



Énergie NB Power



**Ice Storm Outages | 2013
Lessons Learned | 2014**



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Message from Gaëtan Thomas, President and CEO of NB Power



On behalf of all who worked to restore power during the recent series of ice storms, I want to thank NB Power customers in southern New Brunswick for their extraordinary patience and understanding during the outages.

Day after day, we watched customers show incredible heart and persistence in supporting the work of our crews as they cleared ice-covered trees from damaged lines through the 2013/2014 holiday season.

Despite not having electricity in their own homes, our customers brought hot meals, coffee and words of encouragement to our crews, many of whom worked through the holidays on snowy roads far from their families.

This support was critical in helping us reconnect tens of thousands of households in the aftermath of the storms. Your faith in our work boosted the flagging spirits and tired bodies of our employees and contractors. We are humbled by your actions and grateful for your support. From all of this, we have learned that in New Brunswick, generosity knows no bounds.

We know that as a utility, we have a lot of good lessons to learn from these storms and have taken actions to minimize the impact of similar events in future. This is the kind of event you can't prepare for until it happens, and we have used it as a learning opportunity.

In January, we committed to making the following improvements;

- Working to improve our tree-trimming program and do more to educate the public and municipalities about why it is important.
- Improving our customer communications, providing better tools to help customers understand how and why priorities are set in restoring power.
- Doing more to emphasize storm preparedness for all of our customers.

I am proud to present this Lessons Learned report as further commitment to our efforts to improve. Our goal is to provide the best customer service possible, while keeping New Brunswickers safe and connected to the grid.

As CEO, one of the biggest lessons I have learned from this experience is that New Brunswick is a province of neighbours who know how to take care of each other in times of crisis. Thank you for never giving up on us. We feel privileged and proud to serve you.

A handwritten signature in black ink that reads "Gaëtan Thomas". The signature is fluid and cursive.

Gaëtan

1. INTRODUCTION

1.1 Purpose

The purpose of this report is to outline actions taken by NB Power management, staff and contractors during a series of damaging winter storms that caused widespread power outages in southwestern and central New Brunswick in late December 2013 and early January 2014, and to identify operational strengths, challenges and commitments for future improvements.

This series of storms resulted in the most significant outage event in New Brunswick's recent history, with more customers affected than the most comparable ice storm, which hit southwestern New Brunswick in 1998.

Our goal is to improve customer service by sharing key lessons from our review of the NB Power storm response, both successes and challenges, and commit to specific changes where necessary to improve our performance during future events.

1.2 Scope

In the weeks following the storms, NB Power management and front-line staff came together in a series of facilitated discussions to map out the utility's response and lessons learned from the December ice storms. Through frank and open dialogue, gaps and strengths were identified in areas including vegetation management, emergency preparedness planning, and communications. These areas were then assigned to smaller groups for further analysis, and each group reported its findings, along with suggestions and commitments for improvement, which are included here. NB Power senior managers also reviewed our key lessons and response to the storm with members of the Canadian Electricity Association. This allowed us to identify shared best practices and will support further enhancements to our emergency and storm response protocols. Finally, NB Power senior managers reviewed all customer emails, social media posts, logs of customer phone calls and other forms of feedback to inform our recommendations for improvements in customer communication and customer service.

1.3 Contributors to this report

NB Power Employee	Area of Focus
Sherry Thomson VP Customer Service and Distribution	Lead, oversight of review process
Tony O'Hara Executive Director, Transmission and Asset Management	Vegetation Management
Michel Losier Director, Customer Engagement	Vegetation Management
Lynn Arsenaault Director, Provincial Field Operations	Vegetation Management
Huguette Pothier Director, Information Services	Outage Mapping
Charles Hickman Director, Environment	Emergency Preparedness
Brent Staeben Director, Communications and Marketing	Public Communications
Jill Doucet Director, Customer Care	Customer Communications

2. EXECUTIVE SUMMARY

Since this significant event, NB Power's management team has reviewed the Corporation's response through the lessons learned activities described above and makes the following observations:

The series of severe winter storms was among the worst to hit NB Power customers in decades, and overall, the corporation performed extremely well in very challenging circumstances.

Strengths were identified in the areas of safety, resiliency of infrastructure and customer communications.

For improvement, specific measures have been identified to close gaps and improve customer service in the areas of vegetation management, communications and emergency response. Some of these improvements were implemented immediately, supporting our response to a second major storm that hit New Brunswick in late March.

2.1 Strengths

- **Our commitment to safety** was evident as there were no accidents or injuries during approximately 75,000 person hours of work in dangerous weather and work conditions;
- There was **limited infrastructure damage** due to robust engineering and construction standards that are maintained to be consistent with Canadian Standards Association criteria for utility infrastructure;
- **Consistent and proactive customer communications** through traditional and social media, along with the **exceptional response of our customer agents** to four times the regular call volume in our Customer Interaction Centre during the storm outages contributed to New Brunswickers displaying a tremendous amount of patience and understanding through the holiday season. Our customers demonstrated their support of NB Power employees through letters and emails, social media and public comments during the storm, providing a great morale boost to the men and women battling extreme conditions to reconnect their electricity.

