



**A review of the effectiveness
of the Electricity
(Hazards from Trees)
Regulations 2003**





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Executive Summary

- a) It is over ten years since the Electricity (Hazards from Trees) Regulations 2003 were introduced. The purpose of the Regulations is to protect the security of the supply and the safety of the public by:
 - i. Prescribing distances from electrical conductors within which trees must not encroach; and
 - ii. Setting out rules about who has responsibility for cutting or trimming trees that encroach on electrical conductors; and
 - iii. Assigning liability if those rules are breached; and
 - iv. Providing an arbitration system to resolve disputes between works owners and tree owners about the operation of these regulations.
- b) It is estimated that works owners spend over \$30 million per annum on vegetation management in meeting the requirements of the regulations. This represents approximately 17% of all works owner maintenance costs.
- c) ENA member companies have chosen varying means of applying the regulations. Companies that have engaged more ‘talkers’ in the vegetation management roles have had more success in achieving greater clearances than prescribed and enabled by the regulations. Their experience has helped inform this review.
- d) ENA members generally agree that there are issues with the regulations that require change to improve;
 - i. Electricity Network reliability
 - ii. Safety of the public and vegetation management workers
 - iii. Economic efficiency in implementing these regulations
 - iv. Regulatory compliance
- e) This report reviews the above issues and provides recommendations on changes to the regulations, with due consideration for how these matters are addressed in the USA, UK and Australia.
- f) Of all reported tree related incidents, fall zone and overhanging trees have the most significant impact on electricity network reliability, although these trees are not covered under the current regulations. Recommendations are made to change the regulations to ensure that fall zone and overhanging trees can be appropriately managed.
- g) On the public safety front, there have been many breaches of Minimum Approach Distances (MADs) to overhead lines by non-competent persons undertaking vegetation management and fruit harvesting work near overhead lines. This is a serious public safety issue. A package of change is recommended.
- h) The current regulations are inefficient in that tree trimming generally has to be undertaken by competent workers often using hot stick techniques because of the close proximity of vegetation to the electricity network (GLZ restrictions). Changes are recommended to enable work to be done more cost effectively. Allowing work to be approached differently (e.g. by property rather than by tree) will also provide improved

efficiencies. It is estimated that savings of approximately \$5 million per annum could be made by implementing the recommended improved efficiency measures.

1 Strategic Approach (setting the scene)

- a) This report reviews the effectiveness of the Electricity (Hazards from Trees) Regulations 2003.
- b) It is estimated that works owners spend over \$30 million per annum on vegetation management in meeting the requirements of the regulations. This represents approximately 17% of all works owner maintenance costs.
- c) ENA respondents to a survey covering the five years up to 2012, indicated that about 80% of tree related SAIDI was caused by trees that sat outside the clearance zone prescribed in the regulations.
- d) Approximately 13% of all recorded SAIDI is due to trees, but this is an underestimate due to the way data is collected. ENA tree group members note that SAIDI due to trees can rocket to 60/70% in storms and that not all of this SAIDI is accurately assigned to the correct cause.
- e) In the following sections, issues identified by ENA members are listed, under the following overarching headings:
 - i. Network reliability
 - ii. Safety of the public and vegetation management workers
 - iii. Economic efficiency
 - iv. Regulatory
- f) For each issue, international solutions are reviewed (where applicable), options listed, and recommendations are made.
- g) A number of the recommendations associated with each issue have a common thread, or contain similar recommendations. Thus, the report concludes with a summary of recommendations.
- h) In preparing this report, legislation and studies from the UK, USA and Australia were researched to ascertain the key drivers involved in the development of codes, regulations and standards in those countries. A review of current and overseas legislation, as relevant to this report, is detailed in Appendix A.

2 Electricity Network Reliability Issues

2.1 Overhanging and fall zone trees

2.1.1 The issue/discussion

- a) The Growth Limit Zone is specified in the current regulations as the radius from a conductor which must be kept clear of trees. The GLZ does not take into account any overhanging trees or branches (hazard trees) which may fall onto a line in the event of failure due to weather, or tree structural failure.
- b) Specific data is available for Rural Support North Canterbury, where it was observed that during the September 2013 major storm, trees under overhead lines that had been trimmed, caused no problems and that the real damage and cause of significant interruptions was caused by 'fall line' trees [7]. Tree strikes on overhead lines resulted in power supply outages to 40% of customers for more than 12 hours and many customers were without power for up to 15 days. The 2013 Canterbury storm was reported to be the most disruptive in the region in almost 40 years.
- c) In the five years up to 2012, ENA respondents to a survey indicated that approximately 13% of all recorded SAIDI was due to trees, and that 80% of tree related SAIDI was caused by trees that sat outside the clearance zone prescribed in the regulations. This New Zealand SAIDI data compares with a 2009 US study where it was reported that outside right-of-way, tree events accounted for 85% of all outages [6].
- d) If NIWA's prediction of increasing frequency of extreme weather [12] is to be accepted, focus on ensuring adequate fall zone tree management will continue to be of real importance to ensure the safety and reliability of electricity networks.
- e) Trees that seem healthy and not a cause for concern can pose a serious threat. Analysis of six major storm events across the US revealed that between 55% and 70% of the trees that failed and caused damage to overhead lines had no discernable defects and would have been regarded as safe had they been assessed prior to the storm events [8].
- f) Network reliability and fall zone trees are of particular concern in forest areas. ENA members report that outages caused by tree contact in forests disproportionately account for 21% of tree SAIDI minutes compared with 12% of network lines being in forested areas.
- g) Works owners and many of the larger forestry owners/operators have a good working relationship and are very aware of the issues of financial loss due to forest fires, network reliability, and the safety implications of harvesting trees near overhead lines. Some small forestry holders however appear to have more of a focus on maximising the use of land (minimal or no setback) and often plant trees in locations that will eventually cause interference to overhead lines.
- h) Plantings by small forestry block holders present a significant challenge to works owners. Because of their small land holdings, they endeavour to maximise the use of land in order to make their forestry operation financially viable. To achieve this,

small forest owners often plant trees very close to or even underneath overhead lines. The result is that works owners have to be extremely vigilant in monitoring the growth of these trees.

- i) ENA members have argued that the GLZ and tree management notification process specified in the regulations is not appropriate for forestry trees as it is not cost effective, is inefficient and impractical. Additionally, utility and forestry worker safety, and network reliability can be severely compromised when only minimum clearances specified in the regulations are applied.
- j) Setback of forest trees from overhead lines is a significant issue for works owners due to potential tree contact with lines either during harvesting, natural failure of weak trees, or ground instability. Generally, forest owners also agree that setback is needed to reduce the possibility of tree contact with lines and prevent costly forest fires.
- k) While major forestry owners generally agree with reasonable setback distances, works owners report that tree planters are not necessarily following the setback requirements because they get paid by the number of trees planted, (therefore they plant as many as possible) and at times cannot clearly identify the setback lines.

2.1.2 International solutions

- a) The **UK** and **USA** both jurisdictions have a risk based approach to vegetation management. These countries have recently developed risk assessment models and have mandated risk assessments based on Codes and Standard Practice Guides. This change in approach was due to significant disruptions and network damage caused by storms in 2002/2003. Cost/benefit criteria are used to assess the relative risks, and decisions on the amount of clearance are made.

Australia.

- b) In **NSW** plans specify line clearances for various zones. For rural or bushfire areas with bare conductor, the clearance zones generally have no ceiling. For bundled or covered conductors, overhanging vegetation outside the clearance zone is generally permitted. There are also tree preservation and native vegetation regulations which govern the extent of tree trimming and removal.
- c) In **SA** and clearance zones are defined in the regulations and for voltages greater than 33 kV, there is no ceiling on the zone. **Victoria** has a similar approach.
- d) In **NT** there are no statutory vegetation clearance distances specified.
- e) In **WA** guidelines specify clearance zones in urban, suburban, semi-rural and rural areas. One entity specifies that 'generally species that grow no higher than 3 metres are retained within the corridor'. The other entity specifies a Growth Limit Zone of 3 metres below and to the side of any line, and no ceiling above the line.

