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# **Nova Scotia Utility and Review Board**

**IN THE MATTER OF** *The Public Utilities Act*, R.S.N.S. 1989, c.380, as  
amended

## **Nova Scotia Power 2022 Annual Performance Standards Report**

**March 16, 2023**

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**1.0 INTRODUCTION**

The *Electricity Plan Implementation (2015) Act* (EPIA) introduced the requirement for the Nova Scotia Utility and Review Board (NSUARB) to establish performance standards for Nova Scotia Power Incorporated (NS Power) in the areas of customer service, reliability, and response to adverse weather conditions and sections 52A to 52F of the *Public Utilities Act* (PUA) set out the framework for the standards. In 2016, the NSUARB initiated a process and engaged London Economics International LLC (LEI) to assist in the development of those standards. At the conclusion of the process, the NSUARB approved 13 performance standards which were in effect for the period 2017-2021.<sup>1</sup>

The NSUARB began a review of the standards in 2021 for the 2022-2026 period. On February 22, 2022 the Board issued its decision regarding the review process and the Board issued its order updating the Performance Standards for the 2022-2026 period on April 07, 2022.<sup>2</sup>

In its order approving those standards, the NSUARB directed NS Power to provide an annual report summarizing the year-to-date results of the performance standards and file a report within 90 days of December 31 of the preceding year, containing the following information:

- A comparison of performance targets and actual performance results;
- Detailed summary of all Major Event Days (MED) and Extreme Event Days (EED) during the year outlining the following:
  - (i) SAIFI and SAIDI during the event;
  - (ii) Restoration profile;
  - (iii) Restoration challenges;
  - (iv) Customer service results;

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<sup>1</sup> M07387, NS Power Performance Standards, NSUARB Order, December 20, 2016.

<sup>2</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, incorporating by reference the description of required components of the annual report from the December 2016 Order.

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- (v) Crew Information; and
- (vi) Media Releases;
- Details regarding the duration and frequency of all system and circuit planned outages; and
- Revised performance targets for the next ensuing year, and their derivation.<sup>3</sup>
- To report on the progress of the development of customer-level reliability data through the ADMS system in the 2022 Performance Standards Report, including any other available information from other CEA utilities on this topic; and
- To monitor related emerging technologies and to report on updates to the ETR processes in its further annual reports.<sup>4</sup>

This report provides NS Power's 2022 Performance Standards results as well as the proposed performance targets for 2023. In addition to this report, NS Power provided updates on its performance through quarterly reports throughout 2022 on the Company's website (<https://www.nspower.ca/about-us/performance-standards>). NS Power welcomes Performance Standards as part of the strong regulatory oversight of the business. Performance Standards provide the transparency and accountability that customers deserve. NS Power is focused on meeting and exceeding the standards.

Nova Scotians experienced more severe event days in 2022 than any other year on record since at least 2003 with 28 total days (9 Significant Event Days – SEDs, 16 Major Event Days – MEDs, and 3 Extreme Event Days – EEDs). NS Power operated the Emergency Operations Centre (EOC) for 24 hours a day for 43 days in total in 2022. Put another way,

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<sup>3</sup> M07387, NS Power Performance Standards, NSUARB Order, December 20, 2016.

<sup>4</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022.

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1 the EOC was open for 12 percent of the year in 2022. This response far exceeds any other  
2 year on record.

3 Of particular significance was the impact of Hurricane Fiona in the fall of 2022. NS  
4 Power's field resources were fully engaged in restoration activities from when Hurricane  
5 Fiona made landfall on September 23, 2022 to when the last customer was restored on  
6 October 10, 2022. NS Power worked closely with the Nova Scotia Emergency  
7 Management Office (EMO) to ensure power was restored to critical services and  
8 infrastructure such as hospitals and care homes, cell sites, water pumping and treatment  
9 stations, and emergency communications stations in the first days following Fiona's  
10 landfall and destruction. Although it is appropriate to prioritize restoration to this  
11 infrastructure, additional focus on these individual locations impacted overall outage  
12 restoration pace. In the weeks following Hurricane Fiona, crews were engaged in feeder  
13 sweeps and associated clean-up activities associated with thousands of weak and  
14 compromised trees and equipment resulting from the damage caused by Hurricane Fiona's  
15 extreme winds. After the Hurricane Fiona restoration was complete, these crews removed  
16 over 10,000 hurricane-weakened trees.

17 The impact of Hurricane Fiona and the eight other major storm events in 2022 lasted well  
18 beyond when the power was restored in each case. NS Power's system infrastructure and  
19 surrounding trees were weakened by the extreme winds and precipitation. NS Power  
20 proactively removed at-risk trees from over 4,500 locations and continued with feeder  
21 sweeps to identify weakened infrastructure into 2023. Despite this proactive work, the  
22 system remained vulnerable to stormy weather in the weeks and months after the initial  
23 damage from Hurricane Fiona and other major events was restored.

24 Due to population growth and increased electrification (eg. heat pump adoption, upgraded  
25 home electrical service size, adoption of electric vehicles), work requested by customers  
26 has also increased in 2022 with volumes showing a 26 percent increase in hours of work  
27 over 2019 levels. Customer-requested work includes items such as renovation  
28 connections/disconnections, new homes and building connections, and requests for line

1 extensions. In 2022, responding to the continued growth in work volume was further  
2 challenged by the number of days that field resources were engaged in storm response and  
3 restoration activities. The major winter storms at the beginning of the year and Hurricane  
4 Fiona in September resulted in a total of over 40 days of storm response in 2023. The  
5 ongoing impact of the COVID-19 pandemic throughout the winter and spring also  
6 continued to affect field resource availability in 2022. In 2023 NS Power is committed to  
7 adding additional field resources to address the continued growth of customer work. These  
8 additional field resources will contribute to NS Power's ability to meet the demand of both  
9 customer service requests and overall reliability response, including planned reliability  
10 work.

11 NS Power has committed an average annual investment in the transmission and distribution  
12 (T&D) system over the 2022 to 2023 period of approximately \$218.5 million (per year).  
13 This is based on actual investment in 2022 and forecast investment for 2023. This  
14 represents an increased average annual investment over the 2016-2021 period (\$179.7  
15 million), which further represented a 51 percent increase over the average annual  
16 investment in the T&D system in the 2010-2015 period (\$118.9 million). Proposed  
17 investment in 2022 and 2023 represents an 85 percent increase over the 2010-2015 period.  
18 This shows a clear trend of increasing investment in reliability and the overall transmission  
19 and distribution system. NS Power is committed to investing in reliability to build  
20 resiliency in the power system and storm harden lines as severe weather continues to trend  
21 in the direction of more frequent and severe events throughout the province.

22 The 2022 Performance Standards and NS Power's year-end results are summarized in  
23 **Figure 1** and **Figure 2** below. The results by category are included as **Appendix M**.



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1 **Figure 1 – 2022 Performance Standards Met**

Category	Standard	Target	2022 Result
<b>Reliability</b>	CKAIDI	19.81	Feeder 2C-402: 16.79
			Feeder 100C-421: 10.16
			Feeder 24C-442: 7.08
			Feeder 77V-401: 4.71
			Feeder 67C-411: 5.38
	CKAIFI	5.45	Feeder 2C-402: 4.80
			Feeder 24C-442: 3.69
			Feeder 59C-402: 2.58
<b>Customer Service Response</b>	Regular Business Call Answer Rate	A minimum of 70% of calls shall be answered within 30 seconds at NS Power's Customer Care Centre.	71.08%
	Percentage of Bills Estimated	≤2.0	0.7%
	Customer Notification of Outages	Notify all customers of an outage as soon as NS Power has knowledge of an outage event.	Target Met
	New Service Connection Times	Service Installation No Pole: ≤ 3.0 days.	2.98 days

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Category	Standard	Target	2022 Result
		Service Installation Line Extension $\geq 10$ Poles: $\leq 18.1$ days.	12.02 days
<b>Adverse Weather Response</b>	Notification of EOC Opening	NS Power to notify customers of the decision to open the EOC within 4 hours of the decision to open.	Target Met
	Outage Call Answer Rate	A minimum of 85% of calls answered within 45 seconds at Customer Care Centre during severe outage events.	January 7-10: 97.76%
			January 14-18: 98.61%
			February 3: 98.31%
			February 4-9: 98.73%
			February 18-19: 98.54%
			Sept 23 -Oct 10: 95.42%
			Nov 30 -Dec 3: 95.34%
			December 13-16: 95.13%
			December 23-24: 95.15%
	Polite Disconnects	10% or less annually.	3.49%
	Outage Report	Within 75 days for an EED or MED and 45 days for an SED	January 7-8 MED: Target Met January 14-15 MED: Target Met January 18 SED: Target Met

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Category	Standard	Target	2022 Result
			February 4-5 MED: Target Met  February 18 MED: Target Met  April 19 SED: Target Met  Hurricane Fiona: Target Met  December 1 MED: Target Met  December 13 MED: Target Met  December 23-24 MED: Target Met
	ETR Updates without delay	ETR updates provided without delay.	Target Met
	Percent Customers restored in 48 hours	Major Event Days: 91.98% of customers restored within 48 hours.	January 7: 99.09% January 8: 100.0% January 14: 99.92% January 15: 99.57% February 3: 100.0% February 4: 94.19% February 5: 93.88% February 18: 100.0% December 1: 99.97% December 13: 95.16% December 23: 100% December 24: 100%

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Category	Standard	Target	2022 Result
		Extreme Event Days: 78.38% of customers restored within 48 hours	September 25: 82.67%

1

2

**Figure 2 – 2022 Performance Standards Not Met**

Category	Standard	Target	2022 Result
Reliability	SAIDI	≤4.29	5.16
	SAIFI	≤2.05	2.19
	CKAIDI	19.81	Feeder 11S-411: 22.84
Customer Service Response	New Service Connection Times	Service Installation Pole or Transformer: ≤ 4.9 days.	5.09 days
		Service Installation Temporary to Permanent: ≤ 3.2 days.	3.73 days
		Service Installation Line Extension < 10 Poles: ≤ 6.2 days.	6.38 days
	Percent Customers restored in 48 hours	Significant Event Days: 95.05% of customers	September 30: 85.48%

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Category	Standard	Target	2022 Result
Adverse Weather Response		restored within 48 hours.	
		Major Event Days: 91.98% of customers restored within 48 hours.	September 26: 86.39% September 27: 74.88% September 28: 77.53% September 29: 90.20%
		Extreme Event Days: 78.38% of customers restored within 48 hours	September 23: 65.42% September 24: 60.98%

Additional detail and supporting documentation regarding the 2022 Performance Standards results are provided below.

**2.0 PERFORMANCE STANDARDS RESULTS**

**2.1 Customer Service Standards and Targets**

In 2022, the NSUARB approved the following metrics associated with the customer service performance standards:

- (i) Percentage of calls answered within 30 seconds
- (ii) Percentage of customer bills that may be estimated
- (iii) Customer notification of outages
- (iv) New service connection times<sup>5</sup>

The 2022 results for each of these metrics are detailed below.

**2.1.1 Percentage of calls answered within 30 seconds**

The following description of this standard and the applicable target are set out in Appendix A to the NSUARB's 2022 Order:

***Metric:*** Calls answered refers to telephone calls that are answered by a customer service representative after a caller asks to speak to a representative. The wait time associated with the "calls answered" metric is from the time the customer asks to speak to a representative to the time that the call is answered by a representative. Calls answered using an automated system are not included in the estimation of the metric, if a customer chooses to speak to a customer representative. Alternatively, if a customer chooses an automated system, those calls are included in the calculation of this metric.

***Benchmark:*** A minimum of 70 percent of telephone calls shall be answered within 30 seconds at NSPI's customer care center (under normal conditions - i.e., excluding severe weather conditions, where the adverse weather

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<sup>5</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 6.

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response benchmark will apply). This benchmark shall be fixed for the 2022 to 2026 period.<sup>6</sup>

In 2022, NS Power's Customer Care Centre received 1,095,277 calls from customers during regular business (i.e. excluding severe weather conditions, where the adverse weather response benchmark applies). 71.08 percent of these customers received an answer within 30 seconds, meeting the performance target of 70 percent for the year. Supporting data, including a monthly breakdown of the target, is contained in **Appendix A**.

In its decision on the 2017 Annual Performance Standards Report, the NSUARB directed as follows:

Regarding percentage of estimated bills, although the target has been established as an annual goal, it would be informative to understand the reasons why that target has been exceeded in a specific month. NSPI is directed to provide such explanations in its future annual reports. In addition to estimated bills, this requirement also applies to other metrics, such as percentage of calls answered within 30 seconds, new service connection times, percentage of customers restored within 48 hours of a severe weather event, percentage of calls answered within 45 seconds during a severe outage event, and percentage of polite disconnects for all outage calls.<sup>7</sup>

The overall percentage of calls answered within 30 seconds meets the target for 2022, with seven out of the twelve months meeting the target as shown in **Figure 3**.

**Figure 3 – Monthly Percentage of Calls Answered within 30 Seconds**

	Total Interactions	Service Level MTD (Percentage)	Service Level YTD (Percentage)
January	100,233	85.71	85.71
February	124,364	79.43	82.23

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<sup>6</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 6.

<sup>7</sup> M08574, NS Power 2017 Annual Performance Standards, NSUARB Decision Letter, May 1, 2018, page 6.

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	Total Interactions	Service Level MTD (Percentage)	Service Level YTD (Percentage)
March	84,828	71.22	79.21
April	84,113	55.84	74.22
May	82,463	53.53	70.65
June	73,330	63.86	69.74
July	75,699	74.40	70.30
August	74,749	60.35	69.24
September	137,268	85.36	71.88
October	97,161	69.01	71.59
November	103,509	65.93	71.02
December	57,560	71.69	71.08
Total	1,095,277	71.08	71.08

1  
2 In 2022, NS Power's Customer Care Centre received 1,095,277 calls from customers  
3 during regular business operations, which represented an increase of 16.5 percent over  
4 2021. Similarly, customer-driven work has increased by 26 percent over the past three  
5 years, which has increased call volume as customers call to set up new accounts and  
6 understand the connection process. Customer-driven work includes items such as  
7 renovation connections/disconnections, new homes and building connections and requests  
8 for line extensions. Call volumes and associated answer times in April, May and June  
9 reflect this increased volume of customer-driven work.

10 Call volume in August is largely impacted by students calling to request service  
11 connections. NS Power plans for this busy period in August by limiting staff time off,



1 ensuring meetings and training are scheduled outside this period whenever possible and by  
2 utilizing overtime for employees.

3 October and November were challenging months as call volume increased in response to  
4 rescheduled work impacted by Hurricane Fiona and its historic restoration response  
5 spanning from September 23 to October 10, 2023 and the weeks following this period as  
6 crews focused on extensive clean-up operations throughout the province.

7 NS Power has a responsibility to serve customers effectively while managing costs. The  
8 Customer Care Centre is staffed to meet the annual target of 70 percent of calls answered  
9 within 30 seconds. As the Customer Care Centre is staffed to meet the annual target, the  
10 actual result at any given time could be higher or lower than the 70 percent target.

11 NS Power continues to review call patterns to improve scheduling and agent efficiency so  
12 that it can continue meeting service level targets and provide a positive customer  
13 experience.

#### 14 **2.1.2 Customer Bills Estimated**

15 The following description of this standard and the applicable target are set out in Appendix  
16 A to the NSUARB's Order:

17 ***Metric:*** NSPI may on occasion need to estimate a customer's bill if the  
18 customer's meter cannot be accessed, and accurately read. For example,  
19 during winter months, snowfall and icy conditions create difficulties getting  
20 access to meters. This causes NSPI to estimate the bill for the customer or  
21 facility whose meter they could not access. When NSPI crews can access  
22 the meters, the customer's bill is then adjusted retrospectively to reflect the  
23 actual meter reading.

24 ***Benchmark:*** As a percentage of total bills, no more than two percent of  
25 customer bills shall be estimated annually. This benchmark shall be fixed  
26 for the 2022 to 2026 period.<sup>8</sup>

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<sup>8</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 6.

1 The Customer Bills Estimated rate in 2022 was 0.7 percent, achieving the NSUARB's  
2 target of less than 2 percent annually. The target was also met in each month of the year.

3 Supporting data, including a monthly breakdown of performance against the target, is  
4 contained in **Appendix B**.

### 5 **2.1.3 Customer notifications of outages**

6 The following description of this standard and applicable target is set out in Appendix A  
7 to the NSUARB's Order:

8 ***Metric/Benchmark:*** NSPI shall notify all customers of an outage event as  
9 soon as NSPI has knowledge of the outage event. This notification shall be  
10 followed up with prompt updates on restoration status of the outages.  
11 Channels used to communicate this information shall include NSPI's live  
12 outage map, social media and automated messaging.<sup>9</sup>

13 In 2022 customers had uninterrupted access to outage notifications through NS Power's  
14 live outage map, High Volume Call Answer (HVCA) system and the Company's social  
15 media sites, achieving the NSUARB's target for this performance standard. The HVCA  
16 system is equipped on the toll-free outage line and is designed to answer up to 40,000  
17 customer calls per hour immediately without any holds or delays. The Company also  
18 maintains contingency sites which include a backup outage map and customer outage  
19 information in tabular format if a primary outage communication system is offline.

20 **Figure 4** below shows the availability of outage communication systems in 2022. The  
21 Advanced Distribution Management System (ADMS), the system that creates outage  
22 events from customer calls, and the Supervisory Control and Data Acquisition (SCADA)  
23 notifications to ADMS were available over 99.7 percent of the time during in 2022. The  
24 Outage Map was available 99.98 percent of the time.

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<sup>9</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 6.

ADMS and outage map system downtime was due to regular planned system maintenance and the installation of operational patches, which are a normal part of maintaining large operational software systems. Planned maintenance is coordinated to avoid times when weather might pose a risk to the power system.

**Figure 4 – System Availability for Customer Notification of Outages 2022**

	% of Hours System was available	% of hours System was unavailable
<b>ADMS</b>	99.7	0.3
<b>Outage Map</b>	99.98	0.02
<b>Data Network</b>	100	n/a
<b>HVCA</b>	94.7	5.3
<b>Social Media</b>	100	n/a
<b>Contingency Plan Activated</b>	5.3	n/a

The HVCA system was available 94.7 percent of the time during 2022. The HVCA system, which is operated and supplied via a third party vendor, experienced a service interruption from December 1 to December 20 due to the vendor's temporary platform failure. This interruption impacted call services provided by the vendor across North America. NS Power's customers maintained uninterrupted access to outage information throughout this time as the outage map, regular business call line and social media platforms continued with uninterrupted service. NS Power contingency plans rerouted the outage call line within 5 hours and 40 minutes of the interruption, but customers could still reach a customer service representative during this time via the general customer service line. Additionally, banners on the outage map and social media along with targeted outreach advised customers to call the general customer service line if they required to speak to a customer service representative, during this period. NS Power contingency plans stayed in place and

worked effectively until full HVCA service was restored on December 20, 2022. The interruption to the HVCA system did not impact the Company's compliance with other outage communication standards, as noted in this report.

Additional detail on system availability is contained in **Appendix C**.

#### **2.1.4 New Service Connection Times**

The following description of this standard and the applicable target are set out in Appendix A to the NSUARB's Order:

**Metric:** The amount of time taken to establish a new service connection provides a valuable gauge of NSPI's customer service and its ability to provide/establish electrical service within a reasonable time frame. There are 5 different types of service level metrics that are measured, and each of these [has] specific targets for NSPI to meet.

**Benchmark:** The targets for this metric will be set based on a 5-year rolling average plus 1 SD approach, and reset each year. This metric includes a two-day service delivery floor (ie, no service delivery time will be due less than 48 hours from the time of the request). However, within a 5-year review period (i.e., 2022-2026), targets for any subsequent year (e.g. 2023 target) must be equal to or better than the prior year's target (e.g. 2022 target).<sup>10</sup>

Similar to reliability metrics such as SAIDI and SAIFI, benchmarks for new service connections will also be set for normal conditions, i.e., excluding data for MEDs and EEDs.

The figure below identifies the targets for new service connection times (under normal conditions) applicable for 2022, based on NSPI's historical data for the period 2017 to 2021.

Service Installation	Connection Target
No Pole	≤ 3.0 days

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<sup>10</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 7.

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Service Installation	Connection Target
Pole or Transformer	$\leq 4.9$ days
Temporary to Permanent	$\leq 3.2$ days
$< 10$ Poles	$\leq 6.2$ days
$\geq 10$ Poles	$\leq 18.1$ days

Exclusion: When NSPI experiences MEDs and EEDs (as defined using the IEEE 1366-2012 Standard 2.5 and 3.5 Beta methodology respectively), in assessing new service connection times, NSPI shall be allowed to exclude: (i) MEDs and 7 days following MEDs; and (ii) EEDs and 14 days following EEDs, to allow for time needed to return to normal conditions.

**Figure 5** below shows the 2022 targets for connection standards.

**Figure 5 – 2022 Targets for New Connection Standards**

Service Installation Type – 2022 Targets				
No Poles	Pole or Transformer	Temporary to Permanent	Line Extension $< 10$ Poles	Line Extension $\geq 10$ Poles
$\leq 3.0$ days	$\leq 4.9$ days	$\leq 3.2$ days	$\leq 6.2$ days	$\leq 18.1$ days

NS Power met the standard for the service installation “no pole” and “line extension  $\geq 10$  poles” in 2022. The service installation standard for “pole or transformer,” “temporary to permanent” and “line extension  $< 10$ ” poles were not met in 2022.

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The 2022 results for new customer connections, set out in **Figure 6** below, are measured after all customer requirements have been completed (i.e. securing easements, issuance of permits, customer tree trimming, underground infrastructure locations).

**Figure 6 – 2022 Results for New Service Connection Times**

Number of Business Days per Service Installation Type					
	No Pole	Pole or Transformer	Temporary to Permanent	Line Extension < 10 Poles	Line Extension ≥ 10 poles
<b>2022 Target</b>	3.0	4.9	3.2	6.2	18.1
<b>2022 Result</b>	2.98	5.09	3.73	6.38	12.02

NS Power has experienced a 26 percent increase in the hours required for customer-driven work since 2019, with 2022 experiencing a 7 percent increase over 2021. In 2022 there was also a significant increase in the amount of make-ready work for the Internet for NS project that also had to be completed by PLTs. During this time, internal PLT resources have remained constant, as noted in **Figure 7**. In the fall of 2020, the hours of customer-driven work started to increase compared to prior years, as shown in **Figure 7**. In 2020, NS Power was able to meet the additional demand of customer requests through careful allocation of existing internal resources and contractors. NS Power's Line Services Contractor was fully deployed during this period. As growth in customer-requested work continued into 2021, NS Power recognized that additional field resources would be required and subsequently filed the General Rate Application (GRA) with additional field resources included in revenue requirement. In 2022, responding to the continued growth of customer-requested work volume was further challenged by the number of days that field resources were engaged in storm response and restoration activities for major winter storms at the beginning of the year and Hurricane Fiona in September.

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1 During this time, NS Power continued to work with contract resources to supply line work  
2 services. However, the availability of contract labour has been insufficient to offset the  
3 additional resource requirement created by the recent 26 percent increase in customer-  
4 requested work volume.

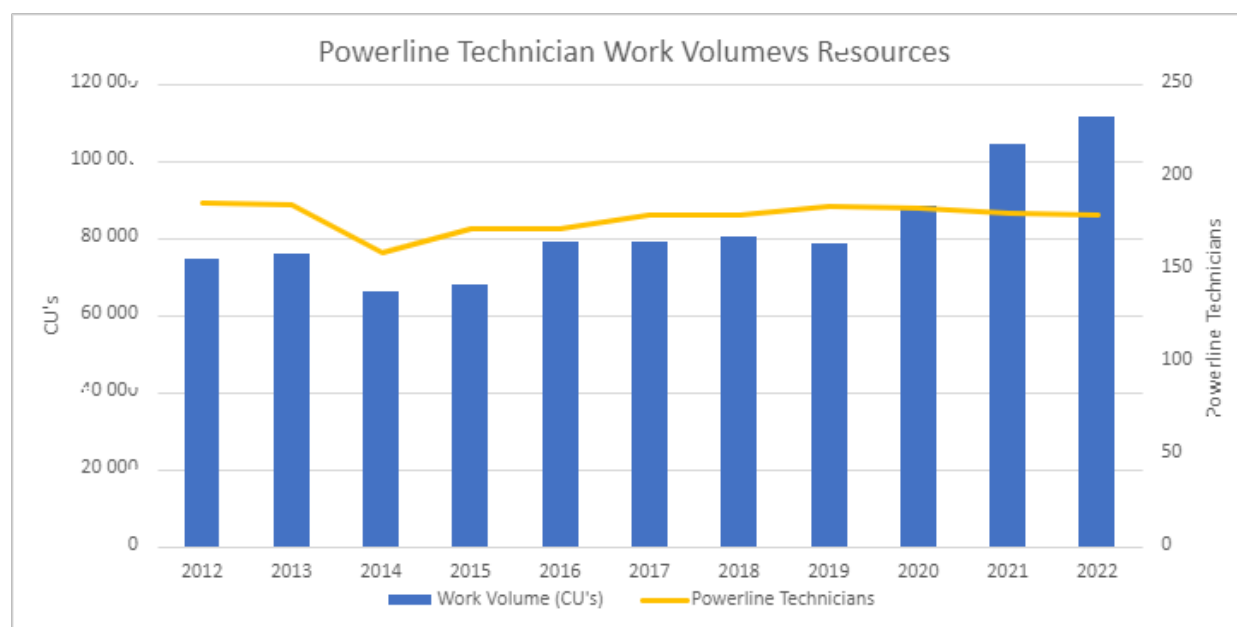
5 In 2023, NS Power is committed to adding additional field resources to address the growing  
6 customer work within the financial context created by Bill 212.

7 In addition to the challenge offered by the increase in customer-driven work, 2022 was  
8 further challenged by the impact of Hurricane Fiona in the fall. NS Power field resources  
9 were fully engaged in restoration activities from Hurricane Fiona's landfall on September  
10 23 until the last customer was restored on October 10. In the weeks following this period,  
11 crews were engaged in the feeder sweeps and associated clean-up activities associated with  
12 thousands of weak and compromised trees and equipment resulting from the damage  
13 caused by Hurricane Fiona's extreme winds.

14 The combined impact of these challenges led directly to NS Power's inability to meet three  
15 of the New Service Connection Times Standard targets in 2022 by times ranging from 0.18  
16 to 0.53 days.

17 NS Power's priority is to meet the new service connection standards and the Company is  
18 committed to adding field resources in 2023 to meet the increased volume of customer-  
19 driven work.

Figure 7 – Powerline Technician Work Volume vs Resources



Additional detail on New Service Connection Times Results is contained in **Appendix D**.

The monthly average details for the individual metrics are provided in **Appendix D**. With respect to meeting New Service Connection times, the role of the Resource Management Centre (RMC) at NS Power is to schedule customer work in the most efficient and productive way possible. Each work order is presented with parameters establishing its priority and any outstanding requirements necessary for execution. Resources are allocated to scheduled work orders based on each work order's priority, which can vary based on safety considerations and commitments to other overall work volumes/priorities for organizations such as Nova Scotia Department of Public Works), commitments to local municipalities, or service delivery commitments such as those established in the New Service Connection Standards.

In the months when the actual service delivery did not meet the annual target due to factors outlined above, NS Power was executing a significant volume of work orders, which in



1 some cases led to individual monthly service connections missing the targets by 1.20 to  
2 3.27 days.

## 3 **2.2 Adverse Weather Response Standards**

4 The NSUARB approved the following metrics associated with adverse weather  
5 response standards:

- 6 (i) Customer notification of an oncoming severe weather event within a  
7 specific time frame;
- 8 (ii) Percentage of calls answered within 45 seconds during a severe outage  
9 event;
- 10 (iii) Polite disconnect rate for all outage calls;
- 11 (iv) Estimated Time to Restore (ETR) updates communicated to customers  
12 during an outage; and
- 13 (v) Percentage of customers restored within the first 48 hours of a severe  
14 weather event - separately for Major Event Days (MEDs) and Extreme  
15 Event Days (EEDs) and Significant Event Days (SEDs) if the SEDs were  
16 excluded from normal conditions as the second 24-hour event, as discussed  
17 in Exclusions associated with reliability performance standards.
- 18 (vi) Outage Report for adverse weather events impacting  $\geq 30,000$  customers.<sup>11</sup>

19  
20 The 2022 results for each of these metrics are detailed below.

### 21 **2.2.1 Notification of an oncoming severe weather event**

22 The following description of this standard and the applicable target are set out in Appendix  
23 A of the NSUARB's Order:

24 ***Metric:*** All NSPI customers shall be notified of an oncoming severe  
25 weather event within a specified number of hours of NSPI having  
26 knowledge of the oncoming inclement weather. The notifications shall be

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<sup>11</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 3.

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provided to all customers using multiple channels, such as the NSPI website, social media and automated messaging.

**Benchmark:** NSPI shall notify all its customers within 4 hours of NSPI's decision to open the NSPI Emergency Operations Centre. This benchmark shall be fixed for the 2022 to 2026 period.<sup>12</sup>

NS Power opened the Emergency Operations Centre (EOC) on eight occasions in 2022 for a total of 43 days, as detailed in **Figure 8** below. On each occasion, customers were notified within four hours of the decision to open the EOC. Supporting documentation is provided in **Appendix E**.

**Figure 8 – Notification of the Opening of the EOC**

Decision to open EOC	Time/Date of EOC Opening	Notification to Public
January 6 <sup>th</sup> @ 10:00	January 7 <sup>th</sup> @ 10:00	January 6 <sup>th</sup> @ 13:43
January 13 <sup>th</sup> @ 15:37	January 14 <sup>th</sup> @ 12:00	January 13 <sup>th</sup> @ 17:03
January 28 <sup>th</sup> @ 09:32*	January 28 <sup>th</sup> @ 10:00	January 28 <sup>th</sup> @ 12:34
February 3 <sup>rd</sup> @ 15:26	February 4 <sup>th</sup> @ 07:00	February 3 <sup>rd</sup> @ 18:15
February 17 <sup>th</sup> @ 14:27	February 18 <sup>th</sup> @ 07:00	February 17 <sup>th</sup> @ 17:41
September 21 <sup>st</sup> @ 14:24	September 23 <sup>rd</sup> @ 08:00	September 21 <sup>st</sup> @ 14:33
December 1 <sup>st</sup> @ 07:00	December 1 <sup>st</sup> @ 08:00	December 1 <sup>st</sup> @ 09:00
December 21 <sup>st</sup> @ 15:37	December 23 <sup>rd</sup> @ 10:00	December 21 <sup>st</sup> @ 18:00

\*Although the EOC was activated for the January 28, 2022 event based on pre-storm weather forecasts, the resulting storm did not meet the qualifications for a Major Event Day, and as such, is not included in other storm metrics.

<sup>12</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 4.

**2.2.2 Percentage of Calls answered within 45 seconds**

The following description of this standard and the applicable target are set out in Appendix A of the NSUARB's Order:

***Metric:*** Calls answered refers to telephone calls that are answered by a customer service representative after a caller asks to speak to a representative. The wait time associated with the "calls answered" metric is from the time the customer asks to speak to a representative to the time that the call is answered by a representative.

Calls answered using an automated system are not included in the estimation of the metric, if a customer chooses to speak to a customer representative. Alternatively, if a customer chooses an automated system, those calls are included in the calculation of this metric.

***Benchmark:*** A minimum 85 percent of telephone calls answered within 45 seconds at NSPI's customer care center during severe outage events (i.e., MEDs and above, as defined by the IEEE 1366-2012 Standard). This benchmark shall be fixed for the 2022 to 2026 period.<sup>13</sup>

The percentage of calls answered within 45 seconds met or exceeded the 85 percent target for each of the following nine separate severe events experienced by NS Power in 2022:

1. MEDs January 7-8, 2022
2. MEDs January 14-15, 2022
3. MED February 3, 2022
4. MED February 4-5, 2022
5. MED February 18, 2022
6. EED/MED (multiple) September 23-30
7. MED December 1, 2022
8. MED December 13, 2022

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<sup>13</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 4.

9. MEDs December 23-24, 2022

**Figure 9** shows the Outage Call Answer rate results for each of these events. NS Power has calculated the percentage of calls answered within 45 seconds for the duration of each severe weather event (MED or EED), starting with the time of the first outage attributable to the storm and ending when the last customer impacted by the storm is restored.

NS Power offers all customers a toll-free telephone line with automated outage information and live agents 24 hours a day. The outage line is equipped with a High Volume Call Answer (HVCA) system that is designed to immediately answer up to 40,000 customer calls per hour without any holds or delays. Customers calling the outage line can report an outage or receive their outage information directly without having to speak to a Customer Service Associate (CSA). While the HVCA system was unavailable, due to the vendor service disruption, NS Power outage calls were rerouted and access was maintained to customers seeking to speak to a CSA.

NS Power also maintains a roster of approximately 100 additional trained NS Power employees outside the Customer Care Centre to assist CSAs in answering customer calls during severe storm events. This ensures that NS Power has the flexibility to ramp up staffing as required to meet the needs of customers during storm events.

**Figure 9 – Percentage of Outage Calls Answered within 45 Seconds**

Severe Weather Event Date(s)		
Date	Target (percent)	Result (percent)
January 7-8	85	97.76
January 14-15	85	99.63
February 3	85	94.13
February 4-5	85	99.15
February 18	85	96.56

Severe Weather Event Date(s)		
September 23- 30	85	93.31
December 1	85	93.05
December 13	85	86.64
December 24-25	85	95.78

Supporting documentation, including a monthly breakdown of performance against the target, is contained in **Appendix F**.

### **2.2.3 Polite Disconnect Rate**

The following description of this standard and the applicable target are set out in Appendix A of the NSUARB's Order:

***Metric:*** A polite disconnect results when a customer on hold waiting for a customer service agent is disconnected after receiving a brief disconnect message. A polite disconnect can result when call lines are very busy, and call volumes may be too high to keep customers on hold.

***Benchmark:*** A 10 percent or less polite disconnect rate will be targeted annually for all outage calls. This benchmark shall be fixed for the 2022 to 2026 period.<sup>14</sup>

NS Power's polite disconnect rate for 2022 was 3.49 percent for all outage calls. This result achieves the NSUARB's polite disconnect rate target of 10 percent or less for all outage calls.

A polite disconnect occurs when the HVCA system is unable to find an open line because the trunking capacity (the number of calls which can be received at any one time) has been exceeded. Multiple attempts are made to put the customer through to the Customer Care

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<sup>14</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 4.

Centre and a polite disconnect only occurs when the system determines there is no open capacity to accept the call because all CSAs are speaking with a customer and the extra telephony trunks are also filled to capacity with customers on hold. Polite disconnects may occur during the peak of a severe weather or outage event.

During the period that the HVCA system was unavailable due to the vendor service disruption, NS Power monitored the general customer service line to confirm that line capacity was not exceeded and therefore customers did not experience a polite disconnect during this period.

Supporting documentation, including a monthly breakdown of performance against the target, is contained in **Appendix G**.

#### **2.2.4 Estimated Restoration Time Updates**

The following description of this standard and the applicable target are set out in Appendix A of the NSUARB's Order:

***Metric:*** The performance standard around estimated restoration times shall aim to promptly provide customers with accurate information based on information available with NSPI.

***Benchmark:*** NSPI shall provide ETR updates to all customers with no delay, once new restoration time estimates are known. This benchmark shall be fixed for the 2022 to 2026 period.<sup>15</sup>

NS Power customers had uninterrupted access to the systems that provide outage Estimated Time to Restore (ETR) updates in 2022, meeting this performance target. ETR updates are provided to customers via the outage map, the HVCA system, social media sites, or contingency sites. **Figure 4** in section 2.1.3 shows the availability of these systems in 2022.

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<sup>15</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 5.

1 NS Power tracks compliance with this metric through the following:

- 2 • Availability of ADMS
- 3 • Availability of the Outage Map
- 4 • Availability of HVCA system
- 5 • Activation of Contingency Plan

6 Supporting data for these results is contained in **Appendix C**.

### 7 **ETR Accuracy**

8 With respect to estimated restoration times, the Board's May 1, 2018 decision included the  
9 following further direction:

10 Although it is understood that the initial ETRs from the predictive  
11 modelling may not have the benefit of actual input from personnel in the  
12 field, and therefore may be less representative of the required restoration  
13 time, it would be beneficial for NSPI to undertake an analysis comparing  
14 the ETRs with actuals to determine the level of accuracy and whether any  
15 further refinements could be incorporated into its estimates. The Board  
16 directs NSPI to include this analysis in its future annual reports and to  
17 illustrate whether the ETRs actually become more accurate as the  
18 restoration process progresses.<sup>16</sup>

19 Further, the following directive was provided in the Board's order regarding matter 10279  
20 on April 7, 2022:

21 ...To monitor related emerging technologies and to report on updates to the  
22 ETR processes in its future annual reports.<sup>17</sup>

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<sup>16</sup> M08574, NS Power 2017 Annual Performance Standards, NSUARB Decision Letter, May 1, 2018, page 5.

<sup>17</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, page 2.

1 The following information pertaining to the accuracy of ETRs, ETR process and emerging  
2 technologies is provided in response to the Board's directive.

3 NS Power provides ETRs to customers for all outages as soon as an outage is identified,  
4 based on historical average restoration times. Initial ETRs are updated to reflect actual  
5 power system impact and time required to restore as soon as field personnel determine that  
6 information. The conditions that impact the duration of an outage (such as access to  
7 equipment due to travel conditions or the full extent of equipment damage) are not always  
8 immediately known by personnel on site and awareness of this information evolves as  
9 restoration continues.

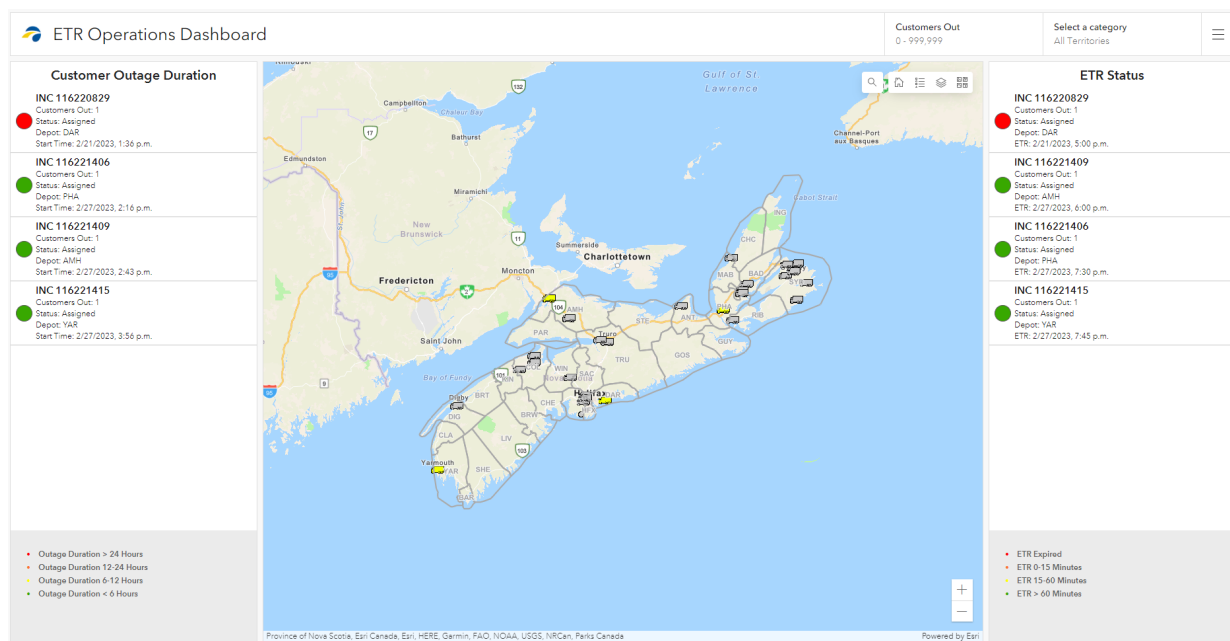
10 NS Power customizes ETR strategies by region, population density (urban or rural  
11 environment), and the number of customers impacted. This allows the automated ETRs  
12 assigned to an outage to be tailored to a more specific area, thereby improving overall  
13 accuracy. In 2021, NS Power further refined the ETR strategy to provide ETRs at the  
14 community level. Automated ETRs are applied during regular operations and then adjusted  
15 further for storm events based on the historical impact of similar weather. The ETRs  
16 automatically assigned during regular operations are reviewed every six months and  
17 updated as appropriate. These refinements resulted in ETR adjustments in 2022 based on  
18 actual response times by area.

19 NS Power has implemented an ETR dashboard for use in the Emergency Operations Centre  
20 during large events. This dashboard ensures that ETRs that have commitments that day or  
21 in the hours ahead are highlighted to the emergency response team so that targeted support,  
22 as required, can be provided to field staff working to meet these targets. This dashboard  
23 also assists in the regular reassessment of established ETRs during an event, to understand  
24 if an area/outage ETR should be adjusted in response to updated field condition data. An  
25 example of the dashboard is found in **Figure 10**.



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Figure 10 – ETR Operations Dashboard



As an ETR is updated with field-validated data, the restoration time can change from the original ETR. Given the variables in repairing equipment aloft under unpredictable and challenging conditions, ETRs evolve as restoration continues. Important variables impacting ETRs include the following:

- Outage cause not immediately visible by crews
- Outage cause located off-road
- Precipitation
- Travel conditions
- Wind speeds exceeding safety levels
- Impact of extreme cold or heat
- Visibility for access due to time of day/night
- Requirements for additional materials or resources.

NS Power's Work and Asset Management Project will roll out functionality in 2024 that will provide field staff with the ability to update outage cause codes and ETRs with field-

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1 validated updates in real time from the tablets in the truck. This will substantially reduce  
2 the need to place a phone call in order to update this information.

3 In 2022, NS Power managed 32,380 outage events, compared to 11,995 outage events in  
4 2021. For perspective, outage events in 2022 increased 170 percent over 2021, and 180  
5 percent over 2020. This is a direct result of the 28 event days (9 Significant Event Days –  
6 SEDs, 16 Major Event Days – MEDs, and 3 Extreme Event Days – EEDs) experienced in  
7 2022. Managed outage events in 2022 further represented a 60 percent increase over 2019,  
8 a year in which there was also a hurricane (Hurricane Dorian). Of the 32,380 outage events  
9 in 2022, 23,653 or 73 percent received a single ETR.

10 Overall, 75 percent of outages receiving a single ETR in 2022 were accurate within plus or  
11 minus four hours and 58 percent were accurate within plus or minus two hours for all  
12 outages excluding MEDs and EEDs. For all events, including those associated with  
13 Hurricane Fiona, 43 percent of outages receiving a single ETR in 2022 were accurate within  
14 plus or minus four hours and 30 percent were accurate within plus or minus two hours for  
15 all outages.

16 **Figure 10** compares 2022 to 2021 for the number of ETR updates customers received for  
17 all outage events.  
18

Figure 11 – Outage Events by Number of ETR Updates

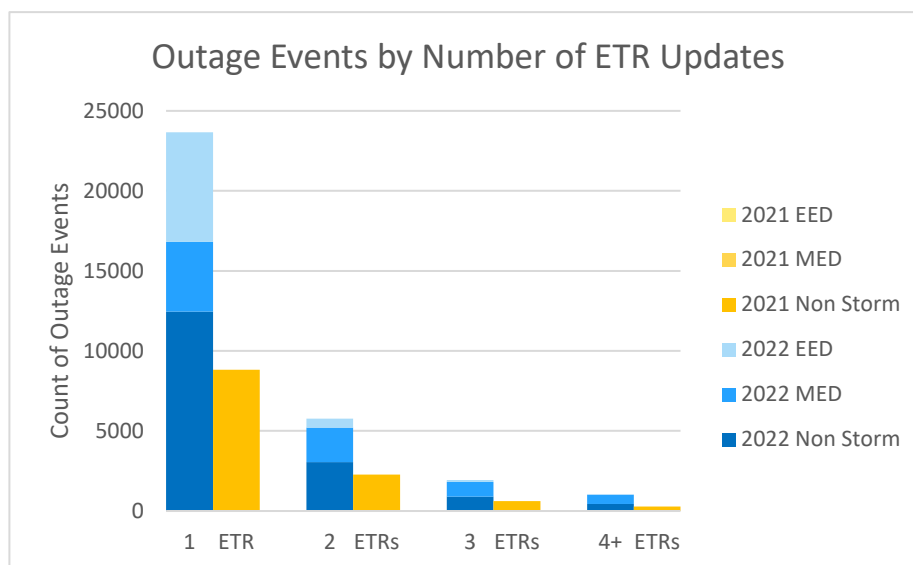
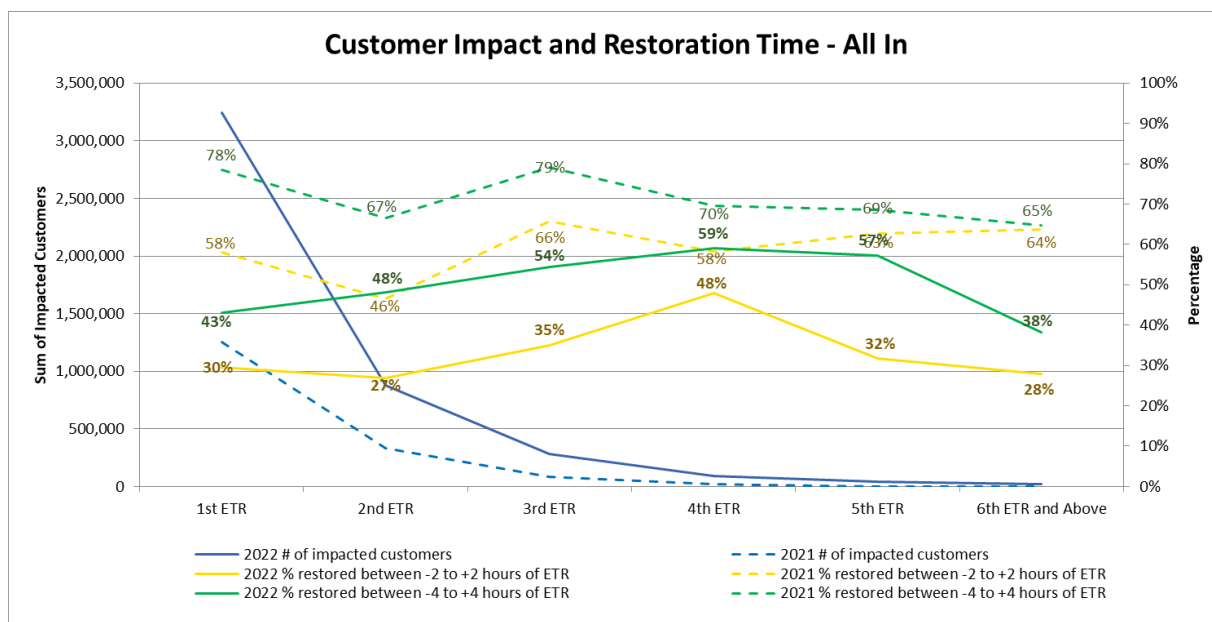


Figure 12 compares the accuracy of ETRs in 2022 and 2021 for all events. As shown on the figure, in 2022 NS Power restored power within four hours of communicated ETRs between 38 and 59 percent of the time, and within two hours of the communicated ETR between 27 and 48 percent of the time. These values show the impact of Hurricane Fiona. For comparison, **Figure 13** shows the ETR experience with storms and the Hurricane Fiona response from September 23 to October 10 removed. This graph shows that for regular business, NS Power restored power within four hours of communicated ETRs between 79 and 94 percent of the time, and within two hours of the communicated ETR between 56 and 80 percent of the time. NS Power remains focused on continuing to improve the ETR experience for customers, especially during storms, and is looking forward to the opportunities provided by the upcoming technology upgrade which will enable field employees to update ETRs directly from the trucks.

