



Énergie NB Power

Ice Storm 2017

Lessons Learned

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Message from CEO

Dear Ms. Wagner,

I respectfully submit our review of NB Power's efforts to restore power during and after the most challenging weather event in NB Power's history.

Between January 24 and February 5, 2017, our employees and contractors restored electricity to thousands of New Brunswickers in southern and northeastern New Brunswick. The impact of this storm required a whole system response, including support from neighbouring utilities and cooperation from partner agencies and government.

Throughout this challenging time, we were reminded once again that New Brunswick is a province of caring and generous neighbours, leaders and helpers who look after one another in difficult times.

Our efforts to reconnect customers were supported by crews from utilities throughout the region. Contractors, provincial government departments working through the New Brunswick Emergency Measures Organization, the Canadian Armed Forces the Red Cross ensured our customers were warm, sheltered and fed while utility crews safely cleared roads from downed lines, rebuilt kilometres of lines and reset hundreds of poles damaged by heavy ice and high winds.

Under the caring, capable leadership of our Premier Brian Gallant, New Brunswickers were calm and secure while our crews focused on what they do best – restoring electricity to customers.

We applied lessons learned from previous years' storms to ensure our service to customers was rapid, effective and safe. I am confident that our restoration effort in 2017 was faster, more coordinated and better communicated thanks to learnings from previous events and our quick response to emergent issues.

During this storm, we also found opportunities to improve service to customers that are identified in this review. This includes improvements in customer communications, storm management and estimated times of restoration, grid resilience, customer safety and coordination with partner agencies.

As we always do, we will apply these improvements to future storm events to ensure New Brunswickers receive the quality of service they expect from NB Power.

Thank you,



Gaëtan Thomas, CEO

NB Power Mandate and Scope of Review

As a public utility, NB Power's legislated mandate is to provide safe, reliable electricity to New Brunswickers at low and stable rates. In the event of extended power outages, the utility's primary role is to provide for timely and safe restoration of electricity guided by a set of protocols that provide instructions to affected utility divisions to ensure a coordinated and efficient response.

This review is limited to NB Power's performance in its primary purpose of safely restoring electricity to customers during the ice storm of 2017 and its aftermath. The review of the restoration response is focused on the following key questions.

1. What did we learn from past storms that we used during this storm or continued to do during this storm (things that work well)?
2. How did we improve our restoration efforts as compared to other past storms (i.e. Post-Tropical Storm Arthur)?
3. What actions do we need to consider to further improve our efforts for future significant events?

This review includes input from a variety of sources including:

- March 2017 internal survey examining storm preparations, response and follow up
 - major areas included communications, operations, logistics and supply chain, environment, contact centre, safety and external relations
- Interviews with NB Power executive team members
- Customer feedback via email/phone/nbpower.com
- Participation in five public meetings in affected communities, which were sponsored by the Government of New Brunswick's Executive Council Office

Summary of Event

Between January 24 and 26 2017, prolonged freezing rain caused significant ice buildup on trees and utility infrastructure, resulting in widespread power outages throughout central, southeastern and northeastern New Brunswick. Miramichi, Kent County and the Acadian Peninsula regions were the hardest hit, experiencing multi-day outages and frigid temperatures. The last storm-related customer outage was restored at approximately 6:30 pm on Sunday, February 5.

This winter storm prompted the largest restoration effort in NB Power history, supported by a coordinated emergency response from the New Brunswick Emergency Measures Organization (NB EMO), the Canadian Red Cross and the Canadian Armed Forces. All available NB Power resources were dedicated to storm response. At peak, 380 tree, pole and line crews conducted damage assessment, made repairs to infrastructure, cleared blocked roads and restored power. A logistics team took care of crew lodging, meals and other items. Customer outreach teams including staff and senior leadership visited warming centres to update customers on restoration efforts and assisted Armed Forces members with door-to-door visits.

Storm-related customer outages peaked at approximately 133,000 on Wednesday, January 25. Heavy ice buildup on lines, poles and cross-arms caused more than 600 poles to collapse, primarily in the Acadian Peninsula. In Miramichi, the majority of outages were caused by heavy snow and ice on trees and utility infrastructure. In Kent County, the majority of outages were caused by ice-laden trees making contact with lines. Nearly 200,000 customers spread across a huge area of our province lost power during the storm.

NB Power and the Government of New Brunswick worked together to ensure that a fact-based, proactive, consistent and coordinated public communication approach was maintained throughout the event.

Premier Brian Gallant and NB Power President and CEO Gaëtan Thomas participated in daily media briefings in affected communities, with the majority carried live on CBC and Radio-Canada online. Public alerts were posted daily on the Government of New Brunswick newswire, with updates provided on nbpower.com, via social channels and to a dedicated outage restoration email list that included internal and external stakeholders. Additionally, NB EMO and NB Power personnel conducted dozens of daily media interviews and proactively circulated social media messaging and safety-related paid media ads on a variety of channels as part of the emergency response.

