Joseph J. Syta
Vice President – Controller & Treasurer

March 15, 2021

Honorable Michelle L. Phillips, Secretary
New York State Public Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

Re: Case 19-E-0378 – Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of New York State Electric & Gas Corporation for Electric Service

Case 19-G-0379 – Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of New York State Electric & Gas Corporation for Gas Service

Case 19-E-0380 – Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of Rochester Gas and Electric Corporation for Electric Service

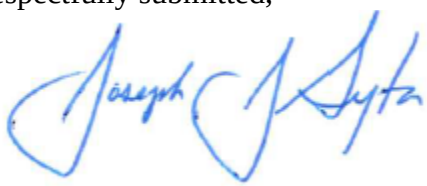
Case 19-G-0381 – Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of Rochester Gas and Electric Corporation for Gas Service

Dear Secretary Phillips:

Pursuant to Page 56 of the Joint Proposal approved by the New York State Public Service Commission's Order Approving Electric and Gas Rate Plans in Accord with Joint Proposal, with Modifications, issued and effective November 19, 2020, in the above-referenced proceedings, New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation hereby submit the attached Capital Investment Plan Annual Variance Report for calendar year 2020.

If you have any questions, please do not hesitate to contact me.

Respectfully submitted,



Joseph J. Syta

Attachment

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NYSEG and RG&E Capital Investment Plan Annual Variance Report 2020

March 15, 2021

Submitted to:
New York State Public Service Commission
Cases 19-E-0378, 19-G-0379,
19-E-0380, 19-G-0381

Submitted by: *NYSEG and RG&E*

Table of Contents

Executive Summary

New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") submit this Capital Investment Plan Status Report (CIP Report) for the calendar year ending December 31, 2020. Pursuant to Section XXVIII(B) of the Joint Proposal approved in the Commission's Order Approving Electric and Gas Rate Plans in Accord with Joint Proposal with Modifications (Order), issued November 19, 2019 in 19-E-0378, 19-G-0379, 19-E-0380, 19-G-0381, the Companies are required to file with the Secretary of the Commission, with a copy provided to Staff, documentation providing the variance between the actual and forecasted capital expenditures, including capital project changes for each identified project that experiences a plus or minus 10% cost variation and/or a six month change in its schedule. This report provides variance analyses on electric projects greater than $1.0M and gas and common projects greater than $500K. Additionally, the report contains narratives for each of these projects discussing project design, permitting and/or construction status, including a construction schedule for each project. Any new projects or programs are also discussed in this report. Additionally, an explanation of any project that has been removed or revised from those projects listed in Appendix R of the Joint Proposal is to be provided. This report is due on March 15 of each year for the prior year's information.

Total 2020 NYSEG capital spending for 2020 was $697 million, which was $174 million over the Joint Proposal Appendix R capital amount. Total 2020 RG&E capital spending through for 2020 was $388 million, which was $14 million under the Appendix R capital amount. The investments by company and line of business are summarized in the Figure 1 below.

	$ in thousands - update Company/Line of Business	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	NYSEG Electric	$ 420,464	$ 120,272	$ 130,918	$ 151,960	$ 175,392	$ 578,542	$ 158,078
2	NYSEG Gas	102,156	12,232	22,765	48,617	34,763	118,376	16,220
3	Subtotal NYSEG	522,620	132,504	153,683	200,577	210,154	696,918	174,298
4							-	
5	RG&E Electric	344,000	63,313	72,782	78,789	105,981	320,865	(23,135)
6	RG&E Gas	58,661	8,836	16,646	17,707	24,244	67,433	8,772
7	Subtotal RG&E	402,661	72,149	89,428	96,495	130,226	388,298	(14,363)
8							-	
9	Total NY	$ 925,281	$ 204,653	$ 243,111	$ 297,072	$ 340,380	$ 1,085,216	$ 159,935

Figure 1 – 2020 NYSEG and RG&E Capital Investment
(includes allocation of Common costs)

I. Electric and Generations Capital Investment Highlights

The NYSEG and RG&E Electric and Generation Capital Investments are noted below. For additional information regarding these investment, please see the Quarterly Variance Report included in Appendix A of this report.

	A *$ in thousands*	B JP Appendix R 2020	C Actual Q1 2020	D Actual Q2 2020	E Actual Q3 2020	F Actual Q4 2020	G YTD Total	H Variance YTD
1	Asset Condition Replacement	$ 120,449	$ 40,780	$ 37,941	$ 34,880	$ 45,683	$ 159,284	$ 38,835
2	Efficiency	12,616	2,114	3,124	3,547	3,740	12,524	(92)
3	Group Initiatives	-	112	668	716	335	1,832	1,832
4	Growth/System Capacity	11,025	968	3,285	4,861	4,270	13,383	2,358
5	AMI	28,900	0	539	4,502	12,896	17,938	(10,962)
6	Mandatory	146,553	45,584	41,405	66,129	65,861	218,980	72,427
7	Reliability	40,361	15,934	19,157	14,167	16,174	65,432	25,071
8	Strategic	5,240	18	55	54	29	157	(5,083)
9	Total	$ 365,144	$ 105,511	$ 106,174	$ 128,857	$ 148,989	$ 489,530	$ 124,386

Figure 2 – 2020 NYSEG Electric and Generation Capital Investment
(does not include any allocation of common costs)

	A *$ in thousands*	B JP Appendix R 2020	C Actual Q1 2020	D Actual Q2 2020	E Actual Q3 2020	F Actual Q4 2020	G YTD Total	H Variance YTD
1	Asset Condition Replacement	$ 75,764	$ 11,702	$ 15,669	$ 20,519	$ 26,742	$ 74,633	$ (1,131)
2	Efficiency	3,418	515	754	604	1,786	3,660	242
3	Group Initiatives	1,500	273	386	754	1,030	2,442	942
4	Growth/System Capacity	125,891	35,047	28,830	25,495	28,331	117,703	(8,188)
5	AMI	12,948	0	434	2,325	6,953	9,713	(3,235)
6	Mandatory	28,208	7,591	6,785	8,128	12,037	34,540	6,332
7	Reliability	69,319	4,958	13,691	10,574	13,035	42,258	(27,061)
8	Strategic	2,256	20	25	26	127	198	(2,058)
9	Total	$ 319,304	$ 60,107	$ 66,574	$ 68,425	$ 90,040	$ 285,147	$ (32,099)

Figure 3 – 2020 RG&E Electric and Generation Capital Investment
(does not include any allocation of common costs)

Project narratives for NYSEG and RG&E Electric and Generation projects are included in Appendix B and Appendix C, respectively.

II. Gas Capital Investment Highlights

The NYSEG and RG&E Gas Capital Investments are noted below. For additional information regarding these investment, please see the Quarterly Variance Report included in Appendix A of this report.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 4,820	414	539	729	1,149	$ 2,831	$ (1,989)
2	Efficiency	5,800	277	1,859	2,034	1,603	5,772	(28)
3	Group Initiatives	-	-	-	-	-		
4	Growth/System Capacity	1,450	(1)	9	29	170	207	(1,243)
5	AMI	7,144	1	1	1	1	2	(7,142)
6	Mandatory	45,746	6,981	11,886	16,394	19,273	54,534	8,788
7	Reliability	23,631	930	2,386	23,747	6,074	33,137	9,506
8	Strategic	-	-	-	-	-	-	-
9	Total	$ 88,591	$ 8,601	$ 16,679	$ 42,935	$ 28,269	$ 96,484	$ 7,893

Figure 4 – 2020 NYSEG Gas Capital Investment
(does not include any allocation of common costs)

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 637	$ 143	$ 133	$ 85	$ 191	$ 553	$ (84)
2	Efficiency	-	-	-	-	-	-	-
3	Group Initiatives	-	-	-	-	-	-	-
4	Growth/System Capacity	-	283	888	235	285	1,692	1,692
5	AMI	5,336	-	-	-	-	-	(5,336)
6	Mandatory	32,584	4,922	9,506	9,385	13,171	36,985	4,401
7	Reliability	10,207	2,203	3,631	3,848	4,208	13,890	3,683
8	Strategic	-	-	-	-	-	-	-
9	Total	$ 48,764	$ 7,551	$ 14,159	$ 13,553	$ 17,856	$ 53,119	$ 4,355

Figure 5 – 2020 RG&E Gas Capital Investment
(does not include any allocation of common costs)

Project narratives for NYSEG and RG&E Gas projects are included in Appendix D and Appendix E, respectively.

III. Common Capital Investment Highlights

The NYSEG and RG&E Common Capital Investments are noted below. For additional information regarding these investment, please see the Quarterly Variance Report included in Appendix A of this report.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
	NYSEG							
1	Asset Condition Replacement	$ 30,661	$ 14,508	$ 18,605	$ 5,198	$ 9,042	$ 47,354	$ 16,693
2	Efficiency	13,285	492	1,972	1,543	5,414	9,420	(3,865)
3	Group Initiatives	350	0	44	23	74	142	(208)
4	Growth/System Capacity	-	-	-	-	-	-	-
5	AMI	-	61	99	38	1,165	1,362	1,362
6	Mandatory	18,204	2,799	6,184	5,159	8,118	22,260	4,056
7	Reliability	665	152	2,753	7,729	2,155	12,788	12,123
8	Strategic	5,547	380	1,173	9,096	6,929	17,578	12,031
9	NYSEG Total	$ 68,712	$ 18,392	$ 30,830	$ 28,785	$ 32,897	$ 110,904	$ 18,037

Figure 6 - 2020 NYSEG Common Capital Investment

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
	RG&E							
1	Asset Condition Replacement	$ 9,092	$ 2,733	$ 4,648	$ 1,060	$ 288	$ 8,729	$ (363)
2	Efficiency	7,857	296	1,424	1,428	11,243	14,392	6,535
3	Group Initiatives	344	(2)	23	22	38	81	(263)
4	Growth/System Capacity	-	-	-	-	-	-	-
5	AMI	-	48	63	30	651	793	793
6	Mandatory	10,266	1,439	1,065	3,682	5,845	12,031	1,765
7	Reliability	-	(4)	795	2,459	1,028	4,278	4,278
8	Strategic	7,036	(18)	676	5,835	3,235	9,729	2,693
9	RG&E Total	$ 34,595	$ 4,491	$ 8,695	$ 14,516	$ 22,330	$ 50,032	$ 15,437

Figure 7 – RG&E Common Capital Investment through Q4 2020

Project narratives for NYSEG and RG&E Common projects are included in Appendix F and Appendix G, respectively.

Introduction

New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") submit this Capital Investment Plan Status Report (CIP Report) for the calendar year 2020. Pursuant to Section XXVIII(B) of the Joint Proposal approved in the Commission's Order Approving Electric and Gas Rate Plans in Accord with Joint Proposal with Modifications (Order), issued November 19, 2019 in 19-E-0378, 19-G-0379, 19-E-0380, 19-G-0381, the Companies are required to annually file with the Secretary of the Commission, with a copy provided to Staff, documentation providing the variance between the actual and forecasted capital expenditures, including capital project changes for each identified project that experiences a plus or minus 10% cost variation and/or a six month change in its schedule. This report provides variance analysis on electric projects greater than $1.0M and gas and common projects greater than $500K. Additionally, the report contains narratives for each of these projects discussing project design, permitting and/or construction status, including a construction schedule for each project). Any new projects or programs are also discussed in this report. Additionally, an explanation of any project that has been removed or revised from those projects listed in Appendix R of the Joint Proposal Order is to be provided.

This report is consistent with the 2020 Q4 Quarterly Variance Report that was filed on January 29, 2021. That quarterly report provided an itemized list of projects that meets the requirements of the Joint Proposal outlined above. A copy of this quarterly report is included as Appendix A of this annual CIP Report. Included in Appendices B through G are project narratives that describe the general scope of work of each project shown in the Quarterly Report as well as portions of the projects that were completed in 2020 and those activities that are planned to occur in 2021.

The specific appendices associated with the Company and line of business are shown below.

- Appendix B –NYSEG Electric and Generation Project Narratives
- Appendix C –RG&E Electric and Generation Project Narratives
- Appendix D –NYSEG Gas Project Narratives
- Appendix E –RG&E Gas Project Narratives
- Appendix F –NYSEG Common Project Narratives
- Appendix G –RG&E Common Project Narratives

The number of the project in each appendix aligns with the line number shown in the Quarterly Report. For example, the below project is a NYSEG Electric project and is included in Appendix 1 of the Quarterly Report.

8 - Line 879 Rebuild - Ausable Town Line to Rainbow Falls

The "8" at the beginning of the above project title represents the Line Item 8 in Appendix 1 of the Quarterly report.

Appendix A

NYSEG and RG&E Capital Investment Plan
Quarterly Variance Report, Q4 2020

NYSEG and RG&E Capital Investment Plan Quarterly Variance Report Q4 2020

January 29, 2021

Submitted to:
New York State Public Service Commission
Cases 19-E-0378, 19-G-0379, 19-E-0380, 19-G-0381

Submitted by: NYSEG and RG&E

Executive Summary

New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") submit this Capital Investment Plan Status Report (CIP Report) for the quarter ending December 31, 2020. Pursuant to Section XXVIII(B) of the Joint Proposal approved in the Commission's Order Approving Electric and Gas Rate Plans in Accord with Joint Proposal with Modifications (Order), issued November 19, 2019 in 19-E-0378, 19-G-0379, 19-E-0380, 19-G-0381, the Companies are required to file with the Secretary of the Commission, with a copy provided to Staff, documentation providing the variance between the actual and forecasted capital expenditures, including capital project changes for each such project that experiences a plus or minus 10% cost variation. The report is due on the last day of the month following the calendar quarter.

Total 2020 NYSEG capital spending through December 31, 2020 was $697 million, which was $174 million over the capital investment plan amount. Total 2020 RG&E capital spending through December 31, 2020 was $388 million, which was $14 million under the capital investment plan amount. The investments by company and line of business are summarized in the Figure 1 below.

	$ in thousands - update Company/Line of Business	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	NYSEG Electric	$ 420,464	$ 120,272	$ 130,918	$ 151,960	$ 175,392	$ 578,542	$ 158,078
2	NYSEG Gas	102,156	12,232	22,765	48,617	34,763	118,376	16,220
3	Subtotal NYSEG	522,620	132,504	153,683	200,577	210,154	696,918	174,298
4							-	
5	RG&E Electric	344,000	63,313	72,782	78,789	105,981	320,865	(23,135)
6	RG&E Gas	58,661	8,836	16,646	17,707	24,244	67,433	8,772
7	Subtotal RG&E	402,661	72,149	89,428	96,495	130,226	388,298	(14,363)
8							-	
9	Total NY	$ 925,281	$ 204,653	$ 243,111	$ 297,072	$ 340,380	$ 1,085,216	$ 159,935

Figure 1 - NYSEG and RG&E Capital Investment through Q4 2020
(includes allocation of Common costs)

I. Electric and Generation Capital Investment Plan Highlights

The NYSEG Electric and Generation Capital Investment, excluding the allocation of common costs, for 2020 was $490 million which was above the Joint Proposal (JP) spend of $365 million. After allocation of common investment, the NYSEG total electric investment is $579 million versus a planned spend of $420 million.

The NYSEG Electric and Generation 2020 Capital Investment by category, as outlined in the JP Appendix R, is shown in Figure 2 below. More detailed information by project is included in **Appendix 1** - NYSEG Electric and Generation Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 120,449	$ 40,780	$ 37,941	$ 34,880	$ 45,683	$ 159,284	$ 38,835
2	Efficiency	12,616	2,114	3,124	3,547	3,740	12,524	(92)
3	Group Initiatives	-	112	668	716	335	1,832	1,832
4	Growth/System Capacity	11,025	968	3,285	4,861	4,270	13,383	2,358
5	AMI	28,900	0	539	4,502	12,896	17,938	(10,962)
6	Mandatory	146,553	45,584	41,405	66,129	65,861	218,980	72,427
7	Reliability	40,361	15,934	19,157	14,167	16,174	65,432	25,071
8	Strategic	5,240	18	55	54	29	157	(5,083)
9	Total	$ 365,144	$ 105,511	$ 106,174	$ 128,857	$ 148,989	$ 489,530	$ 124,386

Figure 2 - NYSEG Electric and Generation Capital Investment through Q4 2020
(does not include any allocation of common costs)

The RGE Electric and Generation Capital Investment, excluding the allocation of common costs, for 2020 was $285 million which was under the planned spend of $319. After allocation of common costs, the RG&E total electric investment was $321 million versus a planned investment of $344 million.

The RG&E Electric and Generation 2020 Capital Investment for 2020 by category, as outlined in the JP Appendix R, is provided in Figure 3 below. More detailed information by project is included in **Appendix 2** - RG&E Electric and Generation Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 75,764	$ 11,702	$ 15,669	$ 20,519	$ 26,742	$ 74,633	$ (1,131)
2	Efficiency	3,418	515	754	604	1,786	3,660	242
3	Group Initiatives	1,500	273	386	754	1,030	2,442	942
4	Growth/System Capacity	125,891	35,047	28,830	25,495	28,331	117,703	(8,188)
5	AMI	12,948	0	434	2,325	6,953	9,713	(3,235)
6	Mandatory	28,208	7,591	6,785	8,128	12,037	34,540	6,332
7	Reliability	69,319	4,958	13,691	10,574	13,035	42,258	(27,061)
8	Strategic	2,256	20	25	26	127	198	(2,058)
9	Total	$ 319,304	$ 60,107	$ 66,574	$ 68,425	$ 90,040	$ 285,147	$ (32,099)

Figure 3 - RG&E Electric and Generation Capital Investment through Q4 2020
(does not include any allocation of common costs)

II. Gas Capital Investment Plan Highlights

The NYSEG Gas Capital Investment excluding the allocation of common costs, for 2020 was $96 million which was over the JP spending of $89 million. After allocation of common investment, the NYSEG total gas investment was $118 million versus a planned spend of $102 million.

The NYSEG Gas Capital 2020 Investment by category, as outlined in the JP Appendix R, is outlined in Figure 4 below. More detailed information by project is included in **Appendix 3** - NYSEG Gas Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 4,820	414	539	729	1,149	$ 2,831	$ (1,989)
2	Efficiency	5,800	277	1,859	2,034	1,603	5,772	(28)
3	Group Initiatives	-	-	-	-	-		
4	Growth/System Capacity	1,450	(1)	9	29	170	207	(1,243)
5	AMI	7,144	1	1	1	1	2	(7,142)
6	Mandatory	45,746	6,981	11,886	16,394	19,273	54,534	8,788
7	Reliability	23,631	930	2,386	23,747	6,074	33,137	9,506
8	Strategic	-	-	-	-	-	-	-
9	Total	$ 88,591	$ 8,601	$ 16,679	$ 42,935	$ 28,269	$ 96,484	$ 7,893

Figure 4 - NYSEG Gas Capital Investment through Q4 2020
(does not include any allocation of common costs)

The RG&E Gas Capital Investment excluding the allocation of common costs, for 2020 was $53 million which was over the JP spending of $49 million. After allocation of common investment, the RG&E total gas investment was $67 million versus a planned spend of $59 million.

The RG&E Gas Capital 2020 Investment by category, as outlined in the JP Appendix R, is outlined in Figure 5 below. More detailed information by project is included in **Appendix 4** - RG&E Gas Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
1	Asset Condition Replacement	$ 637	$ 143	$ 133	$ 85	$ 191	$ 553	$ (84)
2	Efficiency	-	-	-	-	-	-	-
3	Group Initiatives	-	-	-	-	-	-	-
4	Growth/System Capacity	-	283	888	235	285	1,692	1,692
5	AMI	5,336	-	-	-	-	-	(5,336)
6	Mandatory	32,584	4,922	9,506	9,385	13,171	36,985	4,401
7	Reliability	10,207	2,203	3,631	3,848	4,208	13,890	3,683
8	Strategic	-	-	-	-	-	-	-
9	Total	$ 48,764	$ 7,551	$ 14,159	$ 13,553	$ 17,856	$ 53,119	$ 4,355

Figure 5 - RG&E Gas Capital Investment through Q4 2020
(does not include any allocation of common costs)

III. Common Capital Investment Plan

The costs included as Common classification for projects and programs are applicable to both the electric and gas businesses. Examples of the type of projects included within this classification are Facilities, Fleet, Information Technology and Security. These costs are allocated based on company and line of business as outlined in the JP. The agreed upon allocation factors established for each company and associated line of business are:

NYSEG Electric	80.26%
NYSEG Gas	19.74%
Total	100.00%

RGE Electric	71.39%
RG&E Gas	28.61%
Total	100.00%

No listing of projects is included in Appendix R for the Common classification. Consistent with other Appendix R projects, the Companies have provided capital spending categories to match those included for the electric and gas lines of business.

The NYSEG Common Capital 2020 Investment by category, as outlined in the JP Appendix R, is outlined in Figure 6 below. NYSEG Common capital investment during 2020 was $111 million versus the JP amount of $69 million. More detailed information by project is included in **Appendix 5** - NYSEG Common Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
	NYSEG							
1	Asset Condition Replacement	$ 30,661	$ 14,508	$ 18,605	$ 5,198	$ 9,042	$ 47,354	$ 16,693
2	Efficiency	13,285	492	1,972	1,543	5,414	9,420	(3,865)
3	Group Initiatives	350	0	44	23	74	142	(208)
4	Growth/System Capacity	-	-	-	-	-	-	-
5	AMI	-	61	99	38	1,165	1,362	1,362
6	Mandatory	18,204	2,799	6,184	5,159	8,118	22,260	4,056
7	Reliability	665	152	2,753	7,729	2,155	12,788	12,123
8	Strategic	5,547	380	1,173	9,096	6,929	17,578	12,031
9	NYSEG Total	$ 68,712	$ 18,392	$ 30,830	$ 28,785	$ 32,897	$ 110,904	$ 18,037

Figure 6 - NYSEG Common Capital Investment through Q4 2020

The RG&E Common Capital 2020 Investment by category, as outlined in the Joint Proposal (JP) Appendix R, is outlined in Figure 7 below. RG&E Common capital

investment during 2020 was $50 million versus the JP amount of $35 million. More detailed information by project is included in **Appendix 6** – RG&E Common Budget Variance Detail.

	A	B	C	D	E	F	G	H
	$ in thousands	JP Appendix R 2020	Actual Q1 2020	Actual Q2 2020	Actual Q3 2020	Actual Q4 2020	YTD Total	Variance YTD
	RG&E							
1	Asset Condition Replacement	$ 9,092	$ 2,733	$ 4,648	$ 1,060	$ 288	$ 8,729	$ (363)
2	Efficiency	7,857	296	1,424	1,428	11,243	14,392	6,535
3	Group Initiatives	344	(2)	23	22	38	81	(263)
4	Growth/System Capacity	-	-	-	-	-	-	-
5	AMI	-	48	63	30	651	793	793
6	Mandatory	10,266	1,439	1,065	3,682	5,845	12,031	1,765
7	Reliability	-	(4)	795	2,459	1,028	4,278	4,278
8	Strategic	7,036	(18)	676	5,835	3,235	9,729	2,693
9	RG&E Total	$ 34,595	$ 4,491	$ 8,695	$ 14,516	$ 22,330	$ 50,032	$ 15,437

Figure 7 – RG&E Common Capital Investment through Q4 2020

IV. Appendices

Appendix 1 - NYSEG Electric and Generation Budget Variance Detail

Appendix 2 - RG&E Electric and Generation Budget Variance Detail

Appendix 3 - NYSEG Gas Budget Variance Detail

Appendix 4 - RG&E Gas Budget Variance Detail

Appendix 5 - NYSEG Common Budget Variance Detail

Appendix 6 – RG&E Common Budget Variance Detail

Appendix 1 - NYSEG Electric and Generation Budget Variance Detail

NYSEG Electric and Generation December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**ELECTRIC: Asset Condition Replacement**					
2	Substation Modernization	5,000	34	(4,966)	-99%	Engineering is refining the scope and evaluating alternative solutions for five project sites related to Substation Modernization
3	Distribution Line	21,469	43,969	22,500	105%	Make Ready work carried forward from prior years and higher emergency repairs/motor vehicle accidents compared to prior years resulted in higher costs than planned
4	Substation Circuit Breaker Replacement Program	17,316	19,641	2,326	13%	Higher than anticipated number of breakers failed testing resulting in a higher number of breakers being utilized.
5	Transmission Line	15,914	14,372	(1,541)	-10%	Slightly reduced opportunity to perform work on transmission lines due to lower availability of outages
6	Betterments	10,115	12,633	2,518	25%	Increased spend to improve the reliability of the network
7	Line 968 - 115 kV	1,400	234	(1,166)	-83%	Team is defining the scope and evaluating alternative solutions for this project
8	Line 879 Rebuild - Ausable Town Line to Rainbow Falls	7,127	24,390	17,263	242%	Permit delays moved the project execution and spend from 2018-2019 to 2019-2020. Project was placed in service in December 2020.
9	NYSEG - Subst Minor Capital	7,147	11,630	4,482	63%	Additional reliability-centered investments needed due to equipment condition
10	NYSEG Mobile #2 Replacement	3,141	617	(2,524)	-80%	The project has been delayed to 2021 due to changes in design requirements
11	NYSEG Mobile #4 Replacement	3,141	622	(2,519)	-80%	The project has been delayed to 2021 due to changes in design requirements
12	Line 880 Rebuild	6,948	421	(6,527)	-94%	Project originally forecasted to begin in late 2019 and end in early 2022, however due to contract negotiation and permitting delays the project is expected to start in Q1 2021.
13	Line 810 Brewster - 46 kV	687	-	(687)	-100%	Project cancelled due to reassessment of line resulting in lower underlying risk.
14	Line 810 Rebuild - East Norwich to Oxford	1,069	3,450	2,381	223%	Project originally forecasted to begin in mid 2019 and end in early 2020, however due to permitting delays the project started in Q4 2019 and much of the costs were incurred in 2020.
15	Line 885 Rebuild	1,913	2,669	756	39%	Project originally forecasted to begin in late 2019 and end in early 2020, however due to permitting delays the project started Q3 2020 and most of the costs were incurred in 2020.
16	Line 803 - Kent to Tilly Foster	1,158	2,497	1,338	116%	Project originally forecasted to begin in late 2019 and end in early 2020, however due to permitting delays the project started in 2020 and expected to be completed in 2021.
17	Seneca Lake L595 Submarine Cable Rebuild	3,125	2,012	(1,113)	-36%	The project was accelerated in 2019 which reduced capital spend in 2020. Project completed in 2020.
18	Line 962 - 115kV Rebuild	-	1,406	1,406	N/A	This project has been prioritized due to condition of the existing line and associated infrastructure
19	Circuit 590 Rebuild	-	4,548	4,548	N/A	Materials with long lead time procured earlier than planned to prepare for construction in 2021-2022.
20	NYSEG - Heritage Hills Upgrade	-	3,822	3,822	N/A	The cable at the Heritage Hills development as experienced cable failures. This project will replace the conductor and improve reliability in this development.
	Homer City Capital Breakers	6,257	-	(6,257)	-100%	First Energy is responsible for planning and executing work at Homer City and NYSEG pays for a portion of the work. No work was executed by First Energy resulting in no capital spend.
21						
22	Mill C Intake Trash Rack & Rack Raker Project	3,498	3,438	(60)	-2%	
23	All Other	4,024	6,829	2,805	70%	Includes projects and programs less than $1M
24	Total Asset Condition Replacement	120,450	159,284	38,834	32%	
25	**ELECTRIC: Efficiency & Group Initiatives**					
26	NYSEG - Substation Automation Program	10,916	12,376	1,460	13%	Acceleration of the NYSEG Automation program to improve reliability.
27	All Other	1,700	1,980	280	16%	Includes projects and programs less than $1M
28	Total Efficiency & Group Initiatives	12,616	14,356	1,740	14%	
29	**ELECTRIC: Growth/System Capacity**					
30	Dingle Ridge - 2nd Bank and 13.2kV Conversion	3,501	1,095	(2,405)	-69%	Permitting and contract negotiations delayed the start of the in-ground and above-ground construction which resulted in lower capital spend in 2020 than originally planned.
31	Sloan - Add a Second Transformer Bank and Fourth Circuit Position	-	-	-	N/A	
32	Hilldale - 115 kV Source, Transformer Bank Upgrade and Second 12 kV Distribution Circ	787	-	(787)	-100%	This project is being studied for a non-wire alternative solution.
34	Java NWA - Microgrid	1,000	752	(248)	-25%	Timing of final rate case approval resulted in project and capital spend delays
35	Sackett Lake Substation Rebuild	4,813	10,599	5,787	120%	The start of construction was delayed from 2019 to 2020 due to later than planned execution of the construction contracts. Also, additional scope related to a 3- mile fiber optic line between Sackett Lake SS and Coopers Corners SS was added to the project.
36	All Other	924	936	12	1%	Includes projects and programs less than $1M
37	Total Growth/System Capacity	11,024	13,383	2,359	21%	

NYSEG Electric and Generation December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
38	**ELECTRIC: Mandatory**					
39	NYSEG BES Program - FERC Compliance	52,132	55,382	3,249	6%	
40	NERC Alert Priority III - NYSEG	9,108	18,713	9,606	105%	Project acceleration from 2021 to 2020 as well as earlier than planned procurement of materials for 2021 work resulted in higher capital spend in 2020.
41	Non-AMI DSIP Grid Automation	31,551	32,556	1,005	3%	
42	Energy Smart Community	-	1,025	1,025	N/A	Capital spend for evaluating customer facing applications for future extension to the larger Smart Grid system.
43	Distribution Line Inspection	12,731	28,106	15,375	121%	Higher capital spend in 2020 to address past inspection findings that will lead to improved network reliability.
44	New Gardenville Rebuild	735	862	127	17%	Increased capital spend associated with additional engineering efforts to review solution alternatives and define final project scope.
45	NY Battery Storage	-	3,026	3,026	N/A	Project delayed from 2019 to 2020 due to additional time spent obtaining necessary approvals from multiple municipalities and customers.
46	NYSEG Electric Meters - Program	900	2,842	1,942	216%	The original 2020 amounts for analog meter purchases assumed that AMI meters (included in the AMI project line item) would have been installed earlier than now planned. Due to the updated plan/schedule for AMI meter installation, additional analog meters were required resulting in increased capital spend in 2020.
47	Major Government Highway	4,081	3,416	(665)	-16%	Fewer highway projects were requested by municipalities during 2020 than planned.
48	North Brewster Reinforcement (formerly Silo Ridge Field Club)	3,337	787	(2,550)	-76%	Permit and construction contract execution delays have moved the anticipated start of construction from mid-2020 to 2021.
49	Residential Line Extensions	8,430	11,211	2,781	33%	Higher than anticipated new customer service requests
50	Service Connects	5,357	8,829	3,471	65%	Demand for Service Connections were higher than historical average in 2020.
51	Industrial Commercial	5,495	8,466	2,971	54%	Higher than expected customer requests in 2020.
52	Storm Restoration	581	8,972	8,391	1444%	Significant storm activity in the NYSEG territory during 2020, twelve major storms have occurred.
53	College Ave Underground Project	-	1,195	1,195	N/A	New project in the City of Ithaca to move overhead lines to underground lines along College Avenue. Project construction started in mid-2020 and will continue through 2022.
54	NYSEG - Make Ready	-	19,331	19,331	N/A	This program was developed in response to the demand created by communication companies to install facilities on NYSEG assets related to the NY State Broadband Initiative. Due to the significant number of replacements required creation of an individual program to capture these costs apart from the Distribution Line Program.
55	Street Lighting	6,306	11,078	4,773	76%	Significant demand and response for LED Streetlight conversion by municipalities has increased the capital spend on this program in 2020.
56	Non AMI DSIP Enterprise Analytics	1,220	-	(1,220)	-100%	Included in Common: Mandatory
57	All Other	4,590	3,182	(1,408)	-31%	Includes projects and programs less than $1M
58	Total Mandatory	146,553	218,980	72,426	49%	
59	**ELECTRIC: AMI**					
60	AMI	28,900	17,938	(10,962)	-38%	AMI project schedule delayed as part of final rate case outcome, which has resulted in lower capital expenditures for 2020. Project costs are expected to be incurred in 2021-2025.
61	Total AMI	28,900	17,938	(10,962)	-38%	
62	**ELECTRIC: Reliability Risk**					
63	NYSEG - Resiliency Plan	19,895	22,788	2,893	15%	Certain portions of the work were accelerated to improve system reliability and safety. The projects are being completed in phases and will continue into 2021 and later years.
64	Coopers Corners, Add 3rd 345/115kV Trfmr	5,395	15	(5,380)	-100%	The scope of this project was combined into the BES program (line 39 under Electric: Mandatory).
65	CCTP - Columbia County - Valkin 115kv Line	-	8,346	8,346	N/A	Reduced opportunity to perform work on the National Grid System in 2019 due to lower availability of outages. Project completion moved from 2019 to 2020.
67	Flat Street - Bank 2 New Transformer	-	2,254	2,254	N/A	The project was substantially energized in 2019. Additional work related to communications and protective relaying at the Flat St substation remote ends (Eelpout substation and Greenridge substation) were completed in 2020.
68	Wood Street, Add 3rd 345/115 kV Trfmr	1,250	3,401	2,151	172%	The engineering work and material procurements were accelerated from 2021 to 2020.
69	Willet - Install New Transformer	1,932	17,019	15,087	781%	The project capital spend in 2019 was reduced due to a delay in the finalization of the construction contract which moved work and the associated costs to 2020. Additionally, a higher than anticipated amount of rock was encountered that has increased the distribution and transmission line construction costs. The project will be completed in 2021.
70	Carmel New 2nd 115/46 kV Transformer	1,249	-	(1,249)	-100%	This project has been identified as a strong candidate for a non-wires alternative solution. A full study of a non-wires alternative is being performed.
71	Roll Road New 2nd 115/34.5kV Transformer	950	-	(950)	-100%	The project is under engineering review.
72	Lyon Mountain New 2nd 115/34.5kV Transformer	908	-	(908)	-100%	Project cancelled due to updated analysis that shows no adverse transformer loading or voltage issues.
73	Watercure Rd. - 2nd 345 kV Transformer	2,285	4,760	2,475	108%	Construction efforts on second transformer extended into 2020.
74	Kent Falls - Capital Project (Penstock, Ring, Tailrace)	5,186	1,641	(3,545)	-68%	Delays in the start of construction in 2019 due to availability of qualified contractors to fabricate and install the new ring girders, trifurcation and penstock sections. Construction has moved to 2021.
75	NYSEG - Animal Gaurds CAP	-	3,126	3,126	N/A	Newly created program to address reliability issues aimed at minimizing damage caused by animals at substations.
76	All Other	1,309	2,081	772	59%	Includes projects and programs less than $1M
77	Total Reliability Risk	40,361	65,432	25,072	62%	
78	**ELECTRIC: Strategic**					
79	Electric Vehicles NYSEG	4,717	-	(4,717)	-100%	Delays in the program launch date from 2020 to 2021 to accommodate rate case timing.
80	All Other	523	157	(367)	-70%	Includes projects and programs less than $1M
81	Total Strategic	5,240	157	(5,083)	-97%	
82						
83	**TOTAL - ELECTRIC**	365,144	489,530	124,386	34%	

