

UPDATE ON HV LIVE LINE



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BACKGROUND

Powerco HV Live Line Working Group

We have been engaged with our Live Line (LL) service providers and the EEA over the last 3 years to:

- Standardise an approach to planning work that allows the use of LL techniques to complete tasks on the HV Network.
- Establish a Work Method Selection Guide that considers the risks of completing the work live vs. isolated to reduce the risk to ALARP.
- Create a suite of 'standard' guidelines that can be used by the service providers to base their procedures on to ensure consistency regardless of the contactor (39)
- Publish an Asset Exclusion List that lists the assets we deem too complex to work on in the energised state.
- Carry out Bow-tie analysis on LL activities to understand the controls, who owns them and how robust they are and eventually obtain a balance of risk with de-energised processes as a comparison.
- Ensure ECP46 +Practise notes compliance for 'back office' functions



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WORK METHOD SELECTION GUIDE



A document intended to supplement the decision-making process for determining the preferred work methodology (live or isolated) on our HV overhead network.

Powerco needs to;

- Understand the “risks” associated with HV LL work.
- Identify possible work methodologies in the design, planning and delivery aspects of the project life cycle.
- Know when LL is being considered as a work method to complete a task.

Service provider needs to;

- Understand the “risks” associated with HV LL work.
- Have a structured decision making process that evaluates work methods against a set list of risk based criteria to determine the most suitable method to undertake work on an HV overhead Line
- Communicate to Powerco when a LL job is being considered as a work method to complete a task.

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STANDARD GUIDELINES

A suite of documents published in BMS & CWM that provides step-by-step guidance on how to complete certain tasks using LL methods.

Established in conjunction with our service providers and the EEA who have also published their own version of some of the documents.

To date, Powerco has published into CWM;

- 37 guidelines
- A Live Line Works Principles overarching document
- The Asset Exclusions List

Service providers have their own LL manuals with approved work procedures in. The relevant procedures must align with the Powerco guidelines for the same work. Presently the service providers are providing a statement of conformity or a gap analysis for review / discussion.



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ASSET EXCLUSION LIST



A list of assets with known defects or issues that Powerco deems too risky to work on in the energised state due to the risk they pose to the workers.

The initial list has been revised and currently there are 12 items on the list that will be reviewed annually:

- Surge / lightning arrestors
- Conductors on an angle greater than 30°
- Copper or Aluminum wire less than 25mm² or No.8 wire
- Replacing in-line tension joints
- Replacing Twisty or Fargo joints
- Cable termination pot-heads
- Damaged or cracked insulators
- Two-piece 33kV insulators
- Zone substations
- Voltage Regulators
- Capacitors
- Single Wire Earth Return (SWER) lines

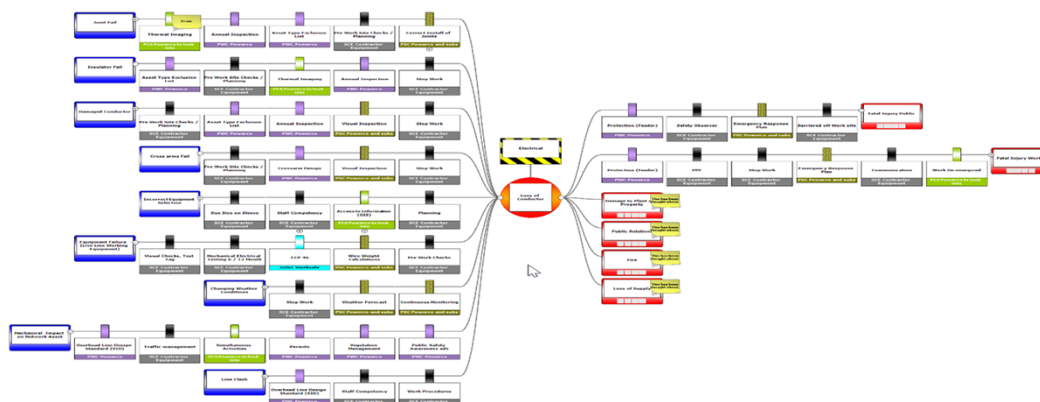
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BOW-TIE ANALYSIS

Bow-tie workshops were held with our service providers and key internal staff for the 2 critical LL events:

- Second Point of Contact, and
- Loss of Conductor



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ECP46 COMPLIANCE

Request for information letters sent to our four approved LL service providers (Downer, Electrix, Northpower and Scanpower) seeking confirmation of compliance with ECP46 in areas that are not observable or auditable on site.

