



Bushfire Mitigation Plan 2023-2024

AU-3008-OPS-PHA-EL-PLN-00001

11 April 2023



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1. Purpose

The purpose of this plan is to prepare and comply with the requirements to the Electricity Safety (Bushfire Mitigation) Regulation 2013. This plan sets out the vision and actions in order to meet this regulation and is to be reviewed annually and submitted to the ESV prior to the 30th of June each year.

2. Definitions

For the purposes of this document, the following terms and definitions apply:

Term	Definition/Abbreviations
Authorised Person	A person with sufficient technical knowledge or experience and authorised by the HV Authority to perform tasks that ascertain to the HV plant under their letter of authorisation
CFA	Country Fire Authority
DFDP	A period of time in which the CFA declare to be a fire danger period under section 4 of the Country Fire Authority Act 1958
ESV	Energy Safe Victoria

3. Document approval

:

Name / Originator	Title	Description	Date	Signature
Yuriy Odarenko	Senior Operations Engineer	Author	11/03/23	
Adrian Ciccocioppo	Production Manager	Reviewer		
Cesar Salvatierra	Executive Manager Operations	Authoriser		



4. Applicable Sites

Portland Wind Farm

The land on which the three stages of Portland Wind Farm are established consists of a combination of grassed pastures and sand dune scrub and is used where possible for low density sheep and cattle grazing. There are trees within the boundaries of the wind farm however there are none in close proximity of the turbines or substations and all overhead lines are kept clear according to Electricity Safety (Electric Line Clearance) Regulations 2020.

The farms associated overhead lines are located on both road reserve and public/private lands. The vegetation along the overhead lines is a mix of trees shrubs and low-lying grasses.

Pacific Hydro recognises that there are multiple electrical assets, not solely electric lines, located at the Portland Wind Farm where fire could originate from, including:

- The wind turbine nacelle,
- The (kiosk) Integrated Grid Connection Transformer and Switchgear adjacent to each wind turbine,
- The Cape Bridgewater (CBW), Cape Nelson North (CNN) and the Cape Nelson South (CNS) substations,
- The P3C and Cape Sir William Grant (CSWG) substations adjacent to the Alcoa Portland Aluminium Switchyard, and
- The 45km of (some single and double circuit) overhead line between the P3C, CBW, CNN, CNS and CSWG substations.

Challicum Hills Wind Farm

The land on which Challicum Hills Wind Farm and its associated overhead line is established consists of grassed pastures and is used predominantly for low density sheep and cattle grazing. There are trees within the boundaries of the wind farm however there are none in close proximity of the turbines or substations and all overhead lines are kept clear according to Electricity Safety (Electric Line Clearance) Regulations 2020.

Pacific Hydro recognises that there are multiple electrical assets, not solely electric lines, located at the Challicum Hills Wind Farm where fire could originate from, including:

- The wind turbine nacelle,
- The Integrated Grid Connection Transformer and Switchgear inside each wind turbine,
- The Challicum Hills Wind Farm (CHWF) Main Substation,
- The Buangor (BGR) Switchyard, and
- The 5km of dual circuit 66kV overhead line between the CHWF Substation and BGR Switchyard.

Crowlands Wind Farm

The overhead lines pass through private land, leased by Pacific Hydro, predominantly used for low density grazing, cropping and includes a combination of ground cover (grasses) and various



maturity tree species including native Eucalyptus (Red Stringybark, Yellow Box, River Red-gum, Blue Gum, etc). There are also areas directly adjacent to the line used for cropping.

Pacific Hydro recognises that there are multiple electrical assets, not solely electric lines, located at the Crowlands Wind Farm where fire could originate from, including:

- The wind turbine nacelle,
- The (kiosk) Integrated Grid Connection Transformer and Switchgear adjacent to each wind turbine,
- The Crowlands substations,
- The 15km of internal overhead lines between Substation and turbine clusters.

5. At-Risk Electric Lines

Portland Electric Lines

There is approximately 45km's of 66kV overhead line that runs between the CBW, CNN and CNS substations to the P3C substation at Cape Sir William Grant whose performance and compliance is helped with the implementation of both this plan and the Electric Line Clearance Management Plan. The overhead line assets are a combination of Pacific Hydro owned wood poles and shared Powercor owned wood poles, Steel Cross Arms, 66kV Insulators, Bare overhead conductor, Optical Fibre Cable and Ground Stays. Worley Power Services Pty Ltd has been engaged as the main Operations and Maintenance provider for the Wind Farm, including the electric line assets.

Challicum Hills Electric Lines

There is approximately 5km's of 66kV overhead line connecting the CHWF Main Substation to the Buangor Switchyard and is strictly managed by the Electric Line Clearance Management Plan. Worley Power Services Pty Ltd has been engaged as the main Operations and Maintenance provider for the Wind Farm, including the electric line assets.

Crowlands Electric Lines

The internal overhead electric lines owned by Pacific Hydro are located immediately to the north of the 220kV Crowlands terminal station. They consist of steel pole, single and double circuit lines with a combined approximately length of 15 km and require vegetation management processes to maintain the clearance space around them. Worley Power Services Pty Ltd has been engaged as the main Operations and Maintenance provider for the Wind Farm, including the electric line assets.

6. Electricity Safety (Bushfire Mitigation) Regulations 2023 (Statutory Rule Number 40/2023)

7. Regulation 6 - Prescribed particulars for the bushfire mitigation plans – specified operators

Specified operator legal entity

Pacific Hydro Pty Ltd (ACN 057 279 508) on behalf of

Pacific Hydro Portland Wind Farm Pty Ltd (ACN 103 162 474) with ESC Licence Code: EG – 04/2004 [PHPWF],

Pacific Hydro Challicum Hills Pty Ltd (ACN 101 989 744) with ESC Licence Code: EG – 01/2003 and

Pacific Hydro Crowlands Pty Ltd (ACN 620 640 486) with ESC Licence Code: EG_01/2003 [PHCH]



7.1 6(a) The name, address, and telephone number of the specified operator:

Mr. Cesar Salvatierra
Executive Manager, Operations
Pacific Hydro Pty Ltd
ABN 31 057 279 508
Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Email: csalvatierra@pacificblue.com.au

7.2 6(b) The person responsible for the preparation of this plan (Challicum Hills Wind Farm) is:

Mr. Yuriy Odarenko
Senior Operations Engineer
Pacific Hydro Pty Ltd
ABN 31 057 279 508
Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Email: yodarenko@pacificblue.com.au

7.3 6(b) The person responsible for the preparation of this plan (Crowlands Wind Farm) is:

Mr. Yuriy Odarenko
Senior Operations Engineer
Pacific Hydro Pty Ltd
ABN 31 057 279 508
Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Email: yodarenko@pacificblue.com.au

7.4 6(b) The person responsible for the preparation of this plan (Portland Wind Farm) is:

Mr. Yuriy Odarenko
Senior Operations Engineer
Pacific Hydro Pty Ltd
ABN 31 057 279 508



Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Email: yodarenko@pacificblue.com.au

7.5 6(c) The person responsible for carrying out the plan (Challicum Hills Wind Farm) is:

Mr. Shaun Harrison
Wind Fleet Contract Manager
Pacific Hydro Pty Ltd
ABN 31 057 279 508
Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Mobile: 0400 535 152
Email: sharrison@pacifichydro.com.au

AND

Mr. Justin Johannesen
Contract Manager – Pacific Hydro
Worley Power Services Pty Ltd
ABN 50 112 723 181
178 Normanby Road
Southbank VIC 3006
Phone: 0400 742 337
Email: justin.johannesen@worley.com

7.6 6(c) The person responsible for carrying out the plan (Crowlands Wind Farm) is:

Mr. Shaun Harrison
Wind Fleet Contract Manager
Pacific Hydro Pty Ltd
ABN 31 057 279 508
Level 13, 700 Collins Street
Docklands, Victoria, 3008
Phone: (03) 8621 6000
Mobile: 0400 535 152
Email: sharrison@pacifichydro.com.au

AND

Mr. Justin Johannesen



Contract Manager – Pacific Hydro

Worley Power Services Pty Ltd

ABN 50 112 723 181

178 Normanby Road

Southbank VIC 3006

Phone: 0400 742 337

Email: justin.johannesen@worley.com

7.7 6(c) The person responsible for carrying out the plan (Portland Wind Farm) is:

Mr. Shaun Harrison

Wind Fleet Contract Manager

Pacific Hydro Pty Ltd

ABN 31 057 279 508

Level 13, 700 Collins Street

Docklands, Victoria, 3008

Phone: (03) 8621 6000

Mobile: 0400 535 152

Email: sharrison@pacifichydro.com.au

AND

Mr. Justin Johannesen

Contract Manager – Pacific Hydro

Worley Power Services Pty Ltd

ABN 50 112 723 181

178 Normanby Road

Southbank VIC 3006

Phone: 0400 742 337

Email: justin.johannesen@worley.com

7.8 6 (d) In case of an emergency contact should be made with:

In first instance to

Worley Control Room

Phone: 0400 317 129

Email: RMC.Sydney@Worley.com

or

24/7 Remote Operations Centre

Level 23, 111 Pacific Highway, North Sydney, NSW 2060, Australia

Phone: 02 9888 5855



Email: RMC.Sydney@Worley.com

or

Mr. Adrian Ciccocioppo

Production Manager

Pacific Hydro Pty Ltd

ABN 31 057 279 508

Level 13, 700 Collins Street

Docklands, Victoria, 3008

Phone: (03) 8621 6000

Mobile: 0438 093 517

Email: aciccocioppo@pacificblue.com.au

or

Powercor Control Room

1800 061 204

7.9 6(e) Policy

To mitigate as far as practicable the risk of fire starting from those at-risk assets that Pacific Hydro own.

7.10 6(f) Objective/s

This Plan in conjunction with the sites Electric Line Clearance Management Plan has been developed with the main objective to:

- identify possible ignition sources that could cause fire, and
- mitigate/reduce the likelihood and consequences of these through the implementation of effective preventative measures.

The plan is also intended to fulfil the Legislative and Regulatory requirements of the:

- Electricity Safety Act 1998, and
- Electricity Safety (Bushfire Mitigation) Regulations 2023 (Statutory Rule Number 40/2023).

7.11 6(g) Maps/ Description

The following table summarises the assets to which this plan applies

Line (feeder denomination)	Voltage (kV)	Number of spans	Length (m)	Insulated Conductor (Y/N)	If insulated, type of insulated conductor	Number of pole	Pole material	Year of construction
P3C to CBW	66	401	29700	N	N/A	1-399	Wood Class II H5	2008



							CCA treated Blackbutt/Spotte d Gum 12kN	
CNS to CNN	66	81	6081	N	N/A	1-81	Wood Class II H5 CCA treated Blackbutt/Spotte d Gum 12kN	2009
CHWF to BGR	66	41	4926	N	N/A	1-41	Wood Class II H5 CCA treated Black Butt 12kN(2 Concrete)	2003
CRW fdr 1	33	13	2587	N	N/A	1-13	Galvanised Steel (600g/m ²) Class II Grade 250 plates and 300 for sections	2019
CRW fdr 2	33	7	2132	N	N/A	14-17	Galvanised Steel (600g/m ²) Class II Grade 250 plates and 300 for sections	2019
CRW fdr 3	33	1	242	N	N/A	22-23	Galvanised Steel (600g/m ²) Class II Grade 250 plates and 300 for sections	2019
CRW fdr 4	33	20	5180	N	N/A	23-43	Galvanised Steel (600g/m ²) Class II Grade 250 plates and 300 for sections	2019

Where the following is

P3C: Portland 3 Capes Substation

CBW: Cape Bridgewater Substation

CNN: Cape Nelson North Substation

CNS: Cape Nelson South Substation

CHWF: Challicum Hills Windfarm

BGR: Buangor Substation

CRW Fdr: Crowlands 33kV feeder

Refer to Appendices for the following maps of the land and location of at-risk electric lines

- Portland Wind Farm Overhead Line – Site Layout
- Cape Bridgewater Site Layout showing the location of the electric lines, CBW substation and the wind turbines
- Cape Nelson South Site Layout showing the location of the electric lines, CNS substation and the wind turbines
- Cape Nelson North Site Layout showing the location of the electric lines, CNN substation and the wind turbines



- Cape Sir William Grant Site Layout showing the location of the electric lines, CSWG substation and the wind turbines
- Challicum Hills Wind Farm Overhead Line – Site Layout (HBRA Classified)
- Crowlands Wind Farm showing the location of electric lines and poles - Site Layout (HBRA)

7.12 6(h & i) Preventative Strategies

In line with this plans objectives, the strategies adopted for the prevention of fire ignition from overhead lines are detailed in this section.

Scheduled 36 month Electric Line inspection The reports stemming from these inspections identify, code and prioritise defect/s and their rectification timings (refer to example report Appendix I and Figure 1 below).