Appendix 2 - RG&E Electric and Generation Budget Variance Detail

RGE Electric and Generation December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**ELECTRIC: Asset Condition Replacement**					
2	Station 43 Modernization Project	9,139	2,799	(6,340)	-69%	The project has been delayed due to changes in design requirements.
3	Station 38 - Total Refurbishment (Modernization)	3,723	2,179	(1,544)	-41%	Portions of the project have been delayed to 2021 due to outage constraints on the 11kV lines.
4	Station 5 - Modernization Project	7,868	4,094	(3,774)	-48%	The scope of work is being reevaluated.
5	ST 418 Upgrades	2,595	10,945	8,350	322%	Project was accelerated to 2020.
6	Station 127 - 115 kV System Upgrade	6,694	5,919	(775)	-12%	Construction started later than planned due to final project scope refinement.
7	Distribution Line Inspection - RGE	2,652	2,111	(541)	-20%	Reallocation of resources to support storm restoration. Moved work from 2020 to 2021.
8	Transmission Line	991	1,034	43	4%	
9	Distribution Line	8,710	17,940	9,230	106%	Demand created by communication companies to install facilities on RG&E assets related to the NY State Broadband Initiative required an increase in spend in 2020.
10	Betterments	4,153	2,003	(2,150)	-52%	Reallocation of resources to support Government Highway projects resulted in reduced capital spend in 2020.
11	Substation Circuit Breaker Replacement Program	3,974	1,738	(2,236)	-56%	Limited availability of qualified contractors reduced the number of breaker replacements.
12	Substations	885	1,592	708	80%	Identified additional 345 kV relay replacement at ST 80 and ST 122 to replace end of life electromechanical relays.
13	RG&E Station 26 - Draft Tube Stop Gates Project	50	1,463	1,413	2825%	Project construction moved from 2019 to 2020 due to high river flow conditions resulting in increased capital spend in 2020.
14	Station 210 - Transformer Replacement and Modernization	-	2,248	2,248	N/A	Project added to address substation equipment that is at end of life and/or obsolete. Project aims to reduced potential customer outage frequency and duration.
15	Station 82 Upgrades	15,899	224	(15,675)	-99%	Project delayed to further review and refine project scope.
16	UG Cable Injection	2,625	2,373	(252)	-10%	Certain portions of this project have been delayed due to outage availability on circuits.
17	Line 785 Rebuild	-	1,515	1,515	N/A	This project was added to address the condition of poles and to increase reliability and resiliency of this line.
18	Line 753 Rebuild	-	3,122	3,122	N/A	Project added to address poor conditions of structures and conductors.
19	Station 208 - Modernization Project	-	2,668	2,668	N/A	Substation equipment is antiquated and has limited automation capabilities. Project will replace the existing substation and install automation to reduce potential frequency and duration of outages.
20	Circuit 794 Rebuild	-	4,194	4,194	N/A	Project was added due to asset condition concerns. Replacement of this circuit aims to improve resiliency and reliability measures.
21	All Other	5,806	4,218	(1,588)	-27%	Includes projects and programs less than $1M
22	Total Asset Condition Replacement	75,763	74,633	(1,131)	-1%	
23	**ELECTRIC: Efficiency**					
24	Pilot Wire Replacement Project	3,418	3,583	165	5%	
25	All Other	-	77	77	N/A	Includes projects and programs less than $1M
26	Total Efficiency	3,418	3,660	242	7%	
27	**ELECTRIC: Group Initiatives**					
28	Fossil Hydro Operations Minor projects	1,500	1,423	(77)	-5%	
29	All Other	-	1,019	1,019	N/A	Includes projects and programs less than $1M
30	Total Group Initiatives	1,500	2,442	942	63%	
31	**ELECTRIC: Growth/System Capacity**					
32	Station 23 - New 115kV Downtown Station	-	4,571	4,571	N/A	The project was extended into 2020 due to multiple outage constraints at Stations 42, 33, 26 and 23.
33	RARP	104,378	106,251	1,873	2%	
34	Station 156 transformer/facilities upgrade	4,140	1,652	(2,488)	-60%	The project has been delayed due to changes in design requirements.
35	Station 46 - Replace #1 and #3 Transformer Banks	3,428	2,054	(1,374)	-40%	Additional detail design required to reflect added scope related to 11kV system.
36	Station 192 Upgrades	2,148	525	(1,623)	-76%	Procurement of long lead time materials now expected in 2021 resulting in lower capital spend in 2020.
37	Station 117 - Replace #1 Transformer Bank and convert 3 circuits to 12kV operation.	5,450	797	(4,653)	-85%	Procurement of long lead time materials now expected in 2021 resulting in lower capital spend in 2020.
38	Station 2 Modernization (Penstock, Intake, Reg Mndates, New Unit)	6,348	1,173	(5,174)	-82%	The scope of work is being reevaluated.
39	All Other	-	679	679	N/A	Includes projects and programs less than $1M
40	Total Growth/System Capacity	125,891	117,703	(8,188)	-7%	
41	**ELECTRIC: AMI**	12,948	9,713	(3,235)	-25%	AMI project schedule delayed as part of final rate case outcome, which has resulted in lower capital expenditures for 2020. Project costs are expected to be incurred in 2021-2025.
42	Total AMI	12,948	9,713	(3,235)	-25%	

RGE Electric and Generation December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
43	**ELECTRIC: Mandatory**					
44	RGE BES Program - FERC Compliance	12,210	7,596	(4,614)	-38%	Change of scope at Station 48 reducing procurement of long lead items, Line 949 determined to require an Article VII filing that delayed material procurement.
45	NERC Alert Priority III - RGE	1,000	8,476	7,476	748%	Project accelerated construction to 2020 given availability of qualified contractors. Large portions of the project were completed in 2020 and overall project life will be reduced.
46	Industrial Commercial	3,433	2,393	(1,039)	-30%	Lower customer demand than anticipated in 2020
47	Residential Service Installation	3,508	2,261	(1,248)	-36%	Fewer residential customer requested line extensions in 2020
48	Service Connects	2,268	2,997	729	32%	Service connections have increased relative to previous years
49	Government Highway - RG&E	1,373	4,138	968	71%	Higher than anticipated demand for facility relocation projects from municipalities.
50	RGE - Rochester Mt Hope Phase 2	-	1,050	1,050	N/A	Project requesting electric facility relocation by NYDOT associated with a road improvement project.
51	Non-AMI DSIP Grid Automation	-	1,220	1,220	N/A	Delays in construction during 2018 and 2019 required work to continue in 2020.
52	Non AMI DSIP ADMS	1,490	-	(1,490)	-100%	Project delayed until 2022.
53	All Other	2,925	16,199	13,274	454%	Includes projects and programs less than $1M
54	Total Mandatory	28,208	34,540	6,333	22%	
55	**ELECTRIC: Reliability Risk**					
56	Resiliency Plan	6,670	7,629	959	14%	Certain portions of the work were accelerated to improve system reliability and safety. The projects are being completed in phases and will continue into 2021 and later years.
57	Station 49 - Transformer and switchgear replacement	5,179	4,463	(716)	-14%	Portions of work planned for 2020 were delayed due to outage constraints. Project is planned to be completed in 2021.
58	Station 168 - Service area reinforcements	9,479	2,544	(6,936)	-73%	The project has been delayed due to increased scope and changes in design requirements.
59	Cable Replacement C759-740	11,335	16,147	4,812	42%	Construction costs higher than anticipated due to higher than expected rock excavation required.
60	Station 262 - New 115/34.5 kV Station	-	9,546	9,546	N/A	Construction costs were higher than originally estimated. Additionally, portions of construction moved from 2019 to 2020 due to outage constraints. Project was completed in 2020.
61	All Other	36,655	1,930	(34,725)	-95%	Includes projects and programs less than $1M
62	Total Reliability Risk	69,319	42,258	(25,277)	-36%	
63	**ELECTRIC: Strategic**					
64	Electric Vehicles RGE	2,156	-	(2,156)	-100%	Delays in the program launch date from 2020 to 2021 to accommodate rate case timing.
65	All Other	99	198	98	99%	Includes projects and programs less than $1M
67	Total Strategic	2,256	198	(2,055)	-91%	
68						
69	**TOTAL - ELECTRIC**	319,302	285,147	(34,155)	-11%	

Appendix 3 - NYSEG Gas Budget Variance Detail

NYSEG Gas December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**GAS: Asset Condition Replacement**					
2	Hornby Station Rebuild	3,000	332	(2,668)	-89%	Project moved to future years due to project reprioritization resulting in lower capital spend in 2020.
3	Post Creek, Gas Main Replacements	500	-	(500)	-100%	This project has been completed and reimbursed by the transmission supplier resulting in no cost to NYSEG gas customers.
4	Chambers Road Gas Main Replacements	500	-	(500)	-100%	This project has been completed and reimbursed by the transmission supplier resulting in no cost to NYSEG gas customers.
8	Slaterville Rd	-	14	14	N/A	
9	All Other	820	477	(343)	-42%	Includes projects and programs less than $500K
10	Total Asset Condition Replacement	4,820	2,831	(1,990)	-41%	
11	**GAS: Efficiency & Group Initiatives**					
12	Gas RTU/Telemetry Upgrade and Zeck 9000 Odorizer Upgrades	5,800	4,972	(828)	-14%	Portions of the project were moved to future years due to project reprioritization.
13	Common Gas SCADA Platform	-	792	792	N/A	Delays in 2019 contract execution resulted in the construction starting in 2020. Project is expected to be completed in 2021.
14	Gas SCADA Upgrade	-	-	-	N/A	
15	All Other		8	8	N/A	Includes projects and programs less than $500K
16	Total Efficiency & Group Initiatives	5,800	5,772	(28)	0%	
17	**GAS: Growth/System Capacity**					
18	Town of Maine, Franchise Expansion	1,450	-	(1,450)	-100%	Delays in obtaining necessary easements moved project start to 2021.
19	All Other	-	207	207	N/A	Includes projects and programs less than $500K
20	Total Growth/System Capacity	1,450	207	(1,243)	(1)	
21	**GAS: Mandatory**					
22	Leak Prone Services Replacement Program	4,514	5,426	912	20%	Higher than expected contractor bid costs.
23	Leak Prone Main Replacement Program	19,076	22,510	3,434	18%	Due to COVID-19 Restrictions limited access to customer residences to tie-in services.
24	West Genesee Street Leak Prone Main Replacement	1,400	2,271	871	62%	Construction costs were higher than planned due to difficult construction conditions and increased amounts of rock excavation.
25	NYSEG - Gas Regulators	317	348	32	10%	Customer demand for gas regulators and relief valves was slightly higher than expected.
26	NYSEG - Gas Meters	2,500	1,561	(939)	-38%	Due to COVID-19 restrictions and company policy, there has been limited entry into customers homes which resulted in decreased capital spend.
27	Incremental Customer Growth - Gas Related Projects	-	-	-	N/A	
28	Gas RTU/Telemetry Upgrades		-	-	N/A	
29	Gas Distribution Mains - Replacements	2,690	4,344	1,654	61%	Higher than expected number of ancillary main replacements and increased contractor costs.
30	Gas Distribution Mains - New Installations	3,380	2,500	(880)	-26%	Customer demand was less than expected.
31	Install New Gas Services	3,777	3,414	(363)	-10%	Demand was lower than expected for new services.
32	Minor Government Jobs, Replace Gas Mains	1,563	562	(1,001)	-64%	Decreased demand for required municipal work.
33	Lansing / Freeville - Distribution Piping	-	2	2	N/A	
34	Large Government Jobs	-	-	-	N/A	
35	Non-Leak Prone Services Replacement Program	5,881	2,618	(3,263)	-55%	Lower than expected required service replacements.
36	North Country Gas Franchise Expansion	-	74	74	N/A	
37	Critical Valve Installations, Binghamton	150	128	(22)	-15%	Some installations moved to 2021 due to material delays from vendor.
38	Goshen 17A, Gate Station to Sorrento	-	1,369	1,369	N/A	Project is part of the Leak Prone Main Replacement program as in listed here due to the project cost being greater than $500K.
39	East Auburn Sennett LPM	-	3,323	3,323	N/A	Project is part of the Leak Prone Main Replacement program as in listed here due to the project cost being greater than $500K.
40	Canandaigua Rt 21 LPM	-	1,495	1,495	N/A	Project is part of the Leak Prone Main Replacement program as in listed here due to the project cost being greater than $500K.
41	State RT 34 East Shore Dr. Main Ext		2,421	2,421	N/A	Project is part of the New Main Replacement Program was broken out due to the projects costs being greater than $500k.
42	All Other	500	168	(332)	-66%	Includes projects and programs less than $500K
43	Total Mandatory	45,746	54,534	8,788	19%	
44	**GAS: AMI**					
	AMI	7,144	2	(7,142)	-100%	AMI project schedule delayed as part of final rate case outcome, which has resulted in lower capital expenditures for 2020. Project costs are expected to be incurred in 2021-
45						2025.
46	Total AMI	7,144	2	(7,142)	-100%	
47	**GAS: Reliability Risk & Strategic**					
48	Gas Regulator Modernization & Automation Program	3,024	2,149	(876)	-29%	Portions of the program (Goshen City POD and Winney Hill RS) moved to future years.
49	Phelps (South) Transmission Replacement	132	1,237	1,105	837%	Restoration costs were incurred in 2020 that were previously expected to occur 2019.
50	DeRuyter Transmission Replacement	-	132	132	N/A	
51	Low Pressure Relief Valve Program	500	285	(215)	-43%	Later than anticipated start of the program resulted in lower capital spend for 2020.
52	Homer System Upgrade	910	1,913	1,003	110%	Construction delays in 2019 resulted in increased capital spend in 2020.
53	Vienna Rd-Macedon Feeder Main Replacement	19,000	25,545	6,545	34%	Higher than expected contractor bid costs.
54	Canandaigua -12" MP Steel	-	1,157	1,157	N/A	Tie line to maintain system pressures to serve customers
55	All Other	65	439	374	576%	Includes projects and programs less than $500K
56	Lansing Non-Pipes Alternative	-	279	279	N/A	This Non-Pipe Alternative project is evaluating potential solutions to replace the Lansing Freeville Gas Reinforcement project.
57	Total Reliability Risk & Strategic	23,631	33,137	9,506	40%	
58						
59	**TOTAL - GAS**	88,593	96,484	7,891	9%	

Appendix 4 - RG&E Gas Budget Variance Detail

RGE Gas December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**GAS: Asset Condition Replacement**					
2	Mendon Gate Station	182	-	(182)	-100%	Project moved to future years due to project reprioritization resulting in lower capital spend in 2020.
3	Caledonia Station Rebuild	182	15	(167)	-92%	Project moved to future years due to project reprioritization resulting in lower capital spend in 2020.
4	All Other	273	538	265	97%	Includes projects and programs less than $500K
5	Total Asset Condition Replacement	637	553	(84)	-13%	
6	**GAS: AMI**	5,336	-	(5,336)	-100%	AMI project schedule delayed as part of final rate case outcome, which has resulted in lower capital expenditures for 2020. Project costs are expected to be incurred in 2021-2025.
7	Total AMI	5,336	-	(5,336)	-100%	
8	**GAS: Reliability Risk & Strategic**					
9	CM-1 Transmission Gas Main Replacement	5,097	3,298	(1,799)	-35%	Capital spend moved to 2021-2022 due to construction delays.
10	CM-4 / CM-1 Relocation	-	1,198	1,198	N/A	Construction planned for 2019 deferred to 2020 due to restoring right-of-way, installing security measures and cutting old mains.
11	CM-1 Transmission Pipeline: Chili GS to Ballantyne Rd, Main Replacement	279	560	281	101%	After preliminary engineering, project is being reevaluated for priority and timing. Currently no plans to move forward with project.
12	Gas Regulator Modernization & Automation Program, Replace Regulator Station	2,820	4,663	1,843	65%	Additional scope and higher than expected contractor costs resulted in increased capital spend.
13	CM3D Transmission Pipeline - Rte 441 to Whitney Rd, Install Gas Main	1,500	50	(1,450)	-97%	Project is being reevaluated for priority and timing.
14	MF60 Southeast Phase 1 (Mendon Gate - Rte 64), Install Gas Main	-	57	57	N/A	
15	MF60 Southeast Phase 2 (Willis Hill Rd), Install Gas Main	35	658	623	1779%	Project accelerated to 2020 from future years to create efficiencies with highway related work.
16	MF60 Southeast Phase 3 (Malone Rd), Install Gas Main	-	104	104	N/A	
17	MF60 Southeast: Boughton Hill Rd, Install Gas Mains	-	-	-	N/A	
18	MF60 Southwest: Simmons Rd Reinforcement, Install Gas Mains	275	326	51	18%	Contractor costs higher than planned.
19	RG&E Transmission Short Segments, Install Gas Mains	200	-	(200)	-100%	Project moved to future years due to project reprioritization.
20	CM-1 Transmission Pipeline: Paul Rd to Buffalo Rd, Gas Main Replacement	-	-	-	N/A	
21	CM2 Robotic Inspections	-	638	638	N/A	Specialized robotic In-Line Inspection of pipeline for reliability purposes.
22	Burritt Road Main Replacement	-	1,284	1,284	N/A	Project is part of the Leak Prone Main Replacement program and is listed here due to the project cost being greater than $500K.
23	Common Gas SCADA Platform	-	999	999	N/A	Delays in 2019 contract execution resulted in the construction starting in 2020. Project is expected to be completed in 2021.
24	All Other	-	55	55	N/A	Includes projects and programs less than $500K
25	Total Reliability Risk & Strategic	10,206	13,890	3,684	36%	
26	**GAS: Efficiency & Group Initiatives**					
27	All Other	-	-	-	N/A	
28	Total Efficiency & Group Initiatives	-	-	-	N/A	
29	**GAS: Growth/System Capacity**					
30	Northeast 60, Phase 5 (State Road Corridor) Install Gas Mains	-	570	570	N/A	Contractor costs higher than planned.
31	All Other	-	1,447	1,447	N/A	Includes projects and programs less than $500K
32	Total Growth/System Capacity	-	1,692	1,692	N/A	
33	**GAS: Mandatory**					
34	RGE- Gas Meters	2,100	1,855	(245)	-12%	Due to COVID-19 restrictions and company policy, there has been limited entry into customers homes which resulted in decreased capital spend.
35	RG&E - Gas Regulators	50	66	16	32%	Higher demand for regulators and relief valves.
36	LPM - Cabot Line	500	-	(500)	-100%	Costs for this project are included in the Leak Prone Main Replacement program below.
37	Leak Prone Main Replacement Program	19,014	17,338	(1,676)	-9%	
38	Leak Prone Services Replacement Program	3,341	2,667	(674)	-20%	Due to COVID-19 restrictions and company policy, there has been limited entry into customers homes.
39	Gas Distribution Mains - New Installations	1,753	1,779	26	2%	
40	Gas Distribution Mains - Replacements	976	1,970	994	102%	Due to higher than expected number of ancillary main replacements related to Leak Prone Main projects and increased contractor costs.
41	Install New Gas Services	2,562	1,737	(825)	-32%	Lower than expected demand for new services.
42	Minor Government Jobs, Replace Gas Mains	640	1,279	639	100%	Increased demand for required municipal work.
43	Non-Leak Prone Services Replacement Program	1,648	1,545	(103)	-6%	
44	Waring Rd LPM	-	3,091	3,091	N/A	Project is part of the Leak Prone Main Replacement program and is listed here due to the project cost being greater than $500K.
45	Whalen Rd LPM	-	3,720	3,720	N/A	Project is part of the Leak Prone Main Replacement program and is listed here due to the project cost being greater than $500K.
46	All Other	-	20,292	20,292	N/A	Includes projects and programs less than $500K
47	Total Mandatory	32,584	36,985	4,400	14%	
48						
49	**TOTAL - GAS**	**48,763**	**53,119**	**4,356**	**9%**	

Appendix 5 - NYSEG Common Budget Variance Detail

NYSEG Common December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**COMMON: Asset Condition Replacement**					
	NYSEG - Fleet Purchase	14,057	29,210	15,153	108%	Additional spend to replace portions of fleet in poor condition and procure more vehicles to meet territory demand. Also includes the cost of outright purchase of light duty vehicles.
2						
	NYSEG - Fleet Light Duty Vehicle Leases	1,371	246	(1,125)	-82%	Change in strategy away from leasing light duty vehicles and purchasing them outright. Cost of light duty vehicles purchases is included in NYSEG - Fleet Purchases on line 2 of Common expenses.
3						
4	BP&SM Projects - NYSEG	500	623	123	25%	Brewster Repaving and Owego Operations building Upgrade projects costs were slightly higher than planned.
5	Telecomm NY WAN Expansion	8,436	8,469	33	0%	
6	IUSA-NetEng LC	532	405	(128)	-24%	Purchase of replacement network devices and equipment supporting the Corporate network was less than expected.
7	Laptop LC	367	1,269	902	246%	The additional demand is related to shifting of individuals to remote work during 2020.
8	Unix LC	915	827	(88)	-10%	Replacement of aging server equipment was less than expected.
9	Storage LC	653	807	154	24%	Additional need for storage device replacement higher than planned.
	NYSEG Perry - Post Fire Upgrades	-	1,017	1,017	N/A	
10						Unplanned project resulting from a fire at the Perry service center. Repair of the facility has taken place over the last two years, and was substantially completed in 2020.
11	All Other	3,830	4,480	651	17%	Includes projects and programs less than $500K
12	Total Asset Condition Replacement	30,661	47,354	16,693	54%	
13	**COMMON: Efficiency**					
14	Facilities Projects - NYSEG	1,415	2,620	1,205	85%	Additional minor upgrade projects were identified during the year. Work included replacement of heat pumps, lighting replacements, and paving upgrades.
15	BMS System	600	75	(525)	-87%	Development of technical requirements and bid process has taken longer than planned due to site access restrictions.
16	Workload Management	930	1,177	247	27%	Higher than planned complexity and quantity of development work increased capital spend in 2020.
17	Enterprise GIS Upgrade	-	974	974	N/A	This project was previously included under the All Other category and is being broken out as a project with >$500K planned/spent. This project will upgrade the existing Global Information System (GIS) and will provide additional functionality to the GIS.
18	Metering and Mobility IT Systems Upgrade	-	2,257	2,257	N/A	This project was previously included under the All Other category and is being broken out as a project with >$500K planned/spent. Capital spend required to enable continued support and use of the Metering and Mobility systems, mitigate obsolescence risk and negative impact on business processes.
19	Damage Prediction Modeling Analytics	-	1,005	1,005	N/A	This project was previously included under the All Other category and is being broken out as a project with >$500K planned/spent. The system will aid in predicting storm damage and help to plan resources to respond to potential storm damage.
20	Digital Projects - Customer Experience	-	626	626	N/A	This project was previously included under the All Other category and is being broken out as a project with >$500K planned/spent. This project will enable digital interaction with customers through omni-channel solutions, web, mobile, social, connected home and embedded customer analytics.
21	All Other	10,340	685	(9,655)	-93%	Includes projects and programs less than $500K
22	Total Efficiency	13,285	9,420	(3,865)	-29%	
23						
24	**AMI**					
25	AMI	-	1,362	1,362	N/A	AMI related capital expenses allocated to gas and electric lines of business.
26	Total AMI Common	-	1,362	1,362	N/A	
27	**COMMON: Group Initiatives**					
28	All Other	350	142	(208)	-60%	Includes projects and programs less than $500K
29	Total Group Initiatives	350	142	(208)	-60%	
30	**COMMON: Mandatory**					
31	Fire Protection	1,875	1,843	(32)	-2%	
32	System Cutover	16,229	15,941	(288)	-2%	
33	Primavera PPM Cloud	-	2,148	2,148	N/A	Implementation of Management Audit recommendation to add more robust Project Management Software package.
34	Non AMI DSIP Enterprise Analytics		1,028	1,028	N/A	Project budget included in Electric: Mandatory category. 2020 capital spend is in alignment with budgeted amount.
35	NYSEG OMS Enhancements		563	563	N/A	Additional needs were identified in 2020 to support the NY Siemens Spectrum and the OMS systems.
36	All Other	100	736	636	636%	Includes projects and programs less than $500K
37	Total Mandatory	18,204	22,260	4,056	22%	
38	**COMMON: Reliability Risk**					
39	Lifecycle Replacement - ECC/XECS systems	665	570	(95)	-14%	Fewer needs identified related to ECC/XECS lifecycle replacement.
40	NY Spectrum HW Refresh NYSEG	-	11,540	11,540	N/A	2020 Capital spend for the hardware replacement of the Spectrum Power 4.75 Energy Management System (EMS) to maintain system reliability, security and support.
41	All Other	-	678	678	N/A	Includes projects and programs less than $500K
42	Total Reliability Risk	665	12,788	12,124	1823%	

NYSEG Common December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
43	**COMMON: Strategic**					
44	Telecomm Fiber	2,754	6,635	3,881	141%	Additional 2020 capital spend to continue the NYSEG fiber network build out that supports the company's security domain.
45	Telecomm Vertical Builds	2,754	2,746	(7)	0%	
46	NET-ACD ROUTING AND TECHNOLOGY	-	-	-	N/A	
47	NET-DIGITAL JOURNEY-PREFERENCE ALERT MANAGEMENT	-	-	-	N/A	
48	Telecomm Infrastrucure	-	7,436	7,436	N/A	Additional capital spend to continue the buildout of the Wireless Broadband services to provide private and secure connectivity for grid features such as distributed automation, resiliency and substation automation communications. Additional capital spend was attributed to reinforcement of existing telecommunication towers to support resiliency of the communications network.
49	NMC Solar Winds	-	717	717	N/A	Software spend necessary for monitoring the Security Domain network.
50	All Other	211	45	(167)	-79%	Includes projects and programs less than $500K
51	Total Strategic	5,719	17,578	11,860	207%	
52						
53	**TOTAL - COMMON**	68,883	110,904	42,020	61%	

Appendix 6 – RG&E Common Budget Variance Detail

RGE Common December 31, 2020 Project Variance Detail and Explanations

	A	B	C	D	E	F
	Capital Project or Category	JP Appendix R 2020 ($000)	Actual 2020 ($000)	Variance ($000)	Percent Variance	Variance explanation
1	**COMMON: Asset Condition Replacement**					
2	RG&E - Fleet Purchase	3,735	3,258	(478)	-13%	The vehicle manufacturer was unable to deliver all ordered vehicles by the end of 2020. Vehicles will be delivered in 2021.
3	BP&SM Projects - RGE	500	1,088	588	118%	Additional capital spend to provide full building backup power to the Scottsville Road facility. This facility is being converted to have storm and emergency response capabilities.
4	Laptop LC	175	669	494	282%	The additional demand is related to shifting of individuals to remote work during 2020.
5	Scottsville Rd Equipment Yard Upgrades	500	-	(500)	-100%	Capital spend for this project is included in the Facilities Project under line 9 below.
7	All Other	4,182	3,715	(468)	-11%	Includes projects and programs less than $500K
8	Total Asset Condition Replacement	9,092	8,729	(364)	-4%	
9	**COMMON: Efficiency**					
10	Facilities Projects - RGE	1,666	1,973	307	18%	Consolidation projects impacting Mushroom Blvd and Scottsville Rd. Includes capital spend on the Scottsville Rd Equipment Yard projects on line 5 above
11	3 City Center - I	-	8,807	8,807	N/A	This project will provide a new main office location for RG&E in downtown Rochester.
12	Metering and Mobility IT Systems Upgrade	-	1,167	1,167	N/A	This project was previously included under the All Other category and is being broken out as a project with >$500K planned/spent. Capital spend required to enable continued support and use of the Metering and Mobility systems, mitigate obsolescence risk and negative impact on business processes.
13	NET-WORKLOAD MANAGEMENT AND OPTIMIZATION	470	821	351	75%	Higher than planned complexity and quantity of development work increased capital spend in 2020.
14	All Other	8,156	2,593	(5,563)	-68%	Includes projects and programs less than $500K
15	Total Efficiency	7,857	13,880	6,023	77%	
16	**COMMON: Group Initiatives**					
17	All Other	344	81	(263)	-76%	Includes projects and programs less than $500K
18	Total Group Initiatives	344	81	(263)	-76%	
19	**COMMON: Mandatory**					
20	Fire Protection	1,132	1,154	22	2%	
21	System Cutover	8,994	8,838	(156)	-2%	
22	Primavera PPM Cloud	-	1,210	1,210	N/A	Implementation of Management Audit recommendation to add more robust Project Management Software package.
23	RGE DSIP - Enterprize Analytics-Cap	-	539	539	N/A	Project budget included in Electric: Mandatory category. 2020 capital spend is in alignment with budgeted amount.
24	All Other	140	291	151	108%	Includes projects and programs less than $500K
25	Total Mandatory	10,266	12,031	1,765	17%	
26	**AMI**					
27	AMI	-	793	793	N/A	AMI related capital expenses allocated to gas and electric lines of business.
28	Total AMI Common	-	793	793	N/A	
29	**COMMON: Reliability Risk**					
30	All Other	-	956	956	N/A	Includes projects and programs less than $500K
31	NY Spectrum HW Refresh CapEx	-	3,835	3,835	N/A	2020 Capital spend for the hardware replacement of the Spectrum Power 4.75 Energy Management System (EMS) to maintain system reliability, security and support.
32	Total Reliability Risk	-	4,790	4,790	N/A	
33	**COMMON: Strategic**					
34	Telecomm Vertical Builds	2,754	2,728	(25)	-1%	
35	Telecomm NY WAN Expansion	3,364	3,403	39	1%	
36	Telecomm Fiber	918	926	8	1%	
37	Telecomm Infrastructure	-	2,219	2,219	N/A	Additional capital spend to continue the buildout of the Wireless Broadband services to provide private and secure connectivity for grid features such as distributed automation, resiliency and substation automation communications. Additional capital spend was attributed to reinforcement of existing telecommunication towers to support resiliency of the communications network.
38	All Other	-	452	452	N/A	Includes projects and programs less than $500K
39	Total Strategic	7,036	9,727	2,692	38%	
40						
41	**TOTAL - COMMON**	34,595	50,032	15,437	**45%**	

Appendix B

NYSEG Electric and Generation Project Narratives

2 - Substation Modernization

Project Overview

The Substation Modernization Program addresses transmission and distribution substations that have been identified as being in poor or very poor condition. The upgrades address the physical condition of the equipment, obsolete assets, and satisfy reliability and operational requirements. Within the Substation Modernization Program, substations are comprehensively evaluated to identify specific substation infrastructure requiring replacement, including steel structures, foundations, breakers, transformers, switches, insulators, batteries and the control and protection systems. Additionally, substations are evaluated from an operational perspective to identify improvements in substation topology that could enhance the functionality and improve safety and reliability. Modernization studies may warrant a full rebuild of the substation or possibly an in-kind replacement of the equipment depending on the results of a comprehensive needs and solutions assessment.

NYSEG Substation Modernization Projects

Bennet Transformer Replacement Scope Overview

Bennett Substation is a 115kV/34.5kV/12.5kV transmission and distribution substation located in the Hornell Division of NYSEG in Hornellsville, NY. The Bennet transformer replacement project includes the installation of a new 34.5/12.5kV 10/14MVA Transformer with LTC, one (1) 34.5kV and two (2) 12.5kV circuit breakers and a new 12.5kV Capacitor Bank.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
03/17/2022	06/16/2022	03/17/2022	11/14/2022	12/28/2022

Woodlawn Transformer Replacement Scope Overview

The Woodlawn 34.5-12.5/7.2/4.8KV substation (located in Elmira Division) was built in 1940's and serves both residential and industrial customers including Anchor Glass and Hilliard. The Woodlawn project includes the replacement of the Bank #1 transformer with a new 34.5/12.5kV 12/16/20 (22.4) MVA transformer with LTC along with the corresponding ancillary equipment.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
05/30/2022	06/27/2022	06/28/2022	11/30/2022	01/10/2023

Hillcrest Rebuild

The existing Hillcrest substation is a 34.5/12.5 kV substation built in the 1960s. A comprehensive needs assessment was performed, and numerous asset condition and reliability needs were identified. This project will replace the existing 34.5/12.5 kV transformer with a new 12/16/20 (22) MVA 34.5/12.5 kV Transformer with LTC as well as the complete rebuild of the substation with GIS.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
06/02/2022	08/25/2022	03/28/2022	12/08/2022	02/03/2023

NYSEG Substation Modernization Studies

The NYSEG substation modernization program currently is evaluating five substations which include Raquette Lake, Wright Ave, Clark Street, Endicott Railway and Noyes Island. Comprehensive needs and solutions reports will be prepared as part of these studies along with a selected solution alternative.

Project Activities / Key Accomplishments in 2020

Eight NYSEG substations were comprehensively evaluated as part of the NYSEG Substation Modernization program and three of these studies resulted in projects (Bennet, Woodlawn & Hillcrest). The remaining five substation studies completed substation needs assessments and developed preliminary solution alternatives (Raquette Lake, Wright Ave, Clark Street, Endicott Railway and Noyes Island).

Project Activities Planned for 2021

The procurement of materials and detailed engineering are anticipated to begin soon for the Bennet, Woodlawn & Hillcrest substation projects. The five previously identified studies will continue with engineering activities throughout 2021.

3 – Distribution Line

Program Overview

The Distribution Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric distribution system. There are thousands of work orders created each year to record various types of unit of properties replaced due to emergency and other situations causing interruptions in service.

Program Activities / Key Accomplishments in 2020

In 2020 over 2,600 poles were replaced, along with 2,300 crossarms, 2,200 transformers, 1,800 cutouts and 390,000 feet of conductor. Portions of the Make Ready Program were included in this program at the beginning of the year prior to separating the Make Ready work to its own program.

Program Activities Planned for 2021

This program is budgeted each year based on costs that have occurred in prior years. It is hard to predict what may break and or be damaged by others, so a historical estimate is used year over year.

4 – Substation Circuit Breaker Replacement Program

Program Overview

This program replaces substation circuit based on the information provided by Assets Management and the Engineering Maintenance groups. As part of this program, the following breakers will be replaced: Breakers with a health index of 4 or 5 (poor or very poor condition), breakers with 4, 5 or 6 bushing in a bad condition and overdutied breakers. If actions are not taken, a failure in one of these breakers will take out of service a portion of the system impacting CAIDI/SAIFI.

Program Activities / Key Accomplishments in 2020

In 2020 54 breakers were replaced. Engineering and procurement was started for replacements planned for 2021.

Program Activities Planned for 2021

This program spans over several years to upgrade/replace and add circuit breakers identified by the Asset Management group. 2021 plan includes the replacement of 80 breakers in the NYSEG territory.

5 – Transmission Line

Program Overview

The Transmission Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric transmission system. Also, work is performed to replace units of property identified from the transmission line inspection program for items that do not meet standards.

Program Activities / Key Accomplishments in 2020

In 2020 over 250 poles were replaced as well as over 17,000 feet of conductor.

Program Activities Planned for 2021

This program is budgeted based on the number of notifications and average cost per notifications experienced over the past several years. An additional amount is added for emergency repairs identified as well based on historical data.

6 - Betterments

Program Overview

The Betterments program replaces various distribution system elements that contribute to higher SAIFI measures. These projects focus on the reliability, operability and flexibility of the electric distribution system.

Program Activities / Key Accomplishments in 2020

In 2020 over 750 poles, 850 crossarms, 350 transformers, 600 cutouts were replaced, and more than 179,000 feet of conductor was replaced.

Program Activities Planned for 2021

Divisions respond to smaller identified jobs to improve reliability of the system and reduce risk for customer outages. The budget is planned based on historical spend levels. Any large job that is identified over $200K is broken out into a separate tracking order.

7 – Line 968 – 115 kV

Project Overview

The conductor was installed in 1950. Many of the structures and related hardware are from the original construction in 1950 and are in poor or very poor condition. This project is an Article VII project under New York State law. As a result, scheduling will be determined after the application is submitted and approved.

Project Activities / Key Accomplishments in 2020

The scope of this project was defined and engineering in preparation of an Article VII filing was started.

Project Activities Planned for 2021

Continuation of engineering and development of Article VII data and documentation will be continued.

High-Level Schedule

The project is still under development and a construction schedule has not been determined.

8 - Line 879 Rebuild - Ausable Town Line to Rainbow Falls

Project Overview

The project scope includes the rebuild of the 46kV, Hammond Lane to Rainbow Falls through Hammond Lane including Peru Tap (and section from Main 879 L to Arizona Ave Sub). This 46kV rebuild has six sections and totals 16.5 miles.

The new construction will include the following: single pole tangent framing was used throughout the project, all angle structures, angle dead ends, and 3-way dead ends are steel poles with caisson foundations, tangent dead ends (for stringing purposes) and any 1-way switch poles are wood poles. All sections that have distribution under build, have new poles with 3-phase 4/0 AAAC 19 conductor and a 1/0 AAAC neutral. The three distribution conductors are on a 10’ wood cross arm 8’ below the new transmission conductor. New conductor is 477 kcmil ACSR 18/1, and static is 36 fiber optical ground wire (OPGW).

The project was split into 6 separate phases/sections defined in the detailed engineering scope. The phases are:

- Section #1 Peru Tap to South Junction (3.6 miles)
- Section #2 South Junction to Indian Rapids Junction (3 miles)
- Section #3 Indian Rapids Junction to Hammond Lane (1.1 miles)
- Section #4 Indian Rapids Junction to Arizona Avenue (1.5 miles)
- Section #5 Peru Tap to Rainbow Falls (4.7 miles)
- Section #6 Peru Tap to Peru Sub (2.6 miles)

An Adirondack Park Permit was obtained for a two-mile portion of the project.

Project Activities / Key Accomplishments in 2020

With the exception of section 1 which was energized on December 8, 2019, all the other sections were completed and energized in 2020.

Project Activities Planned for 2021

This year, the plan is to finish all closeout activities and continue with vegetation management until we attain 80% regrowth within the right-of-way.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
3/1/2016	3/31/2020	10/1/2019	11/30/2020	12/24/2020

9 – NYSEG – Substation

Program Overview

Substation Program includes various work at substations such as the addition of bus covers, animal fences; replacement of surge arresters, insulators, switches, fences, instrument transformers (VT, CCVT…), all of them expected to be under $200K.

Program Activities / Key Accomplishments in 2020

During 2020, switch replacements were completed at 31 substations, 18 substations received animal fence upgrades, regulators at ten substations were completed and insulator replacements were completed at 17 substations.

Program Activities Planned for 2021

This program is budgeted based on historical trend of work needed at the substations.

10 – NYSEG Mobile #2 Replacement

Project Overview

Replacement of Mobile Sub #2 is necessary to help ensure that NYSEG can continue to provide service to its customers during certain situations, whether planned or unplanned. Mobile substations are utilized to replace existing substation power transformers for routine maintenance, construction activities or in the event of an emergency equipment failure. Mobile 2 is currently unavailable for service due to several maintenance needs.