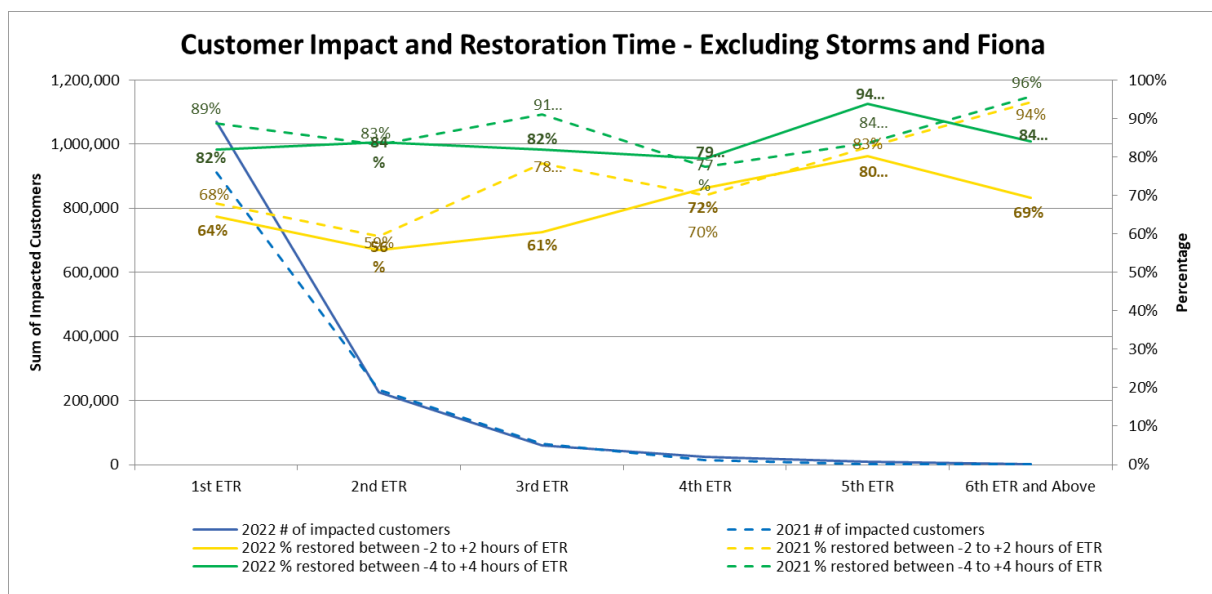
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**Figure 12 – Customer Impact and Restoration Time - All In**



Note: The data displays ETRs weighted for customer impact.

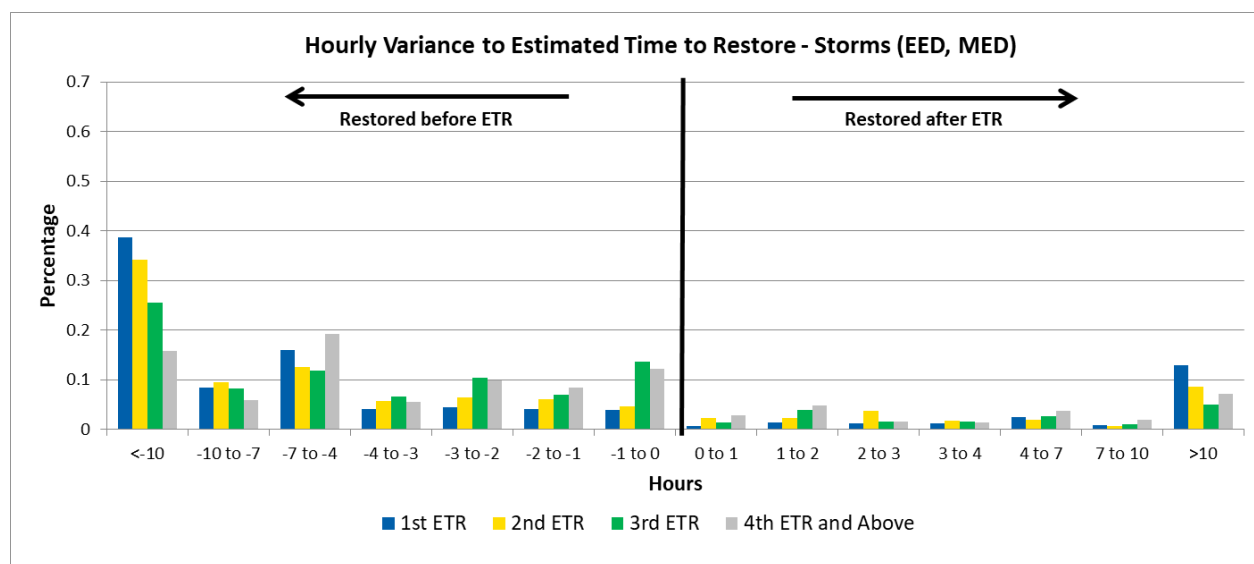
**Figure 13 – Customer Impact and Restoration Time - Excluding Storms and Fiona**



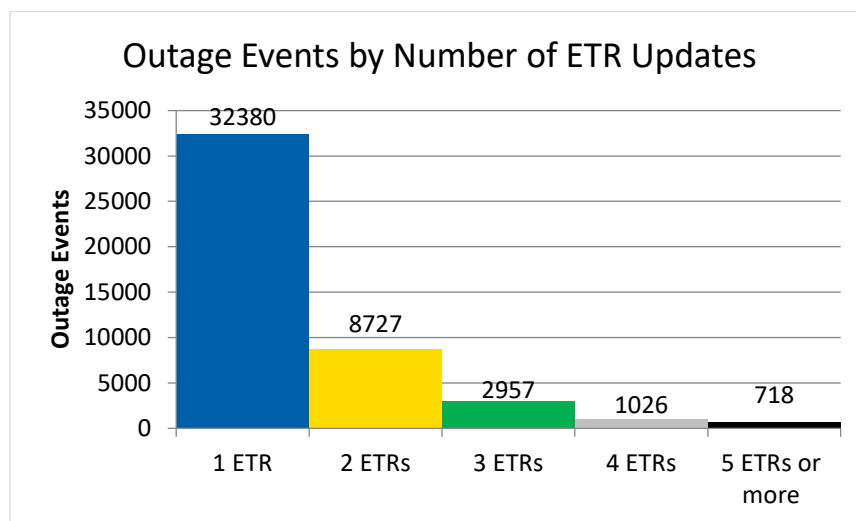
**Figure 14** shows 10 percent of outages were restored within two hours of the first ETR provided to the customer during MEDs and EEDs. Similarly, approximately 22 percent of

outages were restored within four hours of the first ETR during MEDs and EEDs. These figures show the impact on ETRs due to Hurricane Fiona and the difficulty in determining the first ETRs early in the assessment of the devastating damage.

**Figure 14 – Hourly Variance to Estimated Time to Restore - Storms (EED, MED)**

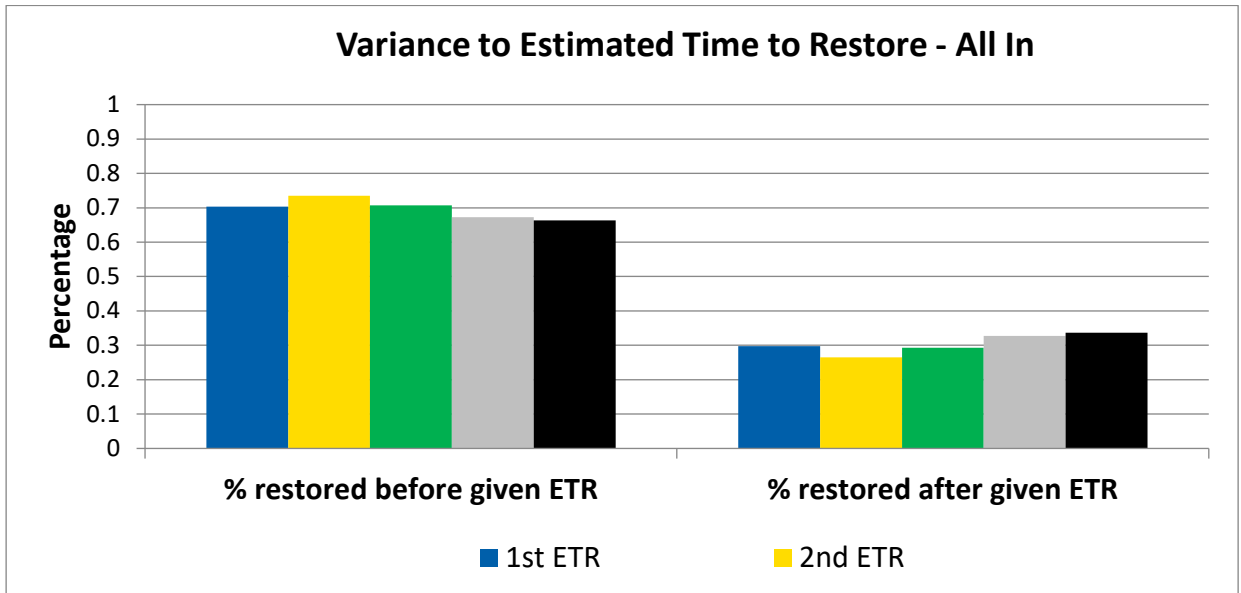


**Figure 15 – Outage Events by Number of ETR Updates**



**Figure 15** shows the number of ETR updates for all outage events, including all event days. Outages were restored before the ETR between 66 and 74 percent of the time for all events in 2022 as shown in **Figure 16**.

**Figure 16 – Variance to Estimated Time to Restore**



#### 2.2.5 Percentage of Customers restored within the first 48 hours of a severe weather event

The following description of this standard and the applicable target are set out in Appendix A of the NSUARB's Order:

**Metric:** This metric has been approved to reasonably quantify the promptness of restoration following a severe weather event and will be estimated separately for: (i) MEDs, (ii) EEDs and (iii) SEDs, if the SEDs were excluded from normal conditions as the second 24-hour event, as discussed in Exclusions associated with Reliability Performance Standards.

**Benchmark:** The targets for this metric shall be based on NSPI's respective historical averages (since 2017) minus one standard deviation. The benchmarks will be updated annually by including the most recent data available at the time of benchmark updating.

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With the data provided from 2017 to 2021, there are 5 data points for SEDs, 19 data points for MEDs and 5 data points for EEDs. The figure below shows benchmarks to be set for the percentage of customers restored within first 48 hours for SEDs, MEDs and EEDs in 2022.<sup>18</sup>

**Figure 3 – 2022 benchmarks for percentage of customers restored within first 48 hours for SEDs, MEDs and EEDs**

	<b>SEDs</b>	<b>MEDs</b>	<b>EEDs</b>
Percentage	95.05	91.98	78.38

Note: Targets are rounded to two decimal places.

The 2022 targets are provided in **Figure 17**.

**Figure 17 – 2022 Targets for Percentage of Customers Restored within 48 Hours**

<b>Percentage of Customers Restored Within First 48 hours</b>			
	<b>SEDs (Percentage)</b>	<b>MEDs (Percentage)</b>	<b>EEDs (Percentage)</b>
<b>2017-2021 Average</b>	98.33	97.32	90.06
<b>Standard Deviation</b>	3.28	5.34	11.68
<b>2022 Target</b>	95.05	91.98	78.38

NS Power experienced 16 MEDs, 3 EEDs and 9 SEDs (one of which followed an MED and therefore is covered under the Percentage of Customers Restored within 48 hours metric) in 2022. NS Power experienced more total event days (28 days) in 2022 than any other year on record since at least 2003.

Of the 20 event days in 2022 covered under the Percentage of Customers Restored within 48 hours metric, 8 were attributable to Hurricane Fiona. In all but seven cases, NS Power

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<sup>18</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 5.

1 met the associated targets. Please refer to **Figure 19**, **Figure 20** and **Figure 21** for  
2 additional detail.

3 NS Power considers the Percentage of Customers Restored within 48 hours standard for  
4 2022 to be met because the timing of restoration events spanning September 23-30 during  
5 Hurricane Fiona was strongly influenced by the priorities of the Provincial and Regional  
6 Emergency Management Offices. Additional detail is provided below.

7 The IEEE Guide for Electric Power Distribution Reliability Indices notes the following  
8 regarding the treatment of “catastrophic” events, a category which NS Power considers  
9 Hurrican Fiona to fall within:

10           It is recommended that the identification and processing of catastrophic  
11           events for reliability purposes should be determined on an individual  
12           company basis by regulators and utilities since no objective method has  
13           been devised that can be applied universally to achieve acceptable results.<sup>19</sup>

14 The IEEE defines “catastrophic events” as events that give rise to unusually sizable daily  
15 SAIDI values.<sup>20</sup> This guidance from the IEEE with respect to the treatment of catastrophic  
16 events demonstrates that storms like Hurricane Fiona, which yield massive damage to the  
17 power system, require individual consideration and treatment.

18 NS Power made considerable progress on restoring power to critical services and  
19 infrastructure in the first several days following Hurricane Fiona’s landfall and destruction.  
20 In some cases, teams of crews worked for hours to remove trees blocking roadways so that  
21 they could access areas with prioritized restoration for critical infrastructure such as  
22 hospitals, medical facilities, care homes, water pumping and treatment stations, emergency  
23 communications stations, and cell sites. NS Power agrees that these were the appropriate  
24 places to prioritize early restoration efforts, but focusing on these individual locations does  
25 impact overall outage restoration pace.

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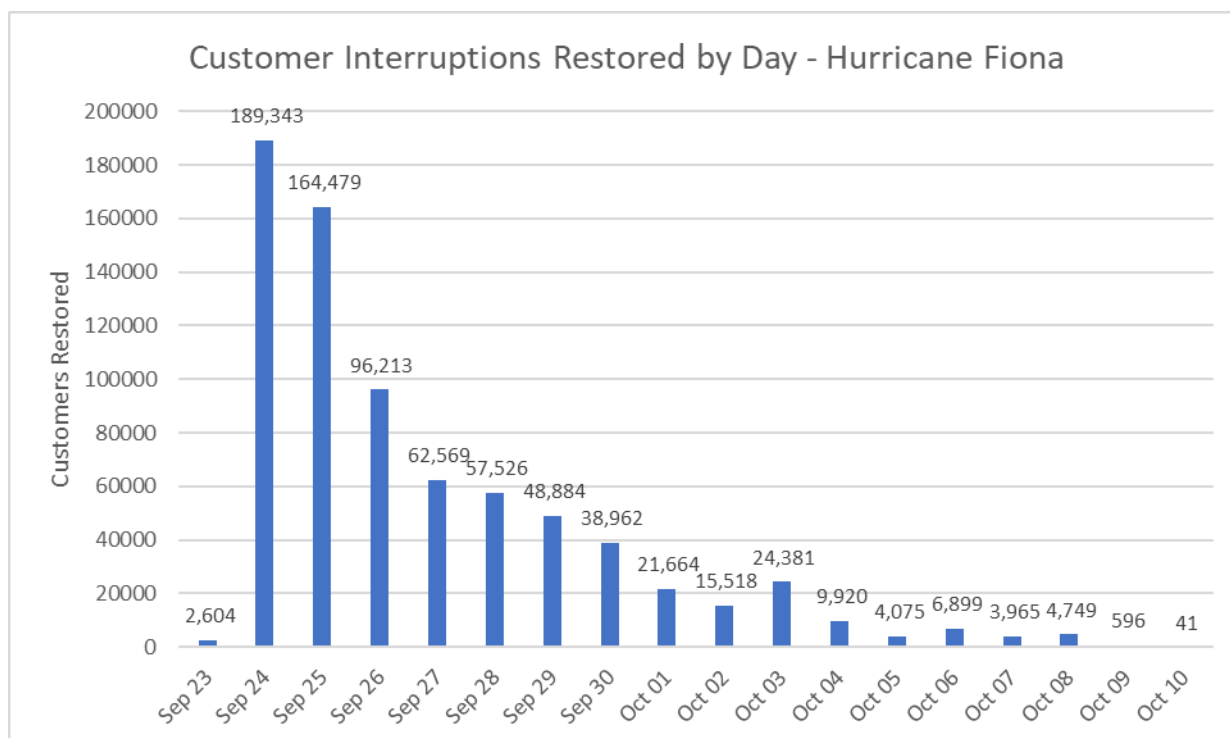
<sup>19</sup> IEEE Std 1366-2022 page 29.

<sup>20</sup> IEEE Std 1366-2022 page 29.



As can be seen in **Figure 18**, NS Power restored power to over 356,000 customer interruptions in the initial three days of the storm. Focus remained firmly on the safety of field crews and customers as field staff accessed every community, road, and back lane that had power infrastructure impacted by the storm. This took time. As NS Power's emergency operations centre learned more each hour and day after the hurricane force winds subsided with respect to the overall damage and condition of the power line system in an area, restoration plans were updated and support teams acted to ensure crews had everything they needed to complete safe restoration.

**Figure 18 – Number of Customer Interruptions Restored by Day during Hurricane Fiona**



As outlined in the 2018 Performance Standards Report, for an event day, the 48-hour period is considered to begin with the first event-related outage on the same day. The total number of customers impacted is the sum of the storm-related outages following this first event until the end of that day.

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For events where the adverse weather does not permit restoration to begin safely at the onset of the outages, the start time for the 48-hour period begins when the Emergency Operations Centre Storm Lead determines it is safe for restoration to proceed.

**Figure 19 – Percentage of Customers Restored within 48 hours of a SED following a MED**

2 <sup>nd</sup> 24hr SED	Restored	Total Impacted	Target	% Restored in 48 Hours
2022/09/30	10,654	12,464	95.05%	85.48%

**Figure 20 – Percentage of Customers Restored within 48 hours of a MED**

MED	Restored	Total Impacted	Target	% Restored in 48 Hours
2022/07/01	170,993	172,563	91.98%	99.09%
2022/08/01	43,200	43,200	91.98%	100.00%
2022/01/14	22,619	22,636	91.98%	99.92%
2022/01/15	90,181	90,566	91.98%	99.57%
2022/02/03	40,551	40,551	91.98%	100.00%
2022/02/04	87,979	93,410	91.98%	94.19%
2022/02/05	86,366	91,999	91.98%	93.88%
2022/02/18	112,679	112,679	91.98%	100.00%
2022/09/26	26,069	301,77	91.98%	86.39%
2022/09/27	16,047	21,429	91.98%	74.88%
2022/09/28	15,443	19,919	91.98%	77.53%
2022/09/29	24,370	27,017	91.98%	90.20%

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MED	Restored	Total Impacted	Target	% Restored in 48 Hours
2022/12/01	115,779	115,814	91.98%	99.97%
2022/12/13	46,228	48,579	91.98%	95.16%
2022/12/23	81,302	81,302	91.98%	100.00%
2022/12/24	58,036	58,036	91.98%	100.00%

**Figure 21 – Percentage of Customers Restored within 48 hours of an EED**

EED	Restored	Total Impacted	Target	% Restored in 48 Hours
2022/9/2 3	113,932	174,167	78.38%	65.42%
2022/9/2 4	222,526	364,911	78.38%	60.98%
2022/9/2 5	52,439	63,433	78.38%	82.67%

#### **2.2.6 Hurricane Fiona Impact on Severe Event Day Thresholds**

The Board directed the following in its decision regarding the five-year review of Performance Standards on February 22, 2022:

Given the significant impact of Hurricane Dorian, the Board will allow NS Power to exclude Hurricane Dorian outage data from its MED and EED calculations, but only data directly associated with the specific days during which Hurricane Dorian occurred (September 7, 8 and 9). NS Power should not assume that data from any future hurricanes or severe weather events will receive similar treatment.<sup>21</sup>

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<sup>21</sup> M10279, NS Power Performance Standards 2022-2026, NSUARB Decision, February 22, 2022, at para. 33.

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Similar to the impact of Hurricane Dorian, Hurricane Fiona has had a significant impact on the event day thresholds in 2023. These thresholds as calculated by the IEEE guidelines has increased over 2022 values due to the 28 total SED, MED and EEDs in 2022 as shown in **Figure 22**. The 2023 values represent a 28 to 49 percent increase over 2022 as shown in **Figure 23**.

**Figure 22 – SED, MED and EED thresholds from 2015 to 2023\***

	SED	MED	EED
<b>2015</b>	n/a	173,513	1,230,442
<b>2016</b>	n/a	153,743	1,044,578
<b>2017</b>	n/a	157,127	1,075,386
<b>2018</b>	n/a	165,849	1,109,365
<b>2019</b>	n/a	184,972	1,254,032
<b>2020</b>	n/a	211,057	1,431,181
<b>2021</b>	n/a	210,750	1,398,779
<b>2022</b>	73,376	182,510	1,129,145
<b>2023*</b>	98,196	253,285	1,685,166

\*2023 threshold values are proposed

**Figure 23 – Change in SED, MED and EED Threshold Values from 2022 to 2023**

	2022 Value	2023 Value	Percent Change
<b>SED Threshold</b>	73,376	98,196	34%
<b>MED Threshold</b>	182,510	253,285	28%
<b>EED Threshold</b>	1,129,145	1,685,166	49%

1 The nature of the IEEE 1366 guideline is such that the MED and EED thresholds will increase  
2 in a year where a utility experiences an increase in the average daily customer hours of  
3 interruption. As Nova Scotia is experiencing more severe weather, and more associated  
4 outages, the statistical SED, MED, and EED thresholds are also increasing. The result of  
5 these increases are such that storms in 2023 of a similar strength, precipitation level, and  
6 wind speed to those occurring in previous years will no longer be evaluated under the same  
7 adverse weather metrics and will instead be included in the “blue sky” SAIDI and SAIFI  
8 metrics.

9 As referenced in the IEEE 1366 guideline,<sup>22</sup> catastrophic events result in significant  
10 disruption to the data such that it is recommended that utilities evaluate their treatment on  
11 an individual basis. Given the 28 to 49 percent increase in the SED, MED and EED  
12 thresholds in 2023 over 2022, NS Power proposes the Board consider maintaining the 2022  
13 thresholds in 2023. This will allow consistent evaluation of storm related outages year over  
14 year

15 All outages impact customers, regardless of whether the outages occur during severe  
16 weather or on a sunny day. NS Power is working to reduce all outage events – those that  
17 are caused by severe weather and those that are caused by other factors. NS Power’s goal  
18 is to continue with sustaining, reliability, and storm hardening system investments which  
19 will improve the system’s resiliency to intense weather. NS Power asks the Board to  
20 consider the impact of the changing weather patterns in the province when considering this  
21 revised approach to event day threshold calculation.

#### 22 **2.2.7 Outage Report for events impacting > 30,000 customers**

23 The following description of this standard and the applicable target are set out in Appendix  
24 A of the NSUARB’s Order:

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<sup>22</sup> IEEE 1366-2012: IEEE Guide for Electric Power Distribution Reliability Indices.

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**Metric/Benchmark:** NS Power shall submit a report for weather-related outages impacting 30,000 or greater customers. The outage report shall be in the form approved by the NSUARB (Matter M09524). NS Power shall file the outage report within 45 days of the event, or within 75 days in the case of a MED or EED with those impacts.<sup>23</sup>

NS Power experienced ten weather events in 2022 which impacted 30,000 or greater customers. In each case, as outlined in **Figure 24** below, a report was prepared in accordance with the established template and filed with the Board.

**Figure 24 – Weather Events impacting >30,000 Outage Report Status**

Weather Event	Date Filed*	Met Target
January 7-8 MED	March 23, 2022	Y
January 14-15 MED	March 30, 2022	Y
January 17th SED	February 14, 2022	Y
February 4-5 MED	April 20, 2022	Y
February 18 MED	April 29, 2022	Y
April 19 SED	June 3, 2022	Y
Hurricane Fiona	December 7, 2022	Y
December 1 MED	February 14, 2023	Y
December 13 MED	February 27, 2023	Y
December 23/24 MED	March 9, 2023**	Y

\* In a case where multiple event days meet the target consecutively, the outage report has been filed for the event at either 45 or 75 days counted from the last event day of the storm.

\*\*Planned date to file the December 23/24 MED Outage Report.

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<sup>23</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 4.

**2.3 Reliability Standards**

The NSUARB approved the following performance standards relating to reliability:

- (i) System Average Interruption Frequency Index ("SAIFI")
- (ii) System Average Interruption Duration Index ("SAIDI")
- (iii) Circuit Average Interruption Frequency Index ("CKAIFI")
- (iv) Circuit Average Interruption Duration Index ("CKAIDI")

Exclusions:

These reliability performance metrics are to be estimated for normal conditions, i.e., excluding: (i) major event days (MEDs and above), as defined by the established MED and extreme event day (EED) thresholds\* utilizing the IEEE 1366-2012 Standard 2.5 Beta methodology; and (ii) planned outages; and (iii) adverse weather-associated outages occurring in the second 24-hour period after a MED or EED.

Only those outages occurring in the second 24-hour period after a MED or EED which can be attributed to the same storm system as precipitated the original MED or EED and meet Significant Event Day (SED\*\*) thresholds are to be excluded from the metric calculation. The second 24-hour event, if excluded, will be considered a severe weather event, and be subject to adverse weather response standards.<sup>24</sup>

The 2022 results for each of these are detailed below.

**2.3.1 SAIDI and SAIFI Standards**

The SAIFI and SAIDI benchmarks/targets are based on a five-year rolling average plus one standard deviation and are reset each year. Within the five-year review period (2022-2026), targets for a subsequent year must be equal to or better than the prior year's target.<sup>25</sup>

The 2022 Performance Standard target for SAIDI was 4.29, meaning that on average, a customer would experience fewer than 4.29 hours of interruption over the year. The 2022

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<sup>24</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, .Appendix A.

<sup>25</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 2.

Performance Standard target for SAIFI was 2.05, meaning that on average, a customer would experience fewer than 2.05 outage events throughout the year.

NS Power's results for SAIDI and SAIFI for 2022 are set out in below. The 2022 result for SAIFI was 2.19 (or about 2 instances per customer per year on average, similar to the target) and the 2022 result for SAIDI was 5.16 (or approximately 5 hours versus target of approximately 4 hours per customer per year on average).

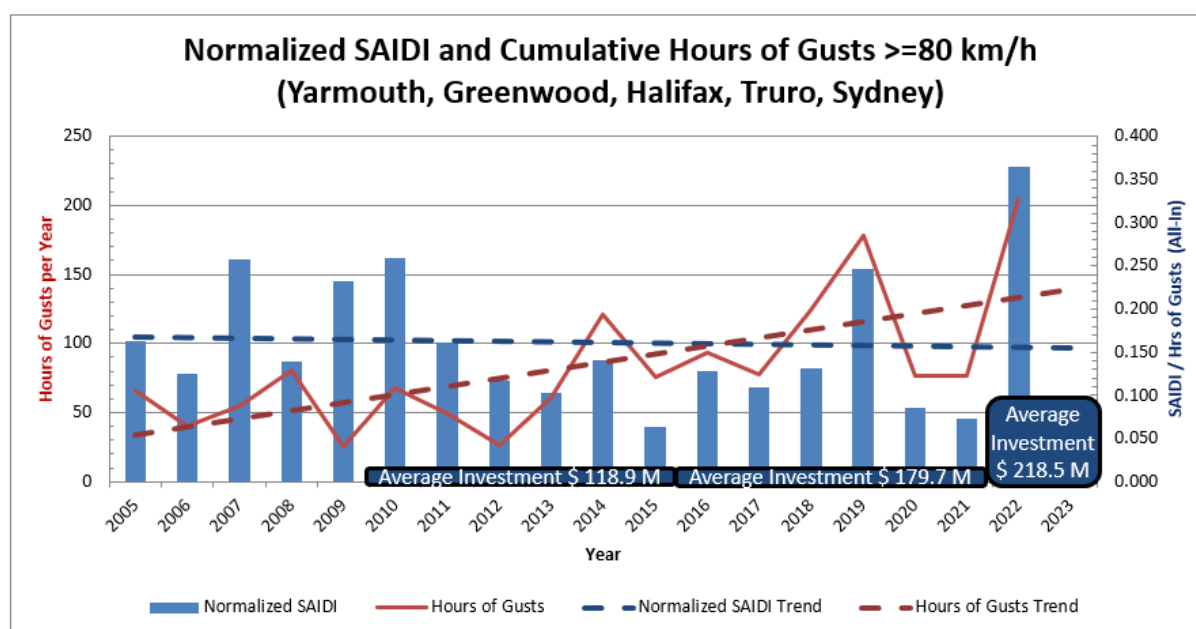
**Figure 25 – SAIDI and SAIFI Results**

Metrics	2022 Target	2022 Actuals
SAIDI	$\leq 4.29$	5.16
SAIFI	$\leq 2.05$	2.19

**Figure 26** details the SAIDI performance normalized for hours of wind gusts greater than 80 km/h. The graph shows that the SAIDI result has trended downward (i.e. improving over the 2005-2022 time period) notwithstanding the increasing trend of wind gusts greater than 80 km/h over that same period. The graph also highlights the increase in the average investment in the transmission and distribution system over the 2010 to 2015 period as compared to the 2016 to 2021 period. The graph shows the average investment over the 2010 to 2015 period was \$118.9 million. Over the 2016 to 2021 period, the average annual investment increased by 51 percent to \$179.7 million. The average investment for the 2022-2023 period is \$218.5 million. This shows a clear trend of increasing investment in reliability and the overall transmission and distribution system.



Figure 26 – Normalized SAIDI and Cumulative Hours of Gusts  $\geq 80$  km/h



90 projects totaling \$55 million identified in the 2023 Annual Capital Expenditure (ACE) Plan will support reliability improvements throughout the province in 2023. In addition to these 90 projects, \$61.5 million in routine and sustaining reliability investments in line and equipment upgrades and another \$63.5 million in growth and customer focused projects are planned for 2023 and build upon similar investments in the last five years. Specifically, the 2023 investment program has committed an additional \$7 million in right-of-way widening and an incremental commitment of \$18 million in new technologies, system upgrades and automation. Together, these investments total over \$180 million in transmission and distribution focused upgrades in 2023.

These investments are necessary for continued improvement of outage duration and frequency year over year, as shown in **Figure 27**, despite the worsening weather experienced in the province. NS Power realized a 14 percent improvement in SAIDI and a 15 percent improvement in SAIFI in 2022 as compared to 2019, a year which also experienced a hurricane. Further gains were realized in 2022 over 2021, despite reduced storm activity in 2021 as compared to 2022. NS Power remains committed to building

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resiliency within the power system and meeting the SAIDI and SAIFI targets, and recognizes that more reliability investment will be required while still balancing affordability for customers.

**Figure 27 – SAIDI/SAIFI Results Percent Improvement**

	Year End 2019 Results	Year End 2021 Results	Year End 2022 (Performance Standards Result)	Percent Improvement 2022 over 2019	Percent Improvement 2022 over 2021	Performance Standards Targets
SAIDI	5.99	5.23	5.16	14%	1%	4.29
SAIFI	2.58	2.27	2.19	15%	4%	2.05

**Figure 28** and **Figure 29** below provide graphical representations of the SAIDI and SAIFI results over the course of 2022.

**Figure 28 – 2022 SAIDI Result**

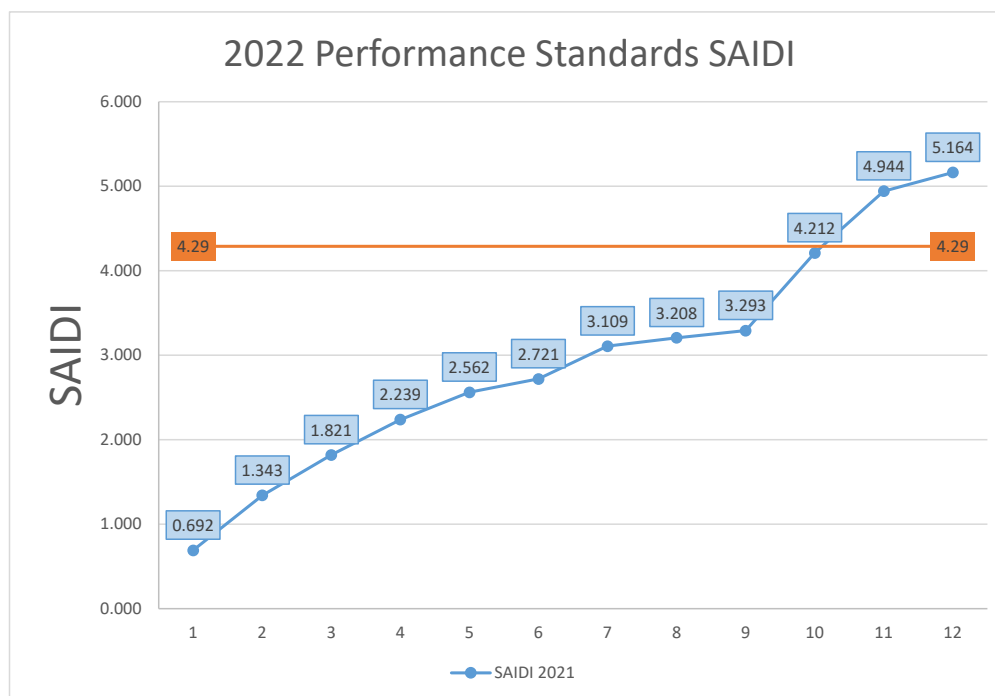
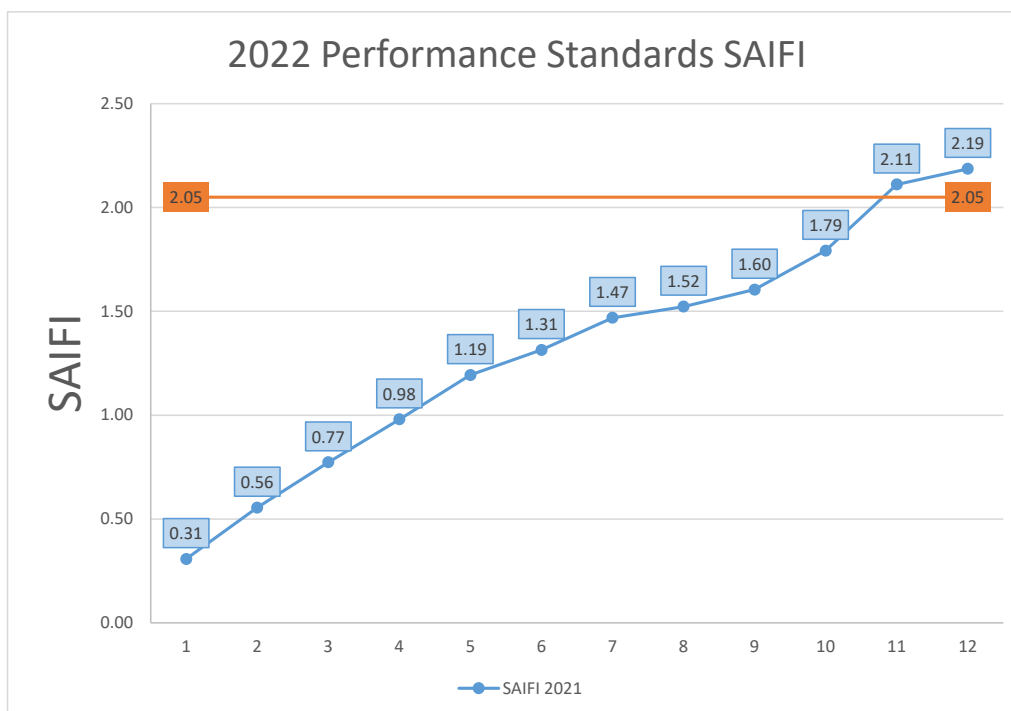


Figure 29 – 2022 SAIFI Result



## 2.4 Customer Reliability Approach

The Company's approach to customer reliability is focused on balancing optimized investments with affordability and is built on four elements:

### 1. Technology & Data

Utilize data and analytic tools to gain new insights into system performance and identify opportunities to improve performance. Continue the integration of operational/health data into risk profiles to better align with mitigation strategies. Gather the latest climate science data to update NS Power's transmission line design, factoring in the latest models on wind, ice loading, and temperature factors. Assess coastal flood risks for critical assets based on climate projections for storm surge and sea level rise.

**2. Innovation**

Explore innovative technologies such as battery storage and micro grids, and supporting systems such as enhanced vegetation condition assessments, and advanced measures and indicators of overall asset health used for decision-making.

**3. New ways of Working**

Implement enhanced risk-based decision making through the creation of focused reliability teams which identify and prioritize work with a customer-first lens. A customer-first lens ensures all projects are viewed with a focus on value for customers, overall customer experience and reliability. Deployment of drones to collect condition data through inspections of transmission and distribution equipment. Deployment of telecommunications to assets throughout the distribution system and integration of visibility and control into operational systems as part of the connected asset strategy. These investments will support management of the future state of the transmission and distribution grid with energy transition challenges brought on by technology advancements including Distributed Energy Resource (DER) proliferation, transportation electrification and bi-directional power flow.

**4. Communication**

Engage in proactive, meaningful and continual communication with customers and key stakeholders.

Building on these foundational elements, the Company is committed to advancing initiatives which will improve the resiliency of the system and overall service reliability as part of a long term strategy. In 2022, the Company continued to invest resources in the following:

- **Feeder Risk Model Analysis**

Utilized new business intelligence tools to provide visibility into problem areas on the system to direct resources proactively before reliability issues present.

1       •       **Work Prioritization Modeling**

2               Utilized asset methodology to optimize investment timing intervals on distribution  
3               equipment to ensure availability of equipment and minimize outages associated  
4               with reactive response while ensuring the creation of an efficient work plan which  
5               balances all inputs including customer requests, capital criteria and equipment  
6               investment.

7       •       **Vegetation Management Initiatives**

8               Forestry and GIS subject matter experts are working to evaluate the potential of  
9               ground-based LIDAR solutions to collect vegetation system inventory data quickly  
10              and accurately. This solution has the potential to improve insight into vegetation  
11              conditions throughout the province and allow vegetation investment to be even  
12              further targeted to deliver the largest proactive reliability impact.

13      •       **Coastal Standard Storm Hardening Design**

14              NS Power has developed an insulator framing design for application on feeder  
15              sections which are exposed to contaminants such as salt spray and industrial  
16              discharges, and to deal with excessive snow and ice accumulation. This framing is  
17              also designed to deal with the structural effects of high winds.

18      •       **Smart Grid Nova Scotia Pilot**

19              The Smart Grid Nova Scotia pilot project is underway. Currently, 135 residential  
20              batteries have been installed at locations across the province chosen to target  
21              reliability issues such as historical problem feeders and cold load pick up challenges  
22              (cold load pick up occurs when a feeder loses load diversity after an outage resulting  
23              in much higher load on the feeder, which means it must be restored in smaller  
24              sections until the load diversifies and levels out). This project explores other  
25              prospects such as smart EV chargers, solar and storage and bi-directional electric  
26              vehicle charging which offer further potential reliability benefits. The learnings

from these ongoing innovation projects continue to advance NS Power's experience and understanding of how to leverage these technological advancements alongside traditional solutions in future system and program design, along with projects and initiatives focused to address reliability challenges.

- **DSCADA – Distribution System Automation and Control**

Recent upgrades to NS Power's Advanced Distribution Management System (ADMS), have enabled the ability to introduce distribution automation via Distribution Supervisory Control and Data Acquisition (DSCADA) development on smart grid devices. DSCADA systems will make use of smart grid and communications-enabled distribution protection devices and switches to allow for remote operation and real-time condition reporting to the NS Power control centre.

- **Distribution System Inspection Technology Pilot**

NS Power is exploring the use of drones in the distribution system inspection program. The pilot goal is to understand how to integrate this technology into existing systems as well as gaining insight into powerline condition. NS Power is working to understand the operational challenges associated with flying drones along distribution lines and the required permissions to fly within some municipalities.

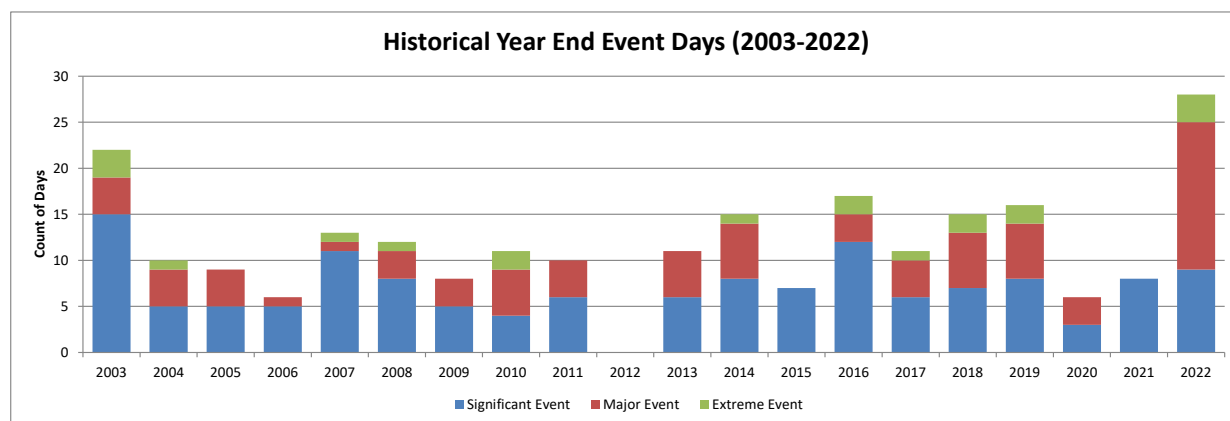
These approaches combine to strengthen and build layers of insight and options for grid reliability and power system resiliency solutions.

## **Weather Impact**

NS Power experienced 28 event days in 2022: 9 SEDs, 16 MEDs and 3 EEDs, as noted in **Figure 30**. This represents more total event days in a single year than any other year on record (since at least 2003). Included in these events were eight distinct severe weather events as well as Hurricane Fiona which caused historic levels of catastrophic damage to

the power system infrastructure. Photos of the damage inflicted by the hurricane are included in **Section 4.6** below.

**Figure 30 – Historical Year End Event Days (2003-2022)**



The restoration response for Hurricane Fiona was the largest in the Company's history. NS Power field resources were fully engaged in restoration activities from Hurricane Fiona's landfall on September 23 until the last customer was restored on October 10. In the weeks following this event, crews were engaged in the feeder sweeps and associated clean up activities associated with thousands of weak and compromised trees and damaged infrastructure resulting from Hurricane Fiona's extreme winds. Specially, NS Power vegetation crews have addressed vegetation issues at over 4,500 locations since October 10, 2022 and proactively removed over 10,000 weak or compromised trees.

**Figure 31** and **Figure 32** present the SAIDI and SAIFI figures for 2022 with the contributions to SAIDI and SAIFI from days meeting significant event day status highlighted. These graphs showcase the impacts of smaller event days (such as localized weather events) that do not reach the threshold of an MED or EED on the SAIDI and SAIFI results in 2022.

Figure 31 – 2022 SAIDI with SED Impacts Highlighted

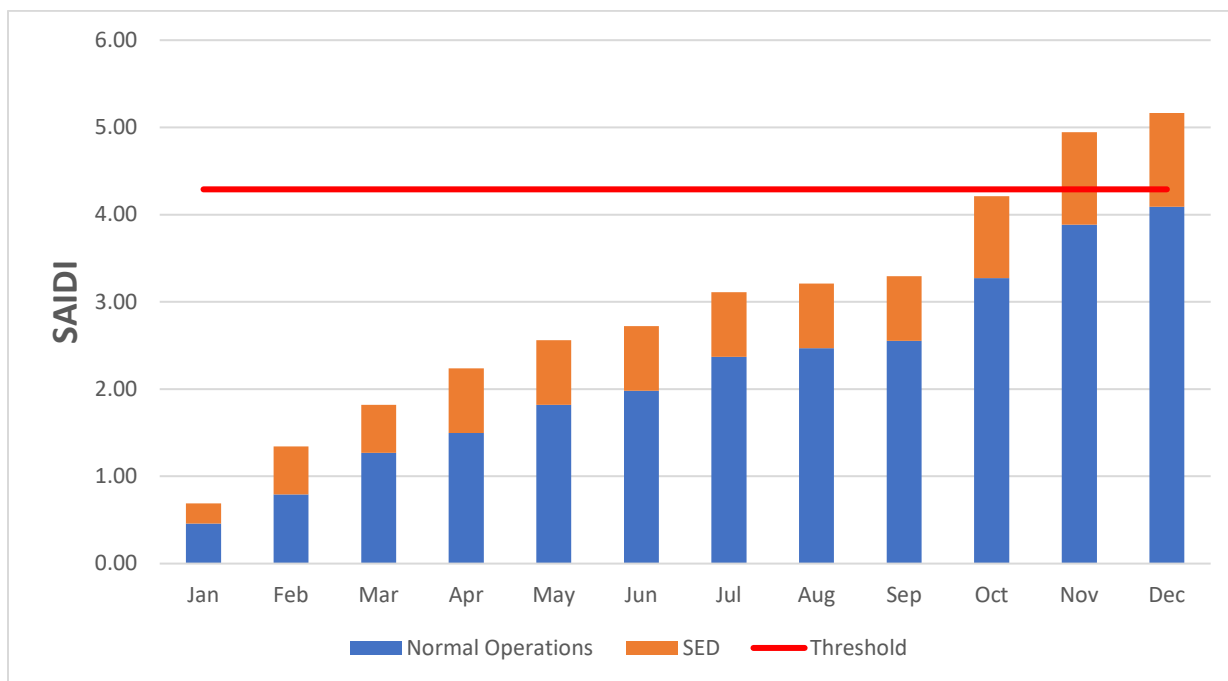
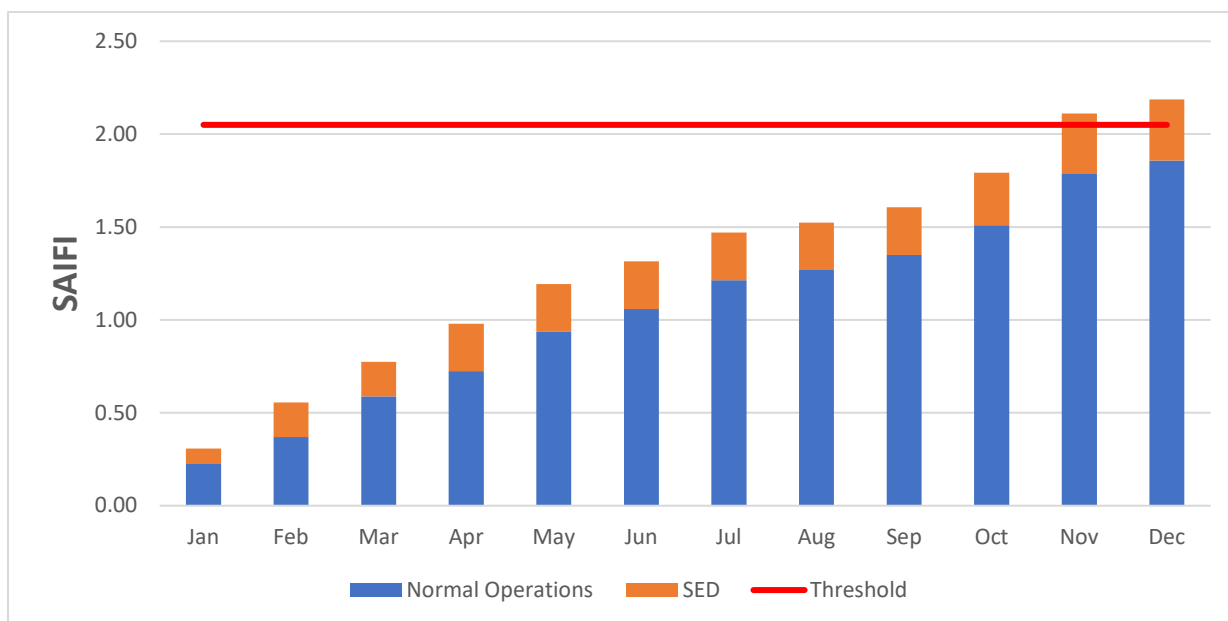


Figure 32 – 2022 SAIFI with SED Impacts Highlighted



The Company respectfully requests that the Board consider the impact of these event days on the 2022 SAIDI and SAIFI results. NS Power further asks the Board to consider the



1 reliability investments underway and planned in the 2023 ACE Plan when evaluating the  
2 Company's reliability performance.

3 Supporting documentation for the SAIDI and SAIFI results, including "all-inclusive"  
4 results,<sup>26</sup> is set out in **Appendix H**.

#### 5 **2.4.1 CKAIDI and CKAIFI Standards**

6 CKAIDI refers to the average duration of all power interruptions for customers connected  
7 to a particular circuit (feeder) during a one-year reporting period. CKAIFI refers to the  
8 average frequency of power interruptions for customers connected to a particular circuit  
9 (feeder) during a one-year reporting period. CKAIDI and CKAIFI results are location-  
10 specific, whereas SAIDI and SAIFI results are province-wide.

11 The following description of the CKAIDI and CKAIFI standards and the applicable targets  
12 are set out in Appendix A of the NSUARB's Order:

##### 13 ***Metrics:***

- 14 • *CKAIFI* is related to the *frequency* of interruptions experienced,  
15 which may be tied to a given circuit. CKAIFI is estimated using the  
16 following formula:

$$17 \text{ CKAIFI} = \frac{\text{Total Number of Customer Interruptions by Circuit}}{\text{Total Number of Customers Served by Circuit}}$$

- 18 • *CKAIDI* is related to the *duration* of interruptions experienced,  
19 which may be tied to a given circuit. CKAIDI is estimated using the  
20 following formula:

$$21 \text{ CKAIDI} = \frac{\text{Sum of All Customer Durations of Interruption by Circuit}}{\text{Total Number of Customers Served by Circuit}}$$

##### 22 ***Benchmarks:***

23 The benchmarking methodology for CKAIDI and CKAIFI is as follows:

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<sup>26</sup> M08574, NS Power 2017 Annual Performance Standards, NSUARB Decision Letter, May 1, 2018, page 5.

