



Device replacement

PAL BUS 7.12 - Device replacement - Jan2020 - Public

Regulatory proposal 2021–2026

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1 Executive summary

Business	CitiPower and Powercor
Title	Device replacement
Project ID	PAL BUS 7.12 - Device replacement - Jan2020 - Public
Category	IT capital expenditure - recurrent
Identified need	<p>Our field and office workforce utilise devices to perform their duties on a day to day basis. These devices require replacement as they reach of useful life to maintain the current level of operational performance.</p> <p>If we do not replace devices at end of useful life we will experience significant cost increases in the delivery field services, as well as deteriorations in network reliability and safety risks.</p>
Recommended option	Option 1—replace devices at end of useful life
Proposed start date	2021/22
Proposed end date	2025/26
Supporting documents	<ol style="list-style-type: none">1. PAL MOD 7.18 - Device replacement - Jan2020 - Public2. PAL MOD 12.02 - Quoted services labour rate - Jan2020 - Public

End user devices (devices) include computers, laptops, mobile phones and tablets, videoconferencing units, projectors and display screens. Our field and office staff use these devices to complete day-to-day work. The use of business applications on devices is embedded in all our business and operational processes and at the core of our current level of productivity performance.

During the current regulatory period we have transformed our approach to field operations through investment in IT systems and the roll out of mobile devices. This transformation has enabled us to deliver our field services more efficiently, reliably and safely.

As devices reach the end of their useful life, their performance deteriorates, they become technically obsolete and capacity constrained, and have increased security risks. As a result, devices can no longer perform their intended role and users can no longer participate in business processes. Users may need to revert to manual processes which lead to loss of productivity, higher costs to customers and detrimental impacts on the delivery of a safe and reliable network.

If devices are not replaced as they reach their end of useful life, we will experience a loss in the advancements made in the current regulatory period, including increased costs, poorer network reliability particularly and higher safety risks.

To mitigate these impacts we have considered the following options for the replacement of devices that will reach end of their useful life during 2021–2026:

- Option 0—do nothing—do not replace devices
- Option 1—replace devices at end of useful life
- Option 2—replace the devices in bulk at the beginning of the period.

Table 1 summarises the options considered in addressing the need to replace aging devices.

Table 1 Options analysis summary, total capital expenditure during 2021–2026 regulatory period (\$ million, 2021)

Option	Cost
0 Do nothing— do not replace devices	20.0
1 Replace devices at end of useful life	19.4
2 Replace the devices in bulk at the beginning of the period	26.7

Source: Powercor

Note: the cost of doing nothing is a high level estimate of increased cost of delivering field and corporate services through manual processes.

We recommend option 1—replace devices at end of useful life. This option is consistent with our current practices and it enables continuation of effective operations while delivering the best value to our customers.

2 Background

2.1.1 Devices we use

The use of devices is embedded in our day-to-day operations, as follows:

- desktop and laptop computers, and the associated accessories such as mice, docks, keyboards, etc.
 - we are progressively replacing all desktops with laptops, to provide flexibility in the workplace. In 2019, laptops accounted for around 80% of all computers
 - control room and design staff have specialist requirements for higher end machines running multi-monitor displays and graphics workstations for architectural drawings
- mobile phones allow staff to communicate efficiently and promptly, regardless of location
 - mobile communication is necessary due to a large portion of staff working across various locations and depots, with field staff often on the road or active on call 24 hours a day (i.e. emergency crew)
 - all mobile phones have access to numerous workplace applications that allow for more efficient communication, for example an application for reporting of safety incidents
- mobile electronic tablets enable efficient processes in the field and office. During the current regulatory period we have transformed our approach to field operations through the roll out of mobile devices supported by investment in back office IT systems (discussed in more detail below)
- video conferencing units that are deployed across each office and depot to enable remote communications and minimise site-to-site travel
- electronic projectors that are deployed in meeting rooms to enable efficient collaboration. The projectors can connect wirelessly to our network which enables employees to access relevant files and share with all participants. This encourages interaction and eliminates the need to print off hard copies of material
- display screens that are deployed in areas of high staff density (e.g. control room, contact centre and IT) to display various statistics and useful information that changes rapidly and is best communicated through a common display (e.g. fault management, customers waiting on a call, IT system resolutions).