Mobile Substation #2 was purchased in the mid 1960's, is at the end of its life and needs to be replaced due to an aging trailer frame and failing electrical components. Mobile #2 is a critical piece of equipment required to support the performance of planned substation maintenance, respond to unplanned substation failures or system emergencies, and to accommodate substation capital improvements.

This a 34.5KV mobile substation

Project Activities / Key Accomplishments in 2020

In 2020 the detailed engineering was advanced. The manufacturer was directed to start the procurement of the major equipment needed to start the fabrication and assembly of the mobile substation in 2021.

Project Activities Planned for 2021

Delivery of the mobile substation to NYSEG facilities is planned to occur in 2021. Upon delivery the Company will commence and complete the Testing and Commissioning. The mobile substation is expected to be available for service by December.

High-Level Schedule

Manufacturing Start	Manufacturing Finish	Construction/Testing and Commission Finish	ISD
7/3/2018	07/30/2021	11/30/2021	12/20/2021

11 – NYSEG Mobile #4 Replacement

Project Overview

Replacement of Mobile Sub #4 is necessary to help ensure that NYSEG can continue to provide service to its customers during certain situations, whether planned or unplanned. Mobile substations are utilized to replace existing substation power transformers for routine maintenance, construction activities or in the event of an emergency equipment failure.

Mobile Substation #4 was purchased in the mid 1960's, is approaching the end of its life and needs to be replaced due to an aging trailer frame and electrical components. Mobile #4 is a critical piece of equipment required to support the performance of planned substation maintenance, respond to unplanned substation failures or system emergencies, and to accommodate substation capital improvements.

This a 46KV mobile substation

Project Activities / Key Accomplishments in 2020

In 2020 the detailed engineering was advanced. The manufacturer was directed to start the procurement of the major equipment needed to start the fabrication and assembly of the mobile substation in 2021.

Project Activities Planned for 2021

Delivery of the mobile substation to NYSEG facilities is planned to occur in 2021. Upon delivery the company will commence and complete the Testing and Commissioning. The mobile substation is expected to be available for service by December.

High-Level Schedule

Manufacturing Start	Manufacturing Finish	Construction/Testing and Commission Finish	ISD
7/3/2018	07/30/2021	11/30/2021	12/20/2021

12 - Line 880 Rebuild

Project Overview

Line 880 has been identified by Asset Management as a line that needs replacement. The 15.4 miles of 46kV line from the Rainbow Falls Substation to the Cabot Substation provides service for 2,300 customers in the area. There is presently no static wire existing for this line. Without a static wire, this line is presently at higher risk for lighting related outages and does not meet Avangrid's standards for lightning protection. The poles have also been rated in poor to fair condition, with the many of the poles being installed between 1947 and 1950 with an overall average age of 51 years

The Line 880 Rebuild Project will rebuild the 15.4 miles of 46kV line from the Rainbow Falls Substation to the Cabot Substation.

Project Activities / Key Accomplishments in 2020

In 2020 NYSEG obtained the Adirondack Park Agency Permit and completed the construction drawing package, including the Storm Water Pollution Prevention Plan (SWPPP).

Project Activities Planned for 2021

During 2021, right-of-way clearing will begin. Construction related to structure replacement will begin as will installation of the conductor.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
2/03/2021	7/01/2022	3/18/2021	7/01/2022	10/31/2022

13 - Line 810 Brewster - 46 kV

Project Overview

This project was planned to rebuild and harden the 810 Line from Carmel to Croton Falls Substations, which is approximately 23 miles of transmission line. The project was developed after a 2013 Transmission Assessment. During a subsequent 2018 Transmission Assessment the line was assessed with a health rating of “fair” to “good”. The change in assessment was due to updated assessment techniques and measures.

Due to the most recent health rating, this project has been cancelled.

14 - Line 810 Rebuild - East Norwich to Oxford

Project Overview

Line 810 is a 46kV transmission line rebuild from the East Norwich substation to the Oxford substation. The project is in the Oneonta Division of NYSEG. The rebuild included installation of new structures with new 477 ACSR conductors. The rebuild also included the addition of Optical Ground Wire (OPGW) on the line. This rebuild has a length of 6.2 miles.

The latest assessment ranked the East Norwich to Oxford section of Line 810 as 'very poor.' The asset had large number of splices. Cross arms and braces were ranked as 'very poor' and woodpecker damage was described as severe. The poles were very old and rotting. Splices, suspension clamps and dead-end assembly were in 'very poor' condition. 75% of the conductor and 50% of the poles were installed in 1929.

Project Activities / Key Accomplishments in 2020

Construction and closeout were completed during 2020 and vegetation management activities continued to achieve 80% regrowth within the right-of-way.

Project Activities Planned for 2021

The project was completed in 2020 and no future activities on this project are planned.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
9/4/2018	5/14/2020	9/4/2018	5/14/2020	5/14/2020

15 - Line 885 Rebuild

Project Overview

Line 885 Dannemora Tap has been identified as being in "Poor" condition with a health score of 42%. This line is a 46kV line that feeds the Dannemora Substation that provides services for 1,831 customers in the respective area (including an important customer of note, the Dannemora State Penitentiary). The existing conductor is considered in poor condition, insulators are noted to be deteriorating on the lines, and there is presently no static wire existing for this line. Without a static wire, this line is presently at higher risk for lighting related outages and does not meet NYSEG's standards for lightning protection. The poles have also been rated in poor condition, with most of the poles being installed between 1932 and 1962.

Project Activities / Key Accomplishments in 2020

In 2020 the Company completed the installation of 24 poles, including four steel poles and associated foundations.

Project Activities Planned for 2021

During 2021 construction will be completed and energization is planned to occur in February. Additionally, we will finish all closeout activities and continue with vegetation management until 80% regrowth is attained within the right-of-way.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
2/1/2019	12/31/2020	2/1/2019	12/31/2020	2/15/2021

16 - Line 803 - Kent to Tilly Foster

Project Overview

This project will redesign/reconductor the 46kV, Kent to Tilly Foster Circuit #803. The project will include the installation of new structures, new 477 kcmil ACSR (18/1) conductor, and a 36-fiber optical ground wire (OPGW). This rebuild will have a length of approximately 2.9-circuit miles.

As a result of observed asset condition and a 2017 Local Transmission Report, the 46kV Line 803 was identified as one of the projects that needed to be rebuilt in order to avoid all thermal and voltage violations. Line 803 (Kent Substation – Tilly Foster Substation) is part of the reconductoring of Line 803 from Croton Falls – Kent. The potential violation is N-1 loss of the Pawling – West Patterson section of the 803 Line which results in loading the Croton Falls – Kent section to 22.1MVA, over its LTE of 19.9MVA.

Project Activities / Key Accomplishments in 2020

All construction permits were obtained in 2020. Major materials for construction were also procured and delivered and actual construction work began in December 2020.

Project Activities Planned for 2021

All construction work will be completed during 2021. The project will also be closed out during the year and vegetation management will continue until we attain 80% regrowth.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
12/7/2020	5/19/2021	12/21/2020	5/26/2021	5/26/2021

17 - Seneca Lake L595 Submarine Cable Rebuild

Project Overview

The Line 595 Rebuild Project will rebuild an underwater electric cable in Seneca Lake. The cable was installed in 1942 and runs approximately three miles across the lake, west to east. The cable is buried on either side of the lake and runs along the bottom of the lake, at depths up to 600 feet; the new cable will do the same. The project will also rebuild the riser structures that the cable connects to on the west and east side of the lake.

The project has environmental and safety needs at the top of its priority. The project plans to remove the four-parallel single existing cables and replace them with two parallel updated triplex cables.

Project Activities / Key Accomplishments in 2020

The project, including integration of the recloser scheme, and final restoration was completed. The project was placed in service in late 2019.

Project Activities Planned for 2021

No future work is planned for this project.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
9/2/2019	12/17/2019	9/2/2019	12/15/2019*	12/17/2019

* restoration work continued through March 2020.

18 - Line 962 - 115kV Rebuild

Project Overview

The Line 962 Rebuild consists of rebuilding 38 miles of 115kV transmission line, from Owego to Elmira, NY and substation work at five substations. The Line 962 Rebuild is being undertaken to address portions of the circuit that have been identified to be in poor overall condition with respect to age, clearance issues, etc. The Line 962 Rebuild project consists of rebuilding an approximately a 35-mile section of the existing 115kV Line 962 from South Owego to Elmira, NY. The project will require an Article VII Permit.

Project Activities / Key Accomplishments in 2020

Preliminary project phase and conceptual review of the potential solutions. Additional project solutions are being considered.

Project Activities Planned for 2021

The project will continue to further evaluate potential solutions and perform reviews to develop an efficient and suitable solution to line needs.

High-Level Schedule

The project is still under development and a construction schedule has not been determined.

19 - Circuit 590 Rebuild

Project Overview

The scope of this project includes rebuilding deteriorated portions of Circuit 590, rebuilding portions of Circuit 590 that don't meet current hardening standards and replacing aged equipment at the substation.

Project Activities / Key Accomplishments in 2020

In 2020, the detailed engineering, long lead materials were procured and the construction RFP for this work was completed.

Project Activities Planned for 2021

Additional engineering and procurement will continue through 2021 in preparation for construction to start near the end of 2021 or beginning of 2022.

High-Level Schedule

The project is still under development and a construction schedule has not been determined.

20 - Heritage Hills Upgrade

Project Overview

This project includes the replacement of the aging underground equipment and cables in an existing condominium subdivision in the Brewster Division. The development was built in the 1970s and 1980s, and much of its underground infrastructure is now well over 30 years old. Equipment failures in this development have become a growing concern over the recent years and a rebuild is required at this time.

Project Activities / Key Accomplishments in 2020

During 2020, the following equipment of the East Hill portion of the development was replaced: underground primary and secondary cables (excluding the 750-primary loop) switch gear, fuse gear, junction cabinets, transformers and hand holes. Additionally, within condominium blocks 1, 3, 10, 7, 4, approximately 20,000 feet of underground cables; 59 transformers; and 20 junction cabinets were replaced.

Project Activities Planned for 2021

Five additional condominium blocks' equipment (underground cables, transformers and junction cabinets) will be replaced during 2021. On an annual basis, the company will replace five condominium blocks' equipment until the entire complex is updated.

21 - Homer City Capital Breakers

Project Overview

This project involves replacement of breakers, LAs, CCVTs, RTU, Security Systems, Disconnect Switches, Backup Relaying, Battery and Battery Chargers and the Homer City Substation. The project is performed in conjunction with First Energy who is responsible for planning and executing the work. NYSEG is responsible for partial reimbursement of work performed at this substation.

Project Activities / Key Accomplishments in 2020

No work was executed by First Energy at this site in 2020.

Project Activities Planned for 2021

First Energy has not provided guidance on any planned work at this site during 2021.

22 - Mill C Intake Trash Rack and Rack Raker Project

Project Overview

The NYSEG Mill C Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Project No. P-2738), is located on the Saranac River in Clinton County, west of Plattsburgh, New York. The facility is unstaffed, with three hydropower turbine-generating units that are remotely monitored and controlled and are rated to produce a total of 6.05 MW. The plant is a Run-of-River operation, which means that a consistent pond level is maintained, while utilizing the natural flow of the river to generate hydroelectric energy.

As a part of the current FERC license for the Project, which was issued on January 19, 2006, NYSEG is required to replace or modify the existing intake trash racks with one-inch clear space trash racks for fish protection per License Article 404, Section 3.4 of the Settlement Agreement and condition B.10 of the New York State Department of Environmental Conservation (NYSDEC) 401 Water Quality Certification (WQC). Installation of the new intake racks at Mill C are to be completed by April 2021 as outlined in the FERC license however construction delays in 2020, as a result of COVID-19, has prevented the work from being be completed per the original plan (April 2021). NYSEG has submitted an extension of time request to the FERC to extend the project completion date. Based on anticipating approval of the extension of time request, the project is scheduled to be complete by December 2021.

In addition to the intake rack upgrades, the following upgrades will be completed:

- The approach of the river into the intake structure will be realigned such that river debris can be more easily passed through a sluice.
- The existing sluiceway in the left dam abutment will be deepened and widened, to allow for larger biodegradable debris to be passed downstream of the dam along with new, automated steel sluice gates.
- Associated intake structural steel and concrete improvements will also be constructed to accommodate installation of a new mechanical hydraulic rack raker for cleaning of the intake racks during operation of the hydroelectric facility.

Project Activities/Key Accomplishments in 2020

In 2020, NYSEG initiated construction at the site and completed a portion of the intake structural steel and concrete improvements. Completion of the remaining construction scope is scheduled to occur in 2021. Construction delays in 2020 were a result of the associated personnel safety requirements and measures that needed to be taken due to the COVID-19 pandemic.

Project Activities Planned for 2021

Based on approval of the extension of time request, the project will be completed and the assets placed in service with project close out completed by December 2021.

26 - NYSEG - Substation Automation Program

Program Overview

The goal of this program is to install a remote terminal unit (RTU) in all substations the do not currently have an RTU, as well as integrate all the bays into our master supervisory control and data acquisition (SCADA) system of those stations where there is an RTU already in service. The addition of supervisory control and data acquisition in the substations will allow for improved visibility and outage assessment which in turn will result in quicker response and improved CAIDI and can also improve SAIFI performance over the longer term.

Program Activities / Key Accomplishments in 2020

In 2020, eight substations were fully automated and projects to automate 13 additional substations in 2021 were started. Of those 13, three are under construction, three more are awaiting construction to begin and the balance are being engineered.

Program Activities Planned for 2021

This program spans over several years to provide full visibility and remote-control capabilities of all the substations bays. 2021 plan includes the automation of 91 bays in the NYSEG territory.

30 - Dingle Ridge - 2nd Bank and 13.2kV Conversion

Project Overview

This project will upgrade the current 5MVA transformer bank substation to a new substation with two 12/16/20 (22.4) MVA transformer banks. It will also convert 9.6 miles of 4.8kV circuits to 13.2kV.

The current 1667 kVA substation transformer is loaded to more than 100% of rating. There are strong ties between the Dingle Ridge substation circuits, Putnam Lake and with Tilly Foster. Thus, a double bank upgrade from 5MVA to 2-12/16/20 MVA to maintain the N-1 redundancy and to off-load the overloaded Tilly Foster, Putnam Lake and Peach Lake circuits.

Project Activities / Key Accomplishments in 2020

In 2020 NYSEG accomplished the completion of the substation construction drawings for in-ground and above-ground construction and the SPC 1&2 drawings. The in-ground and above-ground construction packages were issued for bid and awarded. The substation building permit was received later than planned but will allow construction to begin in 2021.

Project Activities Planned for 2021

Construction work associated with underground and above ground will begin and continue throughout the year. The work includes construction of the transformer foundation, trenching and installation of facilities for the circuit conversion will be started.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
5/11/2021	8/9/2021	7/8/2021	6/22/2022	6/23/2022*

*Substation ISD is 12/08/2021, distribution line work will continue through 6/2022

32 - Hilldale - 115 kV Source, Transformer Bank Upgrade and Second 12kV Distribution Circuit

Project Overview

This project proposed to upgrade the Hilldale 34.5-12.5kV 10.5MVA (3-2.5/2.8/3.5MVA) substation transformers by adding two new 115-12.5kV 12/16/20 (22.4) MVA LTC transformers with provisions for four 12.47 kV distribution circuits. The transformers will be served from the 115kV rather than the 34.5kV transmission system.

During the summer of 2013, the Hilldale substation transformer was loaded up to 98% (10.3MVA) of nameplate rating. Plans have also been received for a new 100 home housing development. The substation has also experienced outages on the 34.5kV subtransmission. Changing the source from the 34.5kV to the 115kV transmission will improve the reliability and allow for future ties (without phasing issues) with the new future 115/12.5kV Old Fall substation. Moving the load from the 34.5kV to the 115kV transmission will also free capacity on the 34.5kV system.

This project is currently being studied for a possible NWA solution. Due to this study, the wires solution is on hold until an NWA determination is finalized.

34 - Java NWA - Microgrid

Project Overview

The Non-Wires Alternative (NWA) Program seeks to identify and implement cost effective alternative solutions to traditional utility transmission and distribution (T&D) construction projects. NWA solutions utilize third-party Distributed Energy Resources (DER) to postpone certain T&D projects needed primarily to correct system overloading conditions and, in some cases, system reliability issues. NWA solutions are procured through competitive solicitations and evaluated utilizing the Companies Benefit Cost analysis (BCA) Handbook.

Project Activities / Key Accomplishments in 2020

NYSEG's Java Substation is a distribution substation located in NYSEG's Lancaster Division consisting of a 5 MVA transformer feeding two 4.8 kV distribution circuits. A request for proposal was issued on February 8, 2016 to solicit NWA (DER) resources to defer the $35.8 million Java Substation upgrade. Eleven proposals were received and evaluated. The developer with the highest BCA was chosen to move forward. The proposed solution consisted of:

- A 1 MW / 8MWh Lithium Ion Battery Storage – Peak shaving
- A 5 MW / 60 MWh Lead Acid Battery Storage – Back up power supply (micro grid/island)
- A 1.5 MW Photovoltaic System – Charge batteries
- Synchronous Condenser – Provide fault current support during islanding mode.

In 2019, NYSEG continued contract negotiations with the selected developer to provide peak load reduction and back-up power services. After lengthy contract negotiations between NYSEG and the developer, and discussions with New York State Department of Public Service Staff, a decision was made to separate the Java NWA project into two separate projects based on:

- Liability and risk issues associated with the back-up power portion (micro-grid) of the project being owned by a third party, and
- Technical and operational complexities and concerns in operating the proposed battery storage as an electrical "island" or micro-grid being owned by a third party.

This project will focus on the reliability (back-up/micro-grid) system need.

In 2020, NYSEG received approval through the Company's rate case to consider utility ownership of the back-up (micro-grid) portion of the Java NWA project. Also, in 2020 NYSEG paused the peak shaving portion of the Java NWA project in order to evaluate the system need as circuit topology changes have lowered the electric load on the Java substation. NYSEG is monitoring the load at the Java substation and will reevaluate the need for the peak shaving project based on existing and future forecasted load levels.

Project Activities Planned for 2021

In 2021, NYSEG is planning to complete the preliminary engineering, begin conceptual engineering design and begin the procurement of long lead materials.

35 - Sackett Lake Substation Rebuild

Project Overview

This project upgrades the existing 7.5 MVA 34.5-4.8 kV transformer with a new 10/14 MVA, 34.5-12.47 kV LTC transformer, with provisions for two 12.47 kV distribution circuit positions. The project will also convert all existing circuits to 12.47 kV operations. Additionally, a fiber optic line between the Sackett Lake and Cooper Corners Substations will be constructed.

Birchwood Estate added load on the Sackett Lake 121 4.8KV circuit. The Sackett Lake 121 circuit has the capacity to support the Birchwood Estate Phases 1 and 2 for a total of 650KVA. However, the Birchwood Estate Phase 3 totaling 273KVA will require that the Sackett Lake 121 circuit be converted to 12.5KV. This project will convert the Sackett Lake substation and circuits to 12.5KV to further support load growth in the area.

Project Activities / Key Accomplishments in 2020

In 2020 the substation construction was completed. The substation was also testing and commissioning was started and substantially completed

Detailed Engineering for the distribution line upgrade and fiber optic line was started.

Project Activities Planned for 2021

During 2021, the detailed engineering related to the distribution line upgrade will be completed and the construction of the line is expected to be completed by November 2021. The substation will be energized in January 2021.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
2/3/2020	12/30/2020	8/15/2018	10/31/2021*	11/5/2021

*The substation work was completed and energized in December 2020. Distribution line construction will continue through November 2021.

39 - NYSEG BES Program - FERC Compliance

Project Overview

To ensure NYSEG is compliant with the FERC Brightline Order, the Company has identified several new electric capital projects to be compliant with NERC Transmission Planning (TPL) Standards. These projects, to be managed under a comprehensive BES Program, include transmission line and substation modifications and upgrades.

The NYSEG BES projects currently under development are the following:

Project Name	Project Scope	Project Phase	Construction Start	Projected In-Service Year
Big Tree	**Reliability:** •Rebuild 115kV, 3-bay BAAH (AIS) •Relocate 115/34kV XFMRs •Relocate 115kV Capacitor •Bring 115 kV Line 151 in and out **Asset Condition:** None	**Construction**	**Jul 2020**	**2022**
Fraser / Delhi	**Reliability:** **Fraser** •Expand 345 kV to 4-bay BAAH •Expand Build 115 kV to 4-bay BAAH •Build a 46kV bus with N.C bus-tie •Install 2nd 345/115/46 kV XFMR 3-winding •Build 46 kV line 824 Tap to Delhi Co-op (3.5 miles) **DELHI** •Remove Delhi 115 kV substation switchyard and move all 115kV lines to Fraser (5 miles)	**Construction**	**Sept 2021**	**2024**

Project Name	Project Scope	Project Phase	Construction Start	Projected In-Service Year
	•Build 46 kV line 841 to Delhi 46 kV (5.5 miles) •Build a 46kV Bus with Tie-Breaker **Asset Condition:** **DELHI** •Replace 2, 12 kV Circuit Breakers			
Fraser Re-routings 115kV (L916, L917, L919, L949, L951)	**Reliability:** • Reroute Lines 916, 917, 919, 951 and 949 into to Fraser.	**Engineering**	**Oct 2021**	**2023**
L824 Fraser to Delhi Co-Op (46 kV)	**Reliability:** • 1 - 46kV line from Fraser to Delhi Co-Op (824).	**Engineering**	**Oct 2023**	**2024**
Fraser to Delhi (L841 New 46 kV)	**Reliability:** • 1 - 46kV line from Fraser to Delhi (841).	**Engineering**	**March 2024**	**2025**
Fraser to Delhi L916 Rebuild	**Reliability:** • 1 - 115kV line rebuild from Fraser to Delhi (916).	**Engineering**	**March 2024**	**2025**
Line 981	**Reliability:** • • Reconductor segment Line 981 (Etna -Str. 21), clearances updating + OPGW installation **Asset Condition:** • None	**Engineering**	**Apr 2024**	**2024**
Erie Street	**Reliability:** •Rebuild 115kV, 3-bay BAAH (AIS) •Install 2x50 MVA capacitors **Asset Condition:**	**Engineering**	**Mar 2024**	**2026**

Project Name	Project Scope	Project Phase	Construction Start	Projected In-Service Year
	•New 15kV GIS replacing 4 kV Breakers •New 38kV GIS replacing 34 kV Breakers •Replace 2, 34/4 kV XFMRs •Replace 34.5 kV capacitor bank •Replace 4 kV capacitor bank •1 - Power House •1 Control house •115, 34, 4.8kV Lines			
Healey Rd.	**Reliability:** • 2 - 115kV, 25MVAR CAPS. • 2 - 115 kV Switches • 2 - 115 kV IPO Breakers **Asset Condition:** • None	**Engineering**	**Jul 2023**	**2024**
Oakdale / Westover	**Reliability:** **Oakdale** • Add 345 kV bay • Install a new 345/115/34.5 kV XFMR • Build a new 34.5 kV line from Westover to Oakdale • Upgrade 34kV Lines 407 and 408 **Asset Condition:** **Oakdale** • New 15kV GIS replacing 12 kV Breakers • 1 - 345/115/34 kV XFMR • Reterminate all 3 115 kV lines from Westover to Oakdale • Reconfigure 115 kV yard into a new 6 bay BAAH (GIS) to accommodate existing lines and	**Engineering**	**Oakdale SS Aug 2024** **Oakdale RR May 2024** **Westover Jul 2024** **Westover RR Sep 2024**	**Oakdale SS 2027** **Oakdale RR 2026** **Westover 2026** **Westover RR DE 2025**

Project Name	Project Scope	Project Phase	Construction Start	Projected In-Service Year
	reterminated lines from Westover • New 38kV GIS replacing 34 kV Breakers **Westover** • New 15kV GIS replacing 12 kV Breakers • New 38kV GIS replacing 34 kV Breakers Reroute Lines 34.5kV: L407, L408, L356, L357, L411, L412, L441, L442, L510, L511, L512 4.8kV: L721, L722, L723, L724 • 2 - 34.5/12.5/4.8kV (dual) XFMR • 3 - 34kV Ground Banks			

Project Activities / Key Accomplishments in 2020

The following activities were accomplished during 2020:

Project	2020 Accomplishment
Fraser	Receipt of building permits and 5 Acre LOD waiver, Construction Contract award, Laydown area and part IG works completion, Design finalization. Procurement activities and material deliveries.
Delhi	Delhi – Design completion and IFC release, Procurement activities
Fraser Re-routings 115kV (L916, L917, L919, L949, L951)	Overhead and underground design completion. SEQR Approved by Delhi Planning Board as part of the Oneonta South Area Improvements Project (OSAIP). Procurement of underground materials. Initiation of structures procurement process. Real Estate Plan for easement acquisition. Access roads design.
L824 Fraser to Delhi Co-Op (46 kV)	Overhead and underground design 80% completion. SEQR Approved by Delhi Planning Board as part of the Oneonta South Area

Project	2020 Accomplishment
	Improvements Project (OSAIP). Detailed Engineering progression. Real Estate Plan for easement acquisition.
Fraser to Delhi (L841 New 46 kV)	SEQR Approved by Delhi Planning Board as part of the Oneonta South Area Improvements Project (OSAIP). Procurement of Detailed engineering. Real Estate & Public Outreach Plans.
Fraser to Delhi L916 Rebuild	SEQR Approved by Delhi Planning Board as part of the Oneonta South Area Improvements Project (OSAIP). Procurement of Detailed engineering. Real Estate & Public Outreach Plans.
Line 981	Design completion. ROW easement acquisition. Procurement of conductor, hardware and steel poles structures. Receipt of materials.
Erie St.	Detailed engineering was developed to a 60% mark. 75% of long-lead items were purchased. Permitting process was 90% completed.
Oakdale	Conceptual engineering was developed to 95% mark. Project estimate was updated.
Westover Re-Routes	Conceptual Engineering was developed to 100% mark.
Big Tree Sub Station	Detailed Engineering was completed to 95%. 99% of long lead items were purchased. Construction started in 2020 and 85% of Inground construction has been completed.
Westover Sub Station	Conceptual Engineering was developed to 100% mark.

Project Activities Planned for 2021

During 2021, the following work is planned:

Project	2020 Accomplishment
Fraser	Fraser Re-commence construction by Sep 2021, incorporate design changes and IFC releases, Developing of SP&C 3-7 Engineering, Manage Procurement updates due to construction changes, Equipment/Material arrivals as needed
Delhi	Delhi – Procurement activities, Permitting activities, Construction RFP preparation
Fraser Re-routings 115kV (L916, L917, L919, L949, L951)	Site Plan - Phase 2 – Fraser & Delhi RR submission for approval. Permits filling. Steel poles and materials procurement. Easement's acquisition. Underground construction procurement. Construction of underground duct banks for three circuits.
L824 Fraser to Delhi Co-Op (46 kV)	Detailed Engineering completion. Site Plan - Phase 3 – Fraser & Delhi RR submission for approval. Permits filling with NYPA. Steel poles and underground materials procurement. Easement acquisitions.
Fraser to Delhi (L841 New 46 kV)	Detailed engineering design. Access Roads design. Real Estate Plan for easement acquisition. Public Outreach Plan. Procurement of services.

Project	2020 Accomplishment
Fraser to Delhi L916 Rebuild	Detailed engineering design. Access Roads design. Real Estate Plan for easement acquisition. Public Outreach Plan. Procurement of services.
Line 981	Project to be resumed in 2023.
Healey Rd.	Starting of Conceptual engineering Q2-2021 and awarding of Detailed engineering Q3-2021.
Erie St	Finishing detailed engineering. Receiving some long lead items. Rest to be delivered at the end of 2023.
Big Tree Sub Station	Finish SPC IFC and progress on construction as planned.
Oakdale Station and Oakdale Reroutes	Completion and update of conceptual engineering design. Update of project estimate.
Westover Re-Routes	Detailed Engineering Starting on Q3-2021 Detail Engineering
Westover Sub Station	Award DE design and begin second Q2-2021.

High-Level Schedule

See above for detail, this project has many phases. Expected completion is 03/14/2033

40 - NERC Alert Priority III - NYSEG

Project Overview

NYSEG must comply with the 2010 NERC Alert mandate to correct all conductor to ground clearances that do not meet NESC standards. Priority I and II line clearances were corrected by 2013. Priority III lines are being addressed in this phase of the project. The Priority III lines are all overhead 115kV transmission lines. There are 60 of these lines with 1,097 Point of Interests in NYSEG totaling 1,011 miles.

The scope of this project is to replace 115kV existing wood structure with a new wood structure, insulators, and cross arms and braces. In addition, the scope involves re-tensioning conductor to address the clearance violation. The NERC Priority III is not a rebuild project and no existing conductor is being replaced.

Project Activities / Key Accomplishments in 2020

In 2020 the Company completed reconciling and correcting points of interest along Line 946.

Project Activities Planned for 2021

This year we will address 27 points of interest along Lines 942, 715 and 919.

High-Level Schedule

Above Ground Construction Start	Above Ground Construction Finish	ISD
1/2017	12/2028	12/2028*

* the dates shown above are the overall start and completion dates of the entire project. There are many sites associated with this project each with its own construction schedule and in-service date.

41 - Non-AMI DSIP Grid Automation

Project Overview

Pursuant to the Reforming the Energy Vision proceeding, an energy modernization initiative to fundamentally transform the way electricity is distributed and used in New York State, as well as the New York non-Automated Metering Infrastructure Distributed System Implementation Plan filings to the Public Service Commission, grid automation efforts aim to facilitate integration of clean energy resources and provide customers with tools to be able to take greater control over their energy usage.

Benefits include but are not limited to: (1) improved customer experience, (2) reduced outage frequency, (3) improved reliability performance, and (4) increased network automation.

Project/ Key Accomplishments in 2020

Grid automation efforts were successful in placing 461 devices in-production. For NYSEG that included 415 reclosers / SCADA switches / sectionalizers and 34 voltage regulators in Auburn, Binghamton, Brewster, Geneva, Hornell, Ithaca, Lancaster, Lockport, Mechanicville and Plattsburgh.

Project Activities Planned for 2021

Grid automation will continue to focus on constructing, commissioning and placing 623 devices into service. Deployment targets for NYSEG include 69 capacitor banks, 403 reclosers / SCADA switches / sectionalizers and 43 voltage regulators across Auburn, Binghamton, Brewster, Elmira, Geneva, Hornell, Ithaca, Lancaster, Liberty, Lockport, Mechanicville, Oneonta and Plattsburgh.

42 - Energy Smart Community

Project Overview

The Energy Smart Community (ESC) is a pilot program to demonstrate AVANGRID's ability to be the Distribution System Platform Provider (DSPP). Since 2016, the ESC has been implementing pilot projects in the fields of integrated system planning, grid operations, and market enablement. As a learning platform for the business, the intent is to scale successful innovations within the business functions, establish best practices, and share lessons learned.

Project/ Key Accomplishments in 2020

In 2020 we successfully transitioned ESC piloted programs including Advanced Metering Infrastructure (AMI), Advanced Distribution Management Systems (ADMS), and Automation to the business operations teams. By the end of 2020, successfully installed 13,433 electric AMI meters with a 99.40% daily read rate and 7,589 gas AMI meters with a 98.46% daily read rate. The opt-out rate (no fee) was 1.35%. The Siemens Spectrum ADMS is operational with Automatic Grid Recovery and Island Detection functionality added to production and operators being hired and trained to operate the ADMS. As part of the rate case Joint Proposal approved in November 2020, the Companies' received approval to implement AMI for all NYSEG and RG&E electric and gas customers, a significant decision related to the Energy Smart Community (ESC). The Joint Proposal provides for the continued operation of the ESC until AMI is fully implemented in the Companies' service territories. The continuation of the ESC in rate case will allow the Company to continue using the already deployed AMI assets as a testbed for projects and future capabilities such as integrated system planning and optimized operations which require granular usage data functionality as AMI begins to be rolled out elsewhere in the Companies' service territories. No new pilot programs will be initiated under the funding included in delivery rates for the ESC, however the ESC platform will remain in operation to be leveraged for new innovation opportunities including pilots using non-ESC funding avenues such as New York State Energy Research and Development Authority (NYSERDA), Department of Energy (DOE), National Science Foundation(NSF) and other grants. AVANGRID will continue to collaborate with ESC stakeholders to support innovation projects in the ESC and continue to use the lessons learned and best practices to benefit our customers.

Project Activities Planned for 2021

The capital spending in 2021 at the ESC will primarily be to assure replacement of existing assets to assure continued usefulness.

43 - Distribution Line Inspection

Program Overview

The Distribution Line Inspection program consists of replacing poles, cross arms, cut outs, transformers and any other unit of property identified by the annual inspection program that deems the unit of property as failing inspection criteria.

Program Activities / Key Accomplishments in 2020

In 2020 over 3,400 poles, 3,200 crossarms, 1,300 transformers, 2,200 cutouts and 189,000 feet of conductor were replaced as part of the Distribution Line Inspection program. The high number of facilities replaced in 2020 reflects the findings of past inspections that needed to be addressed.

Program Activities Planned for 2021

This program is budgeted based on the number of notifications written from the inspection program and an applied average cost per notification developed over historical trend factors.

44 - New Gardenville Rebuild

Project Overview

A comprehensive Needs and Solutions Assessment at NYSEG's New Gardenville Substation was recently conducted. The primary focus of the assessment was to reaffirm and/or revise previous reliability studies, and conduct a thorough asset condition assessment to uncover all remaining needs at the station. The original scope of the NYSEG New Gardenville Rebuild Project was to add a third 230/115/34.5 kV transformer, add A/B separation for the 230 kV equipment and to perform in-kind replacements of the existing 230, 115 and 34.5kV breakers.

New Gardenville's most recent Asset Condition Assessment identified structural deficiencies for all voltage levels e.g. (230, 115 & 34.5 kV) and confirmed that most major electrical equipment is at the end of its useful life. In addition, the New Gardenville 230 kV bus is designated as an NPCC Bulk Power System (BPS), and is required (by NPCC) to install upgrades to its protection and control systems to include full system (A&B) separation as well as a redundant DC supply.

Due to the extent of these identified asset condition needs, a full substation rebuild is required at New Gardenville. Solution alternatives were subsequently developed to address the comprehensive set of newly identified needs (reliability and asset condition). The scope of the New Gardenville station was evaluated against three other solution alternatives and was selected based on multiple factors, such as cost, electrical performance, yard constraints, etc. The scope includes a four position 230 kV AIS ring bus, one (1) 230/115/34.5 kV transformer, two (2) 115/34.5 kV transformers, a new four bay 115 kV GIS BAAH (Breaker and a Half), a new 230/115 kV control house and a new 34.5 kV GIS straight bus.

Project Activities / Key Accomplishments in 2020

The complete scope of the project was confirmed with Transmission Planning and preliminary engineering efforts were started. Changes to the scope of this project have required the re-engineering of this project and have resulted in the project schedule extending to include years later than those identified in Appendix R of the Joint Proposal.

Project Activities Planned for 2021

The Company will continue engineering efforts and begin procurement of long lead time items. No construction is planned for this year.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
5/30/2024	3/19/2025	3/20/2025	1/7/2026	4/1/2026

45 - NY Battery Storage

Project Overview

The New York Public Service Commission (PSC) mandated the installation of two utility scale energy storage systems at NYSEG and at RG&E. Five projects were to be implemented beginning in 2018 consisting of approximately 5 MW of energy storage that will operate to stack multiple use cases to obtain maximum customer and system benefits.

Project/ Key Accomplishments in 2020

Behind the Meter (BTM) sites (NYSEG):

- The Lansing Market and Lehigh Hanson sites were completed and both sites were operational as of July 2020.

- The Ongweoweh installation was the 5th BTM site completed and operational as of August 2020. The capacity of this site is 70 kW.

- The final BTM site completed construction in October 2020 with initial testing and commissioning completed in December 2020. In addition, the final acceptance letter was received in January 2021, making this site fully operational. The capacity of this site is 280 kW.

Circuit Deployed (Brentwood Site - NYSEG):

Pending minor items have been completed in 2020. This project was considered deployed and in- service as of July 2019. The capacity of this site is 477 kW.

Project Activities Planned for 2021

There are no activities planned for 2021.

46 - NYSEG Electric Meters - Program

Program Overview

This program purchases electric meters to replace existing, aged meters as they are removed from service as well as for new installations, as required by Tariff. Electric meters are exchanged for annual PSC required programs including statistical sampling, remediation programs and for other various reasons including, but not limited to, relocation, load increases, meter damage, and special testing.

Program Activities / Key Accomplishments in 2020

In 2020 there were 11,818 electric meters purchased at NYSEG.

Program Activities Planned for 2021

In 2021 there is an estimated 15,000 electric meters to be purchased at NYSEG. The actual numbers were lower in 2020 due to COVID rules related to entering homes, but we expect them to increase closer to normal averages by mid-year. AMI was approved in the rate case in November 2020. AMI meters will not begin to be installed until mid-2022. Therefore, non-AMI electric meters will need to be stocked and maintained throughout all of 2021 and support meter stock into the first half of 2022. The purchasing of AMI meters is included in the cost of the AMI project.