All have confirmed that they believe their processes and systems comply with the requirements of ECP46 regarding:

- Staff selection, training and refreshers
- Health monitoring of workers
- Procurement and storage of LL equipment
- Establishment and proving of procedures
- Record keeping



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ROLLOUT PROCESS



Updates and information sharing sessions on the items noted in this presentation have been held with:

- Downer (Covid-19 special) via Teams
- NOC Release Planners and wider team
- Scanpower
- Eastern Service Delivery PM's
- Northpower

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Engagement

- Publish Work Method Selection process
- Complete gap analysis with service providers on their LL procedures vs. our guidelines.
- Annual review process for Asset Exclusion List.
- Continuous dialog with Downer North Power depots, Electrix, Scan Power and Powerco business units at all levels.
- Develop auditing regime for compliance to ECP46.
- Develop regime / resource for LL field work auditing.
- Work with Planners Asset managers to release work packs with LL specific tasks to enable service providers to refresh competencies.
- Continue to engage with industry / EEA through the various forums, industry best practise.



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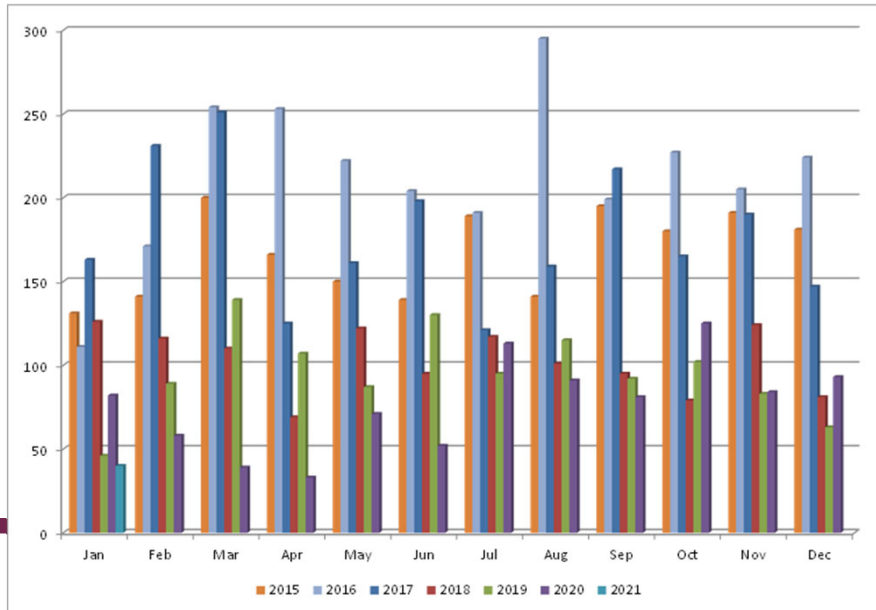
Powerco G&B Applications by yr Raw.

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------|------|------|------|------|------|------|------|
| Jan | 131 | 111 | 163 | 126 | 46 | 82 | 40 |
| Feb | 141 | 171 | 231 | 116 | 89 | 58 | |
| Mar | 200 | 254 | 251 | 110 | 139 | 39 | |
| Apr | 166 | 253 | 125 | 69 | 107 | 33 | |
| May | 150 | 222 | 161 | 122 | 87 | 71 | |
| Jun | 139 | 204 | 198 | 95 | 130 | 52 | |
| Jul | 189 | 191 | 121 | 117 | 95 | 113 | |
| Aug | 141 | 295 | 159 | 101 | 115 | 91 | |
| Sep | 195 | 199 | 217 | 95 | 92 | 81 | |
| Oct | 180 | 227 | 165 | 79 | 102 | 125 | |
| Nov | 191 | 205 | 190 | 124 | 83 | 84 | |
| Dec | 181 | 224 | 147 | 81 | 63 | 93 | |
| Total | 2004 | 2556 | 2128 | 1235 | 1148 | 922 | 40 |

