

# **A Timely Opportunity to Resolve a Long-Standing Problem: THE HIDDEN NATURAL LAWS THAT ARE THE KEY TO DRASTICALLY REDUCING TREE-RELATED OUTAGES**

*Offered for the first time — the secrets to controlling tree-related outages and minimizing maintenance costs — a 2-hour workshop for utility managers — foundation concepts clearly illustrated.*

Dear Utility Manager:

The electric utility industry has embarked on a transition so radical that there's simply no parallel in our experience. The re-structuring impact will be so deep that only the electrification of a century ago will match it. Utilities have set out strategies...hoping these strategies will place them on the leading edge of the wave of the emerging revolution.

Will they be successful? What are the odds? Will success be enduring? What are the emergent risks and challenges?

There is risk to every chosen path ... and even more in standing still. There's no formula or guide book to follow. It comes down to speculation. Only time will tell if the speculation was visionary, based on useful interpretations and grounded in stakeholder values.

There's one specific area of risk that will become increasingly important over the next ten years. It's reliability of the electric service chain. At a time when business is more dependent than ever before on a reliable supply of electricity, constraints in generation, transmission and distribution are impacting reliability.

- With the transition to competitive generation, excess capacity becomes a losing business model. As a result, the experience of seasonally constrained power supplies can be expected to be the new enduring reality.
- The transmission system will increasingly be a limiting factor. While electricity demand is increasing, particularly in highly populated urban centres, the opposition to new transmission lines creates - as a minimum - delays in clearing bottlenecks and the ability to meet demand.
- The overhead distribution system is extremely vulnerable to storm damage by wind, trees and lightning strikes. Climatologists report we are exiting a period of relatively stable weather and that variability is increasing, meaning we are in for more extreme weather events. The trend may already be established. During the last 21 years, 48 extreme weather events each with estimated damages

exceeding US\$1 billion hit the United States. Of these, 41 have occurred in the last 12 years.

## **Trees Can Really Bring You Down. . .**

Trees have always been a problem for overhead electrical systems. For many utilities, trees account for 20% to 50% of all unplanned distribution outages. Those numbers would be even greater if severe storm related outages were included. In the last ten years, tree-conductor conflicts have led to a fire storm in Washington, the burning of a historical town in California and two major western transmission grid crashes, one impacting 7.5 million customers. Much of the 1998 ice storm damage in the northeast arose from trees and tree branches falling across conductors. It was the same story in December of 2000 when Arkansas was hit by two major ice storms. While the geographic area hit by severe wind or ice storms varies on a year to year basis, these events are not rare. Can you think of a year when no utility experienced a severe storm?

Such events have significant financial consequences. There's the cost of responding to the crisis and rebuilding the system ... damage settlements ... litigation expenses ... inquiry expenses ...

... But those are only the obvious costs. There are hidden costs. Fires and outages tend to draw the attention and ire of the public and regulators. In the near term the customer may be captive to the delivery system. Further frustrated by a lack of choice there will emerge a pent-up demand for alternatives. Irritated regulators will ... of course ... respond with new regulation.

What's the cost of new regulation? How much will you need to invest simply to ensure a regulatory outcome that you can live with? What will be the cost of inquiries? What will be the cost of compliance?

## **A Way Out of the Woods**

Is there a way to avoid the risks and costs I've outlined?

Yes, there is. And I want to share it with you in a workshop specifically designed for utility managers.

As long as there are overhead systems and trees in the vicinity of power lines, the risk of tree-related outages and hazards will exist...

... but that risk can be drastically reduced.

My name is Siegfried Guggenmoos. I'm the president of Ecological Solutions Inc. I know from direct experience that tree-conductor conflicts can be drastically reduced.

Twenty years ago when I was managing a national Canadian vegetation management contracting company, I became acutely aware that all the vegetation management programs I'd ever encountered were failing miserably. I had an idea why but verifying my thinking necessitated a client willing to think outside the box ... to challenge the status quo. Such a client did emerge but they wanted me on staff to direct and implement the new program. The thirst for knowledge can be a powerful motivator, so I gave up my profit sharing plan and stock options and went to work for a utility.

So, how did it work out?

Well, first let me say I confirmed my speculation and in the process learned more than I could have imagined. I and many others believe the new program was a success, but you decide for yourself:

- Tree-related outages were reduced 80%
- Tree-related outages were reduced to 2% of all unplanned distribution outages
- Crews removed 75% of all trees handled in the first cycle of the new program
- Within three years productivity was improved 21% and was subsequently sustained at that level
- 98% of customers were satisfied or very satisfied with the tree work

Let me tell you about the reaction of our peers.

