

APPENDIX T. ROLL-UP SCENARIOS

Table of Contents

1	RGDS Roll-Up.....	1
1.1	RGDS Roll-Up Winter 2018.....	1
1.1.1	Columbia Gas Virginia / Maryland.....	5
1.1.2	Columbia Gas Western Pennsylvania / New York.....	5
1.1.3	Constitution Pipeline.....	6
1.1.4	Dominion Eastern New York.....	6
1.1.5	Dominion Western New York.....	6
1.1.6	Dominion Southeast.....	6
1.1.7	East Tennessee Mainline.....	6
1.1.8	Eastern Shore.....	7
1.1.9	Empire Mainline.....	7
1.1.10	Millennium.....	7
1.1.11	New Brunswick Supply / Nova Scotia Offshore Supply.....	7
1.1.12	Tennessee Zone 4 Pennsylvania.....	8
1.1.13	Tennessee Zone 5 New York.....	8
1.1.14	Texas Eastern M2 PA – Southern Branch.....	8
1.1.15	Texas Eastern M3 – Northern Line.....	8
1.1.16	TransCanada Ontario West.....	9
1.1.17	TransCanada Quebec.....	9
1.1.18	Transco Leidy Atlantic.....	9
1.1.19	Transco Zone 5.....	9
1.1.20	Transco Zone 6 Leidy Line to Station 210.....	10
1.1.21	Union Gas Dawn.....	10
1.2	RGDS Roll-Up Summer 2018.....	11
1.2.1	Algonquin Connecticut.....	14
1.2.2	Columbia Gas Virginia / Maryland.....	14
1.2.3	Dominion Southeast.....	14
1.2.4	Eastern Shore.....	14
1.2.5	Iroquois Zone 1 to Zone 2.....	14
1.2.6	New Brunswick Supply / Nova Scotia Offshore Supply.....	15
1.2.7	PNGTS North of Westbrook.....	15
1.2.8	Tennessee Zone 4 Pennsylvania.....	15
1.2.9	Tennessee Zone 5 New York.....	15
1.2.10	Texas Eastern Zone ETX.....	16
1.2.11	Transco Zone 5.....	16

1.3	RGDS Roll-Up Winter 2023	17
1.3.1	Columbia Gas Virginia / Maryland.....	21
1.3.2	Columbia Gas Western Pennsylvania / New York.....	21
1.3.3	Constitution Pipeline.....	22
1.3.4	Dominion Eastern New York.....	22
1.3.5	Dominion Western New York	22
1.3.6	Dominion Southeast.....	22
1.3.7	East Tennessee Mainline.....	22
1.3.8	Eastern Shore	23
1.3.9	Empire Mainline	23
1.3.10	Millennium.....	23
1.3.11	New Brunswick Supply / Nova Scotia Offshore Supply	23
1.3.12	Tennessee Zone 4 Pennsylvania	24
1.3.13	Tennessee Zone 5 New York.....	24
1.3.14	Texas Eastern M2 PA – Southern Branch	24
1.3.15	Texas Eastern M3 – Northern Line.....	24
1.3.16	TransCanada Ontario West.....	25
1.3.17	TransCanada Quebec	25
1.3.18	Transco Leidy Atlantic	25
1.3.19	Transco Zone 5	25
1.3.20	Transco Zone 6 Leidy Line to Station 210	26
1.3.21	Union Gas Dawn.....	26
1.4	RGDS Roll-Up Summer 2023.....	27
1.4.1	Algonquin Connecticut.....	30
1.4.2	Columbia Gas Virginia / Maryland.....	30
1.4.3	Dominion Southeast.....	30
1.4.4	Eastern Shore	30
1.4.5	Iroquois Zone 1	31
1.4.6	New Brunswick Supply / Nova Scotia Offshore Supply	31
1.4.7	PNGTS North of Westbrook.....	31
1.4.8	Tennessee Zone 4 Pennsylvania	31
1.4.9	Tennessee Zone 5 New York.....	32
1.4.10	Texas Eastern Zone ETX	32
1.4.11	Transco Zone 5	32
2	HGDS Roll-Up.....	33
2.1	HGDS Roll-Up Winter 2018.....	33
2.1.1	AlaTenn.....	37
2.1.2	Alliance.....	38

2.1.3	ANR Northern Illinois	38
2.1.4	Columbia Gas Virginia / Maryland.....	38
2.1.5	Columbia Gas Western Pennsylvania / New York.....	38
2.1.6	Constitution Pipeline.....	38
2.1.7	Dominion Eastern New York.....	39
2.1.8	Dominion Western New York	39
2.1.9	Dominion Southeast.....	39
2.1.10	East Tennessee Mainline.....	39
2.1.11	Eastern Shore	39
2.1.12	Empire Mainline	40
2.1.13	Great Lakes East	40
2.1.14	Midwestern	40
2.1.15	Millennium.....	40
2.1.16	New Brunswick Supply / Nova Scotia Offshore Supply	41
2.1.17	NGPL Iowa/Illinois North	41
2.1.18	NGPL Iowa/Illinois South	41
2.1.19	Northern Border Chicago.....	41
2.1.20	Northern Natural Zone D	42
2.1.21	Tennessee Zone 4 Pennsylvania	42
2.1.22	Tennessee Zone 5 New York.....	42
2.1.23	Texas Eastern M2 PA – Southern Branch	42
2.1.24	Texas Eastern M3 – Northern Line.....	43
2.1.25	TransCanada Ontario West.....	43
2.1.26	TransCanada Quebec	43
2.1.27	Transco Leidy Atlantic	43
2.1.28	Transco Zone 5	44
2.1.29	Transco Zone 6 Leidy Line to Station 210	44
2.1.30	Union Gas Dawn.....	44
2.1.31	Viking Zone 1	44
2.2	HGDS Roll-Up Summer 2018	45
2.2.1	AlaTenn.....	48
2.2.2	Algonquin Connecticut	48
2.2.3	Columbia Gas Virginia / Maryland.....	48
2.2.4	Dominion Southeast.....	48
2.2.5	Eastern Shore	48
2.2.6	Iroquois Zone 1	49
2.2.7	New Brunswick Supply / Nova Scotia Offshore Supply	49
2.2.8	PNGTS North of Westbrook.....	49

2.2.9	Tennessee Zone 4 Pennsylvania	49
2.2.10	Tennessee Zone 5 New York	50
2.2.11	Texas Eastern Zone ETX	50
2.2.12	Transco Zone 5	50
2.3	HGDS Roll-Up Winter 2023	50
2.3.1	AlaTenn	55
2.3.2	Alliance	56
2.3.3	ANR Northern Illinois	56
2.3.4	Columbia Gas Virginia / Maryland	56
2.3.5	Columbia Gas Western Pennsylvania / New York	56
2.3.6	Constitution Pipeline	57
2.3.7	Dominion Eastern New York	57
2.3.8	Dominion Western New York	57
2.3.9	Dominion Southeast	57
2.3.10	East Tennessee Mainline	57
2.3.11	Eastern Shore	58
2.3.12	Empire Mainline	58
2.3.13	Great Lakes East	58
2.3.14	Iroquois Zone 1	58
2.3.15	Midwestern	58
2.3.16	Millennium	59
2.3.17	New Brunswick Supply / Nova Scotia Offshore Supply	59
2.3.18	NGPL Iowa/Illinois North	59
2.3.19	NGPL Iowa/Illinois South	59
2.3.20	Northern Border Mainline	60
2.3.21	Northern Natural Zone ABC	60
2.3.22	Northern Natural Zone D	60
2.3.23	Tennessee Zone 4 Pennsylvania	60
2.3.24	Tennessee Zone 5 New York	61
2.3.25	Texas Eastern M2 Pennsylvania – Southern Branch	61
2.3.26	Texas Eastern M3 – Northern Line	61
2.3.27	TransCanada Ontario West	61
2.3.28	TransCanada Quebec to PNGTS	62
2.3.29	Transco Leidy Atlantic	62
2.3.30	Transco Zone 5	62
2.3.31	Transco Zone 6 Leidy Line to Station 210	62
2.3.32	Union Gas Dawn	63
2.3.33	Vector Zone 1	63

2.3.34	Viking Zone 1	63
2.4	HGDS Roll-Up Summer 2023	64
2.4.1	Algonquin Connecticut	67
2.4.2	Columbia Gas Virginia / Maryland.....	67
2.4.3	Dominion Southeast.....	67
2.4.4	Eastern Shore	68
2.4.5	Gulf South Zone 2 Henry Hub.....	68
2.4.6	Iroquois Zone 1	68
2.4.7	New Brunswick Supply / Nova Scotia Offshore Supply	68
2.4.8	PNGTS North of Westbrook.....	69
2.4.9	Tennessee Zone 4 Pennsylvania	69
2.4.10	Tennessee Zone 5 New York.....	69
2.4.11	Texas Eastern Zone ETX	69
2.4.12	Transco Zone 5	70
3	LGDS Roll-Up.....	70
3.1	LGDS Roll-Up Winter 2018	70
3.1.1	Columbia Gas Virginia / Maryland.....	73
3.1.2	Constitution Pipeline.....	73
3.1.3	Eastern Shore	73
3.1.4	Millennium.....	74
3.1.5	New Brunswick Supply / Nova Scotia Offshore Supply	74
3.1.6	Tennessee Zone 4 Pennsylvania	74
3.1.7	Tennessee Zone 5 New York.....	74
3.1.8	Texas Eastern M2 PA – Southern Branch	75
3.1.9	Texas Eastern M3 – Northern Line.....	75
3.1.10	TransCanada Ontario West.....	75
3.1.11	TransCanada Quebec	75
3.1.12	Transco Zone 6 Leidy Line to Station 210	76
3.1.13	Union Gas Dawn.....	76
3.2	LGDS Roll-Up Summer 2018.....	77
3.2.1	Columbia Gas Virginia / Maryland.....	79
3.2.2	Dominion Southeast.....	80
3.2.3	Eastern Shore	80
3.2.4	Texas Eastern Zone ETX	80
3.2.5	Transco Zone 5	80
3.3	LGDS Roll-Up Winter 2023	81
3.3.1	Algonquin Connecticut.....	85

3.3.2	Columbia Gas Virginia / Maryland.....	85
3.3.3	Constitution Pipeline.....	86
3.3.4	Dominion Eastern New York.....	86
3.3.5	Dominion Western New York	86
3.3.6	Dominion Southeast.....	86
3.3.7	Eastern Shore	87
3.3.8	Millennium.....	87
3.3.9	New Brunswick Supply / Nova Scotia Offshore Supply	87
3.3.10	Tennessee Zone 4 Pennsylvania	87
3.3.11	Tennessee Zone 5 New York.....	88
3.3.12	Texas Eastern M2 PA – Southern Branch	88
3.3.13	Texas Eastern M3 – Northern Line.....	88
3.3.14	TransCanada Ontario West.....	88
3.3.15	TransCanada Quebec	89
3.3.16	Transco Zone 5	89
3.3.17	Transco Zone 6 Leidy Line to Station 210	89
3.3.18	Union Gas Dawn.....	90
3.4	LGDS Roll-Up Summer 2023.....	90
3.4.1	Algonquin Connecticut.....	92
3.4.2	Columbia Gas Virginia / Maryland.....	93
3.4.3	Dominion Southeast.....	93
3.4.4	Eastern Shore	93
3.4.5	New Brunswick Supply / Nova Scotia Offshore Supply	93
3.4.6	PNGTS North of Westbrook.....	94
3.4.7	Texas Eastern Zone ETX	94
3.4.8	Transco Zone 5	94

List of Figures

Figure T1.	RGDS Roll-Up Winter 2018: Peak Hour Affected Generation.....	1
Figure T2.	RGDS Roll-Up Winter 2018: Locations with Peak Hour Affected Generation.....	2
Figure T3.	RGDS Roll-Up Winter 2018: Peak Hour Constraints	4
Figure T4.	RGDS Roll-Up Summer 2018: Peak Hour Affected Generation	11
Figure T5.	RGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation.....	12
Figure T6.	RGDS Roll-Up Summer 2018: Peak Hour Constraints	13
Figure T7.	RGDS Roll-Up Winter 2023: Peak Hour Affected Generation.....	17
Figure T8.	RGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation.....	18
Figure T9.	RGDS Roll-Up Winter 2023: Peak Hour Constraints	20

Figure T10. RGDS Roll-Up Summer 2023: Peak Hour Affected Generation 27

Figure T11. RGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation... 28

Figure T12. RGDS Roll-Up Summer 2023: Peak Hour Constraints 29

Figure T13. HGDS Roll-Up Winter 2018: Peak Hour Affected Generation..... 33

Figure T14. HGDS Roll-Up Winter 2018: Locations with Peak Hour Affected Generation..... 34

Figure T15. HGDS Roll-Up Winter 2018: Peak Hour Constraints 36

Figure T16. HGDS Roll-Up Summer 2018: Peak Hour Affected Generation 45

Figure T17. HGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation .. 46

Figure T18. HGDS Roll-Up Summer 2018: Peak Hour Constraints..... 47

Figure T19. HGDS Roll-Up Winter 2023: Peak Hour Affected Generation..... 51

Figure T20. HGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation..... 52

Figure T21. HGDS Roll-Up Winter 2023: Peak Hour Constraints 54

Figure T22. HGDS Roll-Up Summer 2023: Peak Hour Affected Generation 64

Figure T23. HGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation .. 65

Figure T24. HGDS Roll-Up Summer 2023: Peak Hour Constraints..... 66

Figure T25. LGDS Roll-Up Winter 2018: Peak Hour Affected Generation 70

Figure T26. LGDS Roll-Up Winter 2018: Locations with Peak Hour Affected Generation 71

Figure T27. LGDS Roll-Up Winter 2018: Peak Hour Constraints..... 72

Figure T28. LGDS Roll-Up Summer 2018: Peak Hour Affected Generation..... 77

Figure T29. LGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation... 78

Figure T30. LGDS Roll-Up Summer 2018: Peak Hour Constraints 79

Figure T31. LGDS Roll-Up Winter 2023: Peak Hour Affected Generation 81

Figure T32. LGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation 82

Figure T33. LGDS Roll-Up Winter 2023: Peak Hour Constraints..... 84

Figure T34. LGDS Roll-Up Summer 2023: Peak Hour Affected Generation..... 90

Figure T35. LGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation... 91

Figure T36. LGDS Roll-Up Summer 2023: Peak Hour Constraints 92

List of Tables

Table T1. RGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 3

Table T2. RGDS Roll-Up Winter 2018: Frequency and Duration of Constraints..... 5

Table T3. RGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 12

Table T4. RGDS Roll-Up Summer 2018: Frequency and Duration of Constraints 13

Table T5. RGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 19

Table T6. RGDS Roll-Up Winter 2023: Frequency and Duration of Constraints..... 21

Table T7. RGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 28

Table T8. RGDS Roll-Up Summer 2023: Frequency and Duration of Constraints 29

Table T9. HGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 35

Table T10. HGDS Roll-Up Winter 2018: Frequency and Duration of Constraints 37

Table T11. HGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 46

Table T12. HGDS Roll-Up Summer 2018: Frequency and Duration of Constraints..... 47

Table T13. HGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 53

Table T14. HGDS Roll-Up Winter 2023: Frequency and Duration of Constraints 55

Table T15. HGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 66

Table T16. HGDS Roll-Up Summer 2023: Frequency and Duration of Constraints..... 67

Table T17. LGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 72

Table T18. LGDS Roll-Up Winter 2018: Frequency and Duration of Constraints..... 73

Table T19. LGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation..... 78

Table T20. LGDS Roll-Up Summer 2018: Frequency and Duration of Constraints 79

Table T21. LGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 83

Table T22. LGDS Roll-Up Winter 2023: Frequency and Duration of Constraints..... 85

Table T23. LGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation..... 91

Table T24. LGDS Roll-Up Summer 2023: Frequency and Duration of Constraints 92

1 RGDS ROLL-UP

1.1 RGDS ROLL-UP WINTER 2018

Figure T1 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure T1. RGDS Roll-Up Winter 2018: Peak Hour Affected Generation

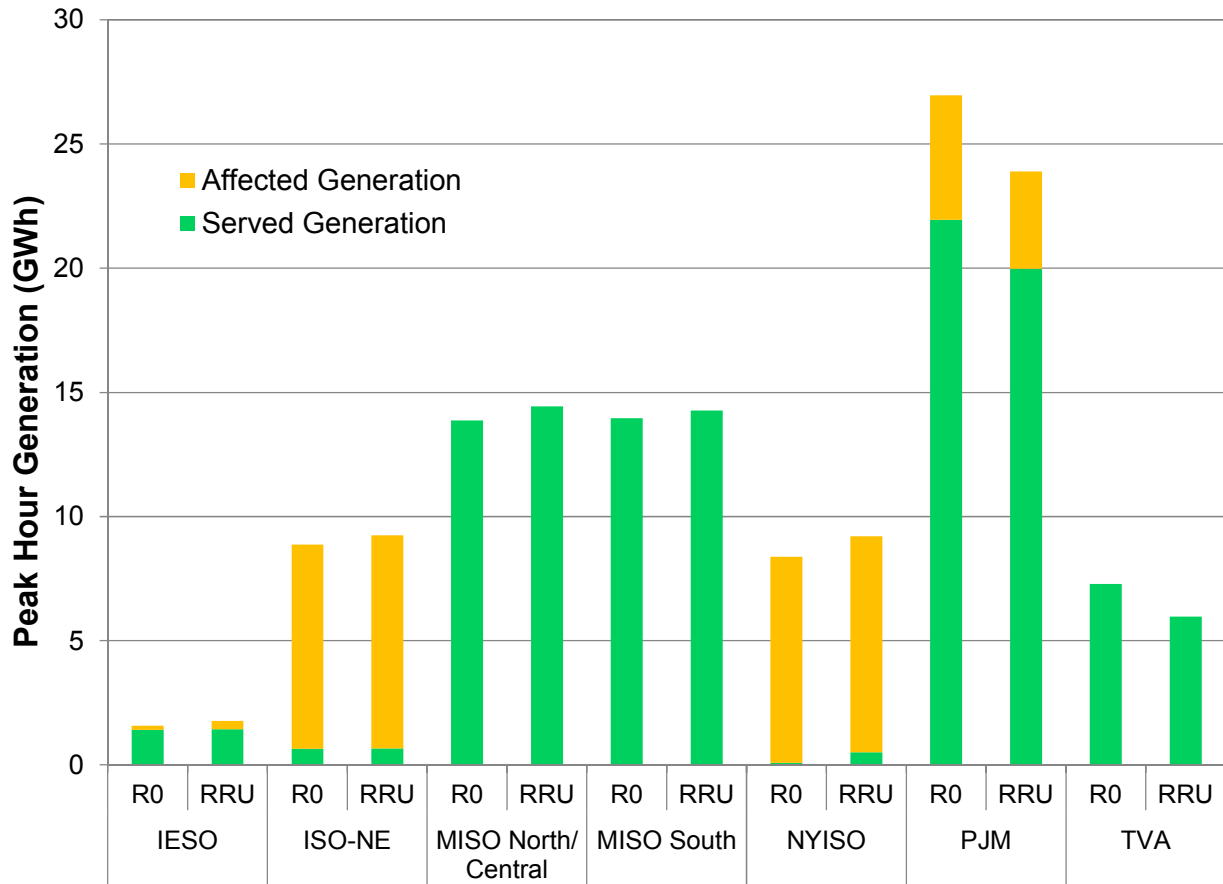


Figure T2 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T1.

Figure T2. RGDS Roll-Up Winter 2018: Locations with Peak Hour Affected Generation

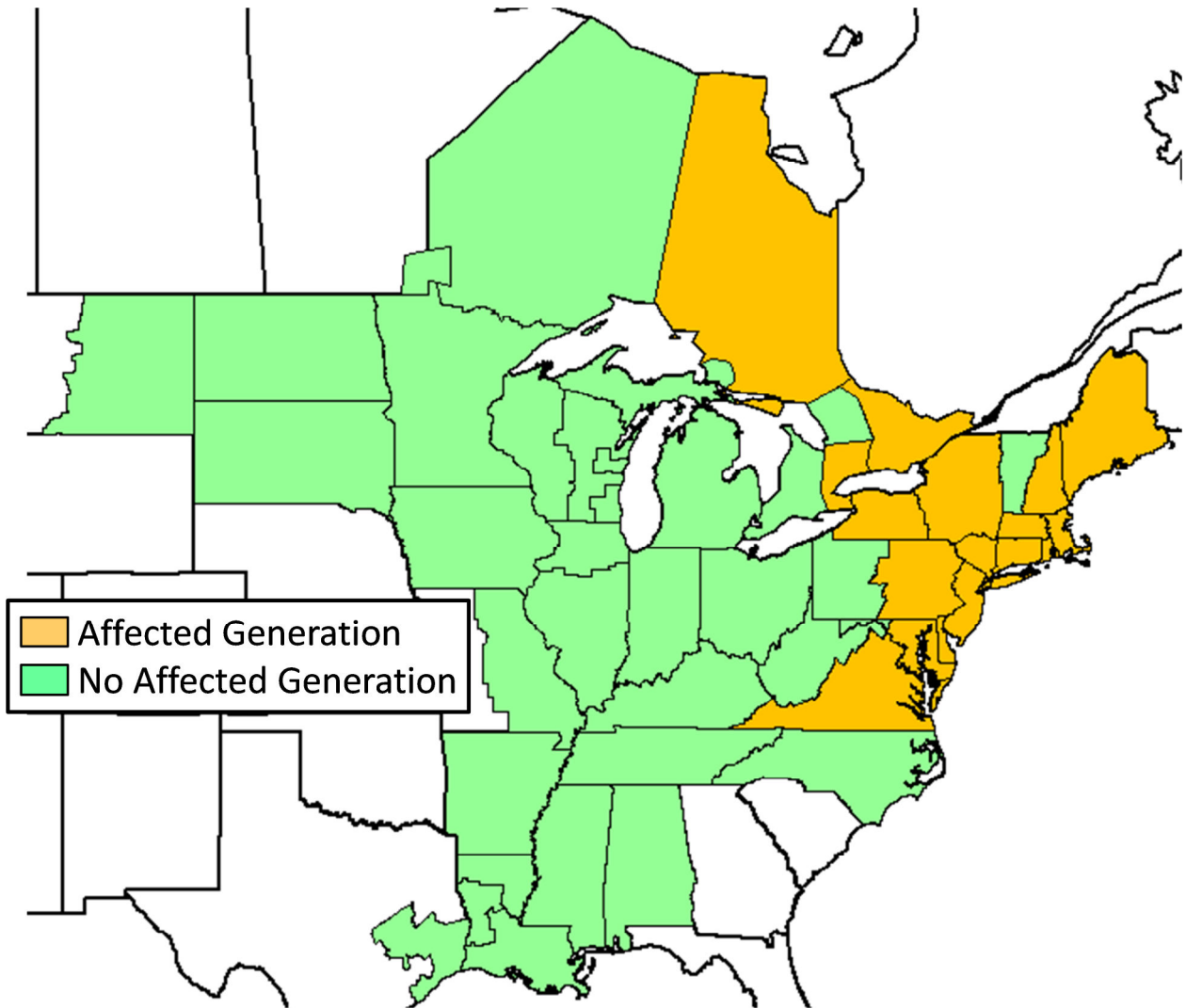


Table T1. RGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	12.2	1,666
Delaware	1.6	199
Maine	10.3	1,386
Maryland Eastern	5.3	574
Massachusetts Eastern	8.5	1,174
Massachusetts Western	14.0	1,931
New Hampshire	9.7	1,288
New Jersey	4.1	511
New York Central Northern	25.9	3,654
New York City	18.7	2,493
New York Long Island	9.2	1,054
New York Southern	10.9	1,312
New York Western	1.6	179
Ontario (CDA)	0.5	55
Ontario (EDA)	1.6	175
Ontario (NDA)	0.8	114
Pennsylvania Eastern	0.4	43
Rhode Island	8.6	1,130
Virginia	19.3	2,584

Figure T3 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T1 during the Winter 2018 peak hour.