2.1.2 Transformation of field services through mobile devices

During the current regulatory period we transformed our approach to field operations through the deployment of mobile devices and investment in IT systems and applications. Field services are now delivered through highly automated processes which rely on remote communications, including:

- automated and centralised works scheduling, remote crew dispatch, live onsite reporting of works completed and live fault monitoring
- onsite access to a vast range of location specific network information in one consolidated place through our map insights application. This has improved site specific situational awareness and reduced the need for revisits and/or off-site calls to source information
- onsite automated safety checks, safety standards, safety training and safety incident logs.

The transformation has provided the following benefits:

- lower costs of delivering field services through better utilisation of field crew, reduced back office support and better utilisation of heavy fleet.
- improved network reliability through optimised and automated dispatch of fault crews and remote live fault monitoring

- reduced safety risks as field staff have ready access to safety grams and technical safety standards, safety monitoring apps and safety incidents log while in the field.

These benefits have already been delivered to customers through lower operating and capital expenditure, improved network reliability and lower safety risks. We estimate cost savings of approximately \$20m has been achieved during the current regulatory period through the transformation of our field services through the deployment of mobile devices.

3 Identified need

As devices reach the end of useful life, the following occurs:

- decreased performance as the device loses functionality. The most common issues include shortened battery life, microphone failures, degraded performance and general wear and tear. Component upgrades for aged phones are often not available from the manufacture and/or it is uneconomic to undertake refurbishments as the maintenance cost exceeds the new purchase cost
- technological obsolesce as software updates cannot be supported on the device. This leads to a loss of connectivity of the device to the businesses IT operating systems (i.e. mobile applications are no longer accessible to the device user)
- capacity constraints as the device cannot support the volume or sophistication of new business applications
- increased security risk as security patches cannot be deployed onto devices which cannot run a supported version of the operating system.

As a result of decreased performance, technical obsolesce, capacity constraints or security risk, devices can no longer perform their intended role and users can no longer participate in business process. Users may need to revert to manual processes which are no longer utilised. Over time there would be reversion of the benefits already realised leading to higher costs to customers and deterioration in network reliability and safety.

To ensure we can continue to deliver a cost efficient, safe and reliable network, we need to replace devices that will reach the end of useful life during the 2021–2026 regulatory period.

Table 2 indicates the average useful life of devices, based on our experiences with devices over the past decade, vendor recommendations and current replacement practices.

Table 2 Average useful life of end user devices

Items	Average useful life
Laptops	4
Desktops	4
Electronic tablets	2
Mobile phones	3
Videoconference units	3
Electronic projectors	4
Display screens	3

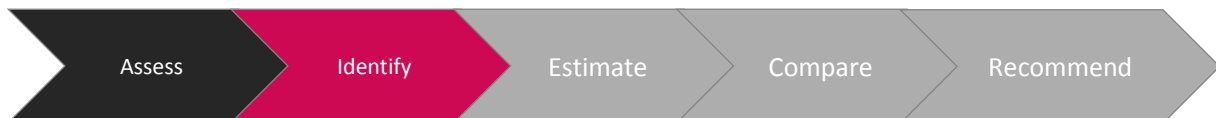
Source: Powercor

4 Options analysis

4.1 Approach

We followed a structured approach to analyse options to address our end user device requirements over the 2021–2026 regulatory period.

Figure 1 High level approach diagram



4.1.1 Assess

To assess our identified need we:

- performed a comprehensive assessment of our existing end user devices fleet
- reviewed trends in device performance and average useful life
- considered different deployment options

4.1.2 Identify

We identified three potential options:

- Option 0—do nothing— do not replace devices
- Option 1—replace devices at end of useful life
- Option 2—replace the devices in bulk at the beginning of the period.

4.1.3 Estimate

We estimated the cost of each option based on:

- the volume of devices requiring replacement based on total stock divided by average device useful life
- the unit cost of devices based on current cost of hardware, including accessories, and the current labour effort for deployment
- labour rates based on a blended external IT labour rate provided by PwC.¹

4.1.4 Compare

We compared the proposed options against our three themes:

- safe and dependable—ensure the overall safety and stability of our services is not compromised
- flexible—maintain a flexible IT ecosystem that can be easily adapted to changing requirements and customer expectations
- affordable—balance costs and benefits, while ensuring that the work performed delivers value to customers and the business.

