

**RGALabs, Inc.**, the industry leader in providing customized electric load forecasting to the energy industry, introduces a new forecasting product designed to help electric Transmission and Distribution (T&D) organizations improve system reliability, and decrease costs—**OutageCast™**.

Given the multitude of issues affecting T&D organizations, **OutageCast™** could become an integral part of a your effort to manage **CAIDI** and **SAIFI** performance, as well as labor costs arising from storm-related recovery efforts.

## T&D Issues

- Due to expansive geographical territories, storm activity can severely strain resources during service restoration, across all geographical areas, thus resulting in an increase in **CAIDI**. In other words, recovery personnel and crews may not be optimally allocated across the various geographic regions, given geographic differences in storm activity and interruption-susceptibility;
- Weather forecasts of storm activity may not always provide meaningful information that can be used for the anticipatory scheduling, staging, and dispatch of work crews for service restoration. This also results in an increase in **CAIDI**. In addition, since forecasts of storm activity are used in the decision process for scheduling recovery crews (both on a call-out and hold-over basis) the accuracy of these forecasts and the potential impact of the forecasts can significantly impact labor costs. An accurate and reliable weather forecast and impact assessment would be a great asset in managing recovery costs;
- Similarly, more effective and targeted prioritization of maintenance activities (including vegetation management), based upon geographic location, interruption causal factors, and index performance, could also reduce **CAIDI** and **SAIFI**.

## What and Who is **RGALabs**?

**RGALabs** is a diversified engineering and technology firm, specializing in the development and implementation of solutions to exceptionally difficult or unusual engineering problems in both research and production environments.

- Industrial Process Forecasting
- Complex computing problems
- Development of new technologies

**RGALabs** was formed in 1998 by two senior engineers with extensive experience in many aspects of generation and distribution systems. These principals, along with various associates, maintain over 125 years of broad experience in a wide domain of computational forecasting and weather management methods.

## Past and Present Clients

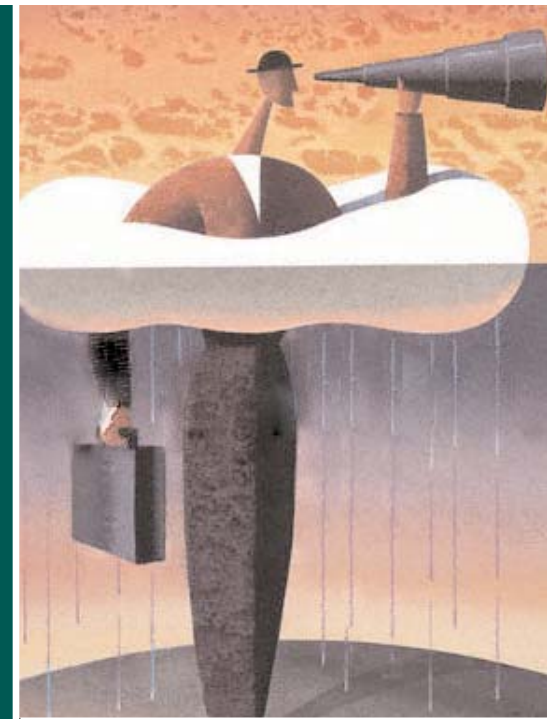
- ComEd's Wholesale Energy Group  
(currently part of the Exelon Power Team)
- Cinergy
- Entergy
- AAR, Inc.
- Iowa Dept of Transportation
- Navigant Consulting, Inc.
- Foresight Weather, Inc.
- Exelon Energy Services

## RGALabs, Inc.

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& Prototype Development*

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## OutageCast™

*The new alternative for  
improving reliability, and  
reducing the costs of operating  
and maintaining electric  
Distribution Systems.*

*...From*

**RGALabs, Inc.**

[www.RGALabs.com](http://www.RGALabs.com)

## OutageCast™ Concept

The concept of *OutageCast™* is based upon the application of high-resolution weather forecasts (i.e. 10 km blocks), along with historical operation and maintenance data, and real-time electric load data in a proprietary Artificial Neural Net (ANN) computational model to forecast distribution interruptions. This system will provide a geographically targeted probability (occurrence and size) of a service interruption, across an entire system. This information can be used for anticipatory scheduling and dispatch of crews, thus reducing interruption times and supporting better management of labor resources.

The system architecture and ANN model can also be used with historical data (feeder-specific interruptions and maintenance activities) to prioritize preventive maintenance activities. The end result of the prioritization would be an optimized and targeted reduction in **CAIDI** and **SAIFI** schedules.

## OutageCast™ Technology

The heart of the *OutageCast™* system is the *Metropolis™ Data Management System* and a proprietary ANN forecasting model, coupled with the Foresight Weather mesoscale weather forecasts.

*Metropolis™* is a fully automated computing system, constructed from a series of asynchronous computing modules that operate independently of each other. All computing modules are linked with independent databases. Each of these databases is able to communicate with the other databases.

The most appealing benefit of *Metropolis™* is the ability to automatically produce valuable information so that it is ready and waiting when it is needed.

The *Metropolis™* system can also provide customized, time-sensitive statistics that objectively quantify the forecast errors, as well as the timing of the errors. These customized

statistics can then provide analysts with the true behavior of forecasting operations, and identify subtle trends in operations. In addition, the *Metropolis™* open SQL database architecture will enable an analyst to develop ad-hoc data queries, in real time, to further evaluate and quantify the risk associated with both weather and maintenance.

## OutageCast™ Operational Logic

Imagine 12 kV feeders running through an older residential area (i.e. a 10 km block), with significant trees and foliage. Many questions come to mind:

- What type of storm will cause an interruption?
- Is it a function of wind speed and direction, time of year, precipitation, tree trimming frequency, age of equipment, or all of the above?
- When will a forecasted storm pass through the residential area?
- How much damage will occur in the area?
- What feeders are the most susceptible to storm damage? Why?
- What will be the impact of more frequent maintenance (tree trimming) upon this damage susceptibility?

The custom-built *OutageCast™* model will incorporate weather, maintenance parameters, and interruption history to determine the key factors for an interruption. The *Metropolis™* system will run the model against current conditions and weather forecasts to provide the probability of an interruption and the number of customers impacted.

Now expand this operational logic (input, processing, and output) to all distribution lines and feeders, at a frequency specified by the user. *OutageCast™* is only limited by the availability of line-specific data from the user.

## OutageCast™ Model Operations

In order to provide the answers to the questions above, as well as other questions, the *OutageCast™* system will perform the following operations:

- Automatically acquire, ingest, and archive high-resolution weather forecasts for the geographic areas where distribution lines are located;
- Automatically access and ingest the operation (load) and maintenance (tree trimming) history of distribution lines (including location specific tree-trimming along the lines);
- Automatically access and ingest real-time load data for the system and/or lines (if available at that resolution);

Automatically input this data into *RGA Labs'* proprietary *OutageCast™ ANN Model*. The results of this model (forecasts of weather-induced line interruptions and preventive maintenance requirements that would improve index performance) will then be automatically presented in a user-specified, web-based output (including a GIS-style mapping system).