NB Power staff worked closely with NB EMO as members of the Provincial Emergency Action Committee to ensure efforts to support customers without power were aligned and managed consistently.

NB Power leadership mobilized to ensure staff presence at 23 community-based warming centres to ensure information was shared directly with customers who could not access the internet or traditional broadcast and print media.

The Canadian Armed Forces provided 222 members and 34 vehicles, NB EMO and the Red Cross coordinated support for warming centres and shelters, providing food, water, firewood and door-to-door checks on residents.

During the storm, four communities declared States of Local Emergency: Saint Marie-Saint Raphael, Le Goulet, Lameque, Tracadie-Sheila.

Unfortunately, suspected carbon monoxide poisoning caused the deaths of two people and hospitalization/treatment of up to 45 others due to unsafe use of generators and other alternative heating devices.

Review Areas of Focus

Customer Communications

NB Power communicates year round with customers about emergency preparedness and safety using a variety of methods and channels including paid ads across broadcast, online and print platforms, face-to-face events and using social media including @NB_Power and @Energie_NB on Twitter, which have more than 16,800 active followers combined and Facebook, with 13,500 followers. This effort ramps up in November of each year, when we conduct public information campaigns across multiple channels as part of our annual Storm Preparedness Week.

Actions prior to event

In November 2016, NB Power launched a multi-week safety-focused 'Be Prepared for Winter Storm Outages' advertising campaign that circulated online and on local radio stations throughout New Brunswick. The campaign highlighted the importance of having an emergency plan and emergency kit at home, safe use of generators and provided information on how to remain safe during weather-related outages.

In the days leading up to the January 2017 storm, NB Power shared essential storm preparation information across all customer channels (online, social media, local media outlets, customer information centre) and via our stakeholder email list prior to the storm's arrival. NB Power also provided frequent updates about the worsening weather, potential impacts of ice on power lines and utility infrastructure, and information about NB Power outage restoration priorities.

In addition, the team coordinated with communications staff at NB EMO and secured additional help from NB Power staff with communications experience from other areas of the utility to ensure a 24/7 response would be available in the event of an extended outage.

Actions during event

Throughout the storm event, NB Power used the same coordinated, multi-channel approach to communications that ensured a consistent message from NB Power regarding the utility response. This approach also allowed customers to circulate reliable and accurate information through their personal conversations and networks, and on their own channels including municipal Facebook sites, and Twitter accounts throughout the duration of the event. This helped ensure accurate media coverage and improve general understanding of the scope of the event and the scale of the response.

Understanding that customers affected by power outages are often offline, NB Power used all available means to reach customers with safety and restoration updates.

- Media relations, executive and field teams provided more than 150 interviews to journalists in French and English between January 24 and February 5, focusing on news outlets that reported directly to the most affected areas. NB Power CEO Gaëtan Thomas participated in daily media briefings with Premier Brian Gallant and NB EMO in affected areas.

- Our website saw a dramatic increase in traffic with no interruption or issues with service. Between January 25 and February 5 NB Power’s outage page had 1.3 million visits with an average of 111,000 visits per day. Daily visits peaked on January 25 at more than 400,000.
- Customer outreach team staffed all warming centres with printed packets of bilingual information to share with customers without access to restoration updates via online or other means. These updates were also shared with door-knocker teams to ensure customers visited at home received relevant information.
- Customer outreach was performed by the Customer Care team to contact customers to provide updates on estimated times of restoration and thank them for their patience.
- Regular and targeted communication to municipalities and Local Service Districts in the affected areas on completed restoration efforts.
- Ads were purchased on radio and on ‘Tims TV’ in Tim Horton’s outlets throughout Miramichi, Kent County and the Acadian Peninsula to share emergency safety and restoration information.
- Essential safety and restoration information was updated at minimum twice daily and shared across all customer channels (online, social media, local media outlets, customer information centre, internal employees) and via our stakeholder email list.

Actions after event

After the last customer was connected on February 5, NB Power immediately launched two information campaigns to thank customers for their kindness to crews during the restoration effort and to advise customers that some bills would be estimated as a result of damage to meters. Two storm warnings immediately followed the outages, and emergency storm preparedness information was shared across all channels for each forecast event.

Lessons learned from previous events

NB Power developed a coordinated, comprehensive approach to sharing emergency public information during the ice storm of 2013 that was refined and improved to include alignment with partner agencies following post-Tropical Storm Arthur in 2014. Our annual preparedness campaigns, along with enhancements to NB Power’s online outage map and outage information centre also followed these events, including improved information on safe installation and use of generators, tree cleanup near downed lines and emergency preparedness at home.

Storm Management and Estimated Times of Restoration (ETRs)

During unplanned outages, NB Power’s goal is to restore electricity as safely and quickly as possible for customers. While crews and operators locate and repair the outage, NB Power provides customers with an estimate of when they can expect electricity to be restored. NB Power doesn’t immediately know when customers lose power. The utility relies on customer outage reports to the website or call centre, and based on those reports dispatches crews to locate, assess and repair the outage. In some simple cases, crews can restore power sooner than estimated. However during severe weather events, the cause of the outage may be difficult to locate or access or the cause may be related to several problems,

so repairs and reconnections can take longer. During major storms, crews must wait until roads are safe before travelling to affected areas to assess damage and begin repairs.