47 - Government Highway

Program Overview

This program relocates electric facilities that conflict with highway and road projects being undertaken by municipalities and other government agencies.

Program Activities / Key Accomplishments in 2020

In 2020 over 200 poles, 300 crossarms, 43 transformers, 120 cutouts and 71,000 feet of conductor were replaced or relocated in association with highway improvements. Large highway projects include the Route 6 Bridge and Peekskill Hollow Rd projects.

Program Activities Planned for 2021

This program is budgeted based on historical trends plus any known projects communicated to the Company by various government agencies.

48 - North Brewster Reinforcement

Project Overview

North Brewster Reinforcement project will strengthen the existing transmission system and increase the capacity of Amenia substation in the Brewster Division, to meet the growing local demand.

The project includes the following system reinforcements and will be completed in two phases:

1. Phase I: Dover Plains substation expansion with one 46kV 5MVAR capacitor bank and accompanying equipment; Pawling substation expansion with two 115kV 44.1MVAR capacitor banks and accompanying equipment.
2. Phase II: Amenia substation rebuild with one 46/13.2kV, 20/26/33 (37.3) MVA transformer, low-side medium voltage GIS, low-side capacitor bank and accompanying equipment, and conversion of 10 miles of 4.8kV Circuits 153 and 154 to 13.2kV.

Project Activities / Key Accomplishments in 2020

In 2020 the substation construction drawings for the in-ground and above-ground were completed and issued for bid. The SPC 1&2 drawings were completed. The final negotiation of construction contracts was completed.

Project Activities Planned for 2021

This year NYSEG plans to complete the permitting process and begin substation construction. Specifically, this year we will work on below-grade substation construction. The permits we will put into process are building permits.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
6/11/2021	8/26/2021	7/8/2021	12/01/2022*	12/01/2022

*Substation upgrades will be completed in March 2022. Distribution line work will be completed in December 2022.

49 - Residential Line Extensions

Program Overview

This program provides distribution line extensions and necessary facilities to provide service to residential development projects. This program provides the necessary equipment (transformers, conductors, conduit, hand holds, man holes, etc.) to large scale residential projects. This program does not include the connection of individual residential units or meters.

Program Activities / Key Accomplishments in 2020

In 2020 over 880 poles, 440 crossarms, 679 transformers, 880 cutouts and 403,000 feet of conductor were replaced or installed to support residential construction demand.

Program Activities Planned for 2021

This program is budgeted based on historical trends and is driven by customer demands. If a project is greater than 200K a separate tracking order is created.

50 - Service Connects

Program Overview

Install new electric service to individual residential units where customers have requested service.

Program Activities / Key Accomplishments in 2020

During 2020 over 745 poles were replaced, 440 crossarms, 1,200 transformers, 1,600 cutouts and 209,000 feet of conductor were installed. 3,386 service connects were completed in 2020.

Program Activities Planned for 2021

This program is budgeted based on historical trends and activities are dependent upon customer demand.

51 - Industrial Commercial

Program Overview

This program provides service connections for industrial and commercial customers. The cost of the service is comprised of tariff portions as well as customer payments for amounts above the tariff required provision.

Program Activities / Key Accomplishments in 2020

In 2020 over 470 poles, 600 crossarms, 540 transformers, 770 cutouts and 232,000 feet of conductor were installed or replaced in support of Industrial and Commercial services.

Program Activities Planned for 2021

This program is budgeted based on historical trends and is dependent upon customer demand. If a project is greater than $200K it is removed from this program and tracked separately.

52 - Storm Restoration

Program Overview

Distribution and/or transmission broken pole and/or conductor replacement during a major storm event.

Program Activities / Key Accomplishments in 2020

In 2020 over 660 poles, 250 crossarms, 300 transformers, 100 cutouts and 17,000 feet of conductor were replaced due to major storm damage. There were twelve storm events over the NYSEG service territory during the year.

Program Activities Planned for 2021

This program is planned based on long term history.

53 – College Ave Underground Project

Project Overview

The City of Ithaca has requested that the existing overhead electric facilities on College Avenue (from Dryden Road to Mitchell Street) be moved underground.

To accomplish this work five single vaults with submersible transformers, and three double vaults with submersible transformer and switchgear are required to be installed. Additionally, approximately 1365 feet of primary duct bank and approximately 500 feet of secondary duct bank is needed. The project will install manholes/handholes on property lines to adequately serve each location.

Project Activities / Key Accomplishments in 2020

The Company designed the project, purchased eight submersible transformers, vaults and cable. Construction started in August 2020 and continued throughout the remainder of the year.

Project Activities Planned for 2021

Installation of the single and double vaults, submersible transformers, switchgear, primary and secondary duct bank and manholes/handholes will be installed during 2021. The project will be substantially completed during 2021.

54 - NYSEG - Make Ready

Program Overview

This program has been separately identified to plan/track make ready work apart from normal Distribution Line program work. Make Ready work is associated with upgrading Company facilities so that third party attachers can safely install their equipment on the Company's assets. Over the past three years the work associated with third party installers has increased substantially due to the Broadband initiative taking place in NY.

When a third party attacher submits an application to attach to poles and the pole fails inspection do to structural standards it is NYSEG's responsibility to replace the asset even if it would normally not have been replaced for many years. Note that if the structure meets design standards and the pole is required to be replaced solely due to the attacher's request, the attacher pays the cost to upgrade the pole and/or move circuits.

Program Activities / Key Accomplishments in 2020

Over 1,800 poles were replaced under this program, all related to third party requests to affix infrastructure on NYSEG owned poles.

Program Activities Planned for 2021

This programs budget is based on number of applications and total poles being attached to each year.

55 - Street Lighting

Program Overview

This program provides new overhead street and area lighting and replaces damaged lighting facilities. This program also includes the conversion of existing lighting to LED lighting at those municipalities that request this change.

Program Activities / Key Accomplishments in 2020

In 2020 over 15,500 LED Cobra Heads were installed.

Program Activities Planned for 2021

This program is planned based on historical trends plus any added work related to LED lighting conversion that are requested by municipalities.

56 – Non-AMI DSIP Enterprise Analytics

Project Overview

For the AVANGRID Enterprise Data Analytics Implementation Project, a qualified industry expert will focus on deploying data quality assessments to complete a series of Use Cases detailed on the Roadmap using a structured and value driven approach, planned to be completed over two years. The deployment will move the Companies from our current initial level of analytics capabilities closer to maturity. The project's outputs will include initial Use Case deployment. Data and analytics are foundational to realizing Utility of the Future initiatives. The "smart" revolution is exponentially compounding the amount of grid and customer data utilities generate. The development of the Distributed System Platform (DSP) will introduce a range of new data in the NYSEG and RG&E service territories, including sub-hourly customer consumption data, status information from grid devices, interval measurements of service conditions on distribution feeders, and a growth in Distributed Energy Resources (DER) information. As the volume of data collected increases in magnitude and diversifies through the platform investments, AVANGRID recognizes the importance of leveraging Data Management, Business Intelligence, and Advanced Analytics to extract insights from this data to help move the business and the market toward a future of informed, proactive, and agile decision making. In addition, the Companies intend to use the Enterprise Analytics effort to better inform data quality and required data elements in support of the use cases envisioned in the recently released Integrated Energy Data Resource (IEDR)Order.

Project/ Key Accomplishments in 2020

In 2020, the installation of the Big Data Analytics platform continued. The platform consists of advanced hardware and software components to develop Use Cases which pull massive amounts of structured and unstructured data together into a data lake which can then be modeled to develop advanced analytics modules that help drive business decisions.

The original technical hardware and licenses of several software products were extended and upgraded to continue our effort in analytics and allow for additional users.

2020 began with a Roadmap-Refresh workshop engagement with business users from many business areas to identify future use case opportunities, and to perform a round of prioritization of projects.

In 2020, the Companies primarily completed second and third Use Cases focused on Distribution Transformer Monitoring and Estimated Time of Restoration respectively. Enhancements to functionality and data validation will be part of the 2021 workplan.

The internal organization developed more concrete governance around data migration, resolving technical issues, engaging the business, and defining specific roles. The

Information Technology (IT) Data Analytics group developed a framework agreement for big data services to document agreement of requirements from the vendors providing the service.

A large goal for 2020 was to implement an Agile methodology and approach to program management and testing procedures to better align with Company initiatives and provide more alignment to business needs.

Project Activities Planned for 2021

2021 includes another refresh of the data analytics Roadmap with a cross functional workshop with business users from many business areas to identify future use case opportunities, and to revisit the prioritization of use cases / projects.- In addition, one of the lessons learned regarding the Companies data in 2020 is that the quality and availability is not to a standard that will allow for robust development of operational and planning use cases. This data is likely to be more readily available once the Companies Grid Model Enhancement Project (GMEP) is completed. Therefore, the Companies will take some time in 2021 to re-assess and re-evaluate the quality and governance processes needed to enable robust use cases. In parallel, we will enhance the current Estimated Time of Restoration (ETR), Transformer Monitoring and Vegetation Management use cases. Through the discovery workshops, we have identified an asset management use case which was kicked off in January 2021 and is ongoing. This effort is expected go live by the end of 2021.

2021 use cases will be using an Agile Methodology, with IT subject matter expert resources assisting the Data Analytics core team in oversight and supervision of the methodology and applying lessons learned and best practices.

Follow-ups will be done with the vendors to ensure that the IT Framework for big data services is applied and followed.

61 – NYSEG AMI

For the narrative on this project please refer to NYSEG Common Project Narrative #26.

63 - NYSEG - Resiliency Plan

Project Overview

NYSEG prepared its Resiliency Plan to reduce the number of customers that experience outages during low-probability, high impact storms and during storms that are less severe but occur more frequently. In addition, the implementation of the Resiliency plan allows the Companies to restore power more quickly when outages occur as well as increasing reliability due to non-weather events.

The Resiliency Plan responds to the number of storms of all types and severity that the Companies have experienced over the last several years and an emerging consensus that the Companies should enhance the resiliency of their electric distribution systems in order to reduce the costs imposed on customers by long outages and expensive restoration efforts. The New York State Department of Public Service (DPS), in its recently completed investigation of the 2018 winter and spring wind storms observed:

> Due to the rise in storm intensity, dedicated storm hardening programs need to be developed and implemented throughout New York State to reduce damage from future weather events. The 2018 Winter and Spring Storms are examples of major storms that greatly impacted New York's electric distribution system in 2018. The experiences from the 2018 Winter and Spring Storms make it clear that storm hardening efforts are needed to mitigate some of the impacts to the distribution infrastructure and customers.[1]

As businesses and residences rely more on electric vehicles and other electric end-uses, the Companies expect that the tolerance for extended outages will continue to diminish.

The Resiliency Plan documents a combination of Hardening, Topology and Automation capital program. A project may include all 3 components or any one of the components. The hardening of the existing infrastructure increases the ability of the system to withstand intense storms and thereby reduce the number of outages.

- Hardening of infrastructure (e.g., poles, cross arms, wires, etc.) involves using more robust construction practices and materials.

- Changes to the topology of circuits enables the Companies to isolate outages and restore power more quickly through a combination of actions including adding or upgrading lines, increasing feeder ties, and adding automation. Automation

[1] 2018 Winter and Spring Storms Investigation, Case 19-M-0285 - In the Matter of Utility Preparation and Response to Power Outages During the March 2018 Winter and Spring Storms, New York Department of Public Service, April 18, 2019, p. 157.

includes the installation of additional Supervisory Control and Data Acquisition (SCADA) enabled line switches, tie switches, and reclosers to segment long circuits into multiple sections that can be isolated automatically in order to limit the number of customers that lose power, and also increase the speed of restoring power.

Project Activities / Key Accomplishments in 2020

Many of the projects included upgrades using covered wire and ground to sky enhanced tree trimming was applied based on voluntary consent from the landowners.

The following NYSEG projects have been completed in 2020. Elmira Division North Urbana 535, nine-mile upgrade with a new tie to Canada road 562 and additional SCADA switch and remote recloser. Plattsburgh division installed two diesel generators with remote capabilities, and two additional SCADA switches and five additional remote reclosers in the Long Lake area. Oneonta South Cooperstown 275, seven-miles were upgraded and included a new remote recloser. Lancaster South Park 471, one-mile upgrade and additional SCADA switch and two remote reclosers. Mechanicville Division had 41 devices installed impacting Raylinski 606, Mulberry 602, Luther Forest 607 and 635. The four circuits have back up capabilities to each other and there are three remaining devices planned to complete the remote capabilities to Energy Control Center. Brewster Division Teakettle Spout 490, 491 and 489, included a four-mile upgrade and two additional SCADA switches and five remote reclosers. Also, several projects were started in 2020 and will be completed in 2021, including Croton Falls 514, 515, 516 - a four-mile upgrade and eight SCADA switches. This will be completed February of 2021. The last project in Brewster started in 2020 is Goldens Bridge 420/421 six-mile upgrade a remote recloser and sixSCADA switches and a mile upgrade on Goldens bridge 418 related to the other circuit work to strengthen ties with surrounding circuits. This work will be completed 2nd quarter 2021. We are completing the remote communications early 2021. The work strengthened ties with surrounding circuits and the source into Heritage Hills Subdivision.

Project Activities Planned for 2021

Planned projects for NYSEG include completing the projects started in 2020 mentioned above and upgrades creating ties and installing automated devices; SCADA switches and reclosers for Brewster Division Crafts 422, 423, 424, Pound Ridge 455, Binghamton Division Vestal 623 and Liberty Division Yulan 204.

This program will continue construction throughout 2021.

64 - Coopers Corners, Add 3rd 345/115kV Transformer

Project Overview

The Coopers Corners project is to install a third 345/115 kV, transformer, install a third 115/34.5 kV transformer, replace the existing 115/34.5 kV and two 345/115 kV transformers and replace the existing 34.5 kV grounding bank. This work is being done in order to improve reliability and address asset condition.

The loss of the 115 kV bus at Coopers Corners Substation results in a configuration where the load in the Liberty area is fed radially from a single 69/34.5 kV transformer at West Woodbourne Substation. In this configuration, voltage collapse conditions were observed. The same condition occurs if both of the existing 345/115 kV transformers are lost.

This project has been moved from being an individual project to being combined with the NYSEG BES program. The project has been changed such that construction will start in 2028 and the completed substation will be placed in service in 2031.

65 - CCTP - Columbia County - Valkin 115kv Line

Project Overview

The original scope of the project was to build a 115kV line from National Grid Trunk #15 to NYSEG Klinekill substation, a new 115kV terminal at Klinekill substation, and a 3-breaker ring bus connecting to the 115kV National Grid line.

An Article VII application was filed and during the Article VII proceeding a 34.5kV option was suggested by the Department of Public Service. The proceeding participants engaged in confidential settlement discussions concerning the 34.5kV alternative, a joint stipulation was signed, and the Article VII application was put on hold while final government approvals to the stipulation were obtained.

The final scope agreed to in the Joint Stipulation consists of the following scope:

1. Loop in and out 115kV tap (about 0.92 miles each way) from National Grid 115kV line to a new substation
2. New Falls Park 115/34.5kV Substation (Located in Ghent, NY) with a 50 MVA transformer and a 115kV ring bus
3. Two distribution feeds from the new substation

Project Activities / Key Accomplishments in 2020

In 2020 the project, including construction and integration of seven miles of distribution Circuits 640 and 641, was completed. The transmission line was completed, and the substation were energized in previous years.

Project Activities Planned for 2021

There is no further work planned for this project.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
6/2018	8/2019	6/2018	6/2020*	6/2020

*Substation and transmission line work was completed in August 2019. Distribution line work was completed in June 2020.

67 - Flat Street - Bank 2 New Transformer

Project Overview

The Flat Street Substation project will installed a second 115kV - 34.5kV, 20/26/33 (36.4) MVA, LTC transformer along with the associated switchgear and protection equipment.

The Flat Street Substation experienced sub-marginal voltages in the areas served from the Pulteny, Dundee, Himrod, Keuka Pk, Lake Mt, Porters, Merrit Hill, Seneca and Transelco substations and the LTE rating was exceeded at the Flat Street Substation 115kV - 34.5kV transformer and at the Dundee - Seneca 34.5kV line upon loss of the Greenidge 115kV - 34.5kV transformer. The exposure to either sub-marginal voltages or thermal overload, given the contingency, is 900 hours per year. Presently, this contingency causes 5,524 customers (with 22.5 MW of summer load and 14.9 MW of winter load) to be dropped. In addition, sub-marginal voltages appeared in the area(s) served from Keuka Pk and Merritt Hill substations upon the loss of Flat Street 115kV - 34.5kV transformer. The exposure to sub-marginal voltages given the transformer loss contingency is 25 hours per year. This contingency would cause 274 customers (with 4.3 MW of winter load) to be dropped.

Project Activities / Key Accomplishments in 2020

Construction, testing and commissioning was completed and energized in 2019. Protection and Control work at the remotes was construction and energized in May 2020.

Project Activities Planned for 2021

There is no addition work planned for 2021.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
1/1/2010	3/31/2020	6/1/2018	4/2/2020	4/15/2020

68 - Wood Street, Add 3rd 345/115 kV Transformer

Project Overview

The Wood Street project is to install a third 345/115 kV LTC transformer rated 150/200/250 MVA at Wood Street Substation and operate it in parallel with the two existing 345/115 kV LTC transformers.

Project Activities / Key Accomplishments in 2020

In 2020 we accelerated the start of detailed engineering and accelerated the procurement process for long lead items such as the transformer and breakers and other equipment.

Project Activities Planned for 2021

This year the Company plans to start execution after the summer and start receiving equipment at site.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
6/3/2021	10/6/2021	10/25/2021	7/1/2022	9/30/2022

69 - Willet - Install Second Transformer

Project Overview

The scope of this project includes the installation of an additional 20/26/33 MVA LTC transformer to operate in parallel with the existing transformer and provide the necessary switchyard equipment as well as protection and control equipment. Presently, sub-marginal voltages appear in the areas served from the Marathon, Chenango Forks, Dorchester, Greene, Katelville, Willet, High Street, Tarbell and Whitney Avenue substations upon loss of the existing Willet 115/34.5kV transformer.

Project Activities / Key Accomplishments in 2020

During 2020, detailed engineering and construction was started. Construction completed during 2020 included in-ground work, transformer installation and testing as well as the control house installation. Additionally, the following work was started and will continue into 2021: above ground work, transmission and distribution line work. All major materials have been delivered to the project site.

Project Activities Planned for 2021

The project will be completed and placed in service in 2021. The following work will be completed during the year: above ground work, installation of transmission and distribution line facilities, energization of the transformers, testing and commissioning of the substation and moving the existing transformer from the Willet Substation to its new location and energize it.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
3/31/2020	10/9/2020	12/3/2018	6/30/2021	6/30/2021

70 - Carmel New 2nd 115/46 kV Transformer

Project Overview

Install a second 115/46 kV, 30/40/50 MVA, LTC transformer at Carmel Substation and operate it in parallel with the existing 115/46 kV, 30/40/50 MVA LTC transformer.

This project is currently being studied for a possible NWA solution. Due to this study, the wires solution is on hold until an NWA determination is finalized.

71 - Roll Road New 2nd 115/34.5kV Transformer

Project Overview

This project scope involved installing a new 34.5kV 5.4 MVAP switched capacitor bank at the Roll Road Substation.

This project is currently under further engineering review and analysis.

72 - Lyon Mountain New 2nd 115/34.5kV Transformer

Project Overview

This project scope involved replacing the Lyon Mountain transformer/ regulator combination with a new 115/ 34kV, 22.4 MVA LTC transformer.

A load analysis done several years ago determined that for overload of the Chateaugay 115/34.5 kV transformer or its 115kV connection, local submarginal voltages appear. The exposure would be 400 hrs./yr., affecting 5524 customers and 14.9 MW of load. Upgrading the Lyon Mt transformer/regulator would allow load transfer to the Lyon Mt substation.

However, after additional engineering review was completed and a current load analysis was done, no transformer loading or voltage issues were identified. As such this project has been cancelled.

73 - Watercure Rd. - 2nd 345 kV Transformer

Project Overview

The scope of this project is to install a second 400mVA 360/240/36.2 kV, LTC transformer at the Watercure Substation, Elmira, NY to work in parallel with the existing one. It is also included in the scope of the project the modification of the 345kV and 230kV Ring Bus Arrangement into full Breaker and a Half Arrangement and the relocation of 230kV line L69 Watercure-Hilldale.

Project Activities / Key Accomplishments in 2020

In 2020 modifications of the 345kV ring bus arrangement into full breaker and a half arrangement were completed. This work included the protection and control equipment.

In addition, the following portions of the project were completed in 2020: installation of the perimeter light system, installation of steel platforms for new breakers, installation of drainage swales, leveling and apply stone layer to the full yard, removal and disposal of soil and cable.

Project Activities Planned for 2021

No activities are planned for 2021.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
4/1/2019	5/31/2019	6/1/2019	6/30/2020	7/31/2020

74 - Kents Falls - Penstock, Ring, Tailrace

Project Overview

The NYSEG Kents Falls Hydroelectric Project is located on the Saranac River, in the Town of Morrisonville, New York (Federal Energy Regulatory Commission Project No. 2738). The facility is unstaffed, with three hydropower turbine-generating units that are remotely monitored and controlled and are rated to produce a total of 13.68 MW. The plant is a Run-of-River operation, which means that a consistent pond level is maintained, while utilizing the natural flow of the river to generate hydroelectric energy.

Approximately 1,000 feet of 11-foot diameter steel penstock is currently supported using steel support saddles, founded on concrete. The penstock saddles are at end of their life and the interface between the penstock and support steel is creating stress points, resulting in localized water leakage from penstock movement during operation of the facility. Removal of the existing penstock saddles and implementation of the new penstock ring girder design will eliminate the stress points and annual maintenance required to address and repair the on-going penstock leaks.

At the downstream end of the 2,668-ft long by 11-foot diameter steel penstock, the penstock trifurcates into three individual 6.5-foot diameter penstocks that provides water to each of the three turbine-generating units. The trifurcation, constructed and installed in 1928, is riveted steel fabrication, original to the plant, and is at end of life. Removal of the existing trifurcation section, and associated penstocks to each turbine-generator, and fabrication of a new welded steel trifurcation and penstock assemblies will eliminate the need for annual inspection and routine repairs, reduce personnel safety access issues and improve overall operational reliability.

Project Activities/Key Accomplishments in 2020

Bids received for the work exceeded the estimated costs. The project is currently being reviewed for scope, schedule and cost.

In 2020, NYSEG completed the Tailrace Improvement Project at Kent Falls. The project involved installation of a new concrete wall in the tailrace of the powerhouse that was originally constructed in the 1920’s and at end of life. In addition, installation of new draft tube stop log guides occurred in preparation for the penstock, ring girder and trifurcation upgrades. Draft tube stop logs will be used to safely isolate the work area during installation of the new trifurcation and penstock sections and prevent water from entering the powerhouse.

Additionally, relocation of the medium voltage electrical circuits into and out of the Powerhouse were completed in 2020. Relocation of the electric service was planned and performed in preparation of the ring girder, trifurcation and penstock upgrades.

Project Activities Planned for 2021

There are no planned construction activities presently scheduled in 2021 on this project. Review of the scope, schedule and cost of the ring girder, trifurcation and penstock upgrades will continue in 2021.

75 - NYSEG - Animal Guards

Program Overview

An analysis of the past 3.5 years of interruptions at NYSEG found that 12% of the interruptions were caused by animal contact. These animal contact interruptions accounted for 5% to 9% of the past 3.5 years SAIFI. Installation of various devices on substation equipment is aimed to reduce animal contacts that lead to damage and outages.

Program Activities / Key Accomplishments in 2020

During 2020 this program procured installed animal bushings and bracket guard at various substations in the Brewster, Elmira, Geneva, Hornell, Lancaster, Liberty, Mechanicville, Oneonta and Plattsburgh Divisions

Program Activities Planned for 2021

This program is budgeted based on average cost to add a animal guards to existing transformers without guarding. New transformers are equipped with these guards in place.

79 - Electric Vehicles NYSEG

Project Overview

The EV Make-Ready Program supports the development of electric infrastructure and equipment necessary to accommodate an increased deployment of EVs within the NYSEG service area by reducing the upfront costs of building charging stations for light-duty EVs. Through this EV Make-Ready Program, entities seeking to install or participate in the installation of Level 2 ("L2") and/or Direct Current Fast Charging ("DCFC") chargers can earn incentives that will offset a large portion of, or in some cases, all of the infrastructure costs associated with preparing a site for EV charger installation. Incentives are categorized by utility-side make ready and customer-side make ready. Utility-side make ready includes all traditional distribution work for new service lines and/ or service upgrades and incentives are recoverable through capital plant in service. Customer-side make ready includes all electrical infrastructure from the point of utility point of attachment up to but not include EV charging stations themselves. Customer-side incentives are recoverable as regulatory assets amortized over 15 years through a surcharge on customer bills.

Project Activities / Key Accomplishments in 2020

The NY PSC authorized the EV Make Ready Program on July 16, 2020. The Companies have collaborated with the Joint Utilities of New York (JU) to jointly and independently file several regulatory compliance deliverables including program plans and other requirements. The NYSEG official program launch date was September 14, 2020. The Companies have received, and are processing, applications for projects in various stages of development, however no incentives were paid in 2020.

Project Activities Planned for 2021

The goal for 2021 is to incentivize the development of 441 L2 charger plugs and 13 DCFC plugs (one EV charging station may have multiple plugs). On-boarding of two key contractors including and program implementation support contractor and a communications and marketing contractor are expected to be complete by the end of Q1 2021.

Appendix C

RG&E Electric and Generation Project Narratives

2 - Station 43 Modernization Project

Project Overview

The Station 43 is an existing 34.5kV – 4kV substation located Rochester NY. The loading on the existing 6.25 MVA transformer banks #3 and #4 at Station 43 has reached 113% and 95% of their PLBN rating respectively during the summer peak of 2011. The transformers are older units, #3T was installed in 1950 and #4T was installed in 1953. The total peak loading at the station is above 12 MVA, attributable to the six circuits, three fed from each transformer. The station serves approximately 6,467 residential and commercial customers. Loss of either transformer places the other in a situation where it is loaded well above its LTE rating, which conflicts with Distribution Planning Criteria.

The scope of this project is to replace transformer Banks #3 and #4 with two 34.5-12.5 kV, 22.4 MVA transformer banks. The project will also convert the existing 4.16 kV distribution circuits 5328, 5329, 5330, 5331, 5332 & 5333 to 12.5 kV. Additional work includes the installation of new 34.5kV & 15kV GIS Switchgears inside of a new pre-fabricated building which will replace the existing control building, also a new battery system will be installed into the new building and two new 100kVA auxiliary service transformers will be also installed.

Project Activities / Key Accomplishments in 2020

In 2020 we completed the detailed design and issued construction drawings. The foundation construction package was bid. Procurement of the control building was completed; the manufacturing of the transformers and switchgear was also completed. Construction was delayed in 2020 to accommodate changes in design requirements.

Project Activities Planned for 2021

This year we plan to start the foundation construction for the two transformers and new control house building.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
7/27/2021	11/22/2021	9/21/2021	2/1/2027	2/9/2027*

*Substation work will be completed in March 2025. Line work will continue through 2027

3 - Station 38 - Total Refurbishment

Project Overview

The scope of this project is to replace the existing switchgear at Station 38 with new 4kV, 11.5 kV and 34.5 kV GIS SF6 switchgear. Additionally, this project includes removal and replacement of 3T and 4T that are outdated, and replacements parts have become difficult and costly to procure. The entire investment encompasses upgrading auxiliary services for the station; new electronic protection relays with IEC 61850 capabilities, new battery banks and AC/DC control panels. The entire infrastructure will increase safety for local operators and protect the reliability of the downtown underground network.

The following construction has occurred; 4kV, 11.5kV and 34.5kV switchgear removals and installation, Medium voltage, Low voltage and Fiber Optic cable installation, two house service transformers replaced, cable supports, cable tray and grounding.

Remaining construction tasks include: replacing 34.5kV Transformers 3T and 4T with new oil containment systems, new station ground grid, medium voltage feeder cables and low voltage cable related to the transformers

No new lines were required for this project; existing underground cables serve the 4kV, 11.5kV and 34.5kV system. High potential voltage testing of new medium voltage cables and splices will be performed as will point to point continuity and Megger testing of low voltage cable and functional testing of relays and alarm circuits will be performed.

Project Activities / Key Accomplishments in 2020

In 2020 RG&E accomplished the removal and replacement of Transformer 4T including a new foundation and oil containment system with energization expected in February 2021. Asbestos abatement and the removal of the old 4kV switchgear was also completed.

Project Activities Planned for 2021

After energizing Transformer 4T, Transformer 3T and its existing foundation will be removed. The foundation, oil containment, fire walls and Transformer 3T will be constructed and installed.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
1/1/2015	9/25/2020	12/3/2012	5/7/2021	7/1/2021

4 - Station 5 - Modernization Project

Project Overview

Station 5 is a Hydro-Generation Plant located in Rochester, NY and also encompasses a substation located at the generation plant. The project scope includes the replacement of the existing 11kV network's breakers, switches, reactors and associated protective devices. The existing equipment will be replaced by three new 11kV GIS switchgear sections. The associated 11kV relays and controls will be microprocessor relays installed on the new 11kV switchgear and relay cabinets. Existing line series reactors will be replaced with new reactors of the same sizes including the R-Y bus reactor. Existing generators grounding breakers, switches, resistors, and electromechanical relays will be replaced. Cable termination and the 11kV line cables upgrade leaving the station up to the first manhole is included within the scope of this project.

Project Activities / Key Accomplishments in 2020

During 2020, the substation and remote end engineering was advanced, and the reactors were procured and received. The route analysis was delayed to review and reevaluate the originally proposed route. Upon agreement of the finalized route, detailed engineering was advanced.

Project Activities Planned for 2021

In 2021, engineering for the substation, remote ends, duct bank inclines and rockfall protection will be completed. The substation construction contract will be bid and awarded. Materials for construction will procured and delivered, including the switchgear, batteries, breakers, and protection and control panels.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
1/2/2012	5/29/2020	1/26/2022	2/17/2023	2/28/2023

5 - Station 418 Upgrades

Project Overview

This project involves upgrading Station 418 to expand its capability to terminate up to four 115kV transmission lines from its current configuration consisting of terminals for Lines 910 and 947 (formerly Line 917). The existing control house and auxiliary systems are at their maximum capacity. The system protection and control schemes and equipment are out of date and they require modernization. The scope of work includes the following: new 115kV control house, new auxiliary AC and DC systems, upgraded protection for 115kV breakers 91012 and 94702 (formerly 91702), replacement of over-dutied circuit switchers 1T41872, 2T41872, 3T41872 and 5T41872, upgraded line protection for Lines 910 and 947 (formerly line 917), upgrading the grounding and lightning protection, installation of in ground infrastructure (conduit and trench) to the control house from existing yard equipment, and retire all equipment in "old" 115kV control house.

Project Activities / Key Accomplishments in 2020

All construction was completed in 2020 and the project was energized.

Project Activities Planned for 2021

No construction activities are planned for 2021 due to project construction being complete.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
7/15/2019	1/6/2020	1/16/2020	12/22/2020	12/31/2020

6 - Station 127 - 115 kV System Upgrade

Project Overview

The existing 34/12kV transformer is loaded to 109% of rating. This 14 MVA unit supports three distribution circuits. The enhanced station capacity will facilitate adjacent stations 149 and 154 12kV circuit tie over for increased N-1 contingency. The larger transformer will improve system reliability by providing N-1 capacity to adjacent circuits that currently are without adequate circuit ties during high demand periods. The increased capacity will also help facilitate future 4-12kV conversions at Stations 149 and 154.

Project Activities / Key Accomplishments in 2020

In 2020 we installed the duct bank for Lines 815 and 816, energized Line 815, installed the access road, Storm Water Pollution Prevention Plan (SWPPP) required features to be installed and the existing yard was expanded to accommodate the next phases of work.

Project Activities Planned for 2021

This year we plan to construct the foundation and oil containment for the new transformer with the transformer delivery scheduled for Q3. Detailed design and SP&C 3-7 design for Phases 2 and 3 will be completed this year. We also plan to construct foundations for the bus extensions and the new switchgear.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
5/6/2020	5/17/2022	4/20/2020	3/6/2023	5/22/2023

7 - Distribution Line Inspection – RG&E

Program Overview

The Distribution Line Inspection program consists of replacing poles, cross arms, cut outs, transformers and any other unit of property identified by the annual inspection program that deems the unit of property as failing inspection criteria.

Program Activities / Key Accomplishments in 2020

In 2020 over 180 poles, 130 crossarms, 200 transformers, 60 cutouts and 14,000 feet of conductor were replaced.

Program Activities Planned for 2021

This program is budgeted based on the number of notifications written from the inspection program and an applied average cost per notification developed over historical trend factors.

8 - Transmission Line

Program Overview

The Transmission Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric transmission system. Also, work is performed to replace units of property identified from the transmission line inspection program for items that do not meet standards.

Program Activities / Key Accomplishments in 2020

In 2020, 20 poles and more than 10,000 feet of conductor were replaced.

Program Activities Planned for 2021

This program is budgeted based on the number of notifications and average cost per notifications experienced over the past several years. An additional amount is added for emergency repairs identified as well based on historical data.

9 - Distribution Line

Program Overview

The Distribution Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric distribution system. There are thousands of work orders created each year to record various types of unit of properties replaced due to emergency and other situations causing interruptions in service. This program also includes pole replacements that are needed due to third party attachers requests to install facilities on Company owned poles.

Program Activities / Key Accomplishments in 2020

In 2020 over 640 poles, 400 crossarms, 300 transformers, 460 cutouts and 128,000 feet of conductor were replaced. Demand from communication companies to install facilities on RG&E owned poles increased in 2020 due to the NY State Broadband Initiative.

Program Activities Planned for 2021

This program is budgeted each year based on costs that have occurred in prior years. It is hard to predict what may break and or be damaged by others, so a historical estimate is used year over year.

10 - Betterments

Program Overview

The Betterments program replaces various distribution system elements that contribute to high SAIFI measures. These projects focus on the reliability, operability and flexibility of the electric distribution system.

Program Activities / Key Accomplishments in 2020

In 2020 over 100 poles, 50 crossarms, 30 transformers, 100 cutouts and 51,000 feet of conductor were replaced.

Program Activities Planned for 2021

Divisions respond to smaller identified jobs to improve reliability of the system reduce risk for customer outages. The budget is planned based on historical spend levels. Any large job that is identified over 200K is broken out into a separate tracking order.

11 - Substation Circuit Breaker Replacement Program

Program Overview

This program replaces substation circuit based on the information provided by Assets Management and the Engineering Maintenance groups. As part of this program, the following breakers will be replaced: Breakers with a health index of 4 or 5 (poor or very poor condition), breakers with 4, 5 or 6 bushing in a bad condition and over-dutied breakers. If actions are not taken, a failure in one of these breakers will take out of service a portion of the system impacting CAIDI/SAIFI.

Program Activities / Key Accomplishments in 2020

In 2020, five breakers were replaced and the engineering and procurement to replace 45 breakers in 2021 was started. The limited number of qualified contractors restricted the number of breakers that were able to be installed at RG&E.

Program Activities Planned for 2021

This program spans over several years to upgrade/replace and add circuit breakers identified by the Asset Management group. 2021 plan includes the replacement of 45 breakers in the RG&E territory.

12 – RG&E - Substation

Program Overview

Substation Minor Program includes various work at substations such as the addition of bus covers, animal fences; replacement of surge arresters, insulators, switches, fences, instrument transformers (e.g. VT, CCVT), all of them under the $200K threshold for a major project.

Program Activities / Key Accomplishments in 2020

Relay equipment at Stations 80 and 122 was upgraded to address end of life electromechanical relays. Additionally animal fences were upgraded at two substations and insulator replacements were completed at six substations.

Program Activities Planned for 2021

This program is budgeted based on historical trend of work needed at the substations.

13 - RG&E Station 26 - Draft Tube Stop Gates Project

Project Overview

The RG&E Station 26 hydroelectric facility has two stop gates located at the discharge of RG&E Station 26 turbine-generator draft tube that allow for the safe isolation of the turbine-generating unit from the tailrace (Genesee River). In combination with the intake stop gate, they form an isolated work zone for the safety of personnel during maintenance and/or inspection activities of the water conveyance system and turbine-generator.

The scope of the Station 26 Capital Project is to design, fabricate, and erect a powered gantry system to facilitate the raising and lowering the two-draft tube stop gates.

The installation of a permanent draft tube stop gate gantry system is intended to create an isolated work zone for the safety of personnel that are performing maintenance and/or inspection on the turbine-generator and water conveyance system, including the draft tube.

The second part of the project is to design and install a new steel reinforced concrete tailrace wall that separates the discharge of Station 26 hydro-electric facility from (Genesee) river flow passing through New York State Canal Corporation's Court Street Dam, from entering the station tailrace. The existing tailrace wall, which was constructed circa 1952, is at end of life. The new wall design is taller than the existing to wall to optimize generation output.

