

February 15, 2019

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 4915 - Proposed FY 2020 Electric Infrastructure, Safety, and Reliability Plan Responses to PUC Data Requests – Set 2

Dear Ms. Massaro:

On behalf of National Grid,¹ I have enclosed ten (10) copies of the Company's responses to the second set of data requests issued by the Rhode Island Public Utilities Commission in the above-referenced docket.

Please be advised that the Company's responses to data requests PUC 2-4 through PUC 2-6 are pending.

Thank you for your attention to this transmittal. If you have any questions, please contact me at 401-784-7288.

Very truly yours,



Jennifer Brooks Hutchinson

Enclosures

cc: Docket 4915 Service List
John Bell, Division
Greg Booth, Division
Leo Wold, Esq.
Christy Hetherington, Esq.
Al Contente, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

February 15, 2019
Date

Docket No. 4915 - National Grid's Electric ISR Plan FY 2020
Docket No. 4857 - Performance Incentives Pursuant to R.I.G.L. §39-1
27.7.1(e)(3)

Service List as of 1/4/2019

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File an original & ten copies w/: Luly E. Massaro, Commission Clerk John Harrington, Commission Counsel Public Utilities Commission 89 Jefferson Blvd. Warwick, RI 02888	Luly.massaro@puc.ri.gov ; John.harrington@puc.ri.gov ; Cynthia.WilsonFrias@puc.ri.gov ; Alan.nault@puc.ri.gov ;	401-780-2107

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4915
In Re: Electric Infrastructure, Safety, and Reliability Plan FY2020
Responses to the Commission's Second Set of Data Requests
Issued on February 8, 2019

PUC 2-1

Request:

Refencing the Response to Division 1-10 on page 309-310, is everything that was approved in Docket 4600 included in the Chart on page 310?

Response:

As noted in the Company's response to Division 1-10, the Chart on page 310 represents all capital items included in Docket No. 4770. The ISR Plan is principally a program for the recovery of capital investment; therefore, the response to Division 1-10 relates to programs and projects associated with the recovery of capital costs and not expenses. Because capital costs incurred by other affiliated companies, including National Grid US Service Company, Inc. are charged to the Company as operating expenses, any capital items included in Docket No. 4770 that would be incurred by an affiliated company are not included in the Chart on page 310.

PUC 2-2

Request:

Referencing page 310, please explain what is meant by the term “economically replacing” units with the latest control technology in the Program Description for the Recloser Replacement Program.

Response:

The term “economically replacing” was used to convey assurance that the Company is appropriately taking future plans into consideration when specifying and purchasing equipment and executing standard construction so that future investments, such as grid modernization, if approved, can be efficiently implemented. Without presuming that certain grid modernization investments will proceed, the Company is taking the appropriate steps to avoid unnecessary investment now and duplication of work later.

Specifically, recloser control cabinets are specified so that future communication equipment can be installed without having to fully replace any units. Additionally, standard construction of new recloser pole installations were developed so that future equipment, like antennas, can be installed without a total rebuild of the pole.

PUC 2-3

Request:

Referencing the proposal to continue the installation of 3V0 protective devices, please provide a list of the substations that the Company plans to install 3V0 protection devices in FY 2020. Please also describe how the Company prioritizes the substations for installation and provide a copy of any plan or forecast that the Company has to continue this expansion in future years.

Response:

As part of the FY2020 program, the Company will complete 3V0 protection installation at Davisville Substation and start 3V0 protection installation at Wolf Hill, Pontiac, Riverside, and Quonset Substations.

The Company developed the program implementation and prioritization through a ranking methodology, which compared interconnected and proposed generation of a station to its minimum load. An initial review of all Narragansett Electric Company Transmission and Distribution substations was completed to identify ongoing project, rebuild, or projected retirement work. The installation of 3V0 protection was added to the scope of ongoing and rebuild project work where possible. The stations that were projected to be retired in the upcoming years were excluded from consideration for 3V0 protection implementation.

The following steps were followed while developing a list of applicable substations:

- High side transformer configuration was identified for each station. Stations with a high side configuration, which would not warrant 3V0 protection, were excluded.
- Stations were investigated for existing 3V0 protection. Substations equipped with high side protection scheme capable of detecting line to ground faults and tripping the low side breaker were excluded from consideration.
- Substations were selected based on interconnected and proposed generation to minimum load ratio. If the ratio of the maximum distributed generation of a station to the minimum load exceeded 50%, the station was considered for 3V0 implementation.

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PUC 2-3, page 2

The program was scheduled over a 5-year period. The following Table shows the schedule of 3V0 protection implementation by station and Fiscal year.

Number	Substation	Station Voltage (kV)	Spend Type	Schedule				
				FY19	FY20	FY21	FY22	FY23
1	Tiverton	115/12.47	T-Sub	Complete				
			D-Sub	Complete				
2	Kilvert Street	115/12.47	T-Sub	Complete				
			D-Sub	Complete				
3	Old Baptist Road	115/12.47	T-Sub	Complete				
			D-Sub	Complete				
4	Davisville	115/34.5	T-Sub	Start	Complete			
			D-Sub	Start	Complete			
5	Wolf Hill	115/23	T-Sub		Start	Complete		
			D-Sub		Start	Complete		
6	Pontiac	115/12.47	T-Sub		Start	Complete		
			D-Sub		Start	Complete		
7	Riverside	115/13.8	T-Sub		Start	Complete		
			D-Sub		Start	Complete		
8	Quonset	34.5/12.47	D-Sub		Start	Complete		
9	Peacedale	34.5/12.47	D-Sub			Start	Complete	
10	Staples	115/13.8	T-Sub				Start	Complete
			D-Sub				Start	Complete
11	Warwick Mall	23/12.47	D-Sub				Start	Complete
12	Point Street	115/12.47	T-Sub				Start	Complete
			D-Sub				Start	Complete

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PUC 2-3, page 3

It is recognized that interconnected and proposed generation can change in future years. This list is reviewed on an annual basis and may be expanded and or re-prioritized to include stations that exceed generation to minimum load ratio threshold of 50%.