Condition of the assessed item	Priority allocation	Need to be actioned within
The item is assessed to pose an immediate supply reliability, fire or public safety risk	Priority 1	24 hours
The item is assessed as not an immediate supply reliability, fire or public risk, however is likely to become one within 42days to 2 years	Priority 42	42 days
The item is assessed as not an immediate supply reliability, fire or public risk, however is likely to become one within 2 years to 3 years	Priority 2	32 weeks
This item is not a priority 1, 42 or 2 but may require attention before the next inspection (>36 months or 3 years)	Priority 3	> 3years

Figure 1 Asset Defect Priority Rating and Rectification Timings

Note: all time periods mentioned in the table are based on calendar days.

There can be 2-3 week delay between inspection and provision of report and associated recommendations.

If an asset is identified by as part of the inspection with deteriorating defects, however:

- they have not exceeded the criteria under sections (f) to (j) to trigger replacement, and/or
- the inspector expects that deterioration will cause the pole to have a 'limited life (L)' or to become 'unserviceable (U)', during the following scheduled inspection interval then an increased inspection/testing interval can either be:
 - specified as part of the scheduled inspection (and associated report), or
 - requested of the electric line specialised service provider by the responsible person for carrying out this plan,
 - to track further deterioration.



The priority that is assigned to a 'serviceable (S)', 'limited life' or 'unserviceable' pole is independent the assignment and should be linked back to the Inspectors assessment of the risk of failure within the timeframes referred to in Figure 1.

Any increased inspection interval will be calculated using previous deterioration information/rates, if available, from previous inspection results. If no historical deterioration information/rates are available, then the increased interval will default to annual, with the following:

- The Pacific Hydro Electric Line Management Clearance Plan details the annual vegetation inspection and clearance works for the overhead lines/spans. The reports stemming from these inspections identify, code and prioritise any applicable clearance work required around the electric lines. The rectification work and timing is programmed according to the codes/priorities stipulated in the reports (refer to example report Appendix H and Figures 2, 3 & 4). The following table outlines the different inspection/reporting codes and definitions.
- For asset inspection and assessment, Pacific Hydro Asset Inspection Manual (at risk overhead lines) will be used. This manual contains information about electrical assets and the standard for observation and or tests to identify and assess the condition.
- Planned invasive inspections are to be conducted every 4 inspections (or 12 years). Below ground inspections of poles are conducted to determine the residual pole strength, identify drainage, moisture or rotting issues or the presence of termites. Drilling into wooden poles or NDT scan of wooden poles (Woodscan) is to be completed above ground and/or below in addition to the below ground inspection. The inspections are carried out by either the dig and drill method or where no-destructive testing is required than Woodscan (for wooden poles) may be used.
- Visual Patrol of Electric Lines from the ground and (or) from drone utilising powered image stabilised binoculars and (or) digital SLR cameras for defects and potential failure points,
- Thermographic Patrols as required. This is an unplanned/non-routine task which will be largely dependent on the person responsible for carrying out the plan and if they deem necessary to carry out this action based on fault event logs and known Electric Line condition,
- Insulator washing as required. This is an unplanned/non-routine task which is dependent on the local conditions and subsequent impact of these on sections of the overhead lines, and,
- The auto reclose functionality is currently suppressed on the power lines and the lines are inspected prior to re-energising after faults.
- Any outstanding maintenance items will be rectified or reinspected prior rectification timings in latest powerline asset inspection report that must be in accordance with Table 1 Asset Defect Priority Rating and Rectification Timings
- Current replacement/modification programs are:
 - to replace defective assets based on priority stated in latest powerline asset inspection report;
 - install powerline vibration dampers if the defect is identified to be related to high powerline vibration;
 - if defect has signs of conductor ware against insulator, the connection is cleaned and is greased with silicone grease for electrical insulation and part lubrication.

Worley are currently contracted as the 'specialised service provider' to perform the scheduled 36 month electric line inspection to procedures in AU-100-OPS-MAN-00002 Pacific Hydro Asset Inspection Manual (at risk overhead lines) and annual electric line vegetation inspection with any subsequent vegetation cutting/removal to be conducted prior to 1st December or the Declared Fire Danger Period (DFDP), <http://www.cfa.vic.gov.au/warnings-restrictions/fire-restrictions-map/>).



7.13 (j) and (k) Qualifications, Experience and Competency of persons

Personnel completing asset inspection and clearance works will hold current qualifications and experience approved by ESV. This at a minimum shall be UET20621 – Certificate II in Asset Inspection and testing or equivalent for Asset inspectors. Further this, personnel carrying out inspections will be inducted into the Asset inspection manual (AU-100-OPS-MAN-00002) prior to performing the task.

Prior to the works starting one of the representatives responsible for carrying out this plan may be on site at the commencement of the inspections to observe/conduct appropriate inductions which may include such a request for records.

If any worker associated with the Electric Lines and tasks covered under this plan are found to be performing works without required training/qualifications/experience or outside of their capabilities or the prescribed documentation, they are supposed to be working under then work will be immediately stopped and the associated personnel removed from the site.

Note: For other persons, referring to 6(k) of the Electricity Safety (Bushfire Mitigation) regulation will be required to meet the above or be under the control of an Authorised Person.

7.14 (l) Operation and Maintenance Plans

This section outlines the plans during certain event/periods.

- **In the event of fire**

In the event of fire which prevents the safe operation of the HV overhead line, the line will be de-energised to minimise further ignition sources.

In such an event PHA should coordinate with the CFA and Local Council to provide support in matters relating to operation of the wind generation site that contain at risk electric lines referenced in this document where the fire is in the area but presents minimal or no risk to the safe operation of the overhead line, the overhead line will continue to operate with the auto reclose suppressed.

- **During a Total Fire Ban (TFB)**

During a time of total fire ban the associated overhead lines will operate in accordance with normal operating practices (auto reclose suppressed) and the prohibition of hot work permits on the at-risk electric lines.

- **During the Fire Danger Period**

The Wind Farm will be operated in accordance with normal operating practices (auto reclose suppressed) during the DFDP.

7.15 (m) Investigations, analysis and methodology

Electrical events/faults, if they influence risk of fire ignition from the sites at-risk electric lines or not, are recorded and reported using Pacific Hydro's 'Electrical Event Report' (Appendix J) form which if considered to be a 'serious electrical event' are reported separately to ESV and/or WorkSafe Victoria.

For faults/incidents/defects requiring further internal investigation the 'Defect Reporting Procedure' and associated electronic form (Appendix K&L) is utilised. This process may also instigate a Root Cause Analysis Report (Appendix M) if either:

- the Defect risk rating is extreme/high, and/or



- there have been multiple events of an identical/similar nature (common/systemic defect or fault), and/or
- a request is made from higher levels within the business.

This process helps to ensure that events/faults are properly reported, investigated and actions taken to reduce their likelihood of re-occurring.

Note:

Where assets are in a share arrangement with the network provider, reporting will be performed by a single party and will be the responsibility of the owner of the particular pole.

The major events that were sources for ignitions are presented on Table 1 which are all previous fire starts resulting from Pacific Hydro assets (current and historical).

Table 1 - The major events that were sources for ignitions

Type of Event	Year of Event	Event Frequency, Years/event	Action to mitigate risk of fire ignition from electric lines at risk
Conductor coming in contact with the wooden type poles	2019	10	Pole vibration sensors were introduced for the investigation of root cause analysis. Mitigations and preventative actions are being implemented to reduce the risk of such event.
Conductor coming in contact with the wooden type poles	2020	6.5	Investigation to this matter continue. Mitigations and preventative actions are being implemented to reduce the risk of such event. One such proposed method could be the introduction of mechanical vibrational dampeners on the electric line where increased wear is observed.

7.16 (n) Processes and Procedures

There are a number of processes and procedures adopted/relied upon to manage this plan including:

- Monitoring the implementation of the plan is performed predominantly through the following method:
 - the use and management of the computerised maintenance management system (CMMS) which records any required scheduled or unscheduled works including, but not limited to, the preventative works listed under section (h & i) of this plan. The specific measure is the closure of maintenance work orders related to bushfire mitigation and line vegetation works which have a due date, or are required to be done, prior to the 1st December or before the DFDP each year, whichever is earlier.

This measure is referred to as the Bushfire Index and is calculated as follows:

$$\text{Bushfire Index} = \text{Number of outstanding works} \div \text{Total works required}$$

Works include all routine Electric Line maintenance and vegetation clearance scheduled and remedial works.

The current '**outstanding works**' include:

PORTLAND WIND FARM

- There are no outstanding/overdue works for this site



CHALLICUM HILLS WIND FARM

- There are no outstanding/overdue works for this site

CROWLANDS WIND FARM

- There are no outstanding/overdue works for this site

The 'works required' include:

PORTLAND WIND FARM

- Line Vegetation assessment
- Line Vegetation cutting/clearing
- 36 month Electric Line Inspection (next due: Nov 2025)

CHALLICUM HILLS WIND FARM

- Line Vegetation assessment
- Line Vegetation cutting/clearing
- 36 month Electric Line Inspection (next due: Nov 2023)

CROWLANDS WIND FARM

- Line Vegetation assessment
- Line Vegetation cutting/clearing
- 36 month Electric Line Inspection (next due: Dec 2023)

Therefore:

$$\text{Bushfire Index} = 0 \div 9 = 0.00$$

Note that the performance/progress of all site maintenance tasks, including the above where applicable, is monitored and reported on monthly by the Australian Operations Department.

Other performance measures which will be collated and reviewed annually prior to the resubmission of this plan to ESV include:

Key Performance Indicator (KPI)	Target	Result (previous year)
Number of electrical events/faults that have occurred on the relevant Electric Lines with the cause identified to be directly related to their condition and/or compliance with the Regulations.	0	0
Annual Number of Fire Starts.	0	0
Number of Stakeholder complaints/correspondence received in relation to the relevant Electric Lines as measured through Pacific Hydro's Communication and External Affairs department and the associated enquires line (1800 010 648) and email address (enquires@pacifichydro.com.au).	0	0
Lost Time Injuries (LTI's) or Medical Treatment Injuries (MTI's) with the cause identified to be directly related to the Electric Lines.	0	0
Future ELCMP submitted by 30th June each year	0	0
Financial Penalties (Penalty Units) received.	0	0

- Auditing the implementation of the plan is largely done in two ways:



- as part of the annual review process prior to resubmission of this plan to ESV, as well as
- an audit prior to the DFDP will be undertaken by a representative responsible for carrying out this plan which includes:
 - a. that the qualifications and experience of personnel performing any scheduled inspection and/or clearance works adheres to both ESV's and this plan's requirements,
 - b. associated report/s have been submitted to the persons responsible for carrying out this plan,
 - c. all inspection/s, report/s and subsequent recommendations from have been conducted in line with the scope/timing of recommendations and to the quality of this plan and the applicable Acts, Regulations, Codes and Standards (as further explained under section (vi). **Note that this task may be conducted by an independent third party, where requested by the persons responsible for carrying out this plan.** Additional inspections may take place throughout the year if in alignment with other scheduled/unscheduled line tasks (e.g., insulator washing, event/fault inspections etc), and
 - d. the inspections and recommendations/works from the report, if any, have an appropriate task/s entered into the CMMS and those task/s have been closed out following completion of the works.

If either of items a, b, or c in above list are believed to have not occurred then a representative responsible for carrying out this plan is to immediately contact the electric line specialised service provider of the reports and request the required information

If either of the remaining items in above list have not occurred then the representative responsible for carrying out this plan is to immediately perform the required work or contact their manager and request support to perform the work.

Person/s responsible for carrying out this plan may also take the opportunity to perform audits outside the above timeframe.

- Identification of any deficiencies in the plan or the plan's implementation can be done via:
 - the annual review process of this plan prior to resubmission to ESV,
 - Person/s carrying out this plan to provide feedback to their manager and/or the person/s responsible for the preparation of this plan when a deficiency is found. This will generally take the form of email correspondence,
 - Pacific Hydro's employee observation/conversation program which requires each employee and Full time Operations and Maintenance contractor to make 12 observations annually, which takes the form of electronic submissions, and/or
 - Review of site/asset risk registers.
- A change, or changes, to the plan and the plan's implementation if any deficiencies are identified under subparagraph (iii) are performed during the annual review of this plan prior to resubmission to ESV. If there are more critical changes required to important information, including but not limited to, contact details or applicable procedures/policies these will be performed as soon as possible and resubmitted to ESV. The updated plans will then be reloaded onto the webpages listed in the plan.



The annual review of this plan is performed by the person/s responsible for preparing the plan in conjunction with the other people listed under sections (a-d). As well as incorporating any of the above changes the reviews intention is to, but is not limited to, re-aligning the plan to any updated Legislation, Regulations or Codes, industry practices and Electric Line configurations/locations.