Project Activities/Key Accomplishments in 2020

In 2020, RG&E completed construction of the permanent draft tube stop gate gantry system and steel reinforced concrete tailrace wall.

Project Activities Planned for 2021

Project closeout activities are scheduled to occur in 1st quarter 2021. Closeout of the project consists of activities such as: paying final invoices, ensuring the project is technically complete, work orders are closed and placing the project assets into service.

14 - Station 210 - Transformer Replacement and Modernization

Project Overview

This project will update Station 210 and includes the following scope:

1. Station Upgrade: replacement of the existing transformer, replace the control house with a new control house, new 12 kV and 34 kV gas insulated switchgear, update the associated 4 kV equipment to 12kV with a new IEC 61850 control system, install a new fiber optic link, patch panel and multiplex.
2. Distribution Circuits upgrade: Reconstruct and convert the four existing 4 kV circuits to 12 kV circuits.

The existing station 34/4kV transformer was installed in 1966. The existing substation transformer is loaded to 92% of rating (2012 loading). This 5.25 MVA unit supports four distribution circuits. The associated equipment is obsolete. Adjacent circuit ties are currently without adequate circuit capacity during high demand periods.

This project aims to reduce CAIDI and SAIFI due to unplanned outages due to obsolete equipment.

Project Activities / Key Accomplishments in 2020

In 2020 we accomplished the acquisition of the adjacent parcel necessary for the expansion of the substation, the demolition of the existing control house building and the demolition of the building on the acquired parcel in December 2020.

Project Activities Planned for 2021

This year we plan to get the construction permits and start the foundation construction.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
6/3/2020	10/27/2023	12/16/2022	9/15/2023	2/9/2024

15 - Station 82 Upgrades

Project Overview

This project requires an upgrade of the substation equipment associated with the Line 902 project, an upgrade of the substation's 115 & 34.5 kV breakers due to either asset condition or SC capacity, as well as the replacement of two 115-34 kV transformers and one 115-12.5 kV transformer due to asset condition. Additionally, the installation of a new control house with disturbance monitoring equipment is required to meet NERC requirements.

Project Activities/Key Accomplishments in 2020

Five alternative solutions for this project are under consideration including pre-conceptual plans, schedules, construction sequences, risk analysis and preliminary cost estimates for this project. Evaluation of these alternatives is necessary to determine best solution based on cost effectiveness and system needs. The team is also considering environmental concerns, permitting and real estate needs.

Due to the review of the originally planned approach reflected in Appendix R, the construction of this project will be moved to future years.

Project Activities Planned for 2021

In 2021, the plan is to complete the alternative analysis, gain approval of the selected alternative, complete the conceptual design and the baseline estimate. Procurement of detailed design will start this year along with the procurement of major materials. There is no construction planned for 2021.

The project is under development and a construction schedule is not yet available.

16 – Under Ground Cable Injection

Project Overview

This multi-year program will focus on treating Underground Residential Development (URD) type XLP (cross link polyethylene insulation that covers the conductor) cable by injecting fluid into the XLP conductor strands via an injection elbow located within the pad mounted transformer. The silicone fluid used is a dielectric enhancement fluid that permeates through the cable installation and fills voids in the insulation to prevent cable failures. These failures are listed under the URD equipment and pad mounted transformer category and account for 33.6% of customer interruptions. This process prevents the water from turning into electrical stress points in the cable and rejuvenates the cables dielectric strength. The cable injection method has been proven by the industry and RG&E to extend service life to 20 plus years, eliminate failures and improve reliability.

Project Activities/Key Accomplishments in 2020

In 2020 the Cable Injection Program for underground XLP distribution cable injected (35) distribution circuits located throughout the RG&E franchise area including circuits in the towns of Greece, Gates, Chili, Webster, and Victor. A total of 147,309 feet of XLP underground cable was treated. Some locations were that were planned for 2020 had to be delayed due to outage availability. These locations will be completed during 2021 when outages are available.

Project Activities/Key Accomplishments in 2021

In 2021 the Cable Injection Program for underground XLP type distribution cable will focus on (35) additional distribution circuits located in the RG&E franchise area (Divisions include: Rochester, Canandaigua, Lakeshore). Approximately 150,000 feet of XLP underground cable will be treated using the cable injection method.

17 - Line 785 Rebuild

Project Overview

The Line 785 Rebuild will undertake the replacement of 17 poles along Lee Rd in Rochester, NY on the 34.5kV Line 785 from Station 86. All poles are to be replaced with composite poles in conjunction with the pilot project completed in prior years at RG&E.

Project Activities / Key Accomplishments in 2020

The installation of all composite poles was completed, and the underground service connections and conduit were installed and energized.

Project Activities Planned for 2021

No further activities on this project are planned.

High-Level Schedule

Above Ground Construction Start	Above Ground Construction Finish	ISD
9/3/2019	5/13/2020	5/14/2020

18 - Line 753 Rebuild

Project Overview

RG&E Asset Management evaluated the condition of the 753 subtransmission line from Substation 158 to Substation 170 and rated it as poor and, after consultation with subject matter experts, recommends rebuilding a portion of the line from former Substation 182 to the recloser at Damsite Road on the north end. The project will also replace the existing 2/0 conductor that is over 90 years old and poles with an average age of more than 45 years. The Circuit 753 Rebuild project consists of rebuilding an approximately 2.7-mile section of the existing 24 mile 34.5kV Circuit 753 between Structures 79 and 161. This portion of the circuit has been identified to be in poor overall condition with respect to splices, clearance issues, and an inadequate wire size. The existing 2/0 conductor is to be replaced with 336.4 AAC to match the conductor used in adjacent line segments, all poles and hardware will be completely rebuilt in this section, and any existing distribution underbuild is to be transferred to the new structures. The project will also survey and address any issues found with the immediately adjacent poles up to the nearby reclosers at pole 76 at the northern section of this segment, and at pole 161-10 near Station 182.

Project Activities / Key Accomplishments in 2020

In 2020 RG&E completed construction, energization and restoration of this line.

Project Activities Planned for 2021

Construction is complete, no future activities are planned for this project.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
10/9/2019	11/27/2020	10/9/2019	11/27/2020	11/27/2020

19 - Station 208 Modernization Project

Project Overview

The scope of this project is to replace the existing AIS with a new 34.5 kV GIS, a new 15kV GIS class working at 12kV, new step-down distribution transformers will be installed to feed the existing distribution circuits and provide optimal conditions for a future conversion and a new battery system and communication system. The new equipment 34.5kV GIS shall be tapped from the existing 34.5kV C796 to the new 14MVA transformer and the new 15kV GIS class shall be connected from the low side of the new 14MVA transformer to the step-down transformers to finally feed the existing 4kV C242 and C243.

This project is being completed due to the station due to the obsolescence of the equipment (the substation was constructed over 50 years ago), the degradation of wooden structures, and the need for a control house.

Project Activities / Key Accomplishments in 2020

In 2020 project engineering as well as GIS and Transformer engineering was completed.

Project Activities Planned for 2021

During 2021, engineering for SPC 3-7 will be completed, a mobile substation will be installed, site demolition will be completed, in-ground and above ground construction will be completed, and the GIS will be delivered and installed. Testing and commissioning will be completed, and the project energized.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
11/20/2020	6/11/2021	6/11/2021	9/26/2021	11/8/2021

20 - Circuit 794 Rebuild

Project Overview

The RG&E Asset Management Health Report identified two segments on the RG&E 34.5 kV Line 794 that require intervention (i.e. additional analysis required to determine the extent of needs and upgrades that can be supported). A full needs and solutions assessment study was conducted in 2020 and included a visual inspection and structural analysis. The results of this needs assessment found that 69% of the poles needed to be upgraded. Other considerations, such as the age of the line, lack of static provisions, and poor ancillary equipment, etc., were evaluated and included in the development of the project scope.

This project will rebuild aged or deteriorated portions of Circuit 794, rebuild portions of Circuit 794 that don't meet current hardening standards, rebuild portions of Circuit 794 that don't meet current NESC clearance standards, and replace aged or deteriorated equipment at the substation remote ends related to Circuit 794.

Project Activities / Key Accomplishments in 2020

Engineering and procurement of major materials was completed. The project construction was bid and awarded. Minor portions of the construction were started.

Project Activities Planned for 2021

Construction of the line will continue throughout the year.

High-Level Schedule

Above Ground Construction Start	Above Ground Construction Finish	ISD
5/2020	4/2023	4/2023

24 - Pilot Wire Replacement Project

Project Overview

The purpose of this project is to replace the existing Pilot Wire cables throughout the RG&E network with fiber optic cables and upgrade terminal equipment and associated protective relays. The existing pilot wires are still in service and all pilot wire relay channels will have to be upgraded and moved to either the RG&E SONET network or to a direct fiber connection. The Pilot Wire Replacement Project will improve the system reliability by replacing the electro-mechanical pilot wire relays currently connected with copper pilot wires, with microprocessor type relays.

At this time, engineering scope is upgrading terminal equipment and associated protective relays. The early phases include stations which already have fiber optic or similar communication available. Later phases will include stations requiring additional work to replace the existing pilot wire cable with fiber optic cables and upgrade terminal equipment and associated protective relays.

The Pilot Wire Project will address the 23 circuits listed below, involving multiple remote end stations located across the RG&E network.

To date, the project has completed the upgrades for Circuits 706, 717, 719, 734 and 735. Construction on Circuit 736 has been started. Most of the circuits involving the remote stations are 34kV.

Circuit	Station A	Station B
567	7	36
609	18	37
628	95	403
633	95	403
652	2	6
680	7	36
706	7	95
711	29	95
713	7	29
714	7	412
715	48	412
716	37	48
717	22,33	37
718	1	29
719	7	95
725	29	33
727	42	56
731	29	33
734	7	18
735	7	81

Circuit	Station A	Station B
766	29	95
770	1	42
903	67	82

Project Activities / Key Accomplishments in 2020

Construction of Pilot Wires 351(P351) (Circuit 717), P352 (Circuit 735), P282 and P283 (P282 and P283 are both on Circuit 734) were completed and energized. Construction of P346 (between Stations 81 and 403) was started. Detailed engineering associated with P347 (Circuit 743), P348 (Circuits 676 and 768) and P349 (Circuit 715) was completed.

Project Activities Planned for 2021

During 2021, construction, commissioning and energization of P346 will be completed. Construction will be started on P347, P348 and 349. Detailed engineering for other phases will continue.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
5/17/2018	8/20/2027	1/2/2015	10/13/2028	11/25/2028

28 - Fossil Hydro Operations Minor projects

Project Overview

The RG&E Minor Capital Portfolio is in place to address multiple small capital projects and equipment upgrades needed to maintain the operating systems and to implement and upgrade safety features at the RG&E hydroelectric generating facilities.

Project Activities/Key Accomplishments in 2020

In 2020, detailed inspections at the RG&E Station 5 hydroelectric facility determined the need for some minor capital projects to allow for continued safe operation of the facilities. RG&E initiated and completed planning, design, and execution of multiple minor capital projects, including Station 5 headgates handrail upgrades and Station 5 powerhouse crane stop upgrades, to improve safe and reliable operation of the hydroelectric facilities.

Project Activities Planned for 2021

In 2021, RG&E plans to initiate and execute additional minor capital projects to address and improve personnel and dam safety, along with asset condition upgrades at the RG&E hydroelectric facilities. Projects include Station 5 Gate 3 Weir Tube Structural Improvements and Station 5 Powerhouse Heater Upgrades.

32 - Station 23 - New 115kV Downtown Station

Project Overview

This project will increase the capacity and reliability of Station 23 and associated remote end stations. The construction work includes work in multiple substations as well as transmission lines. Five fiber routes will also be constructed from Station 23 to its various remote ends.

Project Activities / Key Accomplishments in 2020

In 2020, the fiber optic installations for a new fiber ring around Station 23 was completed. In the station a new HVAC, fire detection and security systems were installed. Restoration efforts completed within the station included a new bathroom, fire walls and fire doors, and pad replacement for grounding transformers were all completed.

Project Activities Planned for 2021

All as-builts will be finalized and full project close out will occur.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
12/31/2014	8/21/2020	12/31/2014	6/30/2020	12/24/2020

33 - RARP

Project Overview

The Rochester Area Reliability Project (RARP) includes two new 115 kV transmission lines (TL) (lines 940 and 941), the re-build and relocation of a section of an existing 115kV line (Line 906), the construction of a new 345kV transmission line (Line 40), and the construction of a new 345 kV/115 kV substation (Station 255). The Project also includes the installation of equipment upgrades and additions at Station 418, Station 23, Station 80, NYSEG's Kintigh substation and New York Power Authority's (NYPA) Niagara substation. Two 345kV NYPA lines are interconnected to Station 255.

RARP provides a new source to the RG&E 115kV system and enables continuous electric service during maintenance or forced outrages of other primary sources into the RG&E system. Additionally, the 115kV lines will reduce thermal stresses on existing lines under both system normal and contingency conditions.

The completion of the RARP scope of work will address load growth and system resiliency under N-1-1 planning criteria.

Project Activities / Key Accomplishments in 2020

In 2020 RG&E completed all the work described above except the relocation of TL906 (which was accomplished in 2019) and Station 80 Bay 4 (which was completed in 2017). All assets were placed in service.

Project Activities Planned for 2021

This year we plan to complete minor restoration work and wetland work associated with plantings, wildlife enhancements, and invasive species control that is part of the agreement with the Natural Resources Conservation Service (NRCS).

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
10/25/2011	12/25/2019	10/25/2011	12/15/2020	12/31/2020

34 - Station 156 Transformer and Facilities Upgrade

Project Overview

The conversion to 12kV will enhance station capacity and adjacent station 12kV circuit tie over for contingency. The larger transformer will improve system reliability by providing N-1 capacity to the station and adjacent circuits that currently are without adequate circuit ties during high demand periods. The substation 1500kVA transformer is overloaded and the existing equipment is in poor condition. Replacement of Transformer Bank #1.

Station 156 is located in Manchester, NY. The facility is located on a small 100' X 100' plot, holds two transformers and a control house, serving 945 customers on three 4kV lines. The station is considered a 4kV island as the surrounding stations have been or are in the process of being upgraded to 12kV. The station's primary 34.5kV source is provided by RG&E Station 168 which is located east of Station 156

The station requires a complete upgrade to provide system reliability and future load growth for the area. Due to customer loading the station needs to remain in service while these upgrades are implemented.

The new station will be installed with state of art Gas Insulated Switchgear / Breakers for both the 34.5kV feeders and 12kV distribution lines. The switchgear will be housed in a new modern structure. A new single 34.5-12kv, 10/12/14MVA transformer will replace the two existing units and provides optimum margins; redundancy requirements will be met by the adjacent 12kV stations in the event of a transformer failure.

Project Activities / Key Accomplishments in 2020

In 2020, major equipment procurement, design and permitting activities were completed. Shop drawings for the transformer, switchgear, and control house were completed.

Project Activities Planned for 2021

This year RG&E plans to complete the detailed design, purchase materials and procure construction contracts. We also plan to procure contracts for SP&C 3-7 design and distribution design. In ground construction will begin in Q3.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
9/20/2021	7/24/2024	4/11/2022	7/3/2025	7/3/2025

35 - Station 46 - Replace #1 and #3 Transformer Banks

Project Overview

RG&E Station 46 is located in Greece, NY.

The loading on the existing 6.25 MVA transformer banks #1 and #3 at Station 46 has reached 99% and 82% of their PLBN rating respectively during the summer peak of 2011. The total peak loading at the station has been 13 MVA for two consecutive years of 2012 and 2013. The station's six distribution circuits serve approximately 6,356 residential and commercial customers. Presently, loss of either transformer places the other in a situation well above its LTE rating, which conflicts with Distribution Planning Criteria.

Transformer Banks #1 and #3 at Station 46 will be replaced with two 34.5-4.16x12.5 kV, 13.4/17.9/22.4 MVA Transformer Banks. Existing 4kV circuits will be converted to 12kV circuits, however, no new lines will be required for this conversion as the existing underground and overhead circuits are 15kV and 34.5kV class. A new control house will be constructed and 34.5kV and 115kV GIS switchgear will be installed. High potential voltage testing of new medium voltage cables and splices will be performed as will point to point continuity and Megger testing of low voltage cable and functional testing of relays and alarm circuits will be performed.

Project Activities / Key Accomplishments in 2020

In 2020 we completed the procurement of major equipment, design and permitting activities. Shop drawings for the transformer, switchgear, and control house were completed. Engineering analysis of the 4kV circuit conversion was completed.

Project Activities Planned for 2021

This year we plan to complete the detailed design, obtain permits, purchase materials and procure construction contracts. We also plan to procure contracts for SP&C 3-7 design and distribution design.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
9/6/2022	5/5/2025	7/6/2023	1/12/2026	3/16/2026

36 - Station 192 Upgrades

Project Overview

Station 192 serves approximately 600 customers in the Wolcott, NY area where the sole existing 34/4kV 1.5MVA transformer was recorded to have load rating of 113%. Replacing this transformer will enhance station capacity and improve station reliability. The conversion to 3 - 12kV distribution circuits will provide increased N-1 capacity to adjacent circuits that are currently without adequate circuit ties during high demand periods. In addition, it will also facilitate the possible decommissioning of nearby Station 181 and be the catalyst to future 4kV to 12kV conversions.

The scope of the project includes replace the existing transformer with a 34.5/12kV 10/12.5(14) MVA LTC Transformer. This will facilitate upgrades of the lines and pole mounted transformers associated with the existing 4kV circuits (C232, C215 & C216). Ratio banks (stepdown transformers) will be installed outside of the substation for 12kV to 4kV phase 2 conversation. The line survey will determine the location for placement of ratio banks. Approximately 20.8 miles of distribution lines (C232, C215 & C216) will be upgraded to support the 12kV load from Station 192.

Project Activities / Key Accomplishments in 2020

The bidding and award of major equipment, design and permitting services was completed during 2020. Shop drawings for the transformer and switchgear are complete. Equipment will be received in 2021.

Project Activities Planned for 2021

This year we plan to complete the detailed design, obtain permits, purchase materials and procure construction contracts. We also plan to procure contracts for SP&C 3-7 design and distribution design. Activities will also include the potential acquisition of adjacent property to Station 192 to allow for efficient and safe construction means.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
2/14/2022	5/18/2023	5/2/2022	10/17/2023	11/22/2024

37 - Station 117 - Replace #1 Transformer Bank and Convert Three Circuits to 12kV Operation.

Project Overview

Station 117 is located in East Rochester; New York and currently serves over 4,000 customers in the local area. This project will replace transformer bank #1 and associated gear with a 34.5-12.5kV, 20/26/33 (22.4) MVA transformer. In addition, the plan is to convert the three existing 4kV distribution circuits to 12kV. This transformer upgrade and this conversion of roughly 23 miles of circuits will enhance station capacity and adjacent station 12kV circuit tie over for contingency. The larger transformer will improve system reliability by providing N-1 capacity to the station, and adjacent circuits that currently are without adequate circuit ties during high demand periods.

Project Activities / Key Accomplishments in 2020

In 2020 we completed the bidding of major equipment, design and permitting activities. Shop drawings for the transformer and switchgear were completed. Equipment will be received in 2021.

Project Activities Planned for 2021

This year we plan to complete the detailed design, obtain permits, purchase materials and procure construction contracts. We also plan to procure contracts for SP&C 3-7 design and distribution design.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
11/29/2021	8/30/2022	5/5/2022	4/26/2023	6/20/2025

38 - Station 2 Modernization (Penstock, Intake, Reg Mandates, New Unit)

Project Overview

RG&E Station 2 is an existing hydroelectric generating station located on the Genesee River in downtown Rochester, New York that was constructed circa the 1950's. The Genesee River is diverted downstream of Gate 1 at the Central Avenue Dam into Browns Race where river water enters the Intake Rackhouse building. River water is then conveyed through the existing 11-foot diameter steel penstock to the 8.5MW turbine-generating unit, which is in the powerhouse near the base of High Falls. The existing penstock was fabricated and installed circa 1903 then reused when Station 2 was rebuilt in the 1950's. The penstock is at its end of life.

The Station 2 Modernization Project consists of two phases as described below:

- Phase 1A of the project includes the removal of the existing 11-ft diameter penstock and installation of a new 14-foot diameter bifurcated penstock and other regulatory mandated improvements.

- Phase 2 of the project includes deepening of Browns Race and construction of a second powerhouse for the additional 6.3MW turbine-generating unit (Station 2 - Unit #2). In addition to the new turbine-generator, the project will involve installation of new auxiliary mechanical and electrical operating systems. Project cost includes testing, commissioning and operating and maintenance documents required for safe, reliable operation of the facility.

In 2018, the project team developed a detailed design package for the Phase 1A scope.

Project Activities/Key Accomplishments in 2020

In 2019, Phase 1A work scope was competitively bid. Bids received in March 2020 revealed that construction costs to build Phase 1A work scope were significantly higher than initially estimated.

Due to the higher than estimated construction bids received for the project, award of the construction bid did not occur, and RG&E re-evaluated the project scope.

Project Activities Planned for 2021

In 1st quarter 2021, RG&E is planning to update FERC, along with other external stakeholders / agencies regarding the schedule to complete the Phase 1A scope of the project. After updating FERC and external stakeholders is complete, RG&E plans to re-initiate a competitive bid process for the Phase 1A scope with the plan to award the construction work in 2022.

42 – RG&E AMI

For the narrative on this project please refer to RG&E Common Project Narrative #28.

44 – RG&E BES Program - FERC Compliance

Project Overview

To ensure RG&E is compliant with the FERC Brightline Order, the Company has identified several new electric capital projects to be compliant with NERC Transmission Planning (TPL) Standards. These projects, to be managed under a comprehensive BES Program, include transmission line and substation modifications and upgrades. These include projects in the Rochester area.

The RG&E BES projects currently under development are as follows:

Project Name	Project Scope	Project Phase	Construction Start	Projected In-Service Year
St 127	**Reliability:** • 2 - 115kV, 20MVAR Capacitor Banks **Asset Condition:** None	**Conceptual Engineering**	**Feb 2023**	**2024**
L947 Re-Build 115 kV (From ST 070 to ST418)	**Reliability:** • Re-Build L947	**Article VII Certification Application**	**Aug 2025**	**2027**
L949 (L499, St418 and ST 48)	**Reliability:** • New 6.7 mile 115KV Line from St 48 to St 418 **Asset Condition:** None	**Article VII Certification Application Approval**	**May 2024**	**2025**
St 56	**Reliability:** • Set up of 115 kV Line 24 into an in-and-out configuration to replace existing tap. • Reconnection of 115 kV line 23 to transformer 2. • Expansion of 115 kV bus with tie breaker. • Replacement of 2 station service transformers • SP&C upgrades	**Detailed engineering**	**Aug 2021**	**2022**

Project Activities / Key Accomplishments in 2020

Project	Accomplishments
St 127	Start of Conceptual Engineering.
L947 Re-Build 115 kV (From ST 070 to ST418)	Conceptual engineering, and creation of Article VII Certification Application Exhibits.
L949 (115KV St 48 to St 418)	Filed Article VII Application Amendment, completed Detailed Engineering of L949 and ST 48. Station 418 detailed engineering to a 90% mark.
St 56	Started detailed engineering, started RFPs for critical long-lead equipment and construction.

Project Activities Planned for 2021

During 2021, the following activities are planned:

Project	Accomplishments
St 127	Completion of Conceptual Engineering and start of Detailed Design. Begin RFP Processes for long lead items.
L947 Re-Build 115 kV (From ST 070 to ST418)	Submit Article VII Certification Application.
L949 (115KV St 48 to St 418)	Article VII Amendment approval begin EM&CP Phase
St 56	Completion of detailed engineering. Start of construction

High-Level Schedule

See above for detail, this project has many phases. Expected completion of the overall project is August 2027.

45 - NERC Alert Priority III – RG&E

Project Overview

RG&E must comply with the 2010 NERC Alert mandate to correct all conductors to ground clearances that do not meet NESC standards. Priority I and II line clearances were corrected by 2013. Priority III lines are being addressed in this phase of the project. The Priority III lines are all overhead 115kV transmission lines. There are 15 of these lines in RG&E with 109 Point of Interests, totaling 139 miles.

The scope of this project is to replace 115kV existing wood structure with a new wood structure, insulators, and cross arms and braces. In addition, the scope involves re-tensioning of conductor to address the clearance violation. The NERC Priority III is not a rebuild project and no new conductor is being replaced. Out of 15 lines, 9 lines were completed and placed in service during 2019. Five additional lines were constructed in 2020 with Line 906 to be completed in 2021. The project will be completed by Q2 of 2021. Guy anchor testing is being performed as part of this scope.

Project Activities / Key Accomplishments in 2020

In 2020 the Company completed construction along Lines 911, 916, 914, 927 and 908.

Project Activities Planned for 2021

This project is expected to be completed in Q1 of 2021.

High-Level Schedule

There are many phases with various construction dates. Construction started in 2018. The final construction work is expected to be completed and placed in service during the first quarter of 2021.

46 - Industrial Commercial

Program Overview

This program provides service connections for industrial and commercial customers. The cost the service is comprised of tariff portions as well as customer payments for amounts above the tariff required provision.

Program Activities / Key Accomplishments in 2020

In 2020 over 60 poles, 10 crossarms, 2 transformers, 10 cutouts and 1,000 feet of conductor were replaced in support of industrial and commercial installations.

Program Activities Planned for 2021

This program is budgeted based on historical trends and is dependent upon customer demand. If a project is greater than 200K a separate tracking order is created.

47 - Residential Service Installation

Project Overview

This program provides distribution line extensions and necessary facilities to provide service to residential development projects. This program provides the necessary equipment (transformers, conductors, conduit, hand holds, man holes, etc.) to large scale residential projects. This program does not include the connection of individual residential units or meters.

Program Activities / Key Accomplishments in 2020

In 2020 over 60 poles, 30 crossarms, 160 transformers, 70 cutouts and 153,000 feet of conductor were installed/replaced supporting various types of residential construction.

Program Activities Planned for 2021

This program is budgeted based on historical trends and is driven by customer demands. If a project is greater than 200K a separate tracking order is created.

48 - Service Connects

Program Overview

Install new electric service to individual residential units where customers have requested service.

Program Activities / Key Accomplishments in 2020

In 2020 over 200 poles, 90 crossarms, 160 transformers, 250 cutouts and 109,000 feet of conductor were installed/replaced. A total of 713 service installations were completed during 2020.

Program Activities Planned for 2021

This program is budgeted based on historical trends and activities are dependent upon customer demand.

49 – RG&E - Government Highway

Program Overview

This program relocates electric facilities that conflict with highway and road projects being undertaken by municipalities and other government agencies.

Program Activities / Key Accomplishments in 2020

In 2020 over 90 poles, 130 crossarms, 20 transformers, 90 cutouts and 40,000 feet of conductor were replaced or relocated in association with highway improvements. Large projects include Mt. Read Blvd and Empire Blvd.

Program Activities Planned for 2021

This program is budgeted based on historical trends plus any known projects communicated to the Company by various government agencies.

50 – RG&E - Rochester Mt Hope Phase 2

Project Overview

The city of Rochester is planning the full reconstruction of Mt. Hope Avenue, from Rossitier Road to Westfall Road. Rochester Gas and Electric (RG&E) has overhead and underground facilities in conflict with the proposed construction and must relocate these facilities before the City begins construction.

RG&E is relocating 39 poles, replacing 10,000 feet of 3-336.4AAB primary wire, 640 feet of 1/0AB primary wire, 3,400 feet of secondary and neutral wires, 400 feet of service triplex, and equipment such as transformers and capacitors. The overhead system consists of one circuit (Circuit 363) from Station 33 with one tie point to Circuit 487. The City has also requested RG&E to move the existing overhead secondary wires crossing Mt. Hope Avenue underground. This will include the installation of 1,700 feet of new 4” 2-way system with trenching and restoration, 500 feet of 1/0A EPR CNJ 15kV cable, and 600 feet of secondary 600V cables

Project Activities / Key Accomplishments in 2020

The above work was designed, installed/removed and transferred during 2020. The project is substantially complete with limited work to be completed in 2021.

Project Activities Planned for 2021

Small residual of clean-up work is being performed during 2021.

51 - Non-AMI DSIP Grid Automation

Project Overview

Pursuant to the Reforming the Energy Vision proceeding, an energy modernization initiative to fundamentally transform the way electricity is distributed and used in New York State, as well as the New York non-Automated Metering Infrastructure Distributed System Implementation Plans filed with the Public Service Commission, grid automation efforts aim to facilitate integration of clean energy resources and provide customers with tools to be able to take greater control over their energy usage.

Benefits include but are not limited to: (1) improved customer experience, (2) reduced outage frequency, (3) improved reliability performance, and (4) increase network automation.

Project/ Key Accomplishments in 2020

Grid automation efforts were successful in placing 461 devices in-production. For RG&E that included 12 reclosers / SCADA switches / sectionalizers in Canandaigua and Lakeshore.

Project Activities Planned for 2021

Grid automation will continue to focus on constructing, commissioning and placing 623 devices in-production. Deployment targets for RG&E include 1 recloser / SCADA switch / sectionalizer and 107 voltage regulators across Canandaigua, Central and Genesee. Work on this program will progress throughout the year.

52 - Non-AMI DSIP ADMS

Project Overview

The Advanced Distribution Management Systems (ADMS) will provide the ability to test distribution power flow, volt-var optimization, demand response, FLISR (Fault Location, Isolation, and Service Restoration), and DERMS (Distributed Energy Resource Management System).

Project/ Key Accomplishments in 2020

Project placed on hold due to the current data sources lacking enough specific and accurate data to feed the ADMS to be effective. The current Grid Model Enhancement Project (GMEP) is a key to producing consistent and accurate data as input to the ADMS system.

Project Activities Planned for 2021

The anticipated start for this project is 2022.

56 – RG&E Resiliency Plan

Project Overview

RG&E prepared its Resiliency Plan to reduce the number of customers that experience outages during low-probability, high impact storms and during storms that are less severe but occur more frequently. In addition, the implementation of this Resiliency plan allows the Companies to restore power more quickly when outages occur as well as increasing reliability due to non-weather events.

The Resiliency Plan responds to the number of storms of all types and severity that the Companies have experienced over the last several years and an emerging consensus that the Companies should enhance the resiliency of their electric distribution systems in order to reduce the costs imposed on customers by long outages and expensive restoration efforts. The New York State Department of Public Service (DPS), in its recently completed investigation of the 2018 winter and spring wind storms observed:

> Due to the rise in storm intensity, dedicated storm hardening programs need to be developed and implemented throughout New York State to reduce damage from future weather events. The 2018 Winter and Spring Storms are examples of major storms that greatly impacted New York's electric distribution system in 2018. The experiences from the 2018 Winter and Spring Storms make it clear that storm hardening efforts are needed to mitigate some of the impacts to the distribution infrastructure and customers.[2]

As businesses and residences rely more on electric vehicles and other electric end-uses, the Companies expect that the tolerance for extended outages will continue to diminish.

The Resiliency Plan documents a combination of Hardening, Topology and Automation capital program. A project may include all 3 components or any one of the components. The hardening of the existing infrastructure increases the ability of the system to withstand intense storms and thereby reduce the number of outages.

- Hardening of infrastructure (e.g., poles, cross arms, wires, etc.) involves using more robust construction practices and materials.

- Changes to the topology of circuits enables the Companies to isolate outages and restore power more quickly through a combination of actions including adding or upgrading lines, increasing feeder ties, and adding automation. Automation

[2] 2018 Winter and Spring Storms Investigation, Case 19-M-0285 - In the Matter of Utility Preparation and Response to Power Outages During the March 2018 Winter and Spring Storms, New York Department of Public Service, April 18, 2019, p. 157.

includes the installation of additional Supervisory Control and Data Acquisition (SCADA) enabled line switches, tie switches, and reclosers to segment long circuits into multiple sections that can be isolated automatically in order to limit the number of customers that lose power, and also increase the speed of restoring power.

Project Activities / Key Accomplishments in 2020

Many of the projects have been upgraded using covered wire and ground to sky enhanced tree trimming was applied based on voluntary consent from the landowners.

The following RG&E projects have been completed from 2019-2020. Rochester Central the following circuits had SCADA switches installed to improve sectionalizing capabilities: 0055RO5240 6 SCADA switches, 0093RO5255 3 SCADA switches, and 0106RO5167 3 SCADA switches. Also, there is an ongoing project on 0419RO5155 4-mile upgrade, and smaller surrounding upgrades and includes a new circuit 0419RO5245, to tie with each other and support surrounding area. The project includes 5 SCADA switches. This project is planned to be completed in 2021 and includes continuing the circuits under I390 and I90. Fillmore Division 8376GV7706 4 SCADA switches and 2 remote reclosers were installed. 8301GV7704 is an ongoing project started in 2020 and continuing into 2021, which includes a 4-mile upgrade to tie with Hornell Division Gainesville 594.

Project Activities Planned for 2021

Planned projects for RG&E include completing the projects mentioned above and installing automation on the following circuits with some upgrades to strength and create ties: 0113RO5101/5102/5228, 0115RO5258, 8327GV7701, 8333GV7701.

This program will continue construction throughout 2021.

57 - Station 49 - Transformer and Switchgear Replacement

Project Overview

Station 49 is located in Rochester, NY and serves approximately 22MW of load which is 6,230 customers. Notable customers include Bausch & Lomb and Rochester General Hospital. During high load periods, loss of one of the 34.5kV/11.5kV transformers at Station 49 results in overloading the other 34.5/11.5kV transformer above its Long-Term Emergency Rating (LTE) and resulting voltage levels. This would result in shedding 2MW of load to relieve the overload on the remaining transformer. The period of exposure is approximately 400 hours per year. The criteria used for this project is the single contingency criteria for the transmission system that provides for loss of any element results in the remaining elements being below their long-term emergency rating.

The scope of this project is to remove the decommissioned capacitor bank, replace existing Transformer 3 (18.75 MVA) and Transformer 4 (18.75 MVA) with larger capacity Transformers 5 and 6 20/26.6/33.3 (37.3) MVA and replace the existing 11kV metal-clad switchgear in the control building with a GIS. The execution of this project is sequenced to utilize two mobile substations during the removals and the duration of construction with the goal to minimize customer impact.

Project Activities / Key Accomplishments in 2020

In 2020 the mobile substation was installed at the site, engineering related to the setting for the temporary connection the mobile substation were completed and the mobile substation was commissioned for service during construction. The existing switchgear was removed and a GIS switchgear was installed. Commissioning of the switchgear was substantially completed. The control house fit up, including the installation of service transformer, HVAC systems and installation of the battery system were completed. Transformer T6 was energized.

Project Activities Planned for 2021

During 2021, the commissioning of the GIS switchgear and the installation of the fire protection system will be completed. Transformers 3T and 4T will be removed. Final energization of the substation will be completed.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
12/31/2012	2/29/2016	12/31/2014	6/7/2021	6/7/2021

58 - Station 168 - Service Area Reinforcements

Project Overview

This project will sectionalize National Grid 115kV Lines, Trunks 2 and 4 at Station 168. Associated work at Station 168 includes replacement of 115kV breakers, upgrading protection and control equipment as well as auxiliary systems. The line protection systems will be modified at the remote ends of Station 168 that includes RG&E Station 122, NYSEG Border City Substation, and the Niagara Mohawk Elbridge and Mortimer Substations. Remote end work includes replacing the existing circuit breaker in the Trunk 4 Bay in the Border City Substation, modifications and/or upgrades to the existing protection and controls system at the Border City Substation and replace both 115/34.5kV transformers at Station 168 with LTC banks having an LTE rating 100MVA or greater. The Station 168 transformers will be operated in parallel on the 34.5kV side.

The basis for this project is to provide system contingency if and when Trunks 2 and 4 (National Grid), are lost under summer or winter peak conditions. The Trunks will also be sectionalized in order to avoid thermal overload on service systems and support transformer load leveling. Replacement of Transformers 1T and 2T Benefits of this project include sectionalization of Trunk 4 will help to ensure that the 12kV load at Station 168 is not dropped for a single-element contingency involving loss of either section of Trunk 4. Sectionalization of both Trunks 2 and 4 will help to ensure that the 34.4kV load at Station 168 is always shared by the two 115/34.5 kV transformers for any single-element contingency involving loss of either section of Trunk 4 or Trunk 7. Replacement of both 115/34.5kV transformers at Station 168 with larger LTC transformers and operating in parallel will help to ensure adequate thermal and voltage support under normal and contingency conditions.

Project Activities / Key Accomplishments in 2020

In 2020 the Company worked on detail engineering design upon finalization of scope requirements. Changes in scope have caused this project’s schedule to extend beyond the time originally planned and shown in Appendix R. The control building and GIS were procured, the permitting processes with the towns of Manchester and Farmington started. The easement agreement process with Old Castle and National Grid was also started.

