TECHNICAL PROCEDURE
ELECTRICAL LINE CLEARANCE
EMERGENCY MANAGEMENT INCIDENT PROCEDURE

PURPOSE

The purpose of this procedure is to provide the processes for a planned response to an emergency situation when contact or breakage occurs with overhead electric supply lines or any associated electrical equipment. Contact with energised electric lines can cause death, electric shock or other injury caused directly or indirectly by electricity. An electric shock can also occur without contact with any overhead electric lines. A close proximity to line conductors may allow a 'flashover' or arcing may occur. The risk of flashover increases as the line voltage increases.

SCOPE

The City of Greater Bendigo is required to maintain vegetation clearance from above ground electrical conductors within the 'Bendigo Declared Area' under the Electrical Safety Act 1998 and the new Electricity Safety (Electric Line Clearance) Regulations. When working in the vicinity of energised electric lines, assessing and limiting the risks of any exposure to health and safety must be a priority. It is also important to regularly check and review any control measures.

This procedure specifies the requirements for dealing with an emergency related to electrical incidents. Overhead electric lines pose significant risks when carrying out tree pruning and removal works. When any assessment for the risks of working near overhead electric line the following should be considered:

- Overhead electric lines can be hidden in trees.
- De-energised overhead electric lines running through tree branches before accessing the tree, and
- Specific qualifications are required for people working near overhead electric lines.

PROCEDURE

If electrical arching or flashover occurs, or if objects, plant, machinery or equipment make contact with overhead power lines;

- As with any emergency situation the first thing to do is to assess the **Danger** to yourself and others.
- **Stay Calm** and **Remain** in the **Vehicle** and call **000.**
- Contact the Asset Owner immediately to have the power turned off.

Powercor on: 13 24 12

- Assume that all power lines are **Live** and are capable of delivering a '**Fatal'** shock.
- Until help arrives, a competent person should remain in control of the situation to direct people into identified safe areas and caution them about the dangers of electrocution.
- Do not allow anyone to touch or approach any part of the plant or any fallen wires. Just being too close may **Kill.**

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Where contact is made with an energised overhead electric line or a flash-over occurs between an energised overhead electric line and a **Crane or Mobile plant** take the following actions:

- Try to break the crane or mobile plant's contact with the energised overhead electric line by moving the jib or driving the mobile plant clear only if safe to do so.

- If it is not possible to break the contact with the energised overhead electric line, the operator of the crane or mobile plant should **remain inside** the cabin of the crane or on the plant item, as long as it is safe to do so.

- Contact the Electricity Supply Authority immediately to isolate electricity to the energised overhead electric line. The operator should remain in place until the electricity has been isolated and the 'all clear' given by the Electricity Supply Authority.

WARNING

When a crane or item of plant inadvertently contacts overhead electric lines, circuit protective devices may operate to automatically turn the electricity off. However some protection devices are designed to automatically re-close, thereby re-energising the electric lines after a short period of time, typically 1-4 seconds.

- If it is essential to leave the cabin or the operator's position because of fire or other life threatening reason, then jump clear of the equipment. Do not touch the equipment and the ground at the same time. When moving away from the equipment, the operator should hop or shuffle away from the mobile plant with both feet together until **at least 8 metres** from the nearest part of the crane or operating plant. Under no circumstances, run or walk from the crane or mobile plant as voltage gradients passing through the ground may cause electricity to pass through the body resulting in an electric shock.

- Warn all other people and members of the public to keep **at least 8 metres clear** from the crane or mobile plant. **Do not touch** or allow other people to touch any part of the crane or mobile plant. **Do not** allow people to approach or re-enter the vehicle until the Electricity Supply Authority has determined the site safe. Remember electricity **Flows through the Ground,** so an electric shock could be received from walking close to the scene. If the crane or mobile plant operator is immobilised, ensure the electricity supply has been isolated and the site made safe before giving help.

- Unauthorised, unequipped people should not attempt to rescue a person receiving an electric shock. Secondary deaths often occur because others get electrocuted trying to help earlier victims. If the crane or mobile plant operator is immobilised, ensure the electricity supply has been isolated and the workplace has been made safe before giving help.