For further detail please see appendix A.

2.1.3 Options

- a) **Maintain status quo.** This is likely to lead to continued avoidable network outages due to overhanging trees and branches, or trees with the fall zone of overhead lines.
- b) **Introduce Risk Assessment of overhanging and hazardous trees.** In New Zealand, while risk assessments are not currently prescribed or given legislative backing, they are at times undertaken by works owners on a site by site basis, when agreement can be reached. The focus for many works owners is to achieve the GLZ clearance requirements, as this is supported by Regulation and is generally accepted by tree owners. It is noted that positive results in terms of reduced storm damage have been experienced where greater clearances have been achieved.

Risk assessment quality and application however is varied and there is no consistent process applied by works owners. A risk based model of cost/benefit criteria for tree management as is in place in the UK and USA could be adopted for all exotic trees.

- c) **Introduce an open ceiling approach to the GLZ** as in Western Australia. This model does not allow vegetation to be present for any distance above conductors or down to 45 degrees below vertical.
- d) **Treat Forests separately.** Forests have specific issues associated with planting pressures, although this is not necessarily a reason to treat them as an exception.
- e) **Do not differentiate forested areas** as this leads to problems with the definition of a forest and allows room for confusion.
- f) **Treat slow growing trees separately.** Slow growing trees including native and specimen trees are likely to be held in higher regard by tree owners than exotic trees. For these more valued trees, it may be more appropriate to utilise a risk based approach – leading to less contention with tree owners. This could be justified as slow growing trees are less likely to cause network outages.
- g) **Place restrictions on planting in the GLZ.** Tree issues could be reduced by restricting the type of tree planted that has potential to encroach the GLZ.
- h) **Improve network management.** Investigate and implement network management improvements such as installing additional switches to better sectionalise network feeders through known tree strike areas and the provision of permanent standby generation and temporary connection points to enable restoration of supply beyond areas prone to damage from wind-blown debris or falling trees. At least one ENA member company has had considerable success with this approach.
- i) **Promote minimum setback distances.** In submissions (2011) to the Ministry for the Environment regarding a proposed National Environmental Standard (NES) on Plantation Forests, electricity industry members strongly argued that ‘Setback for planting is equivalent to fall height at growth limit for harvest plus 2

metres as a minimum from the power lines and their support structures, or, setback as otherwise agreed in writing with the EDB or other power line owner'. From a safety and reliability perspective, this proposed setback is considered to be the minimum required. It is noted that as at May 2013, introduction of the proposed NES has been deferred.

- j) **Adopt EEA standards for setbacks.** The EEA guide to Electrical Safety for Forest & Woodlot Logging Operations [11] recommends a clearance distance of two tree lengths should be maintained between the base of a tree and the nearest conductor during felling operations. While this clearance distance exceeds the setback recommendation, it is considered to be a reasonable approach when felling trees towards an overhead line.
- k) **Treat setbacks the same as fall zones.** While setbacks may be considered as being particularly important for forestry trees they can be considered and treated in the same manner as any other fall zone tree. Setbacks should be subject to a risk assessment process such that appropriate setback is achieved based on the terrain, type of tree and relative location of the line.

2.1.4 Recommendations

- a) The shape of the current GLZ should be revised to take into account fall zone trees and with the exception of native and specimen trees, slow growing trees and for low voltage aerial bundled conductor, should have no ceiling as in the Western Australian models.
- b) Restrictions on planting of tree types that could encroach the GLZ should be mandated.
- c) A risk based model of cost/benefit criteria for tree management should be adopted for all slow growing trees, including natives and specimen trees.
- d) Consideration should be given to ongoing network management improvement initiatives.

2.2 Growth Limit Zone

2.2.1 The issue/discussion

- a) Measurement of scheduled GLZ distances in any part of the span can be extremely difficult particularly in hilly terrain and through forests as these distances vary with span length and distance along the span.
- b) Whilst a GLZ gives the expected clearances between trees and lines, these clearances can be significantly reduced and the GLZ encroached in windy conditions. Similarly, line sag increases with higher temperatures, and clearances can be severely reduced under these conditions.

- c) Some ENA members have been successful in engaging with tree owners to achieve clearances far greater than those specified in the regulations. This has been as a result of engaging ‘talkers’ who have been far more effective than ‘administrators’.

2.2.2 International solutions

- a) The **UK** and **USA** both have a risk based approach to vegetation management.

Australia

- b) In **NSW, SA, Victoria and WA** line clearances are specified for various zones.
- c) In **NT** there are no statutory vegetation clearance distances specified.

For further detail please see appendix A.

2.2.3 Options

- a) **Maintain status quo.** This is likely to lead to further frustrations with ascertaining GLZ distances – particularly with forest owners.
- b) **Introduce Risk Assessment.** A risk assessment process could be used to deduce when to cut and how much to cut. This would not necessarily replace specific distance requirements with an evaluation process but could be supplementary. The downside of this non-prescriptive method is that it could lead to further confusion and conflict between line owners and tree owners by providing only generic advice.
- c) **Revise the GLZ distance specification.** This could be achieved by using an open ceiling GLZ as for fall zone trees.

2.2.4 Recommendation

- a) Revise the GLZ distance specification and include an open ceiling to make measurement and compliance with GLZ distances easier. This should be considered in conjunction with the introduction of a risk assessment approach.

3 Safety Issues

Safety issues are closely related to cost and reliability issues and therefore need to be considered as a whole package. This approach is consistent with international studies and recommendations.

The Issue/discussion

3.1 No notification

- a) ENA members report [3] that less than 12% of tree owners undertaking tree work have notified the works owner of the proposed time and location of cutting or trimming trees as required under Regulation 10 (3). In addition to the safety issue regarding inadvertent tree contact with lines, this is a serious concern as reclose blocking for a high voltage line is unlikely to be in place therefore following a tree induced fault, lines may be re-energised while workers are still in contact with a tree or a line.

3.2 Non competent workers

- a) Following the first cut, the current regulations assign responsibility to tree owners for trees encroaching the GLZ. Tree owners are then required to cause trees to be trimmed or cut to outside of the Notice Zone.
- b) ENA members estimate [1] that approximately 25% of tree owners use non-competent workers to undertake work instructed in cut or trim notices. It is very likely that this percentage would be higher if the no interest option did not exist.
- c) Safety of non-competent workers who undertake tree trimming or cutting work near live overhead lines is of serious concern due to the fact that non-competent workers have neither the training nor specialist equipment required to undertake the work safely.
- d) The cost of undertaking the tree trimming work is reported to be a significant driver for tree owners. Despite clear warnings given in newspaper and radio advertisements and when cut or trim notices are issued by works owners, many tree owners elect to either undertake the work themselves or to employ non-competent (ostensibly lower cost) workers to undertake the work.
- e) Many tree owners argue that they could have the tree trimming work undertaken either by a lower cost supplier, or they could do it themselves (DIY). ENA members report that the DIY attitude of New Zealanders and the cost of the work (including affordability issues) are the most common reasons tree owners don't use competent workers to trim their trees. ENA members report that the third most common reason is a lack of awareness of the safety issues and requirements. This DIY and non-competent worker approach is a serious safety concern.
- f) For over 5 years, ENA and EEA industry members have been trying to get the draft ACOP Part 2 for trimming of trees around power lines approved by DoL/MBIE/Worksafe. This relates to worker competence. The ACOP has not yet been ratified.

3.3 MADs not being enforced

- a) ENA members report [4] that Minimum Approach Distances (MADs) as specified in NZECP 34 are not being enforced. Over the past three years, ENA members have reportedly written to contractors who have breached MADs but little action has resulted. ENA members have also reported incidents of MAD breach to ESS/MBIE. The lack of enforcement of MADs is a safety concern.