2.2 Improvement Measures

Vegetation Management

- Conduct a post storm clean-up in partnership with the hardest hit municipalities.
- Increase broad customer education on why vegetation management is important along with targeted communications to those customers who will be directly impacted by the 2014/15 preventative maintenance plan.
- Pilot Light Detection and Ranging (LiDAR) technology to more efficiently identify “vegetation hot spots” and enable more targeted cutting.
- Review and improve vegetation management processes and vegetation contract management to maximize dollar investments. Budget increased by \$1M to \$5.8M prior to storm hitting in 2014/15 with further investments committed to in 2015/16.

Communications

- Provide improved customer information on estimated times of power restoration through improvements to our outage management system and deploying outage mapping functionality.
- Provide better tools including website enhancements, face-to-face communications with municipalities, social and other media, to help customers understand how and why priorities are set in restoring power and increase broad communications on storm preparedness to customers.

Emergency Preparedness Planning and Execution

- Update and regularly exercise the corporate emergency preparedness plan.
- Improve coordination between NB Power and relevant external agencies.
- Improve emergency response through process improvements involving technology and resource management.



2.3 Immediate Improvements

March 31, 2014 Storm Outages

A second major storm hit southeastern New Brunswick on March 31, 2014, allowing employees to quickly put to use many of the key lessons learned from the December ice storms. This slow-moving weather system brought ice pellets, freezing rain and high winds, knocking out power to approximately 85,000 customers in Shediac and Bouctouche areas, and the City of Moncton throughout the storm period. NB Power employees were battle-tested from the December storms, had identified and integrated improvements, and were able to swing into action immediately, calling on known and practiced resources to responding efficiently based on their recent experience.

Some specific improvements that improved response to the March/April outages included:

- Quicker cross-corporate engagement across NB Power allowed for additional support to crews on the ground.
- Greater emphasis on restoration time updates on the website.
- Early engagement with municipal officials in affected communities during the outages and restoration process.
- Improved coordination with relevant agencies and partners, including New Brunswick Emergency Measures Organization.
- More emphasis and additional resources allocated to assessing damages prior to restoring power, which helped crews understand the job ahead, improving efficiency and response.
- Storm command centre requirements were better understood and resourced quickly, allowing managers to identify necessary skills and allocate appropriate staff.



3. SUMMARY OF EVENT

A series of fierce winter storms and bitter cold hit New Brunswick in an 11-day period between late December and early January, bringing freezing rain, heavy snowfall and extended cold weather that knocked out power to tens of thousands of customers. NB Power crews, with help from neighbouring utilities, private contractors and vegetation management companies, restored power to approximately 24 per cent of our total customer base between December 23 and January 3.

The extreme weather affected approximately 88,000 NB Power customers. Many lost power more than once, and some as many as six times. At the peak of the storms, 54,000 people were without power at the same time.

The December storms impacted more customers than the most severe weather event in recent history, the ice storm of 1998, which at its peak knocked out power to 28,000 customers.

At the peak of restoration, approximately 262 crews were in the field working to clear ice-laden trees from lines and reconnect customers. Crews responded to approximately 4,500 incidents including outages and other service-related issues.

In total, more than 600 employees worked throughout the holiday period, including about 100 staff working behind the scenes to answer calls in the customer contact centre, manage logistics and schedules and coordinate restoration progress.

NB Power crews and contractors worked approximately 75,000 person hours throughout the storms to restore power without a single safety incident.

NB Power's generating facilities operated consistently and reliably during the storm period and the extreme cold snap that followed. In particular, the Point Lepreau Generating Station performed at 100 per cent net capacity factor in early January, when New Brunswick's energy demand reached peak levels.

The entire restoration process cost NB Power approximately \$12 million including estimated costs for a spring clean-up of debris. This figure includes nearly \$9M for contracted crews from within and outside N.B., and \$3 million in extra costs for utility crews and materials along with meals, travel, vehicles, and lodging.

4. AREAS OF FOCUS

4.1 Vegetation Management

New Brunswick is among the most heavily forested provinces in Canada and almost every power line has the potential to interact with trees.

New Brunswick's distribution system is made up of approximately 20,000 kilometres of power lines that carry electricity from substations to individual customers in homes and businesses throughout the province. NB Power requires clearance, known as right-of-ways or easements, around these power lines for the electricity to be delivered safely and reliably. Our goal is to remove trees that are in danger of encroaching on this required right-of-way, and usually this means clearing any tree or branches within 5 to 10 metres of a power line.

NB Power prunes and removes trees around the province on a cyclical schedule, while focusing on areas with historical evidence of tree contact with power lines. This work involves two vegetation management programs, with the greatest investment in preventative maintenance and the remainder going to customer requested vegetation management work.

The 2013/2014 ice storm had the most tree-related power outages in NB Power's history, marking the high (or low) point of what has been a series of escalating weather events since 2000, when the number, frequency and intensity of storms began to increase throughout eastern North America.

In the area of vegetation management for the distribution system, NB Power has divided its response to the storm outages into two categories, which include post-storm cleanup and future process and customer service improvements.