- If an electrical fire occurs **never attempt to extinguish it with water** as this will put you risk of electrocution. Instead, turn power off and use a **fire blanket** or a **dry chemical fire extinguisher**, if safe to do so.

Inspecting plant after contact with electric lines

- When a crane or mobile plant has been in contact with an energised overhead electric line, it should be checked by a competent person for damage to the components of the crane or mobile plant. All recommended actions are to be completed before the crane or mobile plant is returned to service.

- Tyres on cranes and mobile plant that have been in contact with overhead electric lines where electrical flash-over and current flow occurs through the rubber tyres should be considered as a potential hazard. These rubber tyres may catch fire or have the potential to explode. A lesser known danger is when combustion takes place within the tyre and there are no apparent external signs. When excessive heat is developed in or applied to a tyre as in the case from contact with overhead electric lines, it can initiate a process known as pyrolysis, which is the decomposition of a substance by heat. This can generate a build-up of flammable gases and pressure within the tyre, which may rupture or explode.

- Vast amounts of energy can be released by a tyre explosion often leading to significant equipment damage, serious injuries or fatalities. Pyrolysis related explosions are very unpredictable and have been known to occur immediately or up to 24 hours after initiation. An explosion can occur where no fire is visible. The danger area can be **up to 300 metres from the tyre.**

- A crane or mobile plant with rubber tyres involved in an incident where contact is made with overhead electric lines which results in discharges or flash-over of electrical current through the tyres should be considered as a potential hazard. If anyone suspects there is a danger of a tyre explosion, as in the case of a mobile crane contacting overhead electric lines, the procedure should include:

    - Parking the crane in an isolation zone, with a **minimum 300 metre radius**
    - Removing everyone from the area and not allowing entry to the isolation zone for **24 hours**, and
    - **Alerting** firefighting and other relevant emergency services.

If Electrocution or Injury Occurs

Where electrocution or an injury occurs with an energised overhead electric line or a flash-over occurs between an energised overhead electric line and a crane or mobile plant take the following actions:

- Call **000** immediately and assess the level of **Danger** to yourself and others.

- Unauthorised, unequipped people **should not attempt** to rescue a person receiving an electric shock. Secondary deaths often occur because others get electrocuted trying to help earlier victims.

- If the crane or mobile plant operator is immobilised, ensure the electricity supply has been isolated and the workplace has been made safe **before** giving help.

Freeing a Victim from Electrical Contact

Depending on the amount of electrical current flowing through the body, electric shock can damage the skin and internal organs. Electrical contact can cause muscle contraction, preventing the victim from releasing their grip on an electrical source.

- Always assume that **Powerlines are live** if they are in contact with plant or have fallen to the ground.

- Always **Asses the Danger** before attempting to free any victim/s. **Do not become the Next Victim** – anyone touching a victim that is still in contact with an electric current may also receive a severe electric shock.

- Take extra precautions if electrocution occurs in or near water as water can become electrically charged.

- All electric shock injuries should be treated seriously. If the victim is not breathing call **000** and commence **CPR** immediately. For less severe electric shock injuries, seek medical advice as soon as practical.

REFERENCES

Hickmans, D., 2018, Emergency Guidelines Procedure, Unpublished.

MacLeod, T., 2017*, Urban Tree Management Policy,* City of Greater Bendigo.

New South Wales WorkCover, 2012, Mobile plant operation near overhead power lines – Safety Alert, NSW Government. http://www.communitye.com.au/CHSguides/pdfguides/alerts/WorkCover%20NSW%20-%20Update%20-%20Mobile%20Plant%20and%20Overhead%20Power.pdf Accessed September 2019.

Powercor, 2019, Safety – *What to do in an Emergency*, https://www.powercor.com.au/safety/what-to-do-in-an-emergency/ Accessed September 2019

Safe Work Australia, 2014, Working in the vicinity of overhead & underground electric lines, https://www.safeworkaustralia.gov.au/collection/working-vicinity-overhead-and-underground-electric-lines-guidance-material

DOCUMENTATION

IMS Manual - Integrated Management System Manual
PR 13.01 Incident Reporting, Investigation, Prevention and Control
PR 9.05 Emergency Procedures
TP 9057 Incident Investigation
FM 972 Emergency Contact Numbers - General
Hazard / Incident Notification Form