3.4 Harvesting near lines

- a) The harvesting of fruit under or near overhead lines and specifically within MADs is a safety concern. This is particularly an issue in the Bay of Plenty where there are tall avocado trees in several locations growing underneath high voltage transmission lines. This is a similar safety issue to the non-competent workers noted above and as trees continue to grow, clearances are reduced, increasing the risk of flashover or contact with the transmission lines.
- b) Kiwi fruit and particularly the gold crop variety are known to extend risers vertically. In some instances, risers have been found well within the MAD of 11 kV overhead lines.
- c) It is encouraging to see that the New Zealand Avocado Industry Council website promotes the use of the MBIE Best Practice Guidelines for Safe Use of Elevating Work Platforms in the Horticultural Industry. The MBIE however acknowledges [5] that there have been several serious harm accidents where Horticultural Mobile Elevating Work Platforms (H/MEWPs) have come into contact with live power lines resulting in serious injury to the workers involved.

Options

- a) **Maintain status quo.** This is likely to lead to further frustrations and ongoing MAD breaches/safety incidents.
- b) **Raise awareness about the regulations.** Current public education avenues and publications should be reviewed and an appropriate education programme developed by works owners, contractors, MBIE, forestry and horticulture groups.
- c) **Pursue offenders and engage with MBIE** with more vigour. More attention could be given to NZECP 34 breaches and works owners should actively notify MBIE to enforce compliance when it is found that non-competent workers are undertaking work within MADs.
- d) **Increase the GLZ** to allow tree trimming by non-competent persons. Increased Notice Zone and GLZ clearances would allow ordinary workers and competent tree owners to undertake vegetation management.
- e) **Consider replacing the first/second cut regime** with an interest/no interest regime. This is linked to the economic issues in the next section of this report.
- f) **Consider options to engage and encourage DoL/MBIE/Worksafe** to ratify and approve the ACOP Part 2.

Recommendations

- a) Develop a public education package to raise tree owner's awareness of the legal and safety implications when working near energised lines.
- b) Engage with MBIE with a view to pursuing prosecution for breaches of MADs.
- c) Revise the GLZ distance specification and include an open ceiling to make measurement and compliance with GLZ distances easier.
- d) Consider replacing the first second cut regime with an interest/no interest regime.
- e) Consider options to engage DoL/MBIE/Worksafe to ratify and approve ACOP Part 2.

4 Economic efficiency Issues (doing it smarter)

4.1 Notification by individual tree

4.1.1 The issue

- a) The requirement to identify each tree in a notification to a tree owner is considered to be unreasonably onerous and impractical in many instances. In the road reserve for example, naturally sown species such as Manuka, tea tree or bamboo is almost impossible to identify on an individual tree basis.

4.1.2 Options

- a) Identify trees by **GPS location**.
- b) Identify trees by reference to spans of line between **numbered poles**.
- c) Identify trees by **property reference**.

4.1.3 Recommendation

- a) The notification requirement for individual trees should be revised to include options of notification by GPS location, by property, or by overhead line span between numbered poles.

4.2 Principles of the Regulations

4.2.1 The issue

- a) The regulations are prescriptive and require works owners and tree owners to undertake certain activities. There are, however, no defined principles in the regulations, therefore no guidance as to how to achieve the purpose of protecting the security of supply and public safety.

4.2.2 Options

- a) **Maintain status quo.** This does not address the issue of lack of clarity and general intent of the regulations.
- b) **Revise the regulations and reference applicable codes.** To provide clarity of intent.

4.2.3 Recommendations

- a) The regulations should provide clarity in terms of what is intended in the way of outcomes.
- b) A set of guiding principles and reference to applicable codes of practice should be included in the regulations to assist works owners and tree owners to understand and achieve the purpose of the regulations.

4.3 Who pays and when

4.3.1 The issue/discussion

- a) Following first cut or trim, the cost of second and subsequent vegetation management is the responsibility of tree owners. ENA members report that many tree owners are either unwilling or unable to pay the cost of this work, resulting in costly dispute in some cases and leading them to do the work themselves, or engage lower cost unqualified contractors.
- b) Many tree owners believe the works owner should be responsible for the cost of tree trimming and question why the overhead lines should be there anyway. Some tree owners argue that overhead lines should be placed underground at the works owner's expense to avoid interference with trees.
- c) By the time a tree owner receives a cut or trim notice, the tree growth has already encroached the zone where work has to be undertaken by competent workers. The cost of tree trimming can be significant where the work has to be done by competent hot stick workers with the line energised, in order to minimise disruption to customers. If trees were to be kept well clear of MADs, the total cost of tree management could be significantly reduced.
- d) With a few exceptions, tree owners generally agree with first cut or trim work being undertaken. A significant driver for this acceptance is that the works owner meets the cost of the work. ENA members report that tree owners at the second cut stage then declare no interest in approximately 40% of cases. This subsequent declaration results in additional costs that could have been avoided had the tree owner declared no interest at the time of the first cut or trim. However, no interest plays a role in providing a safe 'out' for tree owners.
- e) Deliberately planted trees under or adjacent to overhead lines remain subject to a first cut or trim at the works owners expense regardless of whether or not the tree owner believed the tree may interfere with an existing line in the future. ENA members report

many examples of deliberate planting where tree owners attempt to force works owners to relocate lines. Examples include rural landowners planting trees in the road reserve and horticultural shelter belts planted beneath existing overhead lines.

- f) There have been instances where both private tree owners and Councils have planted trees knowing that they would affect an existing line in the course of time. One example of this is the planting of street trees by Council directly underneath several spans of an existing 11 kV overhead line in Sturges Road, Auckland.
- g) Currently the works owner pays the management cost where it can be proven that the tree owner did not know that the tree when fully grown would encroach the GLZ. This approach has two issues; firstly, properties change hands regularly and in many cases when the tree has encroached the GLZ, the current tree owner is not always the original landowner who planted the tree; secondly, it can be difficult to prove for some species that the tree owner could have known that the tree would encroach the GLZ.
- h) It is estimated that works owners spend over \$30 million per annum on vegetation management in meeting the requirements of the regulations. There are additional vegetation management costs outside the scope of the regulations including RMA costs and insurance payments for forest fires or other equipment damage caused by tree contact with lines. Storm damage cost is also not fully accounted for in this estimate.
- i) The Fire Service and forestry owners often blame forest fires on works owner lines. Lines or line equipment themselves do not generally cause a fire in static conditions but contact from trees is a known source of ignition. While lightning is also a known source of ignition, where there is an overhead line in the vicinity, blame is often put on the line as the cause.
- j) Common law duties relating to nuisance and negligence require that one person's property does not have an injurious effect on another's property. In this regard it can be argued that the tree owner has a common law duty with respect to keeping his trees clear of overhead lines and therefore is at least partly responsible for the cost of containing any fire caused by ignition from an overhead line.
- k) The Rural Fire Service have produced a Fire Management Guide for Small Forests. This guide describes the importance of keeping trees clear of overhead lines. The guide quotes the Growth Limit Zones specified in the regulations as being clearance requirements. As noted above, the regulations GLZs are considered inappropriate for forestry block clearances and it is of concern that small forest owners may consider that meeting the GLZ requirements is adequate. The Rural Fire Service does however acknowledge that 'greater tree setback distances may be wise'.
- l) ENA members report that approximately 33% of direct costs are recovered from tree owners at second cut stage. Therefore 67%, or approximately \$6 M of costs that should be borne by tree owners is not recovered annually. Recovery rate is better for private trees than forest blocks, or trees on Council or NZTA controlled roads. It should be noted that response rates were low here therefore the figures are indicative only.
- m) To put the cost of no interest trees into perspective, 15 ENA respondents report that in 2011/12 no interest was declared in approximately 21,000 trees that had already been

through the first cut process. At an average cost of \$120/tree, that represents an additional \$2.5 M for the 15 respondents. This annual cost extrapolates to approximately \$3.4 M for works owners across New Zealand.