Figure T3. RGDS Roll-Up Winter 2018: Peak Hour Constraints

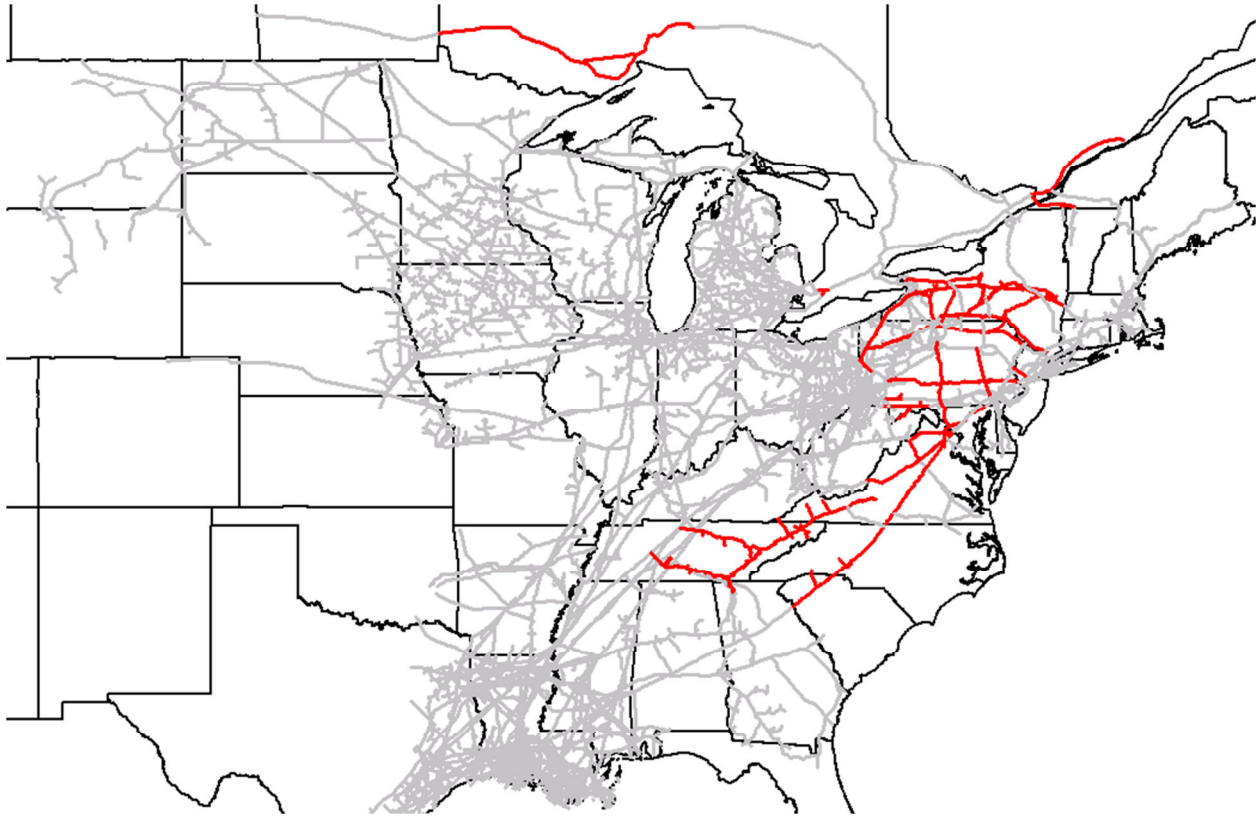


Table T2 summarizes the results of the frequency and duration analysis.

Table T2. RGDS Roll-Up Winter 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	12	1	5	21
Columbia Gas W PA/NY	8	1	3	13
Constitution	2	31	59	90
Dominion Eastern NY	6	12	9	16
Dominion Western NY	1	4	4	4
Dominion Southeast	6	1	3	9
East Tennessee Mainline	5	1	1	5
Eastern Shore	12	1	10	58
Empire Mainline	6	1	12	20
Millennium	7	1	38	69
NB/NS Supply	13	1	20	51
Tennessee Z4 PA	10	1	7	24
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	10	1	13	44
Texas Eastern M3 North	12	1	6	32
TransCanada Ontario West	4	1	8	17
TransCanada Quebec	7	1	13	23
Transco Leidy Atlantic	3	10	48	89
Transco Z5	5	1	2	7
Transco Z6 Leidy to 210	4	1	3	6
Union Gas Dawn	2	1	3	4

1.1.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U1 and Figure U2 relative to the capacity of the segment.

1.1.2 Columbia Gas Western Pennsylvania / New York

The 100% peak hour utilization on Columbia Gas's Western Pennsylvania / New York segment, which is modeled with a capacity of 1,131 MDth/d, potentially affects generators directly connected to Columbia in Pennsylvania, New Jersey, Virginia and Maryland, and generators behind LDCs served by Columbia Gas in Pennsylvania, New Jersey, Delaware, Maryland and Virginia. The locations of these generators are shown in Figure 81 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U3 and Figure U4 relative to the capacity of the segment

1.1.3 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs in New York and Connecticut. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U5 and Figure U6 relative to the capacity of the segment.

1.1.4 Dominion Eastern New York

Dominion's Eastern New York segment is modeled with a capacity of 907 MDth/d. The 100% peak hour utilization on Dominion's Eastern New York segment potentially affects generators directly connected to Dominion and behind LDCs served by Dominion. The locations of these generators are shown in Figure 83 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U7 and Figure U8 relative to the capacity of the segment.

1.1.5 Dominion Western New York

Dominion Western New York is modeled with a capacity of 557 MDth/d. The 100% utilization on Dominion's Western New York segment potentially affects generators directly served by Dominion and behind LDCs served by Dominion. The locations of the plants in each category are shown in Figure 84 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U9 and Figure U10 relative to the capacity of the segment.

1.1.6 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 MDth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U11 and Figure U12 relative to the capacity of the segment.

1.1.7 East Tennessee Mainline

The East Tennessee mainline is modeled with a capacity of 800 MDth/d. The 100% peak hour utilization on East Tennessee's mainline potentially affects generators directly connected to East

Tennessee and generators behind LDCs served by East Tennessee. The locations of these generators are shown in Figure 86 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U13 and Figure U14 relative to the capacity of the segment.

1.1.8 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U15 and Figure U16 relative to the capacity of the segments.

1.1.9 Empire Mainline

The Empire mainline is modeled with a capacity of 525 MDth/d. The 100% peak hour utilization on the Empire mainline across upstate New York potentially affects generators on the Niagara Mohawk LDC system. The locations of these generators are shown in Figure 88 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U17 and Figure U18 relative to the capacity of the segment.

1.1.10 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, particularly in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U19 and Figure U20 relative to the capacity of the segment.

1.1.11 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 24 MDth/d in New Brunswick and approximately 599 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U21 and Figure U22 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

1.1.12 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U23 and Figure U24 relative to the capacity of the segment.

1.1.13 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U25 and Figure U26 relative to the capacity of the segment.

1.1.14 Texas Eastern M2 PA – Southern Branch

The Texas Eastern M2 PA – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern's Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York. Generators that are served by Algonquin and Eastern Shore either directly or behind an LDC would also potentially be affected. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U27 and Figure U28 relative to the capacity of the segment.

1.1.15 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 2,987 MDth/d. The 100% peak hour utilization on the Northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, as well as generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U29 and Figure U30 relative to the capacity of the segment.

1.1.16 TransCanada Ontario West

TransCanada's Western Ontario segment is modeled with a capacity of 3,148 MDth/d. The 100% peak hour utilization on TransCanada's Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U31 and Figure U32 relative to the capacity of the segment.

1.1.17 TransCanada Quebec

TransCanada Quebec is modeled with a capacity of 1,320 MDth/d. The 100% peak hour utilization on TransCanada's Quebec segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure 96 of the report. Limitations for customers in Quebec could arise from this constraint, but such limitations have not been included in the results reported below.

The seasonal daily forecasts of RCI and generator peak hour demand downstream of the constrained segment are shown in Figure U33 and Figure U34 relative to the capacity of the segment. The generator gas demand in these figures includes only gas demand at generators in the Study Region. Gas demand from non-Study Region generators is not included in the tabulation of results.

1.1.18 Transco Leidy Atlantic

The Transco Leidy Atlantic segment is modeled with a capacity of 1,700 MDth/d. The 100% peak hour utilization on Transco's Leidy Atlantic segment potentially affects generators directly connected to Transco in New Jersey, Maryland, Pennsylvania and Virginia and generators behind LDCs served by Transco in Delaware, New Jersey, Pennsylvania, Maryland, Virginia and North Carolina. The locations of these generators are shown in Figure 97 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U35 and Figure U36 relative to the capacity of the segment.

1.1.19 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U37 and Figure U38 relative to the capacity of the segment.

1.1.20 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station 210 segment is modeled with a capacity of 3,310 MDth/d. The 100% peak hour utilization on this segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania, New York City and Long Island. The locations of generators served along this Transco segment are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U39 and Figure U40 relative to the capacity of the segment.

1.1.21 Union Gas Dawn

The 100% peak hour utilization on Union Gas's Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U41 and Figure U42 relative to the capacity of the segment.

1.2 RGDS ROLL-UP SUMMER 2018

Figure T4 summarizes the affected generation during the Summer 2018 peak hour by PPA.

Figure T4. RGDS Roll-Up Summer 2018: Peak Hour Affected Generation

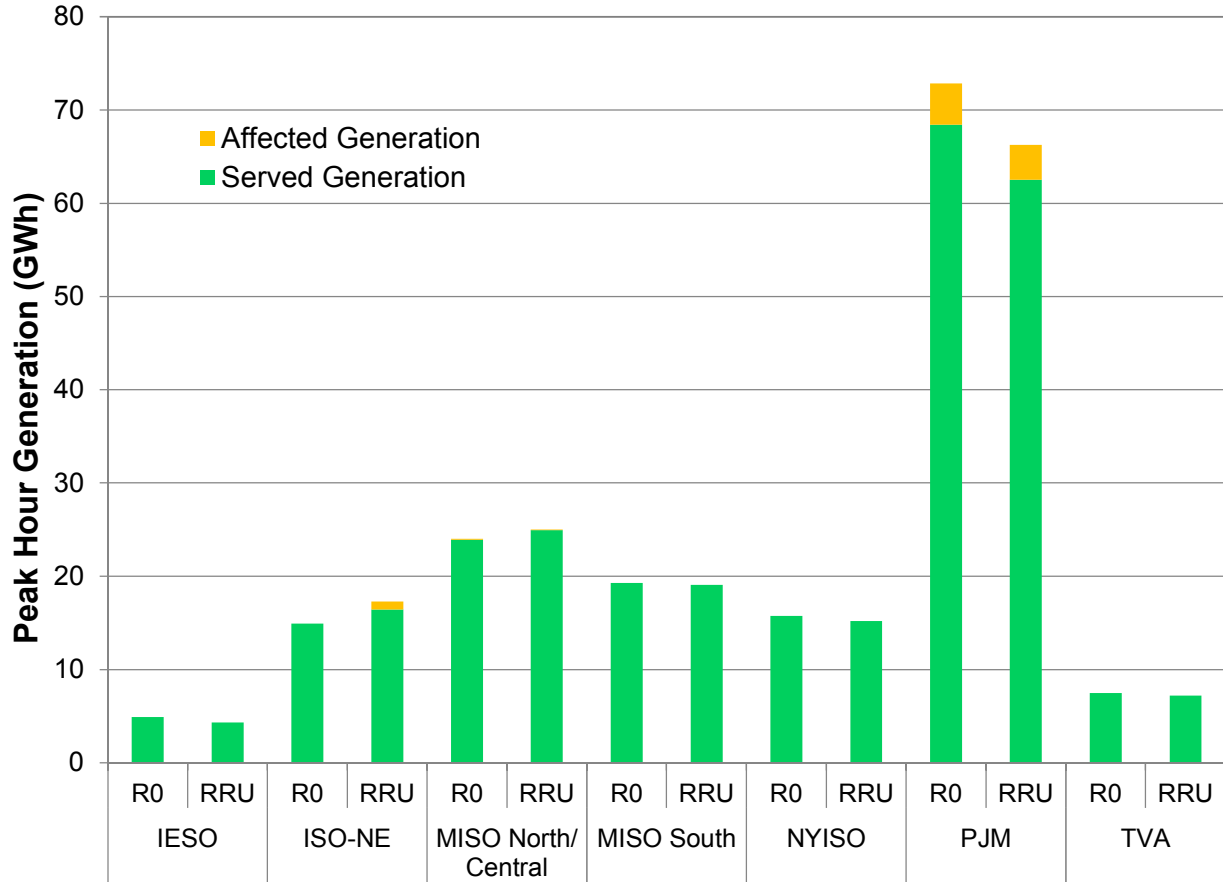


Figure T5 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T3.

Figure T5. RGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation

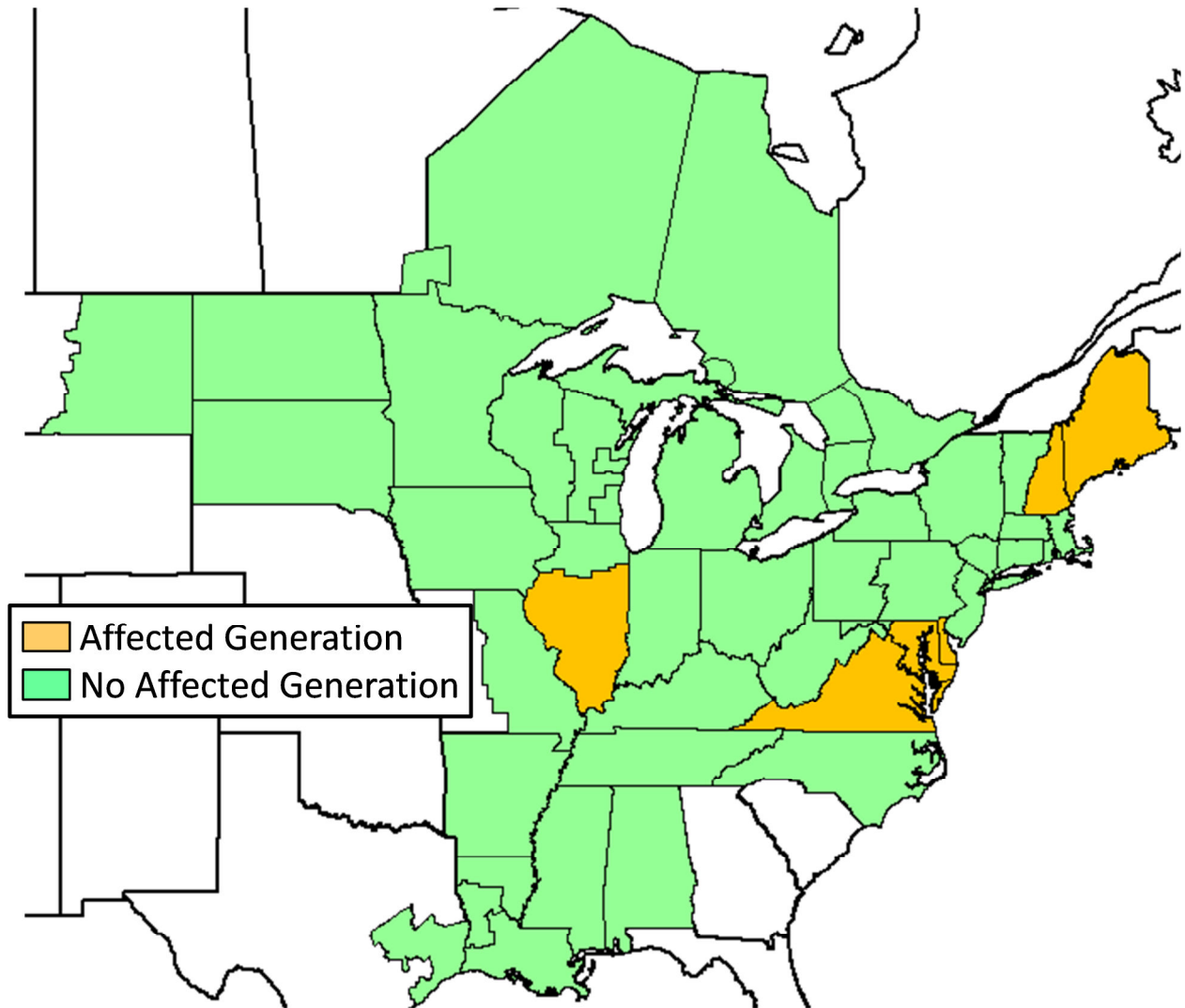


Table T3. RGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	4.4	532
Illinois Southern	1.0	110
Maine	3.2	457
Maryland Eastern	15.9	2,256
New Hampshire	2.9	383
Virginia	8.4	936

Figure T6 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T4 during the Summer 2018 peak hour.

Figure T6. RGDS Roll-Up Summer 2018: Peak Hour Constraints

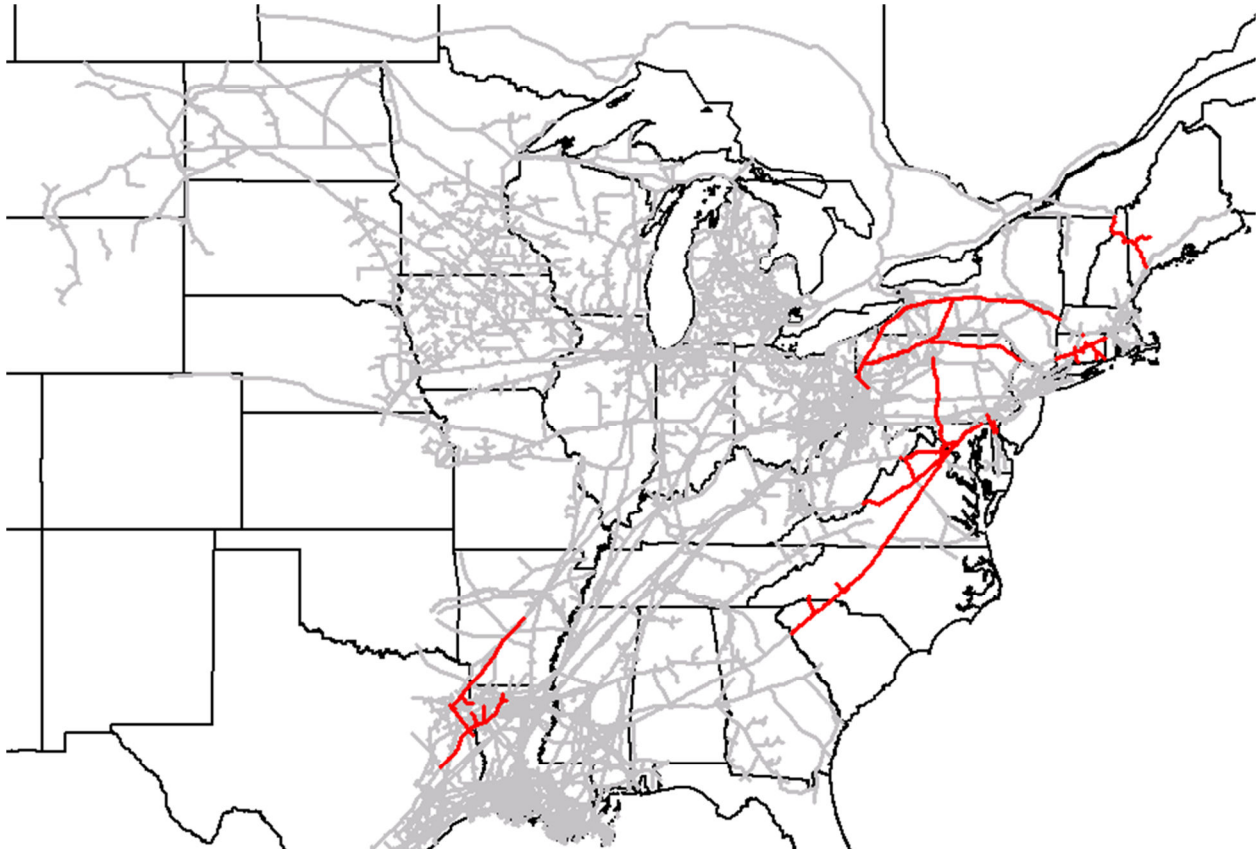


Table T4 summarizes the results of the frequency and duration analysis.

Table T4. RGDS Roll-Up Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	2	1	2	3
Columbia Gas VA/MD	2	1	1	2
Dominion Southeast	5	1	3	8
Eastern Shore	3	1	2	5
Iroquois Z1 → Z2	8	2	10	39
NB/NS Supply	5	1	3	7
PNGTS N of Westbrook	9	1	20	68
Tennessee Z4 PA	1	1	1	1
Tennessee Z5 NY	5	2	61	85
Texas Eastern ETX	6	1	6	14
Transco Z5	9	1	6	20

1.2.1 Algonquin Connecticut

The 100% peak hour utilization on Algonquin’s Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U43 and Figure U44 relative to the capacity of the segment.

1.2.2 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U45 and Figure U46 relative to the capacity of the segment.

1.2.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdth/d. The 100% peak hour utilization on Dominion’s Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U47 and Figure U48 relative to the capacity of the segment.

1.2.4 Eastern Shore

Eastern Shore is modeled with a capacity of 208 MDth/d. The 100% peak hour utilization rate on Eastern Shore’s Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U49 and Figure U50 relative to the capacity of the segments.

1.2.5 Iroquois Zone 1 to Zone 2

The 100% peak hour utilization of the link between Iroquois Zone 1 and Iroquois Zone 1, which is modeled with a capacity of 855 MDth/d, potentially affects generators directly connected to

Iroquois in New York and Connecticut, and generators behind LDCs served by Iroquois in New York and Connecticut. The locations of these generators are shown in Figure D16.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U51 and Figure U52 relative to the capacity of the segment.

1.2.6 New Brunswick Supply / Nova Scotia Offshore Supply

Total supplies from New Brunswick and Nova Scotia Offshore are capped at approximately 283 MDth/d in 2023. This limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes would also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U53 and Figure U54 relative to the total production capacity. The electric demand data set in these figures includes only gas demand at generators in the Study Region, demand from non-Study Region generators is not accounted for.

1.2.7 PNGTS North of Westbrook

The 100% peak hour utilization on PNGTS's North of Westbrook segment, which is modeled with a capacity of 223 MDth/d, potentially affects generators directly connected to PNGTS in New Hampshire in Maine, generators served by LDCs connected to PNGTS, and generators served by M&N either directly or via LDC. The locations of these generators are shown in Figure 112 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U55 and Figure U56 relative to the capacity of the segment.

1.2.8 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC. The locations of these generators are shown in Figure 91 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U57 and Figure U58 relative to the capacity of the segment.

1.2.9 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire;

generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U59 and Figure U60 relative to the capacity of the segment.

1.2.10 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment, which is modeled with a capacity of 623 MDth/d, potentially affects generators directly connected to Texas Eastern in Texas, Arkansas and Illinois. The locations of these generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U61 and Figure U62 relative to the capacity of the segment.

1.2.11 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U63 and Figure U64 relative to the capacity of the segment.