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Any circuit or feeder that is among the worst 5% of all NSPI's circuits or feeders for two consecutive years shall be labeled as a problem circuit. Any problem circuit that is among the worst 5% of all NSPI's circuits or feeders for the third consecutive reporting year shall be labeled a chronic circuit. If the CKAIDI or CKAIFI values of the chronic circuits in a given year is greater than the average CKAIDI or CKAIFI values plus two standard deviations across all NSPI circuits in the same year, NSPI would have not met the benchmark, and shall be subject to a penalty.<sup>27</sup>

**Figure 33** details the 2022 results for CKAIDI and **Figure 34** details the 2022 results for CKAIFI. The target feeders for CKAIDI and CKAIFI are identified in the Board's Decision on the prior year's results.

**Figure 33 – 2022 CKAIDI Results**

	Top 5% 2022	2022 Ranking* (Percentage)	2022 CKAIDI Result	2022 Target**
11S-411	Yes	98.2	22.84	19.81
2C-402	No	93.8	16.79	19.81
100C-421	No	85.8	10.16	19.81
24C-442	No	77.4	7.08	19.81
67C-411	No	70.5	5.38	19.81
77V-401	No	65.3	4.71	19.81

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<sup>27</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, Appendix A, page 2.

**Figure 34 – 2022 CKAIFI Results**

	Top 5% 2022	2022 Ranking* (Percentage)	2022 CKAIFI Result	2022 Target**
<b>2C-402</b>	No	92.5	4.80	5.45
<b>24C-442</b>	No	83.6	3.69	5.45
<b>59C-402</b>	No	70.7	2.58	5.45

\* Feeders with a rank of 95-100 percent are ranked in the top 5<sup>th</sup> percentile of worst-performing feeders in 2022.

\*\* The 2022 target reflects the average of the CKAIDI/CKAIFI values for the year plus two standard deviations.

Supporting documentation for the CKAIDI and CKAIFI results is set out in **Appendix I**.

#### **2.4.1.1 Keltic Drive Feeder 11S-411**

Keltic Drive feeder 11S-411 finished in the top five percent of the worst-performing feeders in 2022 for CKAIDI or outage duration. This feeder had a CKAIDI value of 22.84 versus the target of  $\leq 19.81$  as shown in **Figure 35**. This feeder has a reliability improvement plan underway.

**Figure 35 – 11S-411 CKAIDI Results**

	2020	2021	2022
<b>CKAIDI</b>	13.74	22.50	22.84

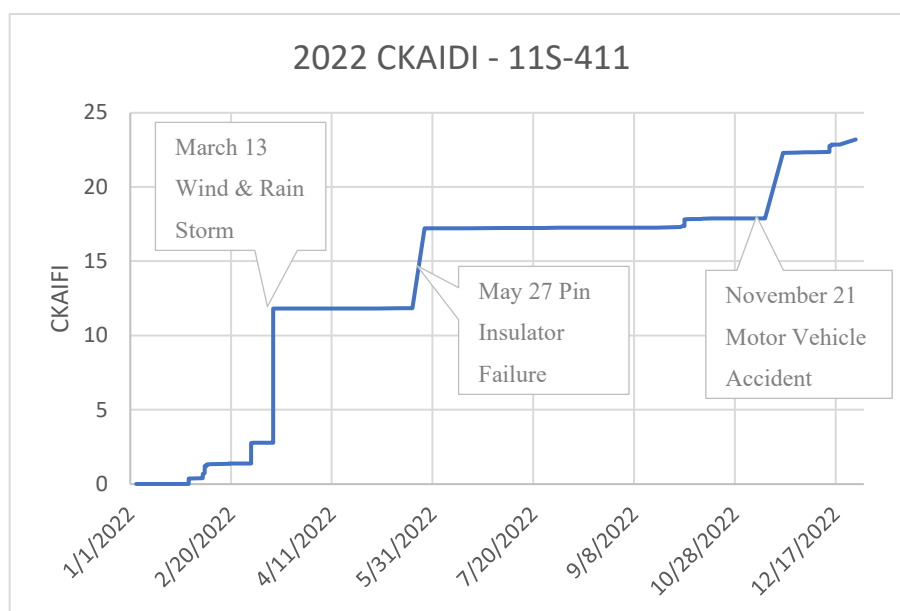
The Keltic Drive feeder serves 3,207 customers along a total distribution circuit length of 178 km running through a suburban to rural area characterized by pockets of heavy trees and sections bordering on the Bras D’or Lakes. Feeder 11S-411 serves customers through Coxheath, Howie Centre, and along both sides of the Bras d’Or Lakes serving the communities of East Bay, Islandview, Eskasoni, and along to the Big Pond area. The feeder is heavily treed with exposure to high wind gusts along the lake. Due to the extensive feeder

length identifying the location of an issue in the event of an outage can be significant. Approximately 28 km of the line runs off-road, requiring access by off-road machinery or on foot to restore outages in these sections.

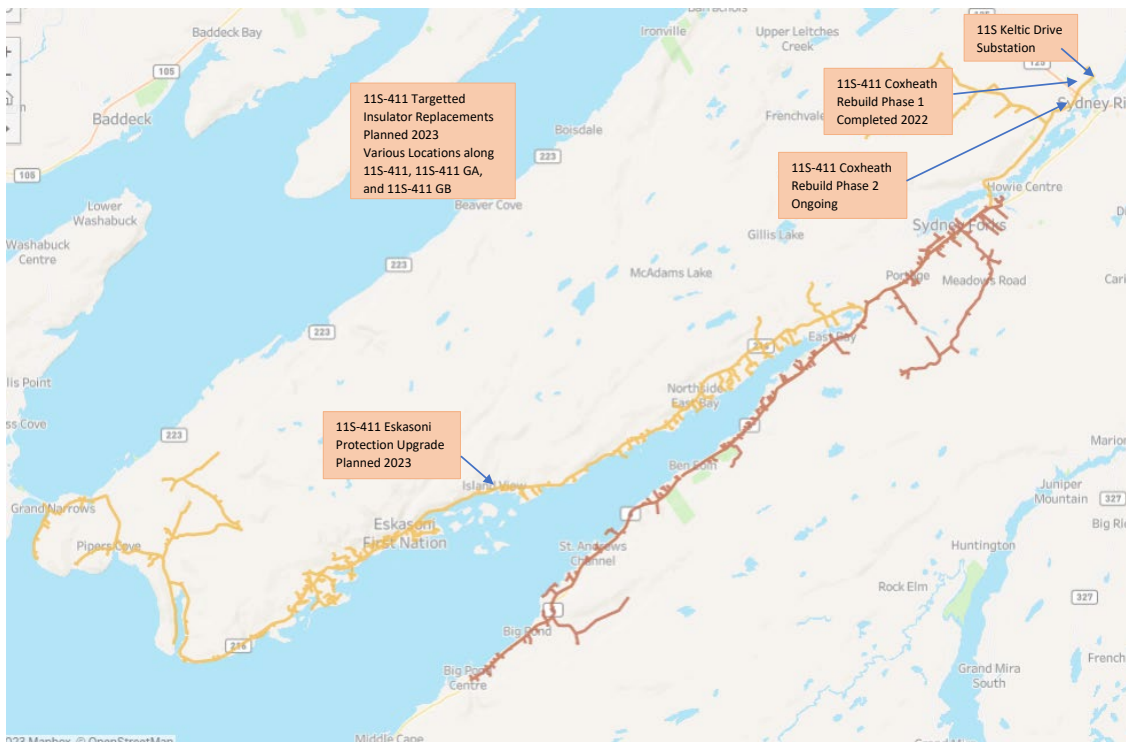
Three significant events in 2022 contributed 14.5 hours out of the 22.84 of total CKAIDI on feeder 11S-411. The events attributed to an insulator failure on May 27 contributed 5.4 hours to CKAIDI or 23.6 percent of the total and the events attributed to a high wind and rain event on March 13 (that did not reach the level of an MED) contributed a further 4.8 hours or 21 percent of the total. A motor vehicle accident on November 21 contributed 4.4 hours to CKAIDI or 19 percent of the total. Combined, these three events contributed 63.8 percent of the entire outage duration to feeder 11S-411 in 2022 as shown in **Figure 36**. Without the impact of the motor vehicle accident, feeder 11S-411 would have met the CKAIDI target in 2022.

The reliability action plan for feeder 11S-411, as detailed below, outlines extensive vegetation management and proactive insulator replacements. NS Power completed an ultrasonic line scan to further assess insulator condition and identified at-risk insulators along the feeder. Replacement of these insulators is in progress.

**Figure 36 – 11S-411 CKAIDI 2022**



**Figure 37 – Feeder 11S-411 Reliability Action Plan Projects**



The details of the 303 outage events on feeder 11S-411 in 2022 are as follows:

- 169 events impacted a single customer
- 102 outages impacted between 2 and 100 customers
- 21 outages impacted between 101 and 1000 customers
- 11 outages impacted over 1000 customers

With the exception of Hurricane Fiona, 24 percent of outages on feeder 11S-411 were restored in less than five hours and 38 percent in less than six hours.

### **Vegetation Management Strategy**

The distribution system vegetation management program has oversight for the 178 km of distribution line which makes up the 11S-411 feeder. NS Power has prioritized vegetation

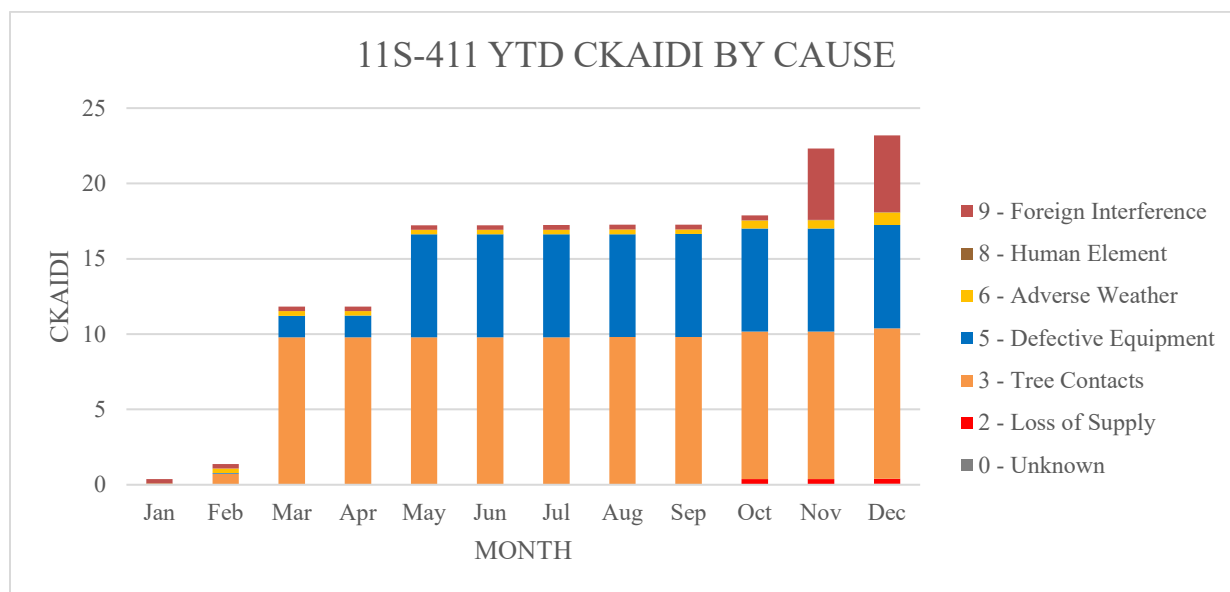
management efforts, totaling \$0.6 million, including right-of-way widening and tree maintenance on 26 km of feeder 11S-411 since 2017.

A review of the remaining spans has identified a further investment of \$0.42 million required over the next three-year period to address emerging vegetation issues on the remaining spans and would be subsequently maintained on a phased basis over a ten-year cycle on the full feeder.

### Reliability Analysis

The leading outage causes on feeder 11S-411 are tree contacts (outages due to trees making contact with electrical equipment), adverse weather conditions (outages due to wind, snow, and ice including trees contacts due to those conditions), and foreign interference (outages beyond the control of the utility such as contact by birds, animals, vehicles, and other foreign objects). **Figure 38** shows the contribution to CKAIDI by cause code.

**Figure 38 – 11S-411 CKAIDI Contribution by Cause**

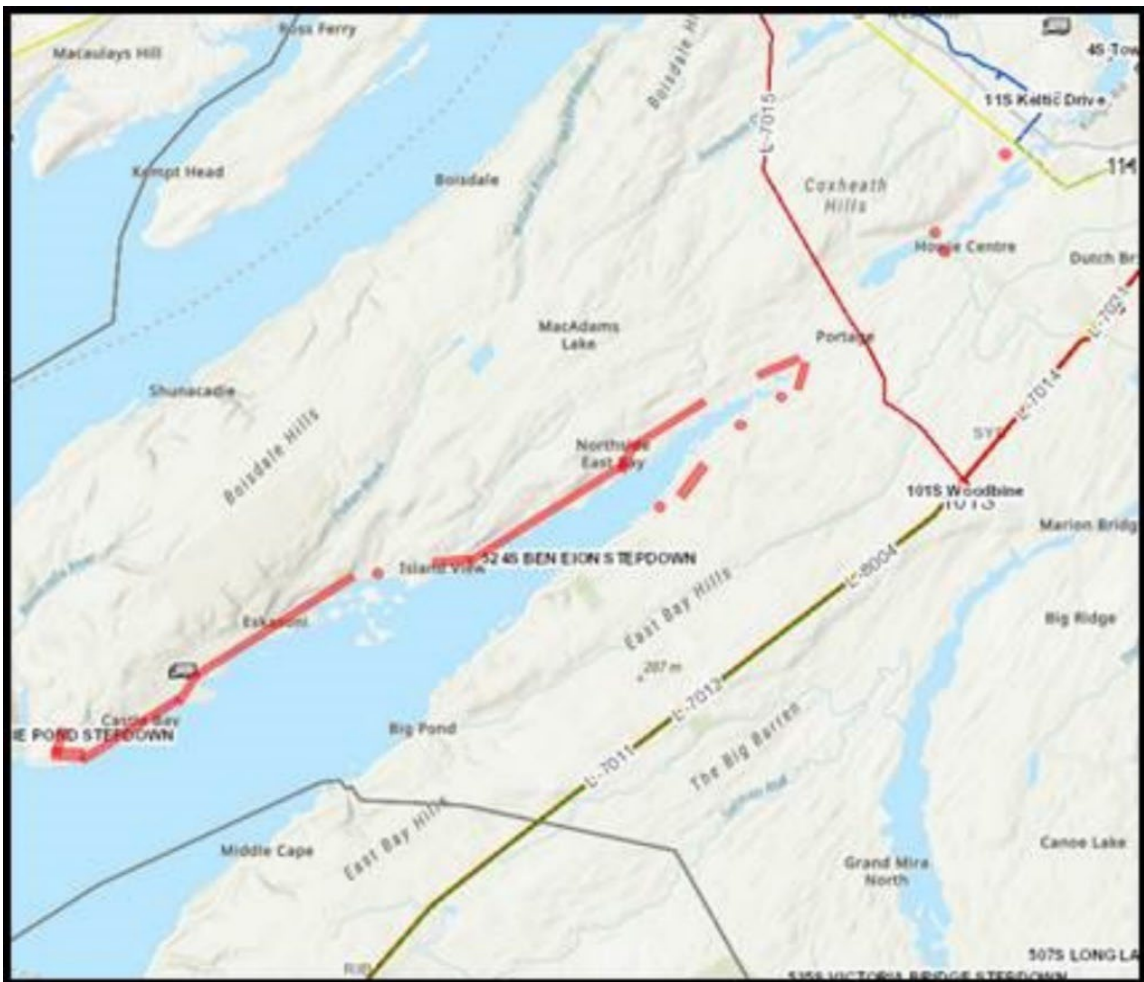


**Feeder 11S-411 Reliability Action Plan**

The Reliability Action Plan for feeder 11S-411 involves \$1.58 million of investment in projects for potential completion between 2023 and 2025. This plan builds on the extensive work, totaling more than \$3.26 million, completed or in progress since 2016 on 11S-411. The following figures provides additional detail on these investments.

**Figure 39** shows the location of the targeted insulator replacement project for feeder 11S-411. This project will replace several hundred insulators along this section of line that have been identified via an ultrasonic scan as being at increased risk of failure. **Figure 40** and **Figure 41** show the extent of the area targeted for rebuild, including reinsulation and reconductor. **Figure 42** shows the location of the Eskasoni protection device upgrade. In addition to the work profiled here, twelve work orders generated from ongoing feeder inspections will be completed. Feeder inspection work proactively identifies equipment which has reached end of life and is prioritized for replacement.

1      **Figure 39 – Feeder 11S-411 Targeted Insulator Replacement**





1      **Figure 40 – Feeder 11S-411 Coxheath Reinsulate and Reconductor**



1      **Figure 41 – Feeder Coxheath Rebuild Phase 2**



**Figure 42 – Eskasoni Protection Upgrade**



### Investment

NS Power started targeted reliability investments on 11S-411 in 2016 and work has continued into 2023. Please refer to **Figure 43** for a summary of NS Power’s reliability investments for this feeder.

**Figure 43 – 11S-411 Reliability Investments 2016-2025**

Year	Project	Description	Investment	Status
2016	Rebuild	11S-411 11S-302 Rebuild Coxheath Road Phase 1	\$182,268.97	Completed
2017	Rebuild	11S-411 11S-302 Rebuild Coxheath Road Phase 2	\$774,528.10	Completed
2017	Vegetation Management	7 km of Vegetation Management	\$167,700	Completed

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<b>Year</b>	<b>Project</b>	<b>Description</b>	<b>Investment</b>	<b>Status</b>
<b>2019</b>	Transmission Upgrades L5564	Structure Replacements and Upgrades	\$780,000	Completed
<b>2020</b>	Vegetation Management	7 km of Vegetation Management	\$152,100	Completed
<b>2021</b>	Vegetation Management	12 km of Vegetation Management	\$284,700	Completed
<b>2022</b>	Rebuild	11S-411 Coxheath Reinsulate and Reconductor	\$921,432.72	Completed
<b>2022</b>	Vegetation Management	Line Management	\$35,000	In Progress
<b>2022-2023</b>	Rebuild	11S-411 Coxheath Rebuild Phase 2	\$850,000	In Progress
<b>2023</b>	Targeted Device Replacement	11S-411 Targeted Insulator Replacement	\$75,000	Planned
<b>2023</b>	Targeted Device Replacement	11S-411GA Targeted Insulator Replacement		Planned
<b>2023</b>	Targeted Device Replacement	11S-411GB Targeted Insulator Replacement		Planned
<b>2023</b>	Protection Upgrade	11S-411 Eskasoni Protection Upgrade	\$76,571.60	Planned
<b>2023</b>	Vegetation Management	5 km of Vegetation Management	\$130,000	In Progress
<b>2023</b>	Transmission System Upgrades L5576	Framing Upgrades	\$130,000	Planned

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Year	Project	Description	Investment	Status
2024	Vegetation Management	5.5 km of Vegetation Mangement	\$140,000	Planned
2025	Vegetation Management	6 km of Vegetation Mangement	\$150,000	Planned

NS Power has invested over \$3.26 million in reliability-focused projects on feeder 11S-411 since 2016. An additional \$1.58 million is committed for vegetation management and bring-to-roadside projects in 2023, 2024 and 2025. These investments will continue to have a positive impact on the reliability of feeder 11S-411 and NS Power anticipates that barring exceptional circumstances, feeder 11S-411 will meet the CKAIID target in 2023.

**Appendix J** provides a map that uses data from NS Power's GIS to overlay locations of each of the 303 events with reliability investments planned or completed on this feeder.

**3.0 CUSTOMER-LEVEL RELIABILITY DATA**

In its order on the 5-year review of Performance Standards on April 7, 2022. The Board stated the following:

The Board orders as follows:

...

To report on the progress of the development of customer-level reliability data through the ADMS system in the 2022 Performance Standards Report, including any other available information from other CEA utilities<sup>28</sup> on this topic.<sup>29</sup>

NS Power has outlined the following stages of the project to develop customer-level reliability metrics:

1. Concept
2. Data Validation
3. Database design
4. Data transfer
5. Beta testing of metric calculation
6. Produce first operational values of metric (\*Present Stage)

Currently, the Company has reached step 6 and produced the first operational values for Customers Experiencing Long Interruption Duration (CELID-8), and Customers Experiencing Multiple Interruptions (CEMI-4 and CEMI-5). CELID-8 is defined as the percentage of customers who experience interruptions with cumulative duration longer than or equal to a given threshold (in this case, 8 cumulative hours). CEMI represents the percentage of customers experiencing a volume of sustained interruptions greater or equal

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<sup>28</sup> The Canadian Electricity Association (CEA) has been renamed Electricity Canada.

<sup>29</sup> M10279, NS Power Performance Standards, NSUARB Order, April 7, 2022, page 2.

to a threshold (in this case 4 and 5 interruptions for CEMI-4 and CEMI-5 respectively).<sup>30</sup>  
The preliminary values can be found in **Figure 44** and **Figure 45**.

NS Power reports a five-year average value for CEMI-5 of 10.2 percent, indicating that 10.2 percent of customers experienced five or more sustained outages on average from 2017-2021 (with MEDs, EEDs and Planned outages removed). Similarly, the preliminary five-year average value for CEMI-4 (four or more interruptions) is 18.7 percent.

NS Power reports the preliminary five-year average value for CELID-8 as 28.9 percent (with MEDs, EEDs and Planned outages removed). This metric indicates that over the same 2017-2021 period, 28.9 percent of customers experienced an average of eight cumulative hours of interruption annually.

As with any new complex reporting system, time is required to develop a baseline for comparison, ensure accuracy of reported data, and to gain perspective about how best to interpret and make sound investment decisions based on the resulting customer level reliability trends.

**Figure 44 – Preliminary Results for NS Power Customers Experiencing Multiple Interruptions - 4 and 5 (MED, EEDs and Planned excluded)**

CEMI (PS) BINS	2017	2018	2019	2020	2021	5-YR AVG
4	12.7%	15.6%	26.4%	16.9%	21.8%	<b>18.7%</b>
5	6.4%	8.5%	14.6%	8.9%	12.9%	<b>10.2%</b>

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<sup>30</sup> IEEE Guide for Electric Power Distribution Reliability Indices, IEEE Std 1366-2022, page 17.



**Figure 45 – Preliminary Results for Customers Experiencing Long Interruption Duration - 8 hours Cumulative (MEDs, EEDs and Planned Outages Removed)**

	2017	2018	2019	2020	2021	5-YR AVG
<b>CELID-8</b>	27.1%	22.1%	38.8%	25.2%	31.6%	<b>28.9%</b>

Per the Board’s direction, NS Power has undertaken an analysis of other Electricity Canada utilities and explored to what extent they are utilizing these metrics. **Figure 46** shows the summarized results from Electricity Canada member utilities.

**Figure 46 – Summary of Customer Level Reliability Metric Use by Electricity Canada Utilities**

Utilities	CEMI	CELID	CEMM	OTHER
<b>Ontario</b>				
Alectra	No	No	No	No
Algonquin	No	No	No	No
Eleicon	No	No	No	No
FortisON	No	No	No	No
Hydro One	No	No	No	No
Hydro Ottawa	No	No	No	No
IESO	No	No	No	No
London Hydro	No	No	No	No
Oakville Hydro	No	No	No	No
OPG	No	No	No	No
Toronto Hydro	No	No	No	No
Utilities Kingston	No	No	No	No



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Utilities	CEMI	CELID	CEMM	OTHER
British Columbia				
BC Hyrdo	Yes	No	No	No
Fortis BC	No	No	No	No
Saskatchewan				
Saskatoon Light & Power	No	No	No	No
SaskPower	No	No	No	No
Newfoundland and Labrador				
Newfoundland and Labrador Hydro	No	No	No	No
Newfoundland Power Inc.	No	No	No	No
New Brunswick				
New Brunswick Power	No	No	No	No
Saint John Energy	No	No	No	No
Alberta				
ENMAX	No	No	No	No
EPCOR	No	No	No	No
FortisAlberta	No	No	No	No
ATCO	No	No	No	No
Quebec				
Hydro Quebec	No	No	No	No
Manitoba				
Manitoba Hydro	No	No	No	No
Prince Edward Island				

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Utilities	CEMI	CELID	CEMM	OTHER
Maritime Electric	No	No	No	No
Yukon				
Yukon Energy Corporation	No	No	No	No
ATCO Electric Yukon	No	No	No	No
Northwest Territories				
Northwest Territories Power Corporation	No	No	No	No
Northland Utilities (ATCO Electric)	No	No	No	No
Nunavut				
Qulliq Energy Corporation	No	No	No	No

This analysis included 32 Electricity Canada member utilities. Of the 32 utilities reviewed, only one reports on a customer-level reliability metric: BC Hydro, which provides annual updates on CEMI-4 as part of its reliability reporting. BC Hydro operates under significantly different conditions from NS Power, in particular with respect to exposure to severe weather events such as hurricanes.. As such, NS Power does not consider BC Hydro's reported metrics for CEMI an appropriate comparator for benchmarking or target-setting.

With this information, and before considering imposition of standards in relation to this data, it will be important to understand how these metrics are being measured, used and reported in other jurisdictions. At present, there is limited data available to determine comparator values in other utilities or to establish benchmarks. NS Power will continue to monitor the use of customer-level reliability metrics and will continue to report on them annually.

**4.0 MAJOR EVENT DAYS AND EXTREME EVENTS DAYS IN 2022**

NS Power experienced 20 event days in 2022: 3 EEDs, 16 MEDs and 1 SED following a MED or EED.

The IEEE 1366-2012 Standard methodology defines a Major Event Day as:

A day in which the daily System Average Interruption Duration Index (SAIDI) exceeds a Major Event Day threshold value. For the purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than  $T_{med}$  are days on which the energy delivery system experienced stresses beyond that normally expected (such as during severe weather). Activities that occur on Major Event Days should be separately analyzed and reported.<sup>31</sup>

SEDs, MEDs, and EEDs are defined by the same standard methodology as the IEEE 1366-2012 standard but with different beta values:

- Significant Events: 2.0 Beta
- Major Events: 2.5 Beta
- Extreme Events: 3.5 Beta<sup>32</sup>

Using the IEEE methodology, in 2022 the customer hours of interruption (CHI) threshold for an SED is 73,376, a MED is 182,510 CHI, and an EED is 1,129,145 CHI. This means that the accumulated CHI during a 24-hour period must exceed these thresholds for the day to be subject to the corresponding adverse weather response standards.

In the sections below NS Power summarizes each of the Major and Extreme event days experienced in 2022 and outlines the specific information requested by the NSUARB. The Company's four territories described in the following sections are as indicated on the map in **Figure 47** below. Further, the geographical areas referenced in the precipitation and

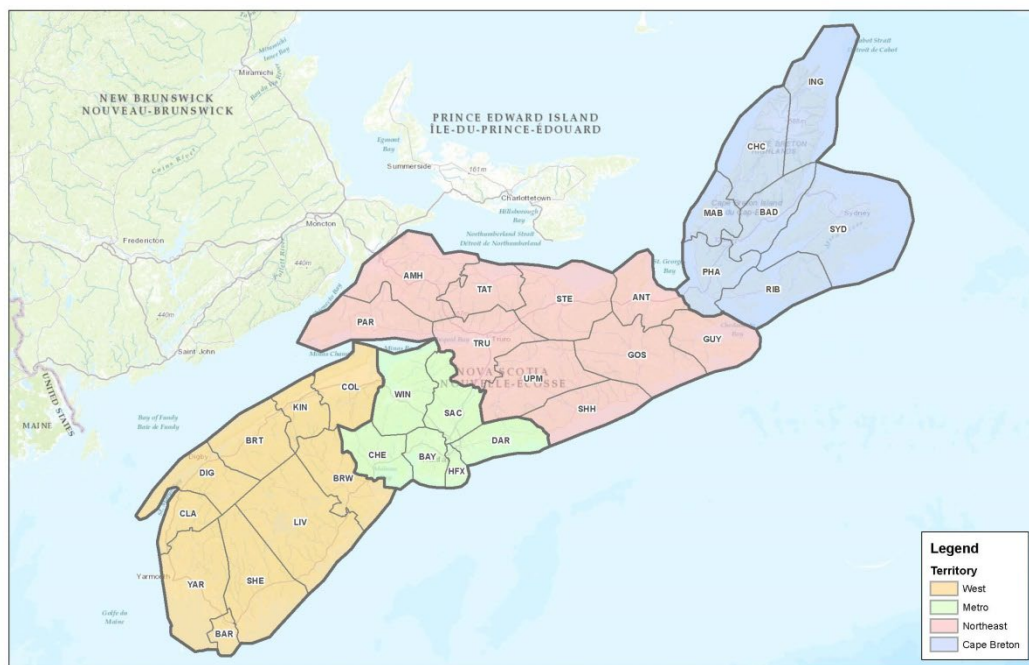
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<sup>31</sup> M07387, Exhibit N-23, LEI Response to Undertaking 1, September 23, 2016, page 16.

<sup>32</sup> M07387, Exhibit N-1, London Economics International LLC, Consultation Paper: Setting Performance Standards for Nova Scotia's electricity sector, May 15, 2016, page 55.

wind speed level tables in **Figure 51** follow the weather reporting zones listed by RWDI (formerly Scotia Weather Service).<sup>33</sup>

**Figure 47 – NS Power Operational Territories**



#### 4.1 Major Event Day – January 7-8, 2022

The event on January 7 and 8, 2022 began on January 7<sup>th</sup> as high winds and heavy snowfall impacted the western part of the province, later moving throughout the rest of the province into January 8<sup>th</sup>. The precipitation was heavy, wet snow with some rain mixing along the Atlantic coast, causing significant accumulation of snow on trees and power lines. **Figure 48** below shows the impact of the snow accumulation on trees.

<sup>33</sup> M08574, NS Power 2017 Annual Performance Standards Report, page 6.

**Figure 48 – Snow Accumulation on Trees in Bear River**



All Performance Standards Metrics were met for the January 7-8, 2022 event. **Figure 49** below sets out the storm target and corresponding result.

**Figure 49 – January 7-8, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hrs	91.98%	January 7: 99.09% January 8: 100%	Achieved
Notification of EOC Opening	Within 4 hrs	Achieved	Achieved
% Outage Calls Answered in 45 sec	85%	97.76%	Achieved

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Metric	Target	Result	Outcome
% Polite Disconnects	10%	0.47%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

**4.1.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the January 7-8, 2022 MEDs are set out in **Figure 50**.

**Figure 50 – SAIDI and SAIFI Values for January 7-8, 2022 MEDs**

Date	CI	CHI	SAIFI	SAIDI
January 7	172,331	1,036,587	0.33	1.96
January 8	40,701	180,505	0.08	0.34

**4.1.2 Restoration Profile and Restoration Challenges**

The January 7-8, 2022 MEDs resulted from a combination of high winds and heavy snowfall. In the storm's wake there was a short warming period along the Atlantic coastline, followed by a rapid cooling period, bringing snow followed by a mix of snow, rain, and freezing rain, and then more snow. Total snowfall exceeded 40 cm in some inland areas, causing challenging travel conditions. Snow accumulation on poles and lines, combined with strong gusts/winds, led to trees and branches falling on power lines. Peak wind gusts for each region are detailed below in **Figure 51**.

**Figure 51 – January 7-8, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	63

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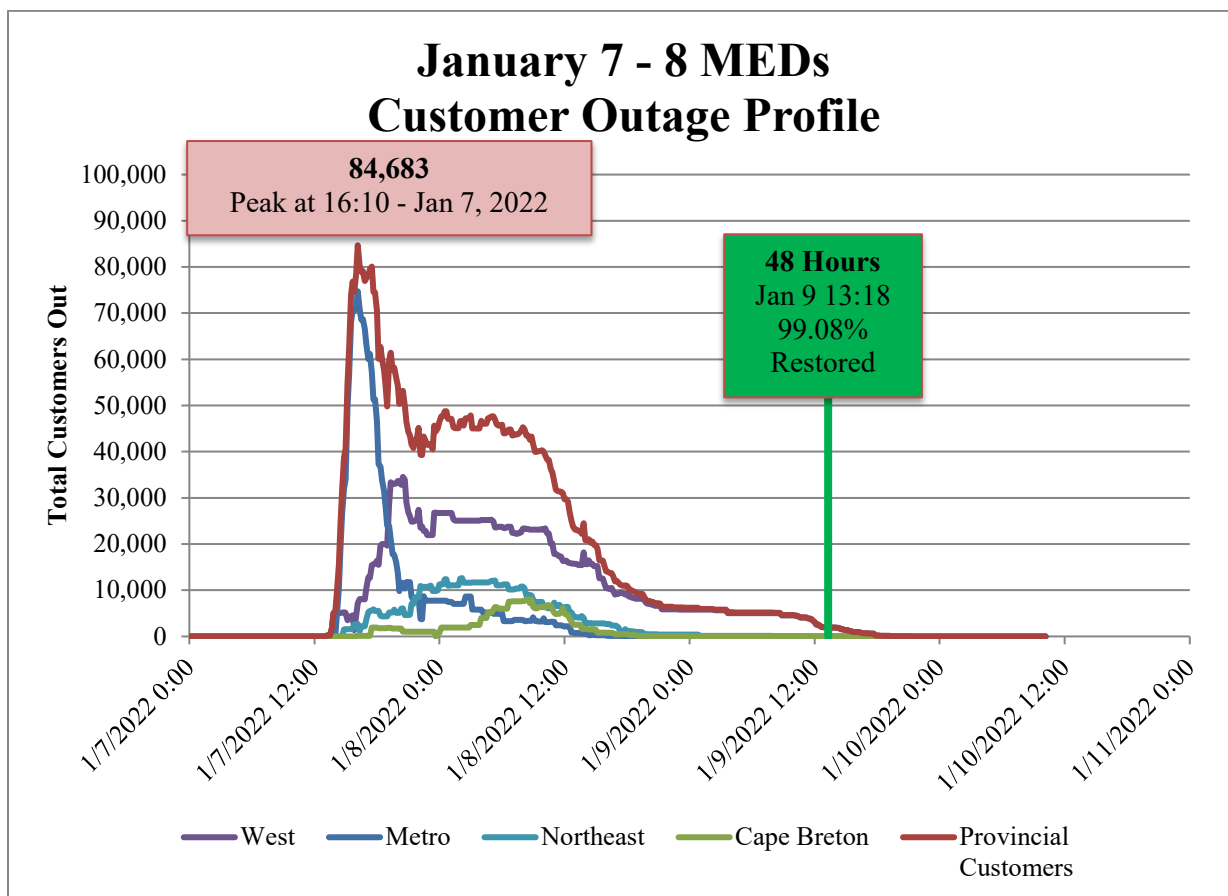
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Region	Peak Gust (km/h)
South Shore	85
Northern	82
Northeast	93
Metro	85
Eastern Shore	100
CB West	126
CB East	87

The customer outage profile shown in **Figure 52** shows that 99.08 percent of all customer interruptions from the January 7 and 8 MEDs combined were restored within the first 48 hours of the event.



Figure 52 – Customer Outage Profile for January 7-8, 2022 MED



#### 4.1.3 Customer Service Results

NS Power's Customer Care Centre received 65,532 calls during the January 7-8, 2022 MEDs. Ninety-seven (97.76) percent of calls were answered within the 45 second metric. Eighty-three (83.88) percent of customers calling were satisfied with the information received through the HVCA system, while 9,752 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 53** details the Customer Service Storm Metrics for the January 7-8, 2022 MEDs.



**Figure 53 – Customer Service Storm Metrics for January 7-8, 2022 MEDs**

Metrics	Volume
Total # Outage Calls Received	65,532
HVCA Satisfied (Self Service)	54,969
Agent Answered (Voice)	9,752
% HVCA Satisfied	83.88
# of Polite Disconnects	50
Average Speed of Answer (in second)	23
Service Level (% Answered in 45 Seconds or Less)	97.76

#### **4.1.4 Crew Information**

NS Power mobilized over 500 field personnel to restore power for the January 7-8, 2022 MEDs as detailed in **Figure 54**. Over 40 contractor crews from Canada and the US joined NS Power's internal resources to restore power to customers.

**Figure 54 – Crew Information for January 7-8, 2022 MEDs**

Crew	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	14
	Metro	25
	Northeast	16
	West	29
<b>External Powerline Technicians</b>	Cape Breton	10
	Metro	11

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<b>Crew</b>	<b>Region</b>	<b>Crew Count</b>
	Northeast	12
	West	18
<b>Forestry Workers</b>	Cape Breton	9
	Metro	9
	Northeast	14
	West	13
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	5
	Northeast	5
	West	5
<b>Distribution Damage Assessors</b>	Cape Breton	8
	Metro	8
	Northeast	5
	West	10
<b>Transmission Damage Assessors</b>	Cape Breton	2
	Metro	2
	Northeast	4
	West	3
	Total Field Resources (individuals)	544

1

2

**4.1.5 Media Releases**

In addition to issuing a media release, the Company communicated the EOC activation notice, along with regular storm updates, via NS Power's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issues by NS Power with respect to this event.

**4.2 Major Event Day – January 14-15, 2022**

The event on January 14 and 15, 2022 began on January 14<sup>th</sup> in the late afternoon as high winds and rain impacted the western part of the province. As the storm system passed through the province, there was a mix of precipitation, starting with rain then transitioning to freezing rain and ice pellets before becoming snow. High winds accompanied the precipitation mix until the evening of January 15<sup>th</sup> as the northerly winds became more westerly and the system tracked towards Newfoundland. **Figure 55** below shows the result of high winds causing trees to land on power lines.

1      **Figure 55 – Trees Landing on Power Lines from High Winds**



2  
3      All Performance Standards Metrics were met for the January 14-15, 2022 event. **Figure 56**  
4      below sets out the storm target and corresponding result.

**Figure 56 – January 14-15, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hours	91.98%	January 14: 99.92% January 15: 99.58%	Achieved
Notification of EOC Opening	Within 4 hrs	Achieved	Achieved
% Outage Calls Answered in 45 seconds	85%	99.63%	Achieved
% Polite Disconnects	10%	0.17%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### 4.2.1 SAIDI and SAIFI

The SAIDI and SAIFI results for the January 14-15, 2022 MEDs are set out in **Figure 57**.

**Figure 57 – SAIDI and SAIFI Values for January 14-15, 2022 MEDs**

Date	CI	CHI	SAIFI	SAIDI
January 14	22,636	159,130	0.04	0.30
January 15	90,544	538,681	0.17	1.02

#### 4.2.2 Restoration Profile and Restoration Challenges

The January 14-15, 2022 MEDs resulted from high winds with snow and ice accumulation on power lines and trees. Six of eight weather regions experienced wind gusts exceeding

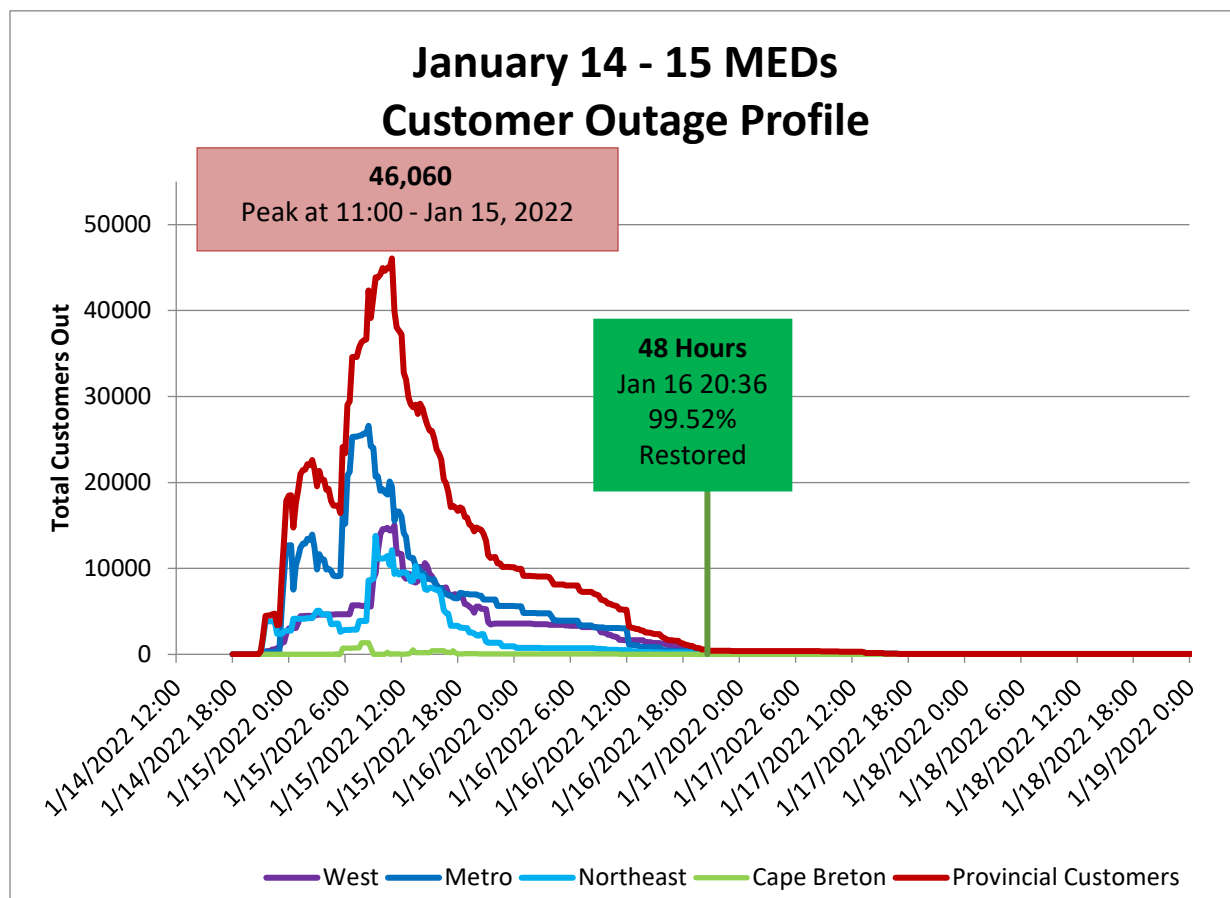
80 km/h. Wind gusts in the Northeast and Metro regions exceeded 90 km/h on January 15<sup>th</sup> while a 121 km/h gust was observed from the Eastern Shore (Beaver Island) weather station. The mixture of rain, freezing rain and snow accumulation stuck to trees and power lines, weighing down branches, causing trees to fall on power lines. Peak wind gusts for each region are detailed below in **Figure 58**.

**Figure 58 – January 14-15, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	69
South Shore	89
Northern	78
Northeast	95
Metro	96
Eastern Shore	121
CB West	89
CB East	80

The customer outage profile shown in **Figure 59** shows that 95.52 percent of all customer interruptions from the January 14 and 15 MEDs combined were restored within the first 48 hours of the event.

Figure 59 – Customer Outage Profile for January 14-15, 2022 MED



### 4.2.3 Customer Service Results

NS Power's Customer Care Centre received 54,482 calls during the January 14-15, 2022 MEDs. Ninety-nine (99.63) percent of calls were answered within the 45 second metric. Eighty-one (81.51) percent of customers calling were satisfied with the information received through the HVCA system, while 9,845 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 60** details the Customer Service Storm Metrics for the January 14-15, 2022 MEDs.

**Figure 60 – Customer Service Storm Metrics for January 14-15, 2022 MEDs**

Metrics	Volume
Total # Outage Calls Received	54,482
HVCA Satisfied (Self Service)	44,411
Agent Answered (Voice)	9,845
% HVCA Satisfied	81.51%
# of Polite Disconnects	17
Average Speed of Answer (in seconds)	5
Service Level (% Answered in 45 Seconds or Less)	99.63%

#### 4.2.4 Crew Information

NS Power mobilized over 600 field personnel to restore power for the January 14-15, 2022 MEDs as detailed in **Figure 61**. Eighty-five contractor crews joined NS Power internal resources to restore power to customers.

**Figure 61 – Crew Information for January 14 - 15, 2022 MEDs**

	Region	Crew Count
NS Power Powerline Technicians	Cape Breton	15
	Metro	26
	Northeast	19
	West	27
External Powerline Technicians	Cape Breton	3
	Metro	25



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	Region	Crew Count
	Northeast	20
	West	37
<b>Forestry Workers</b>	Cape Breton	10
	Metro	9
	Northeast	15
	West	7
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	5
	Northeast	5
	West	10
<b>Distribution Damage Assessors</b>	Cape Breton	7
	Metro	8
	Northeast	6
	West	10
<b>Transmission Damage Assessors</b>	Cape Breton	2
	Metro	2
	Northeast	7
	West	3
	Total Field Resources (individuals)	641

**4.2.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

**4.3 Major Event Day – February 3, 2022**

The event on February 3<sup>rd</sup> was related to salt contamination on electrical equipment. Salt water can act as a conductor on electrical equipment and cause electrical shorting on parts of the system. Most of the salt contamination occurred in the Metro region, mostly in Dartmouth. Temperatures in the day preceding the event were as low as -12° Celsius and with slight winds in coastal areas, salt was blown and accumulated onto equipment. Temperatures on February 3<sup>rd</sup> rose to around 2° Celsius overnight and the moisture in the air combined with the salt caused electrical arcing across the equipment.

All Performance Standards Metrics were met for the February 3, 2022 event. **Figure 62** below sets out the storm target and corresponding result.

**Figure 62 – February 3, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
<b>% Customers Restored within 48 hours</b>	91.98%	February 3: 100%	Achieved
<b>Notification of EOC Opening</b>	Within 4 hrs	Achieved	Achieved

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Metric	Target	Result	Outcome
% Outage Calls Answered in 45 seconds	85%	94.13%	Achieved
% Polite Disconnects	10%	0.00%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

**4.3.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the February 3, 2022 MEDs are set out in **Figure 63**.

**Figure 63 – SAIDI and SAIFI Values for February 3, 2022 MED**

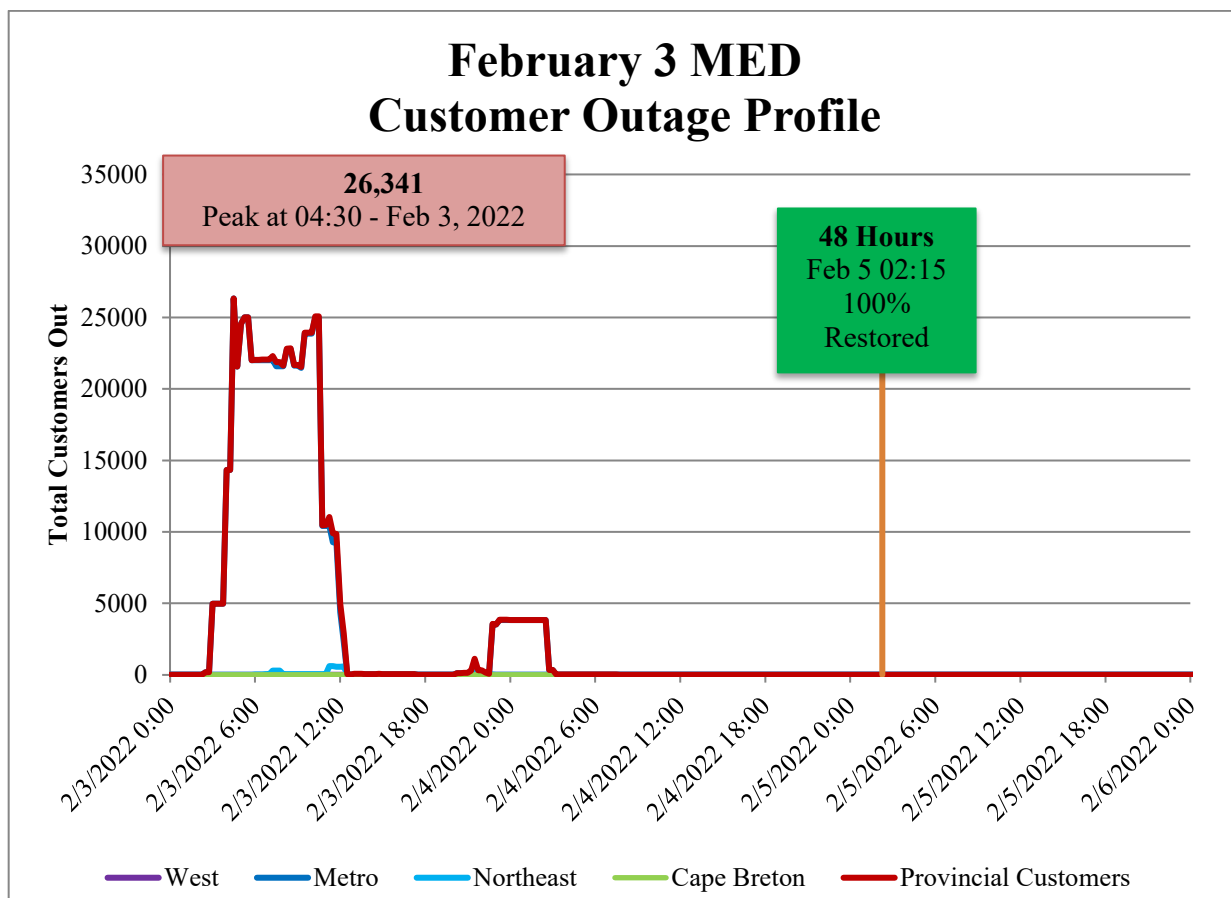
Date	CI	CHI	SAIFI	SAIDI
February 3	40,551	189,263	0.08	0.36

#### **4.3.2 Restoration Profile and Restoration Challenges**

The February 3<sup>rd</sup> MED resulted from electrical arcing due to salt contamination on the equipment. Other than the modest temperature change, weather is not considered a dominant factor in the event. The electrical arcing caused by the salt contamination occurred early in the morning of February 3<sup>rd</sup>. Later in the day there were winds and rain, which helped dissipate the salt on the equipment. Restoration efforts began in the morning of the 3<sup>rd</sup>.