In responding to these events, NB Power relies on the services of 12 operating centres that are strategically located in various parts of the province. These operating centres are responsible for planning, maintaining and repairing utility infrastructure in their respective areas, with support provided as needed from other relevant NB Power divisions.

Actions prior to event

On Monday January 23, NB Power anticipated the need for crews based on weather forecasts. Contracted crews were secured and moved to areas expected to be affected by incoming weather. Sixty contractor crews were secured and dispatched to Woodstock, St. Stephen, Fredericton and Tracadie on Tuesday, January 24. NB Power secured additional crews on Wednesday, January 25 in Miramichi, Tracadie, Bouctouche and Moncton, and opened eight local command centres to ensure community-based assessment and response capacity. These local command centres were located in Bouctouche, Miramichi, Tracadie, Fredericton, St. Stephen, Woodstock, Moncton and Sussex.

Actions during event

The ice storm hit first on Tuesday, January 24 in southern New Brunswick, becoming stronger with more freezing rain, ice pellets and stronger winds as it swung east and north during the next 72 hours.

Crews in the south spent January 24 and 25 assessing damage and making repairs as the storm moved, attempting to assess damage in northern areas where possible as roads were mostly impassable and the storm was continuing.

According to NB Power protocol during extreme weather events, on January 24 NB Power activated 'storm mode' on its website, turning off auto-generated ETRs and sharing a bilingual message that crews would begin assessing damage as soon as it was safe to do so. On Wednesday, customers were provided with broad estimates of when power would be restored to provide a general idea of crew progress in affected communities. These ETRs were updated again in the days that followed, with most of the targets met or exceeded in southern New Brunswick where assessments and repairs were completed.

The morning of Wednesday January 25, NB Power declared a Level 3 Emergency and formally activated its Emergency Storm Response Protocol, which included activating the Executive Emergency Response plan to ensure clear communication about storm impacts and direction from NB Power leadership.

By Thursday, January 26, significant amounts of freezing rain and ice pellets were continuing in northern New Brunswick with the storm continuing late into the evening. Despite progress on restoring power to customers, more outages were occurring due to the ongoing poor weather. This includes two transmission outages affecting customers in the southeast. Crews were focused on restoring customers in the south where the storm had mostly passed, and assessing ongoing damage in the north where possible as the roads were unsafe and the storm was ongoing. However, extreme poor weather

grounded many crews and prevented air patrols of damaged transmission lines as the helicopter was unable to fly due to safety concerns.

On Friday, January 27, active assessment and restoration was underway by more than 300 crews in eight regions, with a cross-functional team dispatched to Tracadie to handle logistical support, and extra agents added to our customers information centre to handle additional call volumes.

In addition, senior leaders including members of the executive team, the CEO, and bilingual customer outreach staff moved to affected areas to work directly with customers in warming centres and local municipal leaders, providing face-to-face restoration information for those without internet, radio or television, and reassurance that the storm response was being managed effectively.

Based on experience with previous storms, knowledge of the grid and available crews, NB Power set and communicated broad restoration targets for the Acadian Peninsula prior to completing full assessments that included percentages of customers that could expect to be restored by a certain date. Once crews were able to safely access affected communities, specifically in northern coastal areas, the extent of the damage was apparent and restoration targets were immediately adjusted and communicated publicly.

Through the weekend, crew numbers increased to 344, with 190 crews focused on Miramichi and the Acadian Peninsula. As crews finished work in the south, they were relocated to northern communities to join efforts to assess damage and restore power.

Crews were working in very challenging conditions, having to 'cut their way' into roads and streets due to many downed lines and poles. Crews were diverted from restoration efforts to clear more than two dozen roads in peninsula communities to allow emergency vehicles and local traffic to move

Damage assessments revealed hundreds of broken poles and other damaged infrastructure, including cross-arms, transformers, switches and downed wires. Additionally, new outages were caused by utility equipment collapsing under the weight of heavy ice days after the storm passed.

Assessments revealed heavy ice buildup on trees, poles and lines of between 50-100 millimetres – four times beyond Canadian Standards Association design requirements.

In Kent County, fallen trees and extreme conditions in the woods and on rural roads continued to slow restoration progress.

While the initial storm event had ended, ongoing poor weather hampered crew progress, as high winds, whiteouts and freezing temperatures slowed and sometimes prevented crews from making repairs throughout the weekend and early in the week.

By Monday, January 30, improving weather and working conditions allowed crews to reconnect large sections of line. Crews numbers peaked at 380, with the vast majority focused on the Acadian Peninsula, restoring power, clearing roads and driveways made impassable by fallen poles, wires and other debris.