1.3 RGDS ROLL-UP WINTER 2023

Figure T7 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure T7. RGDS Roll-Up Winter 2023: Peak Hour Affected Generation

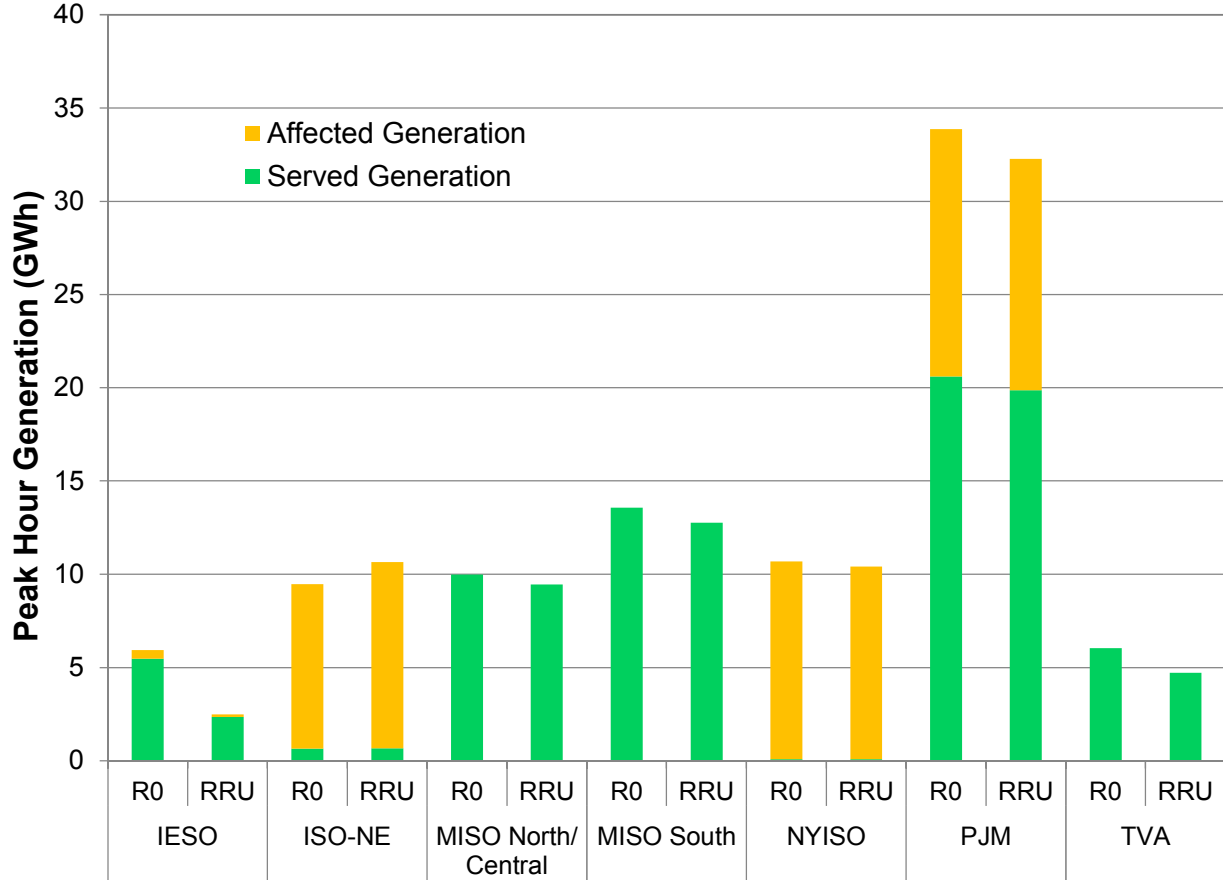


Figure T8 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T5.

Figure T8. RGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation

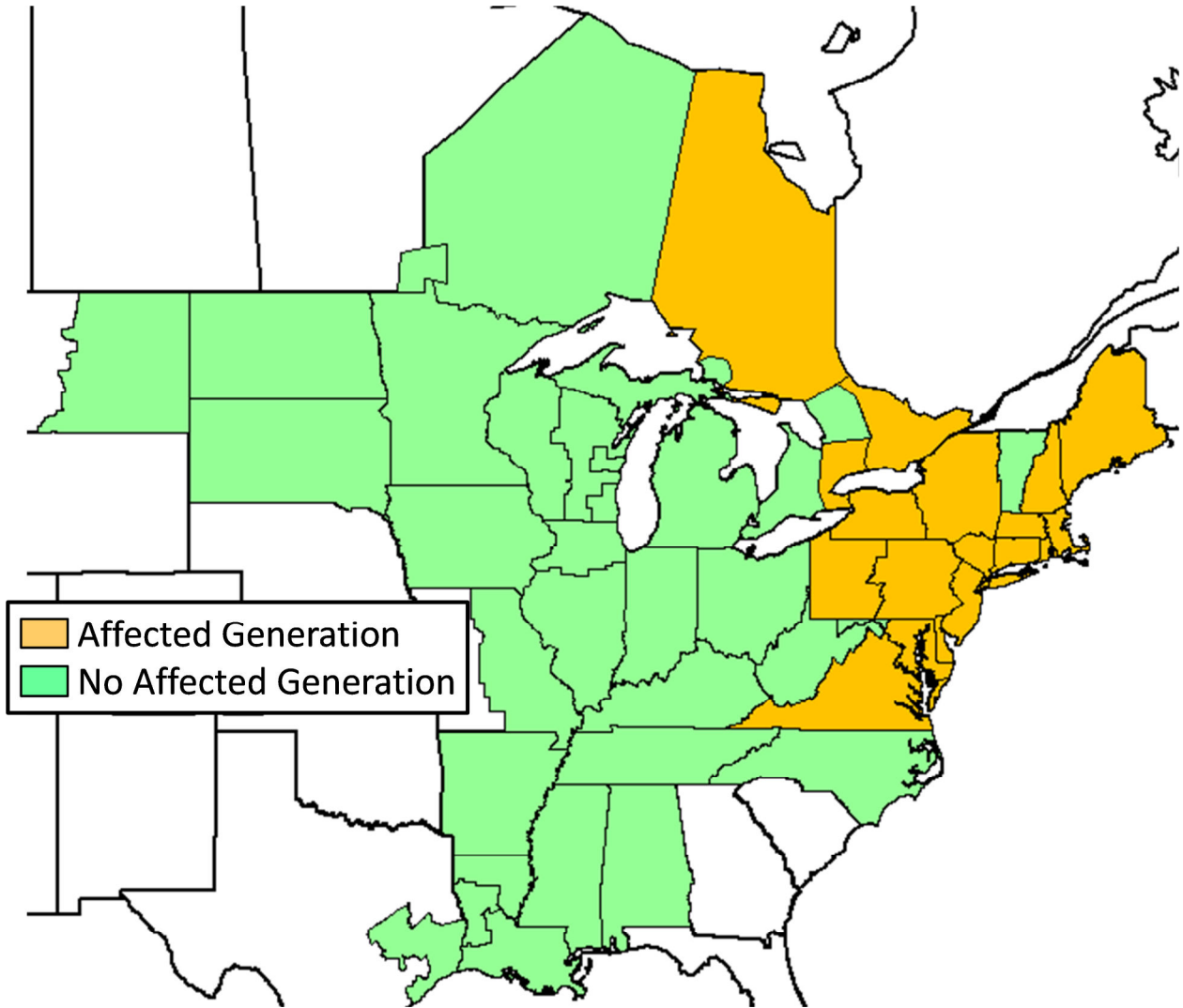


Table T5. RGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	18.2	2,496
Delaware	1.8	220
Maine	10.3	1,386
Maryland Eastern	5.0	539
Massachusetts Eastern	11.1	1,526
Massachusetts Western	14.0	1,931
New Hampshire	9.7	1,288
New Jersey	26.5	3,279
New York Central Northern	39.6	4,697
New York City	17.3	2,298
New York Long Island	10.9	1,139
New York Southern	13.8	1,503
New York Western	2.2	247
Ontario (CDA)	0.2	28
Ontario (EDA)	0.1	7
Ontario (NDA)	0.8	114
Pennsylvania Eastern	26.0	3,499
Pennsylvania Western	6.7	961
Rhode Island	10.3	1,358
Virginia	36.1	4,331

Figure T9 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T7 during the Winter 2023 peak hour.

Figure T9. RGDS Roll-Up Winter 2023: Peak Hour Constraints

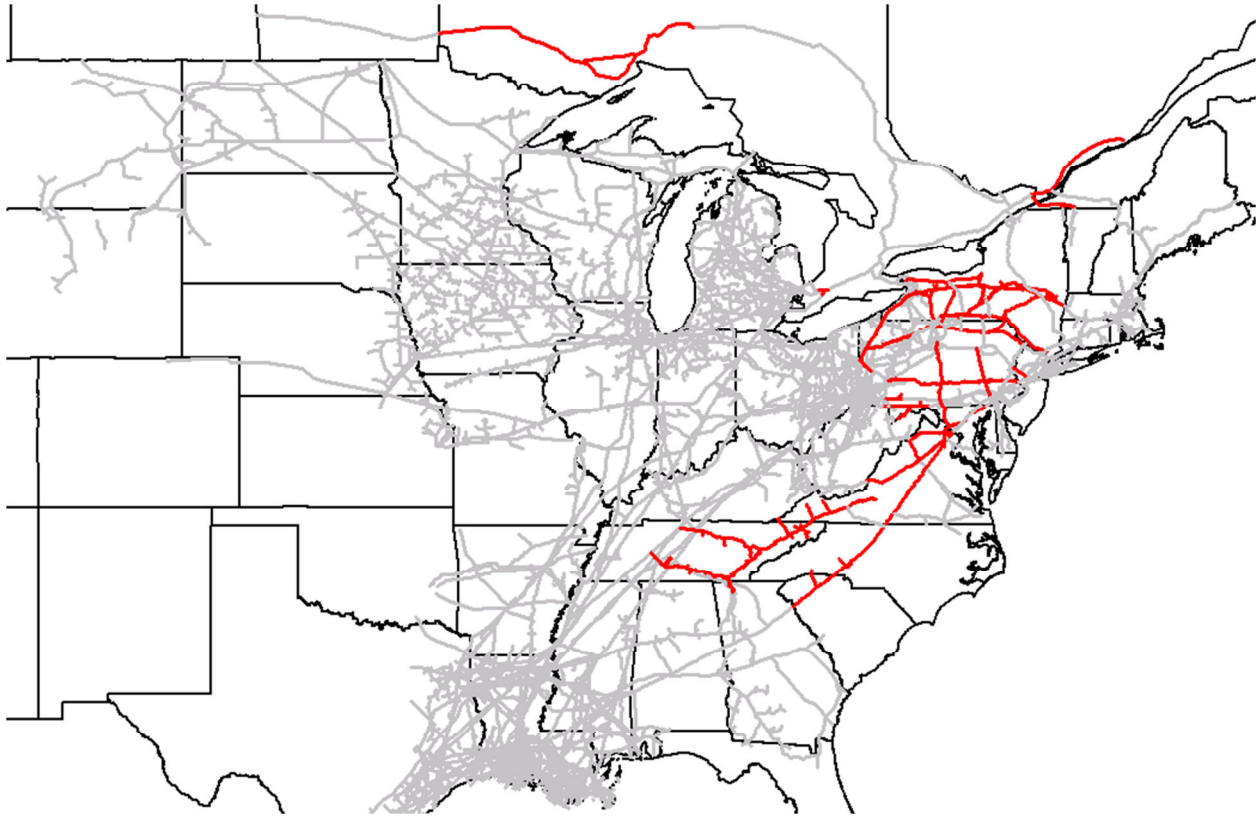


Table T6 summarizes the results of the frequency and duration analysis.

Table T6. RGDS Roll-Up Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	5	1	52	82
Columbia Gas W PA/NY	13	1	4	22
Constitution	2	31	59	90
Dominion Eastern NY	7	1	16	60
Dominion Western NY	1	5	5	5
Dominion Southeast	6	1	32	73
East Tennessee Mainline	3	1	3	6
Eastern Shore	11	1	16	63
Empire Mainline	6	1	44	56
Millennium	7	1	38	69
NB/NS Supply	2	31	59	90
Tennessee Z4 PA	10	1	15	42
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	7	1	17	59
Texas Eastern M3 North	12	1	10	46
TransCanada Ontario West	1	2	2	2
TransCanada Quebec	8	1	14	29
Transco Leidy Atlantic	7	1	27	58
Transco Z5	6	1	2	7
Transco Z6 Leidy to 210	5	1	48	87
Union Gas Dawn	1	2	2	2

1.3.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U65 and Figure U66 relative to the capacity of the segment.

1.3.2 Columbia Gas Western Pennsylvania / New York

The 100% peak hour utilization on Columbia Gas’s Western Pennsylvania / New York segment, which is modeled with a capacity of 1,131 MDth/d, potentially affects generators directly connected to Columbia in Pennsylvania, New Jersey, Virginia and Maryland, and generators behind LDCs served by Columbia Gas in Pennsylvania, New Jersey, Delaware, Maryland and Virginia. The locations of these generators are shown in Figure 81 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U67 and Figure U68 relative to the capacity of the segment

1.3.3 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs in New York and Connecticut. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U69 and Figure U70 relative to the capacity of the segment.

1.3.4 Dominion Eastern New York

Dominion's Eastern New York segment is modeled with a capacity of 907 MDth/d. The 100% peak hour utilization on Dominion's Eastern New York segment potentially affects generators directly connected to Dominion and behind LDCs served by Dominion. The locations of these generators are shown in Figure 83 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U71 and Figure U72 relative to the capacity of the segment.

1.3.5 Dominion Western New York

Dominion Western New York is modeled with a capacity of 557 MDth/d. The 100% utilization on Dominion's Western New York segment potentially affects generators directly served by Dominion and behind LDCs served by Dominion. The locations of the plants in each category are shown in Figure 84 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U73 and Figure U74 relative to the capacity of the segment.

1.3.6 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 MDth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U75 and Figure U76 relative to the capacity of the segment.

1.3.7 East Tennessee Mainline

The East Tennessee mainline is modeled with a capacity of 800 MDth/d. The 100% peak hour utilization on East Tennessee's mainline potentially affects generators directly connected to East

Tennessee and generators behind LDCs served by East Tennessee. The locations of these generators are shown in Figure 86 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U77 and Figure U78 relative to the capacity of the segment.

1.3.8 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U79 and Figure U80 relative to the capacity of the segments.

1.3.9 Empire Mainline

The Empire mainline is modeled with a capacity of 525 MDth/d. The 100% peak hour utilization on the Empire mainline across upstate New York potentially affects generators on the Niagara Mohawk LDC system. The locations of these generators are shown in Figure 88 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U81 and Figure U82 relative to the capacity of the segment.

1.3.10 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, particularly in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U83 and Figure U84 relative to the capacity of the segment.

1.3.11 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 24 MDth/d in New Brunswick and approximately 599 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U85 and Figure U86 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

1.3.12 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U87 and Figure U88 relative to the capacity of the segment.

1.3.13 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U89 and Figure U90 relative to the capacity of the segment.

1.3.14 Texas Eastern M2 PA – Southern Branch

The Texas Eastern M2 PA – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern's Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York. Generators that are served by Algonquin and Eastern Shore either directly or behind an LDC would also potentially be affected. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U91 and Figure U92 relative to the capacity of the segment.

1.3.15 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 2,987 MDth/d. The 100% peak hour utilization on the Northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, as well as generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U93 and Figure U94 relative to the capacity of the segment.

1.3.16 TransCanada Ontario West

TransCanada's Western Ontario segment is modeled with a capacity of 3,148 MDth/d. The 100% peak hour utilization on TransCanada's Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U95 and Figure U96 relative to the capacity of the segment.

1.3.17 TransCanada Quebec

TransCanada Quebec is modeled with a capacity of 1,320 MDth/d. The 100% peak hour utilization on TransCanada's Quebec segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure 96 of the report. Limitations for customers in Quebec could arise from this constraint, but such limitations have not been included in the results reported below.

The seasonal daily forecasts of RCI and generator peak hour demand downstream of the constrained segment are shown in Figure U97 and Figure U98 relative to the capacity of the segment. The generator gas demand in these figures includes only gas demand at generators in the Study Region. Gas demand from non-Study Region generators is not included in the tabulation of results.

1.3.18 Transco Leidy Atlantic

The Transco Leidy Atlantic segment is modeled with a capacity of 1,700 MDth/d. The 100% peak hour utilization on Transco's Leidy Atlantic segment potentially affects generators directly connected to Transco in New Jersey, Maryland, Pennsylvania and Virginia and generators behind LDCs served by Transco in Delaware, New Jersey, Pennsylvania, Maryland, Virginia and North Carolina. The locations of these generators are shown in Figure 97 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U99 and Figure U100 relative to the capacity of the segment.

1.3.19 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U101 and Figure U102 relative to the capacity of the segment.

1.3.20 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station 210 segment is modeled with a capacity of 3,310 MDth/d. The 100% peak hour utilization on this segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania, New York City and Long Island. The locations of generators served along this Transco segment are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U103 and Figure U104 relative to the capacity of the segment.

1.3.21 Union Gas Dawn

The 100% peak hour utilization on Union Gas's Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U105 and Figure U106 relative to the capacity of the segment.

1.4 RGDS ROLL-UP SUMMER 2023

Figure T10 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure T10. RGDS Roll-Up Summer 2023: Peak Hour Affected Generation

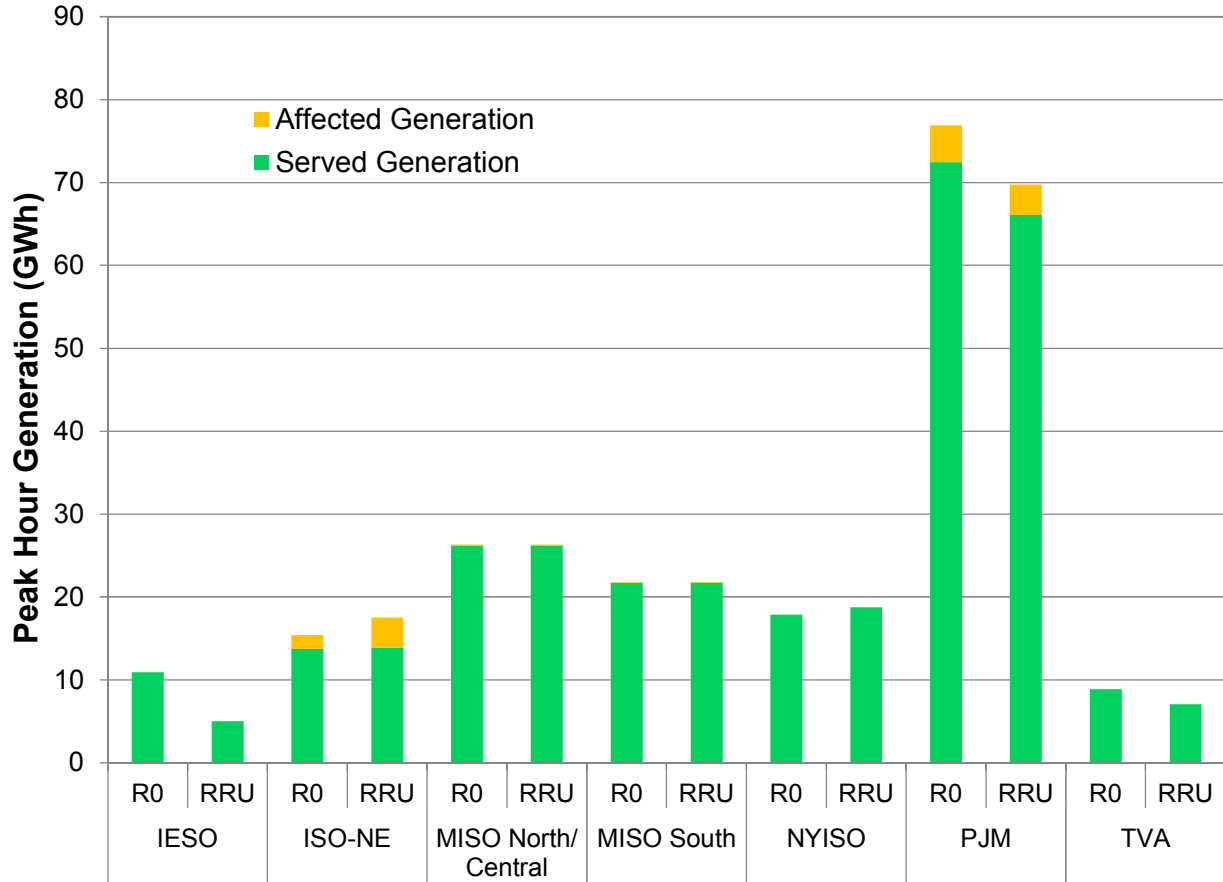


Figure T11 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T7.

Figure T11. RGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation

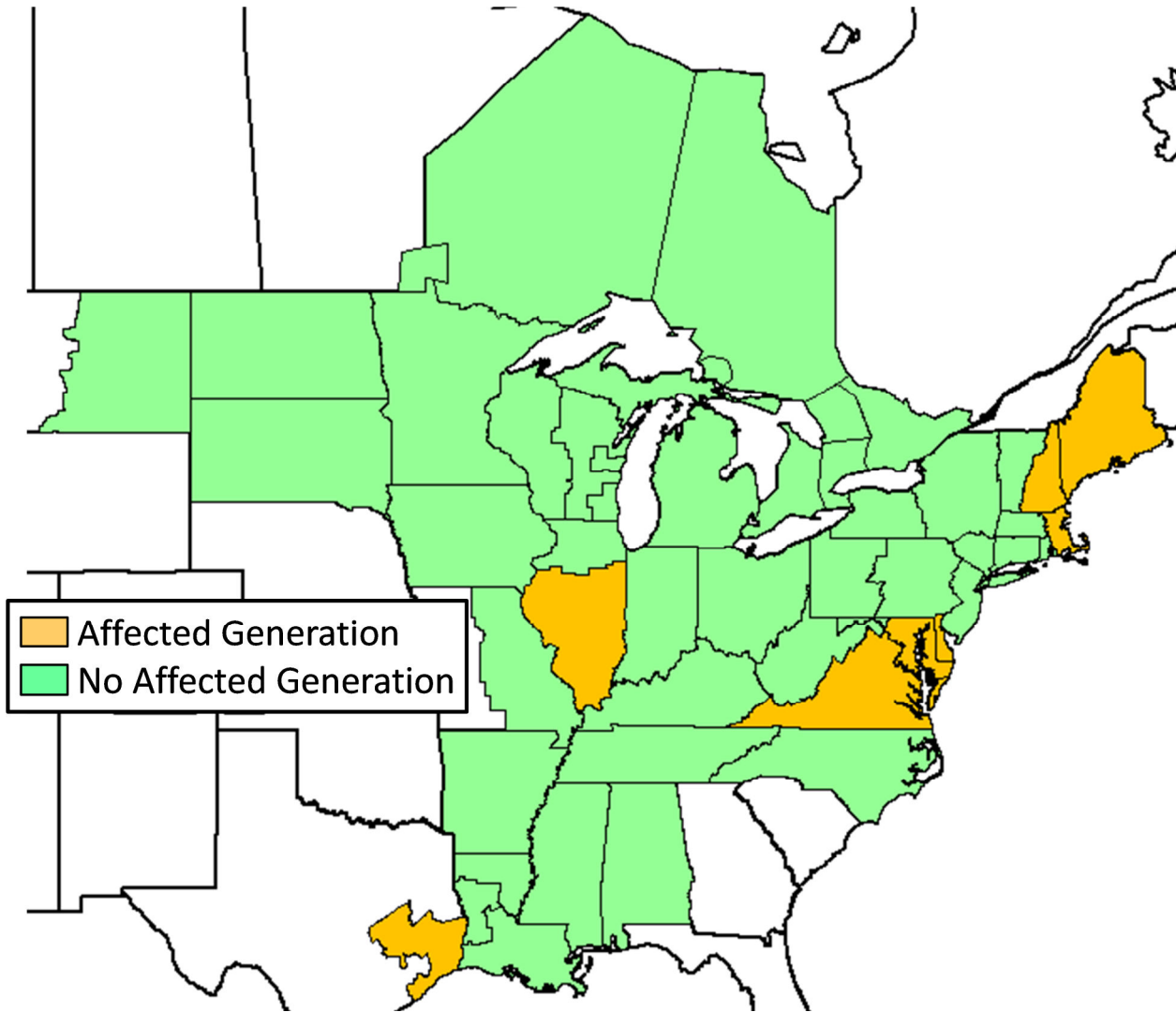


Table T7. RGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	3.7	467
Illinois Southern	1.0	112
Maine	11.9	1,523
Maryland Eastern	15.9	2,256
Massachusetts Eastern	5.0	549
New Hampshire	12.8	1,540
Texas East (SERC)	0.6	81
Virginia	8.4	936

Figure T12 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T10 during the Summer 2018 peak hour.