The customer outage profile shown in **Figure 64** shows that 100 percent of all customer interruptions from the February 3 MED combined were restored within the first 48 hours of the event.

Figure 64 – Customer Outage Profile for February 3, 2022 MED



### 4.3.3 Customer Service Results

NS Power's Customer Care Centre received 8,513 calls during the February 3, 2022 MED. Ninety-four (94.13) percent of calls were answered within the 45 second metric. Eighty-four (84.31) percent of customers calling were satisfied with the information received through the HVCA system, while 1,046 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 65** details the Customer Service Storm Metrics for the February 3, 2022 MED.

**Figure 65 – Customer Service Storm Metrics for February 3, 2022 MED**

Metrics	Volume
Total # Outage Calls Received	8,513
HVCA Satisfied (Self Service)	7,177
Agent Answered (Voice)	1,046
% HVCA Satisfied	84.31%
# of Polite Disconnects	0
Average Speed of Answer (in second)	64
Service Level (% Answered in 45 Seconds or Less)	94.13%

#### **4.3.4 Crew Information**

NS Power mobilized all internal Powerline Technicians to restore power for the February 3 MED as detailed in **Figure 66**.

**Figure 66 – Crew Information for February 3, 2022 MEDs**

	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	16
	Metro	22
	Northeast	15
	West	22
<b>External Powerline Technicians</b>	Cape Breton	NA
	Metro	NA

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	Region	Crew Count
	Northeast	NA
	West	NA
<b>Forestry Workers</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
<b>Distribution Damage Assessors</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
<b>Transmission Damage Assessors</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
	Total Field Resources (individuals)	150

1

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1       **4.4     Major Event Day – February 4-5, 2022**

2       The storm event on February 4 and 5, 2022 brought an extended period of freezing rain to  
3       many areas of the province. The system moved slowly across the province with conditions  
4       remaining favourable for freezing rain throughout. Weather stations in Halifax and Sydney  
5       both experienced over 24 hours of freezing rain. With large amounts of ice accumulation  
6       on trees and poles, temperatures remained below freezing across the province until  
7       February 8, 2022. **Figure 67** shows the impact of ice accumulation on trees, causing the  
8       weighted trees to fall into the power lines.

9       **Figure 67 – Ice Accumulation on Trees**



10  
11       All Performance Standards Metrics were met for the February 4-5, 2022 event. **Figure 68**  
12       below sets out the storm target and corresponding result.



Figure 68 – February 4-5, 2022 MED Performance Metrics

Metric	Target	Result	Outcome
% Customers Restored within 48 hours	91.98%	February 4: 94.19% February 5: 93.88%	Achieved
Notification of EOC Opening	Within 4 hours	Achieved	Achieved
% Outage Calls Answered in 45 seconds	85%	99.15%	Achieved
% Polite Disconnects	10%	0.26%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### 4.4.1 SAIDI and SAIFI

The SAIDI and SAIFI results for the February 4-5, 2022 MEDs are set out in **Figure 69**.

Figure 69 – SAIDI and SAIFI Values for February 4-5, 2022 MEDs

Date	CI	CHI	SAIFI	SAIDI
February 4	93,410	1,061,013	0.18	2.00
February 5	91,947	975,190	0.17	1.84

#### **4.4.2 Restoration Profile and Restoration Challenges**

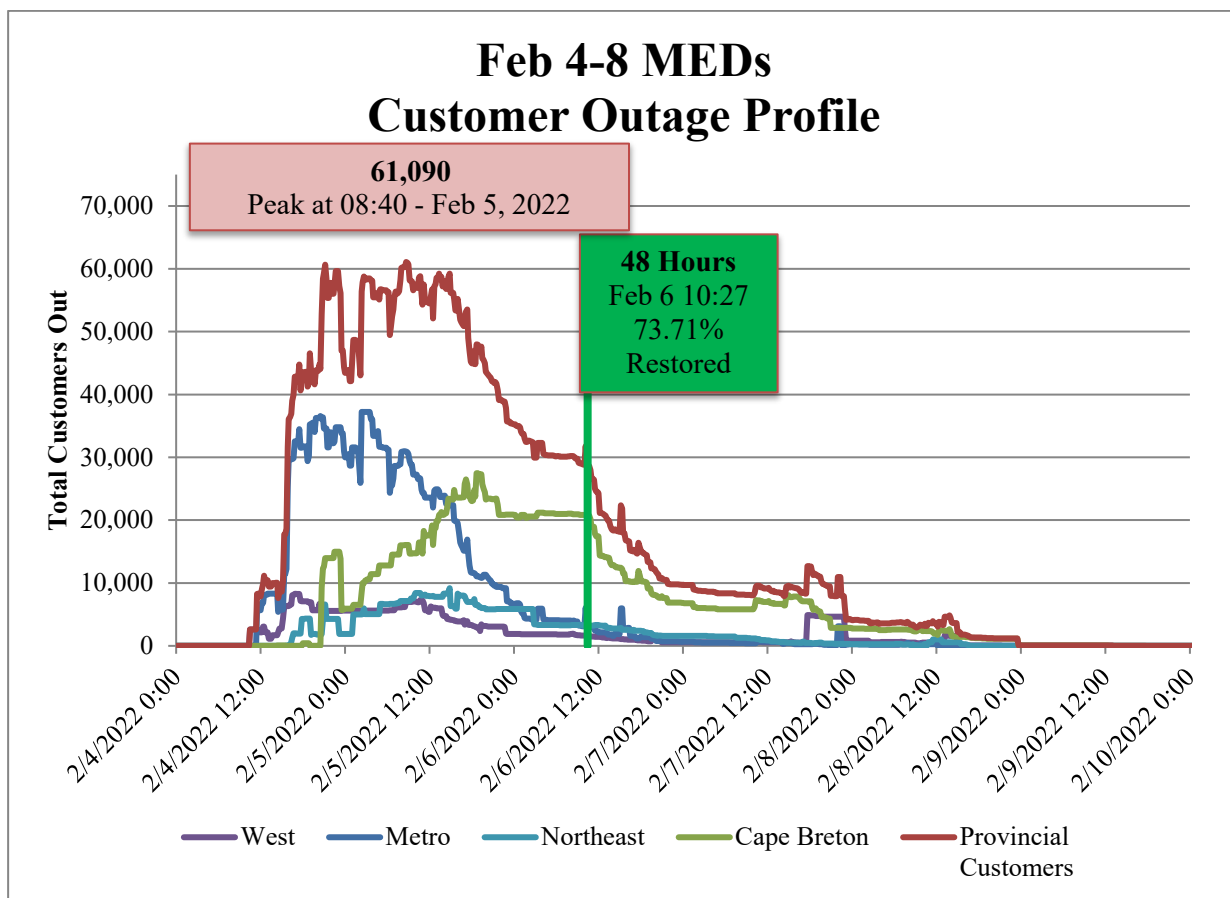
The February 4-5, 2022 MEDs were a result of a prolonged period of freezing rain and subsequent ice accumulation on trees and power lines. Trees bearing the burden of heavy ice accumulation due to freezing rain will bend or break, causing branches to contact the power lines. Freezing rain on power lines and slight winds can cause wires to arc, opening protective devices. Peak wind gusts for each region are detailed below in **Figure 70**.

**Figure 70 – February 4-5, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	41
South Shore	57
Northern	43
Northeast	63
Metro	74
Eastern Shore	61
CB West	67
CB East	65

The customer outage profile shown in **Figure 71** shows that 73.71 percent of all customer interruptions from the February 4 and February 5 MEDs combined were restored within the first 48 hours of the event.

Figure 71 – Customer Outage Profile for February 4-5, 2022 MEDs



#### 4.4.3 Customer Service Results

NS Power's Customer Care Centre received 128,550 calls during the February 4-5, 2022 MEDs. Ninety-nine (99.15) percent of calls were answered within the 45 second metric. Eighty-four (84.18) percent of customers calling were satisfied with the information received through the HVCA system, while 19,614 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details customer can choose to continue to speak to a CSA. **Figure 72** details the Customer Service Storm Metrics for the February 4-5, 2022 MEDs.

**Figure 72 – Customer Service Storm Metrics for February 4-5, 2022 MEDs**

Metrics	Volume
Total # Outage Calls Received	128,550
HVCA Satisfied (Self Service)	108,219
Agent Answered (Voice)	19,614
% HVCA Satisfied	84.18%
# of Polite Disconnects	53
Average Speed of Answer (in second)	9
Service Level (% Answered in 45 Seconds or Less)	99.15%

#### **4.4.4 Crew Information**

NS Power mobilized over 800 field personnel to restore power for the February 4-5, 2022 MEDs as detailed in **Figure 73**. Over 100 contractor crews joined NS Power's internal resources to restore power to customers.

**Figure 73 – Crew Information for February 4-5, 2022 MEDs**

	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	22
	Metro	29
	Northeast	14
	West	22
<b>External Powerline Technicians</b>	Cape Breton	34
	Metro	30

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	Region	Crew Count
	Northeast	17
	West	28
<b>Forestry Workers</b>	Cape Breton	22
	Metro	25
	Northeast	19
	West	30
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	5
	Northeast	10
	West	10
<b>Distribution Damage Assessors</b>	Cape Breton	10
	Metro	7
	Northeast	2
	West	4
<b>Transmission Damage Assessors</b>	Cape Breton	1
	Metro	2
	Northeast	5
	West	5
	Total Field Resources (individuals)	806

1

2

**4.4.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

**4.5 Major Event Day – February 18, 2022**

The storm event on February 18, 2022 brought a period of high winds and heavy rains to the province. The entire province was under a wind and rain warning prior to the event. As the weather system moved from the southern part of the province, winds above warning levels were observed in most of the province.

All Performance Standards Metrics were met for the February 18, 2022 event. **Figure 74** below sets out the storm target and corresponding result.

**Figure 74 – February 18, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
<b>% Customers Restored within 48 hours</b>	91.98%	February 18: 100%	Achieved
<b>Notification of EOC Opening</b>	Within 4 hours	Achieved	Achieved
<b>% Outage Calls Answered in 45 seconds</b>	85%	96.56%	Achieved

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Metric	Target	Result	Outcome
% Polite Disconnects	10%	0.06%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

**4.5.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the February 18, 2022 MED are set out in **Figure 75**.

**Figure 75 – SAIDI and SAIFI Values for February 18, 2022 MED**

Date	CI	CHI	SAIFI	SAIDI
February 18	112,068	329,127	0.21	0.62

**4.5.2 Restoration Profile and Restoration Challenges**

The February 18, 2022 MED was the result of high sustained winds and peak gusts over warning levels. Trees, weakened by an already busy storm season, made contact with power lines, causing outages. Heavy rainfall made travel difficult, resulting in prolonged outages during the unsafe conditions. Peak wind gusts for each region are detailed below in **Figure 76**.

**Figure 76 – February 18, 2022 Peak Gusts by Region**

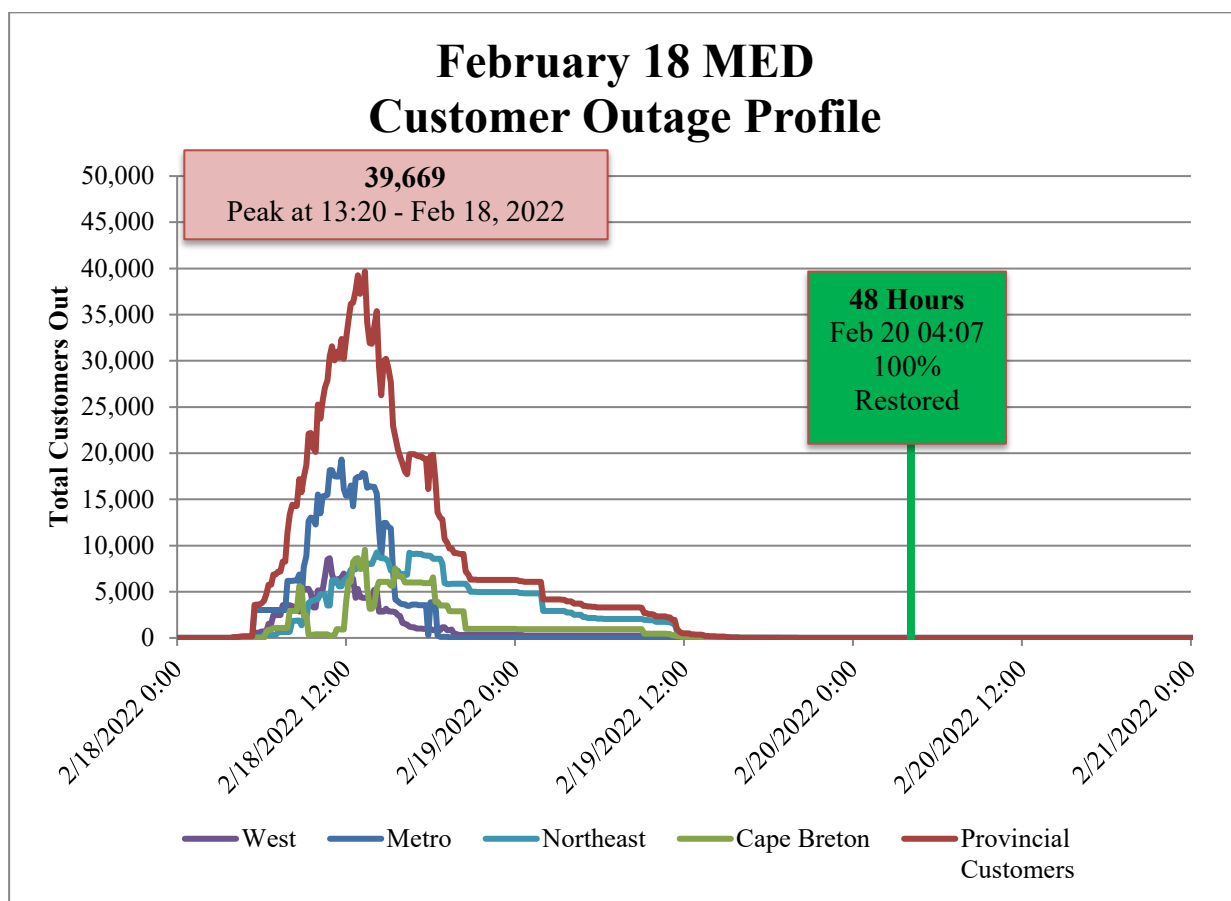
Region	Peak Gust (km/h)
Valley	83
South Shore	83
Northern	76

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Region	Peak Gust (km/h)
Northeast	69
Metro	98
Eastern Shore	117
CB West	100
CB East	109

The customer outage profile shows that 100 percent of all customer interruptions from the February 18 MED combined were restored within the first 48 hours of the event.

**Figure 77 – Customer Outage Profile for February 18, 2022 MED**





**4.5.3 Customer Service Results**

NS Power's Customer Care Centre received 25,001 calls during the February 18, 2022 MED. Ninety-six (96.56) percent of calls were answered within the 45 second metric. Seventy-nine (79.79) percent of customers calling were satisfied with the information received through the HVCA system, while 4,715 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 78** details the Customer Service Storm Metrics for the February 18, 2022 MED.

**Figure 78 – Customer Service Storm Metrics for February 18, 2022 MED**

Metrics	Volume
<b>Total # Outage Calls Received</b>	25,001
<b>HVCA Satisfied (Self Service)</b>	19,948
<b>Agent Answered (Voice)</b>	4,715
<b>% HVCA Satisfied</b>	79.79%
<b># of Polite Disconnects</b>	3
<b>Average Speed of Answer (in second)</b>	30
<b>Service Level (% Answered in 45 Seconds or Less)</b>	96.56%

#### **4.5.4 Crew Information**

NS Power mobilized over 500 field personnel to restore power for the February 18, 2022 MED as detailed in **Figure 79**. Over 60 contractor crews joined NS Power's internal resources to restore power to customers.

**Figure 79 – Crew Information for February 18, 2022 MED**

	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	13
	Metro	31
	Northeast	15
	West	29
<b>External Powerline Technicians</b>	Cape Breton	12
	Metro	5
	Northeast	35
	West	9
<b>Forestry Workers</b>	Cape Breton	10
	Metro	9
	Northeast	17
	West	10
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	5
	Northeast	0
	West	5
<b>Distribution Damage Assessors</b>	Cape Breton	3
	Metro	3
	Northeast	4
	West	4
<b>Transmission Damage Assessors</b>	Cape Breton	2
	Metro	2

	Region	Crew Count
	Northeast	5
	West	6
	Total Field Resources (individuals)	523

#### **4.5.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

#### **4.6 Hurricane Fiona – September 23–30, 2022**

The event days from September 23-30, 2022 were due to the impact of Hurricane Fiona on the province. Late on September 23, 2022 Nova Scotia began to feel the impact of Hurricane Fiona in the western part of the province. Fiona made landfall just after 03:00 on September 24<sup>th</sup>, bringing sustained winds of 167 km/h, equivalent to a Category 2 hurricane. The central pressure of 931 hPa reported during landfall was the lowest pressure reported for any storm in Canadian history. Wind gusts over 100 km/h persisted for 4 hours in Metro, 8 hours in Cape Breton East and up to 13 hours in the Northeast. **Figure 80** below shows the damage of trees falling on power lines in the aftermath of Hurricane Fiona.

1      **Figure 80 – Uprooted Trees Falling on Power Lines During Hurricane Fiona**



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1      **Figure 81 – Distribution Line Damage Resulting from Hurricane Fiona**



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1 **Figure 82 – Aerial view of tree damage in the Browns Mills Rd area North Eastern**  
2 **Nova Scotia**





**Figure 83 – Aerial View of Destruction of Trees and Overhead Equipment due to Hurricane Fiona North Eastern Nova Scotia Area**





1      **Figure 84 – Hurricane Fiona Storm Response**



2

3      **Figure 85 – Stellarton Big Island October 5**



4



1      **Figure 86 – Hurricane Fiona Destruction to Trees and Power Line Infrastructure**



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3



1      **Figure 87 – Hurricane Fiona Aerial View of Destruction to Trees**



2

3

1 **Figure 88 – Crews Engaged in Repair and Damage to Homes and Power Line**  
2 **Infrastructure due to Hurricane Fiona (Cape Breton area)**





1 **Figure 89 – Crews Repairing Damage in Northeastern Area of Nova Scotia due to**  
2 **Hurricane Fiona**



1      **Figure 90 – Damage due to Hurricane Fiona (Cape Breton area)**



2

3



1 **Figure 91 – Damage to Power Line Infrastructure in Sydney Area due to Hurricane**  
2 **Fiona**



1      **Figure 92 – Damage to Power Line Infrastructure due to Hurricane Fiona**



2

3



1      **Figure 93 – Crews Repairing Damage due to Hurricane Fiona, Metro area**



2  
3      **Figure 94 – Mayflower Mall Staging Area for Hurricane Fiona Response**



4

5



1 **Figure 95 – Hurricane Fiona Crew Staging Area and Materials Depot, Hurricane**  
2 **Fiona**



1      **Figure 96 – Crew Staging Area: Hurricane Fiona**



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**Figure 97** below sets out the storm target and corresponding result.

**Figure 97 – September 23-30, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hrs	78.38% (EED)	September 23: 65.42%	Not Achieved
		September 24: 60.98%	
		September 25: 82.67%	
	91.98% (MED)	September 26: 86.39% September 27: 74.88% September 28: 77.53% September 29: 90.20%	Not Achieved
	95.05% (SED)	September 30: 85.48%	Not Achieved
Notification of EOC Opening	Within 4 hrs	Achieved	Achieved
% Outage Calls Answered in 45 sec	85%	93.31%	Achieved
% Polite Disconnects	10%	7.93%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### **4.6.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the September 23-30, 2022 MEDs are set out in **Figure 98**.

**Figure 98 – SAIDI and SAIFI Values for September 23-30, 2022**

Date	CI	CHI	SAIFI	SAIDI
September 23	174,167	8,094,254	0.33	15.18
September 24	364,911	19,301,263	0.68	36.20
September 25	63,433	1,135,220	0.12	2.13
September 26	30,177	547,103	0.06	1.03
September 27	21,429	548,179	0.04	1.03
September 28	19,919	335,246	0.04	0.63
September 29	27,016	315,181	0.05	0.59
September 30	12,464	178,078	0.02	0.33

#### **4.6.2 Restoration Profile and Restoration Challenges**

Hurricane Fiona resulted in three EEDs from September 23-25, four MEDs from September 26-29 and one SED following an MED/EED on September 30. From the onset of the event, NS Power implemented a safety stand-down for all employees until winds fell below safe levels at 12:00 pm on September 24, 2022. When crews were able to begin restoration they encountered difficulties travelling in certain areas due to a significant

amount of trees and debris blocking roadways and localized flooding. Peak wind gusts for each region are detailed below in **Figure 99**.

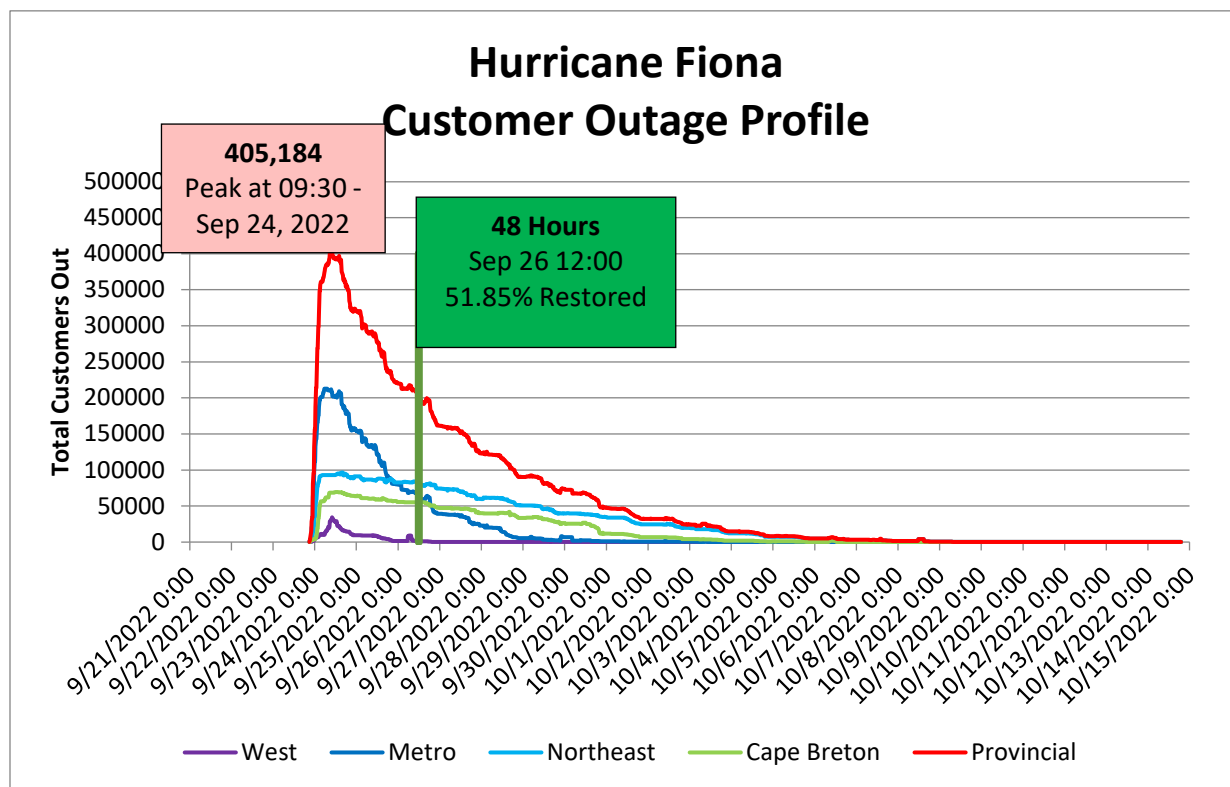
**Figure 99 – September 23-30, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	91
South Shore	81
Northern	91
Northeast	133
Metro	111
Eastern Shore	150
CB West	139
CB East	141

The customer outage profile shown in **Figure 100** shows that 51.85 percent of all customer interruptions from the events from September 23-30, 2022 combined were restored within the first 48 hours of the start of restoration for the event.



Figure 100 – Customer Outage Profile for September 23-30, 2022 MED



#### 4.6.3 Customer Service Results

NS Power's Customer Care Centre received 429,307 calls during the September 23-30, 2022 MEDs. Ninety-three (93.31) percent of calls were answered within 45 seconds. Seventy-eight (78.27) percent of customers calling were satisfied with the information received through the HVCA system, while 63,740 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 101** details the Customer Service Storm Metrics for the September 23-30, 2022 MEDs.

**Figure 101 – Customer Service Storm Metrics for September 23-30 Events**

Metrics	Volume
Total # Outage Calls Received	429,307
HVCA Satisfied (Self Service)	336,012
Agent Answered (Voice)	63,740
% HVCA Satisfied	78.27%
# of Polite Disconnects	7,387
Average Speed of Answer (in second)	110
Service Level (% Answered in 45 Seconds or Less)	93.31%

#### **4.6.4 Crew Information**

NS Power mobilized over 1,800 field personnel to restore power for the September 23–to October 10 restoration period as detailed in **Figure 102**. Over 500 external contractor crews joined NS Power’s internal resources to restore power to customers.

Figure 102 – Crew Information for September 23-30, 2022

		Crew Count																
	Region	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct
NS Power Powerline Technicians	Cape Breton	17	17	16	15	16	17	17	17	18	18	18	18	18	18	18	16	14
	Metro	19	19	25	25	35	30	24	23	20	21	21	21	21	15	15	13	11
	Northeast	15	15	15	17	20	19	30	29	33	33	32	34	33	38	33	21	17
	West	21	21	21	17	13	17	10	9	8	8	8	8	8	8	8	12	0
External Powerline Technicians	Cape Breton	40	80	61	88	105	130	134	139	164	164	164	164	133	69	55	29	27
	Metro	54	54	77	92	92	97	97	72	23	31	26	22	21	14	14	15	14
	Northeast	35	34	84	129	143	214	278	306	333	335	329	340	371	397	396	394	206
	West	9	9	31	21	20	20	12	0	0	0	0	0	0	0	0	0	0
Forestry Workers	Cape Breton	19	19	34	36	37	37	37	42	40	40	40	40	31	31	31	31	4
	Metro	18	22	32	32	34	38	38	22	22	7	7	7	7	1	4	4	0
	Northeast	29	30	43	46	46	48	58	68	75	88	89	89	97	100	91	91	6
	West	15	12	6	6	4	4	1	0	0	0	0	0	0	0	0	0	0
Transmission Line PLTs & Operators	Cape Breton	15	15	15	15	15	15	15	0	0	0	0	0	0	0	0	0	0
	Metro	10	10	10	10	10	10	10	0	0	0	0	0	1	1	1	1	1
	Northeast	15	30	30	20	20	20	20	1	1	2	1	1	0	0	0	0	0
	West	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Damage Assessors	Cape Breton	12	16	15	16	15	15	13	12	12	6	5	5	3	0	0	0	0
	Metro	9	12	12	15	13	10	8	8	8	0	0	0	0	0	0	0	0
	Northeast	16	16	17	17	18	20	17	18	17	26	24	24	11	10	8	8	0
	West	4	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Damage Assessors	Cape Breton	5	5	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0
	Metro	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0
	Northeast	13	13	13	13	13	13	13	0	0	0	0	0	0	0	0	0	0
	West	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Field Resources (individuals)	908	1079	1305	1417	1491	1701	1817	1535	1551	1564	1531	1549	1513	1407	1351	1273	603



**4.6.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

**4.7 Major Event Day – December 1, 2022**

The event on December 1, 2022 was due to a frontal trough between two weather systems, bringing a period of high winds and heavy rain to most of the province. Wind gusts at or above warning levels were observed in all regions of the province except for the South Shore or Northern region. The system tracked eastward across the province, taking 12 hours to move from Yarmouth to Sydney.

All Performance Standards Metrics were met for the December 1, 2022 event. **Figure 103** below sets out the storm target and corresponding result.

**Figure 103 – December 1, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hours	91.98%	December 1: 99.97%	Achieved
Notification of EOC Opening	Within 4 hours	Achieved	Achieved
% Outage Calls Answered in 45 seconds	85%	93.05%	Achieved

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Metric	Target	Result	Outcome
% Polite Disconnects	10%	0.01%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### 4.7.1 SAIDI and SAIFI

The SAIDI and SAIFI results for the December 1, 2022 MEDs are set out in **Figure 104**.

**Figure 104 – SAIDI and SAIFI Values for December 1, 2022 MED**

Date	CI	CHI	SAIFI	SAIDI
December 1	115,779	624,766	0.22	1.17

#### 4.7.2 Restoration Profile and Restoration Challenges

The December 1, 2022 MED was the result of high winds and heavy rains. Trees and equipment, weakened by hurricane Fiona, made the power system at that time susceptible to high winds. Trees falling on or making contact with power lines was the leading cause of outages for this event. Peak wind gusts for each region are detailed below in **Figure 105**.

**Figure 105 – December 1, 2022 Peak Gusts by Region**

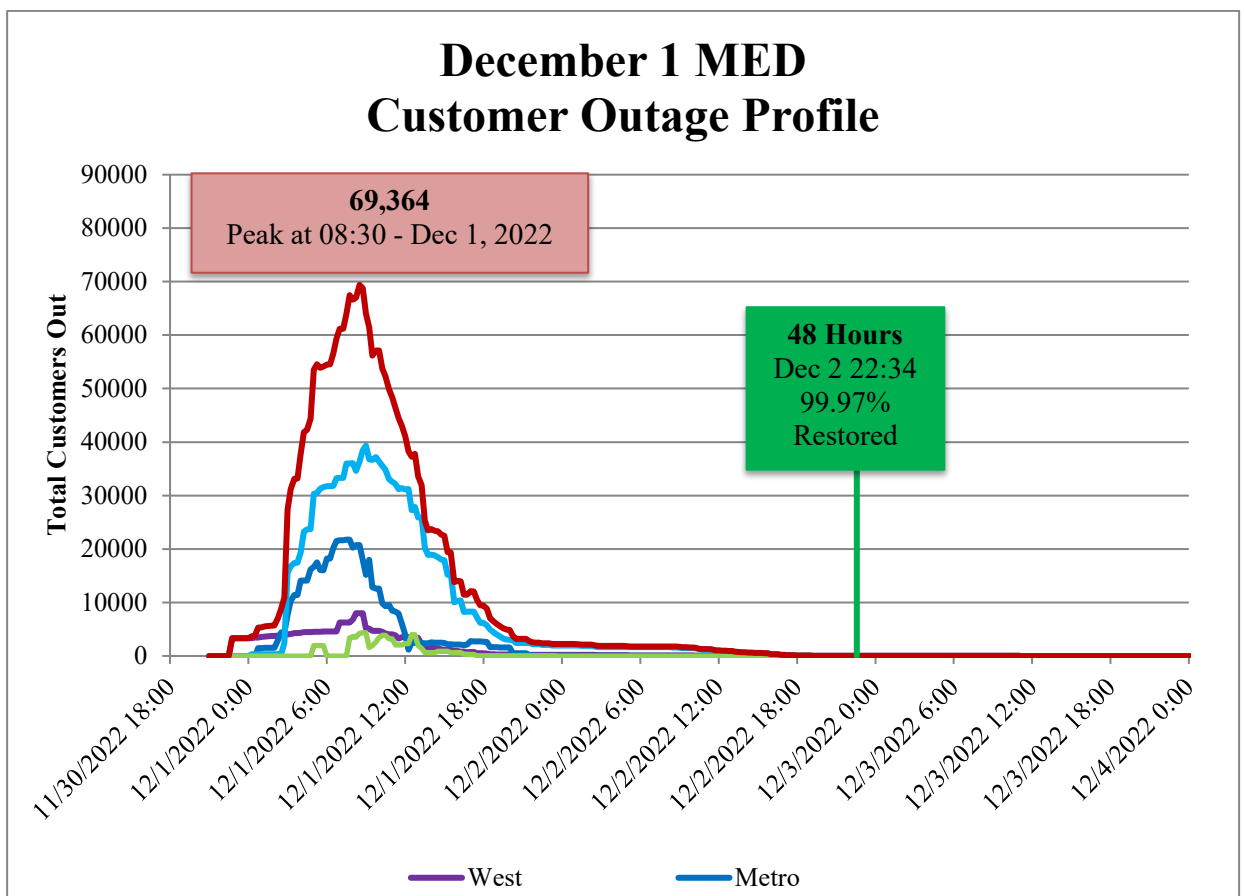
Region	Peak Gust (km/h)
Valley	94
South Shore	69
Northern	74
Northeast	93

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<b>Metro</b>	93
<b>Eastern Shore</b>	87
<b>CB West</b>	104
<b>CB East</b>	96

The customer outage profile shown in **Figure 106** shows that 99.97 percent of all customer interruptions from the December 1, 2022 MED combined were restored within the first 48 hours of the event.

**Figure 106 – Customer Outage Profile for December 1, 2022 MED**



### **4.7.3 Customer Service Results**

NS Power's Customer Care Centre received 16,144 calls during the December 1, 2022 MED. Ninety-three (93.05) percent of calls were answered within the 45 second metric. Eighty-three (83.89) percent of customers calling were satisfied with the information received through the HVCA system, while 8,125 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 107** details the Customer Service Storm Metrics for the December 1, 2022 MED.

**Figure 107 – Customer Service Storm Metrics for December 1, 2022 MED**

Metrics	Volume
Total # Outage Calls Received	16,144
HVCA Satisfied (Self Service)	13,543
Agent Answered (Voice)	8,125
% HVCA Satisfied	83.89%
# of Polite Disconnects	1
Average Speed of Answer (in seconds)	37
Service Level (% Answered in 45 Seconds or Less)	93.05%

### **4.7.4 Crew Information**

NS Power mobilized over 390 field personnel to restore power for the December 1, 2022 MED as detailed in **Figure 108**. Over 50 contractor crews joined NS Power internal resources to restore power to customers.

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**Figure 108 – Crew Information for December 1, 2022 MED**

	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	14
	Metro	20
	Northeast	15
	West	23
<b>External Powerline Technicians</b>	Cape Breton	3
	Metro	1
	Northeast	45
	West	4
<b>Forestry Workers</b>	Cape Breton	13
	Metro	5
	Northeast	18
	West	10
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	0
	Metro	0
	Northeast	5
	West	0
<b>Distribution Damage Assessors</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
	Cape Breton	3

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	Region	Crew Count
Transmission Damage Assessors	Metro	3
	Northeast	3
	West	3
	Total Field Resources (individuals)	391

**4.7.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company’s social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

**4.8 Major Event Day – December 13, 2022**

The major event on December 13, 2022 was the result of an intense low-pressure system, bringing high winds and wet snow to the province. The storm developed south of Sable Island on December 13<sup>th</sup>, tracking northwest, with the centre passing over Cape Breton Highlands on December 14<sup>th</sup>. The event brought prolonged warning level winds to the northeastern and south shore of Nova Scotia. Parts of Cape Breton recorded over 30 mm of total precipitation, most of which was heavy, wet snow.

All Performance Standards Metrics were met for the December 13, 2022 event. **Figure 109** below sets out the storm target and corresponding result.

**Figure 109 – December 13, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hours	91.98%	December 13: 95.16%	Achieved
Notification of EOC Opening	Within 4 hours	Achieved	Achieved
% Outage Calls Answered in 45 seconds	85%	86.64%	Achieved
% Polite Disconnects	10%	0.03%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### **4.8.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the December 13, 2022 MEDs are set out in **Figure 110**.

**Figure 110 – SAIDI and SAIFI Values for December 13, 2022 MED**

Date	CI	CHI	SAIFI	SAIDI
December 13	48,580	453,800	0.09	0.85

#### **4.8.2 Restoration Profile and Restoration Challenges**

The December 13<sup>st</sup> MED was the result of high winds and heavy precipitation. Winds in the Northeastern and South Shore part of the province were above warning levels for 8-12 hours. Trees made contact with power lines during the period of extended winds, leading to outages. Temperatures remained around 0°C, leading to mixed precipitation of rain and snow. The wet heavy snow and moderate winds caused trees to contact the

power lines, leading to outages. The total precipitation made restoration challenging as driving conditions were hampered by the accumulation. Peak wind gusts for each region are detailed below in **Figure 111**.

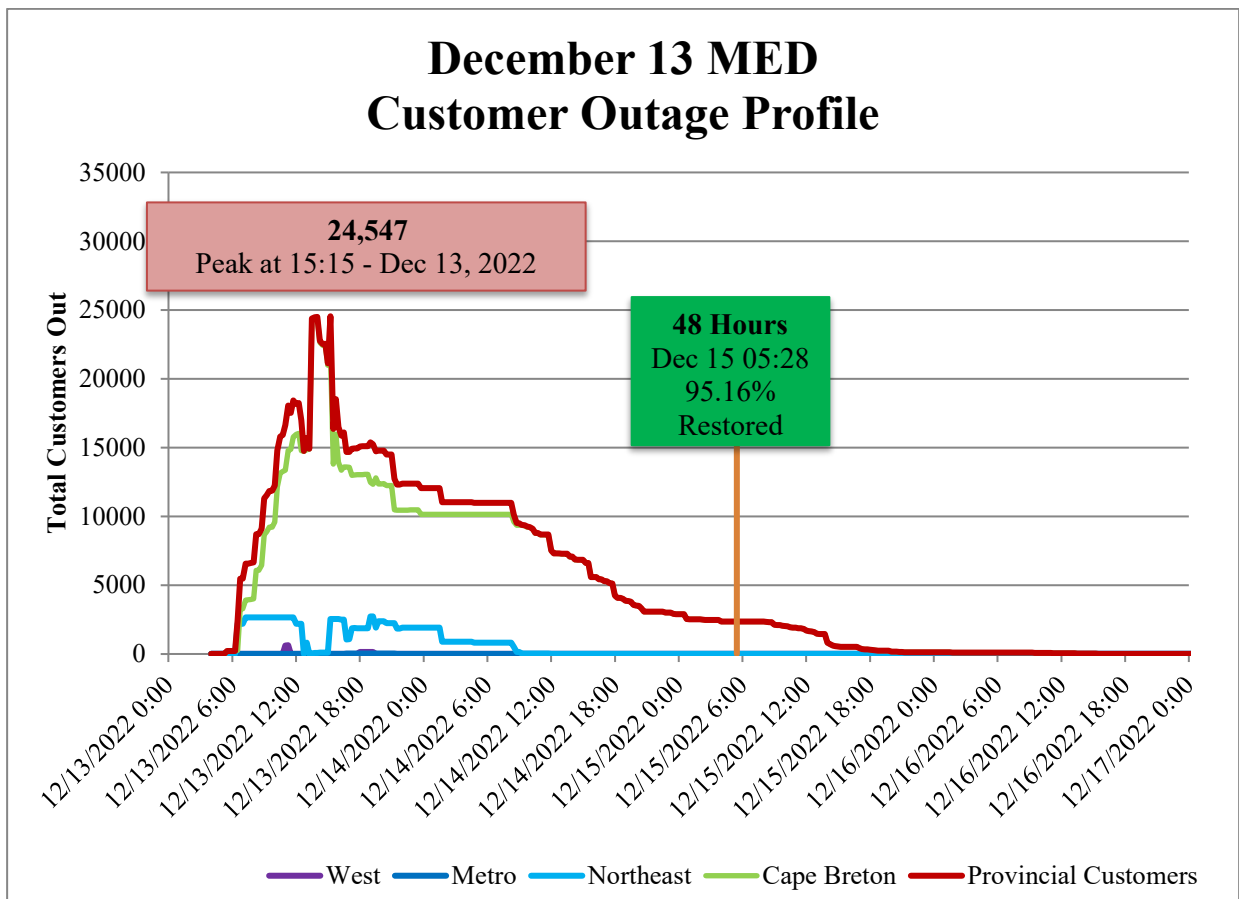
**Figure 111 – December 13, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	50
South Shore	56
Northern	50
Northeast	93
Metro	78
Eastern Shore	95
CB West	67
CB East	65

The customer outage profile shown in **Figure 112** shows that 95.16 percent of all customer interruptions from the December 13 MED combined were restored within the first 48 hours of the event.



Figure 112 – Customer Outage Profile for December 13, 2022 MED



#### 4.8.3 Customer Service Results

NS Power's Customer Care Centre received 17,970 calls during the December 13, 2022 MED. Eighty-six (86.64) percent of calls were answered within 45 seconds. Eighty-three (83.89) percent of customers calling were satisfied with the information received through the HVCA system, while 13,842 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 113** details the Customer Service Storm Metrics for the December 13, 2022 MED.

**Figure 113 – Customer Service Storm Metrics for December 13, 2022 MED\**

Metrics	Volume
Total # Outage Calls Received	17,970
HVCA Satisfied (Self Service)	0
Agent Answered (Voice)	13,842
% HVCA Satisfied	0%
# of Polite Disconnects	5
Average Speed of Answer (in seconds)	21
Service Level (% Answered in 45 Seconds or Less)	86.64%

#### **4.8.4 Crew Information**

NS Power mobilized over 250 field personnel to restore power for the December 13, 2022 MED as detailed in **Figure 114**. Over 25 contractor crews joined NS Power’s internal resources to restore power to customers.

**Figure 114 – Crew Information for December 13, 2022 MED**

	Region	Crew Count
<b>NS Power Powerline Technicians</b>	Cape Breton	15
	Metro	15
	Northeast	16
	West	23
<b>External Powerline Technicians</b>	Cape Breton	9
	Metro	0

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	Region	Crew Count
	Northeast	17
	West	0
<b>Forestry Workers</b>	Cape Breton	6
	Metro	0
	Northeast	7
	West	0
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	0
	Northeast	0
	West	0
<b>Distribution Damage Assessors</b>	Cape Breton	NA
	Metro	NA
	Northeast	NA
	West	NA
<b>Transmission Damage Assessors</b>	Cape Breton	3
	Metro	3
	Northeast	3
	West	3
	Total Field Resources (individuals)	265

**4.8.5 Media Releases**

NS Power did not open the EOC for the December 13, 2022 event, and as such there are no media notifications to report.

**4.9 Major Event Day – December 23-24, 2022**

The event on December 23-24, 2022 resulted from a strong storm system bringing high winds and rain across the province starting on December 23<sup>rd</sup>. The system moved from the southwestern part of the province through to Cape Breton by early December 24, 2022. Wind gusts in the Halifax area and in Cape Breton both reached over 115 km/h. **Figure 115** below shows a tree landing on a power line from the high winds during the event.

**Figure 115 – Weakened Trees Landing on Nearby Power Lines**



NS Power met all Performance Standards Metrics for the December 23-24, 2022 event.

**Figure 116** below sets out the storm target and corresponding result.

**Figure 116 – December 23-24, 2022 MED Performance Metrics**

Metric	Target	Result	Outcome
% Customers Restored within 48 hours	91.98%	December 23: 100% December 24: 100%	Achieved
Notification of EOC Opening	Within 4 hours	Achieved	Achieved
% Outage Calls Answered in 45 seconds	85%	95.78%	Achieved
% Polite Disconnects	10%	0.00%	Achieved
ETRs Updated	Without Delay	Achieved	Achieved

#### **4.9.1 SAIDI and SAIFI**

The SAIDI and SAIFI results for the December 1, 2022 MEDs are set out in **Figure 117**.

**Figure 117 – SAIDI and SAIFI Values for December 23-24, 2022 MED**

Date	CI	CHI	SAIFI	SAIDI
December 23	81,302	282,366	0.15	0.53
December 24	58,036	210,793	0.11	0.39

#### **4.9.2 Restoration Profile and Restoration Challenges**

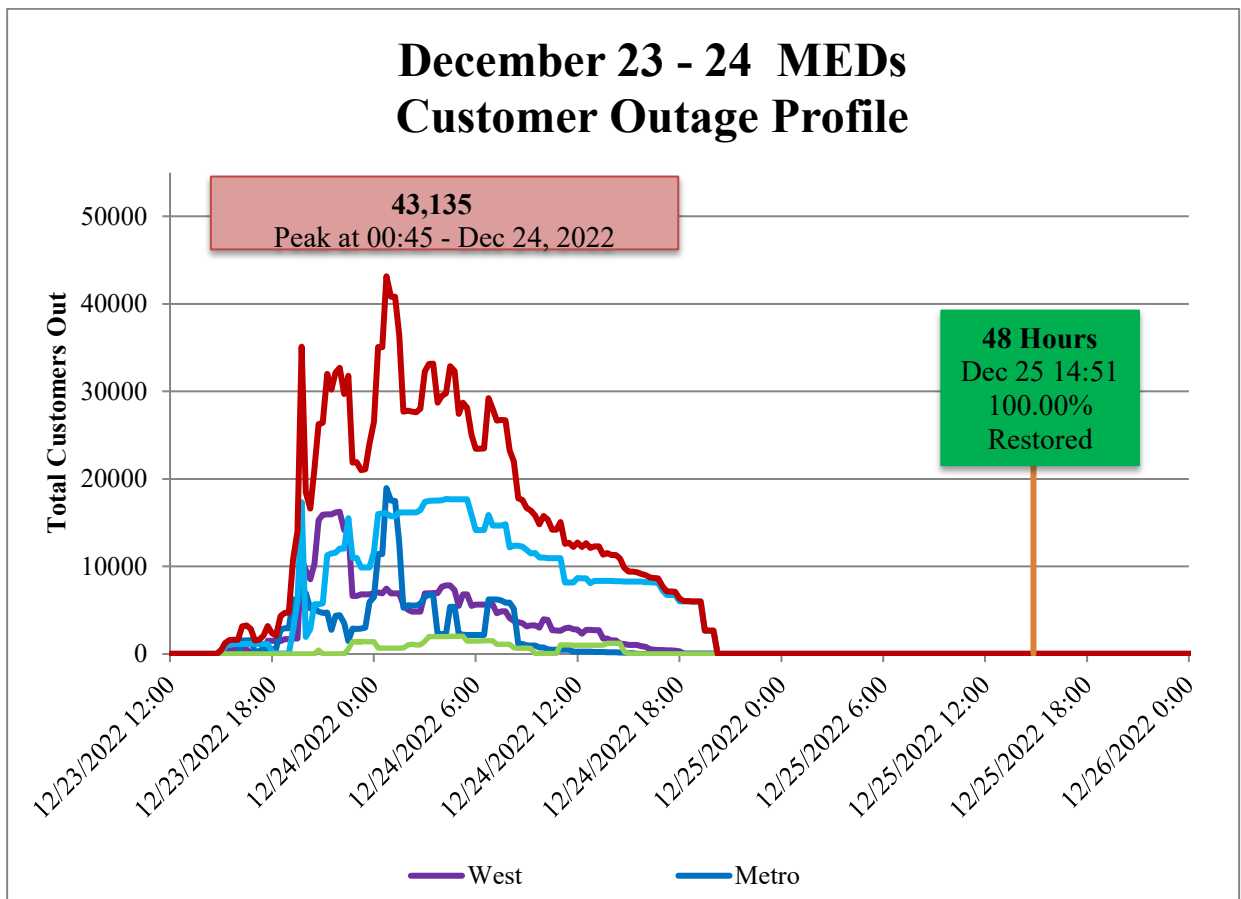
The December 23-24 MED was the result of high winds and heavy rains. Trees falling on or contacting power lines was the leading cause of outages for this event. Peak wind gusts for each region are detailed below in **Figure 118**.

**Figure 118 – December 23-24, 2022 Peak Gusts by Region**

Region	Peak Gust (km/h)
Valley	96
South Shore	104
Northern	76
Northeast	82
Metro	115
Eastern Shore	96
CB West	145
CB East	94

The customer outage profile shown in **Figure 119** shows that 100 percent of all customer interruptions from the December 23-24 MEDs combined were restored within the first 48 hours of the event.

