



August 25, 2020

To: Mayor McNamara and all Town Council members

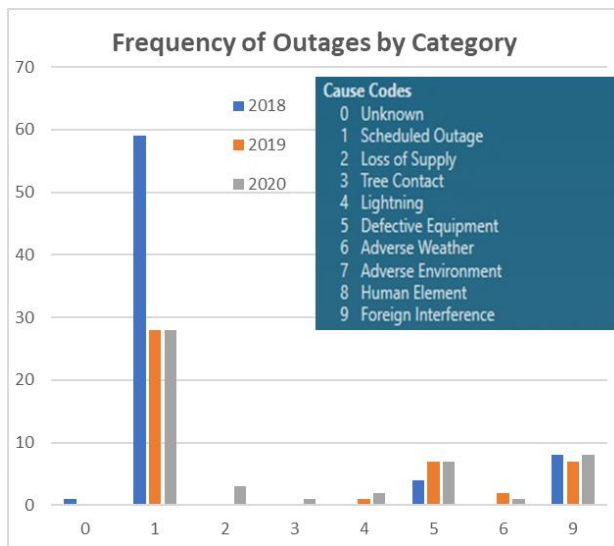
From: Joe Barile, General Manager – Essex Powerlines Corporation

2020 Town of Tecumseh Power Outages with Historical Comparison

Frequency of 2020 Outages with Cause Code

- Period January 1, 2020 to August 19, 2020
- Reporting Style equivalent to Essex Powerlines Distribution System Plan (DSP) and Ontario Energy Board (OEB) Requirements (cause code categories)
- Outage definition
 - to 1 or more customers
 - length 1 minute or greater
- 50 Total Outages
 - 28 Planned – average duration 1 hours 13 minutes
 - 3 LOS - average duration 2 hours 35 minutes
 - 1 Tree - duration 2 hours 2 minutes
 - 2 Lightning - average duration 1 hours 15 minutes
 - 7 Equipment - average duration 3 hours 51 minutes
 - 1 Adverse weather - duration 3 hours 19 minutes
 - 8 Animal Contact - average duration 1 hours 52 minutes

2020 Comparison to Same Period in 2018 and 2019



Frequency of Outages			
Cause Code	2018	2019	2020
0	1		
1	59	28	28
2			3
3			1
4		1	2
5	4	7	7
6		2	1
9	8	7	8
Total	72	45	50



When compared to 2018, Essex Powerlines undertook **less** planned outages in 2019 and 2020. 2020 Construction in Progress has 32 transformer replacements ongoing. In 2020, Essex Powerlines experienced an **increase** in Loss of Supply (3) events. These types of outages by their nature (feeder lock out) usually result in the largest number of customer outage hours. In 2019 and 2020, Essex Powerlines also saw an **increase** in defective equipment related outages when compared to 2018. More details are provided below. Finally, in 2019 and 2020 the Town of Tecumseh did experience some adverse weather and lightning related outages which were not experienced in 2018.

Historical and Future Plans (DSP)

- Planned Replacements are described in the EPL's DSP
- Health Index, inspections, age, configuration, trends, size, quantity & non-destructive examination (NDE) determine assets to be replaced
- NDE methods have acceptable ranges and EPL uses wood pole resistance, infrared, asset loading, voltages, voltage changes, phase balance, strength, temperature, etc.
- Increased reactive and planned outages will occur in 2020 and beyond as Bell (& other communication companies) install fibre to the home on EPL/Bell poles that do not meet minimum CSA standards as well as contractor damage to underground EPL assets
- Underground Primary Replacements Historical and 2020:
 - 2020 4.8km planned for all EPL – 100% in Tecumseh
 - 2019 5.8km planned for all EPL – 31% or 1.8km in Tecumseh
 - 2018 4.9km planned for all EPL – 88% or 4.3km in Tecumseh
- DSP also describes Vegetation Management
 - High Voltage Lines completed in 2017 & 2019 & scheduled every 2 years
 - Low Voltage 2017 and 2021 and scheduled every 4 years
 - Both high & low voltage are scheduled for 2021 in DSP

DSP Asset Plan and Reliability – EPL overall

- Goal is to keep better than 5-year historical average (the lower the number the better). As noted half the years will be above and half below. EPL is within an acceptable range
- Primary Cable and Switchgear failures – half will be above and half below. EPL is doing better in this area.
- Reducing customer-hours of defective equipment – the average of the previous 5 years is 11,000 so 2017 and 2018 is below and 2019 is slightly above due to broken switches that caused large outages (switches accounted for 50% of 13,588 customer-hours). EPL has been proactively changing switches, but



it is difficult to assess which ones will fail. EPL feels that the switches may not be defective, but the porcelain is damaged by the freeze thaw cycles and cause them to crack and break. We no longer install porcelain but use polymer which is more expensive but will last longer. EPL has seen 5-year-old switches fail.