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PUC 2-7

Request:

Referencing the Vegetation Management program, and in particular the issues involving Oak and Ash trees, please detail the company's efforts to coordinate with state and municipal entities to maintain an acceptable level of reliability.

Response:

The Company has coordinated with RIDOT to streamline the permitting process. Prior to this year, the Company was required to obtain permits for each tree removal; we are now able to obtain blanket permits for large sections of highway. RIDOT has also been handling wood removal, which has been helpful in reducing costs. The Company has also coordinated with several towns to reduce removal costs. Cumberland and South Kingstown have both provided traffic control and handled wood removal. With these efforts, the Company has been able to reduce tree removal costs for oak trees, which have been killed by Gypsy Moth.

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PUC 2-8

Request:

Referencing Tables 3 and 4 on pages 128 and 130, are all years on Table 3 captured on Table 4?

Response:

Yes, the list of circuits in Table 4 is the complete list from fiscal years 2008-2017.

The Narragansett Electric Company
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PUC 2-9

Request:

Referencing Table 5 and 6 on page 132, has the Company done any analysis of the additional costs that would be incurred and the additional Customer Interruptions that would occur if the Company did not engage in the EHTM and Cycle Pruning programs? If so, please provide that information.

Response:

No. Cycle pruning and hazard tree removal are both industry standards and utility best practices. The Company has not performed an analysis of the impacts of stopping these activities.

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PUC 2-10

Request:

How does the Company set the EHTM program spending Budget?

Response:

The Company bases the EHTM budget on the estimated number of hazard trees that need to be removed to meet reliability targets in the State of Rhode Island. This number can fluctuate based on many factors, such as drought, extreme weather, or the spread of invasive species.

PUC 2-11

Request:

Please describe the process that the Company uses to determine where to perform the EHTM program. Include a description of how the Company determined to expand the EHTM program as described on page 119.

Response:

National Grid uses a combination of three leading, or risk indicators, and two lagging, or performance indicators, in the circuit selection model. These indicators are used to rank the entire circuit population. The first leading indicator - number of customers served for each circuit-will reflect circuits serving larger populations and result in these circuits ranking higher up the EHTM selection list as an interruption on these circuits would have the largest impact on system SAIFI. The second leading indicator -number of miles of bare-wire, three-phase construction on each circuit-will reflect circuits that are the least tolerant to tree/limb contact and result in these circuits ranking higher up the EHTM selection list. The third leading indicator- tree stocking density, will reflect tree interruptions and result in these circuits ranking higher up the EHTM selection list.

The two lagging indicators are tied to tree-related interruption performance data. The first lagging indicator - the average number of tree-related customers interrupted (CI) calculated over a three-year period-will reflect circuits exhibiting more frequent or larger tree interruptions and result in these circuits ranking higher up the EHTM selection list. The second lagging indicator- the three-year average number of tree-related customers interrupted (CI) per tree event-will result in these circuits with more frequent, historic three-phase tree interruptions higher up in the EHTM selection list.

To summarize, National Grid's circuit selection model uses five indicators, or indexes:

Leading or risk based

1. Customer served on the circuit
2. Miles of bare-wire, three-phase construction
3. Tree stocking density

Lagging or performance based

1. Three-year average total tree CI on the circuit
2. Three-year average tree CI per event

PUC 2-11, page 2

After calculating each of these indicators separately, they are combined to provide a final rank for the circuit. Using this ranking system and local knowledge of tree conditions on each circuit, a final EHTM work plan is created.

The expansion of the program described on page 119 of the FY 2020 ISR Plan refers to the expansion of scope beyond three-phase portions of circuits. The three-phase portions of circuits typically serve the most customers, so removing hazard trees in those sections will have the greatest reliability benefit to the entire system, and this represents most the EHTM work that is done today. However, in order to improve reliability to customers in less densely populated areas, where there have been large number of tree-related outages, the Company expanded the scope of the EHTM program to include some single-phase portions of circuits.

PUC 2-12

Request:

Please provide a copy of the tree risk assessment protocol that the Company uses to identify hazard trees. Does the tree risk assessment protocol take into account the current and expected issues involving Oak and Ash trees in Rhode Island?

Response:

The Company's tree risk assessment protocol is based on the Tree Risk Assessment, companion publication to the ANSI A300 Part 9: Tree, Shrub, and Other Woody Plant Management – Standard Practices (Tree Risk Assessment a. Tree Structure Assessment). The Tree Risk Assessment Standard is a Best Management Practice guide that addresses characteristics that deem a tree a hazard including characteristics as a result of pest damage. This publication contains a copyright restriction against reproduction or distribution of the publication in any form or by any means without the prior written consent of the International Society of Arboriculture. For this reason, the Company has not included a copy of this publication with this response.

PUC 2-13

Request:

Referencing pages 284 and 285, does the Company code the Cause of Customer Interruptions for all feeders for both "Tree Fell" and "Tree – Broken Limb?" If so, please provide that information. In addition, has the Company engaged in any analysis of whether fewer interruptions are caused by causes categorized as "Tree Fell" in areas that have undergone EHTM? If so, please provide that analysis.

Response:

With respect to the first part of this question, please see Attachment PUC 2-13 for Tree Fell and Tree – Broken Limb report.

With respect to the second part of this question, the Company included a Cost/Benefit Analysis in Section 3, Attachment 1 of its December 21, 2018 filing. In this analysis, the Company shows, on average, a 70% reduction in customers interrupted on circuits the year after EHTM compared to the three-year average prior to EHTM. The same circuits also show a 61% reduction in customers interrupted two years after EHTM, and a 59% reduction in customers interrupted three years after EHTM. This analysis, however, looks at all tree-caused outages, not just outages caused by tree fell.