Figure 119 – Customer Outage Profile for December 23-24, 2022 MED



#### 4.9.3 Customer Service Results

NS Power's Customer Care Centre received 16,658 calls during the December 23-24, 2022 MEDs. Ninety-five (95.78) percent of calls were answered within the 45 second metric. Eighty-four (84.61) percent of customers calling were satisfied with the information received through the HVCA system, while 4,174 customers elected to speak to a CSA. Customers calling the Outage Line can report an outage or receive their outage information directly without having to speak to a CSA. The HVCA system provides information about the outage, including the ETR, outage cause and current status. After receiving the details, customers can choose to continue to speak to a CSA. **Figure 120** details the Customer Service Storm Metrics for the December 23 - 24, 2022 MED.



**Figure 120 – Customer Service Storm Metrics for December 23-24, 2022 MED**

Metrics	Volume
Total # Outage Calls Received	16,658
HVCA Satisfied (Self-Service)	14,094
Agent Answered (Voice)	4,174
% HVCA Satisfied	84.61%
# of Polite Disconnects	0
Average Speed of Answer (in seconds)	23
Service Level (% Answered in 45 Seconds or Less)	95.78%

#### **4.9.4 Crew Information**

NS Power mobilized over 400 field personnel to restore power for the December 23-24, 2022 MEDs as detailed in **Figure 121**. Over 20 contractor crews joined NS Power's internal resources to restore power to customers.

**Figure 121 – Crew Information for December 23-24, 2022 MEDs**

	Region	Crew Count
NS Power Powerline Technicians	Cape Breton	18
	Metro	25
	Northeast	14
	West	20
	Cape Breton	3

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	Region	Crew Count
<b>External Powerline Technicians</b>	Metro	3
	Northeast	6
	West	10
<b>Forestry Workers</b>	Cape Breton	8
	Metro	10
	Northeast	19
	West	23
<b>Transmission Line PLTs &amp; Operators</b>	Cape Breton	5
	Metro	0
	Northeast	0
	West	0
<b>Distribution Damage Assessors</b>	Cape Breton	6
	Metro	8
	Northeast	6
	West	5
<b>Transmission Damage Assessors</b>	Cape Breton	3
	Metro	3
	Northeast	3
	West	3
	Total Field Resources (individuals)	417

**4.9.5 Media Releases**

In addition to issuing a media release, NS Power communicated the EOC activation notice, along with regular storm updates, via the Company's social media and website. Storm communication to stakeholders, including media, employees, and government, is provided throughout each EOC event. NS Power staffs appropriately for the increasing amount of social media activity during storms.

Please refer to **Appendix E** for copies of the notifications of EOC opening and media releases issued by NS Power with respect to this event.

**5.0 PLANNED OUTAGES ON NS POWER’S SYSTEM**

With respect to planned outages, the NSUARB directed the following in its 2017 Annual Performance Standards Report decision:

The Board ... directs NSPI to include a year-over-year comparative analysis of planned outages in its future annual reports. In addition, NSPI’s reports are to include a summary of steps taken to reduce the number and duration of planned interruptions.<sup>34</sup>

Whenever practical and when it is safe to do so, NS Power completes planned reliability and upgrade work with the line energized so that there is no outage impact to customers. In some circumstances, the line must be de-energized in order for the Powerline Technicians to complete the work safely. When a planned outage is required in order to complete reliability and upgrade work safely, NS Power follows an established Planned Outage Request process that incorporates outage mitigation considerations and planned outage approvals.

When it is necessary to schedule a planned outage, NS Power considers what can be done to minimize the number of customers affected by the outage and minimize the duration of the outage. This includes:

- Evaluating whether a portion of the load can be transferred to adjacent feeders, transmission lines or substations
- Determining whether the customers can be sectionalized and back-fed from another feeder
- Deciding whether multiple crews can be used to minimize the outage duration
- Determining whether load pick-up jumpers or circuit switchers can be installed.

The need for each planned outage is reviewed and approved by NS Power’s operational personnel (T&D Supervisor, Regional Engineer, Operations Manager, or Director

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<sup>34</sup> M08574, NS Power 2017 Annual Performance Standards Report, NSUARB Decision Letter, May 1, 2018, page 5.

Regional Operations). The level of approval required depends on the number of customers affected and the duration of the outage. These approvers validate the need for the planned outage to complete the reliability and capital line work safely and confirm that all outage mitigation considerations have been evaluated and will be in place to minimize the duration of the outage and the number of customers affected.

NS Power aims to provide enough advance notice to customers so that they can be prepared for the planned outage and, if required, make alternate plans. The Company's preference is to schedule the start time and duration of planned events with the customers' involvement, and in some cases planned outages are rescheduled to a time that works best for the majority of affected customers.

The 2022 planned outage SAIDI and SAIFI values of 0.63 and 0.39 respectively are shown in **Figure 122**. 2022 also showed a reduction of 18 percent in the overall number of planned outages experienced by customers.

On average, approximately 39 percent of NS Power customers experienced a planned outage event in 2022; the overall duration of these outages was approximately 2.98 hours and on average they impacted 440 customers as shown in **Figure 123**.

**Figure 124** provides the planned outage SAIDI value per month and **Figure 125** shows the planned SAIFI values by month for 2021 and 2022.

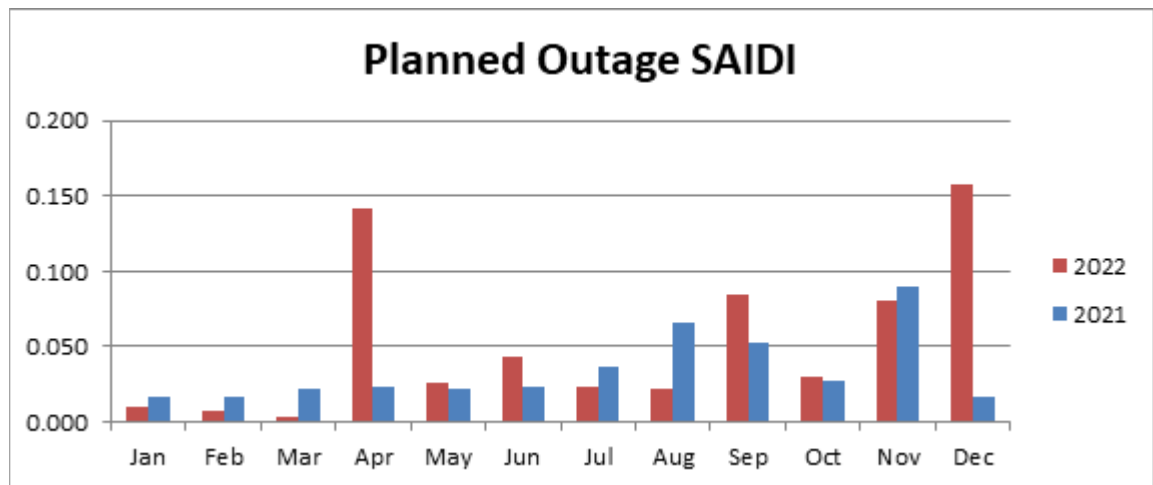
**Figure 122 – 2021 and 2022 Planned Outage SAIDI and SAIFI**

Year	Count of Planned Outages	Planned Outage SAIDI	Planned Outage SAIFI
2021	572	0.41	0.28
2022	467	0.63	0.39

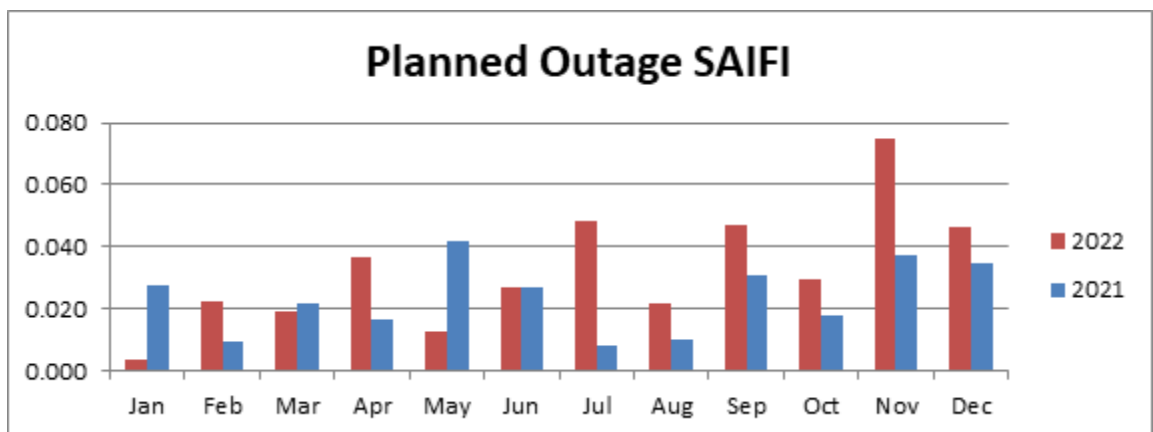
**Figure 123 – Planned Outages 2022 vs 2021**

Year	Average Duration of Planned Outage (hr)	Average # of Customers Impacted by Outage
2021	2.59	258
2022	2.98	440

**Figure 124 – 2021 and 2022 Planned Outage SAIDI by Month**



**Figure 125 – 2021 and 2022 Planned Outage SAIFI by Month**



During regular business operations, crews directly reach out to customers with a knock on their door to coordinate a short outage to facilitate reliability and upgrade work in real time. These outages are not coded as planned outages.

Overall, there were 105 fewer planned outages in 2022 than in 2021, as shown in **Figure 122**. **Figure 127** further breaks down this data by outage type by month. Reliability and capital upgrade work accounted for most planned outages in 2021. 67 of the 467 planned outages impacted a single customer and an additional 115 impacted between 2 and 10 customers.

**Figure 128** breaks down outage duration by outage type. NS Power's commitment to investing in reliability and improving the resiliency in the power system is evident as planned outages associated with reliability and capital upgrades accounted for 33 percent and 37 percent respectively and planned transmission-related outages accounting for 11.5 percent of total events.

**Figure 126 – Planned Outages by Month**

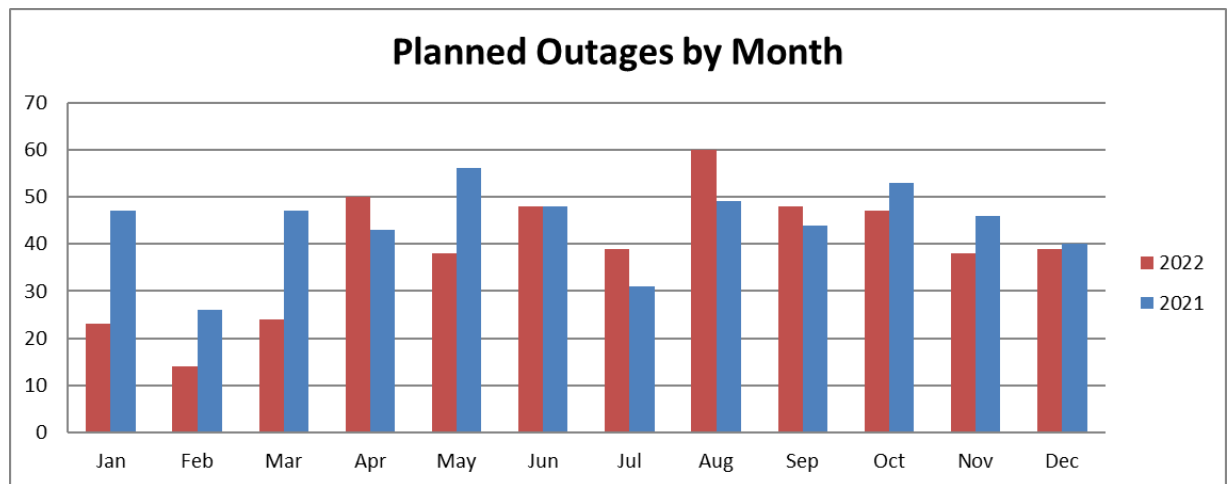


Figure 127 – Planned Outages by Type by Month

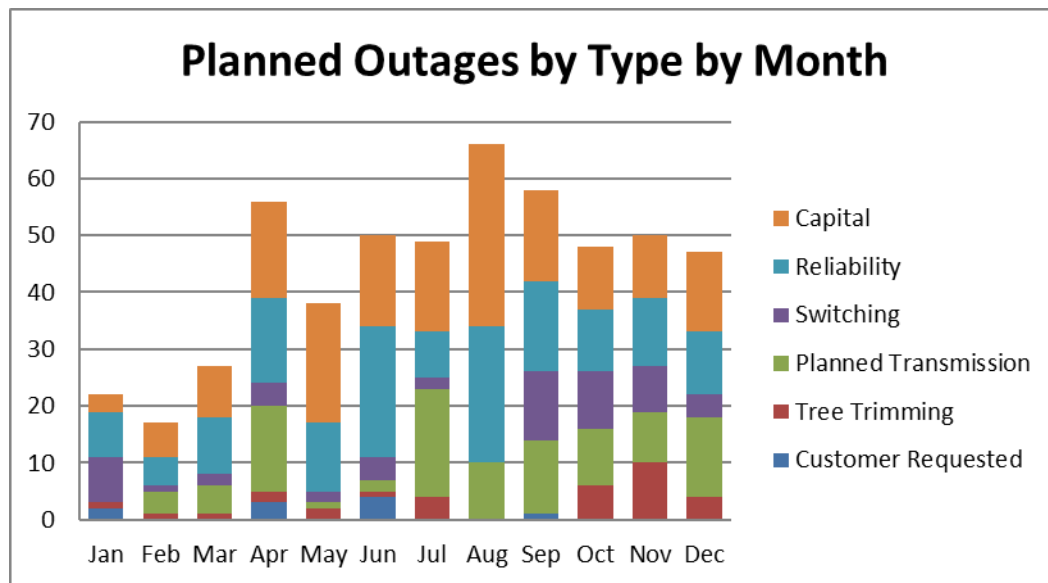
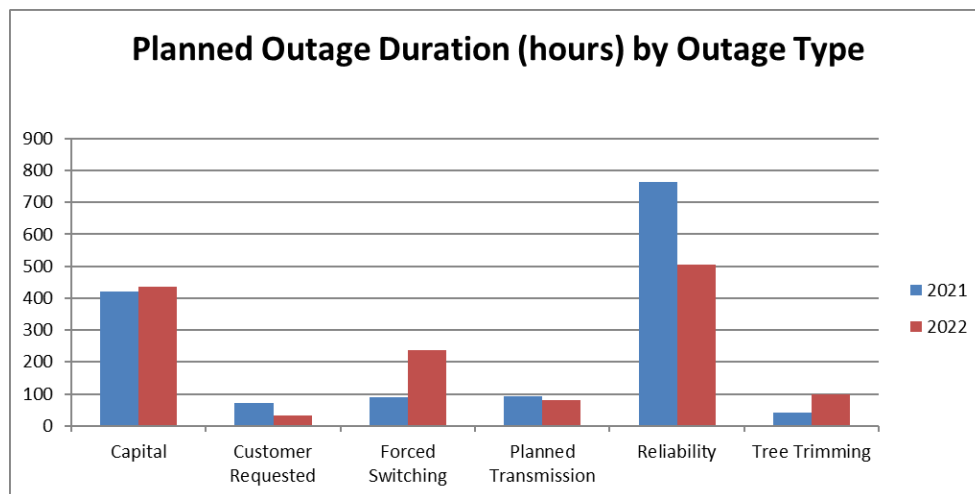


Figure 128 – Planned Outage Duration by Outage Type



Appendix K provides a detailed list of each of the 467 planned outages in 2022.

NS Power seeks opportunities to perform work under live line techniques and avoid planned outages, but in some cases planned outages are required in order to complete work safely by employees and to facilitate customer safety.



**6.0 2023 PERFORMANCE STANDARDS**

The proposed 2023 Performance Targets are summarized in **Figure 129** and further described in the section below and are submitted for the NSUARB's review and approval.

**Figure 129 – 2023 Performance Standards Targets**

Standard	2023 Performance Targets
<b>SAIDI</b>	$\leq 4.29$
<b>SAIFI</b>	$\leq 2.05$
<b>CKAIDI</b>	11S-411, 22C-402*
<b>CKAIFI</b>	22C-402,* 11S-411,* 62N-413*
<b>Notification of EOC Opening</b>	NS Power to notify customers of the decision to open the EOC within 4 hours of the decision to open.
<b>Outage Call Answer Rate</b>	A minimum of 85% of calls answered within 45 seconds at Customer Care Centre during severe outage events.
<b>Polite Disconnects</b>	10% or less annually
<b>ETR Updates without delay</b>	ETR updates provided without delay
<b>Percent Customers restored in 48 hours</b>	Significant Event Days – 95.05% customers restored within 48 hours
	Major Event Days - 91.98% customers restored within 48 hours
	Extreme Event Days 78.38% customers restored within 48 hours

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Standard	2023 Performance Targets
<b>Outage Report</b>	Outage Report required for events impacting greater than 30,000 customers.
<b>Regular Business Call Answer Rate</b>	A minimum of 70% of calls shall be answered within 30 seconds at NS Power Customer Care Centre
<b>Percent Estimated Bills</b>	No more than 2% of customer bills shall be estimated annually
<b>Customer Notification of Outages</b>	Notify all customers of an outage as soon as NS Power has knowledge of an outage event.
<b>New Service Connection Times</b>	Service Installation No Pole: $\leq 3.0$ days
	Service Installation Pole or Transformer: $\leq 4.9$ days
	Service Installation Temporary to Permanent: $\leq 3.2$ days
	Service Installation Line Extension <10 Poles: $\leq 6.2$ days
	Service Installation Line Extension $\geq 10$ Poles: $\leq 18.1$ days

\*New in 2023

In its Decision on the proposed revisions to the Performance Standards the Board approved the following metrics for the 2022 to 2026 period.

**6.1 Reliability Standards**

- (i) System Average Interruption Frequency Index (“SAIFI”)
- (ii) System Average Interruption Duration Index (“SAIDI”)
- (iii) Circuit Average Interruption Frequency Index (“CKAIFI”)
- (iv) Circuit Average Interruption Duration Index (“CKAIDI”)

**Exclusions:** These reliability performance metrics are to be estimated for normal conditions, i.e., excluding: (i) major event days (MEDs) and above, as defined by the established MED and extreme event day (EED) thresholds\* utilizing the IEEE 1366-2012 Standard 2.5 Beta methodology; and (ii) planned outages; and (iii) adverse weather-associated outages occurring in the second 24-hour period after a MED or EED.

Only those outages occurring in the second 24-hour period after a MED or EED severe event which can be attributed to the same storm system as precipitated the original MED or EED and meet Significant Event Day (SED\*\*) thresholds are to be excluded from the metric calculation. The second 24-hour event, if excluded, will be considered a severe weather event, and be subject to adverse weather response standards.

These exclusions will apply to outage data effective January 1, 2022.

**Compliance:** NS Power's compliance across all reliability metrics will be assessed on an annual basis.

\* The provincial MED and EED thresholds will be calculated utilizing the IEEE 1366-2012 Standard methodology, with the outage data associated with Hurricane Dorian (September 7, 8 and 9, 2019) excluded. Specifically, the events associated with the EEDs on September 7 and 8 and the MED on September 9, 2019 will be excluded.

\*\* The provincial SED threshold for the second 24-hour period after a severe outage event will be calculated utilizing the IEEE 1366-2012 Standard 2.0 Beta methodology.

#### **Standards 1 & 2 – SAIFI and SAIDI**

SAIFI and SAIDI are system-wide reliability metrics, commonly used by electric power utilities.

***Metrics:***

- SAIFI measures the average number of times that a system customer experiences an outage during the specific time period of a study. SAIFI is estimated using the following formula:

$$\text{SAIFI} = \frac{\text{Total Number of Customers Interruptions}}{\text{Total Number of Customers Served}}$$

- SAIDI measures the total duration of an interruption for the average customer, during a given time period. SAIDI is estimated using the following formula:

$$\text{SAIDI} = \frac{\text{Sum of All Customer Interruption Durations}}{\text{Total Number of Customers Served}}$$

***Benchmarks:***

The SAIFI and SAIDI benchmarks/targets for NS Power will be set based on a 5-year rolling average plus 1 standard deviation (“SD”) approach and reset each year. However, within a 5-year review period (i.e., 2022-2026), targets for any subsequent year (e.g. 2023 target) must be equal to or better than the prior year’s target (e.g. 2022 target).

**Figure 130** below identifies the SAIDI and SAIFI targets applicable for 2023, based on NS Power’s historical data for the period 2018 to 2022.

**Figure 130 – 2023 Targets for SAIDI and SAIFI**

Metric	2018	2019	2020	2021	2022	2018-2022* Average	Std. Dev	2022 Target	Calculated Target	2023 Target
SAIDI	2.00	2.58	2.05	2.27	5.16	4.60	0.91	4.29	5.52	4.29
SAIFI	4.43	5.99	3.98	5.23	2.19	2.22	0.21	2.05	2.43	2.05

The SAIDI and SAIFI values beginning January 1, 2023 will reflect the updated MED thresholds and allow for the removal of the second 24-hour period after a severe event per the established parameters.

**Standards 3 & 4 – CKAIFI and CKAIDI**

CKAIDI and CKAIFI are linked to circuit level reliability. The goal of these metrics is to mitigate problem circuits that would not normally be captured by system level performance metrics (i.e., SAIDI and SAIFI).

***Metrics:***

CKAIFI is related to the *frequency* of interruptions experienced, which may be tied to a given circuit. CKAIFI is estimated using the following formula:

$$\text{CKAIFI} = \frac{\text{Total Number of Customers Interruptions by Circuit}}{\text{Total Number of Customers Served by Circuit}}$$

CKAIDI is related to the *duration* of interruptions experienced, which may be tied to a given circuit. CKAIDI is estimated using the following formula:

$$\text{CKAIDI} = \frac{\text{Sum of All Customer Durations of Interruption by Circuit}}{\text{Total Number of Customers Served by Circuit}}$$

**Benchmarks:** The benchmarking methodology for CKAIFI and CKAIDI is as follows:

Any circuit or feeder that is among the worst 5 percent of all NS Power’s circuits or feeders for two consecutive years shall be labeled as a problem circuit. Any problem circuit that is among the worst 5 percent of all NS Power’s circuits or feeders for the third consecutive reporting year shall be labeled a chronic circuit. If the CKAIFI or CKAIDI values of the chronic circuits in a given year is greater than the average CKAIDI or CKAIFI values plus two standard deviations across all NS Power circuits in the same year, NS Power would have not met the benchmark, and shall be subject to a penalty.

**Figure 131** identifies NS Power’s circuits that appear among the worst 5 percent of all NS Power’s circuits in both 2021 and 2022.

**Figure 131 – CKAIDI and CKAIFI 2023 Problem Feeders**

Metric	Feeders		
CKAIDI	22C-402	11S-411	
CKAIFI	22C-402	11S-411	62N-413

If any of the problem circuits identified above are among the worst 5 of the company’s circuits for the third consecutive reporting year (i.e., 2022) for CKAIFI and CKAIDI respectively, those will be labeled the “chronic circuits” in 2023.

At the end of 2023, NS Power will file and compare the following data:

- (i) the CKAIFI and CKAIDI of the chronic circuits in 2023, and
- (ii) the average CKAIFI and CKAIDI plus 2 standard deviations of all circuits in 2023.

The comparison of (i) and (ii) will assist the Board in assessing compliance for the year 2022.

## **6.2 Adverse Weather Response Standards**

The Board has approved the following metrics associated with adverse weather response standards:

- (i) Customer notification of an oncoming severe weather event within a specific time frame
- (ii) Percentage of calls answered within 45 seconds during a severe outage event
- (iii) Polite disconnect rate for all outage calls
- (iv) Estimated Time to Restore (“ETR”) updates communicated to customers during an outage
- (v) Percentage of customers restored within the first 48 hours of a severe weather event – separately for Major Event Days (“MEDs”) and Extreme Event Days (“EEDs”)<sup>35</sup> and Significant Event Days (“SEDs”)<sup>36</sup> if the SEDs were excluded from normal conditions as the second 24-hour event, as discussed in Exclusions associated with reliability performance standards
- (vi) Outage Report for adverse weather events impacting  $\geq 30,000$  customers.

**Compliance:** NS Power’s compliance across all adverse weather response metrics will be assessed on an annual basis.

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<sup>35</sup> MEDs and EEDs are defined using the IEEE 1366-2012 Standard 2.5 and 3.5 Beta methodology, respectively, with the outage data associated with Hurricane Dorian (September 7, 8 and 9, 2019) excluded in accordance with the NSUARB’s Decision dated February 22, 2022 (M10279).

<sup>36</sup> SEDs are defined using the IEEE 1366-2012 Standard 2.0 Beta methodology, with the outage data associated with Hurricane Dorian (September 7, 8 and 9, 2019) excluded in accordance with the NSUARB’s Decision dated February 22, 2022 (M10279).

**Standard 5 – Customer notification of an oncoming severe weather event**

**Metric:** All NS Power customers shall be notified of an oncoming severe weather event within a specified number of hours of NS Power having knowledge of the oncoming inclement weather. The notifications shall be provided to all customers using multiple channels, such as the NS Power website, social media and automated messaging.

**Benchmark:** NS Power shall notify all its customers within 4 hours of NS Power’s decision to open the NS Power Emergency Operations Centre. This benchmark shall be fixed for the 2022 to 2026 period.

**Standard 6 – Percentage of calls answered within 45 seconds**

**Metric:** Calls answered refers to telephone calls that are answered by a customer service representative after a caller asks to speak to a representative. The wait time associated with the “calls answered” metric is from the time the customer asks to speak to a representative to the time that the call is answered by a representative.

Calls answered using an automated system are not included in the estimation of the metric if a customer chooses to speak to a customer representative. Alternatively, if a customer chooses an automated system, those calls are included in the calculation of this metric.

**Benchmark:** A minimum 85 percent of telephone calls answered within 45 seconds at NS Power’s Customer Care Centre during each severe outage event (i.e., MEDs and above, as defined by the IEEE 1366-2012 Standard). This benchmark shall be fixed for the 2022 to 2026 period.



**Standard 7 – Polite disconnect rate for all outage calls**

**Metric:** A polite disconnect results when a customer on hold waiting for a customer service agent is disconnected after receiving a brief disconnect message. A polite disconnect can result when call lines are very busy, and call volumes may be too high to keep customers on hold.

**Benchmark:** A 10 percent or less polite disconnect rate will be targeted annually for all outage calls. This benchmark shall be fixed for the 2022 to 2026 period.

**Standard 8 – Estimated Time to Restore (ETR) updates**

**Metric:** The performance standard around estimated restoration times shall aim to promptly provide customers with accurate information based on information available with NS Power.

**Benchmark:** NS Power shall provide ETR updates to all customers with *no delay*, once new restoration time estimates are known.<sup>37</sup> This benchmark shall be fixed for the 2022 to 2026 period.

**Standard 9 – Percentage of customers restored within the first 48 hours of a severe weather event**

**Metric:** This metric has been approved to reasonably quantify the promptness of restoration following a severe weather event and will be estimated separately for (i) MEDs, (ii) EEDs and (iii) SEDs, if the SEDs were excluded from normal conditions as the second 24-hour event, as discussed in Exclusions associated with Reliability Performance Standards.

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<sup>37</sup> For the Board to assess whether ETR updates were provided to customers without delay, as part of its annual reports, NS Power shall submit a compliance statement stating this was achieved, and note any exceptions with reasons.

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**Benchmark:** The targets for this metric shall be based on NS Power’s respective historical averages (since 2017) minus one standard deviation. The benchmarks will be updated annually by including the most recent data available at the time of benchmark updating.

With the data provided from 2017 to 2021, there are 5 data points for SEDs, 19 data points for MEDs, and 5 data points for EEDs. The figure below shows benchmarks to be set for the percentage of customers restored within first 48 hours for MEDs and EEDs in 2022.

**Figure 132** provides the 2023 benchmarks for the percentage of customers restored within first 48 hours for SEDs, MEDs and EEDs.

**Figure 132 – 2023 Benchmarks for Percentage of Customers Restored within 48 hours of a MED/EED**

Percentage of customers restored with 48 hours of:			
	MEDs	EEDs	SEDs
<b>2017-2022 Average</b>	95.99%	82.42%	96.19%
<b>Standard Deviation</b>	6.82%	14.68%	5.65%
<b>2023 Target*</b>	91.98%	78.38%	95.05%

\*NS Power has presented an alternative for consideration

As noted in section 2.2.5, NS Power has presented an alternative for the 2023 event day thresholds, for the Board’s consideration. This proposal holds the thresholds at the 2022 values. The proposed thresholds are shown in **Figure 133**.

**Figure 133 – 2023 Proposed Event Day Thresholds (Customer Hours of Interruption)**

SED (CHI)	MED (CHI)	EED (CHI)
73,376	182,510	1,129,145

**Standard 9A – Outage Report for events impacting > 30,000 customers**

**Metric/Benchmark:** NS Power shall submit a report for weather-related outages impacting 30,000 or greater customers. The outage report shall be in the form approved by the NSUARB (Matter M09524). NS Power shall file the outage report within 45 days of the event, or within 75 days in the case of a MED or EED with those impacts.

**6.3 Customer Service Standards**

The Board has approved the following metrics associated with customer service standards:

- (i) Percentage of calls answered within 30 seconds
- (ii) Percentage of customer bills that can be estimated
- (iii) Customer notification of outages
- (iv) New service connection times

**Compliance:** NS Power’s compliance across all customer service metrics will be assessed on an annual basis.

**Standard 10 - Percentage of calls answered within 30 seconds**

**Metric:** Calls answered refers to telephone calls that are answered by a customer service representative after a caller asks to speak to a representative. The wait time associated with the “calls answered” metric is from the time the customer asks to speak to a representative to the time that the call is answered by a representative. Calls answered using an automated system are not included in the estimation of the metric if a customer chooses to speak to a customer representative. Alternatively, if a customer chooses an automated system, those calls are included in the calculation of this metric.

**Benchmark:** A minimum of 70 percent of telephone calls shall be answered within 30 seconds at NS Power's Customer Care Centre (under normal conditions – i.e., excluding severe weather conditions, where the adverse weather response benchmark will apply). This benchmark shall be fixed for the 2022 to 2026 period.

**Standard 11 – Customer bills estimated**

**Metric:** NS Power may on occasion need to estimate a customer's bill if the customer's meter cannot be accessed and accurately read. For example, during winter months, snowfall and icy conditions create difficulties getting access to meters. This causes NS Power to estimate the bill for the customer or facility whose meter they could not access. When NS Power crews can access the meters, the customer's bill is then adjusted retrospectively to reflect the actual meter reading.

**Benchmark:** As a percentage of total bills, no more than 2 percent of customer bills shall be estimated annually. This benchmark shall be fixed for the 2022 to 2026 period.

**Standard 12 – Customer notifications of outages**

**Metric/Benchmark:** NS Power shall notify all customers of an outage event as soon as NS Power has knowledge of the outage event. This notification shall be followed up with prompt updates on restoration status of the outages. Channels used to communicate this information shall include NS Power's live outage map, social media and automated messaging.

**Standard 13 – New service connection times**

**Metric:** The amount of time taken to establish a new service connection provides a valuable gauge of NS Power's customer service and its ability to

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provide/establish electrical service within a reasonable time frame. There are 5 different types of service level metrics that are measured, and each of these has a specific target for NS Power to meet.

**Benchmark:** The targets for this metric will be set based on a 5-year rolling average plus 1 SD approach, and reset each year. This metric includes a two-day service delivery floor (i.e. no service delivery time will be due less than 48 hours from the time of the request). However, within a 5-year review period (i.e., 2022-2026), targets for any subsequent year (e.g. 2023 target) must be equal to or better than the prior year's target (e.g. 2022 target).

Similar to reliability metrics such as SAIDI and SAIFI, benchmarks for new service connections will also be set for normal conditions, i.e., excluding data for MEDs and EEDs.

**Figure 134** identifies the targets for new service connection times (under normal conditions) applicable for 2023, based on NS Power's historical data for the period 2018 to 2022.

**Figure 134 – 2023 New Service Connection Time Targets**

Service Type	Service Install – No Poles	Service Install – Pole or Transformer	Service Install – Temporary to Permanent	Service Install – Line Ext <10 poles	Service Install – Line Ext ≥10 poles
2018	2.7	4.3	2.7	5.4	12.2
2019	3.0	4.9	3.1	6.6	21.5
2020	2.9	4.7	3.2	5.9	14.7

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Service Type	Service Install – No Poles	Service Install – Pole or Transformer	Service Install – Temporary to Permanent	Service Install – Line Ext <10 poles	Service Install – Line Ext ≥10 poles
2021	3.0	4.8	3.1	5.9	10.2
2022	3.7	5.6	4.4	6.8	12.5
2018-2022 Average	3.1	4.9	3.3	6.1	14.2
Standard Deviation	0.4	0.4	0.6	0.5	3.9
2023 Target	3.0	4.9	3.2	6.2	18.1

**Exclusion:** When NS Power experiences MEDs and EEDs (as defined using the established MED and EED thresholds via the IEEE 1366-2012 Standard 2.5 and 3.5 Beta methodology respectively with the exclusion of outage data associated with Hurricane Dorian on September 7-9, 2019) in assessing new service connection times, NS Power shall be allowed to exclude: (i) MEDs and 7 days following MEDs; and (ii) EEDs and 14 days following EEDs, to allow for time needed to return to normal conditions.

**7.0 CONCLUSION**

NS Power is committed to meeting the Performance Standards as established by the Board. NS Power takes its responsibility to provide a safe, reliable power system as paramount and understands the importance of balancing investments while ensuring the lowest cost for customers.

As 2022 clearly showed, a changing climate is having an immense impact on weather, with increasingly powerful storms impacting the province. Nova Scotians experienced more storm days in 2022 than on record since 2003 with 28 event days (9 Significant Events Days -SEDs, 16 Major Event Days – MEDs, and 3 Extreme Event Days – EEDs) accross 9 storm events. NS Power operated the Emergency Operations Centre (EOC) for 24 hours a day for 43 days in total in 2022. Put another way, the EOC was open for 12 percent of the year in 2022. The Company is responding to the challenges posed by the changing climate and more severe weather with increased investment and the integration of new technologies and automation.

NS Power met all 2022 Performance Standards targets approved by the Board except SAIDI, SAIFI, one of the six feeders tracked under the CKAIID metric, and three of the new service connections targets. Seven of the 20 event days (all occurring during Hurricane Fiona)tracked under the Percentage of Customers Restored in 48 hours metric did not meet the targets. However, NS Power considers this metric to be met due to the impact on restoration pace due to the EMO’s directionon the restoration prioritization of items for public safety and critical infrastructure ahead of the largest customer outages.

As noted in the Board’s decision approving the standards, the expectation is that there will be year-over-year improvement in meeting the standards. In 2022, NS Power achieved a 14 percent improvement in SAIDI and a 15 percent improvement in SAIFI over 2019 values (another year with significant hurricane impacts),; 2022 had the most event days on record, and also experienced the most devastating hurricane that the Company has responded to in its history . The Company acknowledges that there is more

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1 work to be done but has demonstrated a trend of increased investment in the T&D system  
2 over the past decade and this trend will continue in 2023 with over \$180 million of  
3 proposed investments in the T&D system.. NS Power is committed to balancing new  
4 investment with ensuring the lowest cost for customers.

5 Feeder 11S-411 out of Keltic Drive, serving the Coxheath, East, and Eskasoni  
6 communities finished in the top five of worst performing feeders for duration. This  
7 feeder serves a suburban to rural area with pockets of heavy forested areas exposed to  
8 winds and spray from the Bras D'or Lakes. NS Power has completed \$3.26 million in  
9 transmission and distribution system upgrades since 2016 on feeder 11S-411 with a  
10 further \$1.58 million committed for 2023-2025. This investment is focused on vegetation  
11 management and line upgrades. The Company is confident that these investments will  
12 reduce the overall duration and frequency of outages on this feeder.

13 New Service Connection Times were challenged with work volumes in 2022 showing a  
14 26 percent increase over 2019 levels. In 2022, the continued growth of customer-  
15 requested work volume was further challenged by the number of days that field resources  
16 were engaged in storm response and restoration activities due to the frequency of adverse  
17 weather including major winter storms at the beginning of the year and Hurricane Fiona  
18 in September.. In 2023 NS Power is committed to adding additional field resources to  
19 address the continued growth of customer work. Additional field resources will  
20 contribute positively to the ability to meet the demand of customer service requests and  
21 overall reliability response.

22 Given NS Power's demonstrated commitment to investment in the systems and  
23 infrastructure at the core of improving reliability, the Company respectfully submits that  
24 it is not necessary to impose a penalty to promote compliance with future performance  
25 standards or direct to the Company to develop and file a plan for bringing itself into  
26 compliance with any standard as NS Power has already taken steps to address compliance  
27 with the standards that were not achieved in 2022.



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1       The impact of Hurricane Fiona and the eight other severe weather events had a  
2       considerable impact on the Performance Standards results in 2022 and NS Power asks  
3       the Board to consider these events and the investment action plans already in place when  
4       evaluating the Company's results for 2022.

5       NS Power respectfully requests that the NSUARB accept the 2022 Annual Performance  
6       Standards Report, and approve the Performance Standards for 2023 as set out in Section  
7       6 above, including the alternative proposal for severe event day thresholds.

**Appendix A**  
**Regular Business Call Answer Response**  
Supporting Documentation

NS Power 2022 Results for Regular Business Calls Answered within 30 Seconds

		Total Interactions	Service Level MTD	Service Level YTD
			Percentage	Percentage
Customer Care: 70 % Percentage of calls answered within 30 seconds	Jan	100,233	85.71	85.71
	Feb	124,364	79.43	82.23
	Mar	84,828	71.22	79.21
	Apr	84,113	55.84	74.22
	May	82,463	53.53	70.65
	Jun	73,330	63.86	69.74
	Jul	75,699	74.40	70.30
	Aug	74,749	60.35	69.24
	Sep	137,268	85.36	71.88
	Oct	97,161	69.01	71.59
	Nov	103,509	65.93	71.02
	Dec	57,560	71.69	71.08
	YTD	1,095,277	71.08	71.08

**Appendix B**  
**Customer Bills Estimated**  
Supporting Documentation

NS Power 2022 Results for Customer Bills Estimated

Month	Bills Produced	Bills Estimated	Percentage Estimated
January	339,186	2,549	0.8%
February	316,931	3,508	1.1%
March	328,682	2,173	0.7%
April	322,622	2,020	0.6%
May	329,273	1,713	0.5%
June	323,298	1,645	0.5%
July	329,995	1,645	0.5%
August	311,938	1,332	0.4%
September	285,422	870	0.3%
October	381,734	6,371	1.7%
November	337,082	871	0.3%
December	324,172	927	0.3%
<b>YTD</b>	<b>3,930,335</b>	<b>25,624</b>	<b>0.7%</b>

## Appendix C

### ETRS Communicated Without Delay & Outage Communication

#### Supporting Documentation

The following tables provide detail of the availability of the operational systems which process outage calls and manage outage map functionality. **Figure 1** shows data delivery details for ADMS (processes outage calls) and the Kubra Storm Centre (outage map). Data delivery refers to instances when the system was unavailable. **Figure 2** shows uptime information for the outage operational systems for 2022.

**Figure 1: ADMS and Kubra Storm Centre data delivery details**

System	Data delivery issue	Notes
ADMS-OMS	20	Primarily data synchronization or enterprise service bus issues
Kubra Storm Centre	2	Kubra experienced a server issue

**Figure 2: Outage Operational System Uptime and Comments**

Application	2022 Uptime	Comments
ADMS	99.7%	1430 mins total down-time over the year The down time consisted of a number of instances of shorter duration down- time which were quickly identified and addressed. The Contingency Process was activated in these instances.
NSP Outage Map (primary map)	99.98 %	The Kubra outage map system had 120 minutes of interruption in 2022.
BCP Outage Site (contingency site)	99.8 %	The Back up Contingency Site was available at all times during 2022 with the exception of two routine maintenance outages.

Application	2022 Uptime	Comments
<b>HVCA</b>	94.7 %	The HVCA system experienced a service interruption from Dec 1 <sup>st</sup> to December 20 <sup>th</sup> due to the vendor experiencing a platform failure due to a cyber attack.
<b>Social Media</b>	100 %	Social Media Channels (ex., Twitter, Facebook, Instagram, etc.) were available with NS Power outage updates throughout 2022.

The data for the Outage Communication metric is provided by the NSPI Outage Management System and uptime reporting from the NSPI Outage Map website. The metric is derived to reconcile the time when new outages or changed ETRs are updated in the NSPI Outage Management System and the time that ETRs are sent to the NSPI Outage Map website. Any time that the NSPI Outage Map website is not available is factored into the final metric.

## Appendix D

## New Service Connection Times 2022 Supporting Data

Month	Average Number of Business Days (by Service Installation Type)				
	No Pole	Pole or Transformer	Temporary to Permanent	Line Extension <10 Poles	Line Extension ≥10 Poles
January	0.82	1.16	1.06	1.46	2.00
February	2.05	3.44	1.87	3.04	
March	3.05	5.74	3.74	4.47	14.25
April	4.28	6.05	5.52	7.03	10.33
May	2.71	4.86	3.58	6.20	14.80
June	2.82	4.47	3.34	5.71	3.20
July	4.17	6.20	3.73	7.64	18.00
August	3.06	6.26	3.65	7.01	11.17
September	1.82	4.18	1.90	5.12	10.50
October	3.09	5.16	2.98	8.25	3.00
November	4.35	6.26	6.06	9.65	10.67
December	1.74	4.33	3.91	5.38	20.00
2022 YTD	2.98	5.09	3.73	6.38	12.02
2022 Target	3.0	4.9	3.2	6.2	18.1

The data for the New Service Connection Times metric is extracted from Maximo using NC-SD, NC-PTX, TP, NC-LE1, and NC-LE2 order types for all completed work for the month or timeframe desired.

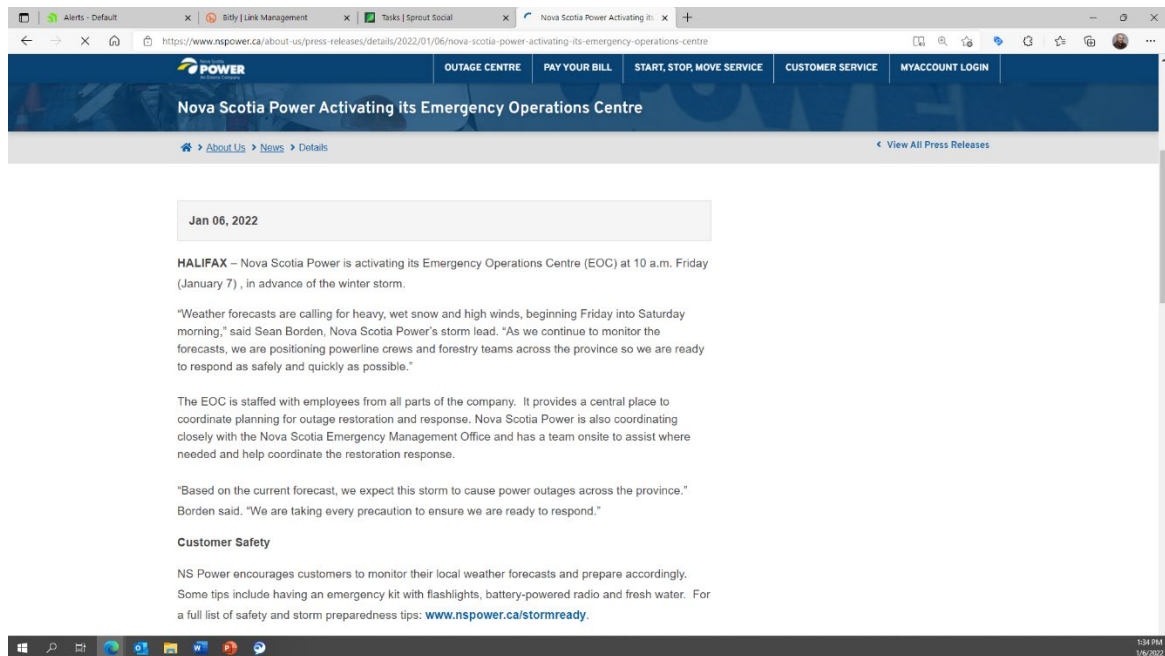
## Appendix E

### 2022 Storm Day Media Communications Documentation

Storm Date	Communication Types	Date of Emergency Operations Centre Opening	Time of Emergency Operations Centre Opening
January 7, 2022	1. NS Power Website 2. Social Media	Friday January 7, 2022	10:00
January 14, 2022	3. NS Power Website 4. Social Media	Friday January 14, 2022	12:00 noon
January 28, 2022	5. NS Power Website 6. Social Media	Friday January 28, 2022	10:00
February 4, 2022	7. NS Power Website 8. Social Media	Friday February 4, 2022	07:00
February 18, 2022	9. NS Power Website 10. Social Media	Friday February 18, 2022	07:00
September 23, 2022	11. NS Power Website 12. Social Media	Friday September 23, 2022	08:00
December 1, 2022	13. NS Power Website 14. Social Media	Thursday December 1, 2022	08:00
December 23, 2022	15. NS Power Website 16. Social Media	Friday December 23, 2022	10:00

Supporting documentation for each storm date is provided below and numbered in accordance with the table above.

## 1. NS Power Website – January 7, 2022



## 2. Social Media – January 7, 2022

## Twitter

← Tweet



We're activating our Emergency Operations Centre at 10am on Friday as we prepare for the first winter storm of 2022. With weather reports calling for heavy, wet snow and wind beginning Friday, we're positioning crews across NS. [#NSstorm](#)

For more info: [bit.ly/3zuVVKG](https://bit.ly/3zuVVKG).



1:41 PM · Jan 6, 2022 · Sprout Social



Facebook


PINNED POST

Nova Scotia Power

Published by Sprout Social · 1m ·

We're activating our Emergency Operations Centre at 10am on Friday as we prepare for the first winter storm of 2022. With weather reports calling for heavy, wet snow and wind beginning Friday, we're positioning crews across the province. We encourage you to prepare as well—visit [nspower.ca/stormready](https://nspower.ca/stormready) for safety tips. #NSstorm

More information can be found in our news release.



NSPOWER.CA

Nova Scotia Power Activating its Emergency Operations Centre

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0

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People reached

Engagements

Distribution score

Boost post

Like

Comment

Share

Comment as Nova Scotia Power

1:44 PM

1/6/2022

## 3. NS Power Website – January 14, 2022

**STORM ALERT**

In advance of a winter storm, we're activating our Emergency Operations Centre on Friday, January 14 at 12pm. More information and safety tips can be found in our news release. [Learn more.](#)

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An Emera Company

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## The path to 2030

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## Nova Scotia Power Activating its Emergency Operations Centre

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**Jan 13, 2022**

**HALIFAX** – Nova Scotia Power is activating its Emergency Operations Centre (EOC) at 12 pm Friday (January 14), in advance of the latest winter storm to hit the province.