- Monitor the effectiveness of inspections under the plan will be performed through the annual review of the performance measures listed under (n)(i) by the person/s responsible for preparing the plan.
- Auditing the effectiveness of any inspections carried out under the plan is performed through conducting a ground based visual audit following the completion of the 36-month Electric Line Inspection works. This will be performed by either:

Personnel who have:

- Knowledge of applicable Acts, Regulations and Codes associated with this plan,
- Knowledge of this plan and its auditing obligations,
- Knowledge of, and are familiar with, the Electric Lines subject to the audit

or,

- an independent third party.

The scope of the visual audit will cover a minimum of 10% of the Electric Lines previously inspected and take the form of a marked-up version of the inspection report. If any significant inaccuracies are noted then the audit scope will be expanded to include 100% of the Electric Lines. These inaccuracies will then be reported back to the electric line specialised service provider.

Person/s responsible for carrying out this plan will also take the opportunity to perform audits outside the above timeframe if other scheduled/unscheduled line works are expected and resourcing is available.

Performance of the electric line specialised service provider can be reviewed/audited through Pacific Hydro's procedure PHA.HSE.09.014 Contractor Performance Evaluation (Appendix N).

The status of 2022-2023 achievement of all cyclic asset replacement/modification programs is provided below table:

Cyclic asset replacement/modification program	Portland Wind Farm	Challicum Hills Wind Farm	Crowlands Wind Farm
Number of defective assets replaced	3	2	0
Number of powerline vibration dampers installed	84	0	0
Number of conductor ware locations greased	57	0	0

7.17 (o) Pacific Hydro Policy on Assistance Provided to Fire Control Authorities

Pacific Hydro will allow access to and assist fire control authorities in the investigation of fires at or near the relevant Electric Lines.



8. Regulation 13 Exemptions Provided by the ESV

Under the regulation, the ESV may in writing provide exemption to the Electricity Safety (Bushfire Mitigation) Regulation for a specified operator or major electricity company.

Currently, Pacific Hydro Australia has not been granted any exemptions.

9. Section 83BA (3) (a) of the Act - Plan available for inspection

The latest ESV approved Bushfire Mitigation Plan is available for inspection on the responsible person's website at either of:

[Challicum Hills Wind Farm](#)

[Cape Nelson North/Sir William Grant Wind Farm](#)

[Cape Bridgewater Wind Farm](#)

[Cape Nelson South Wind Farm](#)

[Crowlands Wind Farm](#)

Any superseded versions of the plan located at the above websites will be overwritten by the Pacific Hydro person responsible for preparing the plan once an updated version of the document has been approved/accepted by ESV.

A hardcopy of the ESV approved/accepted Bushfire Mitigation Plan mentioned above is available for inspection at the responsible person's office, during normal business hours, located at:

Yuriy Odarenko

Level 13, 700 Collins Street

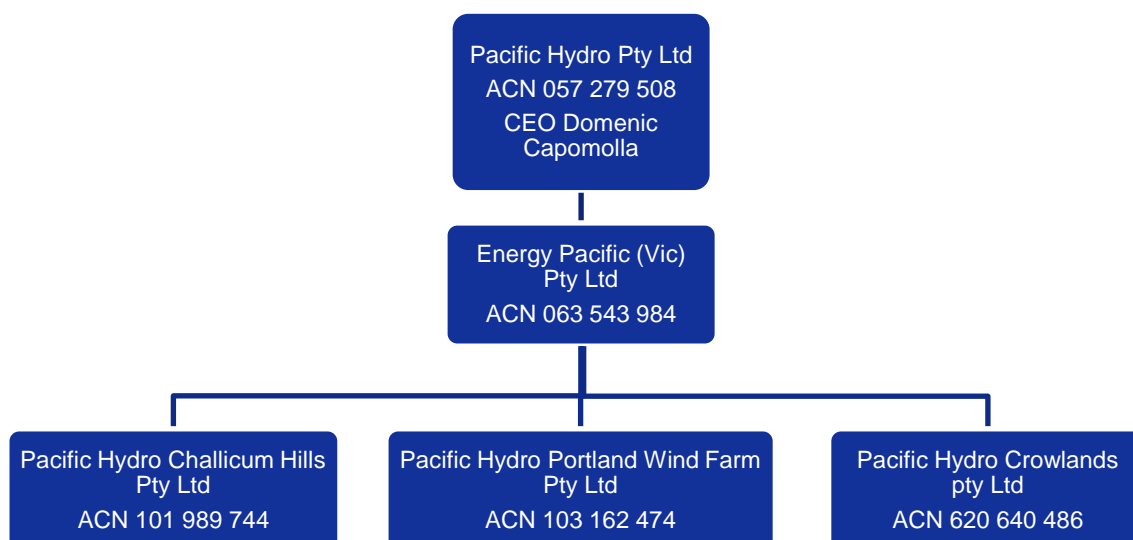
Docklands, Victoria, 3008

Any hardcopy superseded versions of the plan will be destroyed by the person responsible for preparing the plan.

10. Corporate Structure

Pacific Hydro Pty Ltd is a parent company of a group of subsidiary companies which own and operate renewable generation assets including powerlines. For the purpose of the Bushfire Mitigation Plan the below chart specify the relationship between the relevant corporate entities:





Other References and Supporting Documents

The table below lists all the documents that have been referenced within the plan:

Document Number	Document Title
AU-100-OPS-MAN-00002	Asset inspection manual for at risk electric line

11. Document History

The following table lists the changes made to this document:

Version	Date	Amended by	Comments
0	24/05/2022	Daniel Choi Senior Operations Engineer	Replaces legacy document PHA. OPS.08.006
1	16/09/2022	Yuriy Odarenko Senior Operations Engineer	Clarifications for Regulation 6
2	19/10/2022	Yuriy Odarenko Senior Operations Engineer	Corporate Structure clarification
3	11/03/2023	Yuriy Odarenko Senior Operations Engineer	New Pacific Blue Template was used









12. Appendices

- A. **Portland Wind Farm Overhead Line – Site Layout (Lines) (HBRA Classified)**
- B. **Cape Bridgewater Site Layout showing the location of the electric lines and poles (HBRA Classified)**
- C. **Cape Nelson South Site Layout showing the location of the electric lines and poles (HBRA Classified)**
- D. **Cape Nelson North Site Layout showing the location of the electric lines and poles (HBRA Classified)**
- E. **Cape Sir William Grant Site Layout showing the location of the electric lines and poles (HBRA Classified)**
- F. **Challicum Hills Wind Farm Overhead Line – Site Layout (HBRA Classified)**
- G. **Crowlands Wind Farm Overhead Line – Site Layout (HBRA Classified)**
- H. **Example Vegetation Inspection Report**
- I. **Example Asset Inspection Report**
- J. **PHA.OPS.09.036.1 Electrical Event Report**
- K. **PHA.OPS.09.002 Defect Reporting Procedure**
- L. **Defect Reporting Form**
- M. **PHA.OPS.09.010 Root Cause Analysis Report**
- N. **PHA.HSE.09.014 Contractor Performance Evaluation**



Appendix A. Portland Wind Farm Overhead Line – Site Layout (HBRA Classified)



Key	Description
	Wind turbine generator
	Overhead power line
	Overhead power line Chalicum Hills and Crowlands
	Underground cable
	Poles owned by Pacific Hydro
	Poles owned and maintained by DNSP (Powercor)



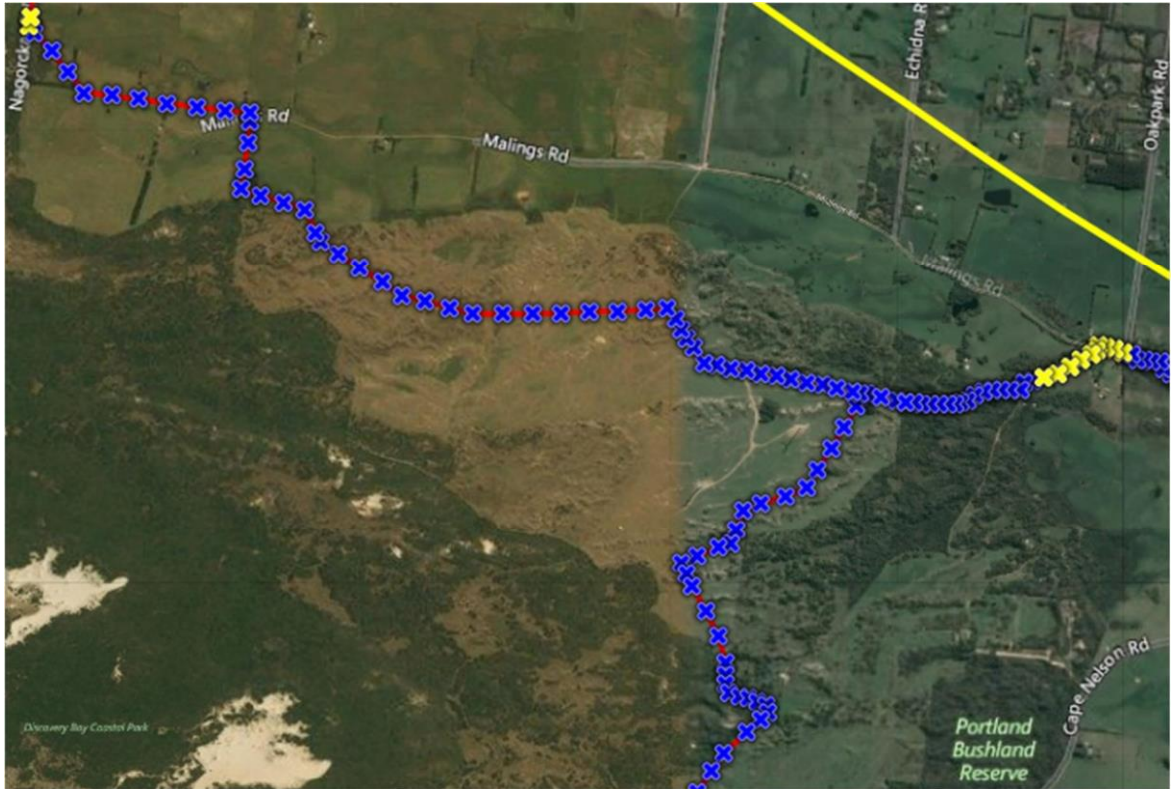
Appendix B. Cape Bridgewater Site Layout showing the location of the electric lines and poles (HBRA Classified)



Appendix C. Cape Nelson South Site Layout showing the location of the electric lines and poles (HBRA Classified)



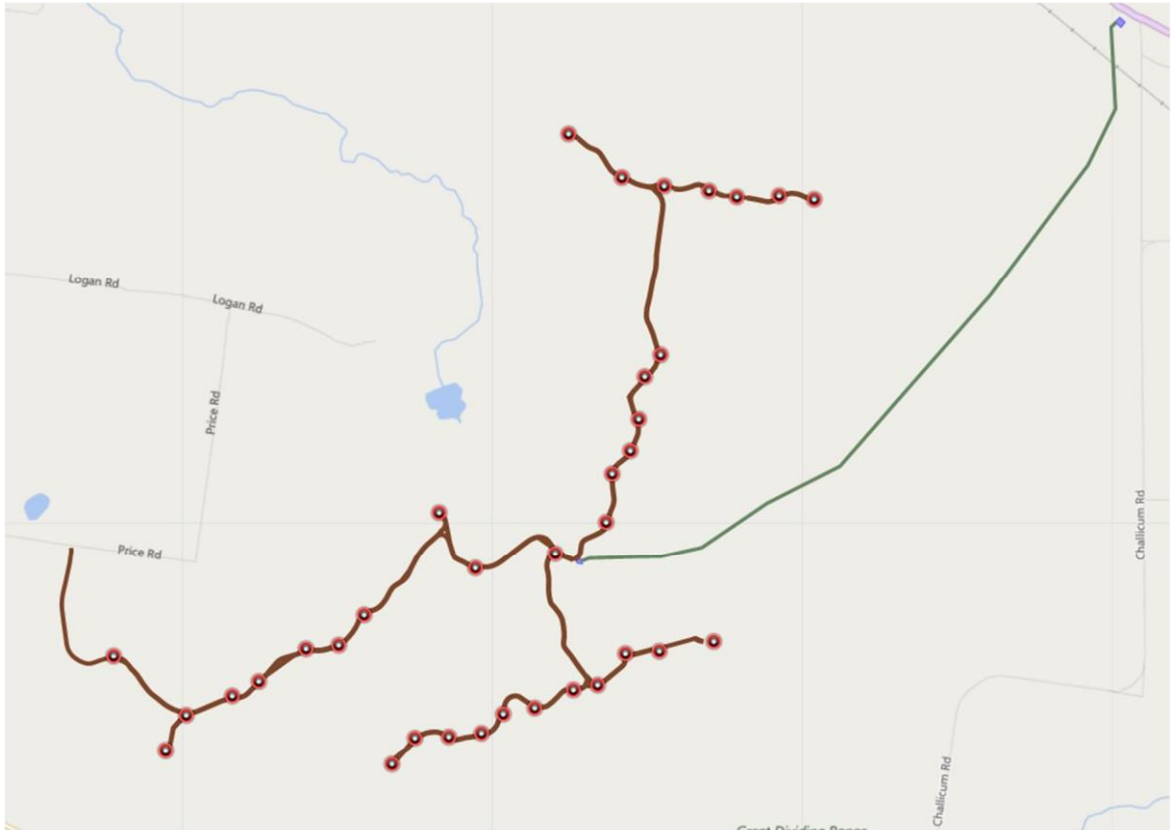
Appendix D. Cape Nelson North Site Layout showing the location of the electric lines and poles (HBRA Classified)