Despite this, NB Power continued to meet or exceed targets as the restoration effort continued, and customers were kept up to date on progress until the final customer was restored on February 5.

Actions after the event

Several utility crews remained in affected areas in the week following the storm, cleaning up debris, securing infrastructure and ensuring necessary environmental checks were complete.

Lessons learned from previous events

NB Power's online outage map and storm centre was created with enhanced functionality and more customer-facing features following post-tropical Storm Arthur in 2014.

To speed the storm management and restoration process, NB Power applied a number of lessons learned from previous events. Following the ice storm of 2013, NB Power created a cross-functional logistics team that is trained and ready to deploy to handle crew lodging, meals, laundry, billing and invoices and other necessities, allowing field operations supervisors to focus on restoring power. Other time-saving learnings from previous events include fueling trucks centrally or in the field, delivering meals to crews, streamlining permitting process and having dedicated 'bird dog' assessment teams to locate outages and determine first-pass repair requirements. With every event, NB Power teams find more logistical efficiencies to allow for greater focus on power restoration in the field.

This focus on accommodating crews in the field during what would under other circumstances be meal time, travel time or rest breaks, supervisory or other services, caused some customers to believe NB Power was not coordinating efforts efficiently to restore power. In fact, bringing services to crews in the field allowed for a faster response and more efficient restoration effort. Crews reported gaining up to four additional hours of productivity per day as a result of this approach.

In addition, NB Power has much improved coordination and cooperation with NB EMO resulting from learnings from previous storm events. This includes efforts to streamline inter-agency communication in a number of areas including but not limited to; identifying and supporting vulnerable or priority customers, ensuring safe access to roads and infrastructure and sharing essential restoration information with first responders and other relevant parties.

Finally, as part of a utility-wide modernization project, NB Power expects to propose investments in advanced metering infrastructure, including smart meters, with the potential to help crews locate and diagnose outages more quickly during storm and other events. Advanced metering has the potential to communicate outage locations and customer status automatically in certain circumstances, without requiring the customer to report via the website or call centre.

Grid Resilience during Extreme Weather Events

Grid infrastructure in New Brunswick is built to Canadian Standards Association (CSA) design specification for our winter climate. The CSA standard classifies the entire Province of New Brunswick as a 'heavy loading' zone, requiring NB Power to design infrastructure for a minimum of 12.5 mm of radial ice. The CSA's most rigorous rating of 'severe' requires a utility to design for a minimum of 19 mm. As

mentioned in the previous section, extreme ice loading from the January 2017 event on the Acadian Peninsula caused buildup of between 50 and 100 millimetres on trees and equipment.

In recent years, storms throughout North America have intensified – bringing more damaging winds and precipitation – with greater effects on infrastructure including the power grid. We are working with our colleagues in the Canadian Electricity Association, the Canadian Standards Association, the New Brunswick Energy and Utilities Board and other organizations to ensure our industry can adapt and mitigate to manage the impacts of these extreme weather events.

Actions prior to event

Throughout New Brunswick, power poles in NB Power’s distribution system are inspected every two to five years and transmission poles are air patrolled twice annually and ground patrolled every four to eight years. All power poles are built to last approximately 55-60 years once installed in the ground. Annually, NB Power installs between 6,000 and 8,000 poles in all parts of the province, along with routine preventative maintenance and capital investments to ensure resiliency of the system.

As a member of the Northeast Power Coordinating Council, NB Power is responsible for reliable operation of the Maritimes Area with oversight over transmission lines and interconnections serving the United States, Quebec, Prince Edward Island and Nova Scotia. As such, NB Power is bound by industry-wide reliability standards overseen by regulators to ensure a robust and resilient power grid in all parts of the province, with equal rigour applied to all geographic locations and communities.

Actions during the event

NB Power crews worked quickly and safely to replace all damaged equipment to facilitate immediate restoration of service to customers. NB Power infrastructure damage during this event was limited to 614 broken poles, 189 replaced transformers and 52 kilometres of wires replaced, mostly in the extreme northeast of the province, where ice buildup was heaviest and winds strongest. Outages in Miramichi were caused mostly by heavy snow and ice on trees and infrastructure while Kent County experienced outages due to heavy ice on trees making contact with lines, mostly located outside NB Power right of ways.

Actions after the event

NB Power conducted an internal audit of a sample (169) of the damaged equipment, which revealed heavy ice and strong winds as the cause of breakage with very little pre-existing signs of deterioration of poles or crossarms. This result was validated by a random check of poles by a Nova Scotia Power storm restoration expert.

Lessons learned from previous events

Extreme weather events of 2013-2014 highlighted New Brunswick’s vulnerability as one of the most heavily forested provinces in Canada, with outages in those events caused by tree contact with lines. Since those events, NB Power has increased budget and effort for tree trimming and cutting, including

stepping up customer communications to reinforce the need for vegetation management and notifications. This effort is beginning to demonstrate progress with fewer tree-related outages since 2014.

