

Network compliance (NLC)

Regulatory Business Case (RBC) 2024-29

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1 Summary

This business case has been prepared to support the 2024-29 Regulatory Proposal. The business case demonstrates that Power and Water has undertaken appropriate analysis of the need for the expenditure and identified credible options that will resolve the need and ensure that Power and Water continues to meet the National Electricity Objectives and maintain the quality, reliability, and security of supply of standard control services and maintain the safety of the distribution system.

The proposed investment identified in this business case will undergo further assessment and scrutiny through Power and Water’s normal governance processes prior to implementation and delivery.

This business case addresses the risks presented by non-compliant installations identified by inspections and members of the public

1.1 Business need

The network non-compliance rectification (NLC) program was established in 2018/19 to address ad-hoc non-compliance issues identified on the network. This program is focused on insufficient clearance of conductors or encroachment related issues (referred to as ‘trespass’) of conductors. It may also result in expenditure on other assets to resolve the conductor compliance issues or to resolve other non-compliances such as distribution transformers that are installed too low or need to be moved to address encroachment issues.

The program addresses non-compliance issues that are identified during routine inspections or that are reported by the public and are not covered by other specific programs. Accordingly, there is no duplication between programs.

Analysis of the historical data shows there were an average of eight non-compliance notices identified and addressed each year from 2018/19 to 2021/22. We expect that this level of non-compliance and that require rectification will continue at similar levels during the next regulatory period.

Based on our assessment of risk there is a need to continue to address non-compliant assets during the next regulatory period.

1.2 Options analysis

The options considered to resolve this need are shown in Table 1.

Table 1 Summary of credible options

Option No.	Option name	Description	Recommended
1	Do nothing	Do not continue the NLC program	No
2	Continue the NLC program	Continue the NLC program (based on historical expenditure)	Yes

As part of a holistic assessment, we considered non-network solutions, capex/opex trade-offs and retirement or derating, but found that none of these options addressed the underlying network issues.

A cost benefit analysis was completed for each of the options where the risk reduction, compared to Option 1, was used as the benefit achieved by the option.

1.3 Recommendation

The recommended option is Option 2 – Continue the NLC program at an estimated cost of \$1.8 million (real 2021/22) to be most prudent and cost effective to meet the identified needs.

The recommended option:

- Is aligned to our strategy and asset objectives.
- Continues the existing NLC program at a volume of activity and expenditure based on historical levels.
- Is aligned to customer expectations for maintaining the reliability and safety of the network.
- Is deliverable.

Table 2 shows a summary of the expenditure requirements for the 2024-29 regulatory period.

Table 2 Annual capital and operational expenditure (\$'000, real 2021/22)

Item	FY25	FY26	FY27	FY28	FY29	Total
Capex	365	365	365	365	365	1,825
Opex	-	-	-	-	-	-
Total	365	365	365	365	365	1,825

2 Identified need

This section provides the background and context to this business case, identifies the issues that are posing increasing risks of overhead services wires to Power and Water and its customers, describes the current mitigation program and its delivery status, highlights the consequence of asset failure, and provides a risk assessment of the inherent risk if no investment is undertaken.

This program addresses non-compliance issues that are identified during routine inspections or that are reported by the public and are not covered by other specific programs. Accordingly, there is no duplication between programs.

Analysis of the historical data shows there were an average of eight non-compliances identified and addressed each year from 2018/19 to 2021/22. We expect that this level of non-compliance and that require rectification will continue at similar levels during the next regulatory period.

2.1 Compliance obligations

The Network Licence, enforced by the Electricity Reform Act 2000, requires Power and Water to remain compliant with legislative requirements, including Power Networks Technical Code and Planning Criteria (Technical Code) and the Northern Territory National Electricity Rules (NT NER).

The NT NER and Technical Code both require that Power and Water ensure the network is safe for both staff and the public.

Failure to maintain compliance can result in financial penalties.

Power and Water is also required to meet the minimum ground clearances and clearance to structures as per the Electricity Reform (Safety and Technical) Regulations and the AS7000:2016 Standard. Depending upon the relevant category, different kinds of infringements are applicable as per Schedule 4 of the Electricity Reform (Safety and Technical) Regulations¹ if there are safety clearance breaches posing health and safety issues for public.

Causes of non-compliance

There are two primary causes of non-compliance associated with this program:

- conductor clearances, where conductors are operating below the minimum safe clearance requirements from the ground, and
- conductor encroachment-related issues, where conductors are operating within the minimum safe clearances from structures.

