HV Live Line Standard Powerco Procedure path

Gavin Paget

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Introduction

Live HV Standard Approach

- People - We want to make sure our service providers are free from harm while working on our network. Live Line has always been an activity where we have been “hands off” and left it up to the service provider to assess all risks to make sure they are free from harm. We aim to be a responsible PCBU and take all practicable steps to ensure that live workers go home safe to their families every day. (Exclusion list = risk assessment asset based)

- Compliance Health and Safety at Work Act 2015 (HSWA) requires Powerco (as the network owner) ensure that, as far as reasonably practicable, the health and safety of workers and that of other people are not put at risk by the work being carried out. This is Powerco’s “primary duty of care” under the HSWA Act 2015. “ALARP” NZECP46 (Practice notes 2014_15) EEA guides HV work selection guide, EEA guide to LW auditing.

Introduction

Live Line history in NZ

- First known LL work in NZ was in the 1930's possibly 1920's. There was definitely HS work going on in Canterbury on 66kV circuits in the 1930's. Unusual binding did support this. The wooden sticks used in that era can still be found in various locations.
  - It appears to be around the early 60's that the first of the FRP Hot Sticks began arriving in NZ and distribution HS work was being carried out. Various American trainers also appeared in NZ and did training whilst here with their products. The HS distribution seems to have faded away probably in the late 70's some .
  - "buzz stick "testing of insulator strings being carried out in the late 70's and early 80's The sticks were effective however heavy It appears this type of work was shelved as lines were duplicated
  - Un In 1989 A.B. Chance trainers with their products, trained an initial 12 linemen to do barehand and hotstick on all available transmission voltages including the DC. Some of these initially trained linemen are still involved today with training and refreshers.
  - In early 90's some distribution HS competent workers were trained by Victorian instructors from Gippsland college. Initially 4 were trained in Auckland and a further 4 in Blenheim. Some of these initial 8 are still involved today with training and refreshers.
  - NZ currently has a HV live line industry in transition with contractors rationalising operations and resource allocations.

Introduction Powerco Contractor Live Line workers

Powerco's Live line contractor base -

- Downer = 52 Line mechanics with live line competency
- North Power = 73 Line mechanics with live line competency _ 30 Whangarei _ 33 Auckland _ 20 (Powerco, WEL, Line Company).
- Electrix = 40 Line mechanics live line trained, 13 with live line competency and 6 active.
- Scan Power = 9 Line mechanics live line trained, 6 with live line competency.

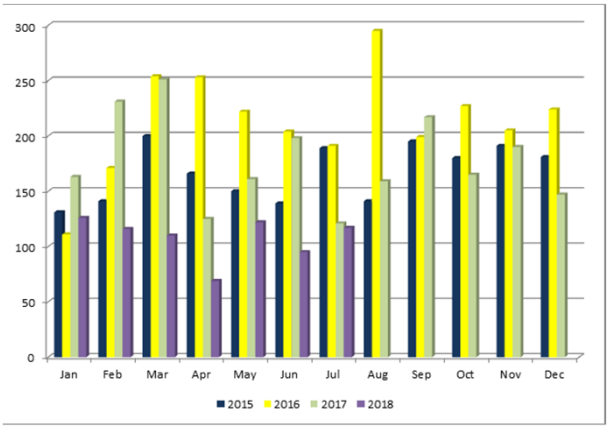
What have we done

Actions to date (Administrative and Engineering Controls included)

- Met with Powerco stake holders management, NOC, Project managers (communications plan June 17).
- Implemented an asset “exclusion list” select assets that can’t be worked on Live Line based on known risks September 17 (risk assessment).
- Visited all Powerco major Live HV contractors and G&B workers Downer, North Power, Electrix, Scan Power, explaining “exclusion list” and its principal September _ October 17.
- Formed a Powerco contractor Live Line contractor committee and subsequent sub committee Nov 17-March 18 several meetings to ratify draft standard procedures between all contractors .
- Implement NOC Standard document that outlines LL work methodology(all LLP applications) Dec 18
- An update to External Tenders so LL isn’t rewarded as a SAIDI mitigation strategy update & SAIDI policy.
- A policy that outlines the approach Powerco are taking with Live Line (In progress).
- Standardisation of Live Line procedures, waiting on EEA guide and written endorsement (In progress).

“Impact” live work exposures

Live line applications 4yrs



Powerco NOC Table of applications region(April 17 to August 18)

	Egmont	Masterton	New Plymouth	Palmerston	Taranaki	Tauranga	Valley	Wanganui	Totals By Type
Work Type									
Assurance	13	2	35	37	18	28	64	18	215
Access Permit	461	904	849	1,416	539	1,992	2,096	649	8,906
LLP	58	216	237	160	75	543	814	488	2,591
Test Permit	2	55	67	202	46	262	121	11	766
Transpower	60	41	85	141	65	83	292	82	849
CACL	82	669	435	557	153	605	1,214	765	4,480
Work Authority	53	410	87	683	47	532	771	282	2,865
Switching Only	38	28	213	129	49	228	146	43	874
CACD	1	30	3	17	1	3	30	24	109
Total by Region	768	2,355	2,011	3,342	993	4,276	5,548	2,362	21,655

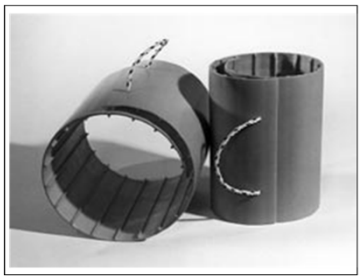
How many standard procedures (38) and why ?