Customer Safety

Actions prior to event

NB Power maintains a robust year-round public safety campaign on multiple channels on a variety of subjects. In the fall and winter, the focus shifts to ensuring customer safety before, during and after power outages at home and work. This includes safety tips about staying clear of downed lines, the importance of having an emergency plan at home with an emergency kit along with how to buy, install and use a generator safely.

Actions during event

During the January ice storm, safety information was shared across all customer channels, using online, phone, face-to-face, media and paid advertisements. Safety messages were shared at every opportunity to ensure broad understanding of the need to stay clear of utility infrastructure on the ground, to properly install and ventilate generators and to stay away from downed trees that may be in contact with lines that are energized. These safety messages were shared by all NB Power staff at every opportunity including the CEO, media relations, customer outreach, field operations and safety teams in the field.

Field crews were in close contact with communications at all times, allowing for hourly turnaround on sharing safety-related information publicly. For example, when customers began salvaging chemically-treated power poles for their own use, NB Power quickly shared advice that they should not be burned as firewood for safety reasons. This information was communicated widely on a variety of channels including social media, news media and on the NB EMO's public advisory.

During the ice storm, no customer safety incidents occurred related to contact with energized equipment. Unfortunately despite best efforts, safety incidents occurred due to carbon monoxide poisoning related to improper use of generators and barbeques.

Actions after event

NB Power continued sharing safety related information through all customer-facing channels and platforms. Weather forecasts during the week of February 5 called for two more potentially damaging storm events, and NB Power used all available channels to share safety information and ensure customers were aware of the possibility for more extreme weather. This included safety-focused radio advertisements and a public alert produced cooperatively with NB EMO.

Learnings from previous events

Following storm events of 2013 and 2014, NB Power enhanced public information on generator safety on its website and through preparedness campaigns. In 2014 and 2015, NB Power partnered with NB EMO to host a series of safety focused outreach efforts during our fall Storm Preparedness Week, including a media event, customer information sessions, refreshed web content, interactive social media campaign, and internal NBP/NB EMO capacity building workshop to ensure alignment of efforts.

Action Items

Key learning and observation	Recommended Action	Timeline
Efforts to reach all customers with preparedness restoration and safety information were not always effective for a variety of reasons.	Greater emphasis and outreach with pre-season preparedness and safety campaign in rural communities, coordinated with local leaders, first responders and NB EMO to ensure customers are informed and prepared prior to storm season.	November 2017
Customers concerned about NB Power's restoration priorities were left wondering why some are reconnected while others have to wait.	Simplify customer restoration updates with greater emphasis on visuals and photographs that explain sequence of events to restore power. Create simple handouts for field staff with visual explanations of a variety of circumstances that occur during extended power outages and the role of customers. (ie: repairing broken masts, unplugging major appliances in the home, disconnecting breakers.)	November 2017
Despite extraordinary efforts to reach customers with essential information via online, in-person and media channels, we could not reach all customers at all times.	Consider working with NB EMO to create a dedicated emergency broadcast station to provide essential information to New Brunswickers in times of crisis	Timing to be determined in consultation with NB EMO
Some customers were unsatisfied with the lack of certainty on estimated restoration times (ETRs), especially in Acadian Peninsula where targets were adjusted and delayed based on actual assessments.	Review NB Power assessment process to provide more accurate estimated restoration times and better upfront data. Ensure NB Power assessors are equipped with appropriate tools to conduct their work and communicate requirements. As part of a utility-wide modernization project, NB Power expects to propose investments in advanced metering infrastructure, including smart meters, with the potential to help crews locate and diagnose outages more quickly during storm and other events. Advanced metering has the potential to communicate outage locations and customer status automatically in certain circumstances, without requiring the customer to report via the website or call centre.	November 2017 November 2017 Pending board and regulatory approval, rollout complete anticipated by end 2020 (~ 3 years implementation)

Key learning and observation	Recommended Action	Timeline
<p>Leaving crews in the field for majority of effort created mistaken impression among some customers that restoration was not being coordinated effectively when in fact bringing services to crews allowed for a faster response and more efficient response.</p>	<p>Review how assessment efforts/ storm management and crew movements are communicated to customers to facilitate understanding of work flow.</p>	<p>Ongoing (part of continuous improvement process)</p>
<p>Despite being built to design standards able to withstand extreme winter weather and ice loading, some infrastructure was not able to withstand the intensity of this storm, particularly in northern coastal areas.</p>	<p>Work underway to review standards with CSA to determine alternative methods of building greater resilience into the grid in areas vulnerable to extreme weather impacts.</p> <p>Implementation underway of Engineering Standards to guide decision-making on the application of specific design standards to storm-harden infrastructure in areas prone to more severe weather. This will result in reinforcing infrastructure in vulnerable areas, such as along the northeastern coastline.</p>	<p>Improvements beginning in Fall 2017</p>
<p>Coordination of storm response with partner agencies including NB EMO, Red Cross and Canadian Armed Forces was a complex effort given the historic impact of this mid-winter storm on customers and the grid.</p>	<p>Review storm effort with a goal of clarifying roles and responsibilities with partner agencies to ensure efficient and effective response to future storms.</p>	<p>Timing and actions to be determined in consultation with NB EMO and partner agencies.</p>

APPENDIX A

Timeline: NB Power actions during Ice storm 2017

Weekend January 20-22, 2017

- Weather reports began circulating within NB Power senior staff and meteorologists calling for a low pressure system bringing snow, rain and ice pellets to New Brunswick the following Tuesday and Wednesday. This prompts internal discussions to ensure adequate resources are secured ahead of the storm's arrival.