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
53-102W41	Tree - Broken Limb	1	29	4,259	35	0.829	121.69	146.86
53-102W44	Tree - Broken Limb	1	61	5,246	2,105	0.029	2.49	86.00
53-102W44	Tree Fell	1	3	201	2,105	0.001	0.10	67.00
53-102W51	Tree Fell	3	723	105,970	2,900	0.249	36.54	146.57
53-102W52	Tree - Broken Limb	1	11	1,023	934	0.012	1.10	93.00
53-102W54	Tree - Broken Limb	1	133	4,389	2,298	0.058	1.91	33.00
53-102W54	Tree Fell	5	3,105	352,100	2,298	1.351	153.22	113.40
53-104J7	Tree Fell	1	617	38,201	856	0.721	44.63	61.91
53-106J3	Tree Fell	1	845	54,031	852	0.992	63.42	63.94
53-107W50	Tree Fell	1	5	435	706	0.007	0.62	87.00
53-107W51	Tree - Broken Limb	1	12	1,164	2,188	0.005	0.53	97.00
53-107W51	Tree Fell	2	10	1,430	2,188	0.005	0.65	143.00
53-107W61	Tree - Broken Limb	1	95	8,645	1,396	0.068	6.19	91.00
53-107W62	Tree Fell	1	2,258	222,041	1,742	1.296	127.46	98.34
53-107W63	Tree - Broken Limb	1	53	2,279	3,148	0.017	0.72	43.00
53-107W63	Tree Fell	1	3,065	147,367	3,148	0.974	46.81	48.08
53-107W65	Tree - Broken Limb	1	41	3,157	1,186	0.035	2.66	77.00
53-107W65	Tree Fell	1	36	6,228	1,186	0.03	5.25	173.00
53-107W83	Tree - Broken Limb	3	1,488	119,163	1,381	1.077	86.29	80.08
53-107W83	Tree Fell	2	97	10,282	1,381	0.07	7.45	106.00
53-107W84	Tree Fell	1	81	26,325	1,648	0.049	15.97	325.00
53-107W85	Tree - Broken Limb	1	16	1,456	553	0.029	2.63	91.00
53-108W53	Tree - Broken Limb	3	494	27,979	2,698	0.183	10.37	56.64
53-108W53	Tree Fell	2	783	132,476	2,698	0.29	49.10	169.19
53-108W55	Tree - Broken Limb	1	536	18,224	528	1.015	34.52	34.00
53-108W55	Tree Fell	1	527	26,350	528	0.998	49.91	50.00
53-108W62	Tree - Broken Limb	1	7	3,115	1,487	0.005	2.09	445.00
53-108W65	Tree - Broken Limb	2	512	28,620	3,537	0.145	8.09	55.90
53-108W65	Tree Fell	4	928	63,401	3,537	0.262	17.93	68.32
53-111J1	Tree Fell	1	460	13,800	1,131	0.407	12.20	30.00
53-111J3	Tree Fell	2	1,128	36,500	1,069	1.055	34.14	32.36
53-112W41	Tree - Broken Limb	2	61	11,429	1,897	0.032	6.02	187.36
53-112W41	Tree Fell	1	9	522	1,897	0.005	0.28	58.00
53-112W42	Tree - Broken Limb	7	417	35,662	2,858	0.146	12.48	85.52
53-112W42	Tree Fell	6	1,362	63,294	2,858	0.477	22.15	46.47
53-112W43	Tree - Broken Limb	4	594	42,686	935	0.635	45.65	71.86
53-112W43	Tree Fell	2	81	16,021	935	0.087	17.13	197.79
53-112W44	Tree - Broken Limb	11	634	64,278	2,270	0.279	28.32	101.38
53-112W44	Tree Fell	10	606	69,738	2,270	0.267	30.72	115.08
53-126W40	Tree Fell	1	153	306	151	1.013	2.03	2.00

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
53-126W41	Tree - Broken Limb	6	670	52,717	2,566	0.261	20.54	78.68
53-126W41	Tree Fell	10	981	175,009	2,566	0.382	68.20	178.40
53-126W42	Tree - Broken Limb	4	50	7,743	508	0.098	15.24	154.86
53-126W42	Tree Fell	1	4	2,024	508	0.008	3.98	506.00
53-126W50	Tree - Broken Limb	4	382	32,986	1,559	0.245	21.16	86.35
53-126W50	Tree Fell	4	187	13,172	1,559	0.12	8.45	70.44
53-126W51	Tree - Broken Limb	5	3,159	203,845	2,445	1.292	83.37	64.53
53-126W51	Tree Fell	3	34	1,696	2,445	0.014	0.69	49.88
53-126W54	Tree - Broken Limb	2	869	72,010	756	1.149	95.25	82.87
53-126W54	Tree Fell	4	69	7,079	756	0.091	9.36	102.59
53-127W40	Tree - Broken Limb	24	2,151	169,539	2,909	0.739	58.28	78.82
53-127W40	Tree Fell	16	1,541	164,994	2,909	0.53	56.72	107.07
53-127W41	Tree - Broken Limb	2	90	4,270	1,012	0.089	4.22	47.44
53-127W41	Tree Fell	5	434	93,338	1,012	0.429	92.23	215.06
53-127W42	Tree - Broken Limb	3	1,047	103,516	1,015	1.032	101.99	98.87
53-127W42	Tree Fell	5	1,117	60,699	1,015	1.1	59.80	54.34
53-13F10	Tree - Broken Limb	3	88	6,059	1,099	0.08	5.51	68.85
53-13F10	Tree Fell	1	5	590	1,099	0.005	0.54	118.00
53-13F3	Tree - Broken Limb	1	343	64,141	1,465	0.234	43.78	187.00
53-13F4	Tree - Broken Limb	8	2,855	283,392	3,507	0.814	80.81	99.26
53-13F4	Tree Fell	1	49	8,186	3,507	0.014	2.33	167.06
53-13F5	Tree - Broken Limb	6	358	112,614	3,690	0.097	30.52	314.56
53-13F5	Tree Fell	1	21	567	3,690	0.006	0.15	27.00
53-13F9	Tree Fell	2	230	40,830	3,559	0.065	11.47	177.52
53-148J3	Tree Fell	1	434	5,208	876	0.495	5.95	12.00
53-15F1	Tree - Broken Limb	2	116	12,164	2,388	0.049	5.09	104.86
53-15F1	Tree Fell	8	120	84,385	2,388	0.05	35.34	703.21
53-15F2	Tree - Broken Limb	22	775	83,445	2,397	0.323	34.81	107.67
53-15F2	Tree Fell	19	2,895	286,602	2,397	1.208	119.57	99.00
53-18F10	Tree - Broken Limb	1	157	8,321	2,725	0.058	3.05	53.00
53-18F10	Tree Fell	2	2,470	64,234	2,725	0.906	23.57	26.01
53-18F11	Tree - Broken Limb	4	29	2,615	1,213	0.024	2.16	90.17
53-18F11	Tree Fell	2	207	7,905	1,213	0.171	6.52	38.19
53-18F13	Tree Fell	2	82	11,890	1,849	0.044	6.43	145.00
53-18F14	Tree - Broken Limb	1	12	636	278	0.043	2.29	53.00
53-18F5	Tree - Broken Limb	1	22	1,386	4,209	0.005	0.33	63.00
53-18F5	Tree Fell	1	38	1,178	4,209	0.009	0.28	31.00
53-18F6	Tree - Broken Limb	5	1,248	62,172	2,102	0.594	29.58	49.82
53-18F6	Tree Fell	5	229	38,566	2,102	0.109	18.35	168.41
53-18F7	Tree - Broken Limb	3	86	8,816	2,422	0.036	3.64	102.51