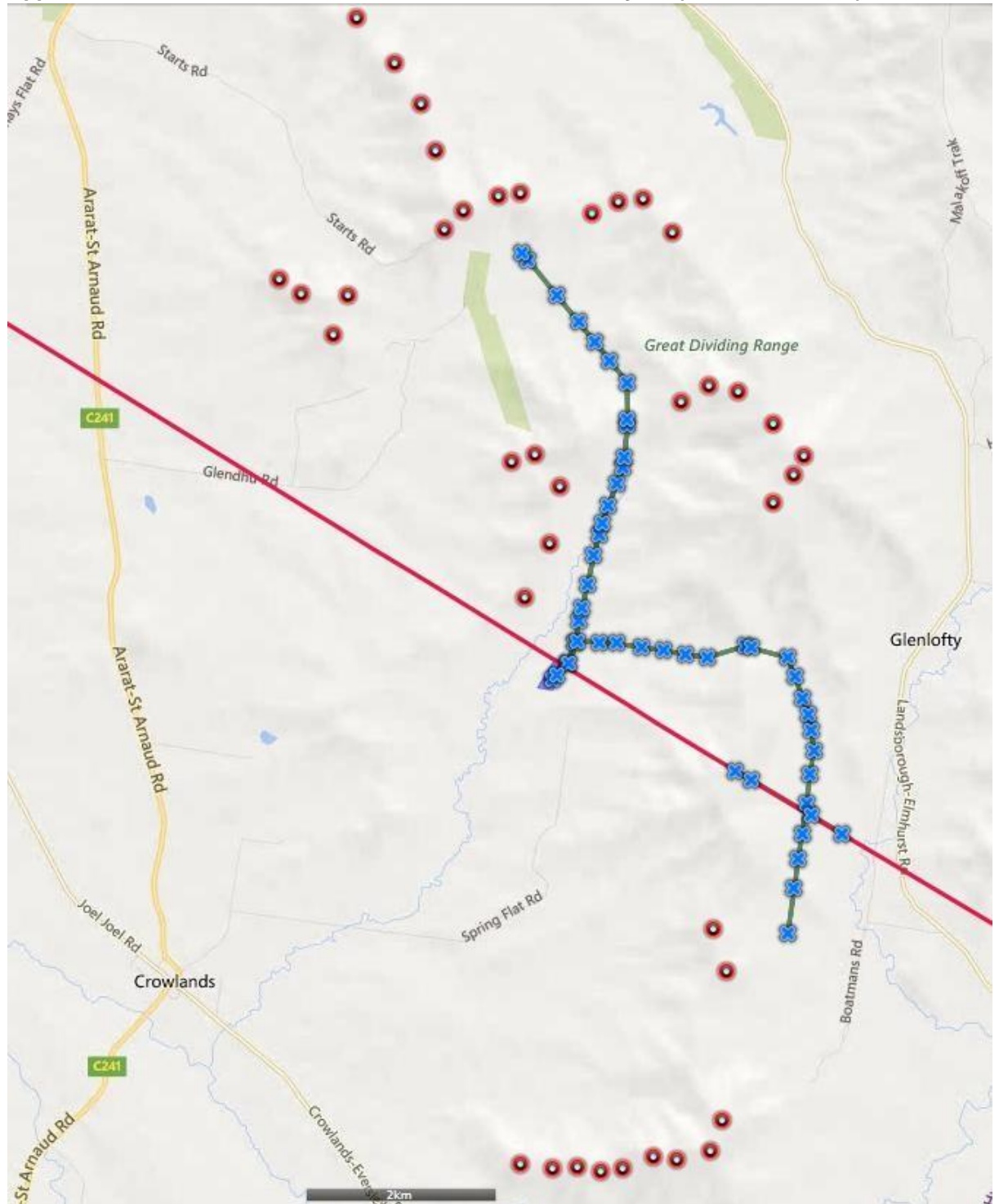
Appendix E. Cape Sir William Grant Site Layout showing the location of the electric lines and poles (HBRA Classified)



Appendix F. Chalicum Hills Wind Farm Overhead Line – Site Layout (HBRA Classified)



Appendix G. Crowlands Wind Farm Overhead Line – Site Layout (HBRA Classified)



Appendix H. Example Vegetation Inspection Report
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2022 Crowlands Powerline Vegetation Inspection
November 2022



Treespan Pty Ltd:

ABN 63 604 604 293

ACN 604 604 293

38 Holcombe Road Glenlyon

Prepared for: Rohan Calvert
Area Manager
Worley

Report prepared by: Rod Sewell
rsewell@utilitytrees.com.au
0448 476 499

DISCLAIMER

This information paper is provided to Worley by Tree Span Pty Ltd on a confidential basis and is provided to the recipient strictly on the understanding that its contents will be kept confidential and will not be disclosed to any other party without Tree Span prior permission in writing. In accepting the proposal, the recipient acknowledges that Tree Span will suffer consequential loss or damage if the confidential information is disclosed whether directly or indirectly or used in any way by the recipient without the consent of Tree Span.

Due to the nature of trees and the practical limitations in accurately assessing the structural integrity of all parts of a tree it is not possible to make a completely comprehensive assessment of the condition of a tree. The recommendations in this report are based on visual assessments and external indicators and there is also some degree of subjectivity. This report is intended to be used as a tool to assist in the risk management of trees growing in the vicinity of infrastructure. It should be noted that any tree near any structure or property or person(s) poses a risk.

To this extent, neither Tree Span nor any of its employees or directors or advisers gives any warranty as to the reliability or accuracy of the information nor accepts any responsibility arising in any other way (including by reason of negligence) for errors or omissions herein nor accepts liability for any loss or damage suffered by any person or any other persons placing any reliance on, acting on the basis of, the contents hereof. No party shall be entitled to raise any claim or suit of action on the basis of the contents of this report.

Scope

Tree Span Pty Ltd have been contracted by Worley to complete an inspection of the 33KV Overhead Powerline at the Crowlands Wind Farm



Inspection includes an assessment of each span with a projection of when the vegetation is likely to enter the clearance space. Identify any tree that may need clearing to ensure compliance with the Electricity Safety (Electric Line Clearance) Regulations 2020 is maintained until the next inspection in 2023.

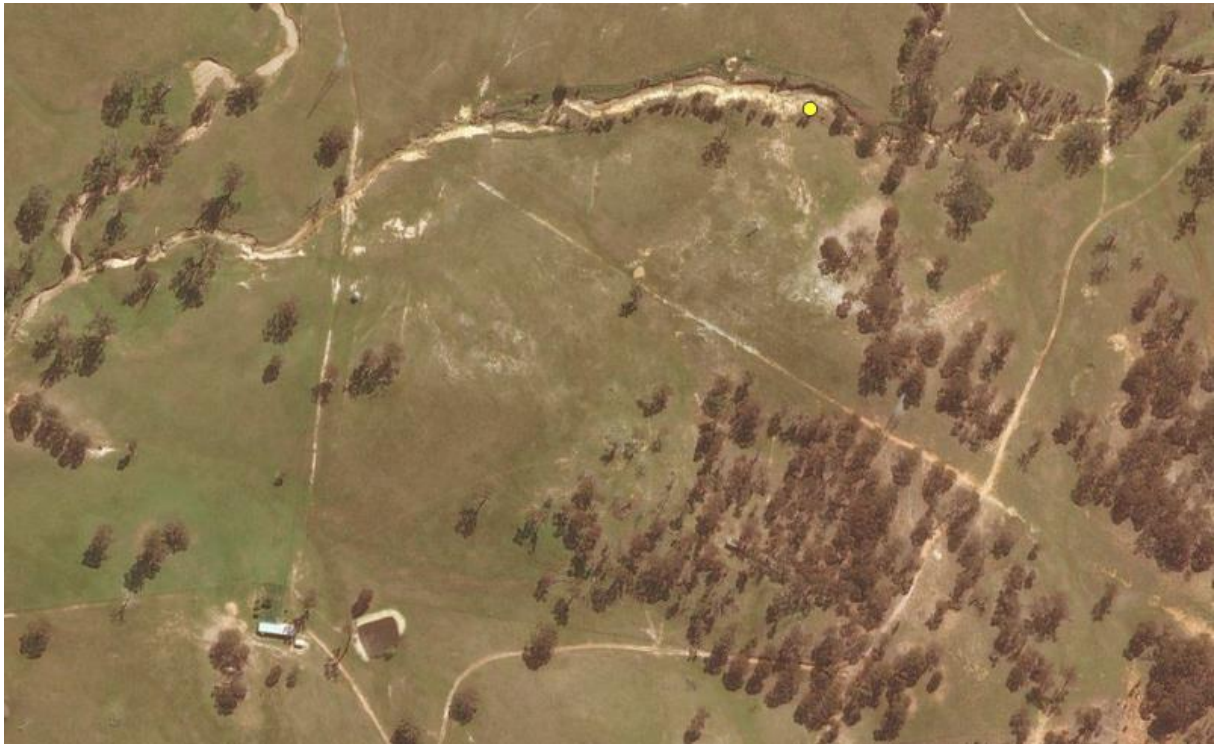
Trees within the vicinity of the Powerlines will be assessed to identify any (Hazard) trees or parts of the trees that are likely to fail and enter the clearance space.

The details of any vegetation identified as likely to enter the clearance space will be reported with cutting details and recommendations to ensure the compliance is maintained.

The report contains the location details of each span and the year the vegetation is likely to grow within the clearance space. Details of trees that need to be cleared including Tree Species, Description of Work, a photograph, Clearance space required and the actual clearance.

Code	Description
55	Foliage in Contact or likely to Contact Conductor
56	Foliage currently inside the Clearance Space
2022	Foliage Predicted to grow into Clearance Space 2022
2023	Foliage Predicted to grow into Clearance Space 2023
2024	Foliage Predicted to grow into Clearance Space 2025
2025	Foliage Predicted to grow into Clearance Space 2025
VS	Foliage Predicted to grow into Clearance Space 2025 to 2010
NVS	Non-Vegetated Span

Map of Locations



Findings


Summary

The 66kV line was inspected on Friday 18th November 2022. All spans were inspected, and the codes have been updated to reflect their status. The data for these lines is within Appendix 1

There is 1 span that are coded “2023” and require clearing to ensure compliance is maintained throughout the upcoming 2022/23 fire season. details are listed in the tables below

Suggest a Ground Crew equipped with the ability to apply herbicide to cut stumps to remove eucalypt scrub at the spans documents with Eucalypt Scrub in Appendix 1.

Site Number	Pole	Code	Work Required
1	22-23	23	2 x Removals

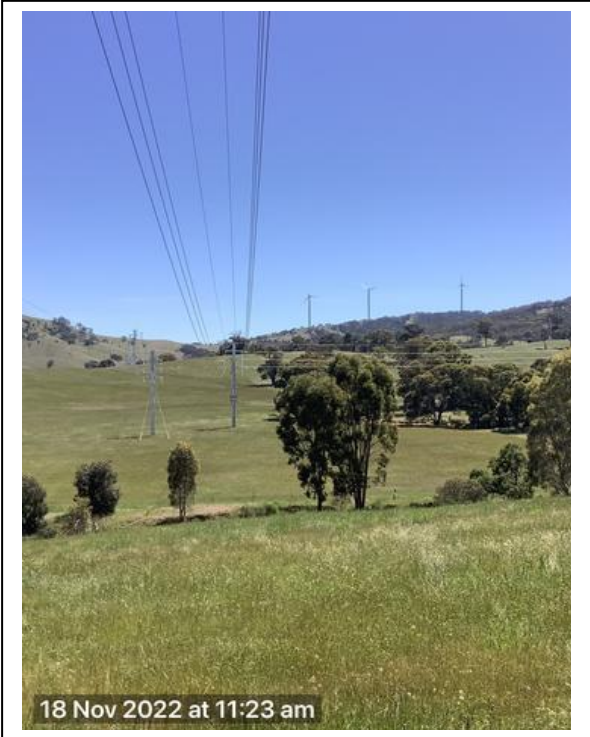
Crowlands tree 1	
Location	Crowlands Substation
Pole Number	22-23
Voltage	33KV
Land Owner	Private
 <p>Photo 1</p>	
Trims	
Removals	2
Species	Eucalypt
Equipment Required	Ground Crew Rope and Winch & Fall Away from Powerline
Comments	

Appendix 1

2022 CROWLANDS WINDFARM 33KV OVERHEAD LINE INSPECTION

Pole No.	Span Length	Code
0-1		Underground to first pole
1-2	221M	2024 - Tree under line mid span 6m 10m under
2-3	238M	NVS
3-4	143M	NVS
4-5	255M	VS
5-6	276M	NVS
6-7	236M	2024 – Eucalyptus at Dam 5.5m under
7-8	145M	2025 – Young Eucalypt Regrowth -
8-9	180M	VS
9-10	242M	VS
10-11	177M	NVS
11-12	104M	NVS
12-13	342M	NVS
13-14	45M	NVS
14-15	393M	VS
15-16	282M	NVS
16-17	248M	NVS
17-18	270M	2024 - Under line 1 st 33% 6m tree hasn't grown
18-19	350M	2024 – 7m Under
19-20	478M	VS
20-21	102M	VS
21-22		Underground to first Pole
22-23	242M	2023 - Eucalypt 4m mid-span remove 2 trees
23-24	233M	2024 - Under line 1 st 33% 6m
24-25	189M	VS
25-26	252M	VS
26-27	234M	VS
27-28	238M	2025 – Eucalypt 1st 1/6 of span
28-29	228M	2025 – young eucalypts under-line
29-30	230M	2025 – new eucalypts suckers under line
30-31	73M	VS
31-32	436M	NVS
32-33	229M	NVS
33-34	241M	2024 – Eucalypt Scrub
34-35	176M	VS – Eucalypt Scrub
35-36	179M	NVS
36-37	201M	2024 – Eucalypt mid span 5.5m
37-38	255M	VS Eucalypt suckers Under-line
38-39	304M	VS
39-40	328M	NVS
40-41	262M	2024 - Mature Eucalypt Mid-Span
41-42	302M	NVS
42-43	474M	VS

Appendix 2



Appendix I. Example Asset Inspection Report
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Pages = 3 (plus reports).