Post-storm cleanup

Due to the extraordinary impacts of these storms, NB Power is working with the hardest hit municipalities to assist with ground clean-up of trees and branches left behind by the winter restoration effort. Work began in early spring as part of NB Power's regular preventative maintenance program and has continued as municipal spring cleanup programs rolled out to residents. In limited cases, NB Power is assisting with clean up in areas where no formal municipal program exists.

Future process and customer service improvements

NB Power has enhanced its preventative maintenance program with the budget increased prior to the storm to \$5.8 million in 2014 (a \$1 million increase over the previous year), and further investments committed for 2015 onward.

We are piloting the use of LiDAR technology to more efficiently identify heavily forested “hot spot” areas with high potential to come into contact with power lines, and to assist in prioritizing cuts in these areas.

We are expanding our education and communications with customers with regard to how, why and when we prune and remove trees that have the potential to come into contact with power lines. This includes an enhanced website with safety, planting and pruning information for customers and a map of areas scheduled for tree maintenance in the 2014 season.

We are currently completing an in-depth review of our vegetation management processes to maximize efficiency and enhance our customer communications, with an eye to ensure proactive, timely, pre-notifications for customers living in areas scheduled for vegetation management.

4.2 Improved communications

NB Power’s communications response to this extraordinary event was based on the principles of transparency, availability, consistency and accountability. Communications and customer service staff provided real time updates through a variety of platforms including our website, traditional media and social media (Twitter), community outreach to Red Cross warming centres and community gathering places.

NB Power’s customer interaction centre responded to a record 33,000 customer calls during the 11 days, four times the normal call volume during that period. Our website received 506, 566 visits during the period, with 310,345 visits from a mobile device.

The value to customers of having immediate and up-to-date outage information available online was clear given the number of visits to our website during the storm period. NB Power has identified a need to provide more meaningful updates to outage information and the restoration process to allow customers to make informed decisions about their homes and families when the power is out.

We are working to improve functionality on our website’s outage management system with enhanced information and improvements to estimated times of power restoration. In addition, we are working to create a virtual storm centre page to provide customers with easy access to information on priorities in power restoration, storm preparedness, outage mapping functionality and restoration progress.

4.3 Emergency Preparedness Planning

NB Power employees responded quickly, efficiently and effectively to the challenges laid out by the repeated storms and response plans were available and executed well in many parts of the organization. As well, the presence of very experienced staff assisted in the successful response to the storm outages.

However the storm response identified an opportunity to update the Corporate Emergency Response Plan, with defined roles and responsibilities in the areas of safety, logistics, planning, communications and community relations for senior managers and executives.

This plan has now been updated and will be regularly exercised to ensure clear understanding of protocols for emergencies with clear connection points with municipalities, the Red Cross, the Province's Emergency Measures Organization, contractors and other organizations involved in emergency preparedness and response efforts

In addition, to better understand and mitigate climate change impacts, NB Power is a senior member of the Canadian Electricity Association's Climate Adaptation working group.



5 LESSONS LEARNED

Key Learning	Recommendation	Status of Response
Vegetation Management Power restoration effort left trees and branches down in hardest hit municipalities.	Work in partnership with affected municipalities to clean debris, and provide support for areas with no formal spring cleaning plan	Underway, with completion date expected August 2014
2013-2014 storm highlighted New Brunswick's vulnerability as the most heavily forested province in Canada with a high number of tree contacts with power lines in rural communities and hard-to-reach areas.	Piloting the use of LiDAR technology to more efficiently identify heavily forested "hot spot" areas with high potential to come into contact with power lines and prioritizing cuts in these areas. Increasing budget and reviewing vegetation management process and practices to maximize dollars invested.	Spring 2014 – Spring 2015
More customer education necessary to explain essential nature of vegetation maintenance programs at NB Power.	Improved website and public communication regarding tree maintenance programs (why, how, when and where) and recommendations to customers on "line friendly" vegetation Investments in improved customer communications and notification.	Spring and Summer 2014
Communications Some customers expressed frustration with functionality of the outage website due to provision of 'estimated' restoration times and lack of explanation of priority restoration process.	Provide improved customer information on estimated times of power restoration through improvements to our outage management system. Deploy outage mapping functionality	December 2015 October 2014
Opportunities for continuous improvement in customer communications and public information.	Provide better tools including website enhancements, face-to-face communications with municipalities, social and other media, to help customers understand how and why priorities are set in restoring power and increase broad communications on storm preparedness to customers.	Ongoing through improved communications planning, training and website enhancements planned for 2014.
Emergency Preparedness Improve alignment between NB Power and other agencies, and ensure roles and responsibilities of senior management team are defined and aligned in emergency situations.	Update the corporate emergency preparedness plan and ensure regular exercising of the revised plan. Improve emergency response efficiencies through process improvements to resource coordination including engaging cross-corporate resources.	Completed March 2014 Underway
Improve current understanding of impacts of climate change on NB Power infrastructure and possible mitigations	Participate in Canadian Electricity Association's Climate Adaptation working group to better understand and mitigate the impacts of climate change..	Underway