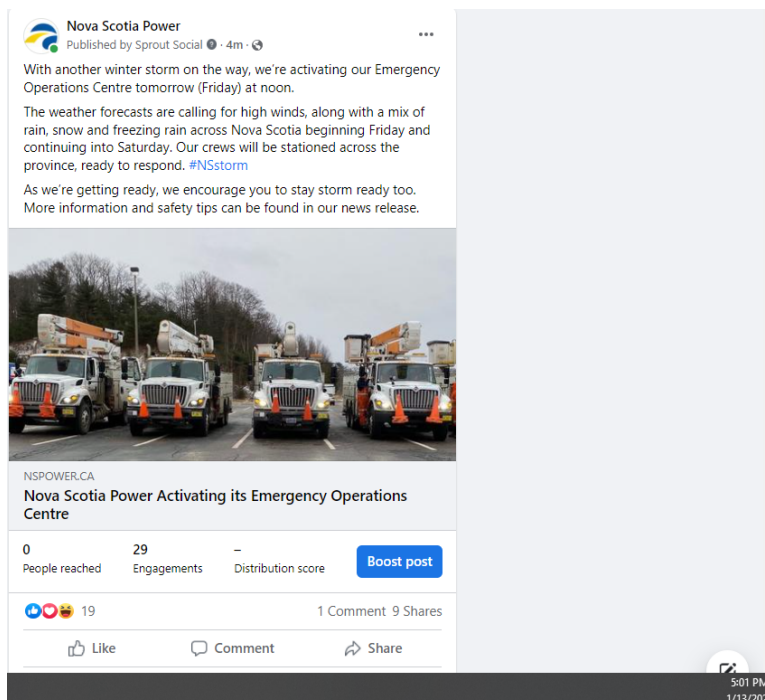
"Along with high winds, the weather forecasts are calling for a mix of rain, snow and freezing rain across the province beginning Friday and continuing into Saturday," said Sean Borden, Nova Scotia Power's storm lead. "There's also a risk of temperatures dropping quickly. Crews are at the ready and

## 4. Social Media – January 14, 2022

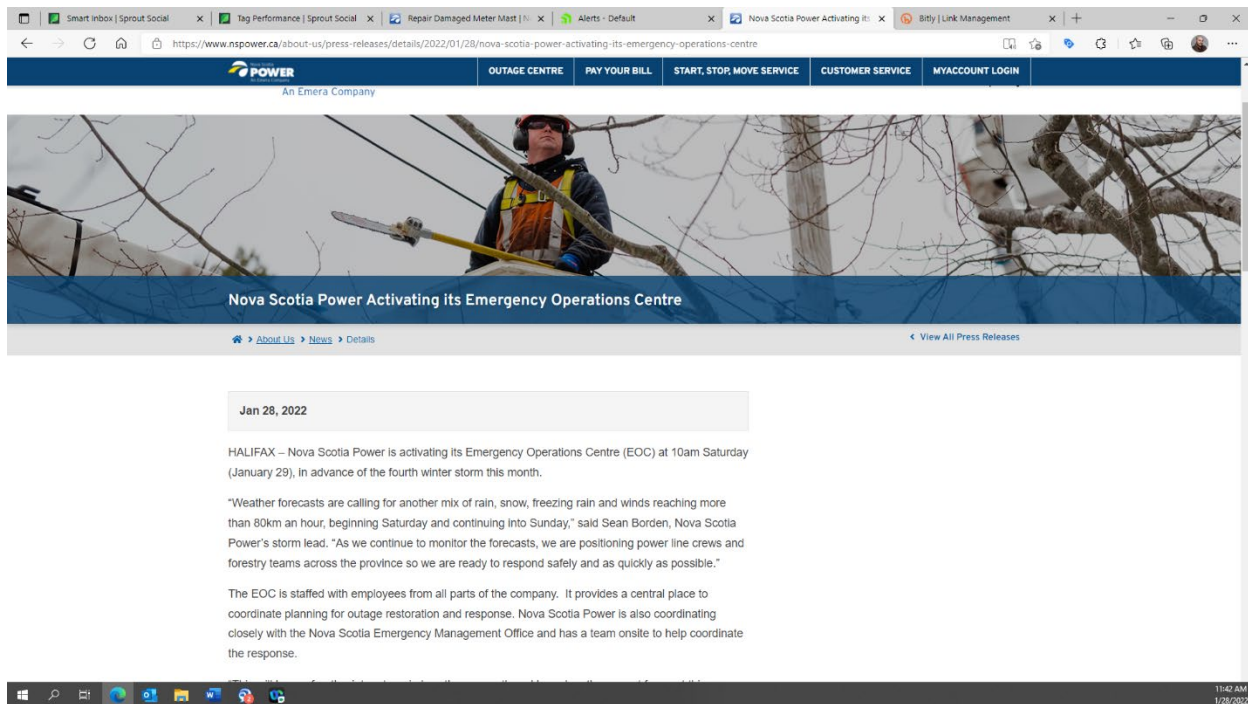
## Twitter



## Facebook

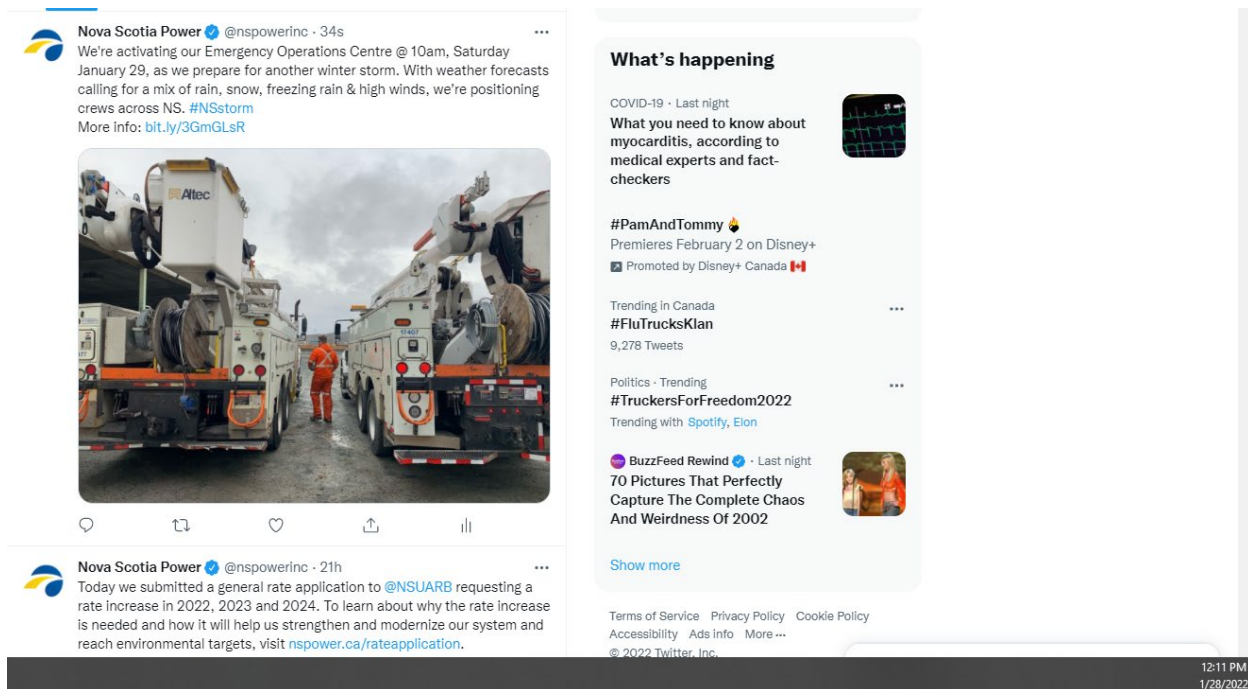


## 5. NS Power Website – January 28, 2022



## 6. Social Media – January 28, 2022

## Twitter





Facebook


Nova Scotia Power

2m · 🌐

...

We're activating our Emergency Operations Centre at 10am on Saturday, January 29, as we prepare for another winter storm. With weather forecasts calling for another mix of rain, snow, freezing rain and high winds, we're positioning crews across the province. We encourage you to prepare as well—visit [nspower.ca/stormready](https://nspower.ca/stormready) for safety tips. #NSStorm

More information can be found in our news release.



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**Nova Scotia Power Activating its Emergency Operations Centre**


Nova Scotia Power is activating its Emergency Operations Centre (EOC) at 10am Saturday (Jan...

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💬 Comment

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Your Pages




Nova Scotia Power

💬 20 Messages

🔔 20+ Notifications

📣 Create promotion

Contacts



Amanda Mills

12:10 PM  
1/28/2022

## 7. NS Power Website – February 4, 2022

The screenshot shows the Nova Scotia Power website on February 3, 2022. At the top, a yellow banner with a warning icon reads "STORM ALERT" and states: "We're activating our Emergency Operations Centre (EOC) at 7am Friday (February 4), in advance of the fifth major winter storm expected to hit the province in the last four weeks. Learn more." Below this is a navigation bar with links: OUTAGE CENTRE, PAY YOUR BILL, START, STOP, MOVE SERVICE, CUSTOMER SERVICE, and MYACCOUNT LOGIN. The Nova Scotia Power logo is followed by links: YOUR HOME, YOUR BUSINESS, CLEAN & GREEN, COMMUNITY, and ABOUT US. A large banner image shows a worker on a bucket truck. Below the banner, the headline reads "Nova Scotia Power Activating its Emergency Operations Centre". A date separator indicates "Feb 03, 2022". The main text of the article states: "HALIFAX – Nova Scotia Power is activating its Emergency Operations Centre (EOC) at 7:00am Friday (February 4), in advance of the fifth major winter storm expected to hit the province in the last four weeks." A quote from Sean Borden, Nova Scotia Power's storm lead, is partially visible: "So far this year, we have seen a significant number of severe weather systems impact Nova Scotia," says Sean Borden, Nova Scotia Power's storm lead. "Weather forecasts are calling for a heavy amount of snow and ice over the next few days." The bottom right corner shows the time "5:37 PM" and date "2/3/2022".

## 8. Social Media – February 4, 2022

## Twitter



We're activating our Emergency Operations Centre at 7am tomorrow (Friday), in advance of the fifth major winter storm expected to hit the province in the last four weeks. We're positioning crews across NS.


[#NSStorm](#)

Find more info in our release here: [bit.ly/3gnOKeo](https://bit.ly/3gnOKeo)



5:41 PM · Feb 3, 2022 · Sprout Social

Facebook




Nova Scotia Power

Published by Sprout Social · 1m · 🌐

We're activating our Emergency Operations Centre at 7am tomorrow (Friday), in advance of the fifth major winter storm expected to hit the province in the last four weeks. Weather forecasts are calling for a heavy amount of rain, freezing rain, snow and ice pellets beginning overnight Thursday and continuing all day Friday. We're positioning crews across the province, and we're ready to safely respond as quickly as possible for our customers. #NSStorm

Please be prepared by visiting [nspower.ca/stormready](https://nspower.ca/stormready) for safety tips. More information can be found in our news release: <https://bit.ly/3gnOKeo>



NSPOWER.CA

Nova Scotia Power Activating its Emergency Operations Centre

Nova Scotia Power is activating its Emergency Operations Centre (EOC) at 7am Friday (Februar...

0

People reached


4


Engagements

—

Distribution score

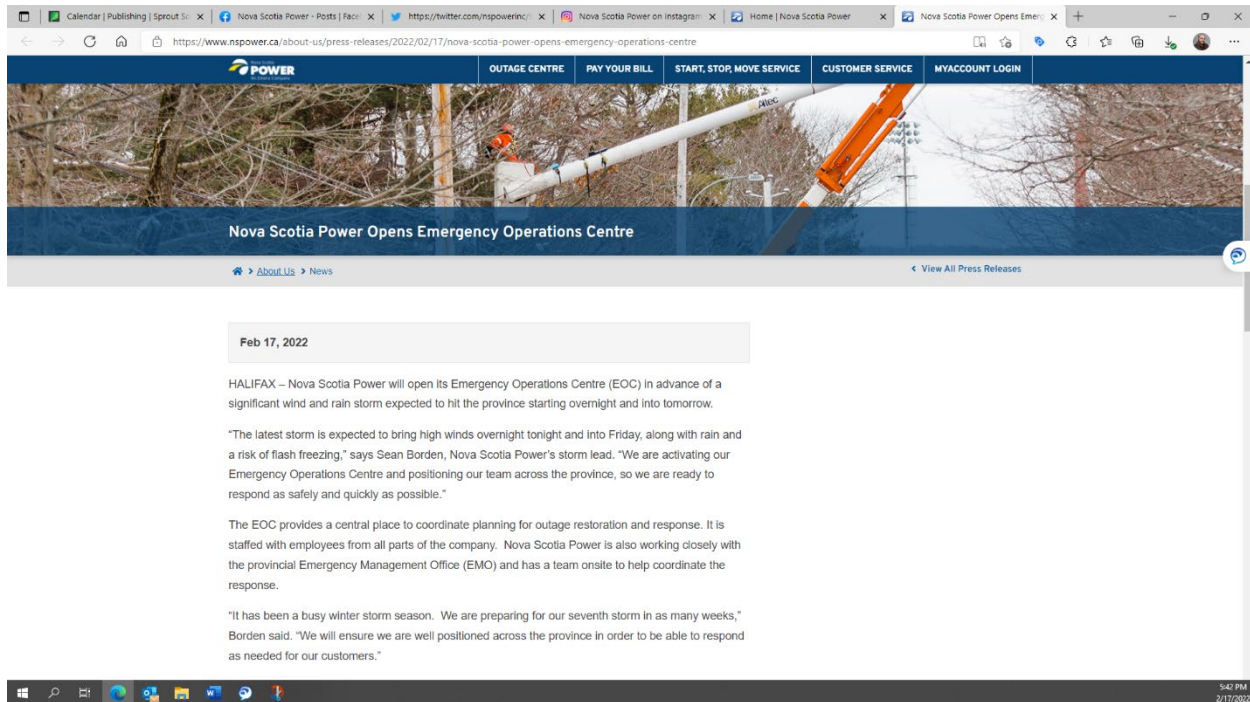
Boost post

 2 Shares



5:44 PM  
2/3/2022

## 9. NS Power Website – February 18, 2022



## 10. Social Media – February 18, 2022

### Twitter



We're opening our Emergency Operations Centre in advance of a significant wind and rain storm expected to hit the province, starting overnight and into tomorrow. Crews will be positioned across NS, ready to respond to the storm. [#NSstorm](#)


For more info: [bit.ly/354V4Fg](https://bit.ly/354V4Fg)



5:41 PM · Feb 17, 2022 · Sprout Social



Facebook




Nova Scotia Power

Published by Sprout Social · 2m ·

We're opening our Emergency Operations Centre in advance of a significant wind and rain storm expected to hit the province, starting overnight and into tomorrow. Crews will be positioned across Nova Scotia, ready to respond to the storm. [#NSstorm](#)

More information and safety tips can be found in our news release.



NSPOWER.CA

Nova Scotia Power Opens Emergency Operations Centre

Nova Scotia Power opens Emergency Operations Centre in advance of a significant wind and r...

0

People reached

0

Engagements

—


Distribution score

Boost post

Like

Comment

Share

 Comment as Nova Scotia Power

5:43 PM

2/17/2022

## 11. NS Power Website – September 23, 2022

**STORM ALERT**  
Our Emergency Operations Centre will be activated at 8 a.m. on Friday ahead of Hurricane Fiona. More information can be found in our news release.

OUTAGE CENTRE | PAY YOUR BILL | START, STOP, MOVE SERVICE | CUSTOMER SERVICE | MYACCOUNT LOGIN

Nova Scotia **POWER**  
An Emera Company

YOUR HOME | YOUR BUSINESS | CLEAN & GREEN | COMMUNITY | ABOUT US | 🔍

**Prepared for Hurricane Fiona: Nova Scotia Power to Activate Emergency Operations Centre**

➡ About Us ➡ News ➡ Details

⏪ View All Press Releases

Sep 21, 2022

HALIFAX – Nova Scotia Power will be activating its Emergency Operations Centre (EOC) Friday at 8am. (September 23) ahead of the first Hurricane expected to impact Nova Scotia this season.

Customers are encouraged to monitor their local weather forecasts and be prepared themselves. It's always a good idea to have an emergency kit with flashlights handy, as well as a battery-powered radio and fresh water. A full list of safety and storm preparedness tips is available at: [www.nspower.ca/stormready](http://www.nspower.ca/stormready)

"We have been monitoring Hurricane Fiona for several days and have been taking steps to prepare," said Sean Borden, Nova Scotia Power's storm lead. "Based on the recent weather forecasts, we are opening our Emergency Operations Centre Friday at 8am to ensure proper plans and crews are in place to manage our storm response."

The EOC provides a central place to coordinate planning for outage restoration and response. It is staffed with employees from across the company. NS Power is also coordinating closely with the Nova Scotia Emergency Management Agency.

2:56 PM  
9/21/2022

## 12. Social Media – September 23, 2022

## Twitter



We will be activating our Emergency Operations Centre Friday at 8 a.m. ahead of Hurricane Fiona. Our crews will be in place and ready to safely respond to the storm. [#NSStorm](#)

Find more info in our new release: [bit.ly/3QVTI7u](https://bit.ly/3QVTI7u).




2:46 PM · Sep 21, 2022 · Sprout Social

## Facebook

**Nova Scotia Power**  
Published by Sprout Social · 19m · 

We will be active Wednesday, September 21, 2022 at 2:32 PM Friday at 8 a.m. ahead of Hurricane Fiona. Our crews will be in place and ready to safely respond to the storm. [#NSStorm](#)

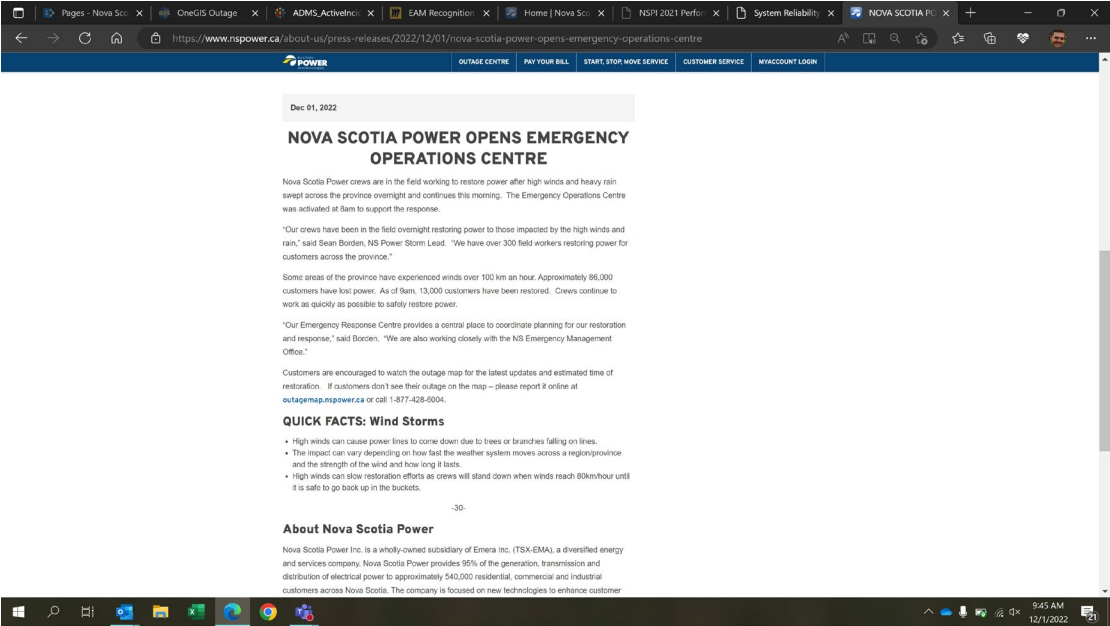
Find more information in our new release.



NSPOWER.CA

**Prepared for Hurricane Fiona: Nova Scotia Power to Activate Emergency Operations Centre**

13. NS Power Website – December 1, 2022



NOVA SCOTIA POWER OPENS EMERGENCY OPERATIONS CENTRE

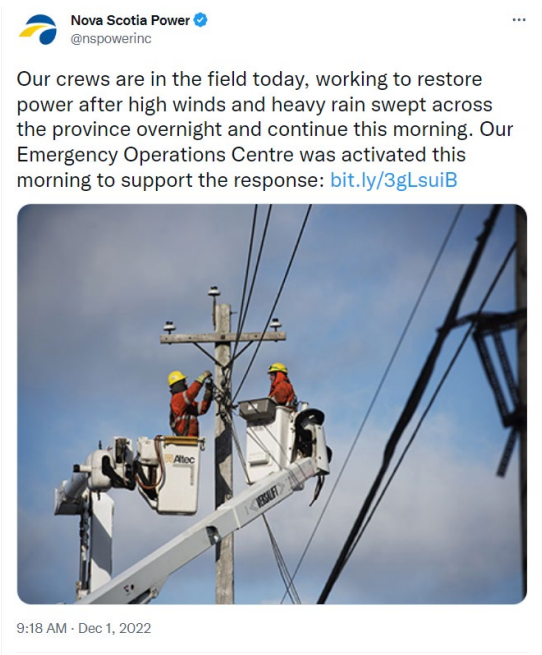
Dec 01, 2022

Nova Scotia Power crews are in the field working to restore power after high winds and heavy rain swept across the province overnight and continues this morning. The Emergency Operations Centre was activated at 8am to support the response.


[Read More about NOVA SCOTIA POWER OPENS EMERGENCY OPERATIONS CENTRE >](#)

14. Social Media – December 1, 2022

Twitter




Facebook



Nova Scotia Power

December 1, 2022 · 🌐



Our crews are in the field today, working to restore power after high winds and heavy rain swept across the province overnight and continue this morning. Our Emergency Operations Centre was activated this morning to support the response. Please stay safe as the stormy weather continues today, and visit <http://outagemap.nspower.ca> for the latest updates and estimated time of restoration.



NSPOWER.CA

**NOVA SCOTIA POWER OPENS EMERGENCY OPERATIONS CENTRE**

Nova Scotia Power crews are in the field working to restore power after high winds and heavy ...

 33

5 comments 17 shares



## 15. NS Power Website – December 23, 2022

**NOVA SCOTIA POWER TO ACTIVATE EMERGENCY OPERATIONS CENTRE**

Dec 21, 2022


Nova Scotia Power is opening its Emergency Operations Centre (EOC) at 10am Friday (December 23) to support response efforts ahead of the pending storm.

[Read More about Nova Scotia Power to Activate Emergency Operations Centre >](#)

## 16. Social Media – December 23, 2022

**Twitter**

Facebook




Nova Scotia Power

December 21, 2022 at 5:59 PM · 🌐

...

With high winds and heavy rain in the forecast for Friday afternoon and Saturday morning, we will be opening our Emergency Operations Centre on Friday morning. This storm is part of the same system expected to affect most of our neighbours in eastern Canada and northeastern US.


While there's never a good time for a power outage, we know it's especially tough to lose power over the holidays. Please know we will do everything we can to try to ensure the least amount of disrupt... [See more](#)



NSPOWER.CA

**Nova Scotia Power to Activate Emergency Operations Centre**

Nova Scotia Power to Activate Emergency Operations Centre



## Appendix F

### Outage Calls Answered Within 45 Seconds

#### Supporting Documentation

	Event	Total Interactions	Service Level MTD	Service Level YTD
			Percentage	Percentage
Storm Response: 85 % Percentage of calls answered within 45 seconds	January 7 – 10	65,532	97.76	97.76
	January 14 – 10	54,482	99.63	98.61
	February 3	8,513	94.13	98.31
	February 4 – 9	128,550	99.15	98.73
	February 18 – 19	25,001	96.56	98.54
	September 23 – October 10	429,307	93.31	95.42
	November 30 – December 3	16,144	93.05	95.34
	December 13 – 16	13,842	86.64	95.13
	December 23 – 24	16,658	95.78	95.15
	YTD	758,029	95.15	95.15

The data for the Outage Calls Answered in 45 seconds metric is extracted from CISCO Unified Intelligence Center (CUIC) and High-Volume Call Answer (HVCA) systems, using the following parameters:

- The reported data is for MED and above events and does not include regular business.
- Customers who abandon/hang up within 45 seconds are not included in the service level calculation



## Appendix G

### Polite Disconnection Rate

#### Supporting Documentation

#### NS Power 2022 Results for Polite Disconnection Rate

		Total Polite Disconnects	MTD Percentage	YTD Percentage
Storm Response: 10 % annual polite disconnect rate	January	73	0.28	0.28
	February	61	0.20	0.24
	March	5	0.07	0.22
	April	9	0.13	0.21
	May	9	0.14	0.20
	June	7	0.11	0.20
	July	5	0.07	0.19
	August	20	0.33	0.20
	September	7,036	12.93	4.77
	October	354	1.69	4.40
	November	12	0.10	4.12
	December	0	0.00	3.49
	YTD	7,591	3.49	3.49

The data for polite disconnects metric is extracted from the Interactive Voice Response (IVR) production database.

## Appendix H

### SAIDI / SAIFI Documentation

#### SAIDI / SAIFI Results 2015-2022

Year	SAIFI	SAIDI
2015	2.23	4.67
2016	2.46	5.06
2017	1.73	3.40
2018	2.00	4.43
2019	2.58	5.99
2020	2.05	3.98
2021	2.27	5.23
2022	2.19	5.16

#### Customer Interruption, Customer Hours of Interruption and Customer Count 2022

Month	CI	CH	Customer Count
Jan	162,804	365,519	528,513
Feb	130,807	344,760	529,337
Mar	115,692	253,370	529,371
Apr	109,419	221,055	529,635
May	113,136	171,630	530,133
Jun	64,198	84,276	530,131
Jul	82,294	206,382	531,234
Aug	28,981	53,514	532,652
Sep	44,013	46,157	533,111
Oct	99,914	488,706	533,436
Nov	169,886	389,833	533,710
Dec	40,472	118,210	533,990
<b>Average</b>	<b>96,801</b>	<b>228,618</b>	<b>531,271</b>
<b>Total</b>	<b>1,161,616</b>	<b>2,743,411</b>	

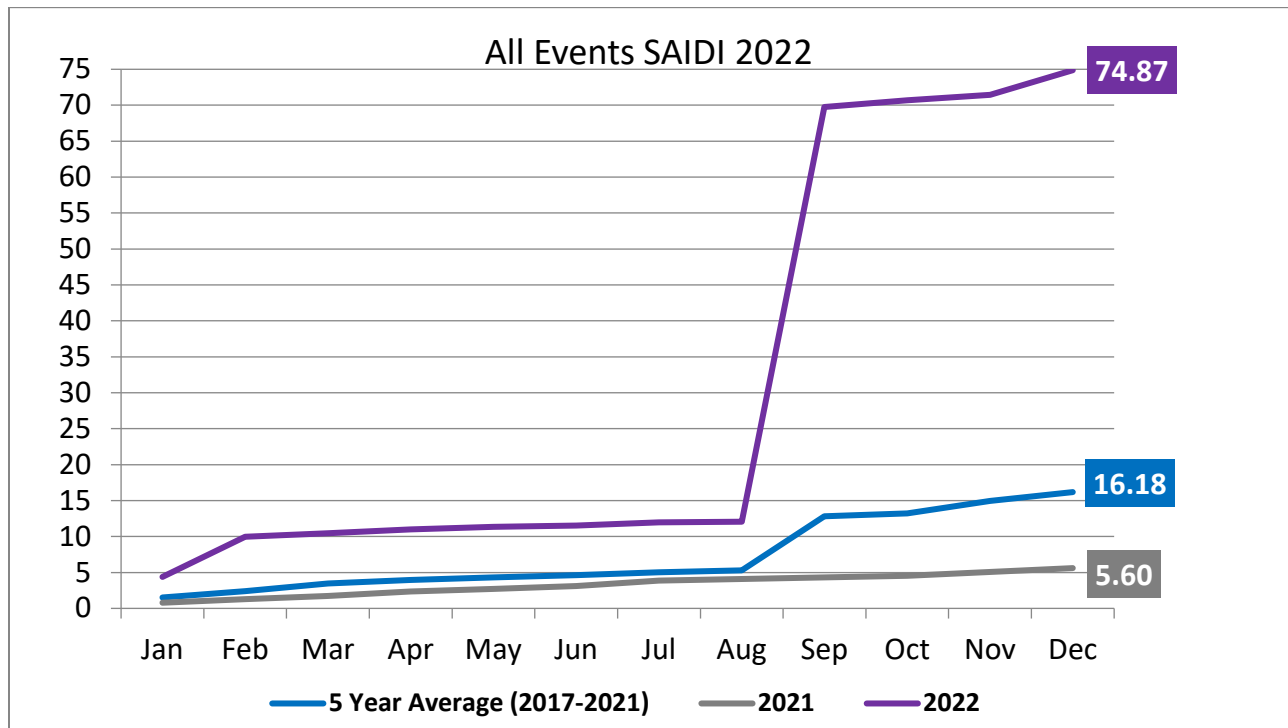
## Monthly SAIDI 2020-2022

SAIDI (cumulative by month)			
Month	2020	2021	2022
Jan	0.41	0.77	0.69
Feb	0.68	1.25	1.34
Mar	0.95	1.69	1.82
Apr	1.47	2.25	2.24
May	1.89	2.58	2.56
Jun	2.07	2.99	2.72
Jul	2.35	3.69	3.11
Aug	2.61	3.89	3.21
Sep	3.13	4.06	3.29
Oct	3.38	4.25	4.21
Nov	3.55	4.72	4.94
Dec	3.98	5.23	5.16
<b>Total</b>	<b>3.98</b>	<b>5.23</b>	<b>5.16</b>

## Monthly SAIFI 2020-2022

SAIFI (cumulative by month)			
Month	2020	2021	2022
Jan	0.19	0.21	0.31
Feb	0.37	0.45	0.56
Mar	0.50	0.67	0.77
Apr	0.79	0.82	0.98
May	0.98	1.02	1.19
Jun	1.07	1.23	1.31
Jul	1.22	1.48	1.47
Aug	1.36	1.61	1.52
Sep	1.61	1.72	1.60
Oct	1.76	1.84	1.79
Nov	1.86	2.07	2.11
Dec	2.05	2.27	2.19
<b>Total</b>	<b>2.05</b>	<b>2.27</b>	<b>2.19</b>

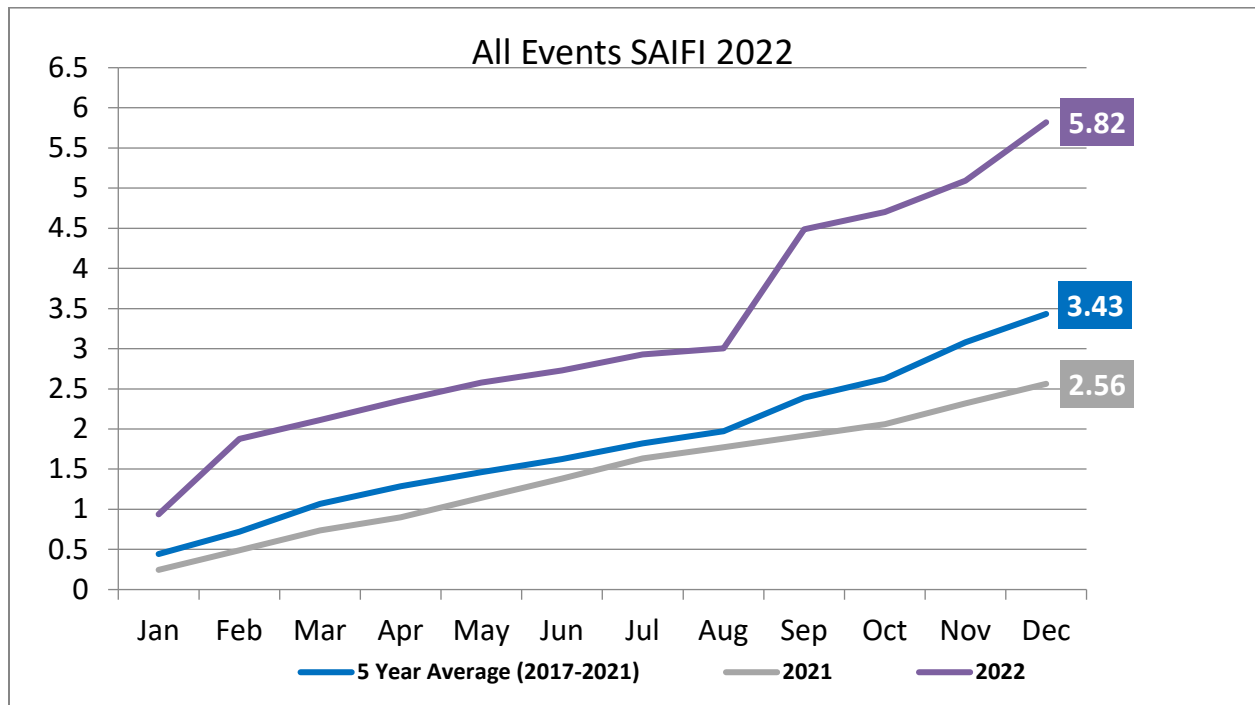
## SAIDI “All Events” Results for 2022



## 2022 All Events SAIDI Results

Month	2021	2022	5 Year Average (2017 – 2021)
Jan	0.79	4.38	1.52
Feb	1.29	9.96	2.40
Mar	1.75	10.44	3.47
Apr	2.34	10.99	3.95
May	2.69	11.34	4.31
Jun	3.12	11.54	4.60
Jul	3.86	11.95	5.02
Aug	4.08	12.06	5.29
Sep	4.30	69.76	12.80
Oct	4.52	70.67	13.21
Nov	5.08	71.45	14.94
Dec	5.60	74.87	16.18

## SAIFI “All Events” Results for 2022



## 2021 All Events SAIFI Results

Month	2021	2022	5 Year Average (2017 – 2021)
Jan	0.25	0.94	0.44
Feb	0.49	1.87	0.72
Mar	0.73	2.11	1.07
Apr	0.90	2.35	1.29
May	1.14	2.58	1.46
Jun	1.38	2.73	1.62
Jul	1.63	2.93	1.82
Aug	1.77	3.00	1.97
Sep	1.92	4.49	2.39
Oct	2.06	4.70	2.63
Nov	2.32	5.09	3.08
Dec	2.56	5.82	3.43

## EXCLUSIONS

MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
100C-421	2.56	2.38	3.28	8.17	4.13	7.02	1.60	10.15	2.07	2.50	18.91	15.69	35.69	10.16
100C-422	6.92	2.27	2.20	3.40	3.37	3.15	2.40	9.11	2.11	3.24	20.16	7.82	21.38	7.81
100C-423	1.07	1.07	1.27	2.09	2.27	3.00	3.42	2.28	0.48	1.29	0.38	6.27	5.26	34.44
101H-411	1.29	0.03	2.22	2.36	1.14	4.08	1.41	1.17	0.06	3.04	3.51	3.54	6.48	4.59
101H-412	0.02	0.04	0.01	1.32	3.02	4.20	2.00	0.04	0.08	0.02	1.21	2.48	5.31	3.21
101H-413	1.07	0.23	2.23	3.67	0.64	3.11	1.17	0.79	0.36	3.11	4.30	1.17	3.53	7.02
101H-421	1.03	0.06	1.11	6.06	2.04	3.47	4.57	0.85	0.11	0.94	9.01	3.04	6.41	3.31
101H-422	1.19	0.29	2.02	2.36	1.13	3.87	3.91	2.37	0.68	6.11	8.69	2.54	9.67	5.26
101H-423	1.21	0.03	3.02	3.21	1.11	2.14	2.08	0.34	0.05	4.79	7.09	1.35	2.45	1.93
102W-311	1.08	1.06	0.05	0.25	0.33	3.32	1.06	0.47	0.19	0.15	0.65	1.02	1.94	2.07
102W-312	0.63	1.19	2.13	1.01	1.74	3.06	0.24	3.45	0.39	3.54	2.02	6.74	1.54	0.52
103C-311	1.11	4.08	0.03	4.18	2.05	5.19	1.03	3.71	12.13	0.11	16.51	7.99	22.17	2.49
103C-313	1.50	1.78	1.01	5.02	1.03	2.06	1.06	1.48	7.04	0.55	17.83	3.11	7.77	2.52
103C-314	4.05	7.65	1.40	5.68	2.40	5.92	5.56	9.21	29.23	1.78	17.50	5.96	23.78	12.26
103H-431	0.01	1.00	3.17	2.10	1.05	0.17	1.34	0.02	2.19	3.72	7.40	0.18	0.60	0.91
103H-432	0.10	0.03	1.49	1.15	1.72	0.79	0.16	0.23	0.07	4.18	4.85	2.08	1.95	0.86
103H-433	0.51	0.62	2.01	3.08	2.08	1.93	0.98	0.07	1.31	4.28	10.05	1.62	3.68	1.96
103H-434	3.43	1.24	4.19	3.69	5.35	3.32	0.09	3.54	3.37	6.26	10.00	4.63	5.86	0.47
103W-311	0.20	0.15	0.28	2.41	0.27	2.08	1.87	0.63	0.67	1.29	3.90	0.60	1.97	6.15
103W-312	0.35	1.28	1.46	4.22	2.51	2.39	1.43	1.55	7.03	2.05	6.46	7.42	2.86	3.18
104H-411	1.29	1.05	3.40	3.97	2.14	2.72	1.20	3.30	1.26	1.43	10.05	8.96	4.18	0.45
104H-412	0.12	2.15	2.88	4.05	2.08	2.59	0.11	0.10	1.83	2.35	4.50	3.32	2.38	0.30
104H-413	3.08	1.89	2.27	3.28	3.95	1.39	3.06	2.85	2.82	0.45	2.68	7.51	4.51	4.36
104H-421	2.02	4.03	4.11	3.12	1.07	1.06	2.13	2.09	4.52	4.69	1.83	0.69	2.32	1.39
104H-422	0.24	1.93	1.34	1.25	2.06	0.47	1.09	0.87	1.33	1.82	1.51	0.85	0.99	0.11
104H-423	1.70	1.94	2.08	1.13	1.12	1.00	0.12	1.11	2.04	2.50	1.31	1.00	0.95	0.30
104H-431	2.52	0.46	1.68	1.10	2.08	2.35	3.97	3.26	0.58	2.35	1.35	0.23	5.30	3.17
104H-432	1.98	0.01	1.98	2.11	4.06	0.08	2.48	2.46	0.01	2.53	3.34	4.92	0.13	1.29
104H-433	0.50	1.00	1.04	1.88	1.07	0.07	1.39	0.06	1.20	2.36	1.47	0.66	0.15	0.73
104H-441	2.07	0.14	1.99	0.23	1.26	1.07	0.03	2.01	0.47	1.98	0.37	1.88	2.15	0.07
104H-442	2.07	2.03	2.00	2.02	1.03	2.98	1.05	1.49	4.24	1.76	1.99	0.21	4.19	1.13
104S-311	4.14	4.01	1.32	4.61	2.12	1.70	1.18	5.13	9.48	3.04	17.26	5.08	4.50	3.16
104S-312	1.54	3.01	1.56	3.29	0.97	0.03	1.22	2.61	5.08	7.07	12.00	6.66	0.09	3.68
104S-313	1.11	4.59	0.76	2.67	3.59	4.33	2.92	6.29	11.24	3.00	9.68	10.76	18.12	8.42
108H-411	1.05	3.03	0.09	1.06	1.02	0.01	0.01	2.76	5.84	0.20	0.47	3.11	0.01	0.03
108H-412	1.02	2.00	0.01	1.00	0.01	0.25	1.02	0.99	1.85	0.02	0.32	0.02	0.14	1.63
108H-413	0.08	2.33	1.05	2.03	1.02	0.16	1.11	0.14	2.15	1.90	1.83	3.06	0.78	1.61
111S-311					0.05	0.02	0.01					0.05	0.04	0.08
111S-312					0.07	0.02	0.47					0.08	0.05	1.64
111S-313					0.11	0.03	0.03					0.58	0.07	0.04
111S-314					0.00	0.00	0.00					0.00	0.00	0.00
113H-431	1.86	1.84	1.02	1.87	3.50	1.05	1.86	1.12	1.12	1.81	0.33	3.77	0.62	2.54
113H-432	0.05	0.05	2.06	0.03	3.06	2.27	2.21	0.10	0.09	1.94	0.09	2.13	4.48	1.53
113H-433	1.32	0.09	0.27	0.30	0.33	0.75	2.41	2.30	0.56	0.31	0.32	0.39	2.14	3.72
113H-434	1.07	1.30	4.03	1.15	1.13	2.09	0.40	2.31	0.70	3.86	3.28	2.16	3.97	0.54
113H-441	1.34	0.07	0.04	1.52	1.56	1.98	0.05	4.29	0.10	0.06	3.88	1.66	4.76	0.14
113H-442	1.04	0.03	1.12	1.07	0.98	4.46	0.06	1.81	0.07	7.26	1.80	0.77	9.31	0.10
113H-443	0.05	3.67	0.69	1.07	2.18	1.05	2.13	0.27	2.10	0.17	0.69	3.20	2.40	0.76
113H-444	0.07	1.82	1.04	0.04	1.01	1.01	1.05	0.21	2.18	1.59	0.08	2.28	5.24	1.10
11N-200					1.00	0.00	0.00					0.33	0.00	0.00
11S-301	8.03	2.15	5.38	3.13	3.66	2.81	2.06	29.27	2.32	8.76	5.95	11.83	22.54	10.13

## EXCLUSIONS

MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
11S-302	0.17	1.12	3.06	4.18	2.14	2.57	2.37	0.38	2.36	5.12	12.60	1.05	4.02	3.94
11S-303	0.04	0.14	1.11	0.08	0.03	1.42	0.08	0.16	0.25	1.88	0.17	0.03	1.35	0.86
11S-304	0.19	1.11	0.12	0.11	0.16	0.20	1.10	0.32	3.32	0.38	0.30	0.29	1.11	3.77
11S-305	0.03	1.03	1.21	1.13	0.93	2.45	1.08	0.10	0.26	1.88	1.03	2.07	10.94	10.37
11S-306	1.00	1.05	0.17	1.06	0.04	1.13	0.07	1.99	3.14	0.33	2.77	0.07	2.67	0.99
11S-411	1.94	3.15	4.61	2.34	3.70	7.64	5.91	4.52	9.31	10.29	10.34	13.74	22.70	23.19
11S-412	1.21	0.52	0.08	0.06	0.17	3.10	1.31	2.93	1.21	0.15	0.07	0.48	15.73	1.75
11W-201	0.00							0.00						
11W-202	0.00							0.00						
11W-203	0.00							0.00						
124H-301	0.19	0.02	0.98	2.25	0.03	0.01	2.98	0.46	0.10	2.17	1.21	0.10	0.01	6.91
124H-302	0.03	0.29	0.00	1.05	0.03	0.06	2.00	0.07	0.70	0.00	0.32	0.09	0.18	4.19
126H-311	1.03	0.06	1.05	0.46	2.87	0.06	1.47	1.11	0.21	1.33	0.77	4.86	0.14	5.36
126H-312	1.52	0.57	8.98	2.27	3.01	3.41	2.42	0.44	0.17	12.75	3.46	2.55	3.95	5.21
126H-313	0.07	0.09	0.04	1.10	1.06	0.26	2.09	0.11	0.31	0.17	9.10	0.27	0.72	4.76
127H-411	1.54	1.63	1.74	4.22	3.07	4.61	1.34	0.75	1.56	2.13	6.31	5.91	4.62	0.48
127H-412	0.50	0.50	0.50	0.50	0.00	1.00	0.00	0.57	0.01	0.50	0.98	0.00	0.05	0.00
127H-413	1.01	0.21	0.93	1.00	0.06	1.02	3.09	2.35	0.20	1.97	0.63	0.16	0.09	14.61
129H-411	0.05	1.05	1.07	3.76	0.05	0.09	1.02	0.07	0.17	0.68	4.67	0.18	0.15	1.94
129H-412	1.09	3.03	0.12	2.04	1.08	2.01	1.17	1.83	1.09	0.13	6.13	1.33	6.24	0.73
129H-413	1.28	1.38	0.01	1.12	0.29	1.02	3.90	1.65	0.65	0.03	0.86	0.57	0.98	3.12
12V-302	0.97	1.92	3.36	2.33	1.07	0.08	3.24	1.34	3.94	6.46	3.44	9.63	0.25	6.49
12V-303	0.07	1.06	2.01	3.25	0.13	0.06	3.93	0.15	1.96	2.45	5.19	0.36	0.42	3.96
12V-304	0.24	2.25	1.35	1.46	2.52	1.72	4.03	0.52	2.76	3.29	3.56	6.47	1.86	9.33
131H-421	0.03	0.03	0.05	0.06	0.06	1.17	0.14	0.04	0.07	0.08	0.20	0.08	1.36	0.32
131H-422	0.49	1.50	1.31	1.95	1.11	2.28	2.40	0.72	1.72	1.10	2.64	2.82	3.30	2.82
131H-423	2.25	0.90	1.93	1.67	2.80	3.15	0.97	2.36	1.18	4.26	1.84	1.96	8.31	0.95
131H-424	2.14	0.34	3.14	7.40	1.22	1.67	0.66	3.87	0.48	3.07	10.79	0.59	2.97	0.15
137H-411		0.00	0.15	3.19	1.05	0.67	1.09		0.00	0.33	8.52	0.77	0.85	0.46
137H-412	0.00	0.01	0.12	1.12	0.04	0.52	8.11	0.00	0.02	0.31	0.77	0.10	1.28	6.57
137H-413	0.30	1.53	1.17	3.30	1.06	0.17	1.20	0.73	1.00	1.67	6.01	1.22	0.28	2.52
137H-414	1.91	0.54	0.18	3.15	0.12	0.91	1.12	3.35	1.26	0.58	8.05	0.16	3.23	0.55
139H-411	3.02	3.03	1.05	5.60	1.06	2.05	3.02	3.43	2.46	1.34	8.94	2.86	5.02	7.50
139H-412						0.06	4.03						0.14	1.89
139H-413	0.07	3.02	1.98	0.00	0.04	0.00	2.01	0.35	6.69	2.19	0.00	0.23	0.00	2.03
139H-414	2.12	2.26	3.04	2.12	1.22	0.16	3.27	2.80	2.96	7.51	3.65	2.37	0.15	3.48
13V-303	0.18	0.59	2.51	0.74	0.64	1.55	0.40	0.70	1.32	6.42	17.40	5.42	4.41	1.49
14V-303	0.18	1.00	1.18	2.08	4.00	1.92	2.29	0.54	0.05	5.77	2.91	8.18	2.37	7.64
15N-202	0.10	1.74	2.20	0.11	0.00	1.06		0.15	4.21	5.42	0.26	0.00	9.39	
15N-203	0.02	2.05	1.55	0.62	0.47	1.22		0.02	1.44	6.75	0.14	1.53	8.65	
15N-401	3.93	1.53	1.28	0.24	1.22	1.70	3.30	4.31	2.14	1.30	0.83	3.07	1.78	3.51
15N-402	0.85	1.00	0.08	0.00	1.36	0.90	2.79	1.69	1.08	0.12	0.00	0.54	2.02	3.27
15N-403	0.76	2.76	0.18	1.16	1.56	1.17		0.25	3.58	0.60	1.35	1.27	1.88	2.62
15N-404	4.75	1.13	3.43	0.14	1.10	0.07	4.20	8.89	1.40	9.13	0.21	3.08	0.14	3.11
15S-301	3.34	1.26	2.25	0.22	5.20	0.38	5.21	2.49	1.58	2.87	0.22	15.83	1.52	13.60
15S-302	1.08	0.02	0.06	2.14	2.07	1.04	1.13	2.40	0.08	0.19	3.21	6.57	1.04	5.34
15S-303	4.54	2.08	1.14	1.04	1.40	2.15	1.84	4.81	2.61	1.10	0.21	2.47	3.35	4.41
16N-301	1.16	0.05	0.44	2.17	2.05	0.24	2.14	1.35	0.09	2.42	4.08	2.12	1.09	8.66
16N-302	1.27	0.08	1.62	2.37	2.22	4.23	2.09	10.50	0.11	7.09	12.26	2.78	9.02	9.07
16V-314	4.19	1.25	2.16	1.34	2.45	0.29	1.88	21.68	4.02	4.13	12.35	8.34	2.35	12.11
16V-315	1.55	0.03	3.28	1.94	2.42	0.58	1.35	14.43	0.08	5.94	11.14	9.50	1.00	8.76