- n) Expenditure on vegetation management has been relatively constant over the period 2009 to 2012 with increase of just over 6% compared with CPI increase of 6.28%. It is expected that 2013 costs will however be greater due to the amount of storm damage this year.
- o) Many works owners had been expecting costs to decrease over the past three years as tree owners should be paying for second and subsequent cut or trim costs. Costs have however remained relatively constant with second cut cost reduction being offset by a higher level of no interest trees, increased traffic management and other operational costs and the increased cost of liaison to implement second cut work.
- p) There is a view amongst some ENA members that the cost of vegetation management should generally be met by works owners and that this cost should then be recovered through line charges. While this approach may overcome the direct cost recovery issue, responsible tree owners would be subsidising the costs of tree management where trees are deliberately planted under or adjacent to lines. There would therefore be no incentive for tree owners to plant and manage trees responsibly.
- q) There are many thousands of sites around New Zealand where individual trees or groups of trees are clearly scorched from contact with lines, however the most significant fire danger is in forests. For the five years up to 2012, claims for over \$1.9 M were lodged against works owners for NZ Fire Service cost of forest fire containment and forest owner losses.
- r) While trees in small forestry blocks have been specifically planted for harvesting, they are still subject to the cut or trim process of the regulations. Works owners therefore have to pay the cost of any first cut or trim of those trees that encroach the GLZ.

4.3.2 International solutions

- a) **UK** Responsibility and cost for keeping trees clear of lines is generally with the tree owner. However, the Electricity Act allows tree owners to reclaim the cost of tree trimming from DNOs. In practice most DNOs undertake the tree trimming work on the tree owner's behalf.
- b) **USA.** The cost of vegetation management is met by the network utility companies and is passed on through line charges.
- c) **Australia.**
 - i. **NSW.** The cost of vegetation management is met by the network operator and is passed on through line charges. Where a tree has been planted under an existing line, the cost of vegetation management is with the tree owner.
 - ii. **SA.** The cost of vegetation management for naturally sown trees is met by the Electricity Entity and is passed on through line charges. The cost and responsibility for maintaining clearance lies with the various

Councils for any cultivated vegetation within a street verge, and with the property owner for vegetation adjacent to the verge.

- iii. **Victoria.** The cost of all vegetation management is met by the distribution companies and is passed on through line charges.
- iv. **Queensland** The cost of all vegetation management is met by the Electricity Entities and is passed on to customers through line charges.
- v. **NT.** The Electricity Entity is liable for any costs associated with vegetation clearing (S64 (5)). Costs are passed on through line charges.
- vi. **WA/** The responsibility for maintaining clearance lies with the local government body for any cultivated vegetation within a street verge and with the property owner for vegetation adjacent to the verge in an urban area. For lines on farms, crown land or reserves, the responsibility lies with the owner/occupier of the property unless the vegetation was naturally occurring. For lines with voltage above 33 kV and most other situations the responsibility lies with the Network Operator

4.3.3 Options

- a) **Maintain status quo.** The above issues reflect the concerns with doing nothing and do not improve overall efficiency of vegetation management.
- b) **Lines companies complete tree management.** Lines companies complete tree management and pass on costs in line charges.
- c) **Tree owners pay.** Tree owners are required to pay for management of trees near lines.
- d) **Restrict planting.** Restrictions on planting of tree types that could encroach the GLZ should be mandated.
- e) **Review the no-interest process.** A no interest declaration should not apply to second or subsequent vegetation management activity and once given, a no interest notice should not be able to be rescinded.
- f) **Revoke the no-interest provision** such that interest has to be declared in a tree and that tree maintenance then is the responsibility of the owner otherwise it is up to the works owner to decide how the tree is managed. This option would be a significant change in approach and would have significant regulatory implications.
- g) **Pay if you plant.** The tree owner should meet the cost of vegetation management for trees that have been planted or nurtured (including forestry plantings) as in the South and Western Australian models.
- h) **Implement a tree replacement programme.** Several works owners have implemented a tree replacement programme where a voucher for an appropriate tree (one that won't interfere with overhead lines when fully grown) is provided to a tree owner where an inappropriate tree is removed. This approach improves works/tree owner relationships and helps with public education with respect to the hazards of trees near lines. More appropriate lower growing trees will improve longer term vegetation management costs.

- i) **Education.** Works owners should be more actively involved in public education and advising tree owners of selecting appropriate species of trees to plant near overhead lines
- j) **Extend GLZ.** This will reduce the incidence of fires and fire related costs.
- k) **Use Common law to achieve redress.** Consideration could be given to enforcing common law actions where works owners are unreasonably targeted with the cost of forest fires.

4.3.4 Recommendations

- a) Restrictions on planting of tree types that could encroach the GLZ should be mandated.
- b) Consider the options of interest versus no interest trees and pay if you plant. A package should be considered taking into account the impact of regulatory change.
- c) Extend GLZs and mandate fall zone risk assessment as recommended above.
- d) Consideration should be given to enforcing common law actions where works owners are unreasonably targeted with the cost of forest fires.
- e) Works owners should be more actively involved in public education and advising tree owners of selecting appropriate species of trees to plant near overhead lines.

4.4 RMA Consent and Arboriculture Standards

The ENA RMA forum has a strong view that a national standard needs to be developed to provide guidance on a number of issues including arboriculture standards and the tree regulations/RMA interface.

4.4.1 The issue/discussion

- a) ENA members report that the time and cost of obtaining consent for vegetation management work is unreasonable in some cases. The Auckland District Plan for example contains an extensive list of scheduled trees and a resource consent is required for every vegetation management activity associated with those trees.
- b) Delays through the resource consent process are frustrating works owners. In one Auckland example, a consent was requested in July 2011. A response was provided declining the consent application 9 months later in March 2012. Following a re-application, consent was finally granted in August 2012.
- c) In some instances, Councils have used the consent application process to attempt to get lines placed underground or other works done. There are many examples where the response to a vegetation management consent has been that the works owner

should place the overhead network on the opposite side of the street or underground. Works owners believe this sort of response is unreasonable and is the cause of much frustration in having to develop proposals that are economically unacceptable.

- d) The cost of consent is a concern to some works owners. One Council is charging in excess of \$700 for every consent application.
- e) Concern has been expressed by some members that there is no little or protection under the RMA for existing works where land use change occurs. An example of this concern is where open arable farm land is converted to forestry use.
- f) There are no mandatory arboriculture standards for vegetation management with respect to overhead lines. Generally, tree owners want their trees to be healthy and when trimming or cutting is necessary, for the work to be undertaken in a professional manner and to a good standard.
- g) Several works owners have developed and have applied vegetation management standards based on the New Zealand Arboriculture Association Best Practice Guideline for Amenity Tree Pruning [10].
- h) There are many examples of poor vegetation management practice throughout New Zealand which have resulted in dispute between tree and works owners.

4.4.2 Options

- a) **Maintain status quo.** This is likely to result in a growing number of disputes.
- b) **Work with Councils.** Works owners should proactively improve their relationships with Councils to better understand the consent application process and restrictions.
- c) **Promote protection in statue** for existing works where there is a land use change.
- d) **Mandate good practice.** Principles of good arboriculture practice should be mandated so that the expectations for works owners and tree owners are defined and to ensure trees are managed safely and in a sustainable, and aesthetically acceptable manner.

4.4.3 Recommendations

- a) Works owners should proactively interact with Councils to better facilitate the consent application process and to gain a better understanding of consent issues.
- b) Promote protection in statue for existing works where there is land use change.
- c) Principles of good arboriculture practice should be mandated so that the expectations for works owners and tree owners are defined and to ensure trees are managed safely and in a sustainable, and aesthetically acceptable manner.