2.1.1 Conductor ground clearance

Conductor sag can be caused through reduction in conductor tension caused by:

- Thermal loading of conductors (where higher loading levels heats the conductor causing it to expand and therefore reducing tension).
- Fatigue and damage to conductor strands, and/or attachment fittings.
- Movement / leaning of the pole reducing tension.

¹ [Legislation Database \(nt.gov.au\)](https://www.nt.gov.au/legislation/database/)

2.1.2 Encroachment-related issues

Inspections may identify that conductors may not be installed within an easement or have encroached on neighbouring property. This may be the result of

- Incorrect construction.
- Change of standards, that have been updated since the asset was constructed.
- Introduction of obstructions.
- Subdivisions/rezoning that has not taken account of minimum clearances.

Collectively, these encroachment-related issues are referred to as 'trespass' non-compliances.

2.2 Historical and current mitigation programs

Typical actions are to address insufficient conductor clearance or trespass by:

- Re-tensioning conductors.
- Replacing conductors.
- Installing new (taller) poles.
- Relocating poles.
- Undergrounding sections of conductor.
- Relocating and/or raising distribution substations.

The historical expenditure by asset type and RIN category is shown in Table 3.

Table 3 Historical expenditure on the NLC program (\$'000, real FY22)

Asset Class	2018/19	2019/20	2020/21	2021/22
Cables	\$-	\$-	\$412.2	\$0.3
Conductors	\$129.4	\$122.4	\$25.4	\$0.3
Distribution Poles	\$12.7	\$87.0	\$44.6	\$159.6
Distribution Substations	\$-	\$150.0	\$169.8	\$0.1
Other	\$-	\$-	\$-	\$151.1
Grand Total	\$142.1	\$359.4	\$652.0	\$311.4

An average of \$365 thousand has been incurred each year for addressing identified non-compliance rectification over the past four years. This expenditure is in addition to other compliance driven programs such as:

- Lake Bennett Feeder replacement which is correcting type, condition and clearance issues.
- Strangways to Humpty Doo sub transmission line which is being replaced to resolve capacity constraints and safety risks caused by numerous breaches of ground clearance requirements.
- Poor performing feeder (NMF).
- Power quality (NPQ) and Overloaded feeder rectification (NOL).

The number of non-compliance notices action from 2018/19 to 2021/22 is shown in Table 4, at an average of eight per annum. We expect that a similar level of non-compliances that require rectification will continue during the next regulatory period.

Table 4 Number of non-compliance events

	2018/19	2019/20	2020/21	2021/22	Average
Number of non-compliances	6	11	9	5	8

2.3 Consequence areas

The consequence areas for calculation of the risk associated with non-compliances are aligned with the Risk Quantification Procedure value dimensions of safety, fire and compliance.

2.4 Risk assessment

Assuming that the average annual number of non-compliances that require rectification continues, we applied the risk quantification procedure to evaluate the risk posed. This is shown in Figure 1 Risk profile if the NLC program does not continue after the current regulatory period

and demonstrates a low but increasing level of risk. The key assumptions applied in this analysis are set out in 4.6Appendix B.