Our Reference: M.0132760.1.01

Date: Monday, 5 December 2022

Dwayne Beyer
Contacts Manager Renewables - Worley
Worley
178 Normanby Road
Southbank, VIC, 3205

Dear Dwayne,

Ref: PORTLAND WINDFARM - VISUAL POLE ASSESSMENT 2022

Omexom wishes to thank you and Worley management for the opportunity to undertake this power line assessment at Portland Windfarm.

Five hundred and fifteen (515) poles were visually inspected for defects during this assessment. A spreadsheet is attached. One (1) pole has been identified as having a high priority maintenance item (P42). There was a mixture of medium (P2) and low priority P3 items identified as seen in the attached report.

We did identify twenty-two (22) instances of trees and vegetation around or near the base of poles. The vegetation will require removal before the commencement of the groundline inspection in 2023.

The attached report contains Omexom's assessment and information about this project. The report includes:

1. Our visual inspection methodology; and
2. Maintenance reports.

Should you have any questions or concerns, please do not hesitate to contact me.

Yours Sincerely,

Peter Bell
Business Manager
Omexom



1. VISUAL INSPECTION METHODOLOGY

OMEXOM's visual inspection of electrical reticulation assets is undertaken, at four points of view, utilising powered image stabilised binoculars and digital SLR cameras and includes, but is not limited to, the following:

1. Inspection of each power pole asset including:

- 1. Cross-arms;**
 - Deterioration.
 - Crack, splits and hardware.
- 2. Poles;**
 - Damage; rust (steel and concrete).
 - Bowed, leaning and hardware.
- 3. Insulators;**
 - Cracks, tracking.
 - Loose hardware and stains.
- 4. Conductors;**
 - Corrosion, broken strands, ties.
 - Clearance issues; and deformity.
- 5. Connectors;**
 - Loose, broken, discoloured and conductor damage.
- 6. Stays;**
 - Wire damage; anchors.
 - wooden insulator damage and eyebolts.
- 7. Transformers;**
 - Oil stains; bushings.
 - Droppers and fusing.
- 8. ABS and switches;**
 - Insulators; switch and blade alignment; handles and earths.
- 9. Fusing and HV apparatus;**
 - Insulators; fuse conditions.
 - Burn marks and tracking.
- 10. Earthing;**
 - Connections and earth wires.
- 11. Vegetation;**
 - Clearance items, species and location.
- 12. Design.**
 - Assets that do not conform to current design standards.

All inspection is undertaken by a qualified Cert iV Asset Inspector.

Insulators

- Cracks or chips
- Tracking
- Loose - Hardware
- Bolt Rust / Expansion
- Age (Brown)
- Bird Covers required
- Insulator - Size vs Voltage
- Insulators missing
- Cross-arm burns

Conductors

- Corrosion
- Insulators Staining
- Broken Strands
- Incorrect Sag
- Clearance Issues
- Broken or loose Ties
- Discolouration (heating)
- Earth Wire (secure)
- Insulation (heating)

Cross-arms

- Deterioration (location?)
- Lateral Splits (length/depth?)
- Bowing or Bending
- Burning or Scorch marks
- Rust Stains
- Malformation
- End Splits
- King Bolt Hole (deterioration or splits)
- Brace Conditions
- Hardware - Loose, Rusty or Broken
- Split bolts installed

EDO - Fuses

- Burning or Scorch marks
- Barrel Deformity
- Infra-Red Survey
- (See Connectors)

Connections

- Loose / Broken
- Discolouration (heat)
- Copper / Alum interface
- Conductor Damage
- Infra-Red Survey

Transformers

- Oil Leaks
- Bushing Covers
- Bushings - Chips / Cracks
- Bushing - Tracking / Burn
- Droppers - Heat / Clearance
- Infra-Red Survey
- (See Connectors)
- (See Fuses)

Switches

- Insulators - (See Insulators)
- Contacts - Discolouration
- Contacts - Aligned and bedded
- Handle and Controls - aligned
- Infra-Red Survey
- (See Connectors)
- (See Fuses)

Stays

- Wire Condition
- Anchor Condition
- Insulator Condition
- Eye Bolt - Secure / Condition
- Eye bolt Cracks

Pole

- Leaning
- Bowed (load)
- Splits and knots
- Concrete - Cracks / Rust
- Steel - Rust / Pitting

Vegetation

- Touching / Near
- Near Clearance Space
- Vegetation type (growth)
- Location - Underline etc

Visual Inspection Items Guide









These OMEXOM Visual Inspection Items are not an exhaustive list but are to be used as a foundation for a comprehensive inspection.

MAINTENANCE REPORT



Omexom ProjectName Pacific Hydro 2022

Omexom Project No M.0132760.1.01

Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
997936 -46 - 15 Nov 2022 - Darren Sealy	Stay Insulator	On Pole	Stay insulator attached above lowest 22kv circuit coming of PLD-6 feeder on pole.	Replace	P2 (32 weeks)	No		
997936 -46 - 15 Nov 2022 - Darren Sealy	Stay Wire	Midspan	Stay wire rubbing on comms cable, lack of clearance from pca asset	Remove, Repair	P2 (32 weeks)	No		
997956 -49 - 15 Nov 2022 - Darren Sealy	EDO/PF Fuse Unit	Paddock side	T fuse Deteriorated-P2 coming of PLD-6 paddock side	Replace	P2 (32 weeks)	No		
998048 -97 - 16 Nov 2022 - Darren Sealy	EDO/PF Fuse Unit	Paddock side	L EDO corroded at base -p2, coming of PLD-6 22kv feeder, paddock side	Replace	P2 (32 weeks)	No		
998048 -97 - 16 Nov 2022 - Darren Sealy	EDO/PF Fuse Unit	Road Side	L EDO Corroded at base p2, coming of PLD-6 feeder ,Rd side	Replace	P2 (32 weeks)	No		


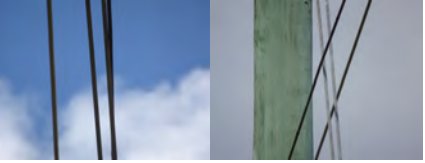
MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998148 -130 - 17 Nov 2022 - Darren Sealy	HV Insulator	Left	Xarm4 22kv CER 7sh insulator bleaching P2 , 22kv feed from PLD-6 running on pole.	Replace	P2 (32 weeks)	No		
998148 -130 - 17 Nov 2022 - Darren Sealy	HV Insulator	Right	Xarm4 22kv 7sh CER Insulator bleaching P2, 22kv feed from PLD6 running on pole.	Replace	P2 (32 weeks)	No		
724769 -133 - 17 Nov 2022 - Darren Sealy	HV Insulator	Right, Left	Xarm4 CER 7sh 22kv insulators bleaching x2 left and right sides, 22kv coming of PLD-6	Replace	P2 (32 weeks)	No		
724807 -151 - 18 Nov 2022 - Darren Sealy	EDO/PF Fuse Unit	Road Side	T Fuse deteriorated P2 rd side, 22kv running on pole PLD-6 feeder.	Replace	P2 (32 weeks)	No		
998664 -178 - 21 Nov 2022 - Darren Sealy	LV Conductor	Midspan	Comms cable low 4.1M across farm paddock. Possibly chance of being damaged from farm machinery.	Tighten	P2 (32 weeks)	No		

MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998797 -3 - 21 Nov 2022 - Darren Sealy	HV Insulator	West side	Xarm6 66kv insulator loose west side	Tighten	P2 (32 weeks)	No		
998763 -235 - 22 Nov 2022 - Darren Sealy	Trees Near Conductors	Midspan	Comms cable touching veg (trees) chance of damaging cable.	Remove	P2 (32 weeks)	No		
998498 -291 - 23 Nov 2022 - Darren Sealy	Stay Wire	Midspan	Stay wire rubbing on comms cable chance of damaging insulation.	Repair	P2 (32 weeks)	No		
998536 -327 - 24 Nov 2022 - Darren Sealy	EDO/PF Fuse Unit	Left	T HV fuse Deteriorated coming of PLD-6 on pole.	Replace	P2 (32 weeks)	No		
998535 -326 - 24 Nov 2022 - Darren Sealy	Stay Wire	Above Ground Line	Stay wire loose livestock rubbing on wire	Tighten	P2 (32 weeks)	No		
998584 -343 - 24 Nov 2022 - Darren Sealy	Stay Wire	Midspan	Stay wire rubbing on comms cable chance of damaging cable insulation, insulation cover moved.	Replace	P2 (32 weeks)	No		

MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998594 -350 - 24 Nov 2022 - Darren Sealy	HV Cross-arm	East side	Xarm2 22kv strap bolt to short half nut secure. East side on PLD-6	Replace	P2 (32 weeks)	No		
745396 -2 - 28 Nov 2022 - Darren Sealy	Pole - Above GroundLine	Top, On Pole	Pole top split needs anti split bolts to prevent split from getting worse. Or pole mount insulator design change.	Repair	P2 (32 weeks)	No		
745488 -65 - 29 Nov 2022 - Darren Sealy	HV Conductor	Road Side	Xarm2 22kv conductor broken strand at insulator Rd side. 22kv running on pole PLD-6 feeder.	Repair	P2 (32 weeks)	No		
997883 -7 - 14 Nov 2022 - Darren Sealy	Pole - Above GroundLine	Top, On Pole	pole top split not a problem yet	Re-Inspect in 2 years	P3 (Observation)	No		
997886 -10 - 14 Nov 2022 - Darren Sealy	Conductor Tie	Road Side	Xarm -1 tie corroded Rd side	Re-inspect in 12 months	P3 (Observation)	No		
997886 -10 - 14 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Vegetation around pole.	Remove	P3 (Observation)	No		





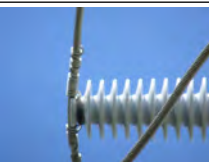
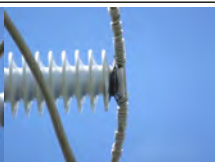

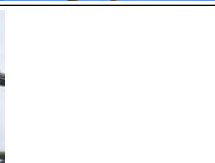
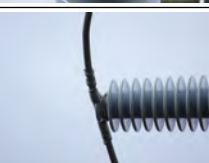
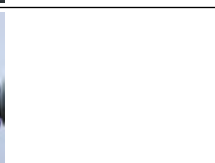
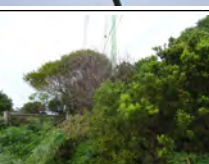



MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
997888 -12 - 14 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
997891 -15 - 14 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
997894 -18 - 14 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Right, Left	Xarm-1 corroded tie, left & right sides	Monitor	P3 (Observation)	No		
997898 -22 - 15 Nov 2022 - Darren Sealy	Hv Catenary Clamps	On Pole	Centenary comms clamp and hook worn	Re-inspect in 12 months	P3 (Observation)	No		
997899 -23 - 15 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection. Also veg clearance needed on track for vehicle access in this area.	Remove	P3 (Observation)	No		
997900 -24 - 15 Nov 2022 - Darren Sealy	Stay Wire	On Pole	Stay arm corroded at knuckle	Monitor	P3 (Observation)	No		










MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
997902 -26 - 15 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Track clearance needed in this area for vehicle access	Remove	P3 (Observation)	No		
997912 -30 - 15 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
997968 -56 - 15 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Road Side, Paddock side	Xarm1 insulator tie's corroded road side & paddock side	Monitor	P3 (Observation)	No		
998001 -69 - 16 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Road Side	Xarm3 insulator tie corroded rd side	Monitor	P3 (Observation)	No		
998001 -69 - 16 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Paddock side	Xarm2 insulator tie corroded paddock side	Monitor	P3 (Observation)	No		
998001 -69 - 16 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998010 -74 - 16 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		

MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998012 -76 - 16 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998014 -78 - 16 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998919 -82 - 16 Nov 2022 - Darren Sealy	66kV Insulator	Left, Road Side	Xarm1 insulator tie corroded rd side	Monitor	P3 (Observation)	No		
998053 -99 - 16 Nov 2022 - Darren Sealy	66kV Insulator	Right, Road Side	Insulator tie corroded on xarm2 Rd side-P3	Monitor	P3 (Observation)	No		
998089 -108 - 17 Nov 2022 - Darren Sealy	Pole - Above GroundLine		Pole leaning 5deg elsewhere	Monitor	P3 (Observation)	No		
998137 -127 - 17 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Left	Xarm1 insulator tie corroded left side P3	Monitor	P3 (Observation)	No		
998137 -127 - 17 Nov 2022 - Darren Sealy	66kV Insulator	Right, Road Side	Xarm1 insulator tie corroded right side P3	Monitor	P3 (Observation)	No		

MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998148 -130 - 17 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Road Side	Xarm3 insulator corroded tie rd side P3	Monitor	P3 (Observation)	No		
724810 -152A - 18 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Road Side	Xarm1 66kv insulator corroded tie P3 rd side.	Monitor	P3 (Observation)	No		
724810 -152A - 18 Nov 2022 - Darren Sealy	66kV Insulator	Right, Paddock side	Xarm3 66kv insulator tie corroded P3, paddock side	Monitor	P3 (Observation)	No		
724835 -153A - 18 Nov 2022 - Darren Sealy	66kV Insulator	Road Side, Paddock side	Xarm2 66kv insulator tie's x2 corroded P3, rd side & paddock side.	Monitor	P3 (Observation)	No		
724835 -153A - 18 Nov 2022 - Darren Sealy	66 kV Cross-arm, Conductor Tie	Road Side	Xarm1 66kv insulator tie corroded P3 rd side.	Monitor	P3 (Observation)	No		
998655 -169 - 18 Nov 2022 - Darren Sealy	King bolt	On Pole	Xarm2 bracket bolt loose P3	Tighten	P3 (Observation)	No		
724840 -168A - 18 Nov 2022 - Darren Sealy	King bolt	On Pole	Xarm1 bracket bolt loose P3	Tighten	P3 (Observation)	No		















MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
724840 -168A - 18 Nov 2022 - Darren Sealy	King bolt	On Pole	Xarm2 bracket bolt loose P3	Tighten	P3 (Observation)	No		
998655 -169 - 18 Nov 2022 - Darren Sealy	Pole Cap	Top, On Pole	Pole cap missing	Replace	P3 (Observation)	No		
998664 -178 - 21 Nov 2022 - Darren Sealy	Pole Cap	Top, On Pole	Pole cap missing replace P3	Replace	P3 (Observation)	No		
998697 -187 - 21 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	West side	Xarm2 66kv insulator tie corroded west side.	Replace	P3 (Observation)	No		
998707 -197 - 21 Nov 2022 - Darren Sealy	Pole Cap	Top, On Pole	Pole cap missing	Replace	P3 (Observation)	No		
998770 -242 - 22 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998792 -259 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		




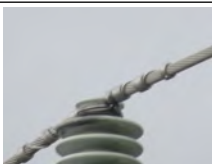
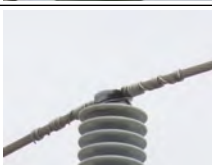
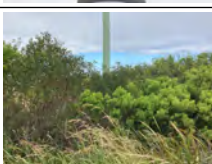



MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998493 -287 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
745820 -288AGX - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998496 -289A - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998496 -289A - 23 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Road Side	Xarm1 66kv insulator tie corroded Rd side	Monitor	P3 (Observation)	No		
998497 -290 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998498 -291 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
732286 -292A - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection.	Remove	P3 (Observation)	No		

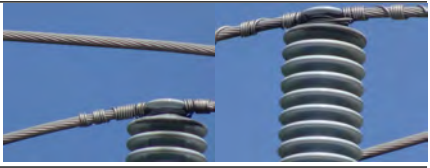





MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
998500 -293 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground inspection	Remove	P3 (Observation)	No		
998501 -294 - 23 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
998531 -322 - 24 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Paddock side	Xarm1 insulator tie corroded paddock side	Monitor	P3 (Observation)	No		
998589 -347 - 24 Nov 2022 - Darren Sealy	66kV Insulator	Left	Xarm1	Monitor	P3 (Observation)	No		
LIS 724887 -390 - 28 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
997866 -X2AGL - 28 Nov 2022 - Darren Sealy	Pole - Above GroundLine		Pole unused Asset	Remove	P3 (Observation)	No		
745446 -39 - 29 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		

MAINTENANCE REPORT



Inspection Details	Maintenance Item	Asset Orientation	Maintenance Description	Recommended Action	Priority	Rectified	Image 1	Image 2
745455 -47 - 29 Nov 2022 - Darren Sealy	66kV Insulator, Conductor Tie	Left, Centre	Xarm1 66kv insulator ties corroded left & centre phases	Monitor	P3 (Observation)	No		
745475 -61 - 29 Nov 2022 - Darren Sealy	Tree and shrub growth at pole	At Ground Line	Veg clearance needed before next ground line inspection	Remove	P3 (Observation)	No		
745486 -64 - 29 Nov 2022 - Darren Sealy	66kV Insulator	Paddock side	Xarm1 66kv insulator tie corroded paddock side	Monitor	P3 (Observation)	No		
745488 -65 - 29 Nov 2022 - Darren Sealy	66kV Insulator	Paddock side	Xarm1 66kv insulator tie corroded paddock side	Monitor	P3 (Observation)	No		
745474 -60 - 29 Nov 2022 - Darren Sealy	66kV Insulator	Road Side	Polymer Ct 12sh 66kv insulator loose fitting Rd side, pole on hill high wind area. Insulator movement.	Tighten	P42 (42 Days)	No		

Appendix J. PHA.OPS.09.036.1 Electrical Event Report
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Electrical Event Report

Report Number

Report Status

PHA.OPS.09.001 Electrical Event Report Procedure

Note: Faults that have the potential to cause injury or property damage are also to be reported on form HSE 012.002.2

Serious Electrical Incidents

Any faults that are deemed to be "serious electrical incidents" must as soon as practicable be reported to Energy Safe Victoria.

- an electrical worker who becomes aware of a serious electrical incident relating to work carried out by that worker;
- an operator of a high voltage electrical installation who becomes aware of any serious electrical incident occurring within that electrical installation
- an operator of a complex electrical installation who becomes aware of any serious electrical incident occurring within that complex electrical installation

Reporting Procedure to Energy Safe Victoria

As soon as it is safe to do so, contact Energy Safe by telephone on Telephone: (03) 9203 9700. This should occur within 4 (four) hours of the incident. The person who reported the incident to Energy Safe Victoria then must submit a written report of the incident to Energy Safe Victoria within 20 business days of the incident.

Short Description *

Reported By *

Notification Date *

Site Name *

Serious Electrical Event? *

Event Number Auto Generated

Event Date & Time * 12 AM 00

Weather at time of event

Brief Description of Fault *

Supporting Attachments

Suspected Cause of Fault

Event Location / Type

Impact of Event - (operations / equipment)

Name / Location /
No of CBs Open

Production
Relay/s Operated
/ Triggered

Tripping Relay
Indications

Attachments

Data Downloaded

Data Location

Externals
Contacts

Power Restored

 12 AM 00

Duration

hours

Immediate
Actions

Date

Who

Description

Future Actions

Is Further Root Cause Required

SAVE

SAVE AND SEND UPDATES

CANCEL

Appendix K. PHA.OPS.09.002 Defect Reporting Procedure
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1138601 - Defect Reporting Procedure

PHA.OPS.09.002



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Document Control

Name /	Description	Date	Signature
Hongtao Cao	Author	02.11.2022	
Adrian Ciccocioppo	Reviewer	02.11.2022	
Cesar Salvatierra	Approver	02.11.2022	

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Document Status	Approved	Links to Related Documents	Link
Next Review Date	02.11.2024	Document Location	Nexo PHA Operations
PH Standard Element(s) and/or Sub-element(s)	Standard Element	Document Type	Procedure

Revision History

Issue	Release Date	Comments
Initial Issued	01.10.2016	



3	3.12.2019	Major Updates to reflect updated NFDA
4	02.2020	Minor updates following improvements to Nintex Forms/Workflows. Format updates.
5	05.11.2021	Minor update to reflect latest NFDA and include the defect form for Outsourced assets
6	02.11.2022	General Review and update



1. Introduction

This procedure outlines the process to be followed when defects (or non-conformances) are found in Assets/systems (hardware or software) which are intended to continue operation.

Management of operational defects is important to ensure safe operation of the Assets and can support prevention of future similar/systemic defects.

Defects can vary in the Risk that they present to the safe operation of the Assets and hence the wider business. To help evaluate this risk we refer to the Risk Matrix in Appendix 1 which forms part of the board approved Enterprise Wide Risk Management Framework. It is important to be familiar with, and refer to, Pacific Blue's Risk Matrix when considering raising a Defect Report to help establish the Risk Rating the Defect poses to Pacific Blue's business.

The rationale around management of Defects/Risk associated with Defects is:

- The Higher the Risk Rating the Higher the level of Review/Approval required.
- The Risk is managed by those best placed to do so.

Examples of defects include: damage to mechanical equipment such as towers, blades, drive train components and hydraulics, damage to electrical equipment such as sensors, transformers, cabling, switchgear, etc. Minor defects such as paint scratches, minor corrosion of ancillary plant, leaks, etc. should not rate as a risk (on the assumption they are picked up early) and hence should be raised as a Task on the Computerised Maintenance Management System (CMMS), with the aim to be rectified in the earliest convenient time possible if needed.

2. Scope

The purpose of this procedure is to define the defect concept across PHA Operations, including clear guidelines to report them and to manage them in alignment with the Enterprise Risk Management Framework of PH Australia, and the Non-Financial Delegation of Authority Procedure (NFDA).

3. Definitions

Term	Definition/Abbreviations
Asset	A piece of fixed or mobile equipment of value
Defect	A defect is any fault in the design, function or qualitative characteristic of an item in operation which differs from the specification, the drawing or recognised standard of good workmanship for that item other than that classified as 'fair wear and tear' within manufacturer's limits and that effects operational functionality or performance.
EWRMF	Enterprise Wide Risk Management Framework



Significant Defects	Defects with a risk rating of High or Extreme according to PH EWRMF
Non-Significant Defects	Defects with a risk rating of Low or Medium according to PH EWRMF
Failure	A Failure is a substandard condition of a component or asset that causes the plant to breakdown or trip. Immediate repair is needed to restore the plant to operation
NFDA	Non-Financial Delegation of Authority
LCM	Lifecycle Cost Model
CMMS	Computerized Maintenance Management System
PHA	Pacific Blue Australia

4. References

PHA.OPS.07.005 Delegation of Authority – Non-Financial

PHA.OPS.09.005 Maintenance Management Procedure

[Major Component Failure spreadsheet](#)

5. Approvals Required to Operate Assets under Defects

As soon as a defect is identified on site in any of the assets within the PHA operating fleet, a thorough risk assessment should be conducted to thoroughly review the risk rating of the defect (Appendix A).

5.1 Outsourced assets:

Contractors need to conduct risk assessment with actions recommended for PHA approval.

5.2 In-housed assets:

Based on this risk review, a definition of “Significant” or “Non-Significant” event should then be allocated to the defect to facilitate its review in accordance to the current NFDA of PHA.

Depending if the defect can be defined as “Significant” or “Non-Significant”, and also depending if the underlying asset impacted by the defect is Critical or Not Critical (NFDA Annex 1.1), different approvals levels will be required to operate the asset under the respective defect. Supervisors and Regional Managers are responsible for ensuring that the proper approval levels have been used when continue operating assets in the presence of high-risk defects.



6. Defect Reporting Procedure

6.1 Outsourced Assets:

1- Raise a Defect Reporting Form

Contractor should refer to the Risk Matrix to determine if the proposed Defect risk rating is low and hence does Not require a Defect Report to be raised.

Otherwise, Defect Reporting Form (Appendix C or Contractors' equivalent Form) is required to be completed with as much information including any action/s that have been undertaken and contractors' engineering/HSE/Management review/endorsement. Contractors should provide the completed Defect Reporting Form to PHA Wind Contract Manager for review.