Figure T12. RGDS Roll-Up Summer 2023: Peak Hour Constraints

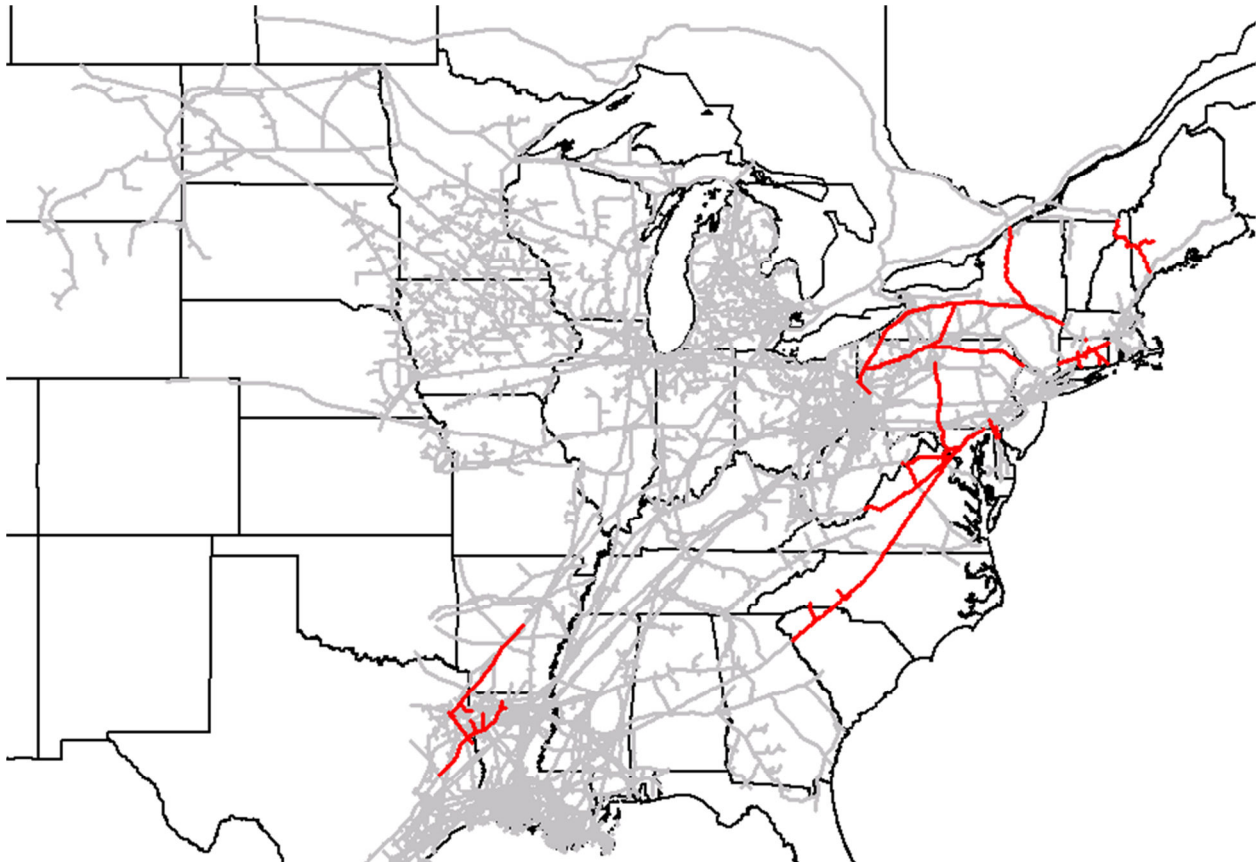


Table T8 summarizes the results of the frequency and duration analysis.

Table T8. RGDS Roll-Up Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	11	1	5	27
Columbia Gas VA/MD	2	1	1	2
Dominion Southeast	12	1	8	24
Eastern Shore	8	1	3	14
Iroquois Z1	11	1	10	43
NB/NS Supply	3	1	81	84
PNGTS N of Westbrook	9	1	19	73
Tennessee Z4 PA	2	1	2	3
Tennessee Z5 NY	13	1	2	34
Texas Eastern ETX	7	1	10	20
Transco Z5	7	1	7	19

1.4.1 Algonquin Connecticut

The 100% peak hour utilization on Algonquin's Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U107 and Figure U108 relative to the capacity of the segment.

1.4.2 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,867 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U109 and Figure U110 relative to the capacity of the segment.

1.4.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U111 and Figure U112 relative to the capacity of the segment.

1.4.4 Eastern Shore

Eastern Shore is modeled with a capacity of 208 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U113 and Figure U114 relative to the capacity of the segments.

1.4.5 Iroquois Zone 1

The 100% peak hour utilization on Iroquois's Zone 1, which is modeled with a capacity of 1,195 MDth/d, potentially affects generators directly connected to Iroquois and generators behind LDCs served by Iroquois. The locations of these generators are shown in Figure D10.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U115 and Figure U116 relative to the capacity of the segment.

1.4.6 New Brunswick Supply / Nova Scotia Offshore Supply

Total supplies from New Brunswick and Nova Scotia Offshore are capped at approximately 283 MDth/d in 2023. This limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes would also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U117 and Figure U118 relative to the total production capacity. The electric demand data set in these figures includes only gas demand at generators in the Study Region, demand from non-Study Region generators is not accounted for.

1.4.7 PNGTS North of Westbrook

The 100% peak hour utilization on PNGTS's North of Westbrook segment, which is modeled with a capacity of 223 MDth/d, potentially affects generators directly connected to PNGTS in New Hampshire in Maine, generators served by LDCs connected to PNGTS, and generators served by M&N either directly or via LDC. The locations of these generators are shown in Figure 112 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U119 and Figure U120 relative to the capacity of the segment.

1.4.8 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC. The locations of these generators are shown in Figure 91 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U121 and Figure U122 relative to the capacity of the segment.

1.4.9 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U123 and Figure U124 relative to the capacity of the segment.

1.4.10 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment, which is modeled with a capacity of 623 MDth/d, potentially affects generators directly connected to Texas Eastern in Texas, Arkansas and Illinois. The locations of these generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U125 and Figure U126 relative to the capacity of the segment.

1.4.11 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U127 and Figure U128 relative to the capacity of the segment.

2 HGDS ROLL-UP

2.1 HGDS ROLL-UP WINTER 2018

Figure T13 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure T13. HGDS Roll-Up Winter 2018: Peak Hour Affected Generation

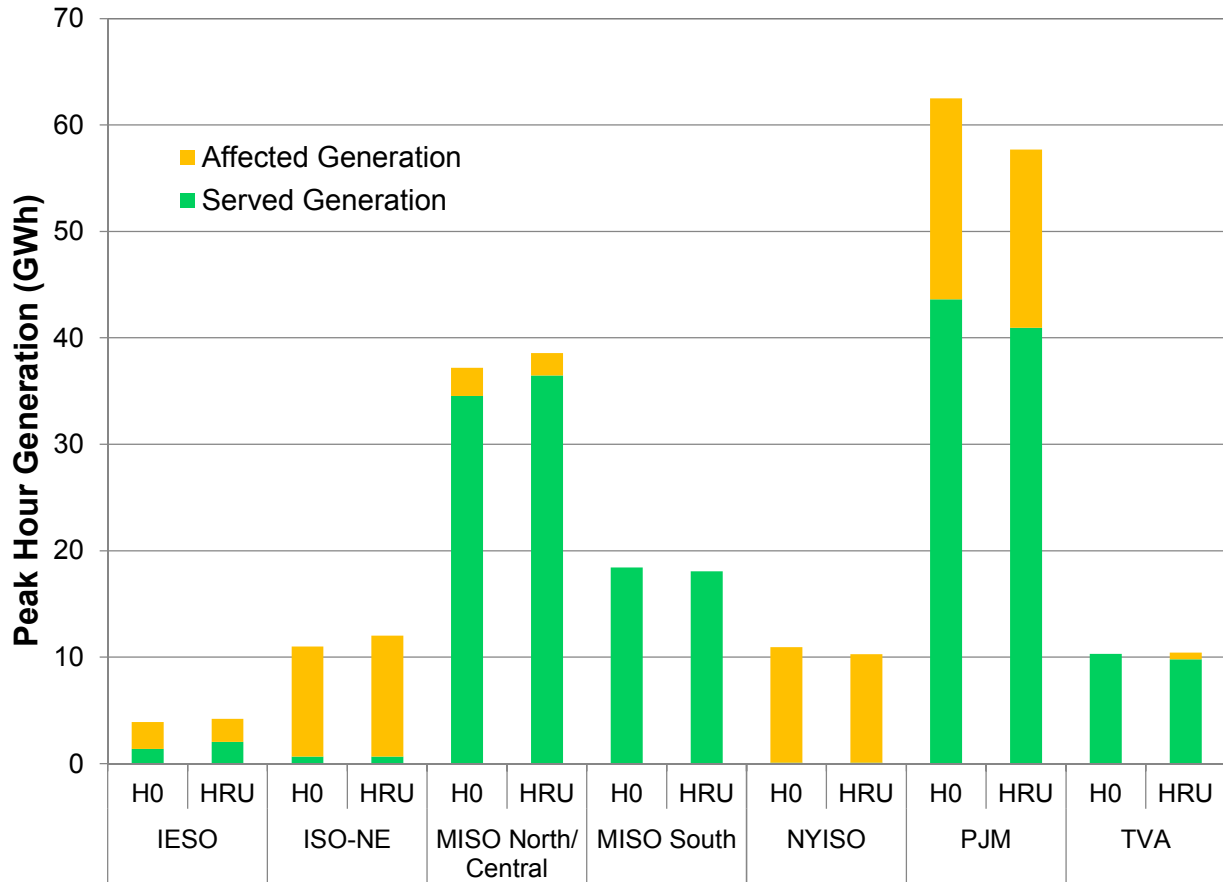


Figure T14 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T9.

Figure T14. HGDS Roll-Up Winter 2018: Locations with Peak Hour Affected Generation

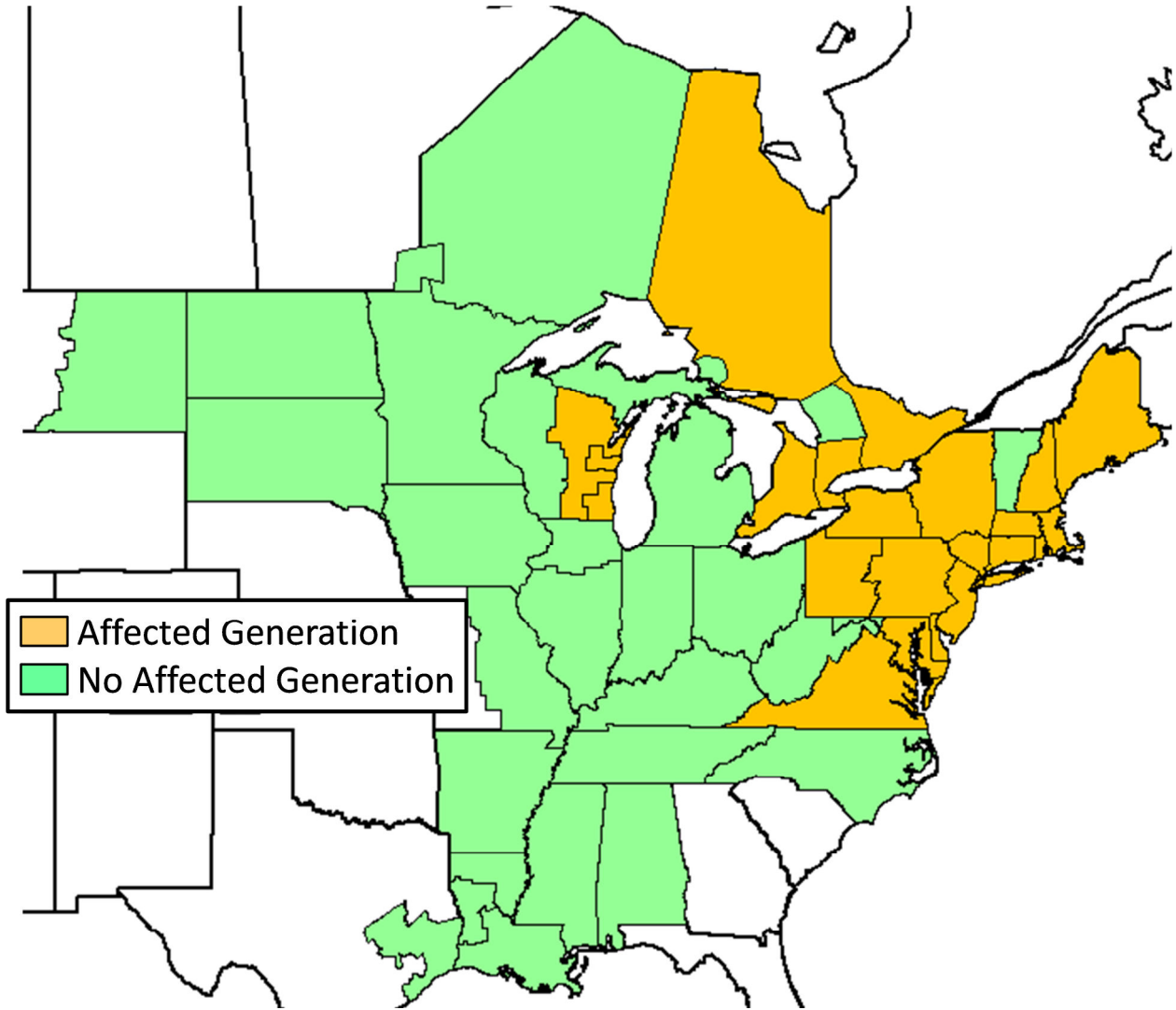


Table T9. HGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	23.5	3,157
Delaware	1.6	205
Maine	9.5	1,292
Maryland Eastern	5.0	539
Massachusetts Eastern	14.6	2,036
Massachusetts Western	7.8	1,059
New Hampshire	13.0	1,764
New Jersey	23.7	3,101
New York Central Northern	38.4	4,939
New York City	20.8	2,601
New York Long Island	6.8	729
New York Southern	10.9	1,312
New York Western	5.3	716
Ontario (CDA)	1.6	181
Ontario (EDA)	12.2	1,247
Ontario (NDA)	1.5	186
Ontario (StClair)	7.0	950
Pennsylvania Eastern	66.5	9,027
Pennsylvania Western	11.0	1,574
Rhode Island	9.2	1,194
Virginia	33.5	4,456
Wisconsin Eastern (RFC)	14.8	1,814
Wisconsin Western (MROE)	6.8	838

Figure T15 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T13 during the Winter 2018 peak hour.

Figure T15. HGDS Roll-Up Winter 2018: Peak Hour Constraints

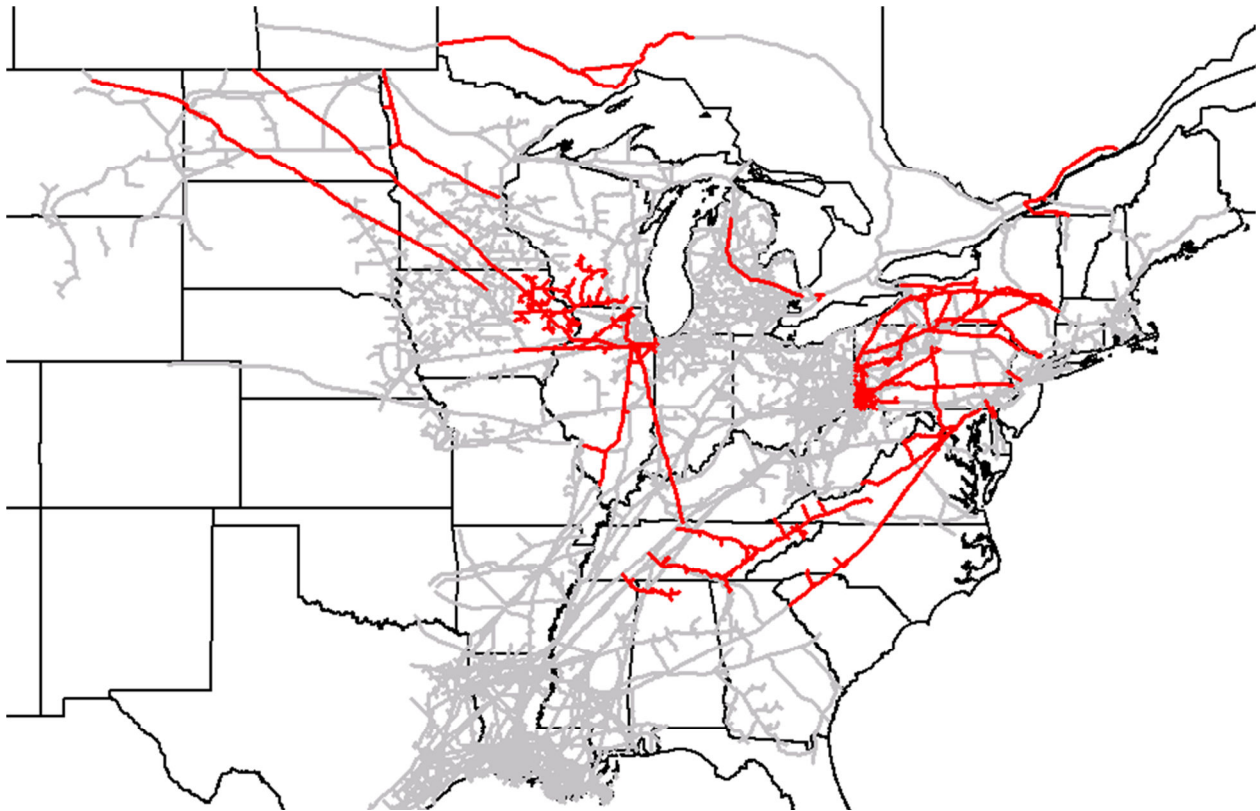


Table T10 summarizes the results of the frequency and duration analysis.

Table T10. HGDS Roll-Up Winter 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
AlaTenn	2	31	59	90
Alliance	4	1	6	10
ANR Northern Illinois	9	1	35	59
Columbia Gas VA/MD	11	2	14	59
Columbia Gas W PA/NY	7	1	3	12
Constitution	2	31	59	90
Dominion Eastern NY	10	1	5	19
Dominion Western NY	6	1	15	34
Dominion Southeast	12	1	14	36
East Tennessee Mainline	6	2	8	26
Eastern Shore	11	1	31	63
Empire Mainline	8	1	7	30
Great Lakes East	11	1	30	66
Midwestern	17	1	12	60
Millennium	7	1	32	63
NB/NS Supply	14	1	20	68
NGPL IA/IL North	9	1	28	58
NGPL IA/IL South	11	1	11	50
Northern Border Chicago	12	1	10	46
Northern Natural D	4	1	4	7
Tennessee Z4 PA	10	1	14	37
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	2	31	59	90
Texas Eastern M3 North	3	1	59	86
TransCanada Ontario West	6	1	8	14
TransCanada Quebec	8	1	13	26
Transco Leidy Atlantic	2	31	59	90
Transco Z5	8	1	12	24
Transco Z6 Leidy to 210	2	31	59	90
Union Gas Dawn	3	1	3	7
Viking Z1	10	1	9	21

2.1.1 AlaTenn

The 100% peak hour utilization on AlaTenn's mainline, which is modeled with a capacity of 197 MDth/d, potentially affects generators served by AlaTenn in Alabama. The locations of these generators are shown in Figure Q16.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U129 and Figure U130 relative to the capacity of the segment.

2.1.2 Alliance

The 100% peak hour utilization on Alliance's mainline, which is modeled with a capacity of 1,800 MDth/d, potentially affects generators behind LDCs served by Alliance and generators behind LDCs served by Guardian. The locations of these generators are shown in Figure D1.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U131 and Figure U132 relative to the capacity of the segment.

2.1.3 ANR Northern Illinois

The 100% peak hour utilization on ANR's Northern Illinois segment, which is modeled with a capacity of 1,337 MDth/d, potentially affects generators directly connected to ANR in Illinois and Wisconsin and generators behind LDCs served by ANR in Illinois and Wisconsin. The locations of these generators are shown in Figure D2.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U133 and Figure U134 relative to the capacity of the segment.

2.1.4 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U135 and Figure U136 relative to the capacity of the segment.

2.1.5 Columbia Gas Western Pennsylvania / New York

The 100% peak hour utilization on Columbia Gas's Western Pennsylvania / New York segment, which is modeled with a capacity of 1,131 MDth/d, potentially affects generators directly connected to Columbia in Pennsylvania, New Jersey, Virginia and Maryland, and generators behind LDCs served by Columbia Gas in Pennsylvania, New Jersey, Delaware, Maryland and Virginia. The locations of these generators are shown in Figure 81 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U137 and Figure U138 relative to the capacity of the segment.

2.1.6 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs in New York and Connecticut. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U139 and Figure U140 relative to the capacity of the segment.

2.1.7 Dominion Eastern New York

Dominion's Eastern New York segment is modeled with a capacity of 907 MDth/d. The 100% peak hour utilization on Dominion's Eastern New York segment potentially affects generators directly connected to Dominion and behind LDCs served by Dominion. The locations of these generators are shown in Figure 83 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U141 and Figure U142 relative to the capacity of the segment.

2.1.8 Dominion Western New York

Dominion Western New York is modeled with a capacity of 557 MDth/d. The 100% utilization on Dominion's Western New York segment potentially affects generators directly served by Dominion and behind LDCs served by Dominion. The locations of the plants in each category are shown in Figure 84 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U143 and Figure U144 relative to the capacity of the segment.

2.1.9 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 MDth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U145 and Figure U146 relative to the capacity of the segment.

2.1.10 East Tennessee Mainline

The East Tennessee mainline is modeled with a capacity of 800 MDth/d. The 100% peak hour utilization on East Tennessee's mainline potentially affects generators directly connected to East Tennessee and generators behind LDCs served by East Tennessee. The locations of these generators are shown in Figure 86 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U147 and Figure U148 relative to the capacity of the segment.

2.1.11 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the

Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U149 and Figure U150 relative to the capacity of the segments.

2.1.12 Empire Mainline

The Empire mainline is modeled with a capacity of 525 MDth/d. The 100% peak hour utilization on the Empire mainline across upstate New York potentially affects generators on the Niagara Mohawk LDC system. The locations of these generators are shown in Figure 88 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U151 and Figure U152 relative to the capacity of the segment.

2.1.13 Great Lakes East

The 100% peak hour utilization on Great Lakes Gas's East segment, which is modeled with a capacity of 1,164 MDth/d, potentially affects generators directly connected to Great Lakes in Michigan, generators behind LDCs served by Great Lakes in Michigan, generators directly connected to Vector, and generators behind Union Gas. The locations of these generators are shown in Figure D3.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U153 and Figure U154 relative to the capacity of the segment.

2.1.14 Midwestern

The 100% peak hour utilization on Midwestern's mainline segment, which is modeled with a capacity of 635 MDth/d, potentially affects generators that are directly connected to Midwestern in Indiana and Indiana, generators behind LDCs served by Midwestern in Indiana and Illinois, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D4.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U155 and Figure U156 relative to the capacity of the segment.

2.1.15 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, particularly in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U157 and Figure U158 relative to the capacity of the segment.