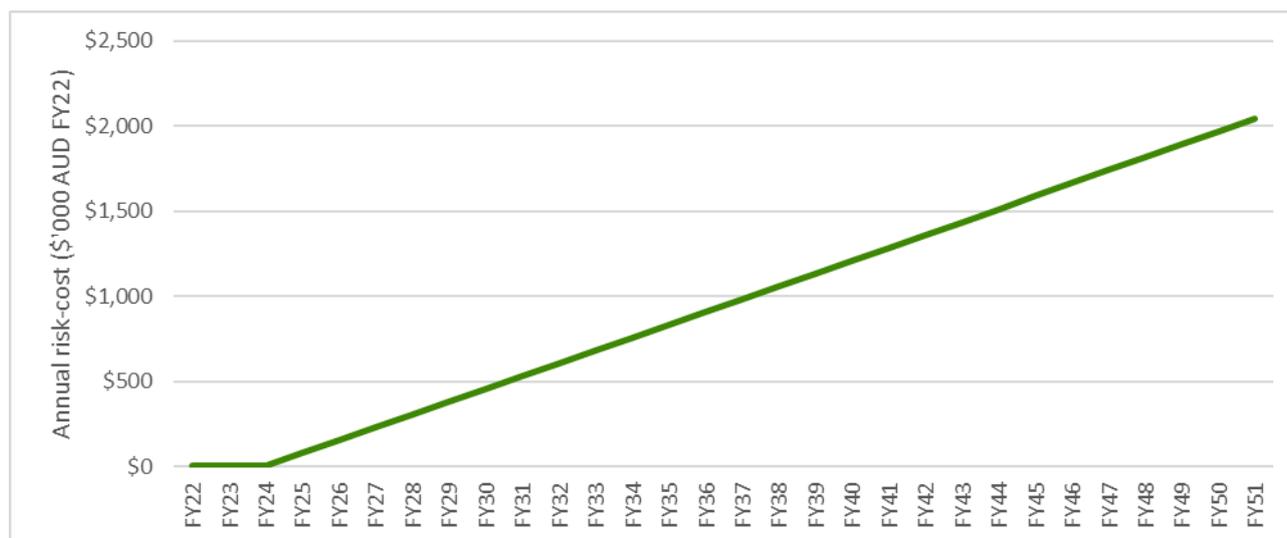


Figure 1 Risk profile if the NLC program does not continue after the current regulatory period

2.5 Summary

Power and Water has historically identified non-compliance issues with parts of its network. In response, Power and Water has implemented a non-compliance rectification program to address non-compliance installations identified by inspections and members of the public. The non-compliances are in addition to those addressed with specific programs.

Power and Water is required to address identified non-compliance issues in accordance with its governing legislation, including the Electricity Reform (Safety and Technical) Regulations.

3 Options analysis

This section describes the various options that were analysed to address the increasing risk to identify the recommended option. The options are analysed based on ability to address the identified needs, prudence and efficiency, commercial and technical feasibility, deliverability, benefits and an optimal balance between long term asset risk and short-term asset performance.

3.1 Comparison of credible options

Credible options are identified as options that address the identified need, are technically feasible and can be implemented within the required timeframe. The following options have been identified:

- Option 1 – Do nothing. This option does not continue the NLC program.
- Option 2 – Continue with NLC program. This option proposes to continue the existing NLC program (based on historical expenditure)

A comparison of the two identified credible options and the issues they address in the identified need is depicted in the table below. A detailed discussion of each option is provided below.

Table 5 Summary of options analysis outcomes

Assessment metrics	Option 1	Option 2
NPV (\$'000, real FY22) ^{Note 1}		-620
BCR		0.61
Capex (\$'000, real FY22)	0	1,825
Meets customer expectations	○	●
Aligns with Asset Objectives	○	●
Technical Viability	○	●
Deliverability	○	●
Preferred	✘	✓

- Fully addressed the issue
- ◐ Adequately addressed the issue
- ◑ Partially addressed the issue
- Did not address the issue

Note 1: this outcome is based on a five year assessment period. When assessed over a longer timeframe, the NPV becomes positive and the BCR greater than one.

3.1.1 Option 1 – Do nothing

Option 1 proposes that the NLC program terminate at the end of the current regulatory period and accept the risk of non-compliance, including to address the assets following failure through another program such as NMFCR. Implementing this option has the following outcomes:

- Increasing risk cost due to the non-compliance and safety risk.
- Potential for injury or death to member of the public from non-compliant asset.
- Potential breach of the Network Licence clause 10 regarding maintaining compliance with all regulatory instruments and the Network Technical Code and Planning Criteria.
- Damage to reputation due to not meeting customer expectations as demonstrated through the recent engagement forums.

The risk associated with this option is shown in Figure 2.