Monday, January 23, 2017

- Approximately 10:30 am, Storm Management Group notifies support staff and executive team of plans to stage 60 contractor crews in various areas and open the Storm Room starting early the next morning (January 24). The North Atlantic Mutual Assistance Group advises a United States utility is looking for 175 line crews and 75 tree crews and NB Power advised we have no crews available for assistance as we are preparing for impending storm.

Tuesday, January 24, 2017

- Storm begins to impact the southwest in the afternoon with messy weather escalating in the Fredericton and Sussex areas around 5:00 pm.
- Contractor crews staged to Woodstock, St. Stephen and Fredericton before noon. Additional crews sent to Tracadie by 4:30 pm.
- NB Power Communication group shares storm preparedness information on Twitter, with local media outlets and to the NB Power Customer Information Centre. Tweets about crew numbers are retweeted 35 times.
- NB EMO activates Provincial Emergency Operations Centre to Level 1 (Enhanced Monitoring), to monitor a "Winter Storm" weather event affecting all regions in New Brunswick.
- Most schools in southern NB cancelled due to weather.

Wednesday, January 25, 2017

- The storm travels from southwest to southeast before moving toward Northeast beginning to impact the Acadian Peninsula early January 25.
- By 10:30 a.m. outages totaled 1249 leaving more than 133,000 customers without power. NB Power declares Level 3 Emergency and activates Emergency Storm Response Protocol.
- Additional crews are hired for Miramichi, Tracadie, Sussex, Bouctouche and Moncton. Contractor and NB Power crews total 206 in northeastern and southeastern NB. NB Power opens 8 local command centres in affected communities.
- NB EMO Operations team are actively monitoring event. Provincial Emergency Action Committee Level 2 (Partial Activation) Provincial Emergency Action Committee members asked

to report to the Provincial Emergency Operations Centre. Active communications underway between NB Power, Justice and Public Safety/NB EMO and leadership.

- Corporate Communications circulates storm-related information updates on Twitter, to local media outlets and to the NB Power customer information centre. Storm-related information updates are also provided to NB EMO for public circulation.
- Broad restoration targets for customers affected by outages are set as follows:
 - Approximately 90 per cent of customers expected to have power restored by end of day January 25 in Rothesay, Bathurst, Eel River, St. Stephen, and Woodstock.
 - Approximately 50 per cent of customers restored by the end of day January 26 in Sussex, Shediac, Bouctouche, Sackville, Miramichi.
 - Approximately 95 per cent of customers restored by end of day January 26 in Fredericton.

Thursday, January 26, 2017

- Significant amounts of freezing rain and ice pellets still falling in northern New Brunswick. The storm continues in the Bathurst area until approximately 10 pm.
- By 9:10 am outage incidents are 1977 impacting 85,845 customers as the worst of the storm hit including two transmission outages that affected a large number of customers in the Southeast. Despite progress in restoring, more outages are occurring due to ongoing weather.
- Crews mostly restoring/reconnecting in south where storm has passed and assessing damage in the north where possible as roads were too dangerous to travel and storm was ongoing. Damage assessment hampered by ongoing poor weather conditions. Helicopter grounded from line patrols due to dangerous winds and freezing rain/ice pellets.
- Proactive communications ongoing, coordination through NB Power, NB EMO, GNB communications and executive leadership team on critical issues continuing through daily meetings throughout storm event.

Friday, January 27, 2017

- Active assessment and restoration underway by more than 300 crews in 8 regions. Additional support is dispatched to handle logistical support with extra agents added to customer information centre to handle additional call volumes.
- As of 2:10 pm, 2389 outages are spread across the province affecting 57,904 customers.
- Crews are assessing damage in the Miramichi Region and in the Acadian Peninsula given the significant impact of the storm there.
- Assessments reveal heavy build-up of ice on trees, poles and our lines between 50 and 100 millimetres on some equipment – beyond CSA design requirements by a factor of four.
- All substations and transmission lines affected by storm are restored with exception of lines feeding Shippagan and Lameque substations due to an off-road machine getting stuck in frozen peat bog.
- Power is restored to hospitals in Tracadie and Caraquet and other critical infrastructures such as gas stations and grocery stores.