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
53-18F7	Tree Fell	1	2	188	2,422	0.001	0.08	94.00
53-18F8	Tree - Broken Limb	2	170	28,092	1,722	0.099	16.31	165.25
53-18F8	Tree Fell	2	1,864	165,188	1,722	1.082	95.93	88.62
53-21F1	Tree - Broken Limb	9	1,325	82,683	2,434	0.544	33.97	62.40
53-21F1	Tree Fell	3	261	28,666	2,434	0.107	11.78	109.83
53-21F2	Tree Fell	4	68	9,426	1,271	0.054	7.42	138.62
53-21F4	Tree Fell	3	113	22,791	1,969	0.057	11.57	201.69
53-23F1	Tree - Broken Limb	1	35	3,395	1,504	0.023	2.26	97.00
53-23F1	Tree Fell	3	47	16,745	1,504	0.031	11.13	356.28
53-23F2	Tree - Broken Limb	7	739	44,929	978	0.756	45.94	60.80
53-23F2	Tree Fell	5	424	59,505	978	0.434	60.84	140.34
53-23F3	Tree - Broken Limb	7	156	41,204	1,471	0.106	28.01	264.13
53-23F3	Tree Fell	8	422	69,044	1,471	0.287	46.94	163.61
53-23F4	Tree Fell	2	76	11,214	212	0.358	52.90	147.55
53-23F6	Tree - Broken Limb	4	99	22,068	2,757	0.036	8.00	222.91
53-23F6	Tree Fell	3	1,065	89,331	2,757	0.386	32.40	83.88
53-26W1	Tree - Broken Limb	13	3,878	204,551	1,420	2.731	144.05	52.75
53-26W1	Tree Fell	19	3,053	277,716	1,420	2.15	195.57	90.96
53-26W3	Tree - Broken Limb	10	839	95,663	2,138	0.392	44.74	114.02
53-26W3	Tree Fell	6	280	32,068	2,138	0.131	15.00	114.53
53-26W5	Tree - Broken Limb	4	322	24,794	2,796	0.115	8.87	77.00
53-26W5	Tree Fell	5	2,859	143,206	2,796	1.023	51.22	50.09
53-26W7	Tree - Broken Limb	3	102	13,444	289	0.353	46.52	131.80
53-26W7	Tree Fell	6	535	57,255	289	1.851	198.11	107.02
53-27F1	Tree - Broken Limb	3	281	17,671	1,795	0.157	9.84	62.89
53-27F1	Tree Fell	2	57	11,557	1,795	0.032	6.44	202.75
53-27F2	Tree Fell	1	70	8,540	3,171	0.022	2.69	122.00
53-27F4	Tree Fell	1	340	18,020	399	0.852	45.16	53.00
53-27F5	Tree - Broken Limb	4	3,047	336,442	2,604	1.17	129.20	110.42
53-27F5	Tree Fell	1	2	3,028	2,604	0.001	1.16	1,514.00
53-30J1	Tree - Broken Limb	1	19	1,900	911	0.021	2.09	100.00
53-34F1	Tree - Broken Limb	40	1,592	371,406	3,306	0.482	112.34	233.30
53-34F1	Tree Fell	44	2,907	610,762	3,306	0.879	184.74	210.10
53-34F2	Tree - Broken Limb	26	3,772	327,006	2,492	1.514	131.22	86.69
53-34F2	Tree Fell	25	2,728	286,283	2,492	1.095	114.88	104.94
53-34F3	Tree - Broken Limb	11	759	112,999	840	0.904	134.52	148.88
53-34F3	Tree Fell	17	617	223,141	840	0.735	265.64	361.65
53-36J4	Tree - Broken Limb	1	3	321	499	0.006	0.64	107.00
53-37J3	Tree - Broken Limb	2	76	5,960	817	0.093	7.29	78.42
53-37J4	Tree - Broken Limb	1	881	24,668	885	0.995	27.87	28.00