2.1.16 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 24 MDth/d in New Brunswick and approximately 599 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U159 and Figure U160 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

2.1.17 NGPL Iowa/Illinois North

The 100% peak hour utilization on NGPL's Iowa/Illinois North segment, which is modeled with a capacity of 1,677 MDth/d, potentially affects generators directly connected to NGPL in Illinois, generators behind LDCs served by NGPL in Iowa, Illinois and Indiana, generators directly connected to Horizon in Illinois, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D5.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U161 and Figure U162 relative to the capacity of the segment.

2.1.18 NGPL Iowa/Illinois South

The 100% peak hour utilization on NGPL's Iowa/Illinois South segment, which is modeled with a capacity of 1,624 MDth/d, potentially affects generators directly connected to NGPL in Illinois, generators behind LDCs served by NGPL in Illinois and Indiana, generators directly connected to Horizon in Illinois, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D6.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U163 and Figure U164 relative to the capacity of the segment.

2.1.19 Northern Border Chicago

The 100% peak hour utilization on Northern Border's mainline, which is modeled with a capacity of 987 MDth/d, potentially affects generators directly connected to Northern Border in Illinois, generators behind LDCs served by Northern Border in Illinois and Indiana, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D7.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U165 and Figure U166 relative to the capacity of the segment.

2.1.20 Northern Natural Zone D

The 100% peak hour utilization on Northern Natural's Zone D segment, which is modeled with a capacity of 800 MDth/d, potentially affects generators directly connected to Northern Natural in Wisconsin, generators behind LDCs served by Northern Natural in Illinois and Wisconsin, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D8.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U167 and Figure U168 relative to the capacity of the segment.

2.1.21 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U169 and Figure U170 relative to the capacity of the segment.

2.1.22 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U171 and Figure U172 relative to the capacity of the segment.

2.1.23 Texas Eastern M2 PA – Southern Branch

The Texas Eastern M2 PA – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern's Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York. Generators that are served by Algonquin and Eastern Shore either directly or behind an LDC would also potentially be affected. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U173 and Figure U174 relative to the capacity of the segment.

2.1.24 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 2,987 MDth/d. The 100% peak hour utilization on the Northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, as well as generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U175 and Figure U176 relative to the capacity of the segment.

2.1.25 TransCanada Ontario West

TransCanada's Western Ontario segment is modeled with a capacity of 3,148 MDth/d. The 100% peak hour utilization on TransCanada's Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U177 and Figure U178 relative to the capacity of the segment.

2.1.26 TransCanada Quebec

TransCanada Quebec is modeled with a capacity of 1,320 MDth/d. The 100% peak hour utilization on TransCanada's Quebec segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure 96 of the report. Limitations for customers in Quebec could arise from this constraint, but such limitations have not been included in the results reported below.

The seasonal daily forecasts of RCI and generator peak hour demand downstream of the constrained segment are shown in Figure U179 and Figure U180 relative to the capacity of the segment. The generator gas demand in these figures includes only gas demand at generators in the Study Region. Gas demand from non-Study Region generators is not included in the tabulation of results.

2.1.27 Transco Leidy Atlantic

The Transco Leidy Atlantic segment is modeled with a capacity of 1,700 MDth/d. The 100% peak hour utilization on Transco's Leidy Atlantic segment potentially affects generators directly connected to Transco in New Jersey, Maryland, Pennsylvania and Virginia and generators behind LDCs served by Transco in Delaware, New Jersey, Pennsylvania, Maryland, Virginia and North Carolina. The locations of these generators are shown in Figure 97 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U181 and Figure U182 relative to the capacity of the segment.

2.1.28 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U183 and Figure U184 relative to the capacity of the segment.

2.1.29 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station 210 segment is modeled with a capacity of 3,310 MDth/d. The 100% peak hour utilization on this segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania, New York City and Long Island. The locations of generators served along this Transco segment are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U185 and Figure U186 relative to the capacity of the segment.

2.1.30 Union Gas Dawn

The 100% peak hour utilization on Union Gas's Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U187 and Figure U188 relative to the capacity of the segment.

2.1.31 Viking Zone 1

The 100% peak hour utilization on Viking's Zone 1 segment, which is modeled with a capacity of 543 MDth/d, potentially affects generators directly connected to Viking, generators behind LDCs served by Viking, generators directly connected to ANR, and generators behind LDCs served by ANR. The locations of these generators are shown in Figure D9.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U189 and Figure U190 relative to the capacity of the segment.

2.2 HGDS ROLL-UP SUMMER 2018

Figure T16 summarizes the affected generation during the Summer 2018 peak hour by PPA.

Figure T16. HGDS Roll-Up Summer 2018: Peak Hour Affected Generation

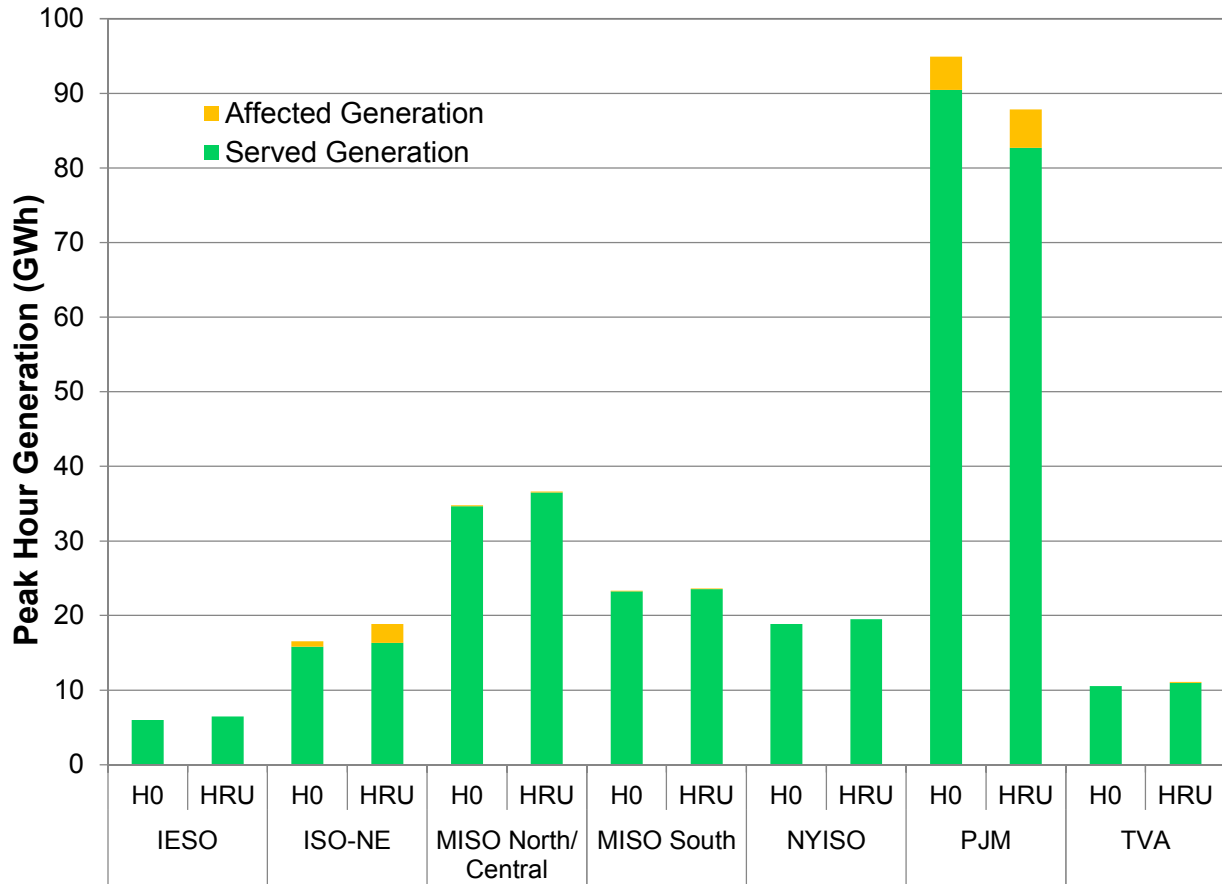


Figure T17 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T11.

Figure T17. HGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation

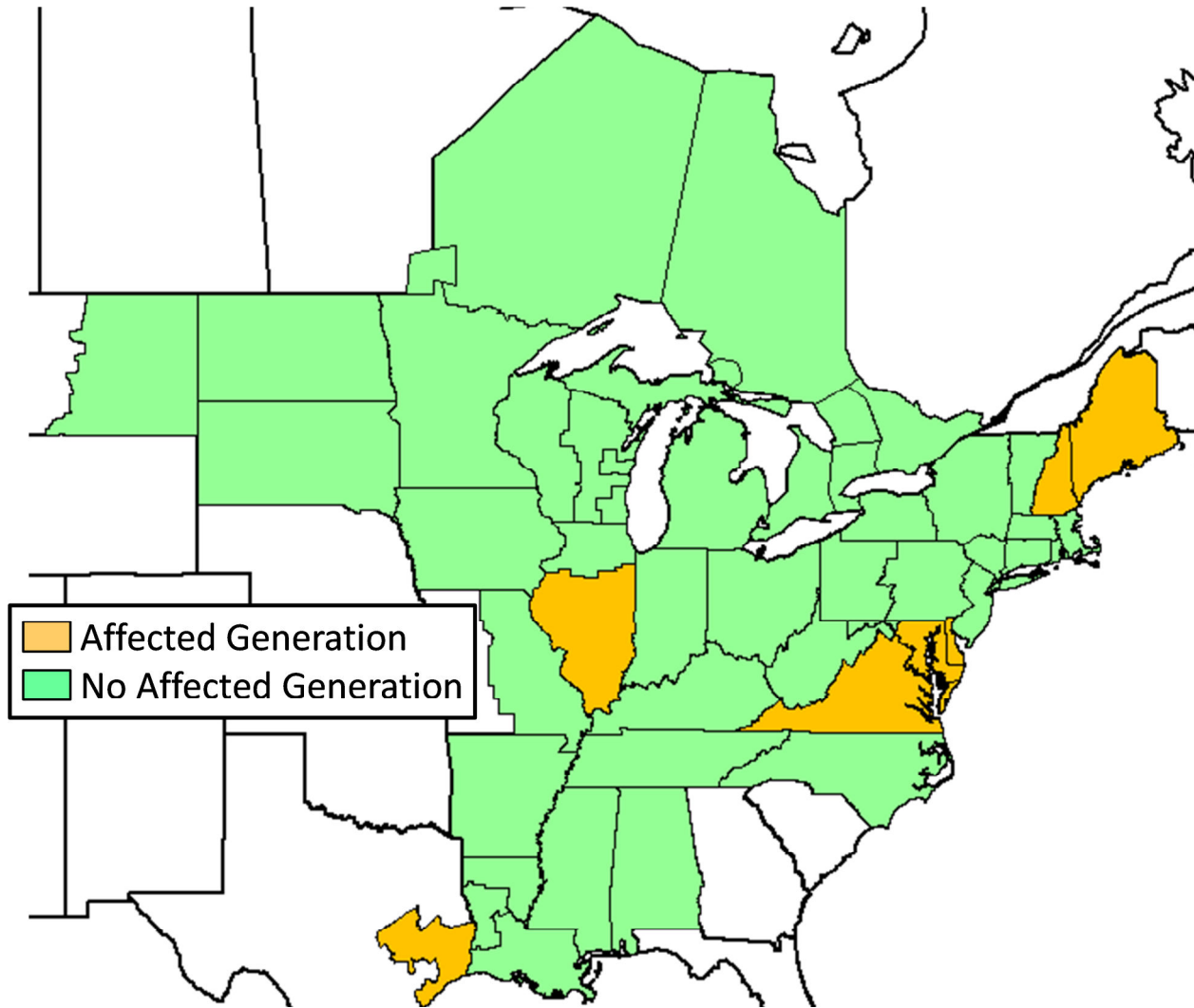


Table T11. HGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.4	1,162
Illinois Southern	1.0	112
Maine	4.0	540
Maryland Eastern	16.7	2,361
New Hampshire	1.4	163
Texas East (SERC)	0.5	70
Virginia	8.4	936

Figure T18 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T16 during the Summer 2018 peak hour.

Figure T18. HGDS Roll-Up Summer 2018: Peak Hour Constraints

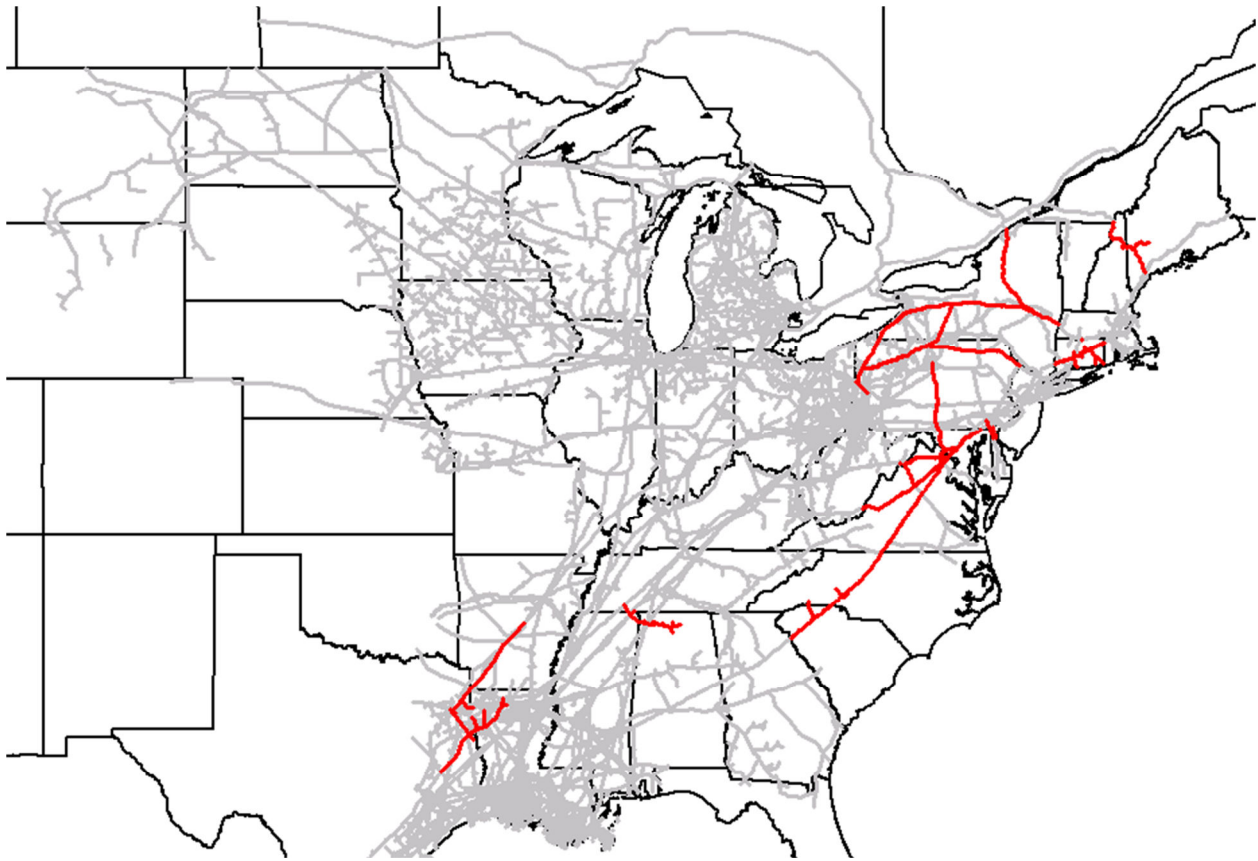


Table T12 summarizes the results of the frequency and duration analysis.

Table T12. HGDS Roll-Up Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
AlaTenn	4	5	37	89
Algonquin Connecticut	4	1	3	9
Columbia Gas VA/MD	9	1	13	40
Dominion Southeast	5	1	33	83
Eastern Shore	7	1	6	24
Iroquois Z1	8	1	26	54
NB/NS Supply	3	1	75	81
PNGTS N of Westbrook	4	1	75	87
Tennessee Z4 PA	3	1	3	6
Tennessee Z5 NY	9	1	10	37
Texas Eastern Zone ETX	9	1	9	24
Transco Z5	6	2	43	76

2.2.1 AlaTenn

The 100% peak hour utilization on AlaTenn's mainline, which is modeled with a capacity of 197 MDth/d, potentially affects generators served by AlaTenn in Alabama. The locations of these generators are shown in Figure Q16.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U191 and Figure U192 relative to the capacity of the segment.

2.2.2 Algonquin Connecticut

The 100% peak hour utilization on Algonquin's Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report..

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U193 and Figure U194 relative to the capacity of the segment.

2.2.3 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U195 and Figure U196 relative to the capacity of the segment.

2.2.4 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U197 and Figure U198 relative to the capacity of the segment.

2.2.5 Eastern Shore

Eastern Shore is modeled with a capacity of 208 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the

Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U199 and Figure U200 relative to the capacity of the segments.

2.2.6 Iroquois Zone 1

The 100% peak hour utilization on Iroquois's Zone 1, which is modeled with a capacity of 1,195 MDth/d, potentially affects generators directly connected to Iroquois and generators behind LDCs served by Iroquois. The locations of these generators are shown in Figure D10.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U201 and Figure U202 relative to the capacity of the segment.

2.2.7 New Brunswick Supply / Nova Scotia Offshore Supply

Total supplies from New Brunswick and Nova Scotia Offshore are capped at approximately 623 MDth/d in 2018. This limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes would also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U203 and Figure U204 relative to the total production capacity. The electric demand data set in these figures includes only gas demand at generators in the Study Region, demand from non-Study Region generators is not accounted for.

2.2.8 PNGTS North of Westbrook

The 100% peak hour utilization on PNGTS's North of Westbrook segment, which is modeled with a capacity of 223 MDth/d, potentially affects generators directly connected to PNGTS in New Hampshire in Maine, generators served by LDCs connected to PNGTS, and generators served by M&N either directly or via LDC. The locations of these generators are shown in Figure 112 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U205 and Figure U206 relative to the capacity of the segment.

2.2.9 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U207 and Figure U208 relative to the capacity of the segment.

2.2.10 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U209 and Figure U210 relative to the capacity of the segment.

2.2.11 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment, which is modeled with a capacity of 623 MDth/d, potentially affects generators directly connected to Texas Eastern in Texas, Arkansas and Illinois. The locations of these generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U211 and Figure U212 relative to the capacity of the segment.

2.2.12 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U213 and Figure U214 relative to the capacity of the segment.

2.3 HGDS ROLL-UP WINTER 2023

Figure T19 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure T19. HGDS Roll-Up Winter 2023: Peak Hour Affected Generation

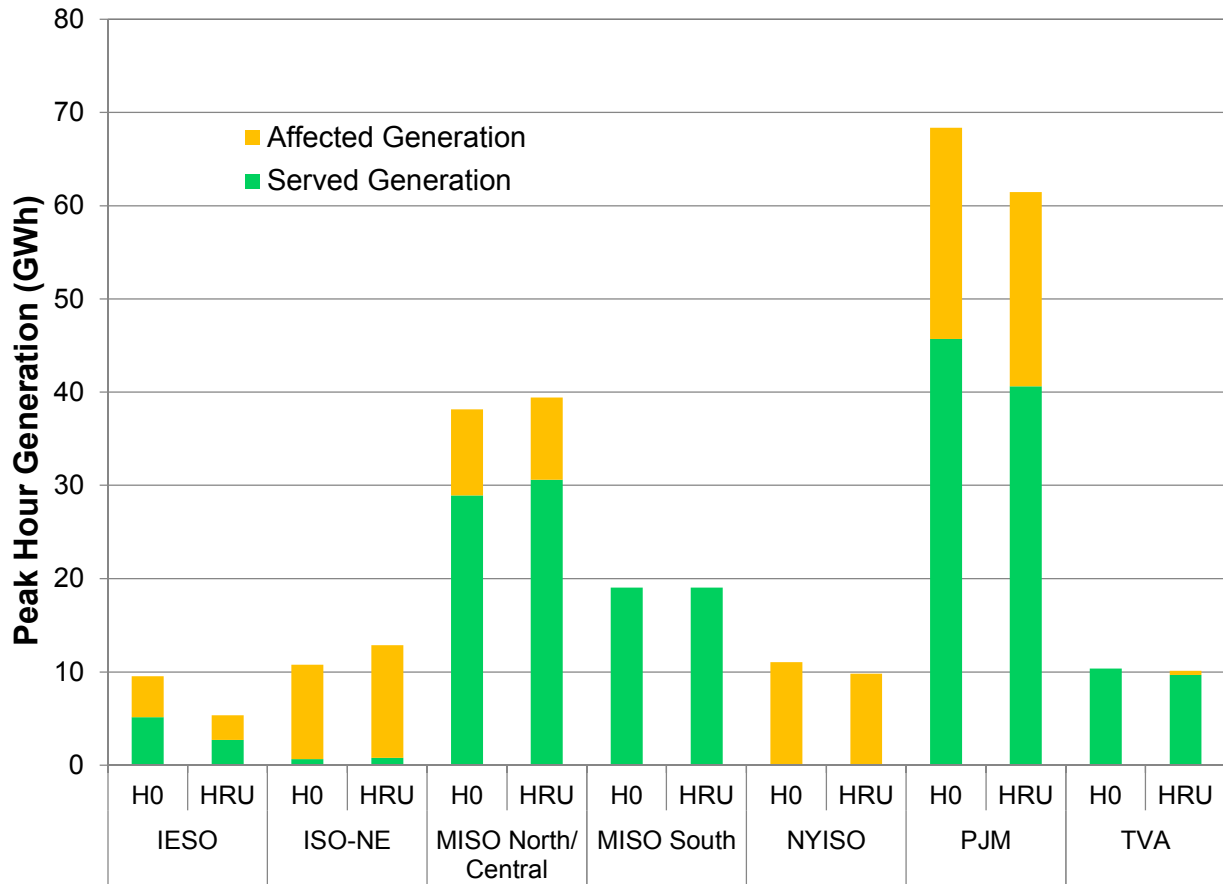


Figure T20 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T13.