- Generator moved to the Inkerman Community Centre to serve as a regional reception centre.
- Broad restoration targets for end of day are set as follows:
 - Moncton, Bouctouche, Sackville, Shediac, Sussex: 99 per cent restored
 - Miramichi: 85 per cent restored
 - Tracadie: 65 per cent restored

Saturday, January 28, 2017

- Crew numbers increase to 344 with 190 crews in the Acadian Peninsula and Miramichi areas.
- All transmission lines repaired and Shippagan and Lameque substations restored as well as Lameque hospital.
- As of 1:10 pm, 2,374 outages are spread across the province affecting approximately 43,000 customers.
- Crews working in some very challenging conditions, including removing trees and debris from lines and roads, and high winds along the Northumberland shore. Crews having to 'cut their way' into roads due to downed lines and poles.
- Equipment and logistical support is moved to Tracadie to support restoration efforts.
- Restoration progress for regions continues to fluctuate due to continuing outages related to ice build-up on equipment and ongoing damage assessments that reveal greater damage to infrastructure than previously understood.

Sunday, January 29, 2017

- Crew numbers increase to 360 with 244 focused on Miramichi/Kent/Acadian Peninsula.
- At 11:10 am, 2083 outages, affecting 32,154 customers.
- Damage assessments reveal approximately 350 broken poles and other damaged infrastructure, including cross arms, transformers, switches and downed wires.
- New outages due to the weight of the ice load also continue to be reported including outages affecting largely the Acadian Peninsula. In Kent County, fallen trees and extreme conditions in the woods and on rural roads continue to impact progress.
- Canadian Armed Forces personnel deployed to Acadian Peninsula to assist with storm effort
- Ice has coated many pieces of critical system infrastructure so thickly that crews been forced to significantly increase their workload to better address each individual outage – thus adding more time to each job.
- Broad restoration times are set as follows:
 - Acadian Peninsula: 60 per cent restored by end of day January 30.
 - Miramichi: 85 per cent by end of day January 29.
 - Kent County: 85 per cent by end of day January 29.

Monday, January 30, 2017

- Crew numbers are 380, with 143 serving the Acadian Peninsula.
- Approximately 21,000 customers are without power provincially, with about 15,000 in the Acadian Peninsula.
- Improving weather, working conditions and efforts to connect large sections of line are improving restoration efforts as crews continue to make good progress.
- Drawing on our close working relationship with Nova Scotia Power, a storm expert with disaster restoration experience supports restoration efforts in Tracadie.

Tuesday, January 31, 2017

- At 7:30 am approximately 14,200 customers are without power, the majority of those in the hardest hit area of the Acadian Peninsula.
- Crews total 380 with the vast majority of efforts focused in the Acadian Peninsula. As crews finish one area, they move to the next outage and continue working to repair and restore power.
- We continue to make good progress clearing roads and driveways made impassable by downed poles and wires and other debris. Our road-clearing teams have ensured safe passage for fire and emergency vehicles on 22 formerly blocked roads throughout the peninsula. They are also increasing safe access to travel routes for residents and regular traffic in areas affected by the storm.
- Broad restoration target set at 70 per cent of customers restored in the Acadian Peninsula by Tuesday evening

Wednesday, February 1, 2017

At 7:30 am, approximately 8,000 customers without power.

- Crews total 380, with growing numbers focusing on the Acadian Peninsula as other areas are reconnected.
- Broad restoration targets are set as follows for Wednesday evening:
 - 75 per cent of customers restored in the Acadian Peninsula,
 - 98 per cent in Miramichi
 - 93 per cent restored in the Kent County areas.

In Moncton, less than one per cent of customers affected by the storm remain without power. These are customers who have damage to their masts that must be repaired before we can reconnect, or remote or seasonal properties.

Thursday, February 2, 2017

- At 8:30 a.m., fewer than 5,000 customers remain without power, mostly in Acadian Peninsula.
- Crews total 365 on the ground in affected areas (some vegetation crews relieved as they were no longer required).
- Broad restoration targets are set as follows for Thursday evening:
 - Up to 85 per cent of customers restored in the Acadian Peninsula
 - 99 per cent of customers in Miramichi and Kent County

Friday, February 3, 2017

- At 4:00 pm 2759 customers without power in the Acadian Peninsula.
- Crews total 314.
- Restoration target set at 90 per cent of customers in the Acadian Peninsula restored by Friday evening and the vast majority of customers by the end of the weekend.

Saturday, February 4, 2017

- At 10:00 am, approximately 1400 customers were still without power with 303 crews on the ground
- Target set for 99 per cent restored by end of the weekend.

Sunday, February 5, 2017

- At 11:00 am, fewer than 300 customers were without power as a result of the storm.
- Achieved 99 per cent restored target Saturday night.
- Last storm-affected customer reconnected at approximately 6:30 pm.