2- Wind Contract Manager Review

After received the Defect Reporting Form from Contractors, Wind Contract Manager needs to review and initiate the Defect Reporting as per section 6.2.

6.2 In-housed Assets:

The basic steps in the Pacific Blue initiated Defect Reporting process are shown below. It is structured to ensure a staged approval process which is graphically represented in Appendix B.

1- Raise a Defect Reporting Form

Initiator should refer to the Risk Matrix, to determine if the proposed Defect risk rating is Low and hence does NOT require a Defect Report to be raised.

Ensure the Defect Reporting Form is completed with as much information including any action/s that have been undertaken to date to minimise potential Rejection from subsequent reviewers

Recommendations from the originator on future action/s should also be included.

2- Supervisor (Regional Services Manager/Contract Manger) Review

Assess impacts, actions and the current unit status. Any additional supervisor actions/comments to be included.

Supervisor to review Risk Rating, the need for a Root Cause Analysis and approve.

Refer to NFDA procedure as to who can endorse/approve a change.

3- Engineer (Senior Asset Engineer) Review

As per their respective discipline's defect actions and future actions should be reviewed for soundness against engineering principles. Further support maybe sought through Subject Matter Experts (SME's) before rejecting/endorsing. The need for a Root Cause Analysis (RCA) should also be done.



Note that under the *Professional Engineers Registration Act 2019* that from July 2021 this engineering review stage may be defined under the definition of “*professional engineering services*” in which case it can only be performed by a registered professional engineer within their registered “*area of engineering*”.

Refer to NFDA procedure as to who can endorse/approve a change.

4- Asset Manager (AM) and/or Production Manager (PM) Review

Subject to the Defect 'Classification' and if it is impacting a 'Critical' Asset this step will either require the Production Manager to provide 'Backup' or 'Joint' endorsement/approval.

Refer to NFDA procedure as to who can endorse/approve a change.

5- Executive Manager, Engineering Services (EMES) Review

Subject to the Defect being classified as both

1. Critical, and
2. Significant (Extreme and High 'Post' Risk ONLY)

this step will be directed to the EMES for review.

Refer to NFDA procedure as to who can endorse/approve a change.

6- Executive Manager, Operations (EMO) Review

Subject to the Defect continuing to be classified as both

1. Critical, and
2. Significant (Extreme and High 'Post' Risk ONLY)

this step will be directed to the EMO for review.

Refer to NFDA procedure as to who can endorse/approve a change.

7- Director of Development, Project and Operation (DDPO) Review

Subject to the Defect continuing to be classified as both

1. Critical, and
2. Significant (Extreme and High 'Post' Risk ONLY), and
3. The Risk Consequence is rated as 'Catastrophic',

this step will be directed to the **DDPO** for review.

Refer to NFDA procedure as to who can endorse/approve a change.

8- Chief Executive Officer (CEO) Review

Subject to the Defect continuing to be classified as both



1. Critical, and
2. Significant (Extreme and High 'Post' Risk ONLY), and
3. The Risk Consequence is rated as 'Catastrophic',

the defect information will be directed to the Corporate Office/CEO for review.

Refer to NFDA procedure as to who can endorse/approve a change.

9- Initiated

Once the Defect form has made it through the review stages it can be commenced.

Note that this review process may not cover all site/task specific documentation such as SWMS/JSA's, Permits, Instructions etc which may still need to be reviewed prior to the task.

10- Completed

Defect status is to be reviewed through scheduled meetings and remain active until all follow-on actions are completed and the defect is resolved.

The Defect form can then be edited to 'Mark As Completed'.



Appendix A – Risk Matrix

Table 1: Risk Likelihood Ratings

Rating	Criteria
Frequent	Is expected to occur in most circumstances Risk has more than 75% chance of occurring Will occur within the next 6 months
Likely	Will probably occur in most circumstances Risk has 50-74% chance of occurring Will occur within 18 months
Possible	Might occur at some time Risk has 25-49% chance of occurring Will occur within 36 months
Unlikely	Could occur at some time Risk has less than 25% chance of occurring Will occur within 54 months
Rare	May occur only in exceptional circumstances Not likely to occur within next 5 years



Table 2: Risk Consequence Ratings

Rating	Financial Impact	Operations	Development Construction	Legal Compliance	Reputation	Environment Community	Health & Safety
<i>Catastrophic</i>	<ul style="list-style-type: none"> Negative Financial Impact is: EBITDA: > \$20M and/or EV: > \$200M 	<ul style="list-style-type: none"> Significant reduction in group operations output: > 30% pa Serious damage to asset/s: > 6 months loss of service 	<ul style="list-style-type: none"> Significant development / construction delays: > 12 months 	<ul style="list-style-type: none"> Significant litigation or breach of regulation with damages / costs: > \$10M Jailing of Director or Officer Court or Regulator imposed fine: > \$1M Class action 	<ul style="list-style-type: none"> Significant / irreparable damage to Pacific Hydro reputation Requires PHPL Board attention Loss of Social Licence to Operate and ability to extend existing project lifecycle 	<ul style="list-style-type: none"> Significant environmental damage or long term impact resulting in costs: > \$10M Significant breach of regulation with imposed fine: > \$1M Significant breach leading to intrusive / restrictive regulation or moratorium Community outrage and/or significant media outcry with national / international coverage 	<ul style="list-style-type: none"> Fatality Lost time injury (LTI) resulting in permanent disability
<i>Major</i>	<ul style="list-style-type: none"> Negative Financial Impact is: EBITDA: \$10M - \$20M and/or EV: \$100M - \$200M 	<ul style="list-style-type: none"> Major reduction in group operations output: 15% - 30% pa Major damage to asset/s: 1 - 6 months loss of service 	<ul style="list-style-type: none"> Major development / construction delays: 6 - 12 months 	<ul style="list-style-type: none"> Major litigation or breach of regulation with damages / costs: \$2M - \$10M Court or Regulator imposed fine: \$0.5M - \$1M 	<ul style="list-style-type: none"> Major damage to Pacific Hydro reputation Requires CEO & CFO attention Social Licence to Operate under threat impacting ability to extend project lifecycle 	<ul style="list-style-type: none"> Major environmental damage or long term impact resulting in costs: \$2M - \$10M Major breach of regulation with imposed fine: \$0.5M - \$1M High-profile community concerns and/or heightened media attention Increased calls for more intrusive regulation 	<ul style="list-style-type: none"> Lost time injury (LTI) resulting in inability to work for > 30 days
<i>Moderate</i>	<ul style="list-style-type: none"> Negative Financial Impact is: EBITDA: \$2M - \$10M and/or EV: \$20M - \$100M 	<ul style="list-style-type: none"> Moderate reduction in group operations output: 3% - 15% pa Damage to asset/s with no loss of service Fines and penalties by regulators 	<ul style="list-style-type: none"> Moderate development / construction delays: 3 - 6 months Fines and penalties by regulators and/or contractors 	<ul style="list-style-type: none"> Moderate litigation or breach of regulation with damages / costs: \$0.5M - \$2M Court or Regulator imposed fine: \$0.1M - \$0.5M 	<ul style="list-style-type: none"> Moderate damage to Pacific Hydro reputation Requires GM attention 	<ul style="list-style-type: none"> Moderate environmental damage or long term impact resulting in costs: \$0.5M - \$2M Moderate breach of regulation with imposed fine: \$0.1M - \$0.5M Medium term community impact that attracts local and national media attention 	<ul style="list-style-type: none"> Lost time injury (LTI) resulting in inability to work for 1 - 30 days
<i>Minor</i>	<ul style="list-style-type: none"> Negative Financial Impact is: EBITDA: \$1M - \$2M and/or EV: \$5M - \$20M 	<ul style="list-style-type: none"> Minor reduction in group operations output: 1% - 3% pa Censure by regulators 	<ul style="list-style-type: none"> Minor development / construction delays: 1-3 months Censure by regulators 	<ul style="list-style-type: none"> Minor litigation or breach of regulation with damages / costs: < \$0.5M Court or Regulator imposed fine: < \$0.1M 	<ul style="list-style-type: none"> Minor damage to Pacific Hydro reputation Requires EM attention 	<ul style="list-style-type: none"> Minor environmental damage or long term impact resulting in costs: < \$0.5M Minor breach of regulation with imposed fine: < \$0.1M Local community complaints that attracts local media attention 	<ul style="list-style-type: none"> Medical treatment injury (MTI) or first aid treatment injury
<i>Insignificant</i>	<ul style="list-style-type: none"> Negative Financial Impact is: EBITDA: < \$1M and/or EV: < \$5M 	<ul style="list-style-type: none"> Negligible group operational impact No loss of service Normal repairs to asset/s 	<ul style="list-style-type: none"> Negligible development / construction impact 	<ul style="list-style-type: none"> Negligible (immaterial) legal issues, non-compliances and breaches of regulation / contracts 	<ul style="list-style-type: none"> Negligible impact Reputation intact 	<ul style="list-style-type: none"> No lasting detrimental effect on the environment Negligible community impact - short term inconvenience 	<ul style="list-style-type: none"> No injury No review required

Figure 1: Risk Assessment Matrix

Consequence	Catastrophic	Major	Moderate	Minor	Insignificant
Likelihood					
Frequent	Extreme 25.00	Extreme 24.00	Extreme 22.00	High 19.00	Medium 11.00
Likely	Extreme 23.00	Extreme 21.00	High 18.00	High 15.00	Medium 10.00
Possible	Extreme 20.00	High 17.00	High 14.00	Medium 9.00	Low 5.00
Unlikely	High 16.00	High 13.00	Medium 8.00	Low 4.00	Low 3.00
Rare	High 12.00	Medium 7.00	Medium 6.00	Low 2.00	Low 1.00

An example of determining the Level of Risk is provided below:

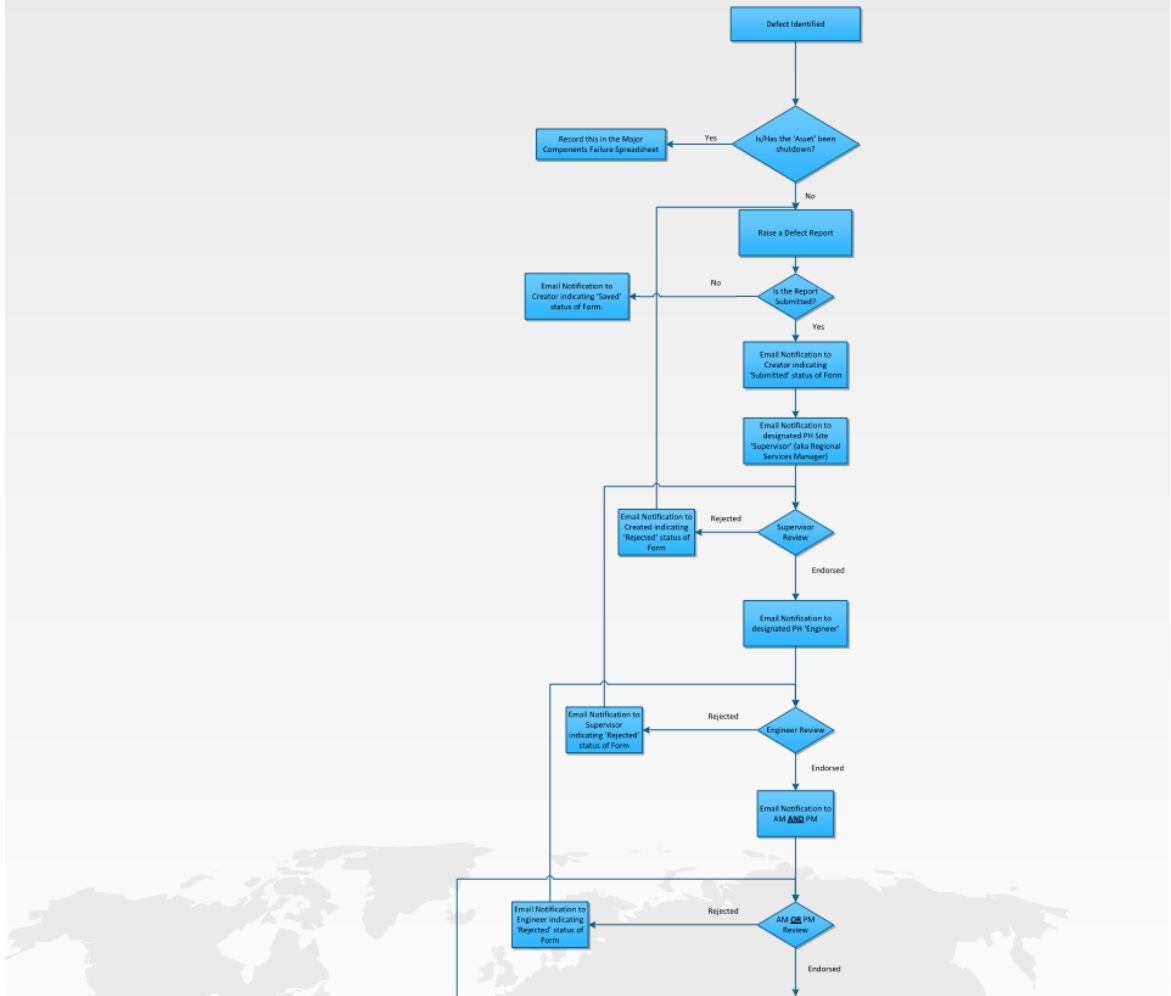
Risk	Likelihood	Consequence	Level of Risk
Risk 1	Frequent	Major	Extreme
Risk 2	Likely	Moderate	High
Risk 3	Possible	Minor	Medium
Risk 4	Unlikely	Insignificant	Low