Figure T20. HGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation

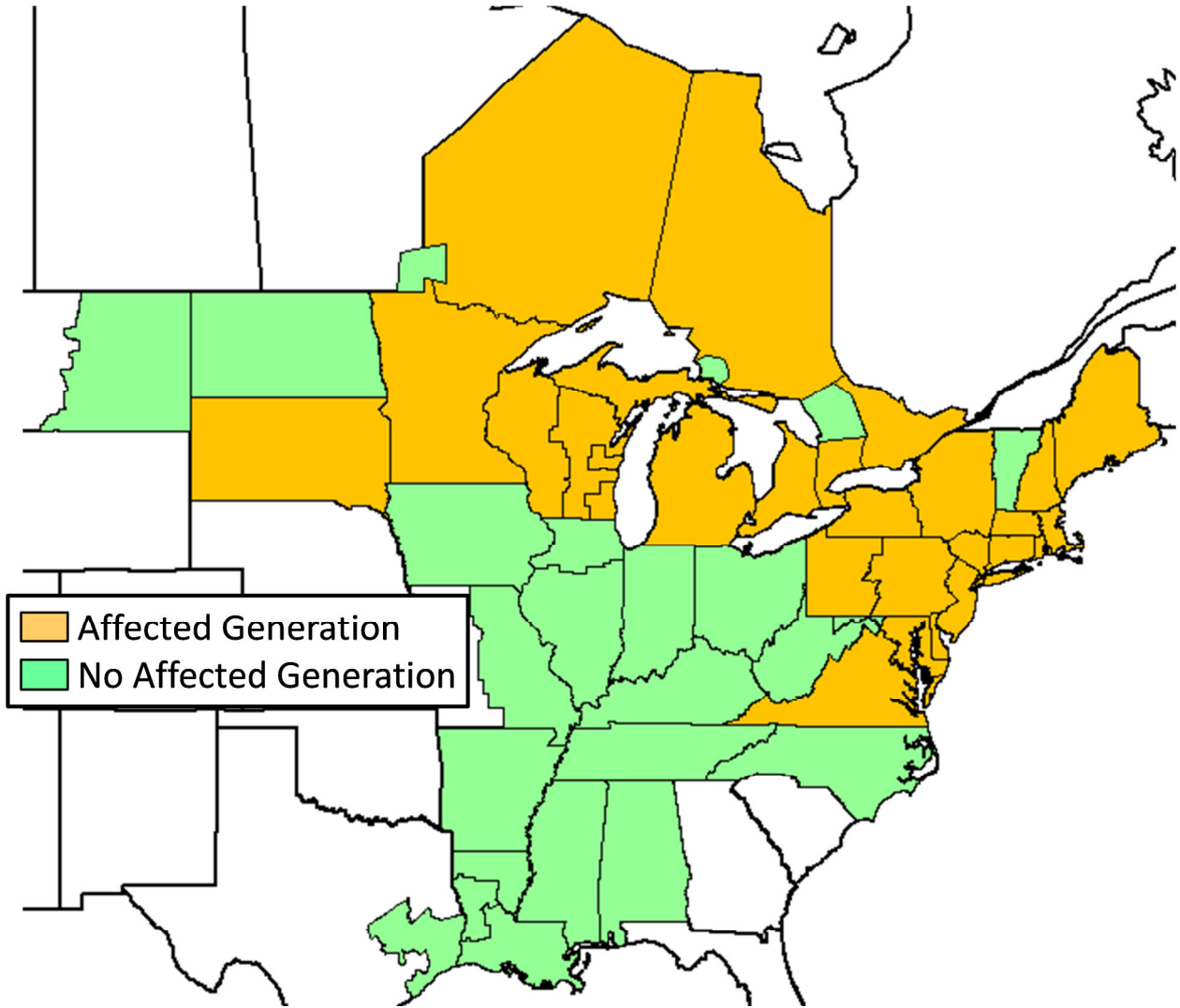


Table T13. HGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	19.0	2,652
Delaware	1.3	173
Maine	12.7	1,799
Maryland Eastern	6.3	662
Massachusetts Eastern	14.8	2,068
Massachusetts Western	7.8	1,059
Michigan Lower Peninsula	0.1	11
Michigan Upper Peninsula	3.6	520
Minnesota	15.7	1,977
New Hampshire	16.7	2,284
New Jersey	22.7	3,133
New York Central Northern	30.1	4,146
New York City	22.3	2,893
New York Long Island	13.7	1,248
New York Southern	10.9	1,312
New York Western	5.2	699
Ontario (CDA)	1.6	181
Ontario (EDA)	12.2	1,653
Ontario (NDA)	1.2	155
Ontario (StClair)	17.2	2,410
Ontario (WDA)	0.4	38
Pennsylvania Eastern	85.4	11,894
Pennsylvania Western	11.0	1,574
Rhode Island	6.3	838
South Dakota	1.0	136
Virginia	35.9	4,742
Wisconsin Eastern (RFC)	30.3	3,921
Wisconsin Western (MROE)	20.2	2,467
Wisconsin Western (MROW)	2.2	223

Figure T21 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T19 during the Winter 2023 peak hour.

Figure T21. HGDS Roll-Up Winter 2023: Peak Hour Constraints

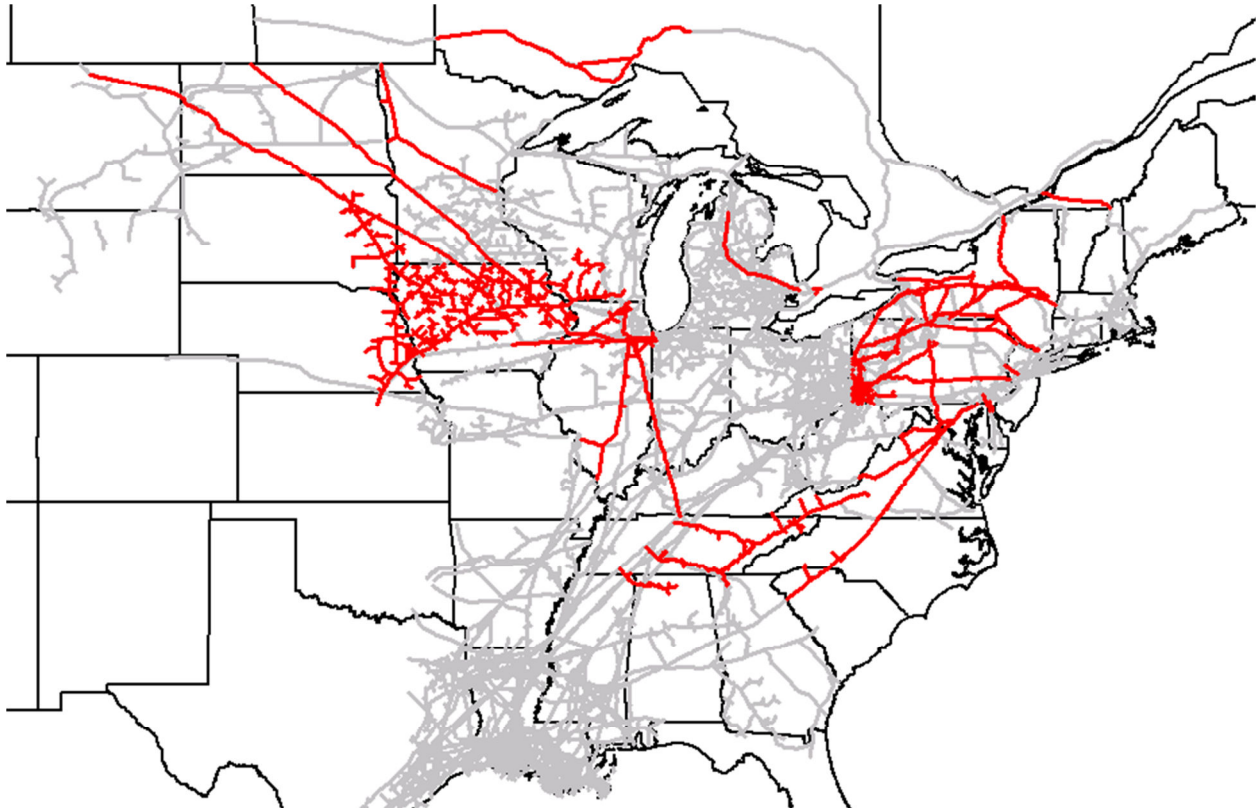


Table T14 summarizes the results of the frequency and duration analysis.

Table T14. HGDS Roll-Up Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
AlaTenn	2	31	58	89
Alliance	4	1	7	10
ANR Northern Illinois	12	1	16	54
Columbia Gas VA/MD	5	2	52	82
Columbia Gas W PA/NY	10	2	11	66
Constitution	2	31	59	90
Dominion Eastern NY	7	1	14	41
Dominion Western NY	7	1	15	37
Dominion Southeast	4	1	54	87
East Tennessee Mainline	6	2	8	26
Eastern Shore	5	1	3	7
Empire Mainline	7	1	16	42
Great Lakes East	7	1	31	81
Iroquois Z1	2	31	59	90
Midwestern	21	1	9	56
Millennium	2	31	59	90
NB/NS Supply	2	31	59	90
NGPL IA/IL North	11	1	19	58
NGPL IA/IL South	11	1	11	42
Northern Border Mainline	2	1	2	3
Northern Natural ABC	11	1	33	52
Northern Natural D	9	1	15	32
Tennessee Z4 PA	8	1	32	60
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	2	31	59	90
Texas Eastern M3 North	3	1	58	86
TransCanada Ontario West	2	2	2	4
TransCanada Quebec to PNGTS	2	31	59	90
Transco Leidy Atlantic	6	1	27	85
Transco Z5	7	1	14	32
Transco Z6 Leidy to 210	2	31	59	90
Union Gas Dawn	2	1	2	3
Vector Z1	2	1	2	3
Viking Z1	12	1	17	59

2.3.1 AlaTenn

The 100% peak hour utilization on AlaTenn’s mainline, which is modeled with a capacity of 197 MDth/d, potentially affects generators served by AlaTenn in Alabama. The locations of these generators are shown in Figure Q16.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U215 and Figure U216 relative to the capacity of the segment.

2.3.2 Alliance

The 100% peak hour utilization on Alliance's mainline, which is modeled with a capacity of 1,800 MDth/d, potentially affects generators behind LDCs served by Alliance and generators behind LDCs served by Guardian. The locations of these generators are shown in Figure D1.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U217 and Figure U218 relative to the capacity of the segment.

2.3.3 ANR Northern Illinois

The 100% peak hour utilization on ANR's Northern Illinois segment, which is modeled with a capacity of 1,337 MDth/d, potentially affects generators directly connected to ANR, generators behind LDCs served by ANR. The locations of these generators are shown in Figure D2.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U219 and Figure U220 relative to the capacity of the segment.

2.3.4 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,867 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U221 and Figure U222 relative to the capacity of the segment.

2.3.5 Columbia Gas Western Pennsylvania / New York

The 100% peak hour utilization on Columbia Gas's Western Pennsylvania / New York segment, which is modeled with a capacity of 1,131 MDth/d, potentially affects generators directly connected to Columbia in Pennsylvania, New Jersey, Virginia and Maryland and generators behind LDCs served by Columbia Gas in Pennsylvania, New Jersey, Delaware, Maryland and Virginia. The locations of these generators are shown in Figure 81 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U223 and Figure U224 relative to the capacity of the segment.

2.3.6 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U225 and Figure U226 relative to the capacity of the segment.

2.3.7 Dominion Eastern New York

Dominion's Eastern New York segment is modeled with a capacity of 907 MDth/d. The 100% peak hour utilization on Dominion's Eastern New York segment potentially affects generators directly connected to Dominion and behind LDCs served by Dominion. The locations of these generators are shown in Figure 83 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U227 and Figure U228 relative to the capacity of the segment.

2.3.8 Dominion Western New York

Dominion Western New York is modeled with a capacity of 557 MDth/d. The 100% utilization on Dominion's Western New York segment potentially affects generators directly served by Dominion and behind LDCs served by Dominion. The locations of the plants in each category are shown in Figure 84 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U229 and Figure U230 relative to the capacity of the segment.

2.3.9 Dominion Southeast

Dominion Southeast is modeled with a capacity of 555 Mdth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U231 and Figure U232 relative to the capacity of the segment.

2.3.10 East Tennessee Mainline

The East Tennessee mainline is modeled with a capacity of 800 MDth/d. The 100% peak hour utilization on East Tennessee's mainline potentially affects generators directly connected to East Tennessee and generators behind LDCs served by East Tennessee. The locations of these generators are shown in Figure 86 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U233 and Figure U234 relative to the capacity of the segment.

2.3.11 Eastern Shore

Eastern Shore is modeled with a capacity of 208 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U235 and Figure U236 relative to the capacity of the segments.

2.3.12 Empire Mainline

The Empire mainline is modeled with a capacity of 525 MDth/d. The 100% peak hour utilization on the Empire mainline across upstate New York potentially affects generators on the Niagara Mohawk LDC system. The locations of these generators are shown in Figure 88 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U237 and Figure U238 relative to the capacity of the segment.

2.3.13 Great Lakes East

The 100% peak hour utilization on Great Lakes Gas's East segment, which is modeled with a capacity of 1,164 MDth/d, potentially affects generators directly connected to Great Lakes in Michigan, generators behind LDCs served by Great Lakes in Michigan, generators directly connected to Vector, and generators behind Union Gas. The locations of these generators are shown in Figure D3.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U239 and Figure U240 relative to the capacity of the segment.

2.3.14 Iroquois Zone 1

The 100% peak hour utilization on Iroquois's Zone 1, which is modeled with a capacity of 1,195 MDth/d, potentially affects generators directly connected to Iroquois and generators behind LDCs served by Iroquois. The locations of these generators are shown in Figure D10.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U241 and Figure U242 relative to the capacity of the segment.

2.3.15 Midwestern

The 100% peak hour utilization on Midwestern's mainline segment, which is modeled with a capacity of 635 MDth/d, potentially affects generators behind LDCs served by Midwestern and behind LDCs served by Guardian downstream of the Joliet Hub. The locations of these generators are shown in Figure D4.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U243 and Figure U244 relative to the capacity of the segment

2.3.16 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, in particular, in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U245 and Figure U246 relative to the capacity of the segment.

2.3.17 New Brunswick Supply / Nova Scotia Offshore Supply

Total supplies from New Brunswick and Nova Scotia Offshore are capped at approximately 283 MDth/d in 2023. This limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes would also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U247 and Figure U248 relative to the total production capacity. The electric demand data set in these figures includes only gas demand at generators in the Study Region, demand from non-Study Region generators is not accounted for.

2.3.18 NGPL Iowa/Illinois North

The 100% peak hour utilization on NGPL's Iowa/Illinois North segment, which is modeled with a capacity of 1,677 MDth/d, potentially affects generators directly connected to NGPL in Illinois, generators behind LDCs served by NGPL in Iowa, Illinois and Indiana, generators directly connected to Horizon in Illinois, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D5.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U249 and Figure U250 relative to the capacity of the segment.

2.3.19 NGPL Iowa/Illinois South

The 100% peak hour utilization on NGPL's Iowa/Illinois South segment, which is modeled with a capacity of 1,624 MDth/d, potentially affects generators directly connected to NGPL in Illinois, generators behind LDCs served by NGPL in Illinois and Indiana, generators directly connected to Horizon in Illinois, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D6.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U251 and Figure U252 relative to the capacity of the segment.

2.3.20 Northern Border Mainline

The 100% peak hour utilization on Northern Border's mainline, which is modeled with a capacity of 2,311 MDth/d, potentially affects generators directly connected to Northern Border in Minnesota and Illinois, generators behind LDCs served by Northern Border in Minnesota, Iowa, Illinois and Indiana, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D11.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U253 and Figure U254 relative to the capacity of the segment.

2.3.21 Northern Natural Zone ABC

The 100% peak hour utilization on Northern Natural's Zone ABC segment, which is modeled with a capacity of 2,138 MDth/d, potentially affects generators directly connected to Northern Natural in Iowa, South Dakota, Wisconsin and Minnesota, generators behind LDCs served by Northern Natural in Iowa, Wisconsin and Minnesota, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D12.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U255 and Figure U256 relative to the capacity of the segment.

2.3.22 Northern Natural Zone D

The 100% peak hour utilization on Northern Natural's Zone D segment, which is modeled with a capacity of 800 MDth/d, potentially affects generators directly connected to Northern Natural in Wisconsin, generators behind LDCs served by Northern Natural in Illinois and Wisconsin, and generators behind LDCs served by Guardian in Wisconsin. The locations of these generators are shown in Figure D8.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U257 and Figure U258 relative to the capacity of the segment.

2.3.23 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC. The locations of these generators are shown in Figure 91 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U259 and Figure U260 relative to the capacity of the segment.

2.3.24 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,404 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U261 and Figure U262 relative to the capacity of the segment.

2.3.25 Texas Eastern M2 Pennsylvania – Southern Branch

The Texas Eastern M2 Pennsylvania – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern's Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York that are served by Texas Eastern, and generators that are served by Algonquin and Eastern Shore, either directly or behind an LDC. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U263 and Figure U264 relative to the capacity of the segment.

2.3.26 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 3,357 MDth/d. The 100% peak hour utilization on Texas Eastern's Zone M3 northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, and generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U265 and Figure U266 relative to the capacity of the segment.

2.3.27 TransCanada Ontario West

TransCanada's Western Ontario segment is modeled with a capacity of 3,508 MDth/d. The 100% peak hour utilization on TransCanada's Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U267 and Figure U268 relative to the capacity of the segment.

2.3.28 TransCanada Quebec to PNGTS

TransCanada's Quebec to PNGTS segment is modeled with a capacity of 270 MDth/d. The 100% peak hour utilization on this segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure D13.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U269 and Figure U270 relative to the capacity of the segment.

2.3.29 Transco Leidy Atlantic

The Transco Leidy Atlantic segment is modeled with a capacity of 1,700 MDth/d. The 100% peak hour utilization on Transco's Leidy Atlantic segment potentially affects generators directly connected to Transco in New Jersey, Maryland, Pennsylvania and Virginia and generators behind LDCs served by Transco in Delaware, New Jersey, Pennsylvania, Maryland, Virginia and North Carolina. The locations of these generators are shown in Figure 97 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U271 and Figure U272 relative to the capacity of the segment.

2.3.30 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 4,117 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U273 and Figure U274 relative to the capacity of the segment. The electric demand data set in these figures includes only gas demand at generators in the Study Region.

2.3.31 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station segment is modeled with a capacity of 3,430 MDth/d. The 100% peak hour utilization on Transco's Leidy Line to Station 210 segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania and both New York City and Long Island. Locations of these generators are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U275 and Figure U276 relative to the capacity of the segment.

2.3.32 Union Gas Dawn

The 100% peak hour utilization on Union Gas's Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U277 and Figure U278 relative to the capacity of the segment.

2.3.33 Vector Zone 1

The 100% peak hour utilization on Vector's Zone 1 segment, which is modeled with a capacity of 1,600 MDth/d, potentially affects generators directly connected to Vector in Illinois, Indiana, Michigan and Ontario and generators behind LDCs served by Vector in Indiana and Michigan. The locations of these generators are shown in Figure D14.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U279 and Figure U280 relative to the capacity of the segment.

2.3.34 Viking Zone 1

The 100% peak hour utilization on Viking's Zone 1 segment, which is modeled with a capacity of 543 MDth/d, potentially affects generators directly connected to Viking, generators behind LDCs served by Viking, generators directly connected to ANR, and generators behind LDCs served by ANR. The locations of these generators are shown in Figure D9.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U281 and Figure U282 relative to the capacity of the segment.

2.4 HGDS ROLL-UP SUMMER 2023

Figure T22 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure T22. HGDS Roll-Up Summer 2023: Peak Hour Affected Generation

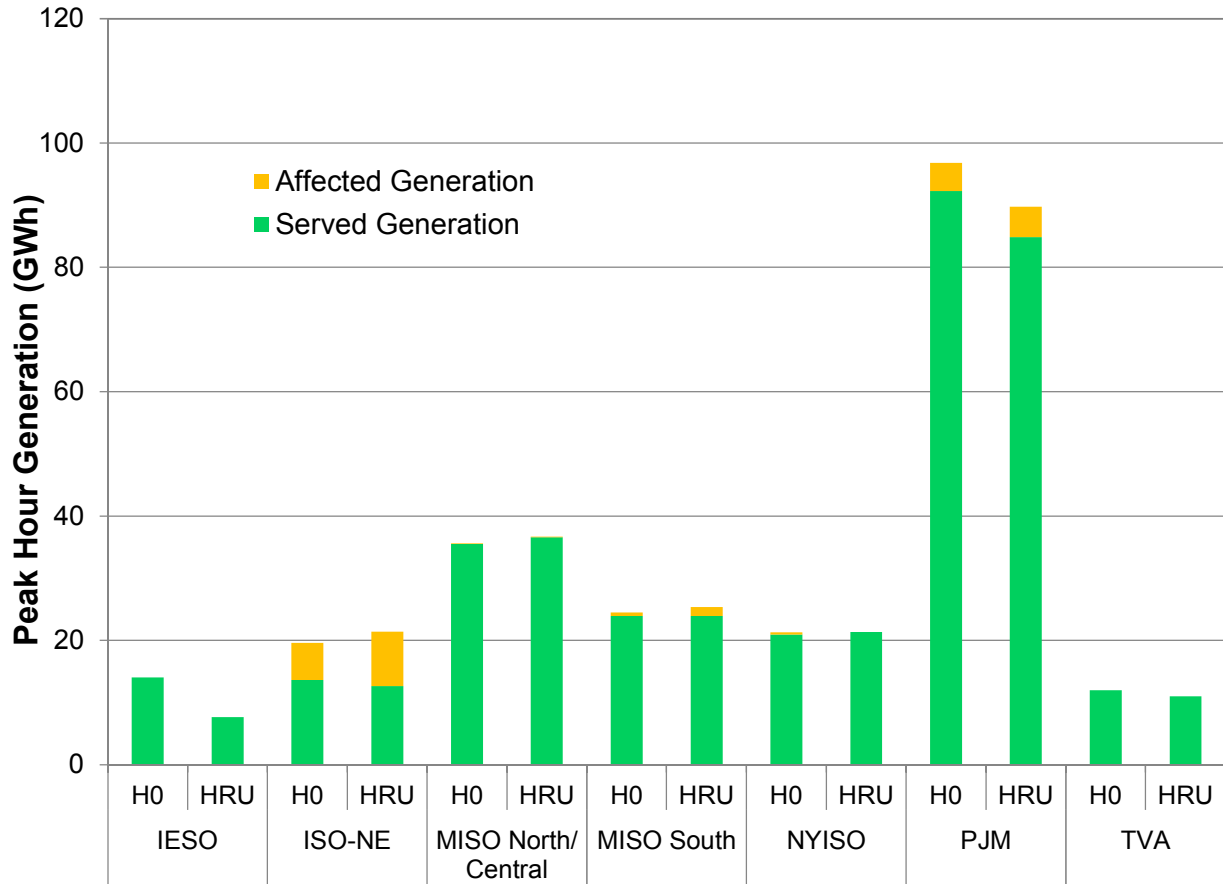


Figure T23 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T15.

Figure T23. HGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation

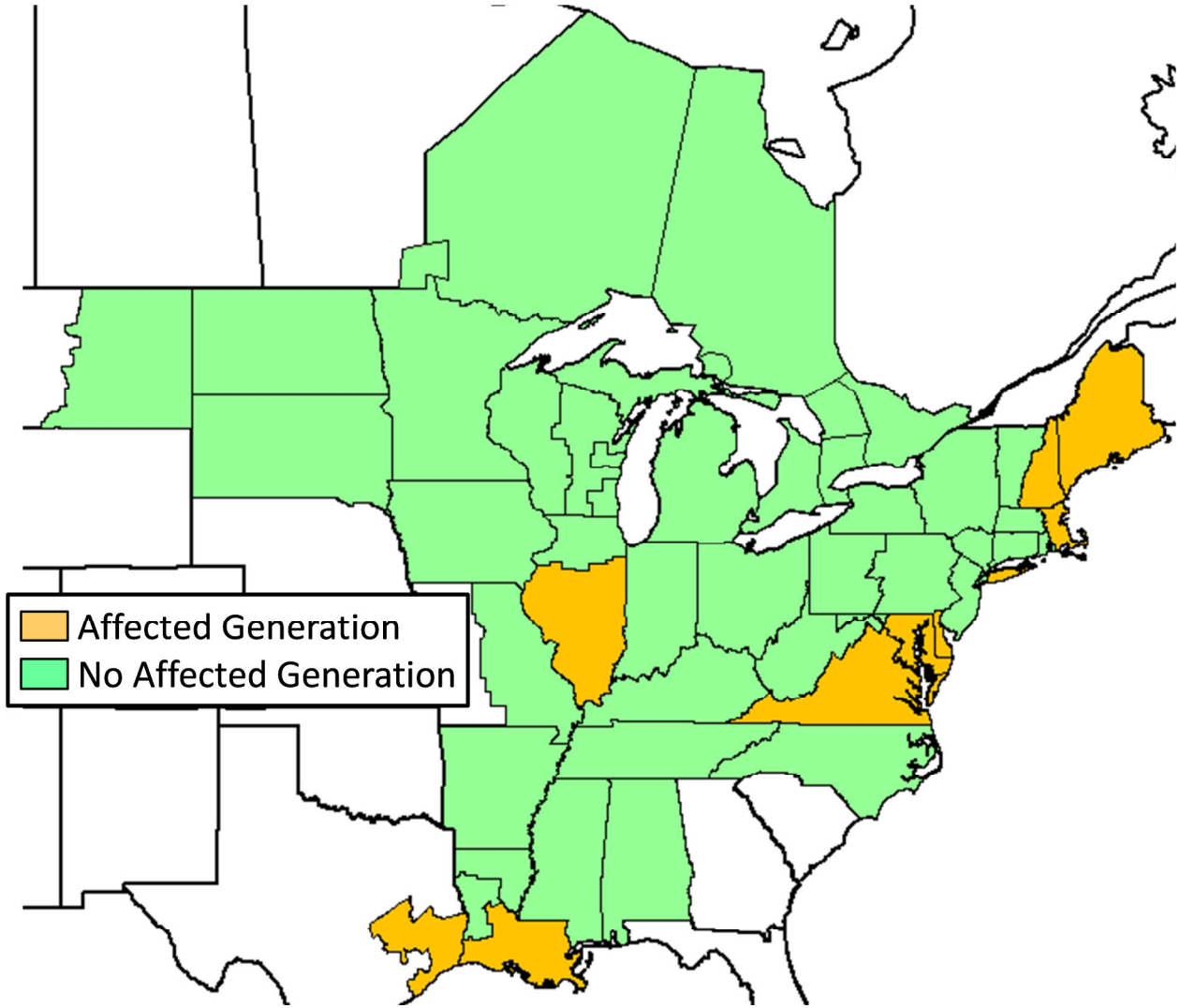


Table T15. HGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.6	1,188.2
Illinois Southern	1.0	112
Louisiana Southern	3.1	331
Maine	17.3	2,335
Maryland Eastern	16.7	2,361
Massachusetts Eastern	17.4	2,337
New Hampshire	7.2	980
New York Long Island	3.5	342
Texas East (SERC)	1.5	209
Virginia	8.4	936

Figure T24 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T22 during the Summer 2018 peak hour.