¹ See PAL MOD 12.02 - Quoted services labour rate - Jan2020 - Public

4.1.5 Recommend

Based on the outcome of the comparison, we selected option1 as it addressed the identified need at the lowest cost to our customers.

4.2 Options summary

Table 3 summarise the cost of each option over the 2021–2026 regulatory period.

Table 3 Summary of options, total capital expenditure \$m, June 2021

Option	Cost
0 Do nothing— do not replace devices	20.0
1 Replace devices at end of useful life	19.4
2 Replace the devices in bulk at the beginning of the period	26.7

Source: Powercor

Note: the cost of doing nothing is a high level estimate of increased cost of delivering field and corporate services through manual processes.

4.2.1 Option 0—do nothing

The do nothing scenario assumes no replacement of existing devices during the 2021–2026 regulatory period. Given the high dependence of our corporate and field services on devices for everyday business operations, this option would result in decreasing performance across the board, leading to higher cost of field operations, poorer network reliability and increased safety risks.

Table 4 summarises the key advantages and disadvantages of option 0.

Table 4 Advantage and disadvantages of option 0

Advantages	Disadvantages
Low cost to customers in short term	Devices would increasingly reach end of useful life and our staff would have to revert to manual processes. This would lead to:
With higher costs longer term	<ul style="list-style-type: none"> poorer reliability and safety outcomes. For example delays in dispatch of field crew leading to longer outage times and potential unsafe electricity supply. Without mobile devices field staff would be unable to receive job allocations remotely and would need to return to the depot significantly delaying their response to outages increased costs as we would require additional labour to complete manual based tasks both in the field and for corporate services. For example field crew would incur greater travel times returning to depots to receive job allocations, would spend more time completing paper forms for works completed and may need to undertake more repeat site visits if network information is not available remotely poorer customer service, for example delays in responding to customer requests and queries, leading to customer dissatisfaction and loss of time and effort in obtaining information. For example, customers calling to get information about an outage would not be able to get an update quickly or accurately, resulting in wasted customer time higher safety risks for field workers without access to safety training, safety monitoring and technical standards onsite.
	We would be increasingly unable to deploy new business applications, as they will be relying on more modern end user devices and operating systems than we will be running. This would limit our ability to develop innovative approaches to network management, resulting in higher long-term costs to our customers.

Source: Powercor

4.2.2 Option 1—replace devices at end of useful life

Under option 1, we would replace devices at the end of their useful life.

As noted above, once devices reach end of useful life we experience decreased performance, technical obsolesce, capacity constraints and security risks. As a result devices can no longer perform their intended role and users can no longer participate in standard business operations and processes. A user may need to revert to manual processes which lead to inefficiency and impacts on network safety and reliability.

This option maintains current levels of operational performance by replacing devices based on end of useful life.

Table 5 summarises the key advantages and disadvantages of option 1.

Table 5 Advantage and disadvantages of option 2

Advantages	Disadvantages
Current operational performance would be maintained in terms of operational costs, network reliability and safety risk	Upfront capital expenditure
Devices will continue to be able to run a supported version of operating systems and office software. As a consequence, security patches will continue to be available for end user devices, reducing the risk of cyber-attack	
The procurement of replacement devices can be efficiently managed throughout the period	

Source: Powercor

4.2.3 Option 2—replace the devices in bulk at the beginning of the period

Under option 2, we would replace devices in bulk at the beginning of the regulatory period. All devices would be refreshed immediately to ensure all staff had the same device specifications and capabilities. This option would be expected to enhance current levels of operational performance, however relative to option 1 the incremental benefits are expected to exceed the incremental costs.

Table 6 Advantage and disadvantages of option 2

Advantages	Disadvantages
Current operational performance would be maintained in terms of operating expenditure and network reliability and safety.	Higher upfront capital costs than other options.
Operational performance would be enhanced due to all staff having access to the latest available technology enabling faster deployment of new applications business wide	Incremental costs exceed incremental benefits, relative to option 1.
Devices will continue to be able to run a supported version of operating systems and office software. As a consequence, security patches will continue to be available for devices, reducing the risk of cyber-attack	Large scale deployment of devices in one year would require additional project management and labour support

Source: Powercor

5 Recommendation

We recommend option 1—replace devices at end of useful life. This option ensures we maintain our current level of operational performance, including retaining the costs efficiencies already realised in the current period and maintaining network reliability and safety.