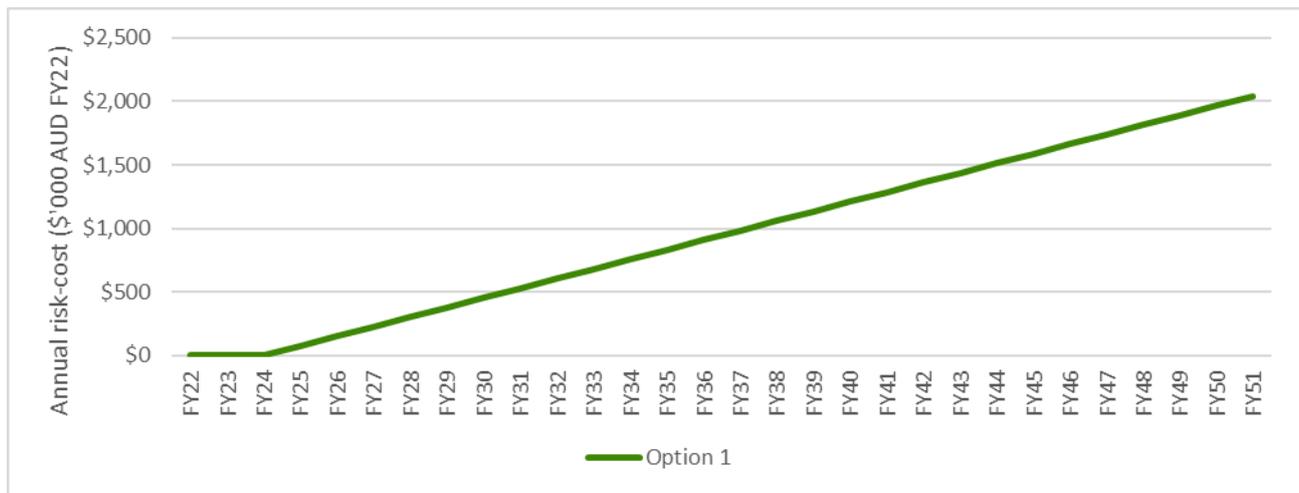


Figure 2 Risk cost profile of Option 1

This option does not align with Power and Water’s obligations set out in the regulations and has an increasing risk cost. This option is not recommended.

3.1.2 Option 2 – Continue the NLC program

Option 2 proposes to continue the NLC program through the 2024-29 regulatory period to mitigate the risk associated with identified non-compliance issues. Implementing this option has the following outcomes:

- Effectively mitigates the risk cost due to the non-compliance and safety risk.
- Effectively mitigates the safety risk of injury or death to member of the public from non-compliant asset.
- Consistent with meeting our compliance obligations, as defined in our Network Licence and regulations.
- Maintains our reputation with customers by meeting expectations demonstrated during the recent engagement forums.

This risk associated with this option is shown in Figure 3.

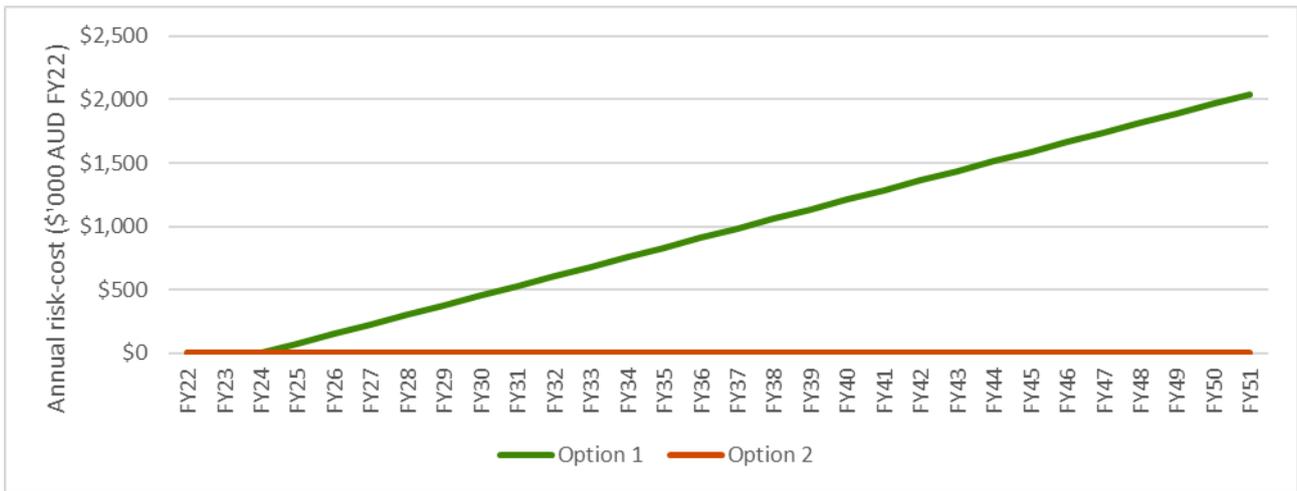


Figure 3 Risk cost profile of Option 2

Based on the historical expenditure, we forecast that this program will require an average annual expenditure of \$365 thousand (real 2021/22) for a total of \$1.8 million (real 2021/22) for the 2024-29 regulatory period.

Based on the risk cost avoided and the capital cost to achieve the benefit (avoided risk cost), we have found that the program has an NPV of -\$620 thousand and BCR of 0.61 when assessed over a five year period. However, as the assessment period is extended, the number of identified non-compliances increases and assuming the same annual average expenditure results in a positive NPV and BCR become s greater than 1.