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
53-38F1	Tree - Broken Limb	32	2,570	137,355	3,044	0.844	45.12	53.45
53-38F1	Tree Fell	28	3,014	255,850	3,044	0.99	84.05	84.89
53-38F2	Tree - Broken Limb	1	32	2,912	518	0.062	5.62	91.00
53-38F3	Tree - Broken Limb	7	2,181	112,264	1,703	1.281	65.92	51.47
53-38F3	Tree Fell	4	2,867	184,344	1,703	1.683	108.25	64.30
53-38F4	Tree - Broken Limb	7	2,315	149,967	1,997	1.159	75.10	64.78
53-38F4	Tree Fell	6	250	36,408	1,997	0.125	18.23	145.63
53-38F5	Tree - Broken Limb	9	263	33,927	2,489	0.106	13.63	129.00
53-38F5	Tree Fell	7	91	18,296	2,489	0.037	7.35	201.05
53-38F6	Tree - Broken Limb	2	65	10,621	2,713	0.024	3.91	163.40
53-38F6	Tree Fell	2	58	7,088	2,713	0.021	2.61	122.21
53-45F2	Tree - Broken Limb	21	1,707	181,552	402	4.246	451.62	106.36
53-45F2	Tree Fell	11	1,175	141,153	402	2.923	351.13	120.13
53-47J2	Tree - Broken Limb	1	62	4,464	866	0.072	5.15	72.00
53-47J2	Tree Fell	1	17	1,020	866	0.02	1.18	60.00
53-48F1	Tree - Broken Limb	1	8	480	3,373	0.002	0.14	60.00
53-48F1	Tree Fell	1	767	3,068	3,373	0.227	0.91	4.00
53-48F3	Tree - Broken Limb	1	3,383	157,175	3,456	0.979	45.48	46.46
53-48F3	Tree Fell	2	99	50,461	3,456	0.029	14.60	509.71
53-48F4	Tree - Broken Limb	2	18	2,304	2,167	0.008	1.06	128.00
53-4F1	Tree - Broken Limb	8	1,929	84,702	1,715	1.125	49.39	43.91
53-4F1	Tree Fell	2	24	7,172	1,715	0.014	4.18	298.83
53-4F2	Tree - Broken Limb	13	468	47,980	3,012	0.155	15.93	102.52
53-4F2	Tree Fell	2	138	24,786	3,012	0.046	8.23	179.61
53-50F2	Tree Fell	2	941	37,633	1,779	0.529	21.15	39.99
53-50J1	Tree Fell	1	18	10,224	441	0.041	23.18	568.00
53-51F1	Tree - Broken Limb	7	887	135,538	2,054	0.432	65.99	152.80
53-51F1	Tree Fell	6	988	116,988	2,054	0.481	56.96	118.41
53-51F2	Tree - Broken Limb	1	12	648	3,649	0.003	0.18	54.00
53-51F2	Tree Fell	1	3,578	135,889	3,649	0.981	37.24	37.98
53-51F3	Tree - Broken Limb	4	102	19,371	2,163	0.047	8.96	189.91
53-51F3	Tree Fell	1	100	37,400	2,163	0.046	17.29	374.00
53-5F1	Tree - Broken Limb	16	3,210	161,710	2,010	1.597	80.45	50.38
53-5F1	Tree Fell	4	2,121	61,319	2,010	1.055	30.51	28.91
53-5F2	Tree - Broken Limb	5	465	43,226	2,529	0.184	17.09	92.96
53-5F2	Tree Fell	4	792	164,508	2,529	0.313	65.05	207.71
53-5F3	Tree - Broken Limb	3	2,089	218,700	2,439	0.856	89.67	104.69
53-5F3	Tree Fell	2	151	10,810	2,439	0.062	4.43	71.59
53-5F4	Tree - Broken Limb	7	539	61,933	3,259	0.165	19.00	114.90
53-5F4	Tree Fell	4	169	14,556	3,259	0.052	4.47	86.13

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53-66J3	Tree Fell	1	10	1,500	856	0.012	1.75	150.00
53-66J5	Tree - Broken Limb	1	13	1,560	353	0.037	4.42	120.00
53-69F1	Tree - Broken Limb	4	251	79,832	3,512	0.071	22.73	318.06
53-69F1	Tree Fell	1	18	2,178	3,512	0.005	0.62	121.00
53-69F3	Tree - Broken Limb	3	157	49,813	4,251	0.037	11.72	317.28
53-6J8	Tree - Broken Limb	2	288	19,566	440	0.655	44.47	67.94
53-71J4	Tree - Broken Limb	1	6	900	564	0.011	1.60	150.00
53-73J1	Tree Fell	1	8	21,344	193	0.041	110.59	2,668.00
53-73J2	Tree Fell	1	408	42,712	263	1.551	162.40	104.69
53-76F1	Tree - Broken Limb	3	23	2,978	1,973	0.012	1.51	129.48
53-76F1	Tree Fell	4	93	30,128	1,973	0.047	15.27	323.96
53-76F2	Tree - Broken Limb	5	167	20,078	3,660	0.046	5.49	120.23
53-76F2	Tree Fell	1	185	13,505	3,660	0.051	3.69	73.00
53-76F4	Tree - Broken Limb	1	20	8,380	4,598	0.004	1.82	419.00
53-76F4	Tree Fell	1	52	3,952	4,598	0.011	0.86	76.00
53-76F7	Tree - Broken Limb	2	19	1,943	2,905	0.007	0.67	102.26
53-76F7	Tree Fell	2	797	86,905	2,905	0.274	29.92	109.04
53-77J3	Tree - Broken Limb	1	1,683	248,944	1,577	1.067	157.86	147.92
53-78F3	Tree - Broken Limb	2	45	8,686	1,290	0.035	6.73	193.02
53-78F4	Tree - Broken Limb	2	684	16,644	805	0.85	20.68	24.33
53-78F4	Tree Fell	1	729	15,309	805	0.906	19.02	21.00
53-79F2	Tree - Broken Limb	1	4	7,484	2,390	0.002	3.13	1,871.00
53-7F1	Tree Fell	2	4	3,732	2,802	0.001	1.33	933.00
53-7F2	Tree - Broken Limb	2	1,341	87,063	2,554	0.525	34.09	64.92
53-7F4	Tree - Broken Limb	1	16	1,728	2,710	0.006	0.64	108.00
56-100F1	Tree - Broken Limb	4	353	45,359	2,337	0.151	19.41	128.50
56-100F1	Tree Fell	2	298	29,070	2,337	0.128	12.44	97.55
56-122J2	Tree - Broken Limb	1	69	3,174	739	0.093	4.29	46.00
56-122J4	Tree - Broken Limb	1	7	553	777	0.009	0.71	79.00
56-122J4	Tree Fell	1	3	909	777	0.004	1.17	303.00
56-131J2	Tree - Broken Limb	2	34	3,824	1,001	0.034	3.82	112.47
56-131J2	Tree Fell	1	32	6,080	1,001	0.032	6.07	190.00
56-131J4	Tree - Broken Limb	1	90	13,770	492	0.183	27.99	153.00
56-146J14	Tree - Broken Limb	2	554	4,122	538	1.03	7.66	7.44
56-146J14	Tree Fell	2	577	984	538	1.072	1.83	1.71
56-14F1	Tree - Broken Limb	5	2,596	369,501	2,572	1.009	143.66	142.33
56-14F1	Tree Fell	3	320	10,896	2,572	0.124	4.24	34.05
56-14F2	Tree - Broken Limb	5	1,839	261,581	1,473	1.248	177.58	142.24
56-14F2	Tree Fell	4	223	40,350	1,473	0.151	27.39	180.94
56-14F3	Tree - Broken Limb	2	1,580	59,844	1,551	1.019	38.58	37.88