Option 1 enables our workforce to continue to utilise devices which are reliable, secure, technically current and software supported. The devices will be replaced at the end of useful life to minimise the risk of lost productivity resulting from device failure.

Option 0—do nothing was not recommended because workforce productivity would decline with a reversion of the cost efficiencies achieved in the current regulatory period. There would also be consequential impacts over time on our ability to maintain a safe and reliable network and delivery of customer services. This option would lead to increasing costs to customers over the long term.

Option 2—replace the devices in bulk at the beginning of the period, was not recommended as the expected incremental benefits would be lower than the incremental costs compared with option 1.

Table 7 summarises the capital expenditure required to deliver the recommended option 1.

Table 7 Recommended option: expenditure profile (\$ million, 2021)

Expenditure forecast	2021/22	2022/23	2023/24	2024/25	2025/25	Total 2021–2026
CitiPower	1.2	1.2	1.2	1.2	1.2	5.8
Powercor	2.7	2.7	2.7	2.7	2.7	13.6
Total	3.9	3.9	3.9	3.9	3.9	19.4

Source: Powercor

A Applications on devices

A number of business applications which support day to day activities of the business are provided via mobile devices. As shown in the table below.

Table 8 Business applications only available on the devices

Application	Purpose
Access Request	Capture site details and work to be completed on site and sent to network controllers
Basemap	Enables users to view, search for, navigate to and display information for assets and maintenance work overlayed on a map
Bright Future	Provide a forum for business improvement ideas and feedback to be delivered to the Strategy and Business Development teams
Cintellate	Reporting of workplace hazards and safety incidents
Click	Schedule and dispatch work to field crews and subsequent job close out.
Concur	Provides capability to efficiently approve employee expense claims
Content Locker	Provides secure access to technical standards and operational diagrams ensuring employees always have access to the latest version.
Expenselt	Concur Travel and Expense allows employees to; <ul style="list-style-type: none">• make air, accommodation and car hire travel reservations with preferred supplier• submit business expenses reports• claim out of pocket expenses• as a manager, approve employee travel requests and expense claims
iLearn	iLearn Central is a cloud based learning content portal that can be accessed via desktop or mobile devices
JSEA	Job Safety Environmental Assessment
Lifting load calculator	An app for line workers and designers to calculate the forces on poles enabling them to select the correct equipment when lifting
Lines	Provides access to policy snippets and enables users to remotely close out maintenance items where no field action was required

Application	Purpose
Map Insights	Provides a visual platform for our employees who monitor, plan and manage assets across our network.
mPower	mPower application provides online training resources to employees across the organisation
Never compromise	The Never Compromise App unites two key business initiatives by enabling the use of smart mobile technology to report directly into Safety Links. This will allow us to initiate the hazards and incidents process in real time from the field including uploading photographs.
Network Fault Data (NFD)	NFD is an iPhone and iPad app developed for use by us and contains near real-time fault information sourced from our Outage Management System (OMS).
Productivity Platform	Enables teams/depots to monitor productivity and help improve the way they work
Quality Audit	Reporting solution for Connections, Construction and Contractor audits
Report IT	Report on defects or inconsistencies to Powercor assets
Skills	Assists fieldworkers in understanding the status of their training
VESI	Provide access to Victorian Electricity Supply Industry (VESI) manuals
Working alone	Monitoring tool for those working alone

Source: Powercor

Further detail on a sample of these applications is provided below.