This is the only option that addresses the identified risk, enables Power and Water’s to meet the obligations set out in the regulations and meets customer expectations. Over the long term, the approach results in a positive NPV. Therefore, this option is recommended.

3.2 Non-credible options

Our analysis also identified a number of options found to be non-credible. These options are described below and were not taken through to detail analysis for the reasons provided.

3.2.1 Non-network solutions – does not address the need

This option proposes to mitigate the risk through non-networks solutions such as installing barriers to prevent access to areas where there are low conductors. Given that the nature of the issues to be addressed by this program and that it covers ad-hoc non-compliances across the network, we do not consider it feasible to effectively isolate the non-compliance from the public. In some circumstances barriers or other non-network solutions may be suitable but not as a general solution for all types of non-compliance in all locations.

3.2.2 Capex/Opex Substitution – does not address the need

Since the driver of this investment is significant deterioration across a fleet of assets causing them to become non-compliant with requirements, it is not feasible to substitute capital expenditure with operational expenditure to resolve the risk. Only capital expenditure to rectify the cause of the non-compliance will resolve the underlying issues.

4 Recommendation

The recommended option is Option 2 – Continue the NLC program at an estimated cost of \$1.8 million (real 2021/22) as the most prudent and cost effective to meet the identified needs.

The proposed program is consistent with the National Electricity Rules Capital Expenditure Objectives as the expenditure is required to maintain the quality, reliability, and security of supply of standard control services and maintain the safety of the distribution system.

4.1 Strategic alignment

The “Power and Water Corporation Strategic Direction” is to meet the changing needs of the business, our customers and is aligned with the market and future economic conditions of the Northern Territory projected out to 2030.

This proposal aligns with Asset Management System Policies, Strategies and Plans that contributes to the D2021/260606 “PWC Strategic Direction” as indicated in the table below.

Table 6 Alignment with corporate strategic focus areas

	Strategic direction focus area	Strategic direction priority
1	Customer and the community at the centre	Improve Public Health and Safety
2	Always Safe	Cost Prudency

4.2 Dependent projects

There are no known projects or other network issues that are dependent on the resolution of this network issue.

4.3 Deliverability

This program has been delivered with the same annual average expenditure across four years as is being proposed for the next regulatory period. Therefore, this program is considered to be deliverable.

4.4 Customer considerations

As required by the AER’s Better Resets Handbook, in developing this program Power Services has taken into consideration feedback from its customers.

Feedback received through customer consultation undertaken at the time of writing this business case, has demonstrated strong support amongst the community for appropriate expenditure to enable long term maintenance of the network to ensure continued reliability, maintainability and safety of supply.

4.5 Expenditure profile

Table 7 shows a summary of the expenditure requirements for 2024-29 regulatory period.

Table 7 Annual capital and operational expenditure (\$'000, real FY22)

Item	FY25	FY26	FY27	FY28	FY29	Total
Capex	365	365	365	365	365	1,825
Opex	-	-	-	-	-	-
Total	365	365	365	365	365	1,825

4.6 High-level scope

The scope of this program will be determined on a case by case basis according to the issues identified during routine inspections or as notified by the public. The scope is expected to be similar in nature to previous years and is likely to include:

- Re-tensioning conductors.
- Replacing conductors.
- Installing new poles to raise conductors.
- Relocating poles.
- Undergrounding section of conductor.
- Replacing distribution substations.

The average volumes of assets that have been installed shown in Table 8.

Table 8 Average annual volumes of assets replaced

Asset class	Unit	Average
Cables	Metres	52
Conductors	Metres	344
Distribution Poles	Unit	12
Distribution Substations	Unit	1

Appendix A. Cost estimation

The forecast for the program was not based on a bottom-up build, hence unit rates were not applied.

The average of historical actual expenditure was used as the most appropriate basis for the forecast given the variable nature of the scope.

Appendix B. Risk assumptions

When applying the risk quantification procedure, the following assumptions were applied:

- Only the safety, fire and compliance value dimensions were considered.
- A custom profile was created based on the historical average of eight non-compliance notices occurring each year and not being addressed.
- No reactive premium was applied so the direct financial cost dimension was set to zero.
- Energy not served and the VCR was set to zero to remove the impact of reliability.

Given that the NLC program is approved for the current period, zero non-compliances were assumed up to FY24 as there was no backlog for the purposes of Option 1.

Option 2 assumed that the non-compliances were addressed and therefore had zero risk contribution.

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