Project Activities Planned for 2021

In 2021 it is planned to obtain the construction permit and start construction of a new access road and being the construction of the yard expansion (new portion of fence, new manholes and conduit trenches).

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
12/31/2014	10/20/2022	5/1/2019	12/20/2023	1/22/2024

59 - Cable Replacement C759-740

Project Overview

The scope of this project is divided between two 34.5 kV circuits. The project scope for Circuit 740 is to replace an aged 0.75-mile nitrogen gas filled cable that is overhead in the Town of Perinton and the Village of East Rochester. The rebuilt circuit will be overhead with open wire construction from Station 62 to pole T-16 and underground from manhole 668.54 to Station 117. The overhead segment distance is approximately 0.5 miles and the underground segment is approximately 0.25 miles.

The project scope for Circuit 759 is to replace approximately 1.65 miles of an aged nitrogen gas filled cable that is both underground and overhead in the town of Penfield. The rebuilt circuit will be underground for a total distance of about 1.6 miles from Station 85 to Whalen Rd, the remaining 250 feet is above ground

Project Activities / Key Accomplishments in 2020

In 2020 RG&E completed energization of both Circuits 740 and 759 and all construction activities were completed.

Project Activities Planned for 2021

The project is in closeout and no construction activities are planned for 2021.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
10/8/2019	10/6/2020	10/28/2019	10/6/2020	10/6/2020

60 - Station 262 - New 115/34.5 kV Station

Project Overview

This project was initiated to alleviate the overload conditions that occur during high load periods on the 11.5 kV Circuit #629 (Station 6 to Station 23 in Rochester, NY). Station 262, a new 115 kV source station for the Station 26 load will provide necessary relief to existing lines and transformers from thermal stress under these contingency conditions. The new 115 kV source will take the form of a new 115/34.5 kV substation, a new 34.5 kV line, and a second 34.5/11.5 kV transformer at Station 26.

Station 262 is a new 115-34.5 kV indoor substation. New property for the substation was purchased. Station 262 will consist of a 115kV double Bus-Bar GIS, a 115-34.5 kV 30/40/50(56) MVA LTC transformer located inside, and a new 34.5 kV GIS. All circuits will enter the Station underground.

In addition to the new Station 262 construction, Station 26 upgrades are being performed, which include the addition of a new 34.5kV line terminal, 34.5kV tie breaker, second 34.5-11.5kV 20/26/33(37) MVA transformer, replacement of the current 34.5-11.5kV transformer, add two new 11.5kV, 3.6 MVAR capacitor banks and new two-story control building. The control building will house 34.5 and 11.5kV GIS equipment.

A new 34.5 kV transmission line, Circuit 806, will be installed at Station 262 to provide a second source for Station 26.

Project Activities / Key Accomplishments in 2020

In 2020 the substation construction, testing and commissioning were completed and all associated circuits (570, 571, 542, 532, 741, new circuit 806 and both new transformers) were completed. The entire project was energized. Exterior restoration was postponed due to COVID.

Project Activities Planned for 2021

This year we plan to complete punch list activities and complete site restoration.

High-Level Schedule

In-Ground Construction Start	In Ground Construction Finish	Above Ground Construction Start	Above Ground Construction Finish	ISD
10/2/2017	12/1/2020	7/21/2011	12/1/2020	12/31/2020

64 - Electric Vehicles RG&E

Project Overview

The EV Make-Ready Program supports the development of electric infrastructure and equipment necessary to accommodate an increased deployment of EVs within RG&E service area by reducing the upfront costs of building charging stations for light-duty EVs. Through this EV Make-Ready Program, entities seeking to install or participate in the installation of Level 2 ("L2") and/or Direct Current Fast Charging ("DCFC") chargers can earn incentives that will offset a large portion of, or in some cases, all of the infrastructure costs associated with preparing a site for EV charger installation. Incentives are categorized by utility-side make ready and customer-side make ready. Utility-side make ready includes all traditional distribution work for new service lines and/ or service upgrades and incentives are recoverable through capital plant in service. Customer-side make ready includes all electrical infrastructure from the point of utility point of attachment up to but not include EV charging stations themselves. Customer-side incentives are recoverable as regulatory assets amortized over 15 years through a surcharge on customer bills.

Project Activities / Key Accomplishments in 2020

The NY PSC authorized the EV Make Ready Program on July 16, 2020. The Companies have collaborated with the Joint Utilities of New York (JU) to jointly and independently file several regulatory compliance deliverables including program plans and other requirements. The RG&E official program launch date was September 14, 2020. The Companies have received, and are processing, applications for projects in various stages of development, however no incentives were paid in 2020.

Project Activities Planned for 2021

The goal for 2021 is to incentivize the development of 441 L2 charger plugs and 13 DCFC plugs (one EV charging station may have multiple plugs). On-boarding of two key contractors including and program implementation support contractor and a communications and marketing contractor are expected to be complete by the end of Q1 2021.

Appendix D

NYSEG Gas Project Narratives

2 - Hornby Station Rebuild

Project Overview

This gate station project will replace existing aged equipment that is still in safely operating condition, replace deteriorated buildings, demolish buildings and remove equipment no longer necessary, and correct site conditions.

The current design standards for a gate station include dual-run regulators for reliability of service.

Project Activities/Key Accomplishments in 2020

Engineering activities were performed in 2020. Engineering activities include: creation of plans, creation of work orders, refinement of the cost estimate, identification of permits and completion of detailed designs.

Project Activities Planned for 2021

There are no activities planned for 2021, due to emergent projects and the continued safe operating condition of the station.

3 - Post Creek, Gas Main Replacements

Project Overview

The project replaced pipe impacted by leaking diesel fuel from a supplier into NYSEG's distribution system. The project included two miles a year of gas main replacement. A portion of the cost will be reimbursed by the company responsible for the diesel fuel leak.

This project replaced plastic pipe impacted by diesel fuel infiltration from a supplier's system. Diesel fuel is not compatible with plastics, softening the plastic gas main and compromising its integrity and safety.

Project Activities/Key Accomplishments in 2020

There was no activity for this project in 2020, since it was completed in 2019. A total of 3,280 feet of gas main was replaced.

Project Activities Planned for 2021

There are no construction activities planned for this project in 2021. Receipt of payment by the third party for the diesel fuel leak is expected.

4 - Chambers Road Gas Main Replacements

Project Overview

This project will take place over multiple years and consists of replacing and uprating low-pressure gas mains and retiring pit regulator stations in poor condition. The project is to take place in Ithaca. A portion of the cost will be reimbursed by the company responsible for the diesel fuel leak.

Uprating low pressure gas mains is necessary as higher-pressure gas mains allow for installation of smaller diameter pipe, are more cost effective both in installation and maintenance, and replacing low pressure gas mains result in a safer and more reliable distribution system.

Project Activities/Key Accomplishments in 2020

Approximately 9,000 feet of main was replaced.

The cost of this work was included in the overall Leak Prone Main Program.

Project Activities Planned for 2021

The remaining 4,700 feet will be replaced in 2021, completing this project. We expect this project to be in service and close out activities complete by the end of the year. Receipt of payment by the third party for the diesel fuel leak is expected.

12 - Gas RTU/Telemetry Upgrade and Zeck 9000 Odorizer Upgrades

Project Overview

Currently, NYSEG utilizes the Fisher ROC 300 series Remote Terminal Unit (RTU) at all remotely operated regulator stations and terminal pressure monitoring locations. The Fisher ROC allows Gas Control to remotely operate and monitor regulator stations and terminal endpoint pressures throughout the NYSEG franchise. The project will replace approximately 35 Fisher ROC 300 RTUs and Zeck 9000 odorizers with GPL 350 units. The GPL 350 is the most cost-effective option to replace the Zeck 9000s. This is a multi-year program.

The current equipment being used is obsolete. Replacement parts have to be custom manufactured, which is costly and has long lead times. As of the end of 2019, the manufacturer no longer custom manufactures replacement parts. This project will replace this equipment with current technology. Planned work is to be done in such a way to minimize impact to field operations and installation costs.

These upgrades are planned at multiple site locations through all NYSEG regions. Construction will consist of facility upgrades, electrical service modifications to support new devices, SCADA modifications; communications; site development; building upgrades, and odorization upgrades.

Project Activities/Key Accomplishments in 2020

The project continued, and commissioning/startup phase was completed at seven sites (Rushville, Chazy, Champlain, Plattsburgh, Dundee, Big Flats, Westover) during 2020. Sites were brought up to current operating standards and municipal codes. Final restoration items will be completed in 2021.

Project Activities Planned for 2021

The planned construction to be completed consists of upgrading five stations to current operating standards and municipal codes.
Site – start date – completion date
Kirkwood – 09/21/20 – 01/29/21
Catatonk – 10/06/20 – 01/29/21
Flat Iron – 12/09/20 – 03/31/21
Farm to Market – 02/08/21 – 03/26/21
E Beecher (Owego) – 03/29/21 – 04/30/21.

13 - Common Gas SCADA Platform

Project Overview

This effort will upgrade/migrate all Avangrid Gas Companies to a common software platform (OASyS 2018 SP3) to standardize and meet regulatory Energy Control Center (ECC) Control Room Management requirements. This project spans 2019 – 2021. The implementation of the AVEVA OASys 2018 Gas Supervisory Control and Data Acquisition (SCADA) system in the New York companies will consist of upgrading the existing system in New York and migrating all data and any customized processes to the AVEVA system. The project also involves the implementation of PI Historian to interact with the OASys SCADA system and to convert the Human Machine Interface (HMI) displays to be Control Room Management Compliant.

Project Activities / Key Accomplishments in 2020

In 2020, the project design was completed along with planning and testing documentation created for New York. Implementation of the upgrade platform was initiated for New York on the VxRail. PI Historian design requirements were identified and finalized. HMI review was initiated for the development of HMI design to achieve Control Room Management compliance, as well as create a common HMI design between all Avangrid Gas companies.

Project Activities Planned for 2021

Buildout of the system on the New York VxRail platform has been completed. Installation of the upgraded system on the New York platform is planned for Q1 2021. Database migration for New York are in the design phase with completion targeting 06/2021. HMI creation for Control Room Management compliance are in the design phase with completion targeting 9/2021 for New York. Training for New York Administrators and Controllers is scheduled for 2/2021 and 3/2021. Testing and Acceptance for the systems are planned for 9/2021 for New York. Go-Live is targeting 10/2021 for New York.

18 - Town of Maine, Franchise Expansion

Project Overview

This project will extend 14,500 feet of gas main and services consistent with the PSC Order issued 4/18/2019 in case 15-G-0284.

Project Activities/Key Accomplishments in 2020

Engineering activities were performed in 2020. Engineering activities include: creation of plans, creation of work orders, identification of permits and detailing of designs.

Project Activities Planned for 2021

Construction is scheduled to start in April of 2021, expected end (in-service) date, restoration and close out activities will be complete by the end of 2021.

22 - Leak Prone Services Replacement Program

Program Overview

Work within this this program retires services that are classified as Leak Prone and are required by various regulations to be replaced.

This work includes but is not limited to: replacing gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way; leak prone gas main replacements; tariff or code requirements; and actively leaking services.

Program Activities / Key Accomplishments in 2020

NYSEG completed 918 leak prone service replacements.

NYSEG completed the leak prone service replacement work within these divisions: Auburn, Binghamton, Brewster, Elmira, Geneva, Hornell/Dansville/Olean, Ithaca/Cortland, Liberty/Goshen, Lockport, Mechanicville, Oneonta, and Plattsburgh.

Program Activities Planned for 2021

NYSEG will continue to replace leak prone services associated with leak prone main projects throughout their respective service areas.

23 - Leak Prone Main Replacement Program

Program Overview

The 2020 mileage requirement for NYSEG was 30 miles. This project replaces leak prone gas main in accordance with the rate case requirements. It includes mains replaced due to condition (Distribution Integrity Management Program and leaks) and municipal projects.

This program is required by the PSC. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with DIMP regulations and leak information.

Program Activities / Key Accomplishments in 2020

NYSEG completed 30.16 miles of leak prone main replacement.

NYSEG completed the leak prone main replacement work within these divisions: Auburn, Binghamton, Brewster, Elmira, Geneva, Hornell/Dansville/Olean, Ithaca/Cortland, Liberty/Goshen, Lockport, Mechanicville, Oneonta, and Plattsburgh.

Program Activities Planned for 2021

NYSEG plans to complete a minimum of 30 miles of leak prone main replacements across all their respective service areas.

24 - West Genesee Street Leak Prone Main Replacement

Project Overview

This project will install approximately 8 miles of 8-inch 124 psig gas main along W Genesee St from the Owasco River crossing to the Wheat St and Union Springs regulator stations. This includes cut dead of existing 10-inch steel gas mains of 1941 and 1953 vintage totaling 15 miles over the course of the project.

This project is necessary to reinforce the system and is part of the Leak Prone Main program. There are portions of the existing gas main that have less than minimum depths of cover, and instances of residents coming in contact with the gas main with equipment. This project will be split into four (4) sections.

Project Activities/Key Accomplishments in 2020

Phase 1 of the project was completed in November 2020 and 10,428 feet of 8-inch gas main was installed.

Project Activities Planned for 2021

Phase 2 will install 9,702 feet of 8-inch gas main, expected to be completed by November 2021. Procurement activities for Phase 3 are planned to be performed in 2021, with construction starting in 2022.

26 - NYSEG - Gas Meters

Program Overview

This program purchases gas meters to replace existing, aged meters as they are removed from service as well as for new installations, as required by Tariff. Gas meters are exchanged for annual PSC required programs including, statistical sampling, and remediation programs and for other various reasons including, but not limited to, relocation, load increases, meter damage, special testing and replacement to non-temperature compensated meters.

Program Activities / Key Accomplishments in 2020

In 2020 there were 7,018 gas meters purchased at NYSEG.

Program Activities Planned for 2021

In 2021 there is an estimated 8,000 gas meters to be purchased at NYSEG.

29 - Distribution Main Replacement Program

Program Overview

The scope of the program includes non-leak prone gas main retirements and replacements across the NYSEG gas system.

Replacement of gas mains is required due to a number of factors including, but not limited to, poor conditions, conflicts with existing or proposed structures, and other miscellaneous field conditions discovered as part of normal operations or other construction and inspection activities.

Program Activities / Key Accomplishments in 2020

NYSEG continued to replace gas mains as necessary. Some of the notable projects that are included within the Distribution Mains Program include:

Frances/Hudson/Hill (Mechanicville), Hornby System Upgrade, Williams Street (Mechanicville), South Meadow Street (Ithaca).

Program Activities Planned for 2021

Work will continue for NYSEG to replace gas mains as necessary, considering the terms of Appendix M of the recently approved Joint Proposal.

30 - Gas Distribution Mains - New Installations

Program Overview

The scope of the program includes installing new gas mains to customers in accordance with tariff.

This program is required to extend new gas mains to new customers.

Program Activities / Key Accomplishments in 2020

NYSEG continued to install new gas mains as required by tariff. Some of the notable projects that are included within the Distribution Mains Program include:
Royalton Canal Crossing (Lockport), Elm St. (Norwich), State Rt 54 (Wayne).

Program Activities Planned for 2021

Work will continue for NYSEG to install new gas mains as required by tariff.

31 - Install New Gas Services

Program Overview

This program installs distribution mains for new commercial and residential customers in accordance with tariff.

NYSEG is required to provide 100 feet of gas main extension free of charge to new customers. Most main extensions are installed to provide gas service in new residential developments.

Program Activities/Key Accomplishments in 2020

NYSEG supported requests for gas services in accordance with tariffs and PSL.

Program Activities Planned for 2021

NYSEG will continue to support and install services for requests for gas services in accordance with tariffs and PSL.

32 - Minor Government Jobs, Replace Gas Mains

Program Overview

The scope of this program consists of replacing gas mains in conflict with municipal highway and street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way.

Government agencies complete various highway improvement projects that require the relocation of existing gas mains; this program provides capital fund allocations to complete these projects. Regulations and terms of highway access permits allow NYSEG facilities to be located within municipal rights-of-way, but mandate relocation of those facilities when it conflicts with street or highway reconstruction projects.

Relocation of facilities prior to the start of construction reduces the potential for damage to Company facilities and prevents unscheduled interruption of service to customers in the affected surrounding area(s).

Program Activities / Key Accomplishments in 2020

NYSEG supported the Program as requested by various government agencies. Some of the notable projects are:

Harriman Drive (Goshen) and Belden Street (Binghamton).

Program Activities Planned for 2021

NYSEG will continue supporting projects as requested by various government agencies.

35 - Non-Leak Prone Services Replacement Program

Program Overview

This program replaces or ties-over any service associated with a gas main replacement project that does not qualify as a leak prone service in accordance with DIMP.

Required by various regulations, the work replaces gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way, tariff or code requirements, and actively leaking services.

Program Activities / Key Accomplishments in 2020

NYSEG supported the program by replacing gas services not classified as leak prone.

Program Activities Planned for 2021

Work performed by NYSEG will continue to support the program.

38 - Goshen 17A, Gate Station to Sorrento

Project Overview

This project replaced 8,050 feet of 120 psig, 6", 1955 vintage steel main with 8" plastic gas main. Due to the size of the project, this project was separated out of the Leak Prone Main Replacement Program for tracking purposes. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The programmed gas main replacements result in a distribution system that is safer and more reliable.

Project/ Key Accomplishments in 2020

The project was completed in October 2020 and 8,247 feet of 8-inch gas main was installed and put into service.

Project Activities Planned for 2021

Restoration and closeout activities will be performed and completed in 2021.

39 - East Auburn Sennett Leak Prone Main

Project Overview

This project contributed to the Leak Prone Main Replacement Program mileage goal. The leak prone gas main work is prioritized based upon leak history, main condition, inspection reports, and various risk factors. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The programmed gas main replacements result in a distribution system that is safer and more reliable. Replacement of pipe categorized as Leak Prone. Projects are prioritized based on condition of pipe.

The project is being separated from the LPM program to follow the rate case Joint Proposal reporting threshold of $500k. Pipe was replaced in kind. Install: 8,174 - 12" SWP, 17' - 6" SWP. Cut Dead: 8,266

Project Activities / Key Accomplishments in 2020

All construction, restoration, and closeout work was completed during 2020 for this project.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

40 - Canandaigua Route 21 Leak Prone Main

Project Overview

This project contributed to the Leak Prone Main Replacement Program mileage goal. The leak prone gas main work is prioritized based upon leak history, main condition, inspection reports, and various risk factors. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The programmed gas main replacements result in a distribution system that is safer and more reliable. Replacement of pipe categorized as Leak Prone Projects are prioritized based on condition of pipe.

The project is being broken out from the LPM program to follow the rate case Joint Proposal reporting threshold of $500k.

Installation: 3452'-12" MP Steel; 1135'-2" MP PE; 51'-12" MP Concrete Coated Steel. Pipe was replaced in kind.

Project Activities/Key Accomplishments in 2020

All construction, restoration, and closeout work was completed during 2020 for this project.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

41 - State Route 34 East Shore Dr. Main Extension

Project Overview

The project installed 5,600 feet of 8-inch 60 psig gas main along East Shore Blvd., NYS Route 34 in the Town of Lansing.

The project improves system pressure at the northern Lansing gas system endpoint for the design day condition. This project improves reliability by increasing pressure under design day peak hour conditions.

Project Activities/Key Accomplishments in 2020

The construction contractor mobilized and installed the entire main and completed 25% of the restoration during 2020.

Project Activities Planned for 2021

The remaining 75% of restoration will be completed, including paving.
Project closeout activities were started, which include: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

46 – NYSEG AMI

For the narrative on this project please refer to NYSEG Common Project Narrative #26.

48 - Gas Regulator Modernization and Automation Program

Program Overview

The scope of this program includes improvements to regulator and gate stations within the NYSEG gas system. There are several types of typical upgrades, including the removal of: regulators; filters; chart recorders; valves; inlet and outlet piping; and enclosures. The aforementioned are replaced with standardized equipment, piping and associated fittings, and include corrosion protection for both equipment and piping. The Program also includes the installation of RTUs and other automation improvements.

These improvements enhance system reliability associated with corroded piping, fittings and end-of-life equipment. The Program includes replacement of obsolete equipment for which there are no repair parts available.

Additional benefits of this program include: system reliability improvement; reduction of potential outages due equipment failures, and improvement of equipment standardization and safety.

Program Activities / Key Accomplishments in 2020

NYSEG completed 39 projects in 2020, consisting of: one heater upgrade; one new regulator station installed; three stations rebuilt; four stations retired; 29 stations upgraded, and one system improvement project.

The heater upgrade was Carlisle POD Station.

The new station installed was Country Club Rd Station.

The three rebuilt stations were Town Center, North 1st Street, and Tom Miller Road.

The four retired stations were: Sullivan John, Durland Road, Dickerson Tap, and Bolton Road.

The 29 upgraded stations were: East Auburn, Meads Hill Rd, West Washington, Partition St, Old Corning Rd, Catherine Maple, East Beach, Fairgrounds, Allen Richard, Fairway & Maple, East Washington Oak, TEPCO Tap, 17th St Roof Replacement, Hendy & 1st St, Border City Heater, Vienna Rd Station (Lyons Relief), Genesee Falls Gate Station, Dillenbeck Station Odorizer, Community Corners, Stewart @ University, Hatfield, Newfane City Gate, King Station, Hawley Corinthia St, Green Station, North 6th Ave, Woods Corners first stage, Woods Corners second stage, and Plattsburgh City Gate Odorizer.

The System Improvement project was the Champlain POD RTU Replacement.

All construction, restoration, and closeout work was completed during 2020 for these projects.

Program Activities Planned for 2021

NYSEG has 19 projects planned for 2021, consisting of station upgrades. The planned work consists of all construction, restoration and closeout activities.

The stations to be upgraded are: Clark St Road, Old Vestal Road, Riverside Ave, Thompson and Southport, Home and Falk, Washington and Euclid, Walnut and Gray, Partition Street Phase 2, Townsend, Bradley Street RTU, Port Gibson heater and filter upgrades, Olean – Ceres Relief, Flat Iron, Cortland Gateway Phase 1 (Clinton Ave), Lansing Terminal RTU, Hamptonburgh Station, CNG Chromatograph Installation, Mitchell Street, and West Oneonta. Work on all stations will be accomplished and completed throughout the year.

49 - Phelps (South) Transmission Replacement

Project Overview

This project rebuilt the Phelps tap regulator station, which includes a new 12-inch, 5.1-mile, Article VII pipeline, and constructed a new Pre-Emption Street district regulator station. It also installed approximately 27,000 linear feet of 12-inch steel pipe, 8,000 linear feet of 8-inch plastic pipe, and 930 linear feet of 4-inch plastic pipe.

This project increased reliability of the Geneva System during peak demand by eliminating the operational practice of seasonally opening and closing the Packwood valve. Additionally, it addressed asset condition by replacing transmission pipe installed in the 1940s.

Project Activities/Key Accomplishments in 2020

Project closeout activities were performed in 2020. Closeout activities include paying final contractor invoices, ensuring all work orders are closed and holding a final project closure meeting.

Project Activities Planned for 2021

There are no planned activities planned for this project in 2021.

51 - Low Pressure Relief Valve Program

Program Overview

The project will add relief valves at low pressure regulator stations that currently have working monitors for over pressure protection (approximately 30 stations). The scope of work varies based on station needs, from the addition of relief valves to the full rebuild of the station. These stations are located in the Elmira, Olean and Binghamton divisions on gas systems previously owned by Columbia Gas. This program is supplemental to the gate and regulator station modernization program.

Project Activities/Key Accomplishments in 2020

Safety Relief Valve and other safety equipment installed at the North 1st Street. C Station in Olean, NY.

Project Activities Planned for 2021

There are no activities planned for this project due to emergent projects within the portfolio.

52 - Homer System Upgrade

Project Overview

This project will take place over multiple years and consists of replacing and uprating low-pressure gas mains and retiring pit regulator stations in poor condition. The project is in Ithaca.

Uprating low pressure gas mains is necessary as higher-pressure gas mains allow for installation of smaller diameter pipe, are more cost effective both in installation and maintenance, and replacing low pressure gas mains result in a safer and more reliable distribution system.

Project Activities/Key Accomplishments in 2020

Phase 3 of the project was completed in October 2020 and 9,364 feet of gas main was installed. Restoration and closeout activities were performed and completed in 2020.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

53 - Vienna Rd-Macedon Feeder Main Replacement

Project Overview

The project installed approximately 39,500 feet of 12-inch, 124 psig steel gas main, from the Vienna Road Regulator Station to the Palmyra City Gate Regulator Station.

The existing system was below 50% of maximum operating pressure (MAOP) on the design day. The downstream system, the Macedon 45 psig MAOP system, has been supplemented by an emergency interconnect with RG&E since 2008 to maintain system pressures during peak usage periods. The emergency interconnect flows from RG&E to NYSEG had been frequently experienced. These improvements would reinforce the system and improve reliability.

Project Activities/Key Accomplishments in 2020

All necessary easements and permits were obtained, construction was completed, and project was put into service in December of 2020. Project closeout activities were started, which include: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

Project Activities Planned for 2021

Final retirement of the main will occur in February of 2021.

54 - Canandaigua -Rt 21 LPM

Project Overview

The project replaced 3,327 linear feet of 8-inch steel and 1,126 linear feet of 4-inch steel main. The new main installed is 3,503 linear feet of 12-inch steel and 1,135 linear feet of 2-inch plastic gas main.

This project contributes to the Leak Prone Main Replacement Program, which helps to improve distribution safety and reliability by replacing gas mains in poor asset condition, and at high risk for failure.

Project Activities/Key Accomplishments in 2020

Construction of this project was completed in December of 2020, with project closeout activities occurring thereafter.

Project Activities Planned for 2021

Project closeout activities will continue into 2021 and include paying final contractor invoices, ensuring all work orders are closed and holding a final closure meeting.

Appendix E

RG&E Gas Project Narratives

6 – RG&E AMI

For the narrative on this project please refer to RG&E Common Project Narrative #28.

9 - CM-1 Transmission Gas Main Replacement

Project Overview

This project will replace approximately 44,000 feet of the existing CM-1 20-inch steel gas transmission main from Caledonia Gate Station to Empire West Chili Gate Station. The new pipe will be 24-inch steel gas pipe, which is to operate at a maximum allowable operating pressure of 330 psig. This will be a key component to creating a new dual supply 330 psig operating system from the Caledonia Gate Station to the New Empire West Chili Gate Station.

The project addresses asset condition by replacing transmission pipe installed in the 1950s, which has leak potential as identified by RG&E's IMP. It is part of the plan to improve system reliability.

Over its entirety, the project will take place on Scottsville-Chili Road and Wheatland Center Road (Route 63). It will pass through the Towns of Chili, Wheatland and Caledonia.

Project Activities/Key Accomplishments in 2020

The permits required for this project are: Article VII CECPN, SWPPP, NWP 12, highway work, and utility occupancy. Easements are expected to be new rights of way on private properties.

The following work was completed in 2020: receipt of Article VII Certificate of Environmental Compatibility and Public Need (CECPN), receipt of NWP 12 pipeline engineering was issued for review; the conceptual design of the main extension; bridge design was completed to 85%; major procurement RFP's were issued, more than 65% of easements have been fully executed and wetland mitigation property has been identified.

Project Activities Planned for 2021

Remaining Materials are expected to be received by the end of Quarter 1. Pipeline construction is expected to commence in late spring at the beginning of the construction season with substantial completion and energization by early Quarter 4. The remaining service tie overs and main extension work will also be complete during the 2021 construction season. Wetland mitigation site design and construction is also expected to occur in 2021. The project is expecting to be closed by the end Quarter 1 of 2022.

10 - CM-4 / CM-1 Transmission Pipeline Replacement Project (Ballantyne Rd to Paul Rd)

Project Overview

This project replaced both a segment of the existing 24-inch CM-4 pipeline with 30-inch pipeline, and a segment of the 22 1/2-inch CM-1 pipeline with a 16-inch pipeline between Ballantyne Road and Paul Road in the Town of Chili. The replacement segments were relocated to allow for better access and more suitable environmental factors, in order to reduce long term operation and maintenance activities. As the CM-4 and CM-1 pipelines operate higher than 125 psig, this project incorporated an Article VII Application and Review Certification process for permitting approvals.

The prior CM-4 and CM-1 pipelines had documented integrity issues. As the combination of these two pipelines provide a majority of the gas supply to the City of Rochester, the relocation and replacement of these pipelines was needed.

Project Activities/Key Accomplishments in 2020

Environmental monitoring, project closeout activities and wetland mitigation were completed in 2020. Project closeout activities were started, which include: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

11 - CM-1 Transmission Pipeline: Chili GS to Ballantyne Rd, Main Replacement

Project Overview

This project will replace an existing 22 ½-inch gas mains parallel with the CM-5 pipeline (Chili GS to Ballantyne Rd) with 23,400 ft – 16-inch WRST. This line will be built with a 124 psig maximum allowable operating pressure.

Project Activities/Key Accomplishments in 2020

There was preliminary engineering done for this project in 2020, and it is being evaluated for priority and timing.

Project Activities Planned for 2021

There are no activities planned for this project in 2021.

12 - Gas Regulator Modernization and Automation Program, Replace Regulator Station

Program Overview

The scope of this program includes improvements to regulator and gate stations within the RG&E gas system. There are several types of typical upgrades, including the removal of: regulators; filters; chart recorders; valves; inlet and outlet piping; and enclosures. The aforementioned are replaced with standardized equipment, piping and associated fittings, and include corrosion protection for both equipment and piping. The Program also includes the installation of remote terminal unit's (RTU) and other automation improvements.

These improvements enhance system reliability associated with corroded piping, fittings and end-of-life equipment. The Program includes replacement of obsolete equipment for which there are no repair parts available.

Additional benefits of this program include: system reliability improvement; reduction of potential outages due equipment failures, and improvement of equipment standardization and safety.

Program Activities / Key Accomplishments in 2020

RG&E completed 24 projects in 2020, consisting of: one heater upgrade; three new regulator stations installed; four regulator stations rebuilt; five stations retired, and 11 stations upgraded.

The heater upgrade was the Bergen Heater Odorizer.

The three new regulator stations were Winton Road north of Penn Central Railroad, Riga Center Road and Churchville Road, and Pittsford Palmyra Road west of Mitchell.

The rebuilt stations were East River at Rochester Institute of Technology– south run, Wheatland Center Road, Atlantic Avenue and Five Mile Line Road, and Bishop Kearney High School M&R.

The five retired stations were: Lyell Ave east of Barge Canal, Mount Read at Lyell (northwest corner), Wheatland Center Road at Wickens, Brooklyn Street and Mt. View Street, and Eagle Street and Murray Street.

The 11 upgraded stations were: Hollenbeck Street at Avenue D, Jefferson Road west of Clover Street, Barone Avenue and Main Street, Regulator Upgrades (00162), Kodak, Elmgrove Road at Pond Road, City of Rochester Magnolia Street, Farm Tap Converstion (Preemption Road & York Settlement), Valve Replacement (00313), South Avenue Hilton, Paul Road at Scottsville Road, and Scottsville Mumford Road-Garbutt (Cabot).

All construction, restoration, and closeout work was completed during 2020 for these projects.

Program Activities Planned for 2021

There are 10 projects planned for RG&E for 2021, consisting of station upgrades. The planned work consists of all construction, restoration and closeout activities.

The 10 station upgrades are planned to be: Chili Reg Modem, Big Tree Well Tap, Child at Smith, Salt and State, Farm Tap Conversion (Steurrys RS), Armstrong Road, Buffalo Road, Greigsville Gate Station, Tyre Station Controller, and Mendon Gate. Work on these stations will occur throughout the year.

13 - CM3D Transmission Pipeline - Rte 441 to Whitney Rd, Install Gas Main

Project Overview

This project includes the installation of approximately 25,000 linear feet of 16-inch WRST pipeline parallel to and 4 miles east of the existing CM3B pipeline; this pipeline will have a maximum allowable operating pressure (MAOP) of 250 psig. The project will also include the construction of a new district regulator station at Whitney and Swadling Road and approximately 5,000 linear feet of 12-inch wrapped steel pipeline (120 psig MAOP) to connect to the existing MF120 Eastern Monroe System. This project will require an Article VII application.

Project Activities/Key Accomplishments in 2020

There was no activity for this project in 2020, and it is being reevaluated for priority and timing.

Project Activities Planned for 2021

There are no activities planned for this project in 2021.

15 - MF60 Southeast Phase 2 (Willis Hill Rd), Install Gas Main

Project Overview

This project installed approximately 8,300 linear feet of 8-inch MDPE main along Willis Hill Road, from NYS Rte. 251 to Dryer Road.

Project Activities/Key Accomplishments in 2020

Project was fully installed and closed out in 2020.
Project closeout activities were started, which include: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

21 - CM2 Robotic Inspections

Project Overview

A project was initiated to develop a way to robotically inspect the CM2 Gas Transmission pipeline in Henrietta, NY. The capital equipment of this project included three-line stopper fittings, 13 two-inch SAV Fittings and the services to tap and install all of the equipment.

Project Activities/Key Accomplishments in 2020

All equipment was installed, and project has been completed including closeout activities. Project closeout activities included: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

Project Activities Planned for 2021

There are no activities planned for this project in 2021.

22 - Burritt Road Main Replacement

Project Overview

The project installed 9,959 linear feet of 8-inch plastic, 6 linear feet of 6-inch plastic and 96 linear feet of 4-inch plastic gas mains along Burritt Road. The existing MF60 Northwest line requires reinforcement to maintain pressures at or above 50% MAOP, specifically in the areas surrounding the Village of Hilton and in the Town of Parma.

This new gas main will improve the efficiency at which gas is distributed through Hilton and Parma. This project is part of a larger plan to improve gas main pressure in the towns northwest of the City of Rochester.

Project Activities / Key Accomplishments in 2020

The entire project was constructed and energized during 2020.

Project Activities Planned for 2021

The project was completed and no additional activities are planned in 2021.

23 - Common Gas SCADA Platform

Project Overview

This effort will upgrade/migrate all Avangrid Gas Companies to a common software platform (OASyS 2018 SP3) to standardize and meet regulatory Energy Control Center (ECC) Control Room Management requirements. This project spans 2019 – 2021. The implementation of the AVEVA OASys 2018 Gas Supervisory Control and Data Acquisition (SCADA) system in the New York companies will consist of upgrading the existing system in New York and migrating all data and any customized processes to the AVEVA system. The project also involves the implementation of PI Historian to interact with the OASys SCADA system and to convert the Human Machine Interface (HMI) displays to be Control Room Management Compliant.

Project Activities / Key Accomplishments in 2020

In 2020, the project design was completed along with planning and testing documentation created for New York. Implementation of the upgrade platform was initiated for New York on the VxRail. PI Historian design requirements were identified and finalized. HMI review was initiated for the development of HMI design to achieve Control Room Management compliance, as well as create a common HMI design between all Avangrid Gas companies.

Project Activities Planned for 2021

Buildout of the system on the New York VxRail platform has been completed. Installation of the upgraded system on the New York platform is planned for Q1 2021. Database migration for New York are in the design phase with completion targeting 06/2021. HMI creation for Control Room Management compliance are in the design phase with completion targeting 9/2021 for New York. Training for New York Administrators and Controllers is scheduled for 2/2021 and 3/2021. Testing and Acceptance for the systems are planned for 9/2021 for New York. Go-Live is targeting 10/2021 for New York.

30 - Northeast 60, Phase 5 (State Road Corridor) Install Gas Mains

Project Overview

This project installed approximately 15,000 linear feet of 12-inch steel gas main along State Road, County Line Road, and Whitney Road in Webster, NY to Lincoln Road in Ontario and Walworth, NY. Additional work consisted of the installation of 1,000 linear feet of 8-inch plastic gas main along Whitney Road, and the installation of new Regulator Station 524 on Whitney Road in Walworth, NY

This was a system improvement project and part of the plan to maintain reliability of the distribution system.

Project Activities/Key Accomplishments in 2020

Restoration and closeout activities were completed in 2020. Project closeout activities included: paying final contractor invoices, ensuring work orders are closed and holding a final closure meeting.

Project Activities Planned for 2021

There are no activities planned for this project in 2021.

34 – RG&E- Gas Meters

Program Overview

This program purchases gas meters to replace existing, aged meters as they are removed from service as well as for new installations, as required by Tariff. Gas meters are exchanged for annual PSC required programs including, statistical sampling, and remediation programs and for other various reasons including, but not limited to, relocation, load increases, meter damage, special testing and replacement to non-temperature compensated meters.

Program Activities / Key Accomplishments in 2020

In 2020 there were 7,945 gas meters purchased at RG&E.

Program Activities Planned for 2021

In 2021 there is an estimated 8,000 gas meters to be purchased at RG&E.

36 - Cabot Line Leak Prone Main

Project Overview

This project replaced approximately 33,000 feet of 14-inch leak prone main, with approximately 33,500 feet of 8-inch and smaller diameter new main. The new main was realigned along public ROW to serve existing customers.

The project contributed to the Leak Prone Main Replacement Program, which helps improve distribution safety and reliability by replacing gas mains in poor asset condition, and at high risk for failure.