## EXCLUSIONS

MED/EXT  
Planned

	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
16W-301	0.54	2.21	1.31	2.25	2.68	1.50	0.35	1.17	1.58	2.92	3.64	2.22	3.36	1.38
16W-302	3.29	0.61	0.09	4.51	3.52	3.08	1.61	8.38	1.18	0.45	6.11	5.18	6.37	2.64
17N-201	0.01	1.20	1.20	1.01	1.01	2.00	0.07	0.01	0.19	15.73	0.12	0.89	3.31	0.32
17N-202	0.02	0.09	0.03	1.10	0.00	0.00	0.08	0.02	1.12	0.03	0.28	0.00	0.00	0.34
17N-203	0.06	3.01	0.38	2.01	0.02	0.02	0.19	0.40	17.15	0.08	2.12	0.03	0.12	0.42
18V-411	3.62	3.10	5.09	1.04	2.07	1.05	1.47	2.40	7.35	7.75	1.34	10.19	5.61	3.23
18V-412	4.97	2.35	5.87	1.34	3.11	2.42	2.37	3.07	6.55	21.13	4.65	11.42	6.53	2.96
18V-413	1.10	5.98	6.90	1.92	2.34	3.22	1.87	1.91	11.73	17.97	2.77	9.09	8.71	1.88
19C-203	1.00	2.00	2.00	2.00	1.02	4.01	0.03	1.60	6.11	4.14	32.99	4.81	13.34	0.13
19C-204	2.00	2.50	4.33	3.67	2.13	4.94	1.02	8.33	5.81	9.29	6.89	7.54	15.88	0.32
19W-311	0.31	4.02	2.75	5.19	3.02	6.05	0.14	0.77	5.31	4.98	11.09	8.23	13.71	0.48
19W-312	0.07	4.00	1.06	3.15	2.09	6.76	1.16	0.36	5.11	2.09	4.25	3.08	6.89	2.01
1C-411	5.73	0.12	1.19	2.97	1.16	1.78	1.07	9.52	0.31	1.89	6.66	3.80	4.44	5.43
1C-412	4.00	1.00	0.00	0.00	1.00	0.00	1.00	5.35	1.59	0.00	0.00	3.35	0.00	4.45
1C-413					1.00	0.00	0.00					32.55	0.00	0.00
1H-403	0.00	1.03	2.00	1.00	2.01	0.09	0.76	0.01	3.04	0.75	1.39	15.24	0.07	5.27
1H-405	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.41	11.33	0.00	0.00
1H-415	0.99	1.68	0.04	1.58	0.00	2.03	1.12	0.29	7.80	0.06	1.91	0.00	3.83	0.52
1H-419	2.15	0.99	0.00	0.96	0.00	2.00	1.50	3.77	5.40	0.00	1.35	0.00	6.08	2.07
1H-424	0.00	0.00	0.00	1.35	0.00	0.00	2.03	0.00	0.00	0.00	1.46	0.00	0.00	2.88
1H-427	0.00	0.98	1.99	2.03	0.06	0.00	0.02	0.00	1.39	0.68	4.13	0.11	0.00	0.12
1H-429	1.00	0.00	0.00	0.67	0.00	0.00	0.67	0.05	0.00	0.00	0.93	0.00	0.00	0.46
1H-431	0.00	0.00	0.03	2.00	0.00	0.00	0.00	0.01	0.00	0.04	2.80	0.01	0.00	0.00
1H-454		0.00	2.81	5.05	1.98	0.04	0.03		0.00	6.89	3.84	2.80	0.12	0.05
1N-402	2.86	1.18	2.64	5.27	0.68	8.61	3.90	2.42	1.77	11.80	8.24	2.39	18.68	8.48
1N-403	3.11	1.09	3.06	0.03	2.04	1.10	5.82	4.08	2.23	8.94	0.07	2.68	0.83	6.65
1N-404	0.02	0.05	0.51	0.03	0.05	2.03	0.11	0.09	0.11	2.01	0.19	0.24	2.90	3.65
1N-405	6.40	1.05	1.09	2.34	3.19	2.84	1.74	7.28	1.07	2.47	4.78	3.60	4.39	5.94
1N-421	1.06	3.02	1.12	1.04	2.30	3.08	2.08	0.19	5.94	3.72	0.24	6.64	6.72	5.05
1V-442	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.61	0.00	0.05	0.00	0.00	0.00
1V-443	2.59	3.98	0.16	5.86	3.88	1.29	4.48	5.61	7.10	0.86	8.21	9.19	4.53	9.93
1W-411	0.38	0.50	1.00	1.86	2.14	3.86	4.00	1.51	1.72	0.17	3.63	15.61	3.18	41.52
20H-301	1.38	0.32	3.27	2.21	1.55	0.36	4.16	2.70	0.59	9.77	1.72	2.26	0.98	6.15
20H-302	0.04	0.03	3.04	1.00	2.18	0.00	1.16	0.07	0.09	5.08	0.90	17.49	0.00	2.72
20H-303	1.23	0.23	3.06	2.09	1.57	2.19	1.11	0.60	0.88	5.98	3.11	0.74	3.65	0.60
20H-304	2.05	0.77	2.28	4.03	0.03	1.08	1.19	5.18	0.15	8.13	4.64	0.06	0.38	0.39
20H-305	2.73	1.38	2.14	2.93	0.12	0.06	4.19	1.04	0.41	8.87	7.71	0.14	0.16	5.59
20H-306	0.00	1.07	2.09	1.06	4.21	1.02	4.03	0.01	1.76	7.69	1.11	1.39	1.52	2.26
20N-201	1.08	0.30	0.00	1.00	1.36	2.00	0.04	1.14	2.61	0.00	0.76	2.44	5.83	0.03
20N-203	0.00	0.02	0.38	1.06	0.07	0.00	0.01	0.00	0.03	0.66	0.70	0.06	0.00	0.15
20N-204	0.02	0.12	0.11	1.25	1.02	1.00	0.25	0.02	0.09	1.31	0.28	0.81	1.43	0.80
20V-311	4.95	1.07	3.57	2.85	1.35	4.35	5.31	5.40	0.21	7.65	7.46	1.92	14.08	3.85
20W-311	0.04	6.00	1.05	2.05	1.02	2.07	1.02	0.16	11.51	2.11	1.90	1.18	3.68	7.96
20W-312	0.04	4.03	1.04	2.05	2.07	3.02	1.02	0.08	6.93	2.10	1.99	3.89	7.41	3.91
21W-311	1.04	5.07	3.10	3.02	1.12	1.04	1.08	1.08	8.51	3.94	8.89	1.20	5.34	3.61
21W-312	2.19	5.01	1.15	3.14	2.06	1.01	0.01	13.23	17.19	2.75	10.29	2.66	5.28	0.05
22C-401	4.00	1.23	1.00	4.03	3.07	0.74	2.72	6.48	2.02	7.17	9.43	6.60	2.26	2.09
22C-402	4.15	1.65	2.49	6.71	2.73	6.90	6.07	18.55	2.76	10.83	21.46	9.12	34.06	20.18
22C-403	1.48	1.71	1.30	6.78	4.15	5.75	14.24	8.35	12.69	4.13	16.36	11.15	16.38	30.79
22C-404	1.17	4.36	1.91	10.82	4.78	6.05	4.11	3.28	7.64	5.89	33.15	11.86	16.88	9.19
22N-401	1.12	4.06	5.00	1.36	1.09	3.18	3.41	1.53	8.91	14.66	2.44	5.12	5.32	6.01



## EXCLUSIONS

MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
22N-402	2.10	3.56	1.37	3.96	1.88	2.28	7.22	6.28	11.42	2.82	9.17	5.06	4.60	12.81
22N-403	1.58	1.63	0.41	0.05	2.56	0.68	1.95	3.42	8.29	0.99	0.30	5.48	1.21	5.04
22N-404	2.04	2.01	2.18	3.06	2.05	2.03	1.05	2.99	10.77	1.53	4.43	4.47	3.12	2.33
22V-312	0.00							0.00						
22V-313	0.03	3.18	2.00	0.27	2.06	0.17	4.08	0.04	3.69	11.30	0.37	1.57	0.32	10.07
22V-314	0.04	1.01	3.02	0.00	1.03	0.04	3.01	0.06	1.45	8.76	0.01	0.14	0.04	8.61
22V-321	0.07	1.05	0.03	0.13	1.04	2.10	4.06	0.14	1.51	0.17	0.14	0.22	2.87	11.07
22V-322	0.20	2.06	1.04	1.03	1.14	0.09	3.95	0.50	3.61	0.32	1.31	0.37	0.17	9.29
22V-323	0.00							0.00						
22W-311	0.91	4.21	3.18	1.41	2.12	1.64	2.72	2.31	6.82	1.34	3.24	2.79	2.55	5.80
22W-312	3.10	3.09	2.84	2.20	3.05	4.08	1.54	1.36	4.43	2.31	3.25	2.71	6.49	8.03
22W-313	0.04	4.33	2.16	1.61	1.32	2.36	0.21	0.13	4.79	0.69	2.42	1.96	2.92	0.23
23H-301	0.15	0.15	2.11	0.28	0.05	1.18	3.16	0.14	0.39	0.22	0.82	0.08	4.76	3.38
23H-302	0.02	1.01	2.09	1.09	1.08	1.07	3.12	0.05	0.38	0.34	1.12	3.30	7.61	4.04
23H-303	1.01	0.08	2.02	0.05	0.45	3.22	2.03	0.27	0.23	0.21	0.11	1.33	2.02	0.38
23H-304	1.32	4.06	3.15	3.26	3.33	2.59	5.27	2.82	5.08	3.43	6.69	4.17	4.40	3.77
23W-301	2.27	1.07	2.02	1.57	0.31	5.25	1.47	3.02	1.92	0.29	5.48	1.90	6.85	1.47
23W-302	2.97	0.67	4.09	3.10	3.22	9.03	1.98	8.03	6.43	12.29	12.72	7.94	13.66	5.17
24C-442	5.10	1.95	2.14	3.64	7.19	6.34	3.69	11.82	4.65	2.86	12.49	22.24	19.24	7.08
24C-443	2.18	1.29	1.13	4.06	0.58	0.45	1.43	6.87	2.17	0.49	4.84	1.88	3.85	3.82
25W-301	1.62	1.18	1.91	2.87	0.34	8.80	1.38	2.36	4.62	1.22	11.24	5.51	15.92	1.70
25W-302	2.09	0.01	2.81	1.21	4.14	7.02	0.48	4.66	0.06	6.07	4.60	11.17	11.44	1.17
25W-303	2.21	1.23	1.21	4.12	2.14	5.06	0.23	3.85	1.95	0.70	6.03	3.74	7.38	0.31
2C-401	2.72	0.13	0.39	2.31	2.19	0.08	3.79	12.85	0.35	1.15	10.91	5.73	0.29	10.73
2C-402	9.79	3.81	4.59	9.03	5.04	8.19	4.80	28.07	12.29	8.30	16.27	22.01	44.76	16.79
2H-411	0.94	2.04	2.02	2.02	2.03	2.40	0.83	1.12	3.63	1.58	2.87	2.82	3.38	1.30
2H-412	0.04	0.21	1.16	4.03	0.07	0.00	1.01	0.07	0.45	3.40	4.43	0.11	0.00	1.62
2H-413	4.65	2.28	1.90	4.02	3.06	2.06	2.05	6.63	6.68	3.27	7.60	4.42	0.48	2.36
2H-421					0.13	0.15	0.05					0.57	0.43	0.19
2H-422						1.64	0.07						4.78	0.09
2H-424					0.20	2.23	2.21					0.40	1.95	2.98
30N-411	3.12	0.88	3.19	1.00	1.31	1.21	2.12	7.74	4.95	26.89	1.81	2.62	1.12	4.86
30N-412	4.06	1.83	1.20	0.97	3.48	0.08	2.17	14.38	8.04	3.78	3.12	12.01	0.51	16.92
36V-301	1.63	1.33	1.06	2.18	2.74	1.26	2.27	2.69	2.25	5.11	3.04	4.90	1.78	5.58
36V-302	2.33	4.79	3.72	3.82	1.17	0.36	1.16	2.17	10.89	9.92	6.71	2.87	1.36	3.93
36V-303	2.28	1.65	1.05	1.53	1.34	0.98	1.73	4.35	3.37	7.07	5.19	3.33	2.06	3.80
36W-301	0.34	1.06	1.91	2.73	0.84	6.08	0.32	1.31	8.08	11.10	19.80	3.92	13.56	1.76
36W-304	0.67	0.26	4.60	0.79	2.29	8.18	0.23	1.54	0.30	12.98	3.60	11.57	12.14	0.41
37N-411	4.55	2.69	6.33	2.72	2.04	1.60	3.20	10.34	6.53	36.36	8.71	3.61	2.45	10.58
37N-412	5.20	4.35	3.89	6.87	1.14	0.95	5.80	13.48	11.81	13.19	19.11	2.62	2.34	21.90
37N-413	2.52	1.06	6.95	2.21	4.95	0.44	3.92	7.95	0.92	25.50	31.77	11.12	0.15	31.98
37N-414	0.04	2.03	0.07	0.13	3.44	0.83	1.22	0.09	6.52	0.10	1.27	6.31	1.73	7.52
37W-201	0.01	0.04	1.29	0.33	0.09	6.06	0.02	0.02	0.47	2.78	0.56	0.36	13.07	0.09
37W-202	0.03	3.22	1.01	0.06	0.21	5.69	0.24	0.23	7.78	1.25	0.33	0.63	14.32	1.63
37W-203	0.00	0.00	1.00	0.00	0.00	5.00	0.00	0.00	0.00	1.20	0.00	0.00	11.13	0.00
3N-411	0.10	3.20	4.20	1.06	2.00	0.10	1.21	1.28	4.62	1.72	2.87	0.89	0.12	4.49
3N-412					1.24	0.36	1.33					1.11	0.46	4.03
3S-301	2.86	1.29	0.04	1.46	1.26	1.13	3.07	2.91	2.75	0.17	2.80	2.79	0.64	1.76
3S-302	1.05	1.11	0.03	0.10	1.83	2.06	2.40	3.22	1.65	0.10	0.26	7.08	2.37	1.44
3S-303	2.09	3.23	0.03	1.10	1.06	7.16	2.13	3.77	6.05	0.14	9.68	0.59	17.16	0.85
3S-307	1.24	3.11	3.26	1.37	1.46	2.13	3.23	1.34	4.59	4.23	6.42	2.33	1.94	4.18

EXCLUSIONS

MED/EXT  
Planned

	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
3S-308	0.02	3.09	1.04	0.04	1.10	3.08	5.47	0.11	7.51	3.51	0.14	1.24	2.66	5.81
3S-309	0.14	3.37	2.02	0.27	2.10	2.08	2.08	0.50	6.71	6.07	1.10	3.11	6.44	1.03
3S-403	1.96	5.22	2.81	5.78	1.28	4.84	4.05	13.29	4.58	7.48	12.92	4.27	27.30	7.33
3S-405	1.04	1.00	0.04	0.00	0.08	0.92	2.03	5.09	1.36	0.17	0.00	0.31	4.62	0.31
3W-201	0.00	0.75	0.89	0.90	4.10	2.80	1.30	0.00	17.46	0.79	0.04	9.63	7.09	3.73
40H-302	0.41	1.03	2.06	2.04	2.57	0.11	0.20	1.05	0.96	2.15	0.41	3.72	0.13	0.34
40H-303	0.00	2.00	0.02	0.00	2.28	0.05	0.04	0.00	1.29	0.03	0.00	2.64	0.11	0.03
40H-304	0.09	1.05	0.08	1.32	3.31	1.06	1.05	0.29	0.09	0.12	0.53	6.96	1.76	0.48
40H-305	0.16	1.19	1.04	0.02	0.03	0.04	0.18	0.28	0.26	0.68	0.04	0.05	0.08	0.23
40H-401	2.09	1.06	1.03	1.02	0.03	0.04	0.01	3.17	1.07	0.09	2.52	0.10	0.07	0.02
424S	0.00							0.00						
46W-301	0.90	2.10	2.37	0.86	3.32	7.78	1.03	3.71	10.10	3.69	4.85	9.29	14.06	5.04
46W-303	1.38	1.88	1.05	2.36	2.43	5.40	1.83	1.70	11.71	1.42	5.31	5.48	7.25	3.95
47C-Dist	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48H-301	0.13	0.02	1.06	1.12	3.44	2.08	0.10	0.18	0.05	1.14	2.31	5.69	6.91	1.65
48H-302	0.15	0.02	2.14	2.03	3.01	4.01	1.23	0.27	0.05	2.63	3.00	2.02	8.51	0.69
48H-303	1.47	2.25	1.59	1.01	3.14	2.01	1.02	2.48	10.34	1.48	0.07	3.49	6.51	0.19
48H-304	0.07	2.06	2.22	2.21	1.03	2.39	2.23	0.09	2.73	1.98	3.99	0.61	7.51	1.58
48W-201	1.35	0.09	1.05	0.99	0.10	0.06	0.11	0.69	1.33	1.48	0.96	0.08	0.20	0.50
48W-203	0.03	0.02	1.00	0.00	0.00	0.00	0.02	0.07	0.13	1.20	0.00	0.00	0.00	0.02
48W-204	0.02	0.23	1.00	0.02	0.01	1.06	0.04	0.12	0.62	1.29	0.07	0.02	0.48	0.20
49N-332	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-424	5.00	1.10	1.92	5.11	2.38	1.06	5.74	20.34	1.68	3.38	8.23	9.09	5.10	15.13
4C-430	5.16	1.30	4.10	4.12	1.32	1.71	2.59	16.73	2.81	7.08	14.05	2.33	4.68	12.63
4C-432	0.56	0.45	1.99	1.00	0.54	2.80	1.52	2.24	0.47	1.97	1.26	1.21	6.02	4.70
4C-441	5.00	0.59	3.60	4.21	3.07	4.60	4.45	17.72	1.50	4.13	6.90	7.23	22.24	15.14
4C-442	0.00	1.00	0.00	2.00	0.00	1.00		0.00	0.72	0.00	0.67	0.00	1.78	
4N-311	0.90	1.64	2.50	4.85	2.26	0.22	4.85	2.69	1.02	3.98	10.38	0.58	0.70	12.31
4N-312	2.14	0.23	0.61	0.57	2.83	0.46	4.31	5.21	0.64	1.82	2.03	1.89	1.19	20.13
4N-313	2.08	1.76	5.07	2.45	2.12	1.51	5.71	3.96	4.25	8.49	4.97	0.50	2.05	21.05
4S-321	1.30	0.03	0.28	1.10	0.53	0.59	0.62	1.17	0.10	0.29	2.29	1.27	1.30	3.23
4S-322	1.98	0.00	0.01	0.19	2.00	0.02	2.14	5.91	0.02	0.01	0.40	0.19	0.09	20.15
4S-323	2.07	1.04	0.16	0.63	1.11	2.93	3.31	5.84	1.30	0.02	3.69	0.30	8.95	5.68
4S-324	0.05	1.19	0.02	1.03	0.06	1.23	0.37	0.46	0.47	0.04	2.24	0.14	2.00	0.73
4S-331	0.69	0.60	1.08	2.08	2.04	2.11	3.47	2.12	1.23	2.07	5.13	4.07	7.34	3.87
4S-332	0.41	0.93	0.19	0.04	2.00	0.43	1.70	0.21	0.97	0.31	0.15	1.38	2.27	4.31
4S-333	0.23	1.11	0.03	1.38	0.12	0.04	0.66	0.90	3.53	0.05	1.41	0.21	0.67	3.24
4S-334	0.00	0.00	0.00	0.00	2.01	0.00	0.67	0.00	0.00	0.00	0.00	3.63	0.00	4.59
4W-211	0.00	0.00	0.00	3.00	4.00	1.40	2.25	0.00	0.00	0.00	9.18	6.69	7.97	1.59
50N-311	0.00	2.00	0.00	0.10	0.00	0.08	0.00	0.00	0.85	3.30	0.19	0.00	0.15	0.00
50N-410	5.45	0.41	2.83	3.04	5.69	3.17	2.56	30.36	1.45	6.39	8.43	8.51	9.23	10.08
50N-411	5.39	0.10	0.03	2.74	5.68	1.11	1.10	3.76	0.15	0.07	3.53	4.97	3.39	1.32
50N-412	0.80	0.19	0.66	1.87	2.31	1.57	0.70	5.15	0.24	1.71	3.65	3.98	3.90	2.46
50N-415	2.26	1.26	1.36	0.25	7.07	3.29	3.00	7.82	3.05	0.74	0.69	9.44	7.88	3.56
50V-401	0.90	0.21	0.22	0.47	0.50	1.11	1.06	1.54	0.28	0.52	1.20	1.01	1.62	2.08
50V-402	1.08	1.18	2.14	0.02	1.06	1.24	0.04	0.82	1.20	8.09	0.04	1.61	1.54	0.10
50W-411	2.11	4.72	0.04	3.88	0.08	1.20	1.43	2.96	22.72	0.29	6.54	0.41	2.47	2.82
50W-412	2.97	7.43	1.47	5.16	3.68	2.79	2.60	9.33	30.62	4.38	16.38	17.73	7.17	3.87
51V-301	1.29	1.30	0.13	0.15	1.77	0.38	1.02	1.01	3.65	0.14	0.17	1.61	0.85	3.49
52V-251	0.00	0.00	0.00	0.00				0.00	0.00	0.00	0.00			
53N-Dist		0.00	0.00		0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00

## EXCLUSIONS

MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
54H-301	2.10	0.09	5.01	2.09	1.85	5.05	0.08	2.45	0.18	8.13	2.32	1.03	8.82	0.31
54H-302	0.01	0.03	1.08	1.19	5.63	2.06	0.01	0.04	0.04	1.10	0.60	6.24	4.82	0.08
54H-303	0.05	0.05	2.05	1.99	1.00	4.58	0.03	0.15	0.16	4.32	2.13	0.95	10.74	0.03
54H-304	4.04	1.01	1.02	4.03	5.23	4.06	0.04	5.21	0.31	1.06	4.34	6.33	6.74	0.10
55N-201	0.06	0.03	0.00	1.01	1.00	0.21	0.08	0.25	0.09	0.01	0.94	0.04	0.54	0.89
55N-202	0.07	0.00	0.01	2.29	1.44	0.34	1.00	1.44	0.02	0.08	6.49	1.08	2.18	0.66
55N-203	0.12	0.06	0.17	1.07	1.04	0.15	0.15	1.20	0.16	0.19	2.17	0.08	0.28	0.27
55N-204	1.46	0.09	1.28	0.07	1.16	0.15	0.17	6.55	0.13	1.92	0.21	0.15	0.13	0.83
55V-313	0.82	1.27	1.74	0.78	2.34	1.64	2.24	1.96	3.41	5.13	1.89	14.70	2.88	8.85
55V-314	0.87	3.52	1.68	2.20	1.26	1.90	2.49	3.64	8.74	5.62	5.02	2.97	5.77	5.51
55V-322	0.40	1.05	0.42	0.94	1.60	1.37	0.35	0.56	1.00	1.70	1.94	3.68	2.02	0.32
55V-323	0.08	0.28	0.89	1.08	1.24	1.74	0.19	0.20	0.40	4.40	0.42	2.66	2.78	0.71
56N-401	5.95	3.32	2.83	1.69	3.49	2.68	2.94	27.70	5.59	3.18	2.81	5.29	4.47	5.50
56N-402	1.00	1.00	0.00	0.00	1.00	0.09	0.18	0.21	1.60	0.00	0.00	0.04	0.79	0.53
56N-414	4.55	3.22	4.15	1.87	3.24	2.10	2.89	17.18	6.22	5.42	7.31	2.44	4.02	17.09
57C-417	2.00	3.06	0.03	1.03	0.04	1.07	1.06	1.77	4.78	0.05	1.42	0.05	4.28	4.63
57C-422	1.80	4.05	3.10	2.14	2.96	2.65	3.56	19.92	5.93	17.73	4.76	4.44	5.99	6.30
57C-426	4.10	4.19	4.23	2.63	4.07	2.69	4.23	11.78	10.92	11.58	7.18	7.90	12.88	29.60
57S-401	7.82	2.60	2.41	4.36	4.19	2.40	6.58	24.05	7.12	6.72	8.42	10.25	9.73	24.72
57S-402	4.28	5.89	3.79	4.85	3.66	2.71	5.54	7.83	11.01	11.80	10.22	8.05	14.45	19.02
57W-401	4.26	2.44	3.93	2.86	5.58	2.62	4.87	5.36	5.13	18.67	11.01	10.40	3.34	19.64
57W-402	0.50	1.09	0.19	4.05	5.84	2.29	2.06	1.42	0.26	0.63	18.78	8.87	3.23	6.03
58C-403	3.17	5.11	6.67	7.21	2.11	5.10	4.17	6.71	14.53	9.03	28.40	6.96	48.89	6.08
58C-405	1.54	4.70	2.95	9.16	3.75	7.18	1.79	2.17	12.92	7.49	32.60	8.53	20.13	4.20
58H-421	2.08	0.03	0.10	1.02	1.04	4.04	3.03	5.06	0.05	0.43	2.04	0.95	6.81	8.56
58H-431	1.21	0.08	1.20	2.02	0.06	4.87	4.47	0.76	0.23	1.98	3.25	0.16	9.07	10.92
58H-Dist					0.00	0.00	0.00					0.00	0.00	0.00
59C-401	1.34	0.18	0.10	4.42	4.06	4.02	4.94	0.86	0.25	0.25	17.91	14.69	14.48	12.41
59C-402	4.49	2.73	2.10	8.37	5.04	6.35	2.59	28.92	8.65	6.16	29.81	12.14	29.07	10.72
59C-403	2.24	1.09	1.00	7.40	2.30	1.29	0.07	10.80	3.34	5.51	20.16	2.26	5.24	0.43
62H-301	0.01	0.00	0.00	0.00	0.00	0.00	1.97	0.02	0.01	0.00	0.00	0.00	0.00	2.26
62H-302	0.00	0.14	2.05	0.01	0.15	1.06	2.76	0.01	0.48	2.28	0.00	1.06	1.13	2.08
62H-303	0.00	0.00	0.00	1.00	1.02	0.00	0.00	0.00	0.00	0.00	0.25	3.03	0.00	0.00
62H-304	0.15	0.17	0.08	0.10	0.11	1.00	0.21	0.62	0.17	0.14	0.64	0.30	1.26	0.30
62N-411	0.40	0.06	3.13	2.14	2.93	2.07	4.03	0.62	0.07	3.54	3.88	2.23	1.08	2.68
62N-412	1.12	1.15	1.17	1.82	2.02	3.78	4.08	1.60	0.46	0.52	3.24	1.50	3.77	3.87
62N-413	8.72	0.55	2.51	3.19	4.11	6.19	5.44	13.05	0.55	3.19	6.52	5.33	7.88	12.92
62N-414	5.96	2.48	0.22	3.07	2.33	4.88	4.43	14.05	6.05	0.47	5.21	2.21	3.16	6.54
62N-415	3.39	3.09	1.57	1.40	3.30	4.29	5.36	7.43	2.86	4.71	3.87	3.22	2.56	9.52
62N-416	1.83	1.52	1.83	1.67	3.38	3.36	5.13	4.19	1.18	1.51	3.88	3.13	2.61	4.98
63V-311	1.31	0.36	2.24	1.06	1.69	2.21	0.44	0.94	0.57	2.17	2.30	3.14	3.22	1.19
63V-312	1.63	0.42	0.12	1.75	1.09	1.89	0.63	1.06	0.66	0.40	2.33	6.07	3.67	0.86
63V-313	1.66	0.76	2.32	1.14	0.20	2.44	1.20	3.29	1.14	6.50	3.80	1.50	5.78	4.30
64V-301	0.58	0.11	2.93	0.25	1.31	2.19	1.18	1.99	0.25	5.44	0.61	2.95	5.15	4.03
64V-302	0.06		1.00	0.00	1.52	1.15	0.00	0.11	0.00	1.44	0.06	2.17	1.65	0.01
64V-303	0.00	0.00	0.00	0.00		1.20	1.00	0.00	0.00	0.00	0.00		1.62	3.37
65V-301	3.92	0.44	3.98	4.28	6.44	3.33	5.01	8.89	0.50	7.56	4.45	11.62	6.66	6.61
65V-302	3.89	1.08	2.46	5.51	0.64	0.53	0.76	6.20	1.34	7.49	9.39	3.47	2.11	1.97
65V-303	1.04	0.27	0.40	5.72	1.09	2.07	0.07	3.38	0.23	0.60	15.76	0.92	10.08	0.21
67C-411	5.45	4.69	4.31	8.89	2.72	7.50	2.06	18.32	11.34	15.02	34.14	14.90	39.97	5.41
67C-412	2.60	3.60	0.90	7.41	2.45	1.43	3.95	11.84	11.13	12.65	22.63	5.95	6.51	13.81

## EXCLUSIONS

MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
6N-301	0.03	2.05	1.19	1.10	1.03	0.23	2.19	0.05	3.32	1.39	3.48	0.35	0.39	1.43
6N-302	0.01	2.14	0.09	1.01	0.17	0.43	1.05	0.01	3.48	0.21	3.08	0.56	0.52	0.20
6S-221	0.06	0.00	0.14	1.22	0.12	0.00	0.15	0.09	0.00	0.27	3.92	0.11	0.01	0.85
6S-223	0.29	0.10	1.03	0.00				3.61	0.24	1.66	0.00			
6S-224	2.08	0.04	0.06	0.00	1.00	0.00		1.67	0.05	0.08	0.01	2.94	0.00	
6S-225	0.22	1.04	0.07	2.16	0.01	1.09	0.07	0.55	0.35	0.17	2.18	0.04	3.50	1.66
6W-201	0.00	0.00	0.25	4.25	2.25	2.00	1.00	0.00	0.00	0.18	30.18	1.06	0.54	0.07
70V-311	1.36	0.89	3.08	2.62	2.90	1.46	2.10	4.15	1.64	6.35	4.40	7.72	2.42	4.32
70V-312	1.27	3.54	3.12	3.95	2.40	2.33	4.65	3.58	5.99	6.56	7.77	5.03	5.87	9.24
70W-203	0.99	0.05	0.00	1.00	2.00	4.11	0.11	2.35	0.04	0.01	2.30	0.55	0.58	0.33
70W-204	0.00	0.03	0.00	1.17	2.00	4.00	0.01		0.15	0.00	2.49	0.57	0.17	0.03
70W-311	0.65	2.15	1.15	1.53	2.81	5.87	2.88	2.39	9.32	3.69	4.79	2.83	7.75	4.88
70W-312	1.11	0.10	0.14	1.03	2.17	5.06	2.14	1.20	0.36	0.15	2.35	1.58	1.31	1.81
70W-313	2.22	3.80	1.23	4.21	3.22	6.76	1.37	8.21	9.48	1.33	12.46	2.26	6.65	3.21
70W-314	0.01	1.11	0.15	1.86	2.73	4.00	1.09	0.02	1.97	0.09	2.56	1.14	0.18	4.69
70W-321	4.08	0.77	0.10	2.15	2.10	5.14	1.05	9.74	1.19	0.28	3.73	0.76	1.17	1.35
70W-322	2.00	1.03	0.03	1.07	2.01	4.03	1.03	1.14	0.81	0.04	2.45	0.57	0.51	1.57
73W-411	2.17	2.98	2.14	4.76	3.02	3.75	2.65	5.68	5.78	3.80	9.74	3.57	14.63	21.34
73W-412	1.05	0.00	0.06	2.02	2.01	2.02	0.02	1.27	0.00	0.18	2.67	0.68	10.34	0.07
74N-411	1.13	2.25	1.12	1.21	0.34	0.39	2.18	0.43	4.48	2.26	3.58	0.79	0.39	1.51
74N-412	0.51	3.00	1.86	2.78	3.70	1.50	2.30	1.61	5.08	6.18	9.81	8.05	2.66	14.91
74V-301	0.00	1.00	2.00	1.74	1.03	0.01	2.64	0.00	1.82	3.28	7.85	0.13	0.02	3.04
74V-302	0.00	1.11	1.11	2.00	1.00	0.13	2.00	0.00	1.97	1.01	6.55	0.05	0.17	1.94
74W-301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75N-251	0.00	0.00	0.00	0.00				0.00	0.00	0.00	0.00			
76V-301	3.14	2.59	3.94	3.11	7.80	3.94	3.52	1.59	8.02	12.64	10.77	18.86	8.61	14.11
76W-201	0.00	1.00	7.00	0.00	0.00	0.00	2.00	0.00	1.41	14.45	0.00	0.00	0.00	5.30
77V-301	0.03	1.00	2.64	2.05	0.00	1.01	1.78	0.05	2.93	3.47	2.83	0.01	0.63	3.00
77V-302	3.67	2.72	2.25	4.65	2.36	1.32	2.98	9.05	5.89	4.65	9.84	13.53	2.74	15.63
77V-303	0.40	2.33	0.31	2.26	1.60	0.37	1.96	0.84	4.70	0.40	3.32	4.63	1.58	2.73
77V-401	3.40	3.65	4.28	4.99	6.06	4.59	3.69	13.88	12.86	9.88	9.42	14.72	23.00	4.71
78W-301	2.83	2.55	8.28	1.58	1.26	1.29	5.04	10.16	7.80	23.85	6.32	4.25	4.41	10.50
78W-302	2.48	6.33	7.76	1.65	0.35	1.06	3.07	8.09	9.73	17.90	3.81	0.88	1.58	5.68
79V-401	1.61	2.64	2.04	4.86	2.47	2.12	1.33	2.82	1.07	4.50	5.72	3.45	6.37	3.49
79V-402	2.08	2.18	1.49	1.07	2.06	2.46	2.68	2.45	0.62	0.61	0.17	1.29	1.90	4.19
79V-403	1.73	2.28	2.25	5.66	1.32	1.07	2.11	3.27	1.03	2.39	5.49	1.37	0.62	4.06
7N-211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7N-301	3.13	2.74	4.84	3.60	0.34	0.16	1.17	17.32	3.80	8.11	14.03	0.36	0.32	2.13
7N-302	4.78	5.14	4.32	1.16	2.07	1.12	0.56	19.23	11.35	5.89	3.46	3.87	0.32	4.52
80W-301	1.64	3.38	7.39	0.32	0.61	1.94	4.38	4.70	6.13	15.54	1.05	1.76	3.44	17.80
80W-302	0.00	0.03	7.00	0.00	0.00	0.00	3.00	0.00	0.04	14.50	0.00	0.00	0.00	5.22
80W-303	0.00	2.00	7.00	0.00				0.00	3.22	14.50	0.00			
81N-411	1.90	1.59	3.50	1.10	1.05	4.29	2.43	1.23	1.45	6.76	2.58	1.64	4.08	13.15
81N-412	4.12	1.62	2.64	3.48	1.24	2.07	2.77	6.58	3.99	18.42	3.85	2.12	7.02	13.89
81S-301	1.06	2.21	2.16	1.22	0.15	2.16	1.32	0.97	2.24	4.73	0.77	0.43	4.28	4.71
81S-302	0.05	4.94	2.22	1.35	1.42	0.31	2.90	0.29	11.85	3.95	3.40	3.32	0.97	13.34
81S-303	1.31	2.25	2.04	3.52	2.31	1.10	1.04	4.07	3.54	8.71	4.22	6.71	1.92	1.87
81S-304	1.05	4.06	1.03	2.08	1.05	0.18	1.19	0.23	3.67	3.10	2.21	2.23	0.27	1.37
81S-305	2.35	2.55	2.12	1.10	3.07	0.32	0.63	5.98	2.51	4.02	1.53	2.76	0.79	2.32
81S-306	1.77	1.22	3.75	0.16	4.35	1.29	1.78	1.66	3.46	9.29	0.39	7.14	7.89	4.91
81S-307	3.12	2.18	2.10	0.22	0.25	1.20	1.20	4.13	2.65	3.32	0.47	0.79	3.24	17.58

EXCLUSIONS

MED/EXT  
Planned

	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 KCAIDI	2017 KCAIDI	2018 KCAIDI	2019 KCAIDI	2020 KCAIDI	2021 KCAIDI	2022 KCAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 KCAIFI	2017 KCAIFI	2018 KCAIFI	2019 KCAIFI	2020 KCAIFI	2021 KCAIFI	2022 KCAIFI	2016 KCAIDI	2017 KCAIDI	2018 KCAIDI	2019 KCAIDI	2020 KCAIDI	2021 KCAIDI	2022 KCAIDI
81W-Dist	0.00	0.00	0.00	0.27	0.68	2.09	2.72	0.00	0.00	0.00	0.58	1.18	8.01	7.70
82S-302	1.00	1.00	0.01	1.00	3.71	1.97	1.05	0.99	3.35	0.04	1.57	6.58	2.33	0.67
82S-303	0.35	2.12	0.19	1.08	2.03	0.44	2.16	2.92	1.59	0.52	1.89	2.35	0.90	7.13
82S-304	0.71	2.07	1.38	1.80	2.40	1.10	0.54	2.19	2.14	1.75	3.22	3.27	0.99	3.46
82V-401	3.94	4.04	1.66	0.47	4.93	1.80	0.73	7.52	5.86	5.01	4.26	6.41	5.38	1.52
82V-402	1.07	3.25	1.21	2.34	3.96	6.11	3.45	1.67	2.37	2.28	8.92	4.54	10.19	8.10
82V-403	3.06	2.04	0.05	4.27	2.04	3.13	0.05	9.65	3.01	0.19	4.25	5.20	6.75	0.11
82V-422	0.10	1.02	0.99	0.13	0.13	3.69	0.94	0.20	0.53	0.10	1.54	0.24	4.54	2.27
82V-423	1.33	1.69	2.77	2.46	1.89	5.45	0.66	2.33	2.08	5.14	2.64	1.93	4.24	1.29
82W-Dist	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83V-301	2.18	1.21	1.85	1.02	1.25	4.75	0.86	2.64	1.32	5.70	2.86	8.03	7.78	3.34
83V-302	0.06	1.03	0.44	0.09	0.04	2.40	0.06	0.21	0.57	0.35	0.09	0.08	1.78	0.09
83V-303	2.56	3.34	4.79	0.49	1.24	2.83	0.30	6.09	6.36	16.93	1.57	1.45	5.31	0.96
84S-302	2.10	1.01	1.09	4.46	1.03	1.02	6.04	2.78	1.07	0.52	16.35	0.49	2.18	22.35
84S-303	0.00				0.00	2.09	3.77	0.00				0.00	12.45	87.54
84S-304	2.80	0.40	0.40	1.00	1.44	0.90		27.36	0.75	0.65	4.40	2.61	3.54	
84S-305	0.07	1.07	1.03	2.45	3.36	0.44	2.14	0.23	1.47	1.74	6.96	11.32	1.63	5.33
84W-301	1.38	5.81	1.14	4.21	2.06	1.40	2.36	0.47	12.55	1.63	8.37	2.41	0.79	1.95
84W-302	1.15	3.97	0.14	1.22	0.19	2.20	0.17	0.58	6.38	0.47	40.59	0.78	4.38	0.66
85S-401	3.11	5.76	17.45	7.64	4.85	3.79	7.98	24.00	20.54	67.68	38.34	14.30	16.87	13.83
85S-402	3.73	8.60	4.43	2.03	1.18	1.78	1.04	18.19	28.25	15.66	1.52	3.19	4.92	4.06
85S-405*	0.00	4.00	9.00					0.00	11.00	107.03				
87H-311	2.24	0.05	0.38	1.45	1.84	0.25	1.12	1.16	0.15	0.84	3.45	1.62	1.86	15.57
87H-312	0.04	0.27	2.11	0.31	2.21	0.55	2.67	0.18	0.17	8.16	0.96	1.32	0.84	21.31
87H-313	1.22	0.18	1.19	2.73	4.47	2.30	2.23	5.18	0.93	2.85	8.02	5.66	4.97	21.28
87W-311	1.31	1.42	2.43	4.56	2.58	1.93	2.86	2.02	2.67	6.24	21.08	3.48	2.27	7.90
87W-312	0.34	1.75	1.39	5.14	2.63	4.11	3.09	1.94	14.41	3.43	27.74	7.56	8.70	4.83
88H-401	0.65	1.88	2.39	5.76	2.61	1.66	5.43	1.22	5.66	9.36	21.31	17.24	9.23	16.36
88H-402	2.08	1.19	5.74	9.60	2.69	1.72	4.15	3.92	3.30	22.83	21.82	17.49	9.81	15.33
88W-311	0.30	0.12	0.14	2.09	1.06	1.04	0.72	0.68	0.25	0.18	2.86	1.07	0.30	0.73
88W-312	0.02	0.07	0.18	3.83	3.38	1.22	3.19	0.05	0.18	0.35	6.70	3.65	1.81	3.87
88W-313	0.13	0.00	3.22	2.05	1.00	0.15	1.01	0.36	0.00	3.95	2.76	0.93	0.51	1.32
88W-314	0.57	0.63	1.05	3.66	1.46	2.25	0.44	0.64	0.75	2.85	8.40	1.89	1.99	0.75
88W-321	0.00	0.00	0.00	0.00				0.00	0.00	0.00	0.00			
88W-322	0.02	1.19	0.57	1.15	1.01	4.01	0.13	0.06	2.36	0.83	1.79	0.32	2.25	0.10
88W-323	1.56	1.23	1.47	2.44	1.21	6.19	3.27	1.82	2.83	9.23	15.08	0.70	8.04	5.49
89H-401	2.40	0.10	1.39	3.31	3.10	1.68	2.14	2.71	1.58	4.49	14.06	11.77	7.09	2.64
89W-301	1.35	0.03	1.09	3.00	2.02	0.82	1.02	0.43	0.02	1.23	2.78	0.58	1.07	4.54
89W-302	2.14	0.35	1.09	4.82	3.55	1.08	1.09	1.93	1.27	1.29	5.53	1.90	1.81	4.62
89W-303	0.97	0.36	2.47	2.77	4.60	0.69	1.15	2.78	1.31	6.91	6.06	9.06	1.05	5.07
89W-304	1.03	0.06	1.02	2.05	3.11	1.10	1.63	0.12	0.11	1.12	2.83	2.67	1.22	7.74
91W-411	3.37	5.48	0.27	6.39	4.82	4.70	5.15	4.59	9.36	1.24	25.75	10.67	4.95	20.22
92H-331	1.38	2.34	1.23	3.32	3.37	3.05	2.01	10.54	9.74	1.67	7.11	2.27	2.49	6.38
92H-332	1.69	2.40	1.05	4.42	0.45	1.81	3.07	10.07	4.47	2.36	8.46	0.55	0.83	2.80
92H-333/L-3202	0.00	0.00	0.00	1.54	0.15	2.00	0.00	0.00	0.00	0.00	3.31	0.42	5.94	0.00
92H-334	3.32	0.08	0.05	2.33	1.09	1.20	0.21	12.46	0.21	0.09	5.91	1.56	0.48	0.72
92V-Dist		0.00	0.00		0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00
92W-302	1.39	3.92	0.33	6.50	2.09	0.76	2.13	1.34	6.99	0.69	7.52	4.67	1.32	3.59
93V-311	1.20	1.20	2.12	3.21	4.24	2.24	4.25	1.22	1.43	12.38	14.76	8.16	2.59	10.58
93V-312	1.23	0.02	2.16	2.11	4.13	1.03	1.11	2.17	0.08	12.29	11.96	7.92	0.98	8.69
93V-313	1.63	0.34	3.65	5.54	7.45	0.16	2.49	2.59	0.47	12.51	19.05	15.87	1.01	9.27

**EXCLUSIONS**MED/EXT  
Planned

	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
Avg + 2 St. Dev	4.77	4.65	5.44	6.16	4.88	5.90	5.47	14.41	12.15	20.47	20.51	13.22	17.81	17.81
St. Dev	1.64	1.55	1.84	1.97	1.52	1.92	1.76	5.42	4.44	8.03	7.37	4.67	6.47	7.32
Average	1.49	1.54	1.76	2.22	1.85	2.06	1.95	3.57	3.26	4.41	5.77	3.88	4.87	5.19

Source Feeder	2016 CKAIFI	2017 CKAIFI	2018 CKAIFI	2019 CKAIFI	2020 CKAIFI	2021 CKAIFI	2022 CKAIFI	2016 CKAIDI	2017 CKAIDI	2018 CKAIDI	2019 CKAIDI	2020 CKAIDI	2021 CKAIDI	2022 CKAIDI
93V-314		0.00	2.12	1.17	3.00	0.13	2.61		0.00	11.89	10.33	7.25	0.54	8.75
95H-251	1.32	0.07	3.43	2.80	3.54	2.17	5.68	5.22	1.18	11.11	30.52	12.84	17.68	9.31
96H-411	2.29	0.35	4.06	6.60	4.07	4.25	5.57	6.22	1.03	12.67	13.46	17.36	12.78	14.42
96H-412	2.41	0.38	3.24	7.58	5.47	1.26	4.58	10.91	1.62	7.87	46.76	29.26	3.43	19.47
99H-311	0.00	2.18	0.01	1.02	2.16	2.05	0.07	0.01	6.33	0.02	3.98	5.83	3.41	0.26
99H-312	0.17	4.13	3.12	1.80	2.00	3.01	1.21	0.08	8.78	4.01	5.49	5.45	2.73	4.05
99V-311	0.33	0.04	0.26	0.01	2.12	2.16	1.15	1.30	0.06	0.41	0.01	1.31	5.02	0.33
99V-312		0.00	4.16	0.12	3.13	5.18	3.24		0.00	13.23	0.13	1.74	6.06	4.67
99V-313	1.05	0.00	1.27	0.05	1.03	1.05	1.17	3.79	0.00	2.19	0.06	0.12	0.64	0.45
99V-314	0.67	0.30	4.07	2.42	2.32	2.01	2.65	0.85	1.11	13.83	4.25	1.83	8.92	5.75
9C-301	1.00	4.00	2.00	2.75	0.00	1.80	1.97	2.92	193.20	3.03	13.64	0.00	7.35	4.84
9C-302	0.20	2.60	0.00	2.00	1.00	1.00	1.00	0.24	7.36	0.00	10.17	0.15	5.84	2.36
9C-303	2.01	4.60	1.88	9.00	0.12	1.11	2.91	3.94	10.57	43.90	34.68	0.81	6.10	6.51
9C-304	2.88	2.12	0.06	1.97	0.04	1.04	1.03	6.15	7.39	0.09	9.96	0.04	6.92	2.42
L-4048		0.00	2.00	0.00	0.00	1.00	0.00		0.00	4.93	0.00	0.00	5.03	0.00
L-4049	0.00	0.00	1.07	1.98	1.01	0.01	1.13	0.00	0.00	2.67	2.67	2.86	0.03	0.84

## **APPENDIX J**

### **Feeder Investment Maps**

#### **11S-411 INVESTMENT MAP**

The following map shows the feeder extents of 11S-411, a 25-kV circuit feeding 3,207 customers out of the Keltic Drive substation. This map overlays the locations of each outage event experienced by these customers in 2022 with the locations of recent reliability investment projects.

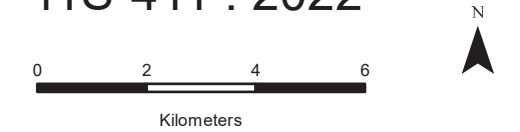
Single customer events are summarized in the legend to simplify the map. “Service Point Events” refers to the total number of single-customer outages.

The map can be interpreted as follows:

- Outages are identified by circles. The size of the circle corresponds to the number of customers impacted by that event.
- Each outage has a “call out” box which depicts the total customer hours (duration) of the event. The “customer hours” is calculated by multiplying the number of customers impacted by an event with the total hours (duration) of the outage.
- Reliability projects are displayed as hatched rectangles and vegetation management projects are depicted by green hatched rectangles.



11S-411 : 2022



### Customer Hours of Interruption

Service Point Events: 114

Average of CHI per  
Single Customer: 50.08







## Fuses

### Customer Impact

- 1 - 8
- 9 - 18
- 19 - 31
- 32 - 149

### Areas of Interest

### Areas of Interests

- |   |   |
|---|---|
|    | 11S Keltic Drive  |
|    | 11S-411 11S-302<br>Coxheath Double<br>Circuit Rebuild<br>Completed 2022 |
|    | 11S-411 11S-302<br>Rebuild Coxheath<br>Road Phase 1<br>Completed 2018   |
|    | 11S-411<br>Coxheath Rebuild<br>Phase 1<br>Complete 2022                 |
|  | 11S-411<br>Coxheath Rebuild<br>Phase 2 Ongoing                          |
|  | 11S-411 Eskasoni<br>Protection<br>Upgrade Planned<br>2023               |




## Transformers

### Customer Impact

- 1 - 2
- 3 - 5
- 6 - 8
- 9 - 11

## Service Points

### Customer Impact

- |   |       |
|---|-------|
|  | 1     |
|  | 2     |
|  | 3 - 4 |

## Dynamic Devices

### Customer Impact

- 12

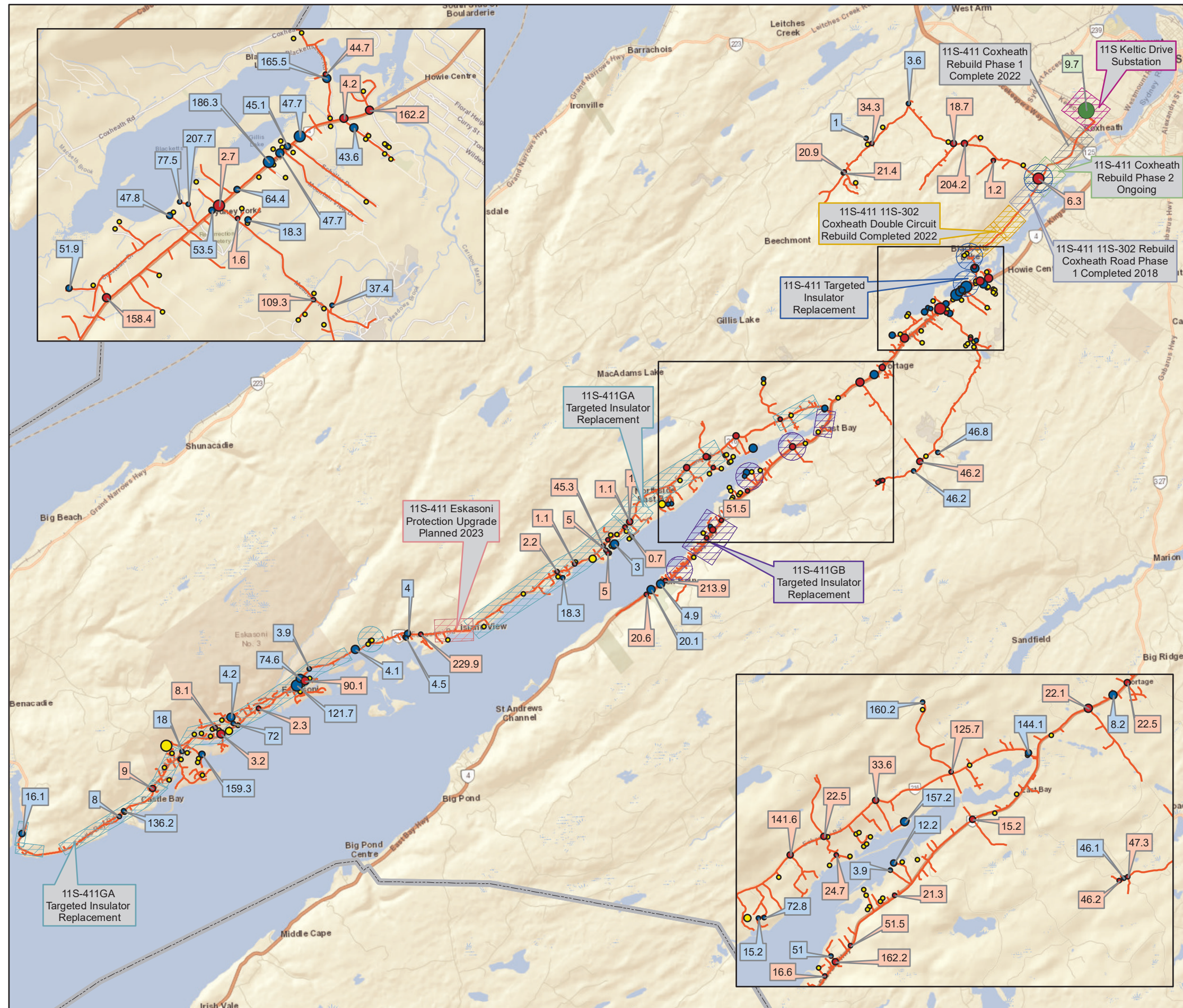
11S-411

WorkDepotTile

This drawing provides reference to Nova Scotia Power Inc. equipment, for the purpose of performing services on our behalf. At any given time the configuration of the actual power system may vary from this representation. No drawing should be relied on for personal safety.