- The Powerco contractor working group agreed that all of the contractor live line procedures were very similar, independent consultant verified them as minor changes.
- Several decades of proven techniques combined into procedures.
- Contractor working group agreed that defined procedures were required for a specific activity hence the numbers of procedures.
- Advantages of defined procedures –
- Transferable skills across contractor base
- Standardisation of equipment types

- Consistency with training
- Easier auditing across contractor base
- Disadvantages -
- Could encourage contractor maintainer migration between entities

Sample Powerco live line procedure template

Powerco Live Line "Strawman procedure sample layout)



1. **PURPOSE**

To provide instruction for Glove and Barrier work in order to satisfy safety, technical and quality requirements.

If work cannot be completed in accordance with this procedure, do not proceed until guidance is obtained from the relevant HV Live Line works Supervisor/Manager.

2. **TEST AND REVIEW**

Field Service providers (FSP) **SHALL** meet the requirements of NZECP 46, SM-EI Rules and EEA Guides in relation to Live Work requirements.

Work techniques **SHALL** be developed and documented for each live line work outcome.

These techniques **SHALL** be proven in a trial on disconnected and earthed equipment to verify that they can be carried out reliably and safely.

A formal review of this work technique should be completed every 5 years.

When a procedure or technique is used, an informal review is conducted during the debrief session any potential issues should be forwarded to the AO and FSP live work review committee, where an immediate review and appropriate actions are undertaken.

Asset Criticality

Powerco Asset criticality standard S3925034

- Bob my wish to expand on this ?

Exclusion List

Asset Name	Activity Description	Activity Description
Version - Week 37 2017		
1	Surge/Lightning Arrestors	Connection or Disconnection of surge/lightning arrestors
2	Conductors (ABS/Terminations/Angles)	Displacement of conductors when replacing or installing ABS poles, termination, angle poles and/or crossarms
3	Conductors	3.1 Work on solid copper conductors and multi strand copper conductors less than or equal to 25mm (Non ACSR less than or equal to 25mm). Some conductor types, faulty No 8, solid copper, rotten, fatigue, corrosion, arc damage, Al. (GIS conductor review automated conductor list - Powerco project pending)
		3.2 Repair or replacement on in-line tension joints withing the conductor length of the adjacent poles on any wire
		3.3 Work on conductors with Fargo joins, twist joints in a span
4	Pot Heads	Connect, disconnect cast iron / metallic pot heads.
5	Insulators	Replacement of cracked insulators or strain devices (asset risk register being developed - Powerco GIS task IT Project)
6	Cable Terminations	Connect, disconnect UG to OH terminations (without a load break device)
7	Zone Substations	Work in Zone substations (protection, complex environment)
8	GFN and NER	Activities on in-service GFN/NER feeder (under technical engineering review, Powerco investigations into voltage impacts, voltage classification to be determined. Powerco IT GIS and Engineering project)
9	Regulators	Activities on in-service voltage regulating devices (place in manual neutral tap position, remove from service)
10	Capacitors	Activities on in-service capacitors or capacitor banks
11	Arc Energy	Activities where arc flash magnitudes (Arc Energy) exceed the standard maximum Powerco PPE overalls garment arc flash rating (GIS layer in future Powerco IT and Engineering project)
12	Red Tag Poles	Work on red tagged poles
13	SWER Lines	All work

Work Methodology Sheet

Needs to be filled out for all Live Line Jobs

Identifier - JOB NAME (or NAPA ID):

Step	Date	Appx time	Work Type (AP, LLP, TP, WA)	Action (What you will be doing)	Equipment (What you will be working on)	Result (What you expect to happen)	Location (Pole No. or Street name or HV Line)
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Some Stats

Live Line Applications by Contractor

- DOWNERS: 1494
- NORTHPOWER: 946
- ELECTRIX: 101
- SCANPOWER: 48

TOTAL APPLIED FOR: 2589

Work Type For Live Line Methodologies Utilised

o	**CIW: Customer initiated work for the installation of new assets:**	**247 (9.6%)**
o	**MAINTENANCE: Ongoing operational sustainability of the asset:**	**973 (37.6%)**
o	**NOC: REACTIVE REPAIRS DNO'S**	**224 (8.7%)**
o	**ASSET REPLACEMENT: Asset has reached the end of its operational life:**	**804 (31%)**
o	**INSTALLATION OF TEMPORARY EQUIPMENT/ LINE BREAKS TO MITIGATE SAIDI:**	**261 (10%)**
o	**VEGETATION CLEARANCE:**	**4 (0.16%)**
o	**Variance Live lines requiring further analysis to clarify/define correct category.**	**76 (2.94%)**

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The End

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