Figure T24. HGDS Roll-Up Summer 2023: Peak Hour Constraints

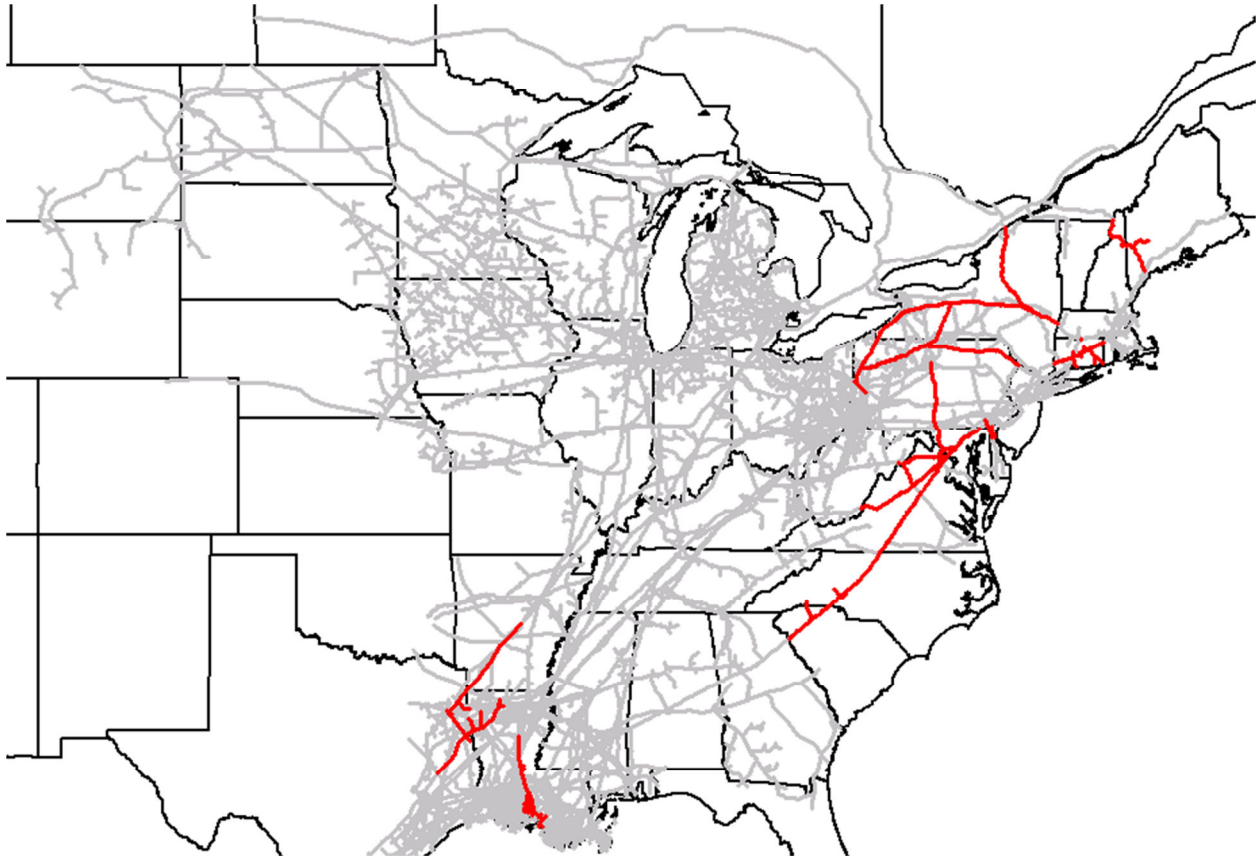


Table T16 summarizes the results of the frequency and duration analysis.

Table T16. HGDS Roll-Up Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	10	1	23	60
Columbia Gas VA/MD	2	1	5	6
Dominion Southeast	6	1	32	80
Eastern Shore	9	1	7	30
Gulf South Zone 2 HH	8	1	7	26
Iroquois Z1	10	1	11	39
NB/NS Supply	5	1	60	78
PNGT N of Westbrook	6	1	33	83
Tenn Z4 Pennsylvania	3	1	3	7
Tenn Z5 New York	2	92	92	92
Texas Eastern Zone ETX	11	1	17	41
Transco Z5	9	1	15	41

2.4.1 Algonquin Connecticut

The 100% peak hour utilization on Algonquin’s Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U283 and Figure U284 relative to the capacity of the segment.

2.4.2 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,867 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U285 and Figure U286 relative to the capacity of the segment.

2.4.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdth/d. The 100% peak hour utilization on Dominion’s Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U287 and Figure U288 relative to the capacity of the segment.

2.4.4 Eastern Shore

Eastern Shore is modeled with a capacity of 208 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U289 and Figure U290 relative to the capacity of the segments.

2.4.5 Gulf South Zone 2 Henry Hub

The 100% peak hour utilization on the Henry Hub segment of Gulf South Zone 2, which is modeled with a capacity of 700 MDth/d, potentially affects generators directly connected to Gulf South in Louisiana, and generators behind LDCs served by Gulf South in Louisiana. The locations of these generators are shown in Figure D15.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U291 and Figure U292 relative to the capacity of the segment.

2.4.6 Iroquois Zone 1

The 100% peak hour utilization on Iroquois's Zone 1, which is modeled with a capacity of 1,195 MDth/d, potentially affects generators directly connected to Iroquois and generators behind LDCs served by Iroquois. The locations of these generators are shown in Figure D10.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U293 and Figure U294 relative to the capacity of the segment.

2.4.7 New Brunswick Supply / Nova Scotia Offshore Supply

Total supplies from New Brunswick and Nova Scotia Offshore are capped at approximately 283 MDth/d in 2023. This limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes would also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U295 and Figure U296 relative to the total production capacity. The electric demand data set in these figures includes only gas demand at generators in the Study Region, demand from non-Study Region generators is not accounted for.

2.4.8 PNGTS North of Westbrook

The 100% peak hour utilization on PNGTS's North of Westbrook segment, which is modeled with a capacity of 223 MDth/d, potentially affects generators directly connected to PNGTS in New Hampshire in Maine, generators served by LDCs connected to PNGTS, and generators served by M&N either directly or via LDC. The locations of these generators are shown in Figure 112 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U297 and Figure U298 relative to the capacity of the segment.

2.4.9 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U299 and Figure U300 relative to the capacity of the segment.

2.4.10 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U301 and Figure U302 relative to the capacity of the segment.

2.4.11 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment, which is modeled with a capacity of 623 MDth/d, potentially affects generators directly connected to Texas Eastern in Texas, Arkansas and Illinois. The locations of these generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U303 and Figure U304 relative to the capacity of the segment.

2.4.12 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco’s Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U305 and Figure U306 relative to the capacity of the segment.

3 LGDS ROLL-UP

3.1 LGDS ROLL-UP WINTER 2018

Figure T25 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure T25. LGDS Roll-Up Winter 2018: Peak Hour Affected Generation

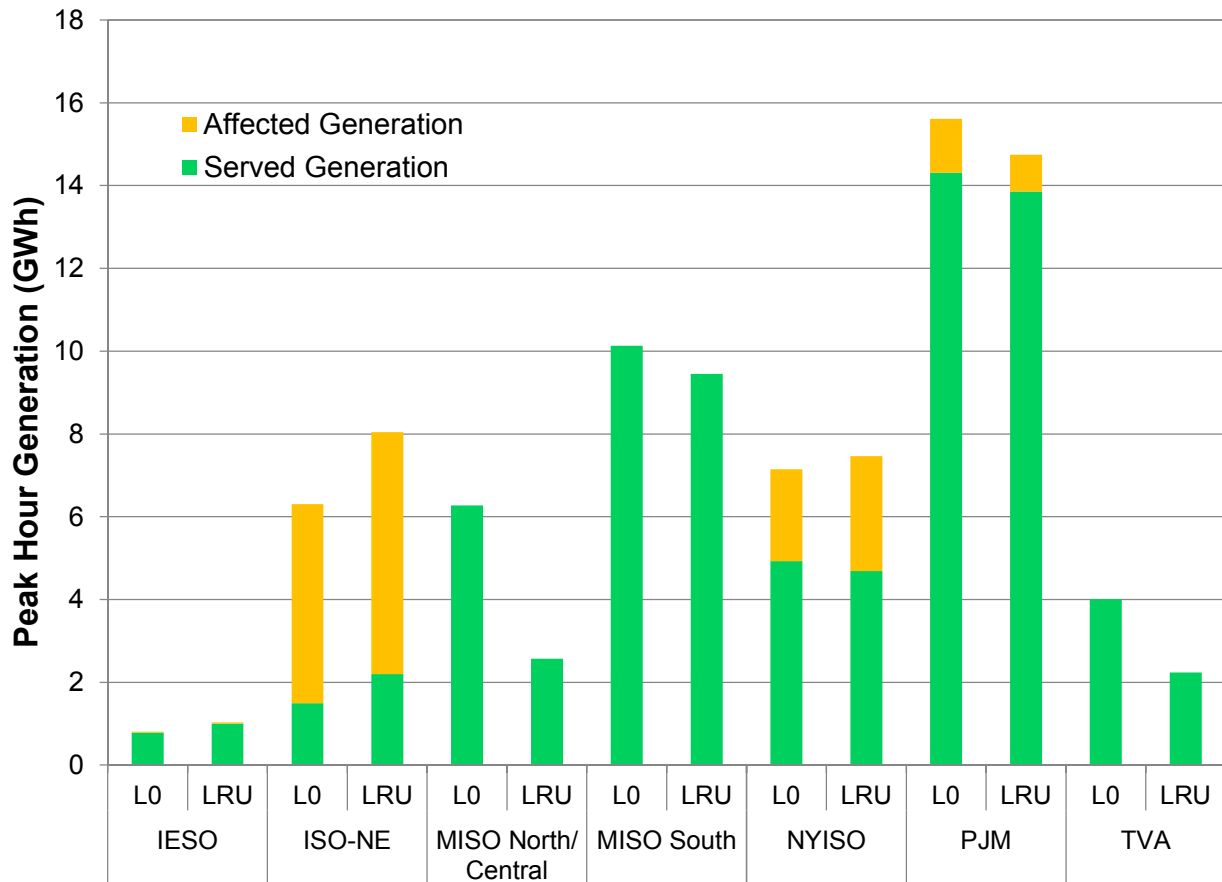


Figure T26 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T17.

Table T17. LGDS Roll-Up Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	12.2	1,666
Delaware	1.1	151
Maine	6.2	848
Massachusetts Eastern	7.9	1,060
Massachusetts Western	0.4	56
New Hampshire	9.7	1,288
New York Central Northern	0.6	71
New York City	13.5	1,818
New York Long Island	9.4	889
Ontario (CDA)	0.2	28
Rhode Island	7.0	927
Virginia	5.4	739

Figure T27 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T25 during the Winter 2018 peak hour.

Figure T27. LGDS Roll-Up Winter 2018: Peak Hour Constraints

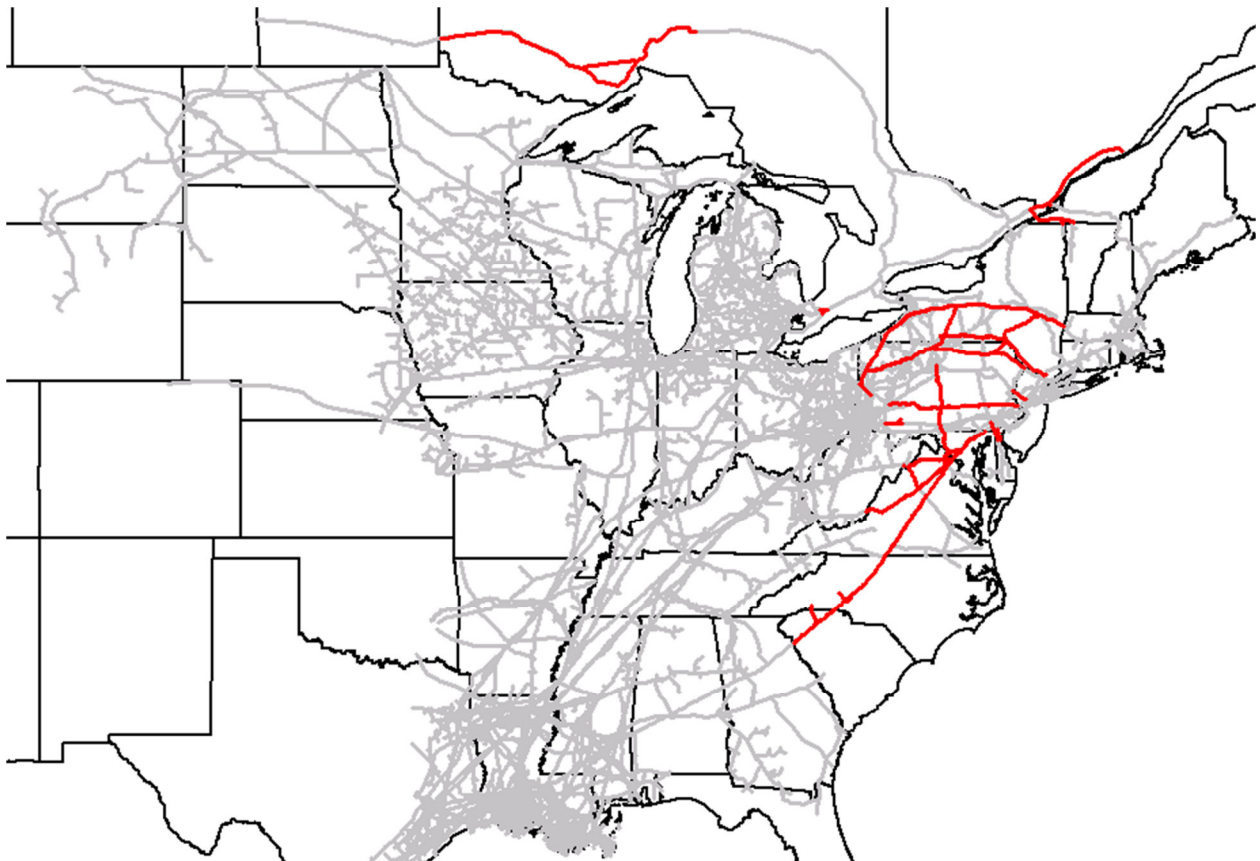


Table T18 summarizes the results of the frequency and duration analysis.

Table T18. LGDS Roll-Up Winter 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	8	1	2	10
Constitution	2	31	59	90
Eastern Shore	8	1	6	16
Millennium	2	2	3	5
NB/NS Supply	13	1	18	46
Tennessee Z4 PA	1	1	1	1
Tennessee Z5 NY	12	1	18	46
Texas Eastern M2 PA South	8	1	3	13
Texas Eastern M3 North	8	1	5	17
TransCanada Ontario West	2	1	2	3
TransCanada Quebec	8	1	5	17
Transco Z6 Leidy to 210	10	1	14	40
Union Gas Dawn	2	1	2	3

3.1.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia; generators behind LDCs served by Columbia Gas in Maryland and Virginia; and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U307 and Figure U308 relative to the capacity of the segment.

3.1.2 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs in New York and Connecticut. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U309 and Figure U310 relative to the capacity of the segment.

3.1.3 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the

Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U311 and Figure U312 relative to the capacity of the segments.

3.1.4 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, particularly in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U313 and Figure U314 relative to the capacity of the segment.

3.1.5 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 24 MDth/d in New Brunswick and approximately 599 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U315 and Figure U316 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

3.1.6 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U317 and Figure U318 relative to the capacity of the segment.

3.1.7 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire;

generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U319 and Figure U320 relative to the capacity of the segment.

3.1.8 Texas Eastern M2 PA – Southern Branch

The Texas Eastern M2 PA – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern’s Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York. Generators that are served by Algonquin and Eastern Shore either directly or behind an LDC would also potentially be affected. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U321 and Figure U322 relative to the capacity of the segment.

3.1.9 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 2,987 MDth/d. The 100% peak hour utilization on the Northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, as well as generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U323 and Figure U324 relative to the capacity of the segment.

3.1.10 TransCanada Ontario West

TransCanada’s Western Ontario segment is modeled with a capacity of 3,148 MDth/d. The 100% peak hour utilization on TransCanada’s Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U325 and Figure U326 relative to the capacity of the segment.

3.1.11 TransCanada Quebec

TransCanada Quebec is modeled with a capacity of 1,320 MDth/d. The 100% peak hour utilization on TransCanada’s Quebec segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure 96 of

the report. Limitations for customers in Quebec could arise from this constraint, but such limitations have not been included in the results reported below.

The seasonal daily forecasts of RCI and generator peak hour demand downstream of the constrained segment are shown in Figure U327 and Figure U328 relative to the capacity of the segment. The generator gas demand in these figures includes only gas demand at generators in the Study Region. Gas demand from non-Study Region generators is not included in the tabulation of results.

3.1.12 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station 210 segment is modeled with a capacity of 3,310 MDth/d. The 100% peak hour utilization on this segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania, New York City and Long Island. The locations of generators served along this Transco segment are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U329 and Figure U330 relative to the capacity of the segment.

3.1.13 Union Gas Dawn

The 100% peak hour utilization on Union Gas's Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in Figure U331 and Figure U332 relative to the capacity of the segment.

3.2 LGDS ROLL-UP SUMMER 2018

Figure T28 summarizes the affected generation during the Summer 2018 peak hour by PPA.

Figure T28. LGDS Roll-Up Summer 2018: Peak Hour Affected Generation

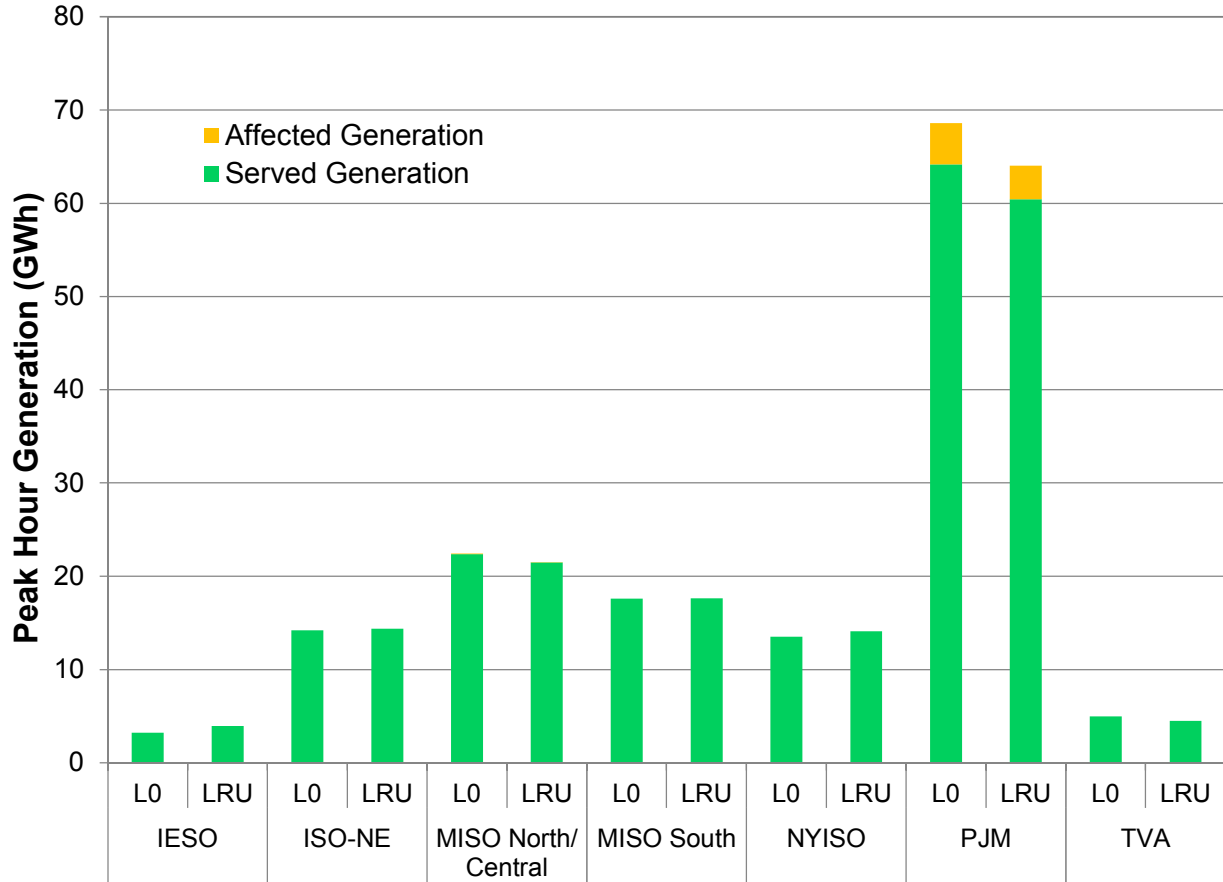


Figure T29 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T19.

