EEA Safety Workshop
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Live Working

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eea Electricity Engineers' Association

Aim of Sessions

- Live Work Update and Industry Consultation
  - High Voltage Live Line Work ECP46
  - High Voltage Overhead Line Work Method Selection
  - Low Voltage Work Method Selection
  - Guide to Live LV Electrical Work

Background

- The ESI has been challenged on a number of occasions over the selection of work methods to undertake work on HV overhead lines. Specifically the decisions between live or de-energised work methods.
- The Health and Safety at Work Act 2015 provides a 'balanced' framework to secure the health and safety of workers and workplaces by protecting workers and other persons against harm to their health, safety, and welfare by eliminating or minimising risks **so far as reasonably practicable** arising from work. This establishes a clear responsibility on PCBU's that in all cases the work method must ensure a safe outcome.

High Voltage Live Line Work ECP46

- New Zealand Code of Practice 46 for High Voltage Live Line Work 2003 (ECP46)
- Mandated by Regulation 102
- Sets the minimum standards for live work on high voltage overhead lines
- NCLW undertook in consultation will industry a comprehensive review of ECP46 in 2014/15
- Results of review have been consolidated as a EEA Industry Practice Note.
- Document has been provided to Worksafe, input to ECP46 review

High Voltage Live Line Work Practice Note

- Insulating Live Line Rope (Insulating Rope). Live Work Rope (Live Line Rope)
- Arc flash hazard added
- Secondary point of contact defined under all 3 Methods
- Section on HSWA added to reinforce PCBU duties
- Reinforced importance of maintaining and providing on site records (i.e. tool test certificates, structure load assessment)
- Increased requirements for medical assessments, defined medical conditions
- Requirements for refresher training extended (hands on time)

High Voltage Live Line Work Practice Note

- Persons conducting field inspections, can be assisted
- Record of conductor/structure load assessment must be on site
- Safety observer may delegate aspects of task observation, reinforced requirement to have process to call a stop to work
- Reinforced duty to monitor light conditions and heat and cold stress
- Added requirements to manage automated equipment GFN (conformation function, voltage rating, ban on live line work equipment faulted to ground)
- Required to have a documented process to stop work, all workers must be informed

High Voltage Live Line Work Practice Note

- Reinforced requirements for crane operators
- On site team review (tailgate) Method, Procedures and Techniques, Managing Change, Communication
- Requirements for PPE (Body Cover, Metal Fittings, Safety Helmets, Protective Footware) expanded
- Impact of work on other work parties
- Minimum number of competent employees in a work team (3)
- Minimum number of employees in an EWP (2)
- Procedure for transition between G&B and Stick Methods

High Voltage Live Line Work Practice Note

- Further details on checking gloves and sleeves
- Temporary jumpers 30% line current must be measured in bridge
- Change to testing frequency hydraulic hoses 6 to 12 months
- 6 monthly testing of dedicated live line EWPs (related work)
- Gloves and Sleeves Ground to Ground
- *Phase* to Earth and Phase to Phase LLMAD for 6.6/11kV, 22kV and 33kV increased to 600mm
- EWP chassis of a crane or EWP shall be earthed and where practical bonded to the structure

High Voltage Live Line Work Practice Note

- Barehand now permits joint testing
- Body belt reference removed
- All reference to relevant standards have been reviewed and updated as required

- Live Work Definition

High Voltage Overhead Work Method Selection

- The approach taken by EEA is based on overseas regulatory frameworks and industry guidelines from UK, Australia and Europe (specifically the UK Electricity at Work. Regulations 1989 – Regulation 14) and existing frameworks used by NZ companies.
- The EEA guide requires in planning a task on high voltage overhead lines there are three high level criteria to be assessed by a PCBUs for determining selection of a work method, these are:
  - *Is it unreasonable in all circumstances for the line to be de-energised?*
  - *Is it reasonable in all circumstances for the employee worker to be working on a live uninsulated conductor?*
  - *Are there limitations on the scope of work that can be undertaken - specifically safety justifications not to proceed?*

High Voltage Overhead Work Method Selection

- In response EEA in consultation with Worksafe, ENA and Transpower developed a guide to the selection of work method on HV overhead lines.
- The purpose of the guide is to assist persons designing and planning work to select the best work method by taking account of regulatory and legislative requirements. Specifically the duty to undertake a hazard and risk assessment to determine the best work methods to eliminate or minimise high voltage live line electricity supply risks.

High Voltage Overhead Work Method Selection

22 Meaning of reasonably practicable

In this Act, unless the context otherwise requires, **reasonably practicable**, in relation to a duty of a PCBU set out in subpart 2 of Part 2, means that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters, including—

(a) the likelihood of the hazard or the risk concerned occurring; and

(b) the degree of harm that might result from the hazard or risk; and

(c) what the person concerned knows, or ought reasonably to know, about—

(i) the hazard or risk; and

(ii) ways of eliminating or minimising the risk; and

(d) the availability and suitability of ways to eliminate or minimise the risk; and

(e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Compare: Model Work Health and Safety Act (Aust) s 18

High Voltage Overhead Work Method Selection

- Network Justification
- Strategic importance in terms of overall network security
- Limitations on undertaking work de-energised, i.e. security of supply, potential economic impact and risks
- Complexity of switching, risk relating to operating or accessing equipment
- Risk from hazards that may arise with de-energised lines, i.e. backfeeds or electric charges
- Significant economic or business impact
- Breakout groups 10 mins to consider Network Justifications

High Voltage Overhead Work Method Selection

- Reasonable to expect employees to work on live uninsulated conductors
- Procedures
- Analysis of task complexity
- Availability of tools and equipment
- Site specific risk assessment
- Breakout groups 10 mins to consider methods and process to determine if it is reasonable to work on live uninsulated conductors

High Voltage Overhead Work Method Selection

- Live work limitations
- Equipment or conductor types
- Risk assessment
- Temporary breaks?
- Cross arm or insulator replacement?
- ABS maintenance?
- Breakout groups 10 mins to consider live work limitations

Low Voltage Work Method Selection

- SMEI requires control of work procedure
- Minor Works Management System
- Where appropriate the equipment shall be isolated for work
- Responsible employee (safety) and the supervisor are responsible for all safety aspects of the work, including any equipment isolations
- An appropriate industry procedure or procedures developed from SMEI shall be followed
- Permit system
- Work Authority or equivalent

Low Voltage Work Method Selection

- Live LV work is governed by Rule 3.717 (added in 2015)
- Work procedures are set out in the EEA Guide to Live LV Electrical Work 2013 (currently under review)
- As with HV live LV work should only be undertaken if a risk assesment shows that there is network justification
- Note: live work on installations is no longer permitted
- EEA Guide (Work Planning – Hazard Identification and Controls. Equipment for Safety, General Requirements, Live Work on Overhead Conductors, Work on Live Cables, Work on other Live Equipment and Testing and Fault Finding)

Low Voltage Work Method Selection

- Discussion on current practice
- Breakout groups 10 mins to consider Network Justifications
- Breakout groups 10 mins to consider live work limitations

Action Plan