4.5 Education

4.5.1 The issue/discussion

- a) Works owners believe that more education is needed and that it is important for this to be delivered independently to improve safety and reduce disputes generally.
- b) Inappropriate selection of planted trees is an ongoing issue and while works owners have been active in attempting to educate the public through websites, news media, flyers and public forums [9], there are many examples of inappropriate tree planting underneath or adjacent to overhead lines.

4.5.2 Options

- a) **Maintain status quo.** This will result in ongoing dispute and planting of inappropriate trees.
- b) **Improve education strategy.** Current public education avenues and publications should be reviewed and an appropriate education programme developed by relevant parties including works owners, MBIE, forestry and horticulture groups.

4.5.3 Recommendations

- a) Improve education strategy with input and delivery by all relevant parties.

5 Regulatory issues

5.1 Tree or Land Owner

5.1.1 The issue/discussion

- a) The regulations require works owners to notify a tree hazard or to issue a cut or trim notice to the tree owner. The tree owner is not always the land owner and in some cases, the issuing of a notice is delayed or not completed because the tree owner cannot be identified or is an absentee landowner. While this is not a significant issue it has been raised by some ENA members.
- b) Disputes have arisen where the tree owner could not be identified at the time of trimming and did not agree with the amount of work undertaken by the works owner after the event.

5.1.2 Options

- a) **Maintain status quo.** Frustration, delays in getting works done and ongoing disputes will continue if this option is chosen.
- b) **Issue notices to the land owner.** Land Information New Zealand registered records are available and accessible to works owners, whereas occupancy or lease information is not. Land owners have a vested interest in the land, land use, and any encumbrances. Tree notices should therefore be issued to the land owner which in the majority of cases will also be the tree owner.

5.1.3 Recommendation

- a) It should be incumbent on the land owner to pass on any notification to the tree owner or any other person with an unregistered interest in the land. Registered forestry rights could be an exception to this as works owners can readily identify and notify forestry rights owners.

5.2 Dispute Arbitration

5.2.1 The issue/discussion

- a) Regulation 3 defines the purpose of the regulations. Dispute arbitration is specified as being provided under Regulation (3) (d) by ‘providing an arbitration system to resolve disputes between works owners and tree owners about the operation of these regulations.’ Dispute arbitration does not however cover ‘the operation of these regulations’ but is limited to being triggered by arbitration with respect to dispensation from tree trimming within the GLZ as described in Regulation 31.
- b) Since the introduction of the regulations, there have been a small number of arbitrations undertaken. Arbitrators have however provided advice to community groups, individuals and works owners regarding their interpretation of the regulations, and in some cases have assisted with obtaining agreement between tree and works owners with respect to the extent and responsibility of proposed tree trimming works.
- c) In the Marlborough Lines Limited v Cassels, High Court Wellington, CIV-2010-406-147 [2102] NZHC9 case, Williams J found the existing regulations to be deficient and unsatisfactory in a number of respects. One of Williams J recommendations was that arbitrators should be expressly empowered to address disputes regarding the location and identity of a tree in terms of regulation 9(3) (b). Williams J also noted that ‘A wider role for arbitrators is not precluded by s 169 of the Act’ and that ‘Most if not all of the difficulties being experienced by the plaintiff would be better determined by an arbitrator, with practical knowledge as to electricity reticulation and on a case-by-case basis.’

5.2.2 Options

- a) **Maintain status quo.** This will not improve the efficiency of application of the regulations.
- b) **Revise the arbitration provisions** of the regulations to include disputes regarding the issue of notices, the disposal of debris, and the application of no interest notices. Arbitrators need to have a good understanding of all of the works owner and tree owner issues.

5.2.3 Recommendation

- a) The arbitration provisions of the regulations should be revised to include disputes regarding the issue of notices, the disposal of debris, and the application of no interest notices.

5.2.4 Recommendations

- a) Principles of good arboriculture practice should be mandated so that the expectations for works owners and tree owners are defined and to ensure trees are managed safely and in a sustainable, and aesthetically acceptable manner.

5.3 Consumer Law Reform Bill (service line ownership)

5.3.1 The issue

- a) There will need to be careful consideration given to the liability that works owners may be taking on, particularly with respect to trees interfering with service lines in rights of way. It is expected that any maintenance liability for lines will include vegetation maintenance and that this will be dealt with as an extension to existing works.

5.3.2 Options

- a) **Maintain status quo.** Works owners may incur increased liability.
- b) **Consider the implications of the Consumer Law Reform Act** and in particular the liability that works owners may be taking on with respect to trees interfering with service lines in rights of way.

5.3.3 Recommendations

- a) Consider the implications of the Consumer Law Reform Act and in particular the liability that works owners may be taking on with respect to trees interfering with service lines in rights of way. It is expected that any maintenance liability for lines will include vegetation maintenance and that this will be dealt with as an extension to existing works.

6 Summary of recommendations

A number of issues have been identified in the report above, and various recommendations proposed. In collating the recommendations it becomes clear that there are similar recommendations to resolve different issues. These recommendations are summarised below – under the two broad headings of Regulatory and Operational. These recommendations are not presented in any order of priority.

6.1 Regulatory

The following is a summary of recommendations relating to regulatory change as identified in this report. These recommendations are not in order of priority.

- a) The regulations should provide clarity in terms of what is intended in the way of outcomes. A set of guiding principles and reference to applicable codes of practice should be included in the regulations to assist works owners and tree owners to understand and achieve the purpose of the regulations.
- b) The shape of the current GLZ should be revised to take into account fall zone trees and with the exception of native and specimen trees, slow growing trees and for low voltage aerial bundled conductor, should have no ceiling as in the South and Western Australian models. This change should include increasing the GLZ to reduce electrical safety risk (harm) due to non-competent workers operating near lines.
- c) Restrictions on planting of tree types that could encroach the GLZ should be mandated.
- d) A risk based model of cost/benefit criteria for tree management should be adopted for all slow growing trees, including natives and specimen trees.
- e) The options of interest versus no interest trees should be considered along with who should maintain trees that have been planted or nurtured, including forestry trees. A package should be considered taking into account the impact of any regulatory change.
- f) The notification requirement for individual trees should be revised to include options of notification by property, or by overhead line span between numbered poles.
- g) It should be incumbent on the land owner to pass on any notification to the tree owner or any other person with an unregistered interest in the land. Registered forestry rights could be an exception to this as works owners can readily identify and notify forestry rights owners.
- h) The arbitration provisions of the regulations should be revised to include disputes regarding the issue of notices, the disposal of debris, and the application of no interest notices.

- i) Principles of good arboriculture practice should be mandated so that the expectations for works owners and tree owners are defined and to ensure trees are managed safely and in a sustainable, and aesthetically acceptable manner.
- j) Promote protection in statute for existing works where there is a land use change.
- k) Consider the implications of the Consumer Law Reform Act and in particular the liability that works owners may be taking on particularly with respect to trees interfering with service lines in rights of way. It is expected that any maintenance liability for lines will include vegetation maintenance and that this will be dealt with as an extension to existing works.

6.2 Operational

The following operational recommendations identified in the report should be considered by ENA members.

- a) Consideration should be given to the benefits of network management improvements.
- b) More attention should be given to NZECP 34 breaches and works owners should actively notify MBIE to enforce compliance when it is found that non competent workers are undertaking work within MADs.
- c) Consider options to engage with DoL/MBIE/Worksafe to ratify and approve ACOP Part 2.
- d) Consideration should be given to enforcing common law actions where works owners are unreasonably targeted with the cost of forest fires.
- e) Through public education, tree owners should be made aware of the cost of vegetation management and particularly the cost of undertaking work around energised lines.
- f) Current public education avenues and publications should be reviewed and an appropriate education programme developed by relevant parties including works owners, MBIE, forestry and horticulture groups, with a view to increasing awareness of the legal and safety implications when working around energised lines.
- g) Works owners should proactively interact with Councils to better facilitate the consent application process and to gain a better understanding of consent issues.

