivery Risk

Between FY15 and FY17, Service Delivery was focused on major capital projects that were of high importance and criticality to the network. As a result, lower criticality projects were deferred. To ensure the delivery of the proposed SCADA and Communications works, the forecast includes a higher reliance on external contractors to reduce the reliance on Power and Water’s internal Service Delivery group.

## 12 Financial Impacts

The forecast for this program of works has been built up based on a bottom up build using known non-compliances that have been identified through internal audits.



### 12.1 Capex Profile

Phase	2017-18 (\$'000)	2018-19 (\$'000)	2019-20 (\$'000)	2020-21 (\$'000)	2021-22 (\$'000)	2022-23 (\$'000)	2023-24 (\$'000)
Investment Planning							
Project Development							
Project Commitment							
Project Delivery			0	0	390	115	225
Review							
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>390</b>	<b>115</b>	<b>225</b>

### 12.2 Opex Implications

There are no opex step changes associated with this asset category or capex opex substation opportunities.

### 12.3 Variance

This forecast for this program of works extends beyond the current SCI period. The first two years on this program aligns with the last two years of the 2017-2018 SCI

## 13 References

### 13.1 Legislation and Regulatory Obligations

- Power Networks Technical Code and Network Planning Criteria Section 2.9.2





## Appendix A

### 1 Forecast Expenditure by Expenditure Category

This information is to allow the forecast to be escalated.

The expenditure is to be in today’s dollars.

RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Total	\$0.0	\$0.00	\$0.39	\$0.12	\$0.22
Labour	\$0.00	\$0.00	\$0.05	\$0.02	\$0.02
Materials	\$0.00	\$0.00	\$0.20	\$0.00	\$0.00
Contractors	\$0.00	\$0.00	\$0.14	\$0.10	\$0.20
Other	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

#### Definitions

Labour – The cost of direct internal Labour for the project. No overheads.

Materials – the cost of materials used in the project. No overheads.

Contractors – the cost of work performed by Contractors in the project, whether Labour or Materials. No overheads.

Other – expenditure that is not Labour, Materials or Contractors. No overheads.

### 2 Forecast Expenditure by RAB Category

Provide the forecast expenditure for this project / or program, in total and broken down by Regulated Asset Base (RAB) category, by year for the regulatory control period.

This information is to enable regulatory modelling.

The forecast is to be in today’s dollars (\$2017-18).

**Program Business Need Identification**



RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Total	\$0.0	\$0.00	\$0.39	\$0.12	\$0.22
<b>System Capex</b>					
Substations					
Distribution Lines					
Transmission Lines					
LV Services					
Distribution Substations					
Distribution Switchgear					
Protection					
SCADA					
Communications			\$0.39	\$0.12	\$0.22
<b>Non-system Capex</b>					
Land and Easements					
Property					
IT and Communications					
Motor Vehicles					
Plant and Equipment					



### 3 Forecast Expenditure by CA RIN Category

This information is to allow the forecast to be escalated.

The expenditure is to be in today's dollars.

RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Total	\$0.0	\$0.0	\$0.39	\$0.12	\$0.22
Repex					
Augex	\$0.0	\$0.00	\$0.39	\$0.12	\$0.22
Connections					
Non-network: IT					
Non-network: Vehicles					
Non-network: Buildings and property					
Non-network SCADA & network control					
Non-network: Other					

### 4 Forecast Asset Disposals by RAB Category

Provide the forecast asset disposals for this project / or program, in total and broken down by RAB category, by year for the regulatory control period.

This information is to enable regulatory modelling.

The forecast is to be in today's dollars (\$2017-18).

RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
System Capex					
Substations					



RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Distribution Lines					
Transmission Lines					
LV Services					
Distribution Substations					
Distribution Switchgear					
Protection					
SCADA					
Communications					
<b>Non-system Capex</b>					
Land and Easements					
Property					
IT and Communications					
Motor Vehicles					
Plant and Equipment					

## 5 Forecast Capital Contributions by RAB Category (if required)

Provide the forecast capital contributions for this project / or program, in total and broken down by RAB category, by year for the regulatory control period.

This information is to enable regulatory modelling.

The forecast is to be in today's dollars (\$2017-18).

RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Total	\$0.0	\$0.0	\$0.39	\$0.12	\$0.22
<b>System Capex</b>					

**Program Business Need Identification**



RAB Category	Regulatory Year (A\$M, \$2017-18, Jul to Jun years)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Substations					
Distribution Lines					
Transmission Lines					
LV Services					
Distribution Substations					
Distribution Switchgear					
Protection					
SCADA					
Communications		\$0.00	\$0.39	\$0.12	\$0.22
<b>Non-system Capex</b>					
Land and Easements					
Property					
IT and Communications					
Motor Vehicles					
Plant and Equipment					