2.3.1.1.2 ".....keep below 2012 to 2016 5-year historical average half the years will be above and half below...."	2017	2018	2019
Actual SAIDI without LOS	0.829	1.846	1.271
Actual SAIFI without LOS	0.565	1.418	0.843
Actual CAIDI without LOS	1.467	1.302	1.508
Previous 5 Year Average SAIDI without LOS	1.252	1.240	1.161
Previous 5 Year Average SAIFI without LOS	0.744	0.735	0.795
Previous 5 Year Average CAIDI without LOS	1.593	1.595	1.455

		2017	2018	2019
Primary Cable Failures	<=3	4	2	1
Switchgear Failures	<=2	2	0	3
Reducing customer hours of defective equipment (defective equipment accounted for the most customer-hours excluding LOS)		2679	4719	13588

EPL Overall Asset Replacement Targets

- Designs are optimized for asset reduction to assist in reducing outage frequency
- in 2019 EPL's DSP removed 75 transformers and replaced them with 40. Planned replacements reduced the number of transformers by 47%
- high voltage cable is being reduced but EPL is also creating looped systems where none existed previously. EPL reduced high voltage cable by 4% while creating "looped" systems to ensure at least 2 points of supply for future reliability. 3 systems were looped that were not looped previously
- EPL installed all 40 new transformers accessible from road or parking lot
- 33 new customer transformers were added while EPL eliminated 35 transformers
- DSP and OEB accepts reasonable replacement frequency within Total Useful Life and Health Index
- it will take EPL 41 years to replace all transformers within its distribution system which lines up with the Total Useful Life (TUL – an OEB measurement for depreciation/replacement TUL for transformers is 40 years)



total	2019 Asset Overview
55	removed UG TX
39	Installed UG TX
20	Removed OH TX
1	Installed OH TX
5621	Removed UG Primary (m)
7784	Installed UG Primary (m)
2473	Removed OH Primary (m)
0	Installed OH Primary
40	Number of TX moved from Inaccessible to Accessible
75	Removed TX total
40	Installed TX Total
47%	Transformer Reduction
8094.1	Removed Primary Total (m)
7784	Installed Primary Total (m)
4%	Primary Reduction
	Created 2 - 1 phase loops and 1 - 3 phase loop

Numbers of Years to replace EPL Assets must be within Useful Life

	Quantity in System	% replaced/2019	# of years to replace all
pad mount TX	1932	2.8%	35
pole mount 1 phase TX	980	2.0%	49
EPL owned TX	3078	2.4%	41

OTHER RELEVANT INFORMATION

EPL's overall DSP has the following replacements scheduled:

- Replace 48.9km of high voltage primary cable – to end of 2020 45% will have been replaced
- Replace an additional 16.9km of high voltage primary cable by 2026 – by budget and resources (cost) it may take until 2028
- Approximately 60% of the above work is in the Town of Tecumseh
- Fibre to the home projects that are not done by joint trench/drilling are increasing EPL costs because there is little or no room for our conductor after 2 or 3 communication companies use the up the road allowance
- It will be challenging for EPL to complete the plans with all new fibre making space extremely tight

DSP Target		2017	2018	2019	2020
replace 48.9KM of primary cable past TUL	part way thru 2026 100% will be replaced	6.1	4.9	5.8	4.8
percentage of 48.9km replaced in each year		13%	10%	12%	10%
replace an additional 16.9km of primary cable by 2026					
percentage of 16.9km replaced in each year	at the end of 2028 96% will be replaced				



CONCLUSION

The majority of outages being experienced by customers in the Town of Tecumseh to date in 2020 were planned. Asset replacement pursuant to our DSP is progressing almost exactly on schedule. This puts a clear emphasis on communication with affected customers either through means utilized by EPL (i.e. social media, flyer delivered door to door, responding to customer inquiries in person) or through equally as effective communication mechanisms used by the Town of Tecumseh.

There has been an increase in Loss of Supply events in 2020 when compared to 2018 and 2019.

The north shore of Essex County has experienced more weather-related events in 2019 and 2020 than 2018.

Year to Date outages related to defective equipment were slightly above average in 2020 which can be attributed to switch failures which EPL has been proactive in replacing and are related to what appears to be a defect (porcelain versus polymer). By the end of 2020 this may level.