7 References

- [1] Electricity Networks Association Trees Working Group Survey 2012. P14.
- [2] Electricity Networks Association Trees Working Group Survey 2012. P15.
- [3] Electricity Networks Association Trees Working Group Survey 2012. P14.
- [4] Electricity Networks Association Trees Working Group Survey 2012. P15.
- [5] Best Practice Guidelines: Safe Use of Elevating Work Platforms in the Horticultural Industry 2013. P20.
- [6] Quanta Technology – Hazard Trees: Benchmark Survey and Best Practices Final Report August 2009. P22.
- [7] Appendix B - Rural Support North Canterbury Letter of 11 October 2013.
- [8] Guggenmoos - Storm Hardening the Electric Transmission System. March 2009.
- [9] Appendix C - Orion Ellesmere A&P Show Display 2013
- [10] New Zealand Arboricultural Association Best Practice Guideline – Amenity Tree Pruning 2011.
- [11] EEA Guide to Electrical Safety for Forest & Woodlot Logging Operations. July 2013. P9.
- [12] Scenarios of Storminess and Regional Wind Extremes under Climate Change. NIWA Client Report: WLG2010-13.
- [13] ENA (UK) Engineering Technical Report 136 – Vegetation Management Near Electricity Equipment – Principles of Good Practice. June 2007
- [14] ENA (UK) Engineering Technical Report 132 – Improving Network Performance Under Abnormal Weather Conditions by Use of a Risk Based Approach to Vegetation Management Near Electric Overhead Lines. March 2006.
- [15] ANSI A300 (Part 1) – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). 2008.
- [16] ANSI A300 (Part 9) – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Tree Risk Assessment a. Tree Structure Assessment). 2011.
- [17] ANSI A300 (Part 7) - Tree, Shrub, and Other Woody Plant Management – Standard Practices (Integrated Vegetation Management a. Utility Rights-of-way). 2006
- [18] ANSI Best Management Practices – Tree Risk Assessment. 2011.

8 Appendix A - Current Legislation and Guides

8.1 New Zealand

The Electricity Act 1992 removed the statutory right of Electricity Network Businesses (works owners) to build and maintain lines on private property and to trim trees interfering with or threatening those lines. Under the Act, these matters were to be dealt with through the Resource Management Act (RMA) 1991. Statutory right of access was maintained for 'existing works', however the 1992 Act did not expressly give lines companies the right to trim trees. Existing works were generally protected by way leaves.

Since January 1993, works owners have generally obtained consent under the RMA and legal easements for lines installed. Most easements include a requirement for land owners to keep vegetation clear of lines.

The Electricity (Hazards from Trees) Regulations 2003 have been in place for almost 10 years. These regulations had been developed in the 1990's in recognition of the need to fill a vacuum as a result of the removal of statutory rights under the 1992 Act. Through the 1990's, works owners continued to attempt to maintain reasonable clearances without any specific legislative requirement or guidance.

Introduction of the regulations was stalled until a public safety event occurred in 2003 when a young boy received serious injuries from contact with a high voltage overhead line while climbing a tree in Auckland. This incident highlighted the need for some form of action and resulted in the regulations coming into force in January 2004.

The purpose of the Electricity (Hazards from Trees) Regulations is to protect the security of the supply and the safety of the public by:

- a) Prescribing distances from electrical conductors within which trees must not encroach; and
- b) Setting out rules about who has responsibility for cutting or trimming trees that encroach on electrical conductors; and
- c) Assigning liability if those rules are breached; and
- d) Providing an arbitration system to resolve disputes between works owners and tree owners about the operation of these regulations.

The regulations are prescriptive in terms of clearance distances between trees and lines with specific distances for Notice Zones (NZ) and Growth Limit Zones (GLZ). The regulations require works owners to notify tree owners and to undertake the first trim or cut of trees encroaching the GLZ, and for tree owners to undertake subsequent trims or cuts.

In general, works owners pay the cost of first cuts or trims and tree owners pay the cost of ongoing cuts or trims. One exception is that works owners must meet the ongoing costs of trimming or cutting of trees on land administered under the Conservation Act 1987.

Codes of Practice for Safety and Health in Arboriculture, and in Tree Work around Power Lines have been in place since 1996. These codes give good guidance to arboriculture and electrical industry workers and management regarding safe working practices although they are not mandatory and certainly not followed by all workers.

The Electricity Engineers Association (EEA) has also produced a guide for non-electricity industry employees using mobile plant near power lines and electricity cables, and a guide to electrical safety for forest and woodlot felling and logging operations. Again these guides are not mandatory.

8.2 International Legislation

Vegetation management legislation in UK, USA and Australia has some similarities to New Zealand legislation. It is of note that both the UK and the USA enacted legislation as a result of extreme weather and major transmission system failure events in 2002 & 2003.

For years, Australia have had significant bushfire issues. Many of these bushfires have resulted from overhead line faults and as a result, Australian legislation for both transmission and distribution lines is quite focussed on vegetation management in bushfire areas.

8.3 United Kingdom

The UK Electricity Act 1989 prescribes the requirements for vegetation management in proximity to overhead electricity line networks.

Following a major storm in October 2002, the Electricity Safety, Quality and Continuity (ESQC) Regulations were amended (2006) to strengthen the obligation of District Network Operators (DNOs) in order to eliminate tree related interruptions where reasonably practical. The amended regulations are the ESQC (A) Regulations 2006. The Act and regulations apply in all parts of the United Kingdom.

Responsibility and cost for keeping trees clear of lines is generally with the tree owner. However, the Electricity Act allows tree owners to reclaim the cost of tree trimming from DNOs. In practice most DNOs undertake the tree trimming work on the tree owner's behalf.

Lines through private land are generally protected by way leaves therefore maintenance including vegetation management is undertaken in consultation with the land owner, but is a permitted activity.

The Office of Gas and Electricity Markets (Ofgem) administer a price control regime which allows DNOs to earn a fair return on activities, while controlling end cost of electricity to customers. There are incentives for improving performance and there are penalties for poor performance. While there is pressure to meet performance requirements, generally costs of vegetation management are passed on through line charges.

The UK Electricity Networks Association (UK ENA) has developed principles of good practice [13] for vegetation management and has developed a risk based approach to vegetation management [14]. Sites are assessed and evaluated in terms of cost/benefit. The principles include direction regarding landowner approvals, access to properties standards of work, planting/re-planting and worker training. Risk is assessed on the basis of identifying the most cost effective locations to carry out resilience related vegetation management in terms of optimising the balance between cost, time to implement and customer service.

Since 2009, DNOs have been required to operate a vegetation management programme in accordance with the UK ENA standard under ESQC regulations. There are no statutory minimum clearances for vegetation with respect to lines although there are national guidelines for safe distances for different voltage levels.

There is no legislated mediation provision for disputes, however the DNOs can resort to vegetation management without the owners agreement under the provisions of the Electricity Act 1989 Schedule 4 Para 9. Such work is undertaken at the DNO's cost.

8.4 USA

Policy and legislation covering the electricity sector in the USA is set by the executive and legislative bodies of the federal government and state governments.

The North American Reliability Corporation (NERC) was designated with the responsibility to develop and enforce standards following a major blackout event in 2003. The legislation developed by NERC addressed vegetation management covering tree trimming on rights of way with respect to transmission lines. In 2013, the Federal Energy Regulatory Commission (FERC) approved vegetation management rules to improve transmission system reliability. Legislation governing vegetation management for distribution lines is the responsibility of the regulatory commissions within each State.

Lines through private land are generally in utility rights-of-way. The utility may own the land in fee, own easements, or have certain franchise, prescription or license rights to maintain facilities.

The American National Standards Institute (ANSI) has developed standards for pruning (2008) [15] tree risk assessment (2011) [16], and integrated vegetation management (2012) [17], as well as a Best Management Practice for Tree Risk Assessment (2011) [18]. While these standards are not mandatory, they are generally being applied by the network utility companies across the USA.