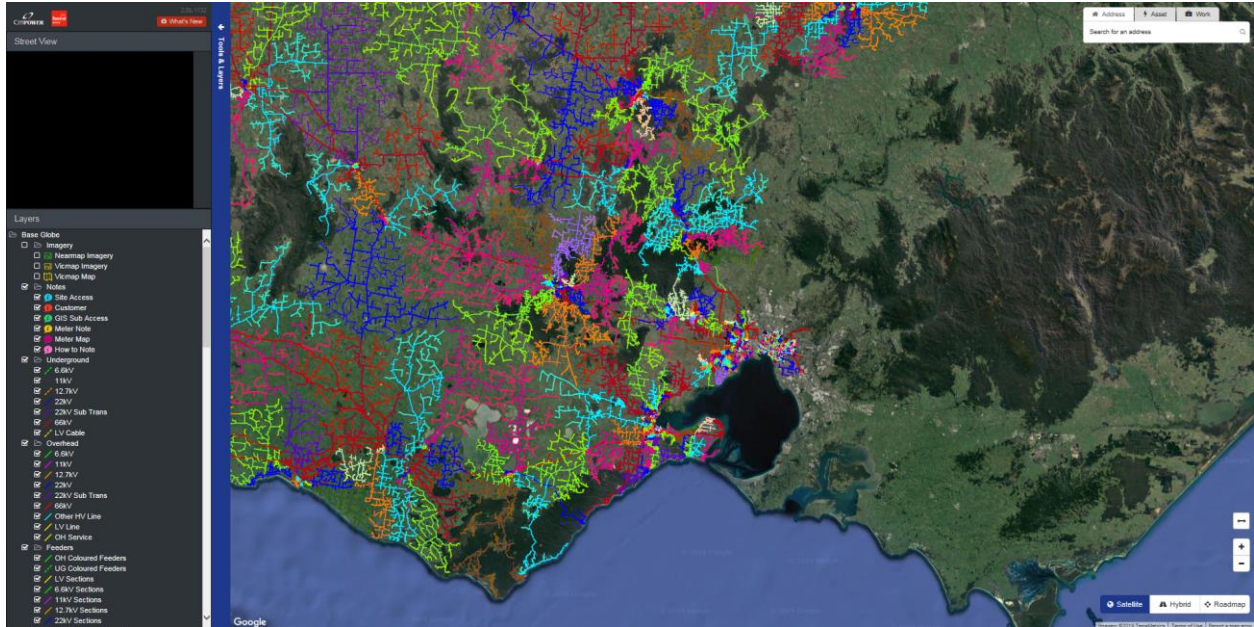
A.1.1 MapInsights

Our Map Insights application allows device users to access a vast amount of information, raising the level of situational/location awareness. This information includes:

- the latest electrical network information
- customer notes
- substation capacity and loading
- outstanding maintenance items
- asset photos
- construction and underground cable plans
- details of life support customers (and their contact number)
- asset access notes
- instructions on how to operate equipment
- sensitive environmental areas – heritage, cultural, biodiversity

The above functions of the Map Insights demonstrate the high standard of safety, efficiency and customer service that would not be possible without the use of devices.

Figure 1 Screenshot of the Map Insights application



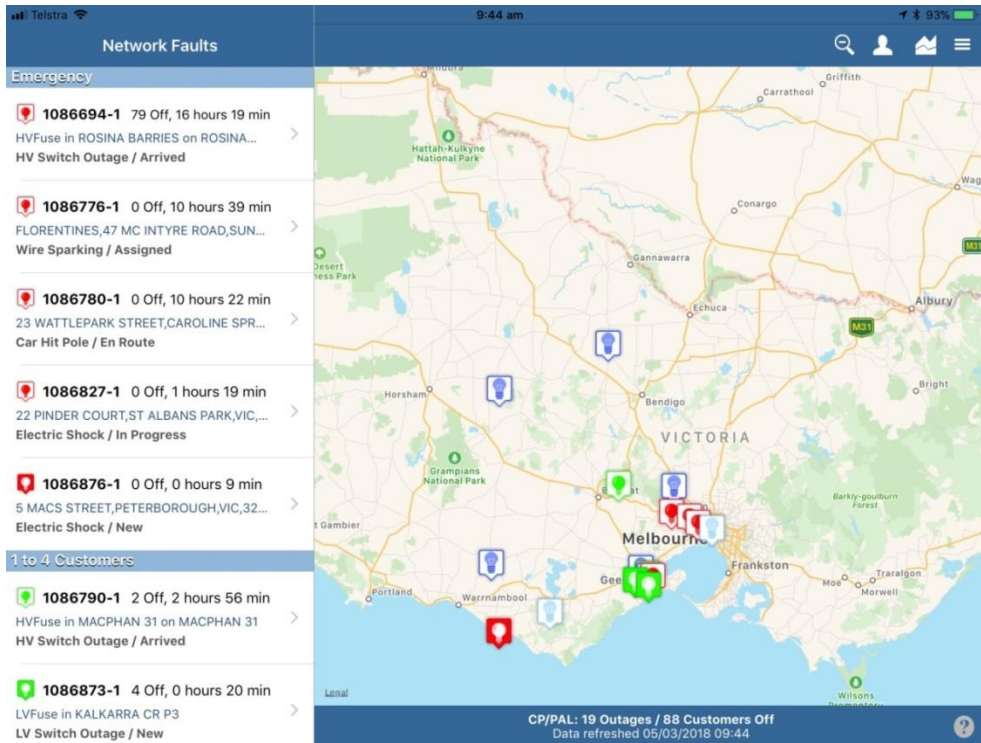
Source: Powercor

A.1.2 Network fault data application

Network fault data (NFD) displays all faults/outages in 'near real' time (every 5 mins) sourced from our Outage Management System (OMS), displays crew details and directions to faults. Top five features of NFD include:

- view all outages (list or map)
- details on the outage
- crew notes
- navigation to fault.

Figure 2 Screenshot of the NFD application in use



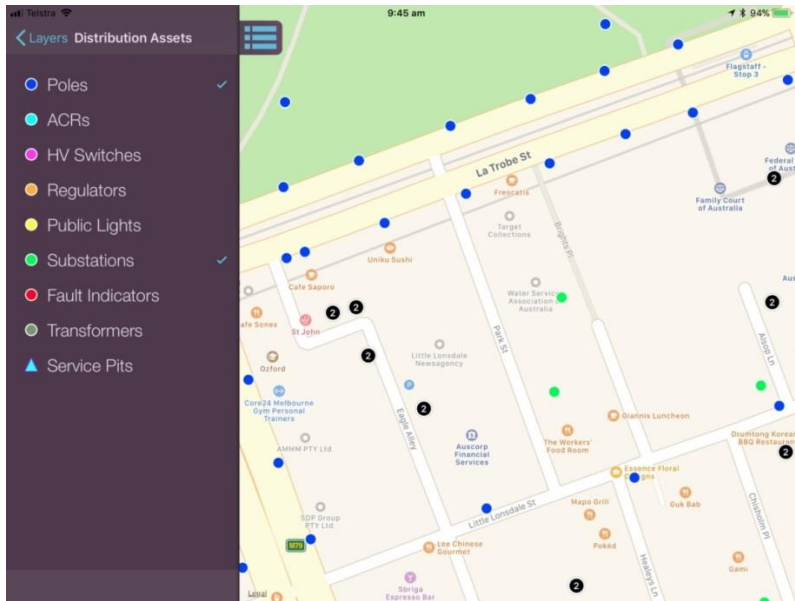
Source: Powercor

A.1.3 BaseMap application

BaseMap application enables users to view, search for, navigate to and display information for electricity network assets and maintenance work overlayed on a map. Top five features of BaseMap include:

- view all assets (poles, ACR's Subs, cables and lines) on an interactive map
- search for assets using LIS number or address
- street view of the asset
- navigation to the asset
- display maintenance items.

Figure 3 Screenshot of the BaseMap application in use



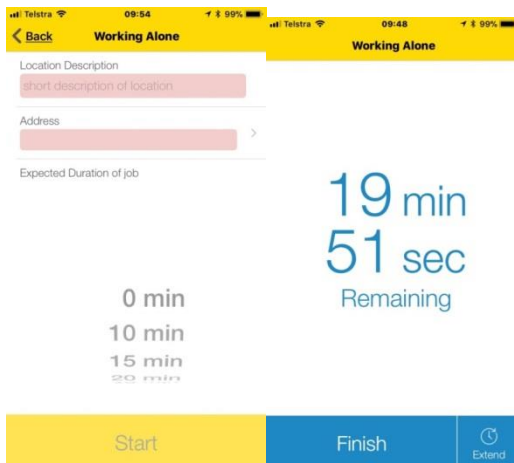
Source: Powercor

A.1.4 Working Alone application

Working Alone application is a monitoring tool for those working alone. Top five features of Working Alone include:

- monitors employees working alone
- escalation process
- captures current location on escalation
- ability to extend completion time
- 5 minute reminder warning.