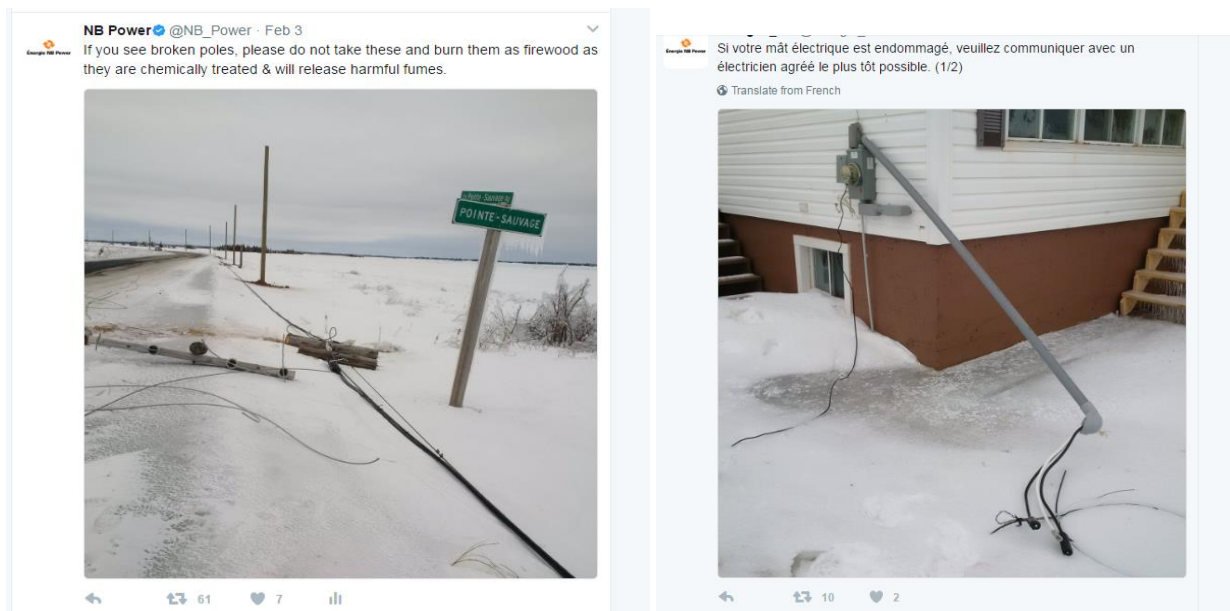
APPENDIX B

Communications Case Study: Social Media during #Ice Storm 2017

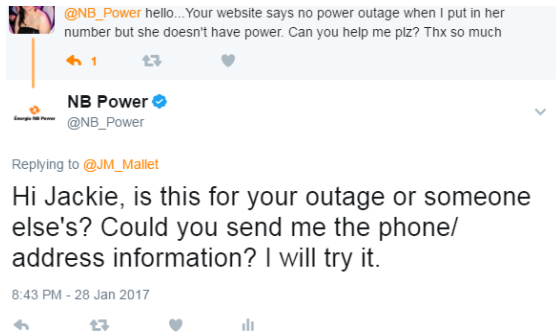
From the time the storm hit and customers began to lose power on January 24, until the final customers were restored on February 5, there were approximately 8,800 mentions of NB Power and the ice storm on Twitter, with an average of approximately 600 a day at the height of the storm. These are both direct (tagging the NB_Power or Energie_NB handles) and indirect mentions through hashtags and search terms. We had substantial reach through sharing of our updates through retweets. While we did interact with customers on an individual basis, the greatest social engagement during this period came through retweets to get important updates shared through communities (60 per cent of total engagement.)

How we engaged

Shared key updates through our Twitter account including, safety and preparedness information, estimated restoration times, press conference updates, safety messages including the photos below starting on Monday, January 23.



Twitter was also used for fielding and escalating customer issues/concerns around restoration times, safety issues and other help (those with failing generators as an example.)



When dealing with these customer issues, social media managers used empathetic, helpful tone when talking with customers to let them know we were there for them and to be careful to not escalate or worsen the feelings of the situation as many were understandably frustrated.

Photos from the ground in affected areas were also updated to our Flickr page and shared individually on our Twitter account to help paint the picture of the damage and progress in areas hardest hit by the storm. This was helpful for showing the complexity of the work required to be completed in order to get everyone back online.



End of the storm

As the final customers were being restored, we shared a guide of important resources on our NB Power blog that included details about warming centres, safety notices as well as the financial assistance programs in place through the Red Cross and the Government of New Brunswick on our blog. Once all customers were restored, we updated this post to include information regarding billing that may be affected as a result of the storm damage. We had 266 link clicks to this blog post through shares on social media and website traffic.

Once all customers were restored we prepared targeted bilingual Facebook ads that linked to another blog post with a thank you message from our President and CEO Gaëtan Thomas. This was shared with the communities who were affected most by the ice storm. We understood the unique and difficult circumstances our customers went through during this storm and its aftermath and wanted to let them know we appreciated their support and patience and the kind gestures they showed to our line crews on a daily basis. This Facebook ad was shared 141 times, received 25 comments (positive overall sentiment) and 739 reactions (likes) from customers in the targeted areas (Moncton, Kent County and Acadian Peninsula.)