As the results started to come in, my colleagues and I were presenting them to industry insiders at the International Society of Arboriculture. When I presented the methodology to our improved contractor productivity, a senior vice president with thirty plus years experience with the world's largest tree expert company said "You just blew the entire room out of the water."

We subscribed to the service of a consulting firm that let us compare our results with about twenty other utilities. All were shocked we were removing 75% of the trees we handled. It was unprecedented ... and almost unfathomable.

When the utility hired Kaset International to assess its customer service, senior management was surprised to find that one part of the company excelled in customer service ... the Distribution Line Clearance group - formerly the single largest source of customer complaints reaching senior management. Management sent one of our utility foresters to present on customer service to the Conference Board of Canada.

... Issues dealing with trees tend to be one of major sources of complaints for utilities. To receive a 98% customer satisfaction rating for essentially removing customers' trees was a remarkable reversal.

The basis of our success was that underpinning this program was an alignment with certain ecological principles. I confirmed both that it was possible to drastically reduce tree-related outages and why most programs fail. I'd like to show you these keys to successful vegetation management.

## **Information is Power...**

### **The Power to Make Good Decisions**

I believe you may be one of the few positioned to appreciate the power of this knowledge ... one who can see the immediate bottom-line impact and recognize that the less tangible contributions may be of even greater value. That's why I'm offering you the opportunity to participate in the workshop *Vegetation Management for Utility Managers*.

In *Vegetation Management for Utility Managers* you'll learn key natural laws and characteristics. If your vegetation management program is not built on these, any reductions in tree-conductor conflicts will not be enduring. Reducing tree-conductor contacts and stabilizing them at a new lower equilibrium has very specific requirements.

... You can prove this to yourself. Examine a graph of annual tree-related outages over the last ten to twenty years. Does it look like a roller coaster? Has this or is it likely to draw regulator attention?

There are two ways to get off that roller coaster. The specific knowledge in *Vegetation Management for Utility Managers* will provide one. You won't like the second one but here it is ... set a mandate to reduce tree-related outages and provide an unlimited budget. The second approach will stabilize tree-related outages but I can't guarantee substantial reductions. More on that in a moment...

In *Vegetation Management for Utility Managers* you'll also learn that a vegetation management program built on ecological principles has an appealing additional benefit to minimizing tree-related outages... surprisingly, maintenance costs are simultaneously minimized.

That doesn't sound logical but I'll show you a graph that'll make it easy to understand why it's true.

## Trees as a Liability

Trees have many positive attributes for which they're valued. They are viewed by municipalities and the public in general, as assets. But utilities should be clear that trees threaten their assets and operations. For utilities, trees are a liability.

In *Vegetation Management for Utility Managers* you'll learn how the tree workload expands and why. In a nutshell, how is exponentially. Trees are an exponentially expanding liability.

The tree workload liability is like a debt. You can stabilize the debt by annually paying the carrying charges. You have the option of paying off some of the principal, thereby lowering future costs. Of course, if the annual contribution is less than the carrying charges, the debt expands exponentially. And we're talking about rates that even credit card companies would envy.

In *Vegetation Management for Utility Managers* I'll show you where the rate of change in the tree workload comes from. It's data that most utilities already have on file. I'll show you how I've used this rate of change to forecast outage and economic impacts of underfunding—that is funding below the level required to meet as a minimum, the equivalent of the annual carrying charges.

## The Source of Tree-Related Outages

Where do tree-related outages come from and are your staff addressing these causes? You may be shocked to learn that tree trimming to avoid trees growing into conductors does very little to improve reliability. Since much of the utility line clearance effort is directed at tree trimming, increasing the funding and doing more of the same is not going to provide significant improvements in line security.

Over the last ten years a number of studies have found that trees contacting distribution primary conductors do not cause faults. The vast majority of tree-related outages, 85% to 90%, are due to tree failure. Tree failures are triggered by weather events. Obviously, where the efforts to improve reliability are focused on tree growth, the degree of success will be limited. Yet that is where most of the effort tends to be focused.

So, why is the focus not on the source of 85% of the outages? Because most of these trees are outside the right of way. That makes dealing with them problematic. What you can or can't do is up to the property owner. Is it an insurmountable problem?