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56-14F3	Tree Fell	1	24	20,736	1,551	0.015	13.37	864.00
56-14F4	Tree - Broken Limb	1	10	720	866	0.012	0.83	72.00
56-154J14	Tree Fell	1	14	1,792	71	0.197	25.24	128.00
56-16F1	Tree - Broken Limb	3	80	16,418	2,163	0.037	7.59	205.23
56-16F1	Tree Fell	5	151	19,169	2,163	0.07	8.86	126.95
56-16F2	Tree - Broken Limb	3	92	8,733	2,795	0.033	3.12	94.92
56-16F2	Tree Fell	5	4,307	255,699	2,795	1.541	91.48	59.37
56-16F3	Tree - Broken Limb	2	1,014	44,631	2,106	0.481	21.19	44.01
56-16F3	Tree Fell	1	25	17,225	2,106	0.012	8.18	689.00
56-16F4	Tree Fell	4	458	89,167	2,046	0.224	43.58	194.69
56-17F1	Tree - Broken Limb	3	299	19,623	2,776	0.108	7.07	65.63
56-17F1	Tree Fell	1	1,995	309,775	2,776	0.719	111.59	155.28
56-17F2	Tree - Broken Limb	2	1,959	251,178	2,908	0.674	86.37	128.22
56-17F2	Tree Fell	5	69	15,026	2,908	0.024	5.17	217.77
56-17F3	Tree - Broken Limb	1	977	71,606	1,910	0.512	37.49	73.29
56-17F3	Tree Fell	4	1,096	58,007	1,910	0.574	30.37	52.93
56-19J14	Tree - Broken Limb	1	217	6,727	214	1.014	31.43	31.00
56-19J14	Tree Fell	1	219	5,694	214	1.023	26.61	26.00
56-21J6	Tree Fell	1	20	8,300	344	0.058	24.13	415.00
56-2222	Tree - Broken Limb	1	2	584	2	1	292.00	292.00
56-22F1	Tree - Broken Limb	4	2,417	125,581	2,334	1.036	53.81	51.96
56-22F1	Tree Fell	3	1,508	642,641	2,334	0.646	275.34	426.15
56-22F2	Tree - Broken Limb	2	87	12,525	2,598	0.033	4.82	143.97
56-22F3	Tree - Broken Limb	4	904	57,570	2,260	0.4	25.47	63.68
56-22F3	Tree Fell	1	337	15,839	2,260	0.149	7.01	47.00
56-22F4	Tree Fell	4	157	34,804	2,173	0.072	16.02	221.68
56-22F6	Tree - Broken Limb	4	147	18,108	1,875	0.078	9.66	123.18
56-22F6	Tree Fell	8	755	176,689	1,875	0.403	94.23	234.03
56-23J2	Tree - Broken Limb	1	17	4,199	409	0.042	10.27	247.00
56-23J4	Tree - Broken Limb	1	18	1,026	836	0.022	1.23	57.00
56-29F1	Tree Fell	1	7	2,366	2,515	0.003	0.94	338.00
56-29F2	Tree Fell	1	176	22,809	178	0.989	128.14	129.60
56-30F1	Tree - Broken Limb	5	103	20,670	1,355	0.076	15.25	200.68
56-30F1	Tree Fell	9	4,585	267,362	1,355	3.384	197.32	58.31
56-30F2	Tree - Broken Limb	16	3,750	263,620	1,823	2.057	144.61	70.30
56-30F2	Tree Fell	23	7,469	671,981	1,823	4.097	368.61	89.97
56-32J12	Tree - Broken Limb	1	14	2,982	454	0.031	6.57	213.00
56-32J12	Tree Fell	3	58	11,978	454	0.128	26.38	206.52
56-32J2	Tree - Broken Limb	1	583	44,891	586	0.995	76.61	77.00
56-33F1	Tree - Broken Limb	6	2,751	317,544	2,673	1.029	118.80	115.43