Work Depot:  
SYD  
11S-411\_2022.MXD

Last revised by: Katie Chute  
Date revised: February 17, 2023





## Appendix K

### Planned Outages by Feeder

Date	Feeder	Start Time (24-hour clock)	Restore Time (24-hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
7/29/2022	100C-421	14:23	15:12	48.96	22.03	27	Capital
4/13/2022	101H-411	9:34	15:30	356.64	1331.46	224	Tree Trimming
8/2/2022	101H-413	12:46	15:06	140.16	9.34	4	Capital
8/3/2022	101H-413	9:44	13:51	247.62	41.27	10	Capital
8/11/2022	101H-413	9:50	14:56	306.42	1031.6	209	Capital
8/12/2022	101H-413	12:48	14:28	100.32	16.72	10	Capital
8/13/2022	101H-413	8:59	12:05	185.46	21.64	7	Capital
8/13/2022	101H-413	12:40	15:22	161.88	18.89	7	Capital
8/14/2022	101H-413	9:04	9:41	37.08	6.18	10	Capital
8/15/2022	101H-413	8:39	11:32	172.26	17.23	6	Capital
8/15/2022	101H-413	12:39	18:44	364.62	24.31	4	Capital
8/17/2022	101H-413	9:17	9:27	9.66	1.61	10	Capital
8/17/2022	101H-413	10:20	15:32	311.82	114.33	22	Capital
10/3/2022	101H-413	9:31	11:02	91.38	60.92	40	Reliability
11/20/2022	101H-413	8:27	14:14	346.86	589.66	102	Capital
6/15/2022	101H-422	23:53	1:14	81.06	99.97	74	Customer Requested
9/2/2022	101H-422	8:53	16:11	437.7	58.36	8	Capital
4/21/2022	101H-423	10:24	16:14	349.5	5.83	1	Capital
7/15/2022	102W-311	20:14	22:26	132.9	2.22	1	Capital
7/19/2022	102W-311	8:53	14:02	309.36	51.56	10	Capital
1/6/2022	102W-312	11:19	12:42	83.04	8.3	6	Capital
3/18/2022	103C-314	11:42	11:48	5.64	0.09	1	Reliability
4/27/2022	103W-312	9:41	11:39	117.72	1.96	1	Capital
11/19/2022	103W-312	9:58	12:17	138.24	9.22	4	Tree Trimming
11/19/2022	103W-312	12:19	14:47	147.84	22.18	9	Tree Trimming
11/19/2022	103W-312	14:38	16:41	122.7	12.27	6	Reliability
1/10/2022	104H-413	9:13	21:27	734.04	12.23	1	Customer Requested
3/16/2022	104H-421	9:49	14:41	291.72	199.34	41	Reliability
6/12/2022	104H-422	12:46	15:21	154.38	33.45	13	Capital
8/10/2022	104H-422	2:49	5:41	171.96	5.73	2	Reliability
8/22/2022	104H-422	20:20	20:47	26.76	1.34	3	Reliability
9/24/2022	104H-423	2:00	18:49	2448.6	606.36	1284	Switching
10/2/2022	104H-423	12:33	15:26	173.64	266.25	92	Tree Trimming
5/7/2022	104H-441	6:30	8:41	130.56	184.96	85	Capital
8/14/2022	104H-441	19:24	0:42	317.94	710.07	134	Capital
9/16/2022	104H-441	0:00	2:30	150.6	17.57	7	Customer Requested
6/20/2022	104S-311	18:00	19:22	82.56	1.38	1	Capital

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
12/12/2022	10H-231	0:05	1:41	96.6	28.98	18	Reliability
2/7/2022	113H-431	22:00	22:25	25.2	1268.4	3020	Switching
11/24/2022	113H-431; 58H-421; 58H-431	21:46	21:49	3.6	271.56	4526	Switching
4/29/2022	113H-434	9:59	10:18	19.44	0.32	1	Reliability
4/29/2022	113H-434	17:12	20:44	211.5	3.53	1	Customer Requested
9/25/2022	113H-434	13:59	14:02	2.46	81.1	1978	Switching
11/17/2022	113H-434	22:06	22:09	2.82	188.14	4003	Switching
11/25/2022	113H-434	10:27	12:04	96.9	40.38	25	Capital
11/25/2022	113H-434	10:31	12:42	131.1	26.22	12	Capital
11/25/2022	113H-434	12:59	13:25	26.22	5.68	13	Capital
11/25/2022	113H-434	13:33	13:45	11.88	3.37	17	Capital
12/19/2022	113H-434	14:29	15:41	72.06	181.35	151	Reliability
4/28/2022	113H-441	10:56	13:19	142.92	314.42	132	Tree Trimming
10/18/2022	113H-441	13:17	15:03	105.9	33.54	19	Reliability
8/22/2022	113H-442	22:54	2:48	233.64	7.79	2	Reliability
6/1/2022	113H-444	9:17	15:01	343.56	5.73	1	Customer Requested
10/6/2022	11S-302	9:06	10:58	112.86	2016.43	1072	Switching
12/7/2022	11S-302	8:21	9:49	88.2	1.47	1	Capital
9/25/2022	11S-303	22:35	22:36	1.2	2.28	114	Switching
10/7/2022	11S-305	9:23	14:43	320.4	42.72	8	Capital
12/17/2022	11S-306	8:45	9:06	20.28	22.31	66	Capital
3/23/2022	11S-411	10:31	13:17	166.26	2.77	1	Capital
11/15/2022	126H-311	8:55	11:49	173.58	60.75	21	Reliability
4/28/2022	126H-312	12:34	13:23	48.84	5.95	8	Reliability
10/14/2022	126H-312	10:16	11:22	65.7	52.56	48	Capital
10/20/2022	126H-312	13:46	13:49	2.94	99.76	2036	Switching
11/16/2022	126H-312	10:17	11:31	74.16	8.65	7	Capital
9/7/2022	127H-411	10:03	12:38	154.56	15.46	6	Capital
9/9/2022	127H-412; 127H-413; 127H-411	17:31	18:02	30.9	1445.61	2807	Planned Transmission
9/8/2022	129H-412	11:04	16:17	313.44	5.22	1	Reliability
5/29/2022	129H-413	21:47	2:14	267.12	347.26	78	Reliability
4/14/2022	12V-302	10:54	11:59	64.68	1.08	1	Reliability
9/18/2022	12V-302	9:02	11:20	138.6	36.96	16	Reliability
3/17/2022	12V-303	9:48	11:02	74.1	308.75	250	Capital
11/23/2022	12V-303	6:02	6:10	8.4	0.14	1	Planned Transmission
11/23/2022	12V-303	6:10	6:13	3.6	0.06	1	Planned Transmission
7/21/2022	12V-303; 12V-302; 12V-304	7:04	7:08	4.74	272.23	3446	Planned Transmission

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
11/23/2022	12V-303; 12V-304; 12V-302	6:02	6:05	2.52	144.61	3443	Planned Transmission
2/17/2022	12V-304	11:42	15:02	200.04	16.67	5	Capital
3/7/2022	12V-304	9:19	11:08	108.54	3.62	2	Capital
4/11/2022	12V-304	8:22	10:25	123.12	90.29	44	Capital
4/27/2022	12V-304	7:57	10:49	171.72	62.96	22	Capital
11/15/2022	131H-422	10:50	12:37	106.62	398.05	224	Reliability
12/21/2022	131H-422	12:03	13:06	63.06	73.57	70	Reliability
11/10/2022	137H-412	23:31	0:36	65.04	3278.02	3024	Reliability
6/7/2022	137H-414	10:06	16:49	403.08	1336.88	199	Reliability
6/9/2022	137H-414; 129H-412	23:26	23:27	1.02	118.98	6999	Switching
4/30/2022	139H-411	8:09	10:17	128.7	4.29	2	Capital
1/7/2022	139H-412	9:26	9:28	1.74	2.15	74	Switching
10/6/2022	139H-414	9:27	12:01	154.86	136.79	53	Switching
3/31/2022	13V-303	10:01	10:36	34.38	65.9	115	Tree Trimming
8/17/2022	13V-303	8:47	11:28	160.8	190.28	71	Capital
1/7/2022	14V-303	19:27	15:12	1185	237	12	Reliability
10/4/2022	14V-303	5:01	5:08	7.74	1.68	13	Planned Transmission
7/19/2022	15N-401	13:11	14:25	73.68	17.19	14	Capital
8/25/2022	15N-403	9:08	12:47	218.7	25.52	7	Capital
10/1/2022	15S-302	11:33	11:45	12.3	213.41	1041	Switching
10/1/2022	15S-303	9:06	9:16	9.72	124.25	767	Switching
10/18/2022	16N-302	12:32	13:26	53.76	0.9	1	Capital
5/12/2022	18V-411	10:30	13:48	197.46	16.46	5	Capital
9/1/2022	18V-413	0:01	3:15	193.74	3225.77	999	Capital
8/18/2022	19W-311; 19W-312	19:26	19:34	8.76	229.07	1569	Planned Transmission
2/22/2022	19W-312	12:06	13:34	87.72	5.85	4	Capital
4/19/2022	19W-312	9:07	9:46	39.66	37.02	56	Reliability
8/25/2022	1C-411	17:55	21:08	193.08	35.4	11	Capital
8/25/2022	1C-411	18:01	18:55	54.18	27.99	31	Capital
8/25/2022	1C-411	18:01	18:55	53.64	10.73	12	Capital
6/6/2022	1H-403	22:04	5:54	469.62	23.48	3	Reliability
6/13/2022	1H-403	22:08	2:15	247.26	12.36	3	Capital
6/28/2022	1H-403	22:14	5:51	457.74	22.89	3	Reliability
8/1/2022	1H-403	23:09	5:47	397.8	1140.36	172	Reliability
8/15/2022	1H-403	21:29	5:59	509.94	17	2	Reliability
8/16/2022	1H-403	21:05	5:16	491.1	16.37	2	Reliability
8/17/2022	1H-403	21:04	5:38	514.44	17.15	2	Reliability
8/22/2022	1H-403	21:06	5:41	515.34	17.18	2	Reliability
8/23/2022	1H-403	21:18	3:34	375.54	12.52	2	Reliability
8/24/2022	1H-403	20:45	2:08	322.62	10.75	2	Reliability
9/18/2022	1H-403	22:03	4:33	390.66	1119.89	172	Reliability
9/19/2022	1H-403	19:46	2:59	433.38	1242.36	172	Reliability

Date	Feeder	Start Time (24-hour clock)	Restore Time (24-hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
4/8/2022	1H-405	23:44	0:36	51.36	0.86	1	Capital
3/13/2022	1H-424	22:04	0:22	138.06	16.11	7	Reliability
8/8/2022	1H-424	23:31	6:24	413.34	48.22	7	Reliability
11/13/2022	1H-424	21:30	7:39	609.9	71.16	7	Reliability
4/25/2022	1H-427	4:27	5:51	84.18	22.45	16	Capital
5/3/2022	1H-427	23:22	2:44	202.5	6.75	2	Reliability
4/7/2022	1H-431	18:13	20:19	126.12	4.2	2	Reliability
9/8/2022	1N-402	10:08	13:15	187.2	127.92	41	Reliability
9/28/2022	1N-403	12:17	12:18	1.5	12.63	505	Switching
9/30/2022	1N-403	19:23	16:03	1239.84	929.88	45	Switching
4/11/2022	1N-405	1:13	1:57	44.88	117.44	157	Reliability
5/10/2022	1N-405	13:24	13:42	18.84	0.31	1	Tree Trimming
10/1/2022	1N-405	7:59	13:28	329.16	2391.9	436	Reliability
4/13/2022	1N-421	10:32	10:58	25.62	0.43	1	Customer Requested
11/11/2022	1N-421; 15N-402; 15N-403; 15N-404; 15N-401	0:30	1:37	67.14	11821.12	10564	Tree Trimming
9/10/2022	1W-411	17:24	18:03	38.52	4.49	7	Planned Transmission
4/25/2022	20H-304	10:38	12:53	135.06	56.28	25	Capital
4/25/2022	20H-304	10:38	12:53	134.28	55.95	25	Capital
3/4/2022	20H-305	14:22	16:22	119.52	17.93	9	Capital
8/22/2022	20H-305	13:49	15:05	75.6	21.42	17	Capital
6/30/2022	20N-204	13:04	14:23	79.32	1.32	1	Customer Requested
1/5/2022	20V-311	12:57	16:10	192.78	6.43	2	Capital
1/12/2022	20V-311	13:21	14:47	85.92	12.89	9	Capital
2/1/2022	20V-311	12:27	14:42	134.46	6.72	3	Reliability
3/20/2022	20V-311	9:12	9:50	38.22	3.82	6	Reliability
10/20/2022	21W-311	6:02	6:05	2.94	19.4	396	Planned Transmission
12/9/2022	21W-311; 21W-312	5:45	6:14	28.32	316.71	671	Planned Transmission
10/20/2022	21W-312	6:02	6:05	2.94	13.38	273	Planned Transmission
8/18/2022	21W-312; 21W-311	19:26	19:34	7.56	84.29	669	Planned Transmission
5/27/2022	22C-402	9:57	14:11	254.46	992.39	234	Switching
5/27/2022	22C-402	16:45	17:04	19.5	122.85	378	Switching
3/13/2022	22C-403	12:16	12:19	3.48	46.63	804	Switching
6/30/2022	22C-403	9:39	13:27	228.3	3011.27	805	Switching
4/3/2022	22C-404	7:58	8:24	26.16	313.92	720	Reliability
5/20/2022	22C-404	10:59	15:38	279.12	13.96	3	Reliability
12/1/2022	22C-404	16:06	16:35	28.44	19.91	42	Tree Trimming
8/16/2022	22N-402	10:28	11:46	78.06	53.34	41	Reliability

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
3/6/2022	22N-404; 22N-401; 22N-402; 22N-403	6:24	6:26	1.98	242.98	7363	Planned Transmission
2/27/2022	22N-404; 22N-402; 22N-401; 22N-403	6:11	6:16	4.26	522.77	7363	Planned Transmission
7/12/2022	22N-404; 22N-403; 22N-402; 22N-401	17:18	17:21	2.82	346.77	7378	Planned Transmission
6/11/2022	22V-313	11:44	13:09	84.9	2.83	2	Customer Requested
6/21/2022	22V-321	13:06	13:47	40.74	0.68	1	Reliability
7/19/2022	22W-311	3:58	5:29	91.68	1792.34	1173	Planned Transmission
7/19/2022	22W-312	3:58	5:29	91.56	1666.39	1092	Planned Transmission
8/3/2022	22W-312	13:32	15:23	111.9	1.87	1	Reliability
8/22/2022	22W-312; 22W-313; 22W-311	6:42	6:51	9.12	503.27	3311	Planned Transmission
7/19/2022	22W-313	4:03	5:15	72.42	1260.11	1044	Planned Transmission
12/30/2022	22W-313	10:45	11:25	40.32	0.67	1	Reliability
8/22/2022	22W-313; 22W-312; 22W-311	5:34	6:33	58.44	3224.91	3311	Planned Transmission
10/14/2022	23H-302	12:41	15:43	182.28	82.03	27	Tree Trimming
10/24/2022	23H-303	11:42	16:01	258.78	1802.83	418	Reliability
5/29/2022	23W-302	5:59	9:06	186.84	2992.55	961	Capital
1/28/2022	24C-442	9:56	11:40	103.98	299.81	173	Reliability
6/6/2022	25W-301	8:51	11:15	143.82	4.79	2	Tree Trimming
7/13/2022	25W-302	10:04	10:57	52.56	293.46	335	Reliability
9/7/2022	25W-303	9:29	11:22	112.92	3.76	2	Capital
5/25/2022	2C-402	11:39	12:39	59.52	17.86	18	Capital
9/7/2022	2C-402	10:40	13:38	178.02	29.67	10	Reliability
6/30/2022	2H-411	11:07	11:28	21.42	0.36	1	Reliability
5/31/2022	2H-413	17:26	20:13	166.14	2.77	1	Tree Trimming
8/25/2022	2H-413	10:31	13:00	148.8	37.2	15	Capital
9/16/2022	2H-413	9:06	12:20	193.98	29.1	9	Capital
9/6/2022	36V-301	21:48	22:13	25.02	16.68	40	Switching
4/21/2022	36V-303; 36V-302; 36V-301	19:15	19:24	9	589.5	3930	Planned Transmission
9/11/2022	36W-301	9:24	10:20	56.46	2.82	3	Capital
10/29/2022	36W-301	9:25	10:58	92.52	47.8	31	Capital

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
9/7/2022	36W-304	9:30	11:22	111.72	74.48	40	Capital
2/27/2022	37N-411	9:03	10:24	80.94	1119.67	830	Reliability
9/14/2022	37N-411	10:41	13:09	148.74	2.48	1	Capital
1/9/2022	37N-414	14:29	16:03	94.14	797.05	508	Reliability
1/11/2022	3N-412	20:45	22:46	120.54	2.01	1	Customer Requested
10/6/2022	3S-302	7:59	12:20	261.06	4207.42	967	Capital
4/19/2022	3S-307	18:17	18:29	12.36	0.21	1	Switching
4/19/2022	3S-307	18:17	18:19	1.74	42.78	1475	Switching
4/19/2022	3S-307	18:37	18:40	2.46	79.01	1927	Switching
4/19/2022	3S-307	18:46	21:03	137.1	2.29	1	Switching
11/8/2022	3S-308	18:16	18:25	8.94	110.86	744	Switching
8/29/2022	3S-309	14:52	16:36	103.74	5.19	3	Reliability
9/10/2022	3W-201	17:50	18:10	19.5	0.33	1	Planned Transmission
8/12/2022	40H-304	20:52	0:03	190.62	25.42	8	Capital
10/7/2022	40H-305	8:46	12:03	197.04	170.77	52	Switching
10/14/2022	48H-301	11:08	12:43	94.62	14.19	9	Switching
10/17/2022	48H-301	10:56	13:25	148.74	22.31	9	Capital
11/16/2022	48H-301	8:56	14:17	321.54	214.36	40	Capital
7/11/2022	48W-201	11:16	17:45	389.94	6.5	1	Reliability
4/8/2022	4C-424	9:33	12:28	174.66	2.91	1	Reliability
7/13/2022	4C-430	14:29	14:55	25.68	7.7	18	Capital
7/13/2022	4C-430	14:30	14:55	24.18	187.15	505	Capital
10/12/2022	4C-430	9:17	11:01	103.68	324.86	188	Tree Trimming
6/1/2022	4C-441	9:27	12:27	180.06	363.12	121	Capital
8/10/2022	4N-312	10:36	15:15	279.48	4.66	1	Capital
10/8/2022	4N-312	18:23	20:05	101.16	5.06	3	Switching
7/8/2022	4S-322	17:25	17:45	19.14	173.86	628	Switching
7/8/2022	4S-322	17:45	14:53	4147.86	207.39	3	Switching
7/6/2022	4W-211	7:22	8:45	82.74	5.52	4	Planned Transmission
9/21/2022	50N-410	10:03	10:18	14.94	79.68	320	Reliability
12/1/2022	50N-410	19:14	20:32	77.28	127.58	1025	Switching
12/3/2022	50N-410	9:32	9:58	25.26	48.84	116	Tree Trimming
8/23/2022	50N-411	11:30	11:45	14.76	1.23	5	Capital
10/5/2022	50N-411	10:09	10:52	43.86	5.12	7	Reliability
11/9/2022	50N-411	8:18	16:17	479.28	63.9	8	Tree Trimming
1/4/2022	50N-412	9:30	12:50	200.16	273.55	82	Tree Trimming
2/1/2022	50N-415	23:22	0:48	86.16	674.92	470	Reliability
12/14/2022	50N-415	15:49	16:07	18.24	1.52	5	Capital
8/27/2022	50V-401	9:03	10:03	60.36	16.1	16	Capital
9/14/2022	50V-402	21:05	21:47	41.16	48.02	70	Switching
6/28/2022	50W-411	9:35	11:04	88.98	1.48	1	Reliability
8/12/2022	50W-412	19:34	19:50	15.48	33.02	128	Capital
9/9/2022	54H-303	3:59	5:25	85.98	282.3	197	Reliability
11/27/2022	54H-303	22:40	1:37	177.3	168.44	57	Reliability



Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
12/4/2022	54H-303	22:45	0:27	102.3	97.19	57	Capital
3/21/2022	55V-313	16:49	17:10	21.84	0.36	1	Reliability
3/30/2022	55V-313	11:18	14:20	182.28	3.04	1	Reliability
5/31/2022	55V-313	9:09	14:55	346.14	323.06	56	Reliability
6/15/2022	55V-323	10:33	11:22	49.02	5.72	7	Capital
6/15/2022	55V-323	10:51	11:22	31.08	0.52	1	Reliability
8/29/2022	55V-323	9:07	10:45	98.4	1.64	1	Reliability
7/22/2022	55V-323; 55V-322; 55V-313; 55V-314	6:00	6:05	4.74	439.79	5567	Planned Transmission
9/6/2022	56N-414	10:53	11:57	64.56	1.08	1	Capital
10/6/2022	56N-414	11:46	12:19	33.00	318.45	579	Switching
10/1/2022	56N-414	15:42	15:53	10.56	43.12	245	Switching
6/3/2022	57C-422	10:52	11:34	41.94	188.73	270	Capital
9/13/2022	57C-422	14:17	15:29	71.76	5.98	5	Capital
9/14/2022	57C-422	8:28	11:25	176.16	5.87	2	Capital
9/22/2022	57C-422	8:58	11:50	171.72	28.62	10	Reliability
10/21/2022	57C-422	8:45	9:57	72.72	330.88	273	Tree Trimming
10/21/2022	57C-422	8:46	9:58	71.94	260.18	217	Tree Trimming
5/25/2022	57C-426	11:04	14:08	183.72	146.98	48	Reliability
5/31/2022	57C-426	10:00	11:42	102.66	107.79	63	Capital
6/30/2022	57C-426	10:36	10:38	1.56	0.75	29	Reliability
7/15/2022	57C-426	8:25	11:02	157.44	2364.22	901	Capital
10/23/2022	57C-426	8:13	10:28	134.58	1265.05	564	Capital
5/17/2022	57S-402	8:58	10:34	95.34	20.66	13	Capital
6/1/2022	57S-402	8:55	10:49	113.52	175.96	93	Capital
2/9/2022	57W-401	16:50	19:30	160.26	2.67	1	Reliability
3/10/2022	57W-402	9:02	10:24	81.36	13.56	10	Capital
6/29/2022	57W-402; 57W-401	5:00	7:42	161.4	3349.05	1245	Reliability
10/4/2022	57W-402; 57W-401	5:01	5:08	7.74	161.51	1252	Planned Transmission
2/1/2022	58C-403	10:53	13:37	164.22	46.53	17	Reliability
11/2/2022	58C-403	9:47	11:38	111.36	1876.42	1011	Reliability
7/13/2022	58C-405	9:11	12:38	206.88	386.18	112	Reliability
8/10/2022	58C-405	10:04	12:20	136.02	383.12	169	Capital
10/25/2022	58C-405	8:45	12:36	231.12	34.67	9	Reliability
11/20/2022	58C-405	7:13	10:34	200.28	1291.81	387	Reliability
12/20/2022	58C-405	11:13	9:05	1312.56	21.88	1	Reliability
7/21/2022	58H-421	14:47	16:47	120.72	2.01	1	Capital
6/22/2022	58H-431	10:01	13:55	233.76	132.46	34	Reliability
6/22/2022	58H-431	15:55	16:12	17.82	5.05	17	Reliability
10/13/2022	58H-431	9:27	14:16	289.86	33.82	7	Capital
11/23/2022	58H-431	9:36	11:07	91.14	16.71	11	Reliability
6/15/2022	59C-401	8:53	12:06	192.66	28.9	9	Reliability
6/21/2022	59C-401	8:20	11:44	203.82	6.79	2	Reliability

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
6/29/2022	59C-402	9:08	12:46	218.34	69.14	19	Reliability
7/20/2022	59C-402	9:02	15:27	385.14	121.96	19	Capital
8/31/2022	59C-402	9:03	13:22	259.74	1017.32	235	Reliability
9/7/2022	59C-403	9:00	14:30	330.18	71.54	13	Capital
4/15/2022	62H-301	7:23	15:45	501.72	8.36	1	Reliability
4/15/2022	62H-301	7:26	15:45	499.62	8.33	1	Reliability
12/28/2022	62N-412	10:11	13:59	227.94	140.56	37	Capital
8/11/2022	62N-413	11:29	16:09	280.2	4.67	1	Reliability
12/9/2022	62N-413	8:48	15:08	380.7	19.04	3	Tree Trimming
7/28/2022	62N-414	7:58	8:39	40.08	36.07	54	Capital
10/25/2022	62N-415	12:31	13:23	52.44	4.37	5	Capital
12/21/2022	62N-416	9:45	11:28	102.96	22.31	13	Reliability
4/25/2022	63V-312	14:13	14:53	39.96	4.66	7	Capital
11/5/2022	64V-302; 63V-311; 64V-301	19:19	19:58	38.34	1613.48	2525	Switching
8/9/2022	65V-301	15:06	16:02	55.86	0.93	1	Reliability
9/7/2022	65V-302	9:55	10:39	43.38	81.7	113	Reliability
1/27/2022	67C-411	9:01	12:40	218.46	451.48	124	Reliability
3/21/2022	67C-411	8:58	11:16	138.12	324.58	141	Capital
3/26/2022	67C-411	14:06	14:28	21.12	41.47	122	Switching
4/7/2022	67C-411	10:51	14:26	215.34	132.79	37	Capital
1/12/2022	67C-412	19:31	19:38	1447.08	1688.26	70	Switching
1/12/2022	67C-412	19:31	22:09	1597.62	931.95	35	Switching
1/13/2022	67C-412	16:02	22:10	367.74	6.13	1	Switching
1/13/2022	67C-412	19:46	22:11	144.48	2.41	1	Switching
5/29/2022	6N-301	6:26	8:01	95.22	1428.3	900	Capital
9/26/2022	6N-301	14:36	14:37	1.14	5.07	267	Switching
5/29/2022	6N-302	6:26	8:01	95.22	349.14	220	Capital
10/6/2022	6S-221; 6S-225	16:14	16:34	19.68	193.52	590	Capital
9/12/2022	6W-201	6:40	6:46	5.82	0.78	8	Planned Transmission
10/20/2022	70V-311	20:01	20:24	23.52	597.8	1525	Planned Transmission
12/10/2022	70V-311	10:24	12:04	100.32	224.05	134	Capital
10/20/2022	70V-312	20:01	20:24	23.58	503.83	1282	Planned Transmission
7/21/2022	70V-312; 70V-311	7:04	7:08	4.02	187.47	2798	Planned Transmission
12/11/2022	70W-203; 70W-311; 70W-321; 70W-313; 70W-322; 70W-312; 70W-204	23:30	4:42	311.64	38357.69	7385	Planned Transmission
8/25/2022	70W-311	9:24	12:53	209.34	188.41	54	Reliability



Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
9/21/2022	70W-311	8:58	13:11	253.14	75.94	18	Reliability
2/7/2022	70W-313	8:51	17:11	499.92	116.65	14	Tree Trimming
5/12/2022	70W-313	9:01	11:59	178.56	369.84	128	Capital
7/25/2022	70W-313	8:30	15:42	431.4	359.5	50	Capital
7/27/2022	70W-313	8:28	15:05	397.02	284.53	43	Capital
12/12/2022	70W-313	9:10	15:03	353.04	64.72	11	Capital
12/12/2022	70W-313	15:42	16:48	65.52	12.01	11	Tree Trimming
12/4/2022	70W-314	13:38	13:57	19.08	171.72	540	Switching
12/11/2022	70W-314	23:30	5:41	370.74	3781.55	612	Planned Transmission
1/16/2022	73W-411	11:33	11:59	25.38	27.92	66	Switching
2/15/2022	73W-411	13:15	14:32	77.28	5.15	4	Capital
2/15/2022	73W-411	14:54	14:56	2.16	2.2	61	Capital
4/11/2022	73W-411	11:14	15:09	235.5	3.93	1	Reliability
4/16/2022	73W-411	10:02	11:28	86.22	209.8	146	Capital
4/21/2022	73W-411	8:57	11:09	131.94	72.57	33	Capital
5/8/2022	73W-411	6:47	10:02	195.06	806.25	248	Capital
5/8/2022	73W-411	7:14	10:26	191.58	3.19	1	Capital
5/8/2022	73W-411	14:01	16:08	127.2	1857.12	876	Capital
5/8/2022	73W-411	14:06	16:11	124.98	10.14	5	Capital
5/9/2022	73W-411	12:04	13:39	94.86	1.58	1	Capital
5/18/2022	73W-411	9:26	12:10	164.52	5.48	2	Reliability
5/18/2022	73W-411	11:28	12:22	53.82	2.69	3	Capital
5/18/2022	73W-411	13:35	14:49	73.2	10.98	9	Reliability
5/18/2022	73W-411	13:48	16:06	137.94	6.9	3	Capital
8/24/2022	73W-411	9:32	15:08	335.58	458.63	82	Reliability
10/14/2022	73W-411	10:30	13:41	191.34	197.72	62	Reliability
11/8/2022	73W-411	8:55	14:24	328.8	2076.92	379	Tree Trimming
12/11/2022	73W-411	23:30	5:40	369.48	10671.81	1733	Planned Transmission
12/11/2022	73W-412; 73W-411	23:30	4:20	290.16	17153.29	3547	Planned Transmission
1/5/2022	74N-412	12:16	13:47	91.26	1.52	1	Reliability
9/22/2022	74N-412	13:17	14:58	101.1	301.62	179	Reliability
7/21/2022	74V-302; 74V-301	7:04	7:08	4.74	6.87	87	Planned Transmission
11/23/2022	74V-302; 74V-301	6:02	6:05	2.52	3.7	88	Planned Transmission
1/6/2022	76V-301	8:22	15:31	428.28	35.69	5	Reliability
4/20/2022	76V-301	19:01	19:10	9.3	49.91	322	Planned Transmission
10/4/2022	76V-301	5:01	5:08	7.74	42.31	328	Planned Transmission
10/12/2022	76V-301	12:38	13:15	36.96	17.86	29	Tree Trimming
4/2/2022	76W-201	6:01	6:09	8.76	0.15	1	Planned Transmission

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
10/31/2022	76W-201	5:23	5:50	27.54	0.46	1	Planned Transmission
12/22/2022	76W-201	5:48	5:51	3.78	0.06	1	Planned Transmission
6/30/2022	77V-301	6:09	7:22	72.84	57.06	47	Capital
1/20/2022	77V-302	17:22	19:12	109.08	18.18	10	Reliability
5/17/2022	77V-302	10:24	11:30	65.94	34.07	31	Reliability
6/11/2022	77V-401	7:01	12:54	352.62	2133.35	363	Capital
6/12/2022	77V-401	6:56	12:48	352.38	2131.9	363	Reliability
6/19/2022	77V-401	6:58	13:01	363.42	2198.69	363	Reliability
6/20/2022	77V-401	9:19	11:04	104.52	8.71	5	Reliability
6/20/2022	77V-401	11:05	12:38	93.48	6.23	4	Reliability
6/21/2022	77V-401	12:52	13:18	26.04	14.76	34	Capital
6/22/2022	77V-401	13:01	14:15	73.8	13.53	11	Capital
1/16/2022	78W-301	19:14	5:16	601.5	10.03	1	Switching
3/8/2022	78W-301	14:10	15:01	50.94	90.84	107	Reliability
3/23/2022	78W-301	9:30	13:44	254.82	416.21	98	Capital
3/23/2022	78W-301	9:30	14:31	301.14	45.17	9	Capital
4/28/2022	78W-301	11:38	14:00	142.08	2.37	1	Reliability
4/2/2022	78W-302; 78W-301	6:01	6:09	8.76	180.75	1238	Planned Transmission
5/23/2022	79V-402	9:01	13:15	254.22	21.19	5	Capital
12/14/2022	79V-402	10:32	13:36	183.9	21.46	7	Capital
5/11/2022	7N-301	10:10	12:46	155.76	158.36	61	Reliability
9/12/2022	7N-301	10:48	12:43	114.78	200.87	105	Capital
4/29/2022	7N-302	10:12	12:12	120.9	32.24	16	Customer Requested
9/30/2022	7N-302; 7N-301	12:34	12:52	18.36	244.49	799	Switching
11/24/2022	7N-302; 7N-301	6:00	6:30	29.7	964.26	1948	Reliability
4/2/2022	80W-302; 80W-301	6:01	6:09	8.76	102.05	699	Planned Transmission
6/15/2022	81N-411	21:04	0:55	231.18	2612.33	678	Reliability
8/15/2022	81N-411	13:16	13:52	36.66	0.61	1	Reliability
8/23/2022	81N-412	11:01	14:40	218.64	3.64	1	Capital
9/1/2022	81N-412	11:30	12:27	56.7	3.78	4	Reliability
8/20/2022	81S-303	12:12	13:31	78.66	7.87	6	Capital
9/15/2022	81S-304	10:26	13:01	154.56	2.58	1	Reliability
10/11/2022	81S-304	11:39	14:30	170.4	25.56	9	Reliability
2/1/2022	81S-305	13:50	14:40	50.16	0.84	1	Capital
9/17/2022	81S-307; 81S-304; 81S-301; 81S-306; 81S-305; 81S-303; 81S-302	6:01	8:59	177.72	29483.75	9954	Planned Transmission

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
11/23/2022	81W-231	9:51	12:47	176.94	227.07	77	Tree Trimming
5/31/2022	81W-232	10:19	15:01	281.82	46.97	10	Capital
6/15/2022	81W-232	8:26	10:02	95.76	122.89	77	Reliability
4/2/2022	81W-233; 81W-232; 81W-231; 81W-322; 81W-321	6:01	6:09	8.76	328.65	2251	Planned Transmission
4/30/2022	81W-321	8:54	13:03	248.4	74.52	18	Capital
12/13/2022	81W-322	10:58	11:26	28.38	293.73	621	Capital
5/2/2022	82V-402	10:09	11:19	69.96	7	6	Capital
5/26/2022	82V-402	10:00	15:45	345.48	241.84	42	Capital
6/8/2022	82V-402	1:25	1:30	4.92	15.91	194	Capital
9/28/2022	82V-402	0:11	0:15	3.54	139.12	2358	Reliability
1/25/2022	82V-403	20:15	20:34	18.72	263.64	845	Switching
6/6/2022	82V-423	9:30	9:38	8.52	26.84	189	Capital
4/2/2022	83V-302	10:05	10:38	33.12	22.63	41	Reliability
3/6/2022	84S-303	9:47	13:56	248.22	45.51	11	Capital
10/29/2022	84W-301	8:32	9:59	86.7	11.56	8	Reliability
1/22/2022	85S-401	12:32	12:36	4.56	0.68	9	Reliability
5/1/2022	85S-401	7:48	9:52	123.54	2448.15	1189	Reliability
12/11/2022	85S-401	7:58	11:30	211.8	7804.83	2211	Capital
8/15/2022	87H-311	11:33	13:21	107.1	10.71	6	Capital
12/19/2022	87H-311	13:05	15:12	127.02	10.59	5	Reliability
12/19/2022	87H-311	13:05	15:11	126.66	23.22	11	Reliability
6/3/2022	87H-312	10:32	11:15	43.32	41.88	58	Capital
8/10/2022	87H-313	11:10	12:24	73.38	14.76	13	Capital
10/13/2022	87H-313	10:41	11:22	41.34	4.82	7	Switching
11/26/2022	87H-313	23:03	5:27	383.94	12202.89	1907	Capital
11/27/2022	87H-313	5:31	5:43	12.6	400.47	1907	Capital
6/27/2022	87W-312	9:53	15:36	343.2	703.56	123	Reliability
9/30/2022	87W-312	8:52	15:00	367.74	3432.24	560	Switching
4/26/2022	88H-401	9:37	10:37	60	3	3	Capital
4/27/2022	88H-401	10:18	10:58	40.44	9.44	14	Capital
4/28/2022	88H-401	11:32	12:38	66.6	4.44	4	Capital
5/31/2022	88H-401	13:54	15:19	85.02	8.5	6	Capital
6/1/2022	88H-401	13:08	15:30	141.36	9.42	4	Capital
6/14/2022	88H-401	9:39	10:16	36.78	4.9	8	Capital
7/5/2022	88H-401	15:47	16:47	59.94	3	3	Capital
7/7/2022	88H-401	8:49	10:58	129.3	30.17	14	Capital
7/27/2022	88H-401	10:01	12:45	163.92	426.19	156	Reliability
8/3/2022	88H-401	9:56	12:27	151.56	30.31	12	Capital
8/15/2022	88H-401	9:04	10:52	107.88	52.14	29	Capital
8/22/2022	88H-401	9:08	9:44	36.24	94.83	157	Reliability
9/12/2022	88H-401	12:59	14:28	89.04	4.45	3	Capital
9/12/2022	88H-401	16:51	17:02	11.52	0.58	3	Capital

Date	Feeder	Start Time (24-hour clock)	Restore Time (24-hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
4/1/2022	88H-401; 88H-402	23:20	11:40	740.46	37491.96	3038	Planned Transmission
3/23/2022	88H-402	10:13	13:53	220.62	3.68	1	Reliability
3/25/2022	88H-402	20:59	21:18	18.48	0.31	1	Reliability
8/2/2022	88H-402	11:26	11:46	19.98	0.67	2	Capital
11/9/2022	88H-402	9:00	12:27	207.18	103.59	30	Reliability
12/3/2022	88W-311	16:20	16:27	6.6	44.66	406	Switching
9/21/2022	88W-312	10:28	12:03	95.94	20.79	13	Reliability
10/21/2022	88W-322	9:57	10:38	40.2	20.77	31	Reliability
4/1/2022	89H-401	23:27	11:26	718.98	1150.37	96	Planned Transmission
6/29/2022	89H-401	15:15	16:24	69.18	17.3	15	Switching
6/29/2022	89H-401	15:15	16:24	68.82	60.79	53	Reliability
7/12/2022	89H-401	9:09	11:52	163.08	255.49	94	Capital
10/4/2022	91W-411	5:01	5:08	7.26	143.75	1188	Planned Transmission
8/9/2022	92H-331	14:21	14:39	18.24	0.3	1	Reliability
3/23/2022	92W-302	5:32	5:40	7.44	115.32	930	Planned Transmission
5/18/2022	92W-302	19:04	19:29	24.24	376.12	931	Planned Transmission
6/15/2022	92W-302	5:02	6:53	110.82	1719.56	931	Planned Transmission
6/20/2022	92W-302	4:02	5:59	116.46	1807.07	931	Planned Transmission
8/31/2022	92W-302	20:05	21:44	99	1549.35	939	Reliability
11/10/2022	92W-302	2:00	4:10	129.72	2034.44	941	Planned Transmission
11/10/2022	92W-302	4:46	5:23	37.02	580.6	941	Planned Transmission
3/7/2022	93V-311	14:11	15:47	95.64	7.97	5	Reliability
5/10/2022	93V-311	8:33	15:49	436.02	7.27	1	Reliability
7/12/2022	93V-312	10:44	11:34	49.8	21.58	26	Reliability
2/22/2022	93V-313	9:01	11:06	125.46	31.37	15	Capital
5/31/2022	93V-313	11:42	12:43	61.02	9.15	9	Reliability
7/5/2022	93V-313	8:11	15:56	465.24	310.16	40	Tree Trimming
7/6/2022	93V-313	7:56	15:36	460.2	306.8	40	Tree Trimming
7/11/2022	93V-313	8:00	16:22	502.32	334.88	40	Tree Trimming
7/12/2022	93V-313	8:00	16:03	482.88	144.86	18	Tree Trimming
7/13/2022	93V-313	8:00	16:03	483.66	145.1	18	Reliability
7/14/2022	93V-313	8:00	16:00	479.88	143.96	18	Reliability
7/15/2022	93V-313	8:00	14:45	404.94	142.99	40	Capital
11/29/2022	93V-313	8:52	15:20	388.56	278.47	43	Capital
12/6/2022	93V-313	8:00	15:58	478.08	143.42	18	Capital
12/7/2022	93V-313	7:58	16:05	486.84	146.05	18	Reliability
12/8/2022	93V-313	8:07	13:26	318.96	95.69	18	Capital
12/12/2022	93V-313	9:25	17:13	467.64	140.29	18	Capital

Date	Feeder	Start Time (24-hour clock)	Restore Time (24- hour clock)	Duration (Minutes)	Customer Hours of Interruption	Customers Interrupted	CEA Subcause
12/19/2022	93V-313	8:06	15:23	437.1	131.13	18	Capital
12/20/2022	93V-313	8:02	16:45	522.66	374.57	43	Reliability
4/10/2022	93V-314	9:03	15:16	373.02	149.21	24	Reliability
7/14/2022	96H-411	10:53	12:14	81.48	1.36	1	Reliability
10/1/2022	96H-411	11:06	17:23	376.68	25.11	4	Reliability
4/1/2022	96H-411; 96H-412	23:16	11:43	746.28	31866.16	2562	Planned Transmission
4/7/2022	96H-412	10:58	13:31	152.64	2.54	1	Reliability
11/29/2022	96H-412	10:31	12:53	142.2	1327.2	560	Capital
9/21/2022	9H-221	10:11	18:56	525.42	376.55	43	Capital
12/18/2022	9H-221	9:56	15:53	356.76	1569.74	264	Reliability
12/1/2022	9H-222; 9H-223; 9H-224; 9H-221; 104H-411	9:08	9:29	21.24	1630.17	4605	Switching

## Appendix L

### Percentage of Customers Restored Within 48 Hours

#### Major Event Days

Date (YYYY-MM-DD)	Number of Customers Restored in First 48 Hours	Percentage of Customers Restored in First 48 Hours
2017-02-13	51,484	97.61
2017-03-14	44,683	100.00
2017-11-23	44,271	99.99
2017-12-26	38,249	99.64
2018-01-05	181,079	100.00
2018-01-31	36,018	100.00
2018-03-08	67,053	100.00
2018-03-13	101,372	99.30
2018-03-14	78,573	99.98
2018-11-03	54,218	99.62
2019-07-21	55,177	100.00
2019-09-09	52,662	79.95
2019-09-10	44,337	91.40
2019-09-11	15,588	86.70
2019-11-28	65,408	99.51
2019-12-10	106,801	100.00
2020-02-07	100,039	95.78
2020-02-08	41,652	99.56
2020-02-27	72,874	100.00
2022/07/01	170,993	99.09
2022/08/01	43,200	100.00
2022/01/14	22,619	99.92
2022/01/15	90,181	99.57
2022/02/03	40,551	100.00
2022/02/04	87,979	94.19
2022/02/05	86,366	93.88
2022/02/18	112,679	100.00
2022/09/26	26,069	86.39
2022/09/27	16,047	74.88
2022/09/28	15,443	77.53
2022/09/29	24,370	90.20
2022/12/01	115,779	99.97
2022/12/13	46,228	95.16
2022/12/23	81,302	100.00
2022/12/24	58,036	100.00
Average		95.99

Date (YYYY-MM-DD)	Number of Customers Restored in First 48 Hours	Percentage of Customers Restored in First 48 Hours
Standard Deviation		6.82
Average - Standard Deviation		89.17
2022 Target		91.98
<b>2023 Target</b>		<b>91.98</b>

**Extreme Event Days**

Date (YYYY-MM-DD)	Number of Customers Restored in First 48 Hours	Percentage of Customers Restored in First 48 Hours
2017-12-25	180,396	98.41
2018-01-04	231,445	99.88
2018-11-29	362,453	99.90
2019-09-07	319,988	79.72
2019-09-08	50,778	72.39
2022/09/23	113,932	65.42
2022/09/24	222,526	60.98
2022/09/25	52,439	82.67
Average		82.42
Standard Deviation		14.68
Average - Standard Deviation		67.74
2022 Target		78.38
<b>2023 Target</b>		<b>78.38</b>



**Significant Event Day (Following a Major or Extreme Event Day)**

Date (YYYY-MM-DD)	Number of Customers Restored in First 48 Hours	Percentage of Customers Restored in First 48 Hours
2017/03/15	32,482	100.00
2018/03/09	30,365	99.95
2018/11/04	26,346	100.00
2019/09/12	10,780	91.77
2019/11/29	24,785	99.95
2022/09/30	10,654	85.48
Average		96.19
Standard Deviation		5.65
Average - Standard Deviation		90.54
2022 Target		95.05
<b>2023 Target</b>		<b>95.05</b>

## Appendix M

### Summary of Performance Standards Results by Category

#### 1. Reliability Standards 2022 Results

Standard	Target	2022 Result	Outcome
SAIDI	$\leq 4.29$	5.16	Not Achieved
SAIFI	$\leq 2.05$	2.19	Not Achieved
CKAIDI	$\leq 19.81$	11S-411: 22.84	Not Achieved
		2C-402: 16.79	Achieved
		100C-421: 10.16	Achieved
		24C-442: 7.08	Achieved
		67C-411: 5.38	Achieved
		77V-401: 4.71	Achieved
CKAIFI	$\leq 5.45$	2C-402: 4.80	Achieved
		24C-442: 3.69	Achieved
		59C-402: 2.58	Achieved

#### 2. Customer Service Response Standards 2022 Results

Standard	Target	2022 Result	Outcome
Regular Business Call Answer Rate	A minimum of 70 % of calls shall be answered within 30 seconds at NS Power Customer Care Centre.	71.08%	Achieved
Percent Estimated Bills	No more than 2% of customer bills shall be estimated annually.	0.7%	Achieved
Customer Notification of Outages	Notify all customers of an outage as soon as NS Power has knowledge of an outage event.	Target Met	Achieved
New Service Connection Times	Service Installation No Pole: $\leq 3.0$ days.	2.98 days	Achieved
	Service Installation Pole or Transformer: $\leq 4.9$ days.	5.09 days	Not Achieved
	Service Installation Temporary to Permanent: $\leq 3.2$ days.	3.73 days	Not Achieved
	Service Installation Line Extension <10 Poles: $\leq 6.2$ days.	6.38 days	Not Achieved

Standard	Target	2022 Result	Outcome
	Service Installation Line Extension $\geq 10$ Poles: $\leq 18.1$ days.	12.02 days	Achieved

### 3. Adverse Weather Response Standards 2022 Results

Standard	Target	2022 Result	Outcome
Notification of EOC Opening	NS Power to notify customers of the decision to open the EOC within 4 hours of the decision to open.	Target Met	Achieved
Outage Call Answer Rate	A minimum of 85% of calls answered within 45 seconds at Customer Care Centre during severe outage events.	January 7 – 10: 97.76 January 14 – 18: 99.63 February 3: 94.13 February 4 – 9: 99.15 February 18 – 19: 96.56 September 23 – October 10: 93.31 November 30 – December 3: 93.06 December 13 – December 16: 86.64 December 23 – December 24: 95.78	Achieved
Polite Disconnects	10% or less annually.	3.49%	Achieved
ETR Updates without delay	ETR updates provided without delay.	Target Met	Achieved
Percent Customers restored in 48 hours	Extreme Event Days: $\geq 78.38\%$ of customer restored within 48 hours Major Event Days: $\geq 91.98\%$ of customers restored within 48 hours. Significant Event Days (Following an EED or MED): $\geq 95.05\%$ of customers restored within 48 hours	EED: October 23: 65.42 October 24: 60.98 October 25: 82.67 MED: January 7: 99.09 January 8: 100 January 14: 99.92 January 15: 99.57 February 3: 100 February 4: 94.19 February 5: 93.88 February 18: 100 September 26: 86.39 September 27: 74.88 September 28: 77.53 September 29: 90.20 December 1: 99.97 December 13: 95.16 December 23: 100 December 24: 100 SED: September 30: 85.48	Achieved

Standard	Target	2022 Result	Outcome
Outage Report for Events Impacting $\geq$ 30,000 Customers	File Report Within 45 days of the event, or within 75 in the case of a MED or EED	Achieved	Achieved