The cost of vegetation management is met by the network utility companies and is passed on through line charges.

8.5 Australia

Each of the six Australian States has its own Electricity Act and regulations that deal with vegetation management. There are many similarities between the Acts and regulations of the six States.

In general, the Electricity Entity/Distribution Company has a duty to take reasonable steps to keep vegetation clear of transmission and distribution power lines under the Entity/Company's control.

8.6 New South Wales

The New South Wales Electricity Supply Act 1995 specifies requirements for network operators with respect to interference from trees. The network operator may serve notice on a tree owner to undertake tree trimming work, or may elect to undertake the work themselves. The Electricity Supply (General) Regulation 2001 deals with tree management plans.

Tree management plans are not mandatory, however each of the three licenced network operators in NSW; Essential Energy, Ausgrid and Endeavour Energy has a tree management plan. Among other things, these plans specify line clearances for various zones depending on voltage, conductor type and span length.

For rural or bushfire areas with bare conductor, the clearance zones generally have no ceiling. For bundled or covered conductors, overhanging vegetation outside the clearance zone is generally permitted.

There are also tree preservation and native vegetation regulations which govern the extent of tree trimming and removal. Regulations take precedent over tree management plans.

The cost of vegetation management is met by the network operator and is passed on through line charges. Where a tree has been planted under an existing line, the cost of vegetation management is with the tree owner.

8.7 South Australia

In 2010, South Australia introduced the Electricity (Principles of Vegetation Clearance) Regulations. These regulations specify the requirement for the Electricity Entity to undertake an inspection and clearance programme on a maximum 3 year cycle. Lines are classified into 'low risk' (non-bushfire) and 'other than low risk' (bushfire) zones. Clearance zones are defined in the regulations and for voltages greater than 33 kV, there is no ceiling on the zone. Clearance zones also widen between support structures to a maximum at mid-span.

The sole Electricity Entity in South Australia is SA Power Networks. SA Power Networks don't have published line clearance requirements or a vegetation management plan however they operate under the ENA Vegetation Guidelines and the clearance requirements of the regulations.

The Office of the Technical Regulator (established under the Electricity Act) is responsible for ensuring the safety of workers, consumers and property as well as compliance with legislation, technical standards and codes in the electricity industry. The Technical regulator may grant exemptions from the principles of vegetation clearance on a case by case basis.

The cost of vegetation management for naturally sown trees is met by the Electricity Entity and is passed on through line charges. The cost and responsibility for maintaining clearance lies with the various Councils for any cultivated vegetation within a street verge, and with the property owner for vegetation adjacent to the verge.

8.8 Victoria

In 2010, the Electricity Safety (Electric Line Clearance) Regulations were introduced in Victoria. These regulations reference the Code of Practice for Electric Line Clearance and prescribe the management procedures for standards and practices for vegetation management. Electricity companies are required to produce an annual vegetation management plan. Clearance zones are defined in the regulations and are similar to that for South Australia.

There are six Major Electricity Companies (MECs) responsible for electricity transmission and distribution within Victoria. These MECs are all members of the Victoria Electricity Supply Industry and undertake vegetation management works based on their individual vegetation management plans, ENA (Australia) Vegetation Guidelines and the regulations.

Energy Safe Victoria may exempt distribution companies from any of the requirements of the regulations.

The cost of all vegetation management is met by the distribution companies and is passed on through line charges.

8.9 Queensland

Queensland's 2006 Electricity Regulations include the requirement for Electricity Entities to maintain vegetation clear of lines. Vegetation management is also covered in the Vegetation Management Act 1999, although this Act does not specifically address line clearances but is more about the ecological management of vegetation.

Energex, Ergon and Essential Energy are the three licenced individual Electricity Entities operating in Queensland. Each company has their own standards that describe the vegetation management process and planned clearances.

Disputes may be referred to the Energy Ombudsman if they cannot be resolved at the Electricity Entity level.

The cost of all vegetation management is met by the Electricity Entities and is passed on to customers through line charges.

8.10 Northern Territory

The Northern Territory Electricity Reform Act 2011 and the Electricity Reform (Administration) Regulations 2012 require the electricity entities to clear vegetation from interfering with power lines in order to avert interruption to supply. There are no statutory vegetation clearance distances specified in the Act or regulations.

Power and Water Corporation (PWC) is the sole Electricity Entity in the NT. PWC does not have published standards for vegetation management.

The Electricity Reform Act specifies that the Electricity Entity is liable for any costs associated with vegetation clearing (S64 (5)). Costs are passed on through line charges.

8.11 Western Australia

EnergySafety as the Western Australia energy industry technical and safety regulator has developed guidelines for the management of vegetation near power lines. These guidelines specify clearance zones in urban, suburban, semi-rural and rural areas and

assign responsibilities for controlling and clearing vegetation around overhead power lines.

Western Power and Horizon Power are the two licenced Network Operators within Western Australia. Neither companies have a published vegetation management standard on the intranet. Western Power specifies that 'generally species that grow no higher than 3 metres are retained within the corridor'. Horizon Power have a Growth Limit Zone of 3 metres below and to the side of any line, and no ceiling above the line.

The responsibility for maintaining clearance lies with the local government body for any cultivated vegetation within a street verge and with the property owner for vegetation adjacent to the verge in an urban area. For lines on farms, crown land or reserves, the responsibility lies with the owner/occupier of the property unless the vegetation was naturally occurring. For lines with voltage above 33 kV and most other situations the responsibility lies with the Network Operator.



50 Hamilton Ave
Fendalton
CHRISTCHURCH 8041

11 October 2013

Mr John O'Donnell
Chief Operations Officer
Orion NZ Ltd
565 Wairakei Rd
CHRISTCHURCH 8053

Dear Sir

As a rural based organisation, we have been heavily involved in supporting people affected by the recent windstorm.

Obviously, coping with power outages lasting up to two weeks, has caused major upheavals, both to farm operations and households.

While we are aware that you have a policy regarding keeping your lines clear of branches, we wonder if that is enough. In many cases, as we have travelled our district, it seems while branches are clear, the fall line takes trees across the wires.

The most obvious factor from our experience, is that trimmed hedges under power lines have caused no problems.

Can we suggest that in future, a much firmer stance is adopted when looking at the relativity between trees and power lines.

Yours faithfully
Doug T. Archbold
Chairman
North Canterbury Rural Support Trust

per

A handwritten signature in black ink, appearing to read "L.A. Birkett".

L.A. Birkett
Secretary. NCRST

Cut or Trim Notice

For trees in proximity to overhead electrical lines

Refer to Electricity (Hazards from Trees) Regulations 2003 ('the Regulations')

Date: / /

Work type: Scheduled Tree enquiry Fault

Reference: CTN1- **217381**

Order No.	T#	Contract Ref.	Liaison Officer

Tree Owner's Name: Phone No:

Site Address:

Postal Address (if different than Site Address):

Vector has identified that your tree(s) specified below is encroaching the **Growth Limit Zone** with respect to its electricity network lines and must be cut or trimmed in accordance with the Regulations. Your tree(s) must be cut or trimmed to the extent of the **Notice Zone** to provide the following minimum clearances specified in the Regulations:

Tree Species and Descriptions	No.	Current clearances from electricity line (m)			Notice Zone (m)	Work Required (comments)
		Under	Side	Over		

Substation Name	Feeder Code	Voltage	Transformer	Pole #1	Pole #2

You must arrange for your tree(s) to be cut or trimmed to the extent of the Notice Zone within 10 / 25 / 45 days of the date of this notice. Under the Regulations, you are responsible for the cost of having your tree(s) cut or trimmed pursuant to this notice. See Section A (overleaf) for further information about your responsibilities.

Tree owner request for quotation
 If you require Vector to arrange a quotation for the above works, please complete the details below and return this form to Vector. We will aim to provide you with a quotation within two weeks after the receipt of this request.