Well, I say not at all. Do you remember the 75% removal and 98% customer satisfaction ratings? These were attained on a distribution system that had no registered easements.

In *Vegetation Management for Utility Managers* I'll introduce a method of quantifying the risk of tree-conductor contacts. It's called the Optimal Clear Width Calculator. I'll give you the underlying rationale and show why a hazard tree removal program is likely to have very limited success in improving reliability. This quantitative approach used in combination with outage statistics to identify problem line segments will facilitate targeted percentage reductions in tree-related outages. Not only will this be extremely useful if your PUC has set reliability standards or enacted performance based rate making but future maintenance costs will be permanently reduced.

I'll also identify two distinct tree failure modes that seriously impact reliability. Addressing tree failures is the path to simultaneous substantial reductions in tree-related outages and reductions in future maintenance costs. Returning to the debt analogy, it's the equivalent of making principal payments.

## A Limited Opportunity

Obviously, there are some drawbacks to offering *Vegetation Management for Utility Managers* in an environment of unprecedented change in the electric utility industry. Utility management is caught up in mergers and acquisitions, divestiture, protection of capital investment, etc.... Trees don't seem very important.

But I know there are utility managers who see the connection between reliability and customer retention - who understand that customers would like 100% reliable service - that regulators will increasingly focus on reliability... and therefore, see the potential for an exceptional rate of return on investing in *Vegetation Management for Utility Managers*.

*Vegetation Management for Utility Managers* is not going to appeal to all utilities. That's good. It will provide a competitive advantage to those who buy *Vegetation Management for Utility Managers*.

## Re-Regulation

For ten years or so we've been talking about deregulation ... but it's really re-regulation. There are probably more rules to the competitive market than there were when operating a monopoly.

Regulators have become more active in the area of vegetation management. The direction seems to be to mandate tree to conductor clearances ... or some standard that facilitates the measuring of compliance. California may have started this trend but it's certainly resonating with a number of other PUC's.

The results of a R.J. Rudden Associates Inc. survey of utility commissioners in 1995 is revealing:

- 97% listed reliability as the major concern of their Commission
- 69% expect competition will result in an increase in the number of customer complaints

That gives a clear signal what balls the PUC's have their eyes on.

What's happened since? .... Well in a sense you might say the industry has lived up to the commissioners' expectations. Changing conditions in the supply chain have resulted in lower reliability. And

many utilities have reduced staff, affecting their ability to respond in a crisis.

Regulators besieged with customers complaints about not being able to contact the local utility during a major storm event or the perceived lack of speed of service restoration, have been motivated to “do something”. In some jurisdictions regulators have mandated specific reliability targets. We can expect this approach to spread. And we can expect the targets will become more difficult to achieve ... that the punitive component will increase ... and that such a vehicle to publicly demonstrate resolve will be irresistibly appealing to regulators.

Regulators will be supported in making “big stick” regulation by customers and the competition - the non-wires electricity marketing firms.

With regulator attention focussed on reliability, if your vegetation management efforts have not yet come under scrutiny, it’s only a matter of time before they do. When regulators see that roller coaster record of tree-related outages it will reinforce their belief in the need for intervention.

As a minimum, wouldn’t it be nice to show them a plan and why it will work. In *Vegetation Management for Utility Managers* I’ll give you the tools to develop such a plan.

I look at money defensively spent on conflicts with regulators as non-productive ... a waste of resources which should rightfully accrue to a few stakeholders - customers, shareholders and employees. I think you’d agree and would rather spend the money on maintenance, staffing and actions that will increase customer retention.

## Customer Retention

I’ve said that outages and the threat of outages via constrained power supplies is creating a pent-up demand for more reliable alternatives. We’ve already seen an expression of this demand as people frightened by the northeast ice storm and possible Y2K related problems bought back up generators at a rate exceeding the supply capability.

While we might chuckle at the \$/kWh cost of electricity produced by these back up systems, it is also very instructive. Clearly in customers’ minds reliability is linked to security. People are prepared to pay for security!

That’s why distributed generation will have enormous appeal. And while we talk about a high cost of entry, it won’t be if projections can be met. Plug Power, for example, has indicated a introductory capital cost of \$6,000 to \$10,000. That’s not a barrier if it’s going into a new house and is amortized over 30 years.

For commercial and industrial customers the advent of the digital age has resulted in an unprecedented bottom line driven, demand for reliable power. The annual U.S. economic loss due to power outages is estimated to range from a conservative US\$50 billion (EPRI) to US\$100 billion (Bank of America).