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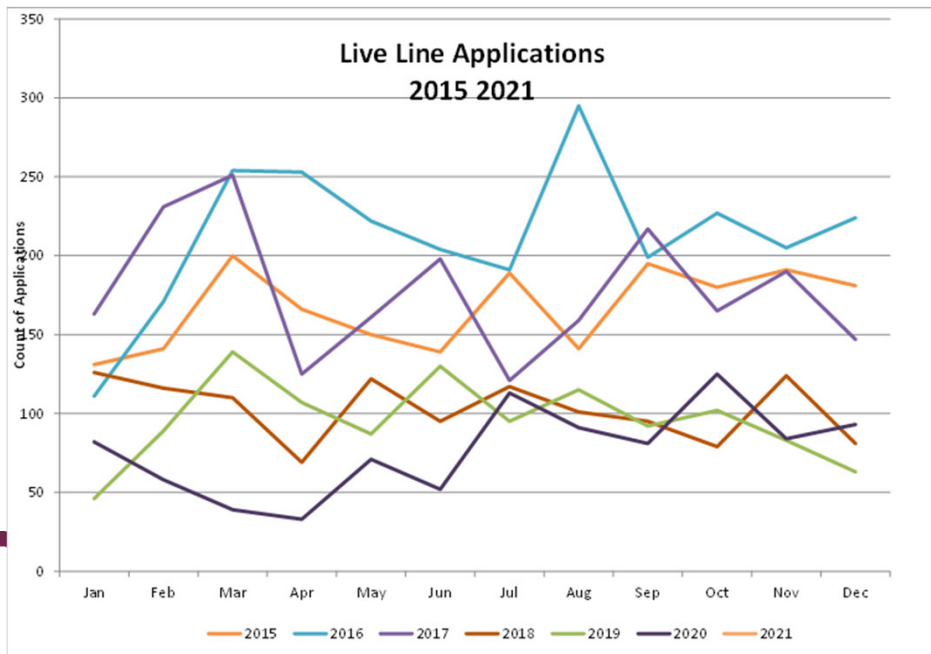
PC G&B APPLICATIONS Yr



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PC G&B AP Trend by Year



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EEA Work Method Selection

Assessment of work Method to undertake High Voltage overhead Live Line Work Guide

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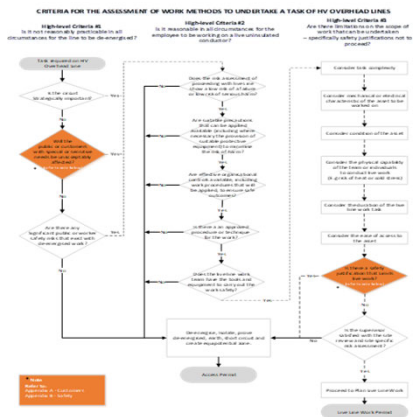


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Electricity Engineers'
Association

Some useful EEA publications

- May 2017 EEA ECP 46 Industry practice note (supplement to NZECP 46)
- Nov 2019 EEA HV Voltage Live Work Model Procedures for Glove and Barrier work, (11 procedures)
- Sep 2016 EEA Guide for the Assessment of Work methods to Undertake High Voltage Overhead Line work
- Dec 2019 EEA Live Line Work restart - Industry Practice Note
- July 2020 EEA High Voltage Live Work Auditing and Inspection Guide
- July 2019 EEA Guide for the Selection of Work Methods to Undertake Low Voltage Work on Electricity Supply Assets

Linked but not an NCLW guide (*Segway into the wider agenda for the day*)

- Feb 2021 EEA Guide to Low Voltage Works Management for Distribution (Network) Infrastructure Assets.



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QUESTIONS?



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