I/We request that Vector arrange a quotation for the above tree works and consent to a contractor entering onto the land specified above to prepare the quotation. Yes No

Land entry conditions (please specify if any):

Signed: Date: / /

The **Growth Limit Zone** is the minimum clear space required to surround the electricity line in all directions as specified in the Regulations. The actual distance (in metres) is determined by the span length, conductor type and voltage of the electricity line.

The **Notice Zone** is the clear space surrounding the electricity line in all directions to which the tree should be trimmed in accordance with the Regulations. The Notice Zone extends not more than one metre beyond the Growth Limit Zone.

Where Vector is aware that there is immediate danger to persons or property because a tree has come into contact with, or constitutes a hazard to an electricity line, or a tree has caused damage to an electricity line and may cause more damage, Vector is obliged to undertake any work needed to remove that danger.

An owner or occupier of land, who doesn't wish to be responsible for future maintenance of the tree, may issue a No Interest Notice to Vector in writing no later than ten working days from the date of this Cut or Trim Notice.

The circumstances in which a No Interest Notice can be given are set out in Regulation 15. A copy of the Regulations is available to download from the Energy Safety Service website at http://www.ess.govt.nz/rules/pdf/elec_hazard.pdf

If an owner or occupier gives a No Interest Notice, Vector may arrange to either trim or remove the tree after obtaining permission to enter the land. If permission to enter the land is not granted the No Interest Notice is of no further effect.

The tree owner may apply to Vector for dispensation from cutting or trimming the tree within the Growth Limit Zone. Any application must be made no later than five working days from the date of receipt of this notice.

The tree owner may apply to an arbitrator if dispensation is not granted, or if the tree owner disagrees with the terms of any dispensation. Any application must be made no later than five working days from receipt of notice regarding that dispensation. Contact details for arbitrators are available on the Energy Safety Service website www.ess.govt.nz

If the tree owner refuses Vector access onto the land to cut or trim the tree, the tree owner is responsible for the maintenance of the tree, including the cost of the first cut or trim.

The tree owner is liable to Vector for the costs of remedying any damage caused to its electricity network lines if the tree owner fails to comply with the requirements of the Regulations.

SECTION A - If the tree owner is required to undertake the cutting or trimming work, the following applies:

The tree owner must advise Vector of the time and location of the proposed cutting or trimming of the tree at least three working days before the tree is cut or trimmed.

Tree cutting or trimming work must be undertaken by a competent worker in accordance with OSH Approved Code of Practice for Safety and Health in Tree work - Part 2: Maintenance of Trees Around Power Lines.

A tree owner commits an offence where a notice to cut or trim a tree is given, and without reasonable excuse, the tree owner fails to cause the tree to be cut or trimmed in accordance with Regulation 10, or fails to advise Vector of the time and location of the cutting or trimming of the tree.

A person who commits an offence by failing to arrange for a tree to be cut or trimmed in accordance with Regulation 10, or failing to advise Vector of the time and location of the cutting or trimming of a tree is liable on summary conviction to a fine not exceeding \$10,000 and if the offence is continuing, a further fine not exceeding \$500 for every day or part day during which the offence has continued.

For enquiries and notifications, contact the Project Manager (Trees):

Vector customers

(Auckland, Manukau, and parts of the Papakura District)

Ph: (09) 303 0626

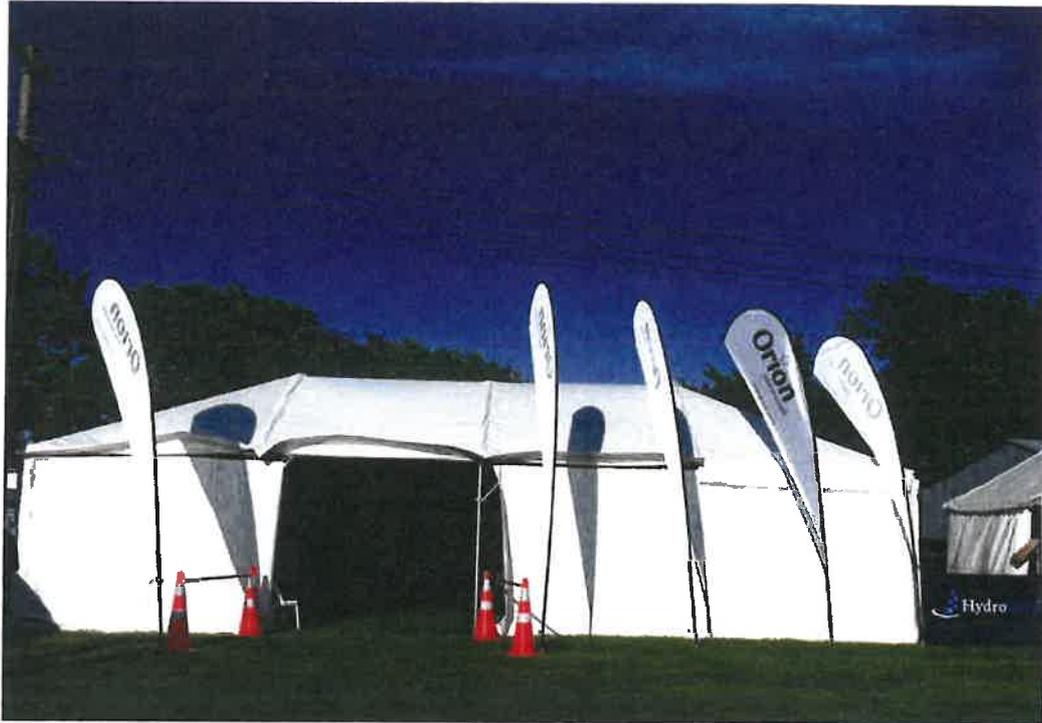
Email: info@vectortrees.co.nz

Post: PO Box 99882, Newmarket, Auckland



11 Appendix D – Orion Ellesmere A&P Show Display

Ellesmere A & P Show display – 19 October 2013



Orion
your network

Appendix E

ENA Member MAD Breach Examples

Details of incidents where MAD breaches have been reported to MBIE

File Number: 68719

5 October 2012 – A Shelterbelt Trimmer was observed cutting a shelterbelt with his machine near Hastings. The trees were within 4m of the power lines and the shelterbelt trimmer failed to advise the Works Owner that he was cutting within the network area. He was reported to the Works Owner by a concerned member of the public. The Works Owner immediately went to investigate, but the Shelterbelt Trimmer had gone by the time they arrived at the site.

The Works Owner reported the incident to the Ministry of Business, Innovation & Employment (“MBIE”), Palmerston North, who issued the File Number: 68719. MBIE advised that their Napier field officer was unable to witness the Shelterbelt Trimmer breaching. MBIE spoke to the Shelterbelt Trimmer and he advised that he was outside the 4m limit. MBIE decided no further action was required and the file was closed. MBIE suggested that in future the Works Owner provide photos which will assist MBIE with their investigations.

Details of incidents where unskilled workers including tree owners have encroached MADs and have undertaken tree trimming work

This is quite a common occurrence. There have been many incidents where a person operating a chainsaw or their personal hand held hedge trimmers will be within 4m of a live power line. A specific incident occurred at Taupo. A Cut or Trim Notice was issued to the tree owners in March 2013. The pine tree shelterbelt, planted directly below the power lines by a previous land owner was within the growth limit zone (“GLZ”) of the 11kV conductors. The Works Owner was arranging to clear the site under a shutdown and was scheduled to cut it on the Monday morning. The site was visited on the previous Saturday afternoon by an off duty staff member and observed the site had been cleared resulting in the planned work being cancelled. The tree owner was contacted on the Monday morning to ask if they knew anything about what had happened, to which he replied “no”. It was eventually established that the tree owner had cut the trees himself, however he would not admit to it and therefore nothing more could be done. A specific safety discussion was held to ensure future maintenance of the hedge is done in a safe manner.



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