In areas frequently ravaged by severe storms, being free of the grid will have considerable appeal. Such a ready-made market for distributed generation will attract quite a few vendors. Competition will be fierce. DG will really blow the doors off the notion of a service territory. While you might be positioned to sell DG, why would the customer buy from you rather than one of the competitors? And how can you entice the customer to

not leave the grid?

It's ugly. I don't know if you can. But it may be possible to salvage something if you haven't alienated the customer with a perceived lack of regard for his profitability or security. At least you should have a distinct advantage to sell DG alternatives.

Reliable service isn't likely to increase your customer base but it may be the best strategy for customer retention. In this light it's difficult to put a dollar value on the benefit of reducing tree-related outages.

## A Workshop of Inestimable Value

If you believe reliability is or will become a major issue in the next five years, *Vegetation Management for Utility Managers* will be of great value. You'll learn why the economic consequences of delaying action on reducing tree-related outages are much greater than you'd expect.

To illustrate the extent of the potential value of *Vegetation Management for Utility Managers* let's assume that regulators force you take action on tree-related outages five years from now. Let's also assume you've misjudged by 20% the amount of annual work required. For every million dollars "saved" the tree workload liability will actually have expanded by \$2 million for a net present value loss of \$1,000,000. (This loss is conservative since I'm using tree growth rates from an area with a 3 month growing period.)

To return tree-related outages to the level at the beginning of the period would require a budget in year six that is 225% of the five year average.

How receptive will regulators, who are forcing action on you, be to more than doubling of your vegetation management budget? How much of those charges will be disallowed and forced onto your shareholders? That is the potential value of *Vegetation Management for Utility Managers*.

... But that's not the total value. What if you could avoid tree-related outages becoming an issue ... or a greater issue than it is ... what is the value of the avoided legal and regulatory filing/hearing costs?

... And what will be the impact of improved reliability on customer retention?

## The Workshop

*Vegetation Management for Utility Managers* is designed for busy managers. It does not require a major time commitment. It's a two hour workshop. I recognize two hours may be hard for you to find. But as you saw above, it may very well be worth more than 125% of your annual vegetation management budget. In that two hours you'll learn the key concepts necessary to reduce tree-related outages on a sustainable basis. ... And you don't need to be a tree expert. I can say this with confidence, as I've presented these concepts to lawyers, engineers and other non-tree professionals.

To realize the value in *Vegetation Management for Utility Managers* the concepts presented must be incorporated into the vegetation management program. Because such a change will require the support of management, the workshop is intended for utility management. Attendance is limited to eight people.

While the value of the information you'll receive in *Vegetation Management for Utility Managers* is in the millions of dollars, the workshop for your management group is being offered at the introductory price of \$10,000 plus travelling expenses.

But better yet, if you get your *Vegetation Management for Utility Managers* workshop booking to me in the next 30 days I'll include an Individual subscription to the Optimal Clear Width Calculator, a \$2,500 value.

Subsequent to the workshop you will receive hard copies of a report covering the workshop material. You will have an opportunity to contract for and have incorporated into the report the modelling of underfunding impacts on future outages and costs specific to your utility. The predictive model will serve to justify maintenance costs to the local PUC and protect shareholders by transferring liability to an unresponsive PUC.

Arrangements can also be made to:

- Assess the suitability of data available for deriving the tree workload rate of change
- Receive a range of options available in the level of detail of underfunding impact modelling
- Present the material in the *Vegetation Management for Utility Managers* workshop to your line organization
- Provide guidance in the use of the Optimal Clear Width Calculator
- Train your staff in the use of the Optimal Clear Width Calculator
- Facilitate or guide the implementation of selected elements

I encourage you to act quickly. Return the enclosed Workshop Booking Form to put your utility on the path to lower and stabilized tree-related outages and reduce the risk of regulatory intervention in your vegetation management program.

Yours truly,



Siegfried Guggenmoos  
President, Ecological Solutions Inc.

**P.S.** While I'm certain you'll appreciate knowing how to reduce tree-related outages you'll love being able to achieve this and simultaneously minimize maintenance costs. It sounds contradictory but I assure you it's so. A simple graphic used to express ecological facts, makes it accessible and apparent.

**P.S.S.** Tree workload is like a debt. It pays to start taking care of it sooner rather than later. Respond within 30 days and I'll give you an Optimal Clear Width Calculator, a \$2,500 value. It will show you how to reduce the principal portion of that debt.