Figure 4 Screenshot of the Working Alone application in use



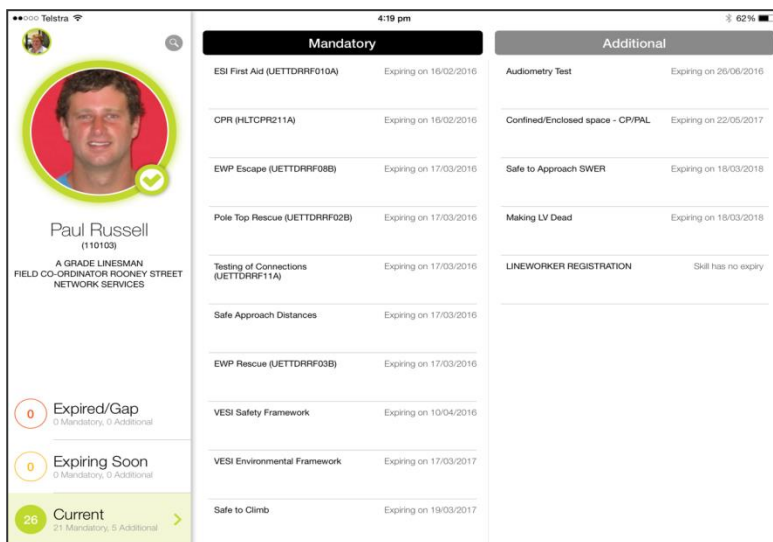
Source: Powercor

A.1.5 Skills application

Skills application assists fieldworkers in understanding the status of their training. Top five features of Skills include:

- instantly get a picture of your own training compliance
- identify what training has expired, is expiring soon or is current
- assess another employee's training status
- assess a contractor's status
- receive notifications for expiring training

Figure 5 Screenshot of the Skills application in use



Source: Powercor

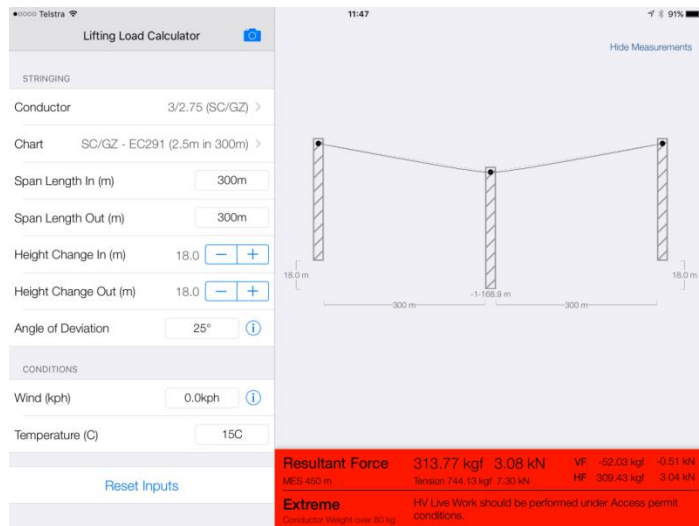
A.1.6 Lifting Load Calculator application

The Lifting Load Calculator application is used by line workers and designers to calculate the forces on poles enabling them to select the correct equipment when lifting.

Top five features of Lifting Load Calculator include:

- determine vertical force on poles
- determine horizontal force on poles
- determine resulting force on poles
- options to adjust span length and height in and out
- options to include wind and temperature conditions.

Figure 6 Screenshot of the Lifting Load Calculator application in use



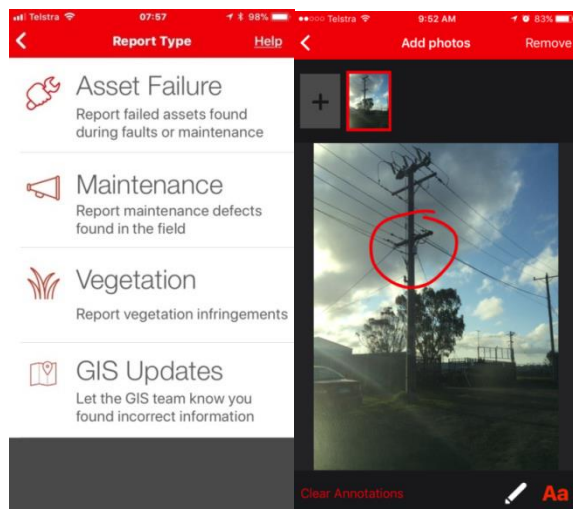
Source: Powercor

A.1.7 Report IT application

Report IT application is used to report on defects or inconsistencies to our assets. Top five features of Report IT includes:

- report an asset failure
- report a maintenance defect
- report a vegetation infringement
- report a geographic information system (GIS) update
- select assets based on GPS location of photo.

Figure 7 Screenshot of the Report IT application in use



Source: Powercor