Project Activities/Key Accomplishments in 2020

There was limited activity for this project in 2020, since it went into service in 2019.

Project Activities Planned for 2021

There are no activities planned for this project in 2021.

37 - Leak Prone Main Replacement Program

Program Overview

The 2020 mileage requirement for RG&E was 30 miles. This project replaces leak prone gas main in accordance with rate case requirements. It includes mains replaced due to condition (Distribution Integrity Management Program and leaks) and municipal projects.

This program is required by the Public Service Commission. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with DIMP regulations and leak information.

Program Activities / Key Accomplishments in 2020

RG&E completed 30.26 miles of leak prone main replacement.

RG&E completed the work within its division, which includes nine counties and the cities, towns, and villages: Monroe, Wayne, Ontario, Wayne, Cayuga, Alleghany, Wyoming, and Livingston.

Program Activities Planned for 2021

RG&E plans to complete a minimum of 30 miles of leak prone main replacements across all their respective service areas.

38 - Leak Prone Services Replacement Program

Program Overview

Work within this this program retires services that are classified as leak prone and are required by various regulations to be replaced.
This work includes but is not limited to: replacing gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way; leak prone gas main replacements; tariff or code requirements; and actively leaking services.

Program Activities / Key Accomplishments in 2020

RG&E completed 1,051 leak prone service replacements.

RG&E completed the work across its division, which includes nine counties and the cities, towns, and villages therein: Monroe, Wayne, Ontario, Wayne, Cayuga, Alleghany, Wyoming, and Livingston.

Program Activities Planned for 2021

RG&E will continue to replace leak prone services associated with leak prone main projects throughout their respective service areas.

39 - Gas Distribution Mains - New Installations

Program Overview

The scope of the program includes installing new gas mains to customers in accordance with tariff.

This program is required to extend new gas mains to new customers.

Program Activities / Key Accomplishments in 2020

RG&E continued to install new gas mains as required by tariff. Some of the notable projects that are included within the Distribution Mains Program include:

Mildahn St. (Rochester),
Stone Rd (Greece) and
Wickens Rd (Rochester).

Program Activities Planned for 2021

Work will continue for RG&E to install new gas mains as required by tariff.

40 - Gas Distribution Mains - Replacements

Program Overview

The scope of the program includes non-leak prone gas main retirements and replacements across the RG&E gas system.

Replacement of gas mains is required due to a number of factors including, but not limited to, poor conditions, conflicts with existing or proposed structures, and other miscellaneous field conditions discovered as part of normal operations or other construction and inspection activities.

Program Activities / Key Accomplishments in 2020

RG&E continued to replace gas mains as necessary. Some of the notable projects that are included within the Distribution Mains Program include:

Monroe Avenue (Rochester),
South Avenue (Rochester) and
High Street (Victor).

Program Activities Planned for 2021

Work will continue for RG&E to replace gas mains as necessary, considering the terms of Appendix M of the recently approved Joint Proposal.

41 - Install New Gas Services

Program Overview

This program installs distribution mains for new commercial and residential customers in accordance with tariff.

RG&E is required to provide 100 feet of gas main extension free of charge to new customers. Most main extensions are installed to provide gas service in new residential developments.

Program Activities/Key Accomplishments in 2020

RG&E supported requests for gas services in accordance with tariffs and PSL.

Program Activities Planned for 2021

RG&E will continue to support and install services for requests for gas services in accordance with tariffs and PSL.

42 - Minor Government Jobs, Replace Gas Mains

Program Overview

The scope of this program consists of replacing gas mains in conflict with municipal highway and street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way.

Government agencies complete various highway improvement projects that require the relocation of existing gas mains; this program provides capital fund allocations to complete these projects. Regulations and terms of highway access permits allow RG&E facilities to be located within municipal rights-of-way, but mandate relocation of those facilities when it conflicts with street or highway reconstruction projects.

Relocation of facilities prior to the start of construction reduces the potential for damage to Company facilities and prevents unscheduled interruption of service to customers in the affected surrounding area(s).

Program Activities / Key Accomplishments in 2020

RG&E supported the Program as requested by various government agencies. Some of the notable projects that are included within this program include:

Empire Boulevard (Rochester),
Mount Hope Avenue (Rochester) and
North Road (Rochester).

Project Activities Planned for 2021

RG&E will continue supporting projects as requested by various government agencies.

43 - Non-Leak Prone Services Replacement Program

Program Overview

This program replaces or ties-over any service associated with a gas main replacement project that does not qualify as a leak prone service in accordance with DIMP.

Required by various regulations, the work replaces gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way, tariff or code requirements, and actively leaking services.

Program Activities / Key Accomplishments in 2020

RG&E supported the program by replacing gas services not classified as leak prone.

Program Activities Planned for 2021

Work performed by RG&E will continue to support the program.

44 - Waring Rd Leak Prone Main

Project Overview

This project contributes to the Leak Prone Main Replacement Program mileage goal. The leak prone gas main work is prioritized based upon leak history, main condition, inspection reports, and various risk factors. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The programmed gas main replacements result in a distribution system that is safer and more reliable. Replacement of pipe categorized as Leak Prone. Projects are prioritized based on condition of pipe.

The project is being separated from the LPM program to follow the rate case Joint Proposal reporting threshold of $500K. The Waring Road LPM project consists of 4,200 feet of 12" steel main. Pipe was replaced in kind.

Project Activities/Key Accomplishments in 2020

All construction and installation work was completed during 2020 for this project.

Project Activities Planned for 2021

Restoration, tie-in and closeout activities will be completed by the end of 2021.

45 - Whalen Rd Leak Prone Main

Project Overview

This project contributes to the Leak Prone Main Replacement Program mileage goal. The leak prone gas main work is prioritized based upon leak history, main condition, inspection reports, and various risk factors. The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The programmed gas main replacements result in a distribution system that is safer and more reliable. Replacement of pipe categorized as Leak Prone. Projects are prioritized based on condition of pipe.

The project is being separated from the LPM program to follow the rate case Joint Proposal reporting threshold of $500K. The Whalen Road LPM project consists of 4,000' of 12" steel main. Pipe was replaced in kind.

Project Activities/Key Accomplishments in 2020

All construction, restoration, and closeout work was completed during 2020 for this project.

Project Activities Planned for 2021

There are no future activities planned for this project in 2021.

Appendix F

NYSEG Common Project Narratives

2 - NYSEG - Fleet Purchase

Program Overview

The Fleet Replacement Program will provide a safe, reliable, regulatory compliant and cost-effective fleet of vehicles and equipment to the operating companies of AVANGRID, enabling them to deliver optimum network performance and customer service.

Fleet Services strives to achieve economies of scale that result in cost reduction opportunities by utilizing national contracts, standardized or “Off the Shelf” specifications and, wherever feasible, to take advantage of preferential purchasing terms in accordance with procurement guidelines.

The annual Fleet Replacement Program is based on unit age and/or usage (Miles/Hours). Understanding that units achieving the replacement criteria based on age and/or mileage are proposed for replacement and the results checked and collated to form the Fleet Replacement Matrix. This criterion ensures that the optimum combination of age and mileage is attained, while also taking into consideration the total cost of ownership.

Model year advancements by the vehicle and equipment manufacturers are factored into the acquisition process to ensure that the latest technical and safety features are included when applicable. Changes in operational requirements are also considered, based on feedback form the end-users of the AVANGRID fleet.

Vehicles and equipment that have been removed from the fleet (retired), are sold at public absolute auctions only. This safeguards AVANGRID from risk, as all units are sold in the “AS IS” condition, with no implied warranties.

Program Activities / Key Accomplishments in 2020

The 2020 Fleet Replacement Program encompassed ordering vehicles and equipment from four distinctive groups, involving over seven suppliers. Deliveries of completed units began arriving mid-year and completed by year-end.

The Light-Duty/Medium/Heavy-Duty/Equipment (LD/MD/HD/EQ) fleet, 328 units meeting the replacement criteria were ordered and replaced, 55 additional units were ordered and will be delivered in second quarter 2021. Three hybrid bucket trucks were added to the fleet. COVID made for limited manufacturer production slots and delays in vehicle arrivals. Aligning budget allocations, specification changes, end-user requirements and unit additions were all considered in final replacements.

Program Activities Planned for 2021

The 2021 Fleet Replacement Program reflects an estimate of 396 units of the NYSEG fleet (LD/MD/HD/EQ) meeting the replacement criteria. 47 Hybrid bucket trucks will be added to the fleet. Contracts are being prepared to allow purchase orders to be placed, with estimated delivery of year-end. The 2021 Fleet Replacement Plan is projected to involve over four suppliers, across four distinctive vehicle and equipment groups. NYSEG and RG&E are planning to order a total of 14 fully electric vehicles to the fleet.

3 - NYSEG - Fleet Light Duty Vehicle Leases

For the narrative on this project please refer to NYSEG Common Project Narrative #2.

4 - BP&SM Projects – NYSEG

Project Overview

The facility investments are projects needed to maintain, update or replace the Companies' facilities due to asset condition, age, safety and/or environmental considerations. Project improvements typically are associated with mechanical, electrical, building structures, control systems, etc. The facilities projects are aimed at providing safe working conditions at all of our locations – office space, operations buildings and work centers.

Project Activities / Key Accomplishments in 2020

2020 activities at NYSEG included the construction of a new ECC Integrated Control Center in Binghamton; upgrade of the Operations Building in Owego; upgrade of the Call Center data cabling in Kirkwood; restoration of a Fire Main Break in Brewster; repaving project in Brewster, installation of EV Chargers at multiple locations and reconstruction of the Perry Service Center after a fire occurred at this location.

Project Activities Planned for 2021

NYSEG has 22 projects planned for 2021, consisting of: one generator upgrade; one roof replacement; three HVAC & lighting upgrades; three consolidation projects; eleven overall upgrades (including fencing, floor drains, storage building, overall site upgrades, etc.); SPCC program at multiple locations; purchase of COVID equipment; and EV charger installation at multiple locations.

The generator upgrade is to be at the Granville Service Center. Generator is at the end of life cycle and we would not have power in an emergency. The ATS has already failed thus requiring manual intervention. The electrical distribution is also end of life and breakers are unavailable if needed for replacement. Construction schedule to begin in August and in-service in December 2021.

The roof replacement is to be at the Lancaster Office. Both the Service Center and the UCM roof are end of life and have no warranty left. They are both EPDM and the seams are failing which creates openings the building structure and interior. Continual repairs to the roof and interior has been done over the last five years. Water infiltration can lead to environmental hazards (mold) and building system failures (grounding, power outages, finishes damages, deterioration of steel, etc.) Construction schedule to begin in September and in-service in October 2021.

The three HVAC and lighting upgrades are to be at the Elmira, Auburn and Geneva Service Centers. Construction schedule for Elmira HVAC and lighting to begin in November and in-service in December 2021. Construction schedule for Auburn HVAC and lighting to begin in September and in-service in December 2021. Construction

schedule for Geneva HVAC and lighting to begin in October and in-service in December 2021.

The three consolidation projects are to be at the Kirkwood General Office and the Binghamton and Ithaca Service Centers. Construction schedule for all three consolidation projects to begin in November and in-service in December 2021.

The eleven overall upgrades are to be at multiple locations including but not limited to Liberty, Owego, Endicott, Norwich, Lockport, Auburn, etc.

The Spill Prevention, Control and Countermeasure (SPCC) program, the purchase of COVID equipment and EV chargers are to be at multiple locations throughout the NYSEG service territory. Purchase and installation of this equipment will be accomplished throughout the year.

5 - Telecomm NY WAN Expansion

Project Overview

New York Wide Area Network (WAN) Expansion involves WiMAX (Worldwide Interoperability of Microwave Access) Deployments to support automation activities at New York State Electric and Gas (NYSEG) and Rochester Gas and Electric (RG&E). The New York WAN Expansion project is a WiMAX area network conceptualized to support smart grid communication equipment deployments as an end-to-end solution to meet requirements for communication paths and provide flexible solution for the companies.

Project/ Key Accomplishments in 2020

In 2020 the Telecom Department delivered services and automation to our internal departments while preparing and implementing WiMAX technology for grid automation technologies. We provided our Distribution Automation group with 414 Cabinets for automation. We built 166 WiMAX cabinets for WiMAX and commissioned 50 thus far. In 2020 we have automated more devices in the field than projected. We are well on our way to having the WiMAX infrastructure fully functional in four of our NY operating areas.

Project Activities Planned for 2021

Based on the 2020 activity with the heavy emphasis on engineering and the pre-build of cabinets, we are well on our way and will have the WiMAX infrastructure fully functional in four of our NY operating areas. Along with that there will be a continuation of more of the same as we continue to expand our reach to the end devices in the field for automation and control of the grid in all the New York territories. We will activate all WiMAX capable cabinets and continue to provision more cabinets for 2021 Customer Premises Equipment (CPE) needs. Our goal is to complete our first four NY operating areas by the end of 2021. Engineering for all other areas will continue for us to extend the WiMAX infrastructure as we move through the New York territory.

6 - IUSA-NetEng Life Cycle

Program Overview

The objective of the Network Engineering Lifecycle project is to plan and implement a continuous improvement and refresh process such that the Avangrid Corporate Network infrastructure meets and exceeds established availability requirements. The lifecycle plan is also our mechanism for ensuring that the network infrastructure is scalable, meeting the increasing demands of our business users.

Program Activities / Key Accomplishments in 2020

Avangrid targets known problematic, end of life devices and/or devices aged 7+ years for potential refresh. Technology refresh is also periodically required as the Avangrid architecture is updated to meet current user demands.

Devices procured in support of lifecycle efforts in 2020 included network routers, switches, voice gateways, console servers and wireless access points. Additionally, routine purchases of fiber lasers, jumpers and patch cables are made as needed to support growth and maintenance demands.

In 2020, 111 devices were purchased for lifecycle refresh NYSEG. Additionally, a total of 31 devices were purchased for planned growth and or to be maintained as inventory for deployment in a break fix scenario.

Growth initiatives in 2020 included procurement and deployment of Nexus 9000 series devices to accommodate growth of the Orange data center. Other key initiatives included the transformation of aged infrastructure in our East Coast data center as well as the build out of our Portland Oregon Disaster Recovery initiative.

Program Activities Planned for 2021

In 2021 we have planned refresh activities throughout the Avangrid enterprise, maintaining our refresh strategy including the purchase and continuous deployment of 71 devices across the Avangrid New York companies. These devices include routers, switches, wireless access points, Cisco Fabric Extenders (FEX), and Cisco Application Centric Infrastructure (ACI).

Additionally, Network Engineering will be replacing/refreshing our Cisco Identity Services Engine (ISE) Distributed Network Access Control (NAC) appliances as the existing solution is approaching end of life. The updated solution will also serve to enhance of our security posture by adding PxGrid functionality.

7 - Laptop Life Cycle

Program Overview

The overall goal of this project is to refresh all NYSEG laptop computing devices following the refresh lifecycle defined for NYSEG's equipment (laptops, 4 years) for users in scope. This project also provides Personal Computers (PC) in support of new hires and refresh demand requirements enterprise wide.

Program Activities / Key Accomplishments in 2020

Project activities and key accomplishments completed in 2020 included ordering and receipt of PCs, labeling and asset assignment, client communication and scheduling, imaging of machines, application installation as required, deployment of new PCs, data transfer, backup, and retrieval. Close out activities included retrieval, quarantine, data cleansing, and disposal of legacy devices. Additional devices were deployed in 2020 in support of work from home requirements surrounding COVID.

Program Activities Planned for 2021

The project includes project management for deployment strategy, client communication, and procurement of PCs in a timely manner. Hardware will be received, at primary facilities, by Deskside Support, and staged for deployment as outlined in the asset management process. Aged equipment will be quarantined for a five day period after which, hard drives will be wiped, packaged, palletized, and picked up by environmentally responsible approved recycler.

8 - Unix Life Cycle

Program Overview

This project purchases, provisions, and integrates Unix server infrastructure to support lifecycle efforts. This effort meets availability, performance and scalability requirements while following Information Technology (IT) Infrastructure global standards. Project efforts include: assistance with Data Center Consolidation effort, replacement of aging hardware - devices that are currently off support, server capacity increase to meet growth demand.

Program Activities / Key Accomplishments in 2020

The 2020 effort focused on these areas: infrastructure preparations for server migrations to the Orange, Connecticut datacenter, server sizing assessment, procurement of IBM Power series servers, upgrades that align with sizing results, and West Coast DR (Disaster Recovery) capacity expansion.

Program Activities Planned for 2021

The 2021 effort will focus in these areas: infrastructure preparations for server migrations to the Orange, Connecticut datacenter, server sizing assessment, procurement of IBM Power series servers to replace servers nearing end of life, and West Coast DR (Disaster Recovery) capacity expansion.

9 - Storage Life Cycle

Program Overview

This investment program will purchase, provision, and integrate storage infrastructure to support lifecycle efforts. This effort will meet availability, performance and scalability requirements while following Information Technology (IT) Infrastructure global standards. Project efforts include: assistance with data center consolidation effort, replacement of aging hardware - devices that are currently off support, storage capacity increase to meet growth demand.

Program Activities / Key Accomplishments in 2020

The 2020 effort focused on these areas: Infrastructure preparations for server migrations to the Orange, Connecticut datacenter, server/application migrations - storage capacity assessment, procurement of additional SVC (SAN Volume Controller) capacity and SAN (Storage Area Network) director port capacity. West Coast DR (Disaster Recovery) storage capacity expansion.

Program Activities Planned for 2021

The 2021 effort will focus in these areas: Infrastructure preparations for server migrations to the Orange, Connecticut datacenter, Server/Application migrations storage capacity assessment, Procurement of additional SVC capacity - Lifecycle SVC1- end of life, Procurement of additional SAN director port capacity, West Coast DR (Disaster Recovery) capacity expansion, Backup and Recovery – transition to Commvault.

10 - NYSEG Perry - Post Fire Upgrades

Project Overview

The purpose of this project is to rebuild the facility after a fire which occurred in 2018.

NYSEG Perry Service Center is located at 348 S. Main Street, Perry, NY. This facility is part of the corporation's critical infrastructure that houses the divisions Electric Operations. The building has approx. 8,000 sq. ft. of space and houses approximately six people.

The current facility sustained severe damage from heat and smoke caused by a fire that occurred on July 26, 2018 and rendered the facility unusable. The plan is to rebuild the facility to the original condition prior to the fire. The overall project scope is to provide temporary provisions, perform investigations, demo, remove all damaged components, design, rebuild, commission, and perform all as-built documentation to meet all applicable standards.

Project Activities / Key Accomplishments in 2020

During 2020 after completing the design and the tender process, the construction started in March 2020. 90% of the construction was completed in 2020.

Project Activities Planned for 2021

The punch list and other requested activities will be completed in 2021 as will the final close-out of the project.

14 - Facilities Projects – NYSEG

Project Overview

The facility investments are projects needed to maintain, update or replace the Companies' facilities due to asset condition, age, safety and/or environmental considerations. Project improvements typically are associated with mechanical, electrical, building structures, control systems, etc. The facilities projects are aimed at providing safe working conditions at all of our locations – office space, operations buildings and work centers.

Project Activities / Key Accomplishments in 2020

Minor capital projects were carried out to upgrade systems in each facility due to: end of life, failures associated with mechanical, electrical, building structures, control systems etc. Additional projects were completed that improved the efficiency, reduced energy consumption, reduced greenhouse emissions etc. and/or addressed security and safety issues. These minor projects included: Purchase of Ergonomic Furniture, Kirkwood General Office Sprinkler Heads, Oneonta Lighting Cages, Chatham Door Replacement, Brewster Milan Road Paving, Mechanicville Hyperloop System, Auburn LED Lighting, Elmira Parking Lot Upgrades, Elmira Sump Pump Upgrades, Geneva LED Lighting, Hornell Heat Pumps & Elmira LED Lighting.

Project Activities Planned for 2021

NYSEG has multiple minor capital projects planned to be carried out in 2021 including but not limited to: Elmira Dock Upgrades, Geneva Man Doors, Hamburg Hot Water Tank, Hamburg Lift Station, Hammondsport Site Upgrades, Ithaca UPS, Penn Yan LED Lighting, Auburn HVAC Upgrades, Lockport Exterior LEDs, Geneva Overhead Door & Brewster Garage LED Lighting.

15 - BMS System

Project Overview

Design and install a new BMS (Building Management System) system throughout all High and Medium Priority Facilities across NYSEG occupied facilities – approximately 20 buildings in Phase 1. The BMS system will provide local / remote access to control and monitor all building system including, but not limited to: heating equipment, cooling equipment, temperature balancing, electrical switchgear, electrical loads, UPS, generators, lighting, OH doors, elevators, sumps, OWS (Oil Water Separator), fuel levels, fire panel monitoring, and utility monitoring. The system will allow for automatic alarm monitoring and alerting to maintenance technicians. The system will be based on the newest technology available globally and be based on an open protocol interface allowing for non-proprietary maintenance and support.

Project Activities / Key Accomplishments in 2020

This project included data collection, vendor selections, development of the technical specification and RFP documents.

Project Activities Planned for 2021

The project will proceed with engineering, equipment procurement, and sequenced installation (half the buildings). Complete installation, commissioning, and Go Live in 2022.

16 - Workload Management

Project Overview

Robotics Process Automation (RPA) refers to a type of automation (called a robot or bot) which interacts with computer coded software that enables the automation of repetitive, rule-based processes, mimics interactions of users and works across functions and applications.

The goal of the project is to define an RPA Strategic Program for Customer Service and to implement Bots to complete high-value business processes. The project is introducing Robotics Process Automation for cost savings, consistency, improved productivity, and to free up manual resources for more value-added tasks focused on improving customer service.

Project Activities / Key Accomplishments in 2020

A Robotics Factory was consolidated running RPA development as a Factory, providing functional and technical expertise and supporting Bot monitoring.

The RPA technical architecture used for bots development, testing and execution was moved to VDI Platform (virtual devices).

RPA governance model that defines the RPA Program was developed and shared with the Customer Service team. The Governance Model includes defined roles and responsibilities of the programs sponsorship and core RPA functional and technical teams. It includes project planning, development, implementation, post go-live support model, communications plan, change management plan, cost of implementation/return on investment, and will result in a repository of documents that may be utilized by all AVANGRID business areas interested in Robotics Process Automation.

The stabilization of the bots implemented in 2019 and the delivery of new bots, up to 13 bots, running in 2020.

Project Activities Planned for 2021

In 2021, Wave 2.2 will be completed with the development of four bots planned.

17 - Enterprise GIS Upgrade

Project Overview

This project is upgrading NYSEG's gas and electric Geographic Information System (GIS) databases and software from an older version to the latest supported release. It includes new virtual server infrastructure in AVANGRID's datacenter as well as upgrades to the underlying database versions. This project is also replacing legacy GIS Viewing web applications that are built on technology approaching end of life.

Project Activities / Key Accomplishments in 2020

The main accomplishments in 2020 include the issuing and awarding of a Request for Proposal (RFP) to integration vendors. The project held workshops and requirements-gathering sessions with the successful integration vendor and NYSEG personnel related to GIS applications, integrations, web applications, as well as architecture design. In addition, the infrastructure was procured and deployed. GIS software deployments and configurations began.

Project Activities Planned for 2021

The major items planned for 2021 include database migrations and upgrades, completing software deployments and configurations, as well as integration deployments. Development and deployment of a new web viewer is planned. User testing and training will take place, with the go-live planned for the fourth quarter.

18 - Metering and Mobility IT Systems Upgrade

Project Overview

A number of metering and mobility systems at NYSEG are operating in extended support by the vendor, approaching end of life and require an upgrade to enable the continued support and use of these systems. This upgrade will mitigate the obsolescence risk and impact on business processes.

The following applications will be upgraded:

MV90 – Meter read collection system used for large electric customers at NYSEG. This requires an upgrade from 5.0 to the latest version 6.1, as current version will be at EOL in Q1 2021.

Tesco Meter Manager – Tesco is used for meter inventory management and testing in NYSEG.

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SAP Business Warehouse – The SAP Business Warehouse (BW) is used to support reporting for NYSEG. This current version of the system is 7.1 and is required to be upgraded to 7.5 to maintain support and provide additional foundational capabilities.

Streamserve – Streamserve is used for document composition and presentment for NYSEG bills. The current version is 5.5 is to be upgraded to version 16.6. Version 5.5 is in a sustained maintenance period with no new maintenance packs being distributed.

Click – Click software is utilized in NYSEG as the mobility and scheduling platform, supporting field service processes (turn on, turn off, meter testing, field investigation, collections, etc.) The current version 8.1.7 is at end of life in December 2020 and has a Microsoft Silverlight Dependency which is to be discontinued by Microsoft in October 2021. This requires an upgrade to the Click FSE (Field Service Edge) system.

Project Activities / Key Accomplishments in 2020

In 2020, the main accomplishments included the New York StreamServe application being successfully upgraded to Exstream 16.6.

Also, the New York Click Version 8.1 was upgraded to Click FSE (Field Service Edge) platform and the Phase 1 rollout was completed for Geneva, Ithaca, Binghamton and Auburn service divisions.

The TESCO meter manager system was upgraded to release 2020.07.16.53316.

The BW upgrade User Acceptance Testing (UAT) was completed in December 2020.

The MV90 platform configuration was completed and the User Acceptance Testing (UAT) began.

Project Activities Planned for 2021

The main activities planned for 2021 include go-live of the BW upgrade that began in 2020. The go-live is planned to occur at the end of January 2021.

The MV90 Upgrade User Acceptance Testing will continue in 2021 with the go-live planned for early March 2021.

The project will continue to provide post go-live technical and system support for all the upgraded and deployed systems noted above.

19 - Damage Prediction Modeling Analytics

Project Overview

The New York Department of Public Service Storm Report recommended that the company develop an outage prediction model. The model will leverage Avangrid Network's incident history, infrastructure, and geographic information system (GIS) data, along with known vegetation and weather forecasting using a variety of proprietary models. Scope to include cross validation of results.

Project Activities / Key Accomplishments in 2020

Data Transmission Network (DTN), a private company, was contracted to analyze and develop a predictive model that utilizes the Company's existing outage history and correlate this data to storm event data. The model includes the overhead network infrastructure and utilizes machine-learning models. Models were developed for wind, thunderstorm, and snow events and specifically integrate the weather, infrastructure and other idiosyncrasies within each of the Company's service divisions. A user interface matches the Company's divisions, event type, and nomenclature used by the company. These models were developed and delivered in 2020.

Project Activities Planned for 2021

No additional work is planned on this project in 2021.

20 - Digital Projects - Customer Experience

Project Overview

The objective of Digital Customer Journey Program is to provide customers, an effortless digital experience to maximize the use of self service options, giving customer flexibility and choice, and improving customer satisfaction.

The intention is to have a consistent Digital Experience through all the different channels, making the different solutions available in an omnichannel environment.

Project Activities / Key Accomplishments in 2020

The key accomplishments and project activities for the Web Channel include the deployment of a customer preference portal on the web for customers to manage their account preferences (eBill, AutoPay, Outage Alerts, Budget Billing, Energy Supplier Market Place, and Meter Read Alerts) and customize their Digital Experience. The Enhanced Outage Reporting process is more secure and authenticated.

The key accomplishments and project activities for the Mobile Channel include deployment of new functionalities to the mobile applications, including credit card payment options, outage estimating time to restore, autopay enrollment, FaceID/TouchID login after password change, and several technical functionalities to support the latest iOS/Android versions.

The key accomplishments and project activities for the Interactive Voice Response (IVR) Channel include several enhancements to the IVR system deploying new functionalities such as enroll/de-enroll/increase Budget Billing Plan, enroll/de-enroll Outage Alerts, and Gas Emergency Message.

Project Activities Planned for 2021

The planned activities for 2021 are to continue the technical evolution of the websites, migrating them onto the new Liferay Digital Experience Platform. Also, the different third-party services, alerts, and payments will be integrated in the different channels (Mobile, Web, IVR). In addition, the project plans to implement a virtual assistant platform (IBM Watson) to create a new Cognitive channel including chatbots and virtual voice assistants.

26 – NYSEG AMI

Project Overview

New York Advanced Metering Infrastructure (AMI) will be an essential foundational system in realizing REV (Reforming the Energy Vision) goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of Distributed Energy Resources (DER), and minimize environmental impacts of power generation and energy consumption. New York State Electric and Gas (NYSEG) and Rochester Gas and Electric (RG&E) will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

Project/ Key Accomplishments in 2020

After receiving the Order approving the Joint Proposal ("Order") on November 19, 2020, the AMI team concurrently focused on collaboratively developing a Benefit Implementation Plan ("Plan") with New York Department of Public Service (DPS) Staff, executing contracts with AMI Equipment and Services Vendors, and focusing on the initial phase of developing the Information Technology (IT) infrastructure needed to support the AMI project. The Plan was filed within the 60-day timeframe set by the New York PSC on January 18, 2021 and was received with no further comment. Additionally, there will be ongoing engagement with Staff including following a meter approval process (monthly meetings), conducting a deployment plan review (when draft is completed with Grid One), holding a Home Area Network (HAN) workshop to discuss the process to deliver streaming energy data directly from the customers meter via Wifi to applications and devices in the home, and providing general informal updates on our progress to keep them informed. At the time of the Regulatory Order the team had Proposals for Award (PA) in place for all the major Request for Proposal (RFP) for quick approval and prompt contract negotiations. Contracts with the major AMI Systems vendors and the System Integration partner were fully executed by December 31, 2020. Expenditures for 2020, for the most part were based on the IT infrastructure. Field deployment of AMI meters and network will not begin until 3rd quarter 2022.

Project Activities Planned for 2021

In early 2021, the team focus is on conducting Business Process and Technical Requirements blueprinting workshops. Following this, the AMI system design, build, and integration phases will commence with initial testing cycles to begin in late 2021. Also, the Energy Manager front end and platform will be built, integrated, and go live to an initial set of Avangrid companies. In addition, the team expects to have fully executed the remaining contracts with the AMI Equipment and Services Vendors.

#	Summary of Key Milestone & Description	Target Completion
1	New York Public Service Commission AMI Approval and Order	11/2020
2	Resource Plan (2020-2022)	12/2020
3	AMI Foundation Contract Execution*	12/2020
4	Benefit Implementation Plan	01/2021
5	Remaining AMI Contract Execution	06/2021
6	AMI/ Customer Relationship Management & Billing (CRM&B) Infrastructure	06/2022
7	AMI/CRM&B/Energy Manager Go-Live	07/2022
8	Meter and Network Deployment	06/2025

31 - Fire Protection

Program Overview

This program is for fire protection system projects to ensure safety and security of our facilities as well as ensuring our systems are up to date and in compliance with National Fire Protection Association (NFPA), local and federal requirements. Fire protection projects include the design and installation/replacement of smoke detector/fire alarm systems, mass notification systems, automated extinguisher monitoring systems and fire suppression systems.

Program Activities / Key Accomplishments in 2020

2020 Fire Protection activities continued the replacement/upgrade of end-of-life systems and installation of new systems as required. Fire protection projects were completed at New York State Electric and Gas (NYSEG) service centers, substations and hydroelectric generation facilities, including a Battery Energy Storage System (BESS) at Ithaca Waste Water Treatment Plant, Elmira, Chateaugay, Geneva Phase I, Lewis, Long Lake, Pavillion, Penn Yann, Hammondsport, Long Lake, Owego, Stamford Stephentown, Lockport, West Stephenstown and Geneva Service Centers; and Caddyville, High Falls, Kent Falls, Mechanicville, Mill C and Rainbow Falls hydroelectric facilities.

Program Activities Planned for 2021

2021 Fire Protection activities will concentrate on fire protection systems at service centers and critical substations. Fire protection projects are planned at NYSEG facilities including Goshen, Fleischmanns, Lowville, Norwich, Owego, Pawling, Perry and Waterville Service Centers.

32 - System Cutover

Program Overview

This program relates to security work on various facilities to continue implementing the five-year Security Deployment plan. Systems to be installed are based on a security tier for each facility that is based on risk. Tier 1 and 2 facilities (e.g., bulk substation) receive card access control systems, Public Address (PA) systems, video surveillance, video analytics and thermal cameras (Tier 1 also receives additional physical hardening due to critical nature). Tier 3 facilities (e.g., large office/service center, cash office, hydro) receive card access control systems, video surveillance and video analytics. Tier 4 facilities (e.g., small offices, store yards) receive card access control systems and video surveillance. Additional work includes the enhancement of communication networks to allow for the transport of video back to the Security Operations Center (SOC) for remote monitoring.

Program Activities / Key Accomplishments in 2020

2020 Security activities included site specific work at New York State Electric and Gas (NYSEG) facilities for the last mile fiber connections and upgrades / installations of security devices. Specific facilities at NYSEG included Montour Falls, Elmira, Hammondsport, Hornell and Plattsburgh Service Centers; Kirkwood General Office and several substations including Robinson Road, Stony Creek, Wethersfield, High Sheldon, Oakdale and Wood Street.

Program Activities Planned for 2021

2021 Security activities will continue to concentrate on implementing the Security Deployment plan as well as connecting facilities to the new communications network, upgrading the facility security systems and migrating those systems onto the new network. Work will include completion of projects from 2020 and new projects at the following NYSEG substations: Wood Street, Fraser, Oakdale, South Perry, Wethersfield, Stony Creek, High Sheldon, Stolle Road, Robinson Road, Somerset, Coopers Corners. Work will also be completed at the Vestal Energy Control Center.

33 - Primavera PPM Cloud

Project Overview

Primavera PPM Cloud is a fully integrated system of three modules that provide scheduling (P6), project controls, cost controls, and workflows (Unifier), and business analytics and data warehouse (Analytics).

Project Activities / Key Accomplishments in 2020

In 2020, purchase authorization and generated PO's (Oracle) were created and kickoff meetings held. The conceptual design was completed and detail design of the Oracle P6, Unifier, Integration and Analytics modules was started.

Project Activities Planned for 2021

This year the company plans to complete the design of the Oracle P6, Unifier, Integration and Analytics modules, migrate the schedule and financial data, link the modules together in an integrated portfolio management system, test, train, go-live for Phase 1, develop additional business processes, test, train and go-live for Phase 2.

High-Level Schedule

Project Start	*Project Finish*	*ISD*
01/02/2020	12/15/2021	12/31/2021

34 – Non-AMI DSIP Enterprise Analytics

Project Overview

For the AVANGRID Enterprise Data Analytics Implementation Project, a qualified industry expert will focus on deploying data quality assessments to complete Use Cases using a structured and value driven approach, planned to be completed over two years. The deployment will move the Companies from our current initial level of analytics capabilities closer to maturity. The project's outputs will include initial Use Case deployment. Data and analytics are foundational to realizing Utility of the Future initiatives. The "smart" revolution is exponentially compounding the amount of grid and customer data utilities generate. The development of the Distributed System Platform (DSP) will introduce a range of new data in the NYSEG/RG&E service territories, including sub-hourly customer consumption data, status information from grid devices, interval measurements of service conditions on distribution feeders, and a growth in Distributed Energy Resources (DER) information. As the volume of data collected increases in magnitude and diversifies through the platform investments, AVANGRID recognizes the importance of leveraging Data Management, Business Intelligence, and Advanced Analytics to extract insights from this data to help move the business and the market toward a future of informed, proactive, and agile decision making. In addition, the Companies intend to use the Enterprise Analytics effort to better inform data quality and required data elements in support of the use cases envisioned in the recently released Integrated Energy Data Resource (IEDR)Order.

Project/ Key Accomplishments in 2020

In 2020, the installation of the Big Data Analytics platform continues. The platform consists of advanced hardware and software components to develop Use Cases which pull massive amounts of structured and unstructured data together into a data lake which can then be modeled to develop advanced analytics modules that help drive business decisions.

The original technical hardware and licenses of several software products were extended and upgraded to continue our effort in analytics and allow for additional users.

2020 began with a Roadmap-Refresh workshop engagement with business users from many business areas to identify future use case opportunities, and to perform a round of prioritization of projects.

In 2020, the Companies primarily completed second and third Use Cases focused on Distribution Transformer Monitoring and Estimated Time of Restoration respectively. Enhancements to functionality and data validation will be part of the 2021 workplan.

The internal organization developed more concrete governance around data migration, resolving technical issues, engaging the business, and defining specific roles. The Information Technology (IT) Data Analytics group developed a framework agreement for

big data services to document agreement of requirements from the vendors providing the service.

A large goal for 2020 was to implement an Agile methodology and approach to program management and testing procedures to better align with Company initiatives and provide more alignment to business needs.

Project Activities Planned for 2021

2021 includes another refresh of the data analytics Roadmap with a cross functional workshop with business users from many business areas to identify future use case opportunities, and to revisit the prioritization of use cases / projects.- In addition, one of the lessons learned regarding the Companies data in 2020 is that the quality and availability is not to a standard that will allow for robust development of operational and planning use cases. This data is likely to be more readily available once the Companies Grid Model Enhancement Project (GMEP) is completed. Therefore, the Companies will take some time in 2021 to re-assess and re-evaluate the quality and governance processes needed to enable robust use cases. In parallel, we will enhance the current Estimated Time of Restoration (ETR), Transformer Monitoring and Vegetation Management use cases. Through the discovery workshops, we have identified an asset management use case which was kicked off in January 2021 and is ongoing. This effort is expected go live by the end of 2021.