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56-33F1	Tree Fell	7	1,220	132,469	2,673	0.456	49.56	108.58
56-33F2	Tree - Broken Limb	5	990	74,684	2,532	0.391	29.50	75.44
56-33F2	Tree Fell	4	2,733	229,379	2,532	1.079	90.59	83.93
56-33F3	Tree - Broken Limb	24	3,103	281,884	2,932	1.058	96.14	90.84
56-33F3	Tree Fell	16	2,530	168,459	2,932	0.863	57.46	66.58
56-33F4	Tree - Broken Limb	28	6,136	614,361	3,333	1.841	184.33	100.12
56-33F4	Tree Fell	28	10,725	988,451	3,333	3.218	296.56	92.16
56-36W41	Tree - Broken Limb	1	28	3,360	2,065	0.014	1.63	120.00
56-36W41	Tree Fell	2	43	19,470	2,065	0.021	9.43	452.79
56-36W42	Tree - Broken Limb	7	365	25,077	1,848	0.198	13.57	68.70
56-36W42	Tree Fell	2	235	19,973	1,848	0.127	10.81	84.99
56-36W43	Tree - Broken Limb	1	26	3,484	1,712	0.015	2.04	134.00
56-36W43	Tree Fell	1	2	396	1,712	0.001	0.23	198.00
56-36W44	Tree - Broken Limb	2	43	8,105	2,115	0.02	3.83	188.49
56-36W44	Tree Fell	4	2,210	81,252	2,115	1.045	38.42	36.77
56-37W41	Tree - Broken Limb	3	27	4,785	2,049	0.013	2.34	177.22
56-37W41	Tree Fell	2	725	36,157	2,049	0.354	17.65	49.87
56-37W42	Tree - Broken Limb	3	196	33,512	2,512	0.078	13.34	170.98
56-37W43	Tree - Broken Limb	1	9	684	2,264	0.004	0.30	76.00
56-37W43	Tree Fell	1	31	8,215	2,264	0.014	3.63	265.00
56-38W2	Tree - Broken Limb	1	16	912	2,299	0.007	0.40	57.00
56-38W2	Tree Fell	3	45	1,920	2,299	0.02	0.84	42.67
56-3F1	Tree - Broken Limb	2	201	14,267	2,012	0.1	7.09	70.98
56-3F1	Tree Fell	6	2,037	253,917	2,012	1.012	126.20	124.65
56-3F2	Tree - Broken Limb	5	290	22,031	1,804	0.161	12.21	75.97
56-3F2	Tree Fell	1	1,886	115,046	1,804	1.045	63.77	61.00
56-42F1	Tree - Broken Limb	6	219	15,304	2,877	0.076	5.32	69.88
56-42F1	Tree Fell	5	650	110,651	2,877	0.226	38.46	170.23
56-43F1	Tree - Broken Limb	2	600	68,808	2,130	0.282	32.30	114.68
56-43F1	Tree Fell	1	290	119,480	2,130	0.136	56.09	412.00
56-45J3	Tree - Broken Limb	1	6	1,860	1,150	0.005	1.62	310.00
56-45J3	Tree Fell	5	341	17,075	1,150	0.297	14.85	50.07
56-45J4	Tree - Broken Limb	1	3	582	477	0.006	1.22	194.00
56-45J4	Tree Fell	1	3	351	477	0.006	0.74	117.00
56-46F1	Tree - Broken Limb	5	193	50,708	1,413	0.137	35.89	262.74
56-46F1	Tree Fell	3	141	24,850	1,413	0.1	17.59	176.24
56-46F2	Tree - Broken Limb	18	1,426	219,161	1,635	0.872	134.04	153.69
56-46F2	Tree Fell	11	2,542	272,895	1,635	1.555	166.91	107.35
56-46F3	Tree - Broken Limb	4	1,998	145,962	1,946	1.027	75.01	73.05
56-46F3	Tree Fell	8	2,610	416,773	1,946	1.341	214.17	159.68

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56-46F4	Tree - Broken Limb	1	38	4,522	3,077	0.012	1.47	119.00
56-46F4	Tree Fell	4	3,626	264,787	3,077	1.178	86.05	73.02
56-49J1	Tree - Broken Limb	2	140	18,734	631	0.222	29.69	133.81
56-49J1	Tree Fell	3	116	17,510	631	0.184	27.75	150.95
56-49J3	Tree Fell	2	14	4,810	809	0.017	5.95	343.57
56-51J12	Tree Fell	1	263	17,443	261	1.008	66.83	66.32
56-51J16	Tree - Broken Limb	2	269	19,587	792	0.34	24.73	72.81
56-51J2	Tree Fell	1	26	6,708	828	0.031	8.10	258.00
56-52F1	Tree - Broken Limb	3	188	11,598	1,577	0.119	7.35	61.69
56-52F1	Tree Fell	1	146	13,578	1,577	0.093	8.61	93.00
56-52F2	Tree - Broken Limb	1	44	3,168	1,579	0.028	2.01	72.00
56-52F2	Tree Fell	2	1,213	30,960	1,579	0.768	19.61	25.52
56-52F3	Tree - Broken Limb	6	185	25,913	2,618	0.071	9.90	140.07
56-52F3	Tree Fell	5	241	66,755	2,618	0.092	25.50	276.99
56-54F1	Tree - Broken Limb	50	1,910	228,369	2,615	0.73	87.33	119.56
56-54F1	Tree Fell	39	7,922	628,011	2,615	3.029	240.16	79.27
56-57J2	Tree - Broken Limb	2	20	2,737	597	0.034	4.58	136.85
56-57J3	Tree - Broken Limb	1	12	2,484	1,043	0.012	2.38	207.00
56-59F1	Tree - Broken Limb	8	280	88,194	1,134	0.247	77.77	314.98
56-59F1	Tree Fell	3	25	3,098	1,134	0.022	2.73	123.92
56-59F2	Tree - Broken Limb	1	22	616	2,528	0.009	0.24	28.00
56-59F2	Tree Fell	5	291	27,916	2,528	0.115	11.04	95.93
56-59F3	Tree - Broken Limb	16	2,286	231,575	2,773	0.824	83.51	101.30
56-59F3	Tree Fell	17	4,090	353,547	2,773	1.475	127.50	86.44
56-59F4	Tree - Broken Limb	3	26	3,049	1,092	0.024	2.79	117.27
56-59F4	Tree Fell	4	806	31,546	1,092	0.738	28.89	39.14
56-61F1	Tree - Broken Limb	1	2	172	296	0.007	0.58	86.00
56-61F1	Tree Fell	2	291	2,993	296	0.983	10.11	10.29
56-61F2	Tree - Broken Limb	10	213	20,176	1,524	0.14	13.24	94.72
56-61F2	Tree Fell	9	293	64,583	1,524	0.192	42.38	220.42
56-61F3	Tree - Broken Limb	6	551	39,547	831	0.663	47.59	71.77
56-61F3	Tree Fell	3	208	19,166	831	0.25	23.06	92.14
56-61F4	Tree - Broken Limb	2	136	10,988	1,096	0.124	10.03	80.79
56-61F4	Tree Fell	1	17	1,088	1,096	0.016	0.99	64.00
56-63F1	Tree Fell	1	8	8	8	1	1.00	1.00
56-63F2	Tree - Broken Limb	2	108	10,608	1,176	0.092	9.02	98.22
56-63F2	Tree Fell	6	942	58,694	1,176	0.801	49.91	62.31
56-63F3	Tree - Broken Limb	11	369	67,329	2,003	0.184	33.61	182.46
56-63F3	Tree Fell	9	2,393	141,111	2,003	1.195	70.45	58.97
56-63F4	Tree - Broken Limb	2	101	8,984	1,923	0.053	4.67	88.95