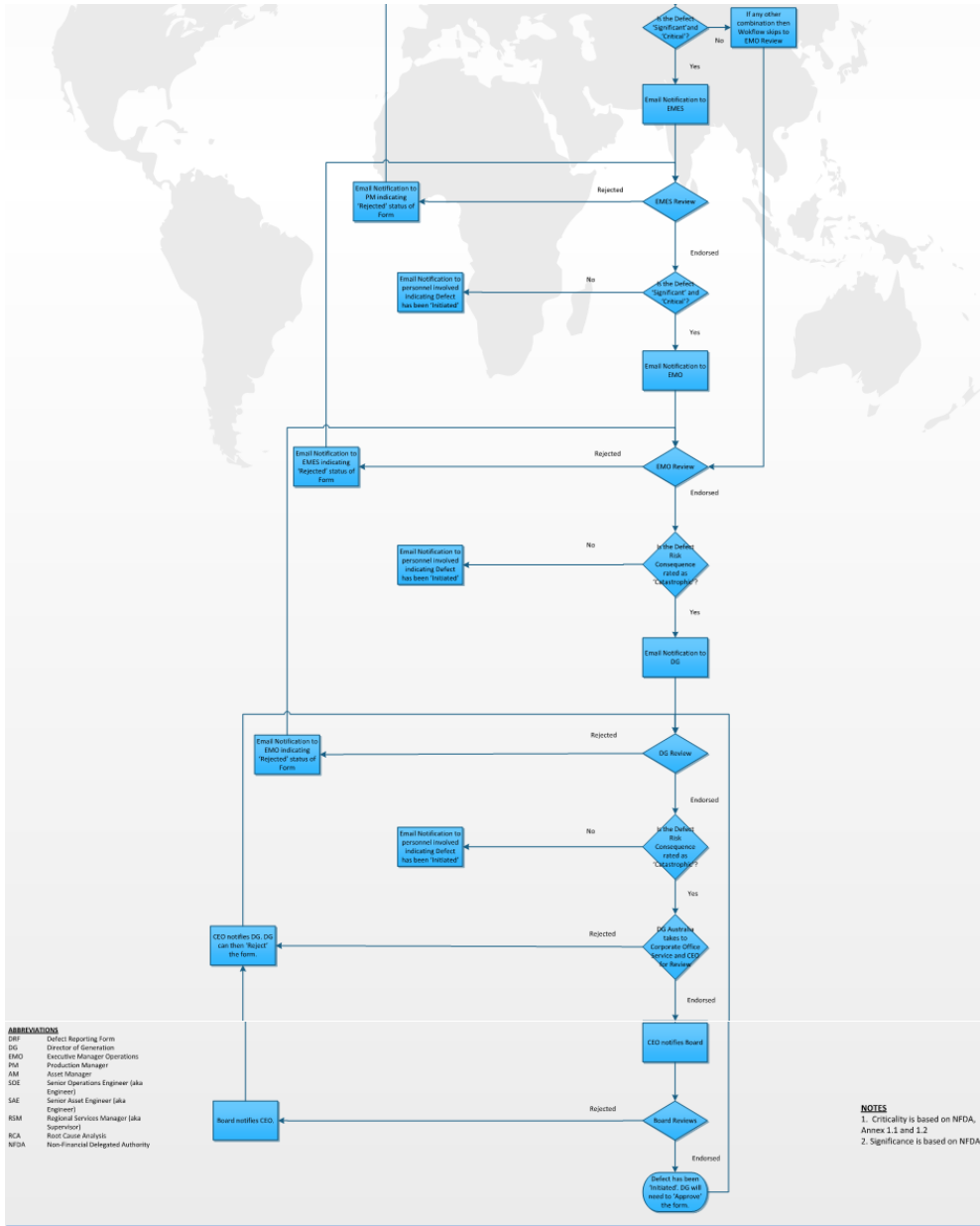


Appendix B – Defect Reporting Workflow



Defect Reporting Workflow





Appendix C – Defect Reporting Form (for outsourced assets)

Part 1 Define Defect Details				
Short Description:		Register No:		
Site:	Unit Number:	Defected Asset:		
Event Date:	Report Date:	CMMS Number:		
<p>Current Status:</p> <p> <input type="checkbox"/> Temporarily Operating: Operate until <input type="checkbox"/> Shutdown </p> <p>Current Status Comments:</p> <p>.....</p> <p>.....</p>				
<p>Risk Assessment (Refer Appendix A):</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Pre/Inherent</p> <p>Consequence</p> <p>Likelihood:</p> <p>Risk Rating:</p> <p>Consequence Type:</p> <p> <input type="checkbox"/> Health & Safety <input type="checkbox"/> Environment & Community <input type="checkbox"/> Financial <input type="checkbox"/> Operations <input type="checkbox"/> Development Construction <input type="checkbox"/> Legal Compliance <input type="checkbox"/> Reputation <input type="checkbox"/> Other..... </p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Post/Residual</p> <p>Consequence:</p> <p>Likelihood:</p> <p>Risk Rating:</p> </td> </tr> </table> <p>Consequence Description:</p>			<p>Pre/Inherent</p> <p>Consequence</p> <p>Likelihood:</p> <p>Risk Rating:</p> <p>Consequence Type:</p> <p> <input type="checkbox"/> Health & Safety <input type="checkbox"/> Environment & Community <input type="checkbox"/> Financial <input type="checkbox"/> Operations <input type="checkbox"/> Development Construction <input type="checkbox"/> Legal Compliance <input type="checkbox"/> Reputation <input type="checkbox"/> Other..... </p>	<p>Post/Residual</p> <p>Consequence:</p> <p>Likelihood:</p> <p>Risk Rating:</p>
<p>Pre/Inherent</p> <p>Consequence</p> <p>Likelihood:</p> <p>Risk Rating:</p> <p>Consequence Type:</p> <p> <input type="checkbox"/> Health & Safety <input type="checkbox"/> Environment & Community <input type="checkbox"/> Financial <input type="checkbox"/> Operations <input type="checkbox"/> Development Construction <input type="checkbox"/> Legal Compliance <input type="checkbox"/> Reputation <input type="checkbox"/> Other..... </p>	<p>Post/Residual</p> <p>Consequence:</p> <p>Likelihood:</p> <p>Risk Rating:</p>			
<p>Defect Classification:</p> <p> <input type="checkbox"/> Mechanical <input type="checkbox"/> Electrical <input type="checkbox"/> Software <input type="checkbox"/> Procedure <input type="checkbox"/> Control <input type="checkbox"/> Other..... </p>				
<p>Defect Cause:</p> <p> <input type="checkbox"/> Design <input type="checkbox"/> Manufacture <input type="checkbox"/> Installation <input type="checkbox"/> Environment <input type="checkbox"/> Human Factors <input type="checkbox"/> Fatigue <input type="checkbox"/> Corrosion <input type="checkbox"/> End of life <input type="checkbox"/> Inadequate Maintenance <input type="checkbox"/> Other..... </p>				



Defect Full Description:

Warranty Defect: Yes No

Observed Defect Frequency:

.....
.....
.....

Root Cause Analysis

.....
.....
.....
.....
.....

List of Attachments Supporting Defect Reporting:

.....
.....
.....

Originator Details

Name.....Signature.....Date

Part 2 Actions

Initial Action Date: Responsible Name:

Description:

.....
.....
.....



Further Actions **Target Date:** **Responsible Name:** **Completed Date:**

Description:

.....

.....

.....

.....

Part 3 Review and Endorsement

Engineering Review and Comments:

.....

.....

.....

.....

.....

Reviewer Name: Signature..... Date:

HSE Review and Comments:

.....

.....

.....

Reviewer Name: Signature..... Date:



Management Endorsement:

.....

.....

.....

Name: Signature..... Date:

Appendix D: Electronic Defect Reporting Form:

Links to the Defect Reporting Form are located at:

- Operations Dashboard under the 'Forms' field
- Operation and Maintenance Portals
<http://nexo.pacifichydro.com.au/sites/ausops/Pages/RMS-Operations-and-Maintenance-Portal.aspx>



Appendix L. Defect Reporting Form
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Defect Reporting Form



Request Number

Request Status New

Defect Reporting Procedure PHA.OPS.09.002

- Defect Details
- Attachments
- Actions
- Reviewer Notes
- History
- Print View

Short Description (max 100 chars)

Site * Unit Number * Part Number Event Date * Report Date *

Current Unit Status * Temporarily Operating Shutdown Operate until:

Current Status Comments

Asset Other

Consequence Pre * Likelihood Pre *

Consequence Post * Likelihood Post *

Consequence Type * Critical

Consequence Description

Show Risk Matrix

Risk Rating

Pre/Inherent	Post/Residual	Significant?
		No

Risk Rating Change (Justification)

Classification Mechanical Electrical Software Procedure Control Other

Cause Design Fatigue Manufacture Corrosion Inadequate Maintenance Installation Environment End of Life Human Factors Other Operational

Warranty Defect

Observed Defect Frequency

Full Description

Computerised Maintenance Management System (CMMS) Task Number

Root Cause Analysis Employment Type Name ETA of RCA

Est Rectification Man Hours

Est Rectification Downtime Hours

Appendix M. PHA.OPS.09.010 Root Cause Analysis Report

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Root Cause Analysis (RCA)

Site:	Unit No:	Report Date:	CMMS Task #:(If applicable)
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Defect Report Request Number (eg, DRF_01_01_2020_12_00_00_PM):(if applicable)

Observed Problem Frequency: (To be checked against all previous RCA's and Defect Reports)

First time
 2-5
 5-10
 10-15
 15-25

Brief Description of Event/Problem: (If part of Defect Report then refer to Defect Report Form)

-
-

Impact/s on People, Environment, Business:

-
-

Root Cause Summary: (include RCA methodology used)

Action/s to take: (If any)	Name:	Date:
•
•
•

Analysis Members:

.....

Analysis Lead Member:

Name: Signature..... Date:

Appendix N. PHA.HSE.09.014 Contractor Performance Evaluation

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HSE Contractor Performance Evaluation

Contractor:		Single Project / Annual Review:	
Job Reference:		Assessed by:	
Location:		Date of Evaluation:	

Safety Performance

Did the contractor have any work injuries on site during the period of the contract / last 12 months? If YES, give details.	YES / NO
--	----------

Was the contractor involved in any safety, environmental or other incidents? If YES, give details.	YES / NO
---	----------

Safety Management and Standards

Poor = 1 Satisfactory = 2 Good = 3 Very Good = 4 Excellent = 5					
	1	2	3	4	5
Rate the contractors ability to prevent injuries & achieve a goal of zero injuries and incidents					
Rate the adequacy of the contractor's safety management system					
Rate the adequacy of the contractor's safety auditing and inspections					
Rate the contractor's safety performance					
How good was the housekeeping and orderliness?					
Rate the safety attitude and cooperation of the contractor's supervisors.					
Rate the safety attitude and cooperation of the contractor's employees e.g. wearing PPE, barricading					
Rate the planning of safety during the contract. Was it positive and proactive? Toolbox Talks etc					
Rate the quality of the contractor risk assessments					

Comments on overall safety performance:					
Contract					
Poor = 1 Satisfactory = 2 Good = 3 Very Good = 4 Excellent = 5					
	1	2	3	4	5
How well were requirements understood, incl. safety					
How responsive was the contractor to requests?					
How easy was communication (fax, email, etc.)?					
Comments:					
HSE Work Performance					
Poor = 1 Satisfactory = 2 Good = 3 Very Good = 4 Excellent = 5					
	1	2	3	4	5
Was all the work completed safely on time?					
How prompt & complete was the HSE work documentation?					
Did the finished work meet the contract HSE specifications?					
How well was the contract HSE 'self-managed'?					
Comments on contract award:					
Note on consultation with the Project Manager add to the Approved Contractor List. Yes/No					

Overall, would you like to use this contractor again?	YES / NO
Recommend: a) Stay on Approved Contractors List <input type="checkbox"/>	or
b) Remove from Approved Contractors List <input type="checkbox"/>	
c) Need for further Dialogue re safety issues <input type="checkbox"/>	