2021 use cases will be using an Agile Methodology, with IT subject matter expert resources assisting the Data Analytics core team in oversight and supervision of the methodology and applying lessons learned and best practices.

Follow-ups will be done with the vendors to ensure that the IT Framework for big data services is applied and followed.

35 - NYSEG OMS Enhancements

Project Overview

This project will continue the build out of the New York Siemens Spectrum system and the Outage Management systems (OMS). The enhancements consist of the New York Spectrum core OMS, the iCDS reporting OMS system (quality of service/ outage management Spanish reporting system) and related interface work. The continued build out of these systems is critical to realize the full benefits and efficiencies they provide.

Project/ Key Accomplishments in 2020

OMS system reliability was at 99.99% in 2020, which is a significant accomplishment given the pandemic and associated challenges. Significant OMS system build-out and enhancement work also completed in 2020. This included three large Spectrum OMS (core system) software releases and twelve iCDS reporting system releases. These releases included a variety of enhancements and code corrections and over 75 items in total.

The Department of Public Service (DPS) recommendations that were detailed in last year's report were all closed out in 2020. This included enhanced OMS error logging/reporting, continuing to improve system performance and associated stress testing. A PSC mandated simulation was conducted on our test system in which over 90% of New York customers were taken out of power. Restoration testing was performed as part of this exercise with good system performance.

The iCDS OMS reporting system was expanded in 2020 to include mapping and basic OMS update functionality. This new functionality has been successful in providing a simpler interface for many users and with maps providing situational awareness to the already robust reporting system.

Work continued with DPS Staff to replace the Electric Outage Reporting System (EORS) and Electric Incident Reporting System (EIRS) outage/incident management systems. The initial EORS solution was delivered and it being tested by DPS on their test system. EIRS replacement work is still underway with DPS per the agreed upon schedule. Work on both systems will continue in 2021.

Project Activities Planned for 2021

2021 OMS enhancement work will include the completion of items from 2020, several new initiatives and continuation of the OMS buildout process.

We plan to implement 3 large Siemens Spectrum releases in 2021, which will include a significant OMS component as well as updates to the Supervisory Control and Data Acquisition (SCADA), Transmission Network Applications (TNA), Independent Frontend

System (IFS) components of the Energy Management System (EMS). These systems combine to form a robust solution, all benefiting from increased device automation (recloser projects). We also expect 10 – 12 implementations of our web-based OMS system (iCDS). This work will greatly expand its functionality and allow us to free up Spectrum system seats for other EMS related work. The enhanced system logging and automated alerts will continue to build out for both systems, which will greatly improve supportability.

As a result of New York Automated Metering Infrastructure (AMI) project approval, OMS functionality and interfaces are being designed and built to support AMI in the OMS systems. This effort will further contribute to automation and as a result improve OMS system efficiency.

We will continue working closely with DPS on the EORS and EIRS system replacements, largely developed in 2020. Given the significant change and large volume of data in the new EORS system, we expect some iteration with this implementation. We also expect some additional requirements and are already working some of these with DPS. Work will also continue on other OMS-related interfaces with Geographic Information System (GIS) and Damage Assessment systems.

#	Summary of Key Milestone & Description	Target Completion
1	Automated OMS alerts and associated process restarts	3/2021
2	Three core OMS system major software updates	12/2021
3	OMS/Automated Metering Infrastructure (AMI) interface functionality update	10/2021
4	OMS interface improvements (Information Technology, Damage, Geographic Information System (GIS), Electric Outage Reporting System (EORS)	12/2021
5	OMS web system tiered enhancements	12/2021

39 - Lifecycle Replacement - ECC/XECS systems

Program Overview

This project will continue the build out of the New York Siemens Spectrum system and the Outage Management System (OMS). The New York Spectrum system enhancements consist of Supervisory Control and Data Acquisition (SCADA), Transmission Network Applications (TNA), and Software upgrade work. The continued build out of these systems is critical to realize the full benefits and efficiencies they provide.

Program / Key Accomplishments in 2020

For Substation automation in New York State Electric and Gas (NYSEG) 27 SCADA maps were developed and approved out of which 14 were commissioned in the SCADA/EMS system. On RTU telecommunication migration, 5 RTUs were migrated from TRW-9550 to DNP protocol and 4 RTUs were converted from dial-up RTU to Cellular.

For DER and Distribution automation projects 258 devices were commissioned in the SCADA/EMS system for NYSEG. New functions/enhancements were implemented in the EMS system: Automatic Grid Restoration (AGR). AGR is used for the Fault Location, Isolation and Restoration. Historic Information System (HIS) updated to provide better real time information to the back office

Program Activities Planned for 2021

Substation automation for NYSEG will continue in 2021 with an estimated 20 stations to be commissioned this year.

For migrating from bit-oriented protocol (TRW-9550) to Distributed Network Protocol (DNP specific protocol used for communications), it is estimated that 20 RTUs will be migrated. All these migrations are dependent on telecommunications availability.

DER and Distribution automation projects will continue with the commissioning of 400 new devices: reclosers/switches, voltage regulators and capacitor banks for New York State. New enhancements to the TNA and Operator Training Simulator (OTS) modules will be added to make them more robust.

#	Summary of Key Milestone & Description	Target Completion
1	Advanced Distribution Management Systems (ADMS) enhancements in SCADA/EMS system	12/2020
2	TNA and OTS enhancements in SCADA/EMS system	12/2020
3	Remote Terminal Unit (RTU) migration from TRW9550 (bit oriented) to DNP protocol (specific protocol used for communications)	12/2020 & 12/2021
4	Substation automation commissioned in SCADA/Energy Management System (EMS)	12/2020 & 12/2021
5	Distributed Energy Resources (DER) and Distribution automation projects	12/2020 & 12/2021

40 - NY Spectrum HW Refresh NYSEG

Project Overview

The project will cover the hardware replacement of the Spectrum Power 4.75 Energy Management System (EMS) at the New York Energy Control Center. This hardware will replace the original hardware that was purchased and implemented in 2012. The replacement of the hardware will allow us to install the latest version of the Solaris 11 operating system and Oracle DB 19 components. Solaris 11 is incompatible with the current hardware environment.

Project Activities / Key Accomplishments in 2020

In 2020, contractual requirements were completed and all required approvals for resources were received. Project team ordered, received and installed the required components to replace the current Siemens Spectrum System 4.75.

Project Activities Planned for 2021

In 2021, the continued installation of the Siemens Spectrum System 4.75 software will occur with the installation of the latest version of the Solaris 11 operating system and Oracle DB 19 components.

#	Summary of Key Milestone & Description	Target Completion
1	Obtain Charter Approval	05/2020
2	Identify and Secure Resources	06/2020
3	Execute Purchase Orders for new hardware	08/2020
4	Execute Vendor Contract with Siemens	08/2020
5	Receive and install all required hardware	12/2020
6	Complete Network Configuration	05/2021
7	Install All OS and DB components	05/2021
8	Complete Siemens Spectrum Installation	06/2021
9	Complete Site Acceptance test	10/2021
10	Go-Live	11/2021

44 - Telecomm Fiber

Project Overview

Expand network communications infrastructure for improved capacity, security, reliability, and functionality for operation of gas and electric networks.

Project/ Key Accomplishments in 2020

Request for Proposal (RFP) for additional IRU's, and Fiber Construction was executed, and we have begun the purchase of new fibers at the end of 2020 for further expansion of the fiber backbone. We also were able to complete the following activities from our previous IRU purchases. Within NYSEG, 76 fiber locations have been delivered, 48 Wide Area Network (WAN) sites built and 41 sites activated.

Project Activities Planned for 2021

The activity planned for 2021 is aimed at completing the remaining fiber sites from previous IRU purchase. Fiber will be tested and turned-up at 87 sites across the NYSEG and RG&E service territories with activity and connectivity focuses in Brewster as well as eastern and western sides of New York state such as Lancaster and Lockport. Total acquisition of fiber IRUs will be completed in 2021 and tied to the ASD network. As fiber is terminated, we will continue to connect all facilities with switches for transport and routers for data traffic throughout all NYSEG and RG&E territories.

45 - Telecomm Vertical Builds

Project Overview

This project is intended to support AVANGRID's need for delivering wireless technologies. These technologies include: Distribution Automation, Substation Automation, Core network backhaul via microwave point to point, private land mobile radio, and will support future technologies such as 5G, advanced metering and renewable energy integration.

Project/ Key Accomplishments in 2020

Invested in continuous growth and expansion of WIMAX infrastructure. Specifically procurement, construction and outfitting of communication cabinets was started in preparation for installation scheduled in 2021.

Project Activities Planned for 2021

Similar to original plans for 2020, AVANGRID will continue with site specific findings and use case analysis efforts as well as construction of towers upon Vertical Infrastructure Request for Proposal (RFP) award.

Investigation of third-party locations as an interim to close gaps in fiber optic core network along with investigation and delivery of solutions to further reduce or displace operating expenses related services are set to occur as well.

An effort to resolve deficiencies in existing Vertical Infrastructure and apply findings reports to acquire additional building permits as necessary followed by development of strategic RF Network expansion utilizing private Vertical Infrastructure.

To date, site specific research activities have commenced. Multiple use case investigations continue as well as Third Party tower investigations have been initialized.

48 - Telecomm Infrastructure

Program Overview

This program's purpose is to expand network communications infrastructure for improved capacity, reliability and functionality for operation of gas and electric networks.

Program / Key Accomplishments in 2020

The Telecommunications Infrastructure expansion in 2020 completed RFPs for Dense Wavelength Division Multiplexing (DWDM) and Internet Protocol Multi-Protocol Label Switching (IP MPLS) required equipment for 2021 installation. At NYSEG, 48 WAN IP MPLS sites were built for DWDM and activated 41 in 2020. With our RFP's completed and contracts soon to be completed, we will be able to continue the build of the DWDM and IP/MPLS infrastructure going forward. As for the consolidation project for Rochester properties, we have done the majority of the telecom work needed for the move and we are prepared for cutover. The pandemic has delayed the initial dates for moving.

Program Activities Planned for 2021

We will continue with the purchase and deployment of DWDM and IP/MPLS switching and routing equipment for transporting AVANGRID traffic across the backbone. As the Fiber infrastructure grows and the convergence of services onto the network, we will have to meet the demand by onboarding legacy services onto the network with this technology.

49 - NMC Solar Winds

Project Overview

This Project is to provide SolarWinds Licenses, professional and technical services for the expansion of the existing monitoring system currently on the AVANGRID Security Domain (ASD). The project purpose is to meet the ever-growing requirements of the AVANGRID Network, for the surveillance and monitoring of all AVANGRID assets to be managed by Operational Smart Grids - Network Management Center (NMC).

Project Activities / Key Accomplishments in 2020

In 2020, the project team was able to bring the engineers with historical knowledge of the network to the project. In addition to onboarding and reengaging the engineers to the project in 2020, the formal vendor contract was executed, and licensing purchases were completed at the end of 2020 for use in 2021.

Project Activities Planned for 2021

The optimization of the network management system is a key activity for 2021. As well as the alignment of licenses for the project. The continued growth of the ASD and security site migrations will be supported by this project.

#	Summary of Key Milestone & Description	Target Completion
1	Contract with Unlimited Technologies Inc (UTI) signed	05/2020
2	Project Manager and Engineers onboarded to the project.	07/2020
3	License purchased for 2021	12/2020
4	Optimization of Network Management System	12/2021

Appendix G

RG&E Common Project Narratives

2 - RG&E - Fleet Purchase

Program Overview

The Fleet Replacement Program will provide a safe, reliable, regulatory compliant and cost-effective fleet of vehicles and equipment to the operating companies of AVANGRID, enabling them to deliver optimum network performance and customer service.

Fleet Services strives to achieve economies of scale that result in cost reduction opportunities by utilizing national contracts, standardized or “Off the Shelf” specifications and, wherever feasible, to take advantage of preferential purchasing terms in accordance with procurement guidelines.

The annual Fleet Replacement Program is based on unit age and/or usage (Miles/Hours). Understanding that units achieving the replacement criteria based on age and/or mileage are proposed for replacement and the results checked and collated to form the Fleet Replacement Matrix. This criterion ensures that the optimum combination of age and mileage is attained, while also taking into consideration the total cost of ownership.

Model year advancements by the vehicle and equipment manufacturers are factored into the acquisition process to ensure that the latest technical and safety features are included when applicable. Changes in operational requirements are also considered, based on feedback form the end-users of the AVANGRID fleet.

Vehicles and equipment that have been removed from the fleet (retired), are sold at public absolute auctions only. This safeguards AVANGRID from risk, as all units are sold in the “AS IS” condition, with no implied warranties.

Project Activities / Key Accomplishments in 2020

The 2020 Fleet Replacement Program encompassed ordering vehicles and equipment from four distinctive groups, involving over seven suppliers. Deliveries of completed units began arriving mid-year and completed by year-end.

The Light-Duty/Medium/Heavy-Duty/Equipment (LD/MD/HD/EQ) fleet, 26 units meeting the replacement criteria were ordered and replaced. One hybrid bucket truck was added to the fleet. COVID made for limited manufacturer production slots and delays in vehicle arrivals. Aligning budget allocations, specification changes, end-user requirements and unit additions were all considered in final replacements. NYSEG and RG&E are planning to order a total of 14 fully electric vehicles to the fleet.

Project Activities Planned for 2021

The 2021 Fleet Replacement Program reflects an estimate of 49 units of the RG&E fleet (LD/MD/HD/EQ) meeting the replacement criteria. Three hybrid bucket trucks will be added to the fleet. Contracts are being prepared to allow purchase orders to be placed, with estimated delivery of year-end. The 2021 Fleet Replacement Plan is projected to involve over four suppliers, across four distinctive vehicle and equipment groups.

3 – RG&E - BP&SM Projects

Project Overview

The facility investments are projects needed to maintain, update or replace the Companies' facilities due to asset condition, age, safety and/or environmental considerations. Project improvements typically are associated with mechanical, electrical, building structures, control systems, etc. The facilities projects are aimed at providing safe working conditions at all of our locations – office space, operations buildings and work centers.

Project Activities / Key Accomplishments in 2020

2020 activities at RG&E included the replacement of the generator at Scottville Road and the start of the HVAC Phase I project at Scottsville Road.

Project Activities Planned for 2021

RG&E has nine projects planned for 2021, consisting of: one HVAC upgrade; one parking lot upgrade; two generator upgrades; three consolidation projects; purchase of COVID equipment; and EV charger installation at multiple locations.

The HVAC upgrade is to be at the Scottsville Road Service Center. Engineering in 2020. Construction schedule to begin in September and in-service in December 2021.

The parking lot upgrade is to be at the Scottsville Road Service Center. Construction schedule to begin in September and in-service in December 2021.

The generator upgrades are to be at the Scottsville Road and Mushroom Boulevard Service Centers. Construction schedule for Scottsville Road Generator began in 2020 and in-service in April 2021. Construction schedule for Mushroom Boulevard Generator to begin in May and in-service in December 2021.

The three consolidation projects are to be at the 3 City Center, Scottsville Road and Mushroom Boulevard Service Centers. Construction schedule for 3 City Center began in 2020 and in-service in August 2021. Construction schedule for both Scottsville Road and Mushroom Boulevard began in 2020 and in-service December 2021.

The purchase of COVID equipment and EV chargers are to be at multiple locations throughout RG&E.

4 - Laptop Life Cycle

Program Overview

The overall goal of this project is to refresh all Rochester Gas and Electric's (RG&E) laptop computing devices following the refresh lifecycle defined for RG&E's equipment (laptops, 4 years) for users in scope. This project also provides Personal Computers (PC) in support of new hires and refresh demand requirements enterprise wide.

Program Activities / Key Accomplishments in 2020

Project activities and key accomplishments completed in 2020 included ordering and receipt of PCs, labeling and asset assignment, client communication and scheduling, imaging of machines, application installation as required, deployment of new PCs, data transfer, backup, and retrieval. Close out activities included retrieval, quarantine, data cleansing, and disposal of legacy devices. Additional devices were deployed in 2020 in support of work from home requirements surrounding COVID.

Program Activities Planned for 2021

The project includes project management for deployment strategy, client communication, and procurement of PCs in a timely manner. Hardware will be received, at primary facilities, by Deskside Support, and staged for deployment as outlined in the asset management process. Aged equipment will be quarantined for a five day period after which, hard drives will be wiped, packaged, palletized, and picked up by environmentally responsible approved recycler.

5 - Scottsville Rd Equipment Yard Upgrades

For the narrative on this project please refer to RG&E Common Project Narrative #10.

10 - Facilities Projects – RG&E

Project Overview

The facility investments are projects needed to maintain, update or replace the Companies' facilities due to asset condition, age, safety and/or environmental considerations. Project improvements typically are associated with mechanical, electrical, building structures, control systems, etc. The facilities projects are aimed at providing safe working conditions at all of our locations – office space, operations buildings and work centers.

Project Activities / Key Accomplishments in 2020

Minor capital projects were carried out to upgrade systems in each facility due to: end of life, failures associated with mechanical, electrical, building structures, control systems etc. Additional projects were completed that improved the efficiency, reduced energy consumption, reduced greenhouse emissions etc. and/or addressed security and safety issues. These minor projects included: Purchase of Ergonomic Furniture, 89 East Ave Sump Pump, Eastern Monroe Bathroom Upgrade, Eastern Monroe Truck Bay Lighting, Fillmore Site Upgrades, and Western Monroe LED Lighting. The engineering for the Scottsville Rd Parking Lot Improvement project and the Scottsville Rd Equipment Yard projects were started.

Project Activities Planned for 2021

RG&E has multiple minor capital projects planned to be carried out in 2021 including but not limited to: Canandaigua Site Generator, Eastern Monroe Drainage Upgrade Wolcott Kitchenette Install.

11 - 3 City Center

Project Overview

The Rochester Consolidation project, will ultimately consolidate several properties in Rochester. The main goal of this project is to manage the facility spaces that RG&E has in Rochester more efficiently and to provide a first class set of buildings regarding quality and safety.
3 City Center (3CC), located in downtown Rochester, was chosen to relocate and consolidate the majority of office spaces in Rochester.

Project Activities / Key Accomplishments in 2020

The project redesigned the layout of the five floors of this building according to the global model standard of space management and began furnishing the facility. Construction of space started in October 2020.

Project Activities Planned for 2021

The construction activities will be completed in the second quarter of 2021. Employees and contractors from 89 East Ave, Scottsville Rd. and West Ave will be relocated to this facility following the completion of construction. The project is planned to be completed, including project closeout, in the third quarter of 2021.

12 - Metering and Mobility IT Systems Upgrade

Project Overview

A number of metering and mobility systems at RG&E are operating in extended support by the vendor, approaching end of life and require an upgrade to enable the continued support and use of these systems. This upgrade will mitigate the obsolescence risk and impact on business processes.

The following applications will be upgraded:

ITRON Field Collection System – Field Collection System (FCS) in use at RG&E requires an upgrade from 2.6 to 4.0.5.12. The current version is at end of life (EOL) and under extended support by the vendor.

MV90 – Meter read collection system used for large electric customers at RG&E. This requires an upgrade from 5.0 to the latest version 6.1, as current version will be at EOL in Q1 2021.

Tesco Meter Manager – Tesco is used for meter inventory management and testing in RG&E.

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SAP Business Warehouse – The SAP Business Warehouse (BW) is used to support reporting for RG&E. This current version of the system is 7.1 and is required to be upgraded to 7.5 to maintain support and provide additional foundational capabilities.

Streamserve – Streamserve is used for document composition and presentment for RG&E bills. The current version is 5.5 is to be upgraded to version 16.6. Version 5.5 is in a sustained maintenance period with no new maintenance packs being distributed.

Click – Click software is utilized in RG&E as the mobility and scheduling platform, supporting field service processes (turn on, turn off, meter testing, field investigation, collections, etc.) The current version 8.1.7 is at end of life in December 2020 and has a Microsoft Silverlight Dependency which is to be discontinued by Microsoft in October 2021. This requires an upgrade to the Click FSE (Field Service Edge) system.

Project Activities / Key Accomplishments in 2020

In 2020, the main accomplishments included the New York StreamServe application being successfully upgraded to Exstream 16.6.

Also, the New York Click Version 8.1 was upgraded to Click FSE (Field Service Edge) platform and the Phase 1 rollout was completed for Geneva, Ithaca, Binghamton and Auburn service divisions.

The TESCO meter manager system was upgraded to release 2020.07.16.53316.

The BW upgrade User Acceptance Testing (UAT) was completed in December 2020.

The FCS system upgrade build was completed in December 2020.

The MV90 platform configuration was completed and the User Acceptance Testing (UAT) began.

Project Activities Planned for 2021

The main activities planned for 2021 include go-live of the BW upgrade that began in 2020. The go-live is planned to occur at the end of January 2021.

The MV90 Upgrade User Acceptance Testing will continue in 2021 with the go-live planned for early March 2021.

The Itron FCS user-acceptance testing will continue in 2021 and the planned go-live is for April 2021.

The project will continue to provide post go-live technical and system support for all the upgraded and deployed systems noted above.

13 – Net Workload Management and Optimization

Project Overview

Robotics Process Automation (RPA) refers to a type of automation (called a robot or bot) which interacts with computer coded software that enables the automation of repetitive, rule-based processes, mimics interactions of users and works across functions and applications.

The goal of the project is to define an RPA Strategic Program for Customer Service and to implement Bots to complete high-value business processes. The project is introducing Robotics Process Automation for cost savings, consistency, improved productivity, and to free up manual resources for more value-added tasks focused on improving customer service.

Project Activities / Key Accomplishments in 2020

A Robotics Factory was consolidated running RPA development as a Factory, providing functional and technical expertise and supporting Bot monitoring.

The RPA technical architecture used for bots development, testing and execution was moved to VDI Platform (virtual devices).

RPA governance model that defines the RPA Program was developed and shared with the Customer Service team. The Governance Model includes defined roles and responsibilities of the programs sponsorship and core RPA functional and technical teams. It includes project planning, development, implementation, post go-live support model, communications plan, change management plan, cost of implementation/return on investment, and will result in a repository of documents that may be utilized by all AVANGRID business areas interested in Robotics Process Automation.

The stabilization of the bots implemented in 2019 and the delivery of new bots, up to 13 bots, running in 2020.

Project Activities Planned for 2021

In 2021, Wave 2.2 will be completed with the development of four bots planned.

20 - Fire Protection

Program Overview

This program is for fire protection system projects to ensure safety and security of our facilities as well as ensuring our systems are up to date and in compliance with National Fire Protection Association (NFPA), local and federal requirements. Fire protection projects include the design and installation/replacement of smoke detector/fire alarm systems, mass notification systems, automated extinguisher monitoring systems and fire suppression systems.

Program Activities / Key Accomplishments in 2020

2020 Fire Protection activities continued the replacement/upgrade of end-of-life systems and installation of new systems as required. Fire protection projects were completed at RG&E service centers and substations, including Station 255, Station 418, and Pavilion Service Center.

Program Activities Planned for 2021

2021 Fire Protection activities will concentrate on fire protection systems at service centers and critical substations. Fire protection projects are planned at RG&E facilities and substations, including Canandaigua, Fillmore Geneva Phase II, Station 42, Station 48, and Station 67.

21 - System Cutover

Program Overview

This program relates to security work on various facilities to continue implementing the five-year Security Deployment plan. Systems to be installed are based on a security tier for each facility that is based on risk. Tier 1 and 2 facilities (e.g., bulk substation) receive card access control systems, Public Address (PA) systems, video surveillance, video analytics and thermal cameras (Tier 1 also receives additional physical hardening due to critical nature). Tier 3 facilities (e.g., large office/service center, cash office, hydro) receive card access control systems, video surveillance and video analytics. Tier 4 facilities (e.g., small offices, store yards) receive card access control systems and video surveillance. Additional work includes the enhancement of communication networks to allow for the transport of video back to the Security Operations Center (SOC) for remote monitoring.

Program Activities / Key Accomplishments in 2020

2020 Security activities included site specific work at RG&E facilities for the last mile fiber connections and upgrades / installations of security devices. The specific RG&E facilities include Scottsville Road and substations Station 125, Station 255 and Station 23.

Program Activities Planned for 2021

2021 Security activities will continue to concentrate on implementing the Security Deployment plan as well as connecting facilities to the new communications network, upgrading the facility security systems and migrating those systems onto the new network. Work will include completion of projects from 2020 and new projects at the following RG&E Substations 122, 124, 135, 13A, 23 and 42.

22 - Primavera PPM Cloud

Project Overview

Primavera PPM Cloud is a fully integrated system of three modules that provide scheduling (P6), project controls, cost controls, and workflows (Unifier), and business analytics and data warehouse (Analytics).

Project Activities / Key Accomplishments in 2020

In 2020, purchase authorization and generated PO's (Oracle) were created and kickoff meetings held. The conceptual design was completed and detail design of the Oracle P6, Unifier, Integration and Analytics modules was started.

Project Activities Planned for 2021

This year the company plans to complete the design of the Oracle P6, Unifier, Integration and Analytics modules, migrate the schedule and financial data, link the modules together in an integrated portfolio management system, test, train, go-live for Phase 1, develop additional business processes, test, train and go-live for Phase 2.

High-Level Schedule

Project Start	*Project Finish*	*ISD*
01/02/2020	12/15/2021	12/31/2021

23 – RG&E DSIP - Enterprise Analytics

Project Overview

For the AVANGRID Enterprise Data Analytics Implementation Project, a qualified industry expert will focus on deploying data quality assessments to complete Use Cases using a structured and value driven approach planned to be completed over two years. The deployment will move the Companies from our current initial level of analytics capabilities closer to. The project's outputs will include initial Use Case deployment. Data and analytics are foundational to realizing Utility of the Future initiatives. The "smart" revolution is exponentially compounding the amount of grid and customer data utilities generate. The development of the Distributed System Platform (DSP) will introduce a range of new data in the NYSEG/RG&E service territories, including sub-hourly customer consumption data, status information from grid devices, interval measurements of service conditions on distribution feeders, and a growth in Distributed Energy Resources (DER) information. As the volume of data collected increases in magnitude and diversifies through the platform investments, AVANGRID recognizes the importance of leveraging Data Management, Business Intelligence, and Advanced Analytics to extract insights from this data to help move the business and the market toward a future of informed, proactive, and agile decision making. In addition, the Companies intend to use the Enterprise Analytics effort to better inform data quality and required data elements in support of the use cases envisioned in the recently released Integrated Energy Data Resource (IEDR)Order.

Project/ Key Accomplishments in 2020

In 2020, the installation of the Big Data Analytics platform continues. The platform consists of advanced hardware and software components to develop Use Cases which pull massive amounts of structured and unstructured data together into a data lake which can then be modeled to develop advanced analytics modules that help drive business decisions.

The original technical hardware and licenses of several software products were extended and upgraded to continue our effort in analytics and allow for additional users.

2020 began with a Roadmap-Refresh workshop engagement with business users from many business areas to identify future use case opportunities, and to perform a round of prioritization of projects.

In 2020, the Companies primarily completed second and third Use Cases focused on Distribution Transformer Monitoring and Estimated Time of Restoration respectively. Enhancements to functionality and data validation will be part of the 2021 workplan.

The internal organization developed more concrete governance around data migration, resolving technical issues, engaging the business, and defining specific roles. The Information Technology (IT) Data Analytics group developed a framework agreement for

big data services to document agreement of requirements from the vendors providing the service.

A large goal for 2020 was to implement an Agile methodology and approach to program management and testing procedures to better align with Company initiatives and provide more alignment to business needs.

Project Activities Planned for 2021

2021 includes another refresh of the data analytics Roadmap with a cross functional workshop with business users from many business areas to identify future use case opportunities, and to revisit the prioritization of use cases / projects.- In addition, one of the lessons learned regarding the Companies data in 2020 is that the quality and availability is not to a standard that will allow for robust development of operational and planning use cases. This data is likely to be more readily available once the Companies Grid Model Enhancement Project (GMEP) is completed. Therefore, the Companies will take some time in 2021 to re-assess and re-evaluate the quality and governance processes needed to enable robust use cases. In parallel, we will enhance the current Estimated Time of Restoration (ETR), Transformer Monitoring and Vegetation Management use cases. Through the discovery workshops, we have identified an asset management use case which was kicked off in January 2021 and is ongoing. This effort is expected go live by the end of 2021.

2021 use cases will be using an Agile Methodology, with IT subject matter expert resources assisting the Data Analytics core team in oversight and supervision of the methodology and applying lessons learned and best practices.

Follow-ups will be done with the vendors to ensure that the IT Framework for big data services is applied and followed.

28 – RG&E AMI

Project Overview

New York Advanced Metering Infrastructure (AMI) will be an essential foundational system in realizing REV (Reforming the Energy Vision) goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of Distributed Energy Resources (DER), and minimize environmental impacts of power generation and energy consumption. New York State Electric and Gas (NYSEG) and Rochester Gas and Electric (RG&E) will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

Project/ Key Accomplishments in 2020

After receiving the Order approving the Joint Proposal ("Order") on November 19, 2020, the AMI team concurrently focused on collaboratively developing a Benefit Implementation Plan ("Plan") with New York Department of Public Service (DPS) Staff, executing contracts with AMI Equipment and Services Vendors, and focusing on the initial phase of developing the Information Technology (IT) infrastructure needed to support the AMI project. The Plan was filed within the 60-day timeframe set by the New York PSC on January 18, 2021 and was received with no further comment. Additionally, there will be ongoing engagement with Staff including following a meter approval process (monthly meetings), conducting a deployment plan review (when draft is completed with Grid One), holding a Home Area Network (HAN) workshop to discuss the process to deliver streaming energy data directly from the customers meter via Wifi to applications and devices in the home, and providing general informal updates on our progress to keep them informed. At the time of the Order the team had Proposals for Award (PA) in place for all the major Request for Proposal (RFP) for quick approval and prompt contract negotiations. Contracts with the major AMI Systems vendors and the System Integration partner were fully executed by December 31, 2020. Expenditures for 2020, for the most part were based on the IT infrastructure. Field deployment of AMI meters and network will not begin until 3rd quarter 2022.

Project Activities Planned for 2021

In early 2021, the team focus is on conducting Business Process and Technical Requirements blueprinting workshops. Following this, the AMI system design, build, and integration phases will commence with initial testing cycles to begin in late 2021. Also, the Energy Manager front end and platform will be built, integrated, and go live to an initial set of Avangrid companies. In addition, the team expects to have fully executed the remaining contracts with the AMI Equipment and Services Vendors.

#	Summary of Key Milestone & Description	Target Completion
1	New York Public Service Commission AMI Approval and Order	11/2020
2	Resource Plan (2020-2022)	12/2020
3	AMI Foundation Contract Execution*	12/2020
4	Benefit Implementation Plan	01/2021
5	Remaining AMI Contract Execution	06/2021
6	AMI/ Customer Relationship Management & Billing (CRM&B) Infrastructure	06/2022
7	AMI/CRM&B/Energy Manager Go-Live	07/2022
8	Meter and Network Deployment	06/2025

31 - NY Spectrum Hardware Refresh

Project Overview

The project will cover the hardware replacement of the Spectrum Power 4.75 Energy Management System (EMS) at the New York Energy Control Center. This hardware will replace the original hardware that was purchased and implemented in 2012. The replacement of the hardware will allow us to install the latest version of the Solaris 11 operating system and Oracle DB 19 components. Solaris 11 is incompatible with the current hardware environment.

Project Activities / Key Accomplishments in 2020

In 2020, contractual requirements were completed and all required approvals for budget and resources were received. Project team ordered, received and installed the required components to replace the current Siemens Spectrum System 4.75.

Project Activities Planned for 2021

In 2021, the continued installation of the Siemens Spectrum System 4.75 software will occur with the installation of the latest version of the Solaris 11 operating system and Oracle DB 19 components.

#	Summary of Key Milestone & Description	Target Completion
1	Obtain Charter Approval	05/2020
2	Identify and Secure Resources	06/2020
3	Execute Purchase Orders for new hardware	08/2020
4	Execute Vendor Contract with Siemens	08/2020
5	Receive and install all required hardware	12/2020
6	Complete Network Configuration	05/2021
7	Install All OS and DB components	05/2021
8	Complete Siemens Spectrum Installation	06/2021
9	Complete Site Acceptance test	10/2021
10	Go-Live	11/2021

34 - Telecomm Vertical Builds

Project Overview

This project is intended to support AVANGRID's need for delivering wireless technologies. These technologies include: Distribution Automation, Substation Automation, Core network backhaul via microwave point to point, private land mobile radio, and will support future technologies such as 5G, advanced metering and renewable energy integration.

Project/ Key Accomplishments in 2020

Invested in continuous growth and expansion of WIMAX infrastructure. Specifically procurement, construction and outfitting of communication cabinets was started in preparation for installation scheduled in 2021.

Project Activities Planned for 2021

Similar to original plans for 2020, AVANGRID will continue with site specific findings and use case analysis efforts as well as construction of towers upon Vertical Infrastructure Request for Proposal (RFP) award.

Investigation of third-party locations as an interim to close gaps in fiber optic core network along with investigation and delivery of solutions to further reduce or displace operating expenses related services are set to occur as well.

An effort to resolve deficiencies in existing Vertical Infrastructure and apply findings reports to acquire additional building permits as necessary followed by development of strategic RF Network expansion utilizing private Vertical Infrastructure.

To date, site specific research activities have commenced. Multiple use case investigations continue as well as Third Party tower investigations have been initialized.

35 - Telecomm NY WAN Expansion

Project Overview

New York Wide Area Network (WAN) Expansion involves WiMAX (Worldwide Interoperability of Microwave Access) Deployments to support automation activities at NYSEG and RG&E. The New York WAN Expansion project is a WiMAX area network conceptualized to support smart grid communication equipment deployments as an end-to-end solution to meet requirements for communication paths and provide flexible solution for the companies.

Project/ Key Accomplishments in 2020

In 2020 the Telecom Department was very successful in delivering services and automation to our internal departments while preparing and implementing WiMAX technology for grid automation technologies. We were able to provide our Distribution Automation group with 18 Cabinets for automation at RG&E. We built 23 WiMAX cabinets for WiMAX and commissioned four thus far. In 2020 we have automated more devices in the field than projected. We are well on our way to having the WiMAX infrastructure fully functional in four of our NY operating areas.

Project Activities Planned for 2021

Based on the 2020 activity with the heavy emphasis on engineering and the pre-build of cabinets, we are well on our way and will have the WiMAX infrastructure fully functional in four of our NY operating areas. Along with that there will be a continuation of more of the same as we continue to expand our reach to the end devices in the field for automation and control of the grid in all the New York territories. We will activate all WiMAX capable cabinets and continue to provision more cabinets for 2021 Customer Premises Equipment (CPE) needs. Our goal is to complete our first four NY operating areas by the end of 2021. Engineering for all other areas will continue for us to extend the WiMAX infrastructure as we move through the New York territory.

36 - Telecomm Fiber

Project Overview

Expand network communications infrastructure for improved capacity, security, reliability, and functionality for operation of gas and electric networks.

Project/ Key Accomplishments in 2020

Request for Proposal (RFP) for additional IRU's, and Fiber Construction was executed, and we have begun the purchase of new fibers at the end of 2020 for further expansion of the fiber backbone. We also were able to complete the following activities from our previous IRU purchases. Nine fiber locations have been delivered. Two Wide Area Network (WAN) sites built and two activated.

Project Activities Planned for 2021

The activity planned for 2021 is aimed at completing the remaining fiber sites from previous IRU purchase. Fiber will be tested and turned-up at 87 sites across the NYSEG and RG&E territories with activity and connectivity focuses in Brewster as well as eastern and western sides of New York state such as Lancaster and Lockport. Total acquisition of fiber IRUs will be completed in 2021 and tied to the ASD network. As fiber is terminated, we will continue to connect all facilities with switches for transport and routers for data traffic throughout all NYSEG and RG&E territories.

37 - Telecomm Infrastructure

Program Overview

This program's purpose is to expand network communications infrastructure for improved capacity, reliability and functionality for operation of gas and electric networks.

Program / Key Accomplishments in 2020

The Telecommunications Infrastructure expansion in 2020 completed RFPs for Dense Wavelength Division Multiplexing (DWDM) and Internet Protocol Multi-Protocol Label Switching (IP MPLS) required equipment for 2021 installation. At RG&E, we built and activated two WAN IP MPLS sites for DWDM in 2020. With our RFP's completed and contracts soon to be completed, we will be able to continue the build of the DWDM and IP/MPLS infrastructure going forward.

Program Activities Planned for 2021

We will continue with the purchase and deployment of DWDM and IP/MPLS switching and routing equipment for transporting AVANGRID traffic across the backbone. As the Fiber infrastructure grows and the convergence of services onto the network, we will have to meet the demand by onboarding legacy services onto the network with this technology.