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
56-63F4	Tree Fell	1	515	82,660	1,923	0.268	42.98	160.50
56-63F5	Tree - Broken Limb	3	120	10,841	3,662	0.033	2.96	90.34
56-63F5	Tree Fell	6	718	167,059	3,662	0.196	45.62	232.67
56-63F6	Tree - Broken Limb	34	882	131,947	2,574	0.343	51.26	149.60
56-63F6	Tree Fell	32	1,697	349,637	2,574	0.659	135.83	206.03
56-64F1	Tree - Broken Limb	2	25	4,908	1,257	0.02	3.90	196.32
56-64F1	Tree Fell	5	1,729	272,028	1,257	1.375	216.41	157.33
56-64F2	Tree - Broken Limb	1	2,528	75,840	2,567	0.985	29.54	30.00
56-64F2	Tree Fell	1	2,587	331,136	2,567	1.008	129.00	128.00
56-65J12	Tree - Broken Limb	1	2	78	684	0.003	0.11	39.00
56-65J12	Tree Fell	3	27	11,376	684	0.039	16.63	421.33
56-65J2	Tree - Broken Limb	2	27	3,016	1,002	0.027	3.01	111.70
56-65J2	Tree Fell	3	669	61,770	1,002	0.668	61.65	92.33
56-68F1	Tree - Broken Limb	15	966	99,461	2,565	0.377	38.78	102.96
56-68F1	Tree Fell	15	2,575	134,672	2,565	1.004	52.50	52.30
56-68F2	Tree - Broken Limb	11	1,976	142,797	4,135	0.478	34.53	72.27
56-68F2	Tree Fell	10	121	40,190	4,135	0.029	9.72	332.15
56-68F3	Tree - Broken Limb	14	478	139,501	3,139	0.152	44.44	291.84
56-68F3	Tree Fell	14	1,435	186,726	3,139	0.457	59.49	130.12
56-68F4	Tree - Broken Limb	13	889	158,894	1,609	0.553	98.75	178.73
56-68F4	Tree Fell	10	395	60,645	1,609	0.245	37.69	153.53
56-68F5	Tree - Broken Limb	1	29	2,291	86	0.337	26.64	79.00
56-72F2	Tree - Broken Limb	6	473	106,043	2,612	0.181	40.60	224.19
56-72F2	Tree Fell	1	57	6,858	2,612	0.022	2.63	120.32
56-72F3	Tree - Broken Limb	1	42	19,446	3,103	0.014	6.27	463.00
56-72F3	Tree Fell	5	3,405	109,741	3,103	1.097	35.37	32.23
56-72F4	Tree - Broken Limb	5	465	42,724	2,617	0.178	16.33	91.88
56-72F4	Tree Fell	3	210	27,141	2,617	0.08	10.37	129.24
56-72F5	Tree - Broken Limb	4	230	38,753	3,289	0.07	11.78	168.49
56-72F5	Tree Fell	3	114	15,404	3,289	0.035	4.68	135.12
56-72F6	Tree - Broken Limb	1	22	2,024	2,261	0.01	0.90	92.00
56-85T1	Tree - Broken Limb	5	144	21,810	787	0.183	27.71	151.46
56-85T1	Tree Fell	7	905	62,996	787	1.15	80.05	69.61
56-85T3	Tree - Broken Limb	16	429	46,177	2,679	0.16	17.24	107.64
56-85T3	Tree Fell	10	3,231	335,268	2,679	1.206	125.15	103.77
56-86F1	Tree - Broken Limb	10	357	51,147	3,539	0.101	14.45	143.27
56-86F1	Tree Fell	17	4,778	812,457	3,539	1.35	229.57	170.04
56-87F1	Tree - Broken Limb	1	5	7,925	1,121	0.004	7.07	1,585.00
56-87F3	Tree - Broken Limb	1	55	5,335	1,162	0.047	4.59	97.00
56-87F3	Tree Fell	1	11	2,992	1,162	0.009	2.57	272.00

Feeder	Cause	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
56-87F5	Tree Fell	2	216	30,655	1,381	0.156	22.20	141.92
56-87F6	Tree - Broken Limb	1	6	918	730	0.008	1.26	153.00
56-87F6	Tree Fell	2	33	25,557	730	0.045	35.01	774.45
56-88F1	Tree - Broken Limb	13	812	87,024	2,128	0.382	40.89	107.17
56-88F1	Tree Fell	17	1,970	235,282	2,128	0.926	110.56	119.43
56-88F3	Tree - Broken Limb	15	253	45,639	2,259	0.112	20.20	180.39
56-88F3	Tree Fell	13	716	215,859	2,259	0.317	95.56	301.48
56-88F5	Tree - Broken Limb	11	229	20,286	2,218	0.103	9.15	88.59
56-88F5	Tree Fell	13	488	145,951	2,218	0.22	65.80	299.08
56-88F7	Tree - Broken Limb	5	51	4,682	2,172	0.023	2.16	91.80
56-88F7	Tree Fell	6	395	28,539	2,172	0.182	13.14	72.25

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4915
In Re: Electric Infrastructure, Safety, and Reliability Plan FY2020
Responses to the Commission's Second Set of Data Requests
Issued on February 8, 2019

PUC 2-14

Request:

Does the Company engage in any analysis of how to proportion spending between the EHTM and Cycle Pruning programs? If so, please provide that information.

Response:

No, the Company has not conducted this analysis.

PUC 2-15

Request:

Referencing Chart 12 on page 124, why did the Company propose to reduce the budget for Cycle Pruning and increase the budget for the EHTM program? Has the Company analyzed whether it would be more cost effective to shift more spending from the Cycle Pruning program to the EHTM program?

Response:

The Company reduced the budget for cycle pruning because there are less miles scheduled for pruning in fiscal year 2020 compared to fiscal year 2019. The Company increased the spend for EHTM because of the large number of trees throughout the state being killed by Gypsy Moth.

No, the Company has not analyzed whether it would be more cost effective to shift more spending from the cycle pruning program to the EHTM program. Cycle pruning is an industry standard and a utility best practice. The cycle pruning budget is calculated using the total number of miles scheduled for pruning and the estimated cost per mile to complete all necessary work and remain on cycle. Any shift in spending from cycle pruning to EHTM would result in the Company not being able to complete a full cycle.