Figure T29. LGDS Roll-Up Summer 2018: Locations with Peak Hour Affected Generation

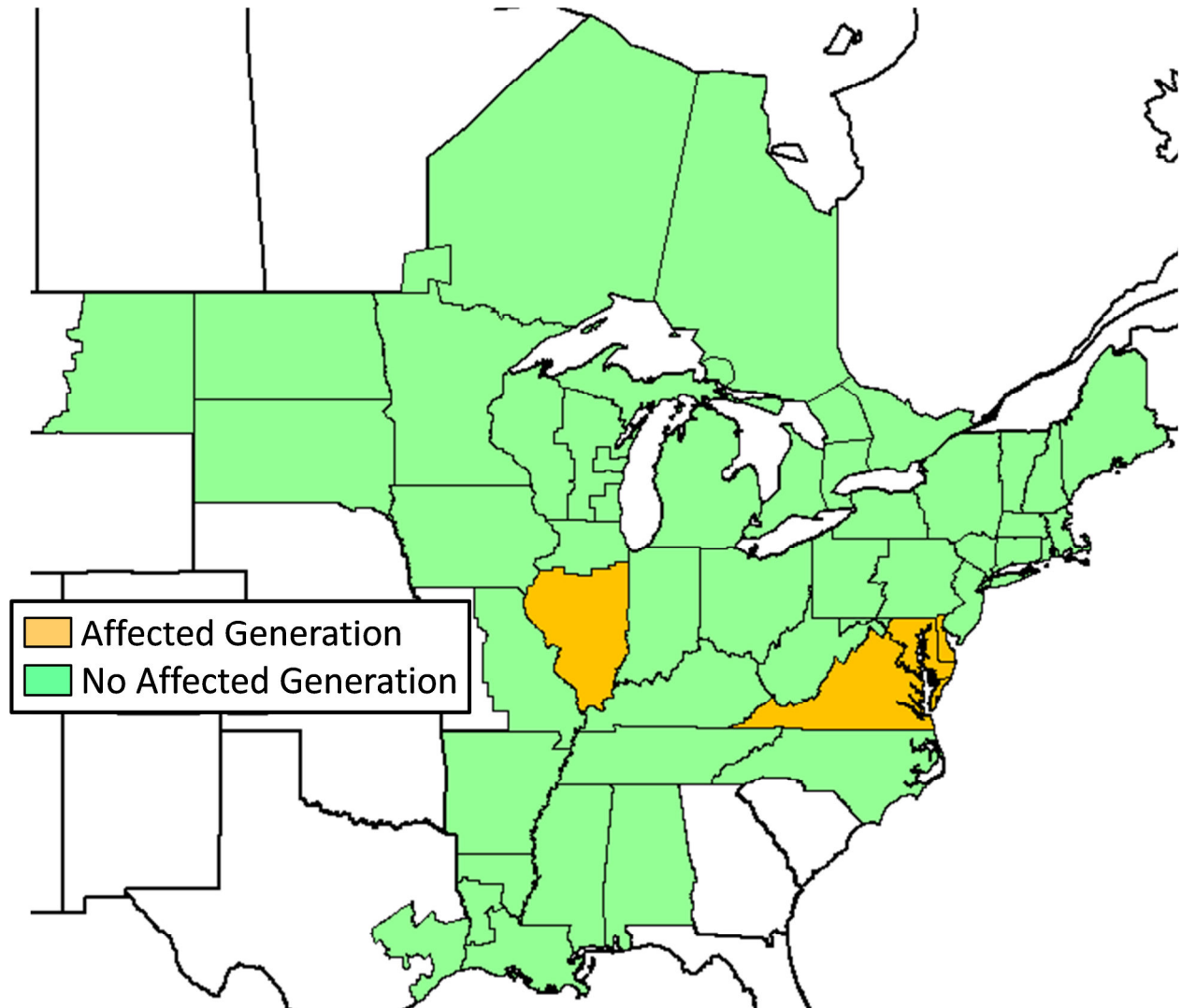


Table T19. LGDS Roll-Up Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	3.1	407
Illinois Southern	0.5	50
Maryland Eastern	15.9	2,256
Virginia	8.4	936

Figure T30 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T28 during the Summer 2018 peak hour.

Figure T30. LGDS Roll-Up Summer 2018: Peak Hour Constraints

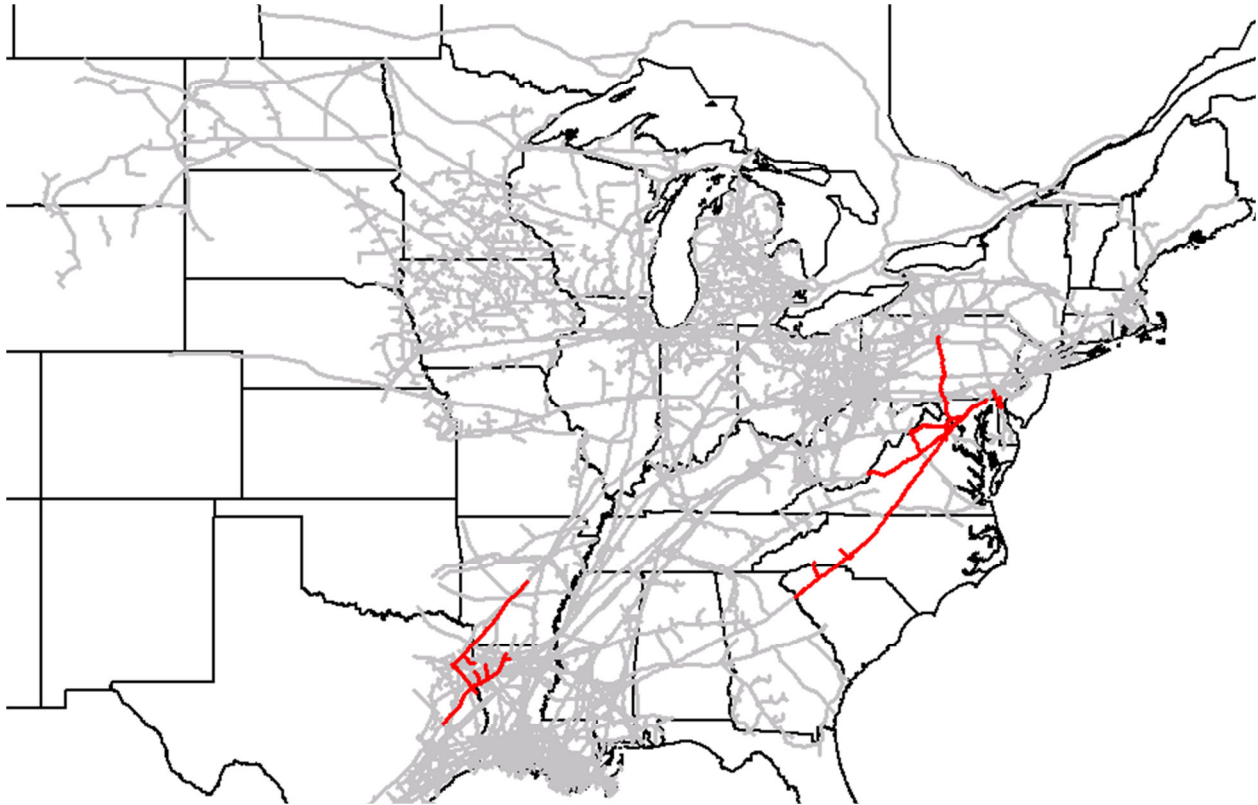


Table T20 summarizes the results of the frequency and duration analysis.

Table T20. LGDS Roll-Up Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	2	1	1	2
Dominion Southeast	1	1	1	1
Eastern Shore	3	1	2	5
Texas Eastern ETX	6	1	6	14
Transco Z5	4	1	3	7

3.2.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,477 MDth/d, potentially affects generators directly connected to Columbia in Maryland and Virginia, generators behind LDCs served by Columbia Gas in Maryland and Virginia, and generators served by Dominion Cove Point and PPL Interstate downstream of interconnections with Columbia Gas. The locations of these generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U333 and Figure U334 relative to the capacity of the segment.

3.2.2 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 MDth/d. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U335 and Figure U336 relative to the capacity of the segment.

3.2.3 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U337 and Figure U338 relative to the capacity of the segments.

3.2.4 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment, which is modeled with a capacity of 623 MDth/d, potentially affects generators directly connected to Texas Eastern in Texas, Arkansas and Illinois. The locations of these generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U339 and Figure U340 relative to the capacity of the segment.

3.2.5 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U341 and Figure U342 relative to the capacity of the segment.

3.3 LGDS ROLL-UP WINTER 2023

Figure T31 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure T31. LGDS Roll-Up Winter 2023: Peak Hour Affected Generation

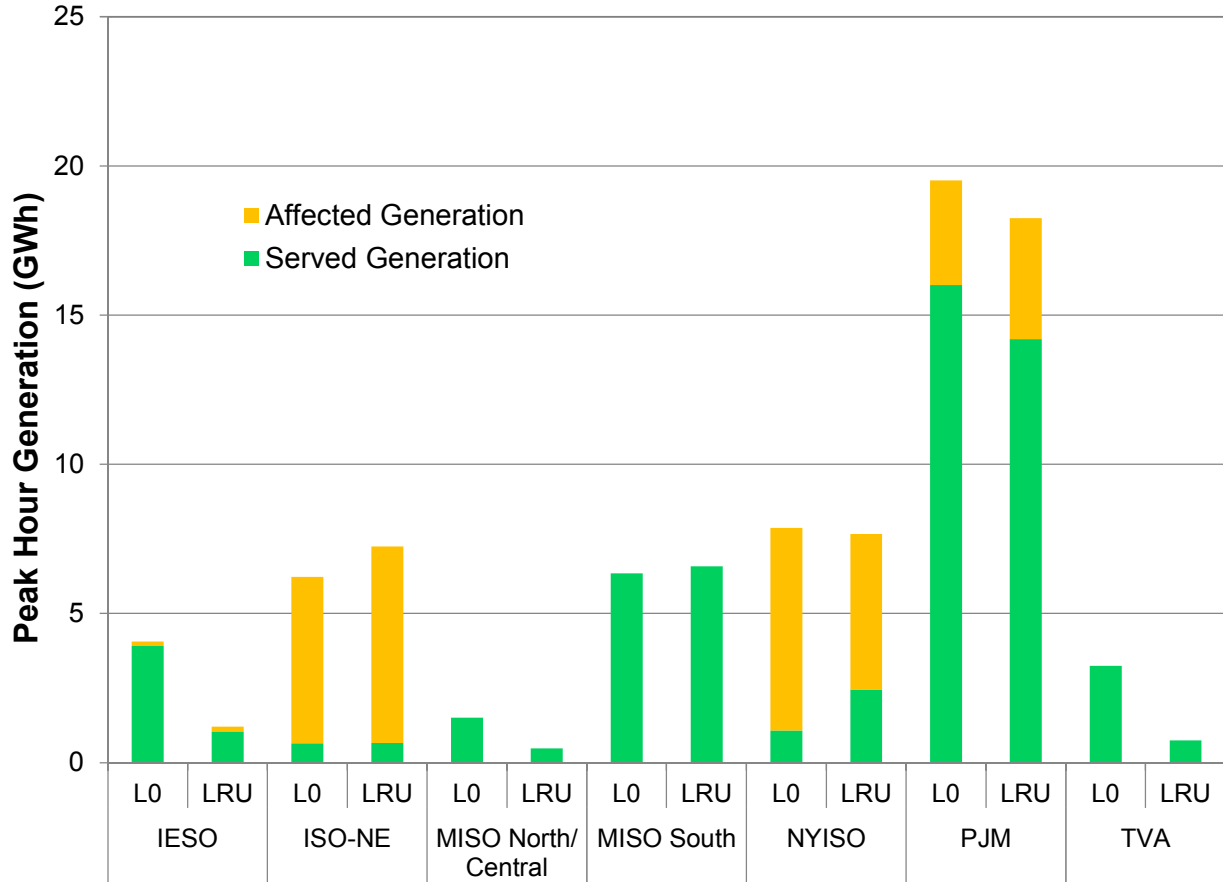


Figure T32 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T21.

Figure T32. LGDS Roll-Up Winter 2023: Locations with Peak Hour Affected Generation

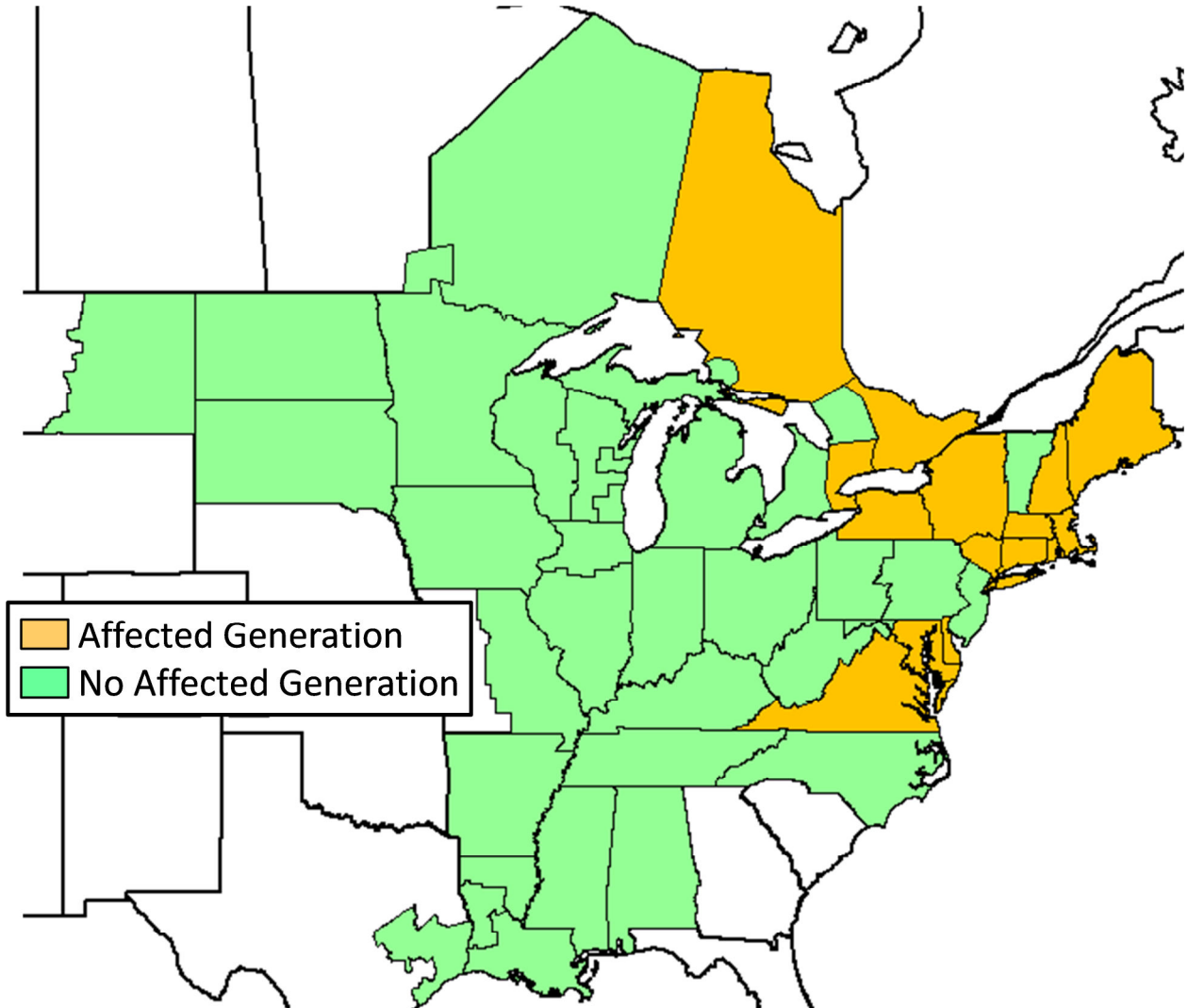


Table T21. LGDS Roll-Up Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	10.2	1,390
Delaware	1.6	199
Maine	6.2	848
Maryland Eastern	5.0	539
Massachusetts Eastern	8.0	1,063
Massachusetts Western	11.5	1,564
New Hampshire	5.7	755
New York Central Northern	9.3	1,343
New York City	19.9	2,479
New York Long Island	11.5	1,092
New York Southern	1.6	158
New York Western	1.3	143
Ontario (CDA)	0.2	28
Ontario (EDA)	0.1	7
Ontario (NDA)	0.8	114
Rhode Island	7.4	968
Virginia	25.9	3,314

Figure T33 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T31 during the Winter 2023 peak hour.

Figure T33. LGDS Roll-Up Winter 2023: Peak Hour Constraints



Table T22 summarizes the results of the frequency and duration analysis.

Table T22. LGDS Roll-Up Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin CT	12	1	15	40
Columbia Gas VA/MD	7	1	52	76
Constitution	2	31	59	90
Dominion Eastern NY	3	2	3	7
Dominion Western NY	3	1	1	3
Dominion Southeast	7	1	16	34
Eastern Shore	13	1	9	38
Millennium	4	3	59	86
NB/NS Supply	3	2	56	89
Tennessee Z4 PA	4	1	4	8
Tennessee Z5 NY	7	1	41	83
Texas Eastern M2 PA South	3	1	2	4
Texas Eastern M3 North	3	1	2	5
TransCanada Ontario West	1	2	2	2
TransCanada Quebec	6	1	6	20
Transco Z5	5	1	2	6
Transco Z6 Leidy to 210	6	1	3	10
Union Gas Dawn	1	2	2	2

3.3.1 Algonquin Connecticut

The 100% peak hour utilization on Algonquin’s Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.343** and **Error! Reference source not found.344** relative to the capacity of the segment.

3.3.2 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,679 MDth/d, an increase of 202 MDth/d over the 2018 capacity. The locations of the potentially affected generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.345** and **Error! Reference source not found.346** relative to the capacity of the segment.

3.3.3 Constitution Pipeline

Constitution's proposed delivery capacity is 650 MDth/d. The 100% peak hour utilization on Constitution potentially affects generators served by Iroquois both directly and behind LDCs in New York and Connecticut. The locations of these generators are shown in Figure 82 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.**³⁴⁷ and **Error! Reference source not found.**³⁴⁸ relative to the capacity of the segment.

3.3.4 Dominion Eastern New York

Dominion's Eastern New York segment is modeled with a capacity of 907 MDth/d. The 100% peak hour utilization on Dominion's Eastern New York segment potentially affects generators directly connected to Dominion and behind LDCs served by Dominion. The locations of these generators are shown in Figure 83 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.**³⁴⁹ and **Error! Reference source not found.**³⁵⁰ relative to the capacity of the segment.

3.3.5 Dominion Western New York

Dominion Western New York is modeled with a capacity of 557 MDth/d. The 100% utilization on Dominion's Western New York segment potentially affects generators directly served by Dominion and behind LDCs served by Dominion. The locations of the plants in each category are shown in Figure 84 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.**³⁵¹ and **Error! Reference source not found.**³⁵² relative to the capacity of the segment.

3.3.6 Dominion Southeast

Dominion Southeast is modeled with a capacity of 555 MDth/d, an increase of 15 MDth/d over 2018. The 100% peak hour utilization on Dominion's Southeast segment serving Virginia and Maryland potentially affects generators directly served by Dominion, generators behind LDCs served by Dominion, and generators served by Dominion Cove Point via interconnect. The locations of these generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.**³⁵³ and **Error! Reference source not found.**³⁵⁴ relative to the capacity of the segment.

3.3.7 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d. The 100% peak hour utilization rate on Eastern Shore's Receipt Zone 1 and Delivery Zone 2 potentially affects generators on the Delmarva Peninsula that are served by Eastern Shore. The locations of these generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in **Error! Reference source not found.355** and **Error! Reference source not found.356** relative to the capacity of the segments.

3.3.8 Millennium

Millennium is modeled with a capacity of 784 MDth/d. The 100% peak hour utilization on Millennium's mainline potentially affects generators directly connected to Millennium, generators behind LDCs served by Millennium, and generators served by Algonquin, particularly in southern New England. The locations of these generators are shown in Figure 89 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.357** and **Error! Reference source not found.358** relative to the capacity of the segment.

3.3.9 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 40 MDth/d in New Brunswick and approximately 243 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in **Error! Reference source not found.359** and **Error! Reference source not found.360** relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

3.3.10 Tennessee Zone 4 Pennsylvania

Tennessee Zone 4 Pennsylvania is modeled with a capacity of 1,887 MDth/d. The 100% peak hour utilization on Tennessee's Zone 4 segment in Pennsylvania potentially affects generators directly connected to Tennessee in Pennsylvania and New Jersey; generators behind LDCs served by Tennessee in Pennsylvania, New Jersey, downstate New York and Connecticut; and generators served by Algonquin either directly or via LDC in New England. The locations of these generators are shown in Figure 91 of the report.

The peak hour demand forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.361** and **Error! Reference source not found.362** relative to the capacity of the segment.

3.3.11 Tennessee Zone 5 New York

Tennessee Zone 5 New York is modeled with a capacity of 1,189 MDth/d. The 100% peak hour utilization on Tennessee's Z5 New York segment potentially affects generators directly connected to Tennessee in upstate New York, Massachusetts, Rhode Island and New Hampshire; generators behind LDCs served by Tennessee in upstate New York, Massachusetts, Connecticut and Rhode Island; and generators served by Iroquois, Granite State and PNGTS either directly or behind an LDC. The locations of these generators are shown in Figure 92 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.363** and **Error! Reference source not found.364** relative to the capacity of the segment.

3.3.12 Texas Eastern M2 PA – Southern Branch

The Texas Eastern M2 PA – Southern Branch is modeled with a capacity of 2,068 MDth/d. The 100% peak hour utilization on the southern branch of Texas Eastern's Zone M2 segment through Pennsylvania potentially affects generators directly connected to Texas Eastern in Pennsylvania, generators behind LDCs in Pennsylvania, Delaware and downstate New York. Generators that are served by Algonquin and Eastern Shore either directly or behind an LDC would also potentially be affected. The locations of these generators are shown in Figure 93 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.365** and **Error! Reference source not found.366** relative to the capacity of the segment.

3.3.13 Texas Eastern M3 – Northern Line

The Texas Eastern M3 Northern Line is modeled with a capacity of 2,987 MDth/d. The 100% peak hour utilization on the Northern line through Pennsylvania potentially affects generators directly connected to Texas Eastern in New Jersey and Pennsylvania, generators behind LDCs served by Texas Eastern in New Jersey, Pennsylvania and downstate New York, as well as generators served by Algonquin both directly and behind LDCs. The locations of these generators are shown in Figure 94 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in **Error! Reference source not found.367** and **Error! Reference source not found.368** relative to the capacity of the segment.

3.3.14 TransCanada Ontario West

TransCanada's Western Ontario segment is modeled with a capacity of 3,148 MDth/d. The 100% peak hour utilization on TransCanada's Western Ontario segment potentially affects generators directly connected to TransCanada and generators behind the Enbridge and Union

local distribution systems. The locations of these generators are shown in Figure 95 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.369** and **Error! Reference source not found.370** relative to the capacity of the segment.

3.3.15 TransCanada Quebec

TransCanada Quebec is modeled with a capacity of 1,320 MDth/d. The 100% peak hour utilization on TransCanada's Quebec segment potentially affects generators served by PNGTS, North Country and Vermont Gas. The locations of these generators are shown in Figure 96 of the report. Limitations for customers in Quebec could arise from this constraint, but such limitations have not been included in the results reported below.

The seasonal daily forecasts of RCI and generator peak hour demand downstream of the constrained segment are shown in **Error! Reference source not found.371** and **Error! Reference source not found.372** relative to the capacity of the segment. The generator gas demand in these figures includes only gas demand at generators in the Study Region. Gas demand from non-Study Region generators is not included in the tabulation of results.

3.3.16 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d. The 100% peak hour utilization on Transco's Zone 5 segment potentially affects Study Region generators directly connected to Transco in Virginia and generators behind LDCs served by Transco in North Carolina and Virginia. The locations of these generators are shown in Figure 98 of the report. Non-Study Region generators in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.373** and **Error! Reference source not found.374** relative to the capacity of the segment.

3.3.17 Transco Zone 6 Leidy Line to Station 210

The Transco Zone 6 Leidy to Station 210 segment is modeled with a capacity of 3,310 MDth/d. The 100% peak hour utilization on this segment potentially affects generators directly connected to Transco in New Jersey and Pennsylvania and generators behind LDCs served by Transco in New Jersey, Pennsylvania, New York City and Long Island. The locations of generators served along this Transco segment are shown in Figure 99 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in **Error! Reference source not found.375** and **Error! Reference source not found.376** relative to the capacity of the segment.

3.3.18 Union Gas Dawn

The 100% peak hour utilization on Union Gas’s Dawn segment, which is modeled with a capacity of 5,000 MDth/d, potentially affects generators directly connected to Union, generators directly connected to TransCanada, and generators served by the Union Gas and Enbridge distribution systems. The locations of these generators are shown in Figure 100 of the report.

The seasonal daily forecasts of RCI and generator peak hour gas demand downstream of the constrained segment are shown in **Error! Reference source not found.377** and **Error! Reference source not found.378** relative to the capacity of the segment.

3.4 LGDS ROLL-UP SUMMER 2023

Figure T34 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure T34. LGDS Roll-Up Summer 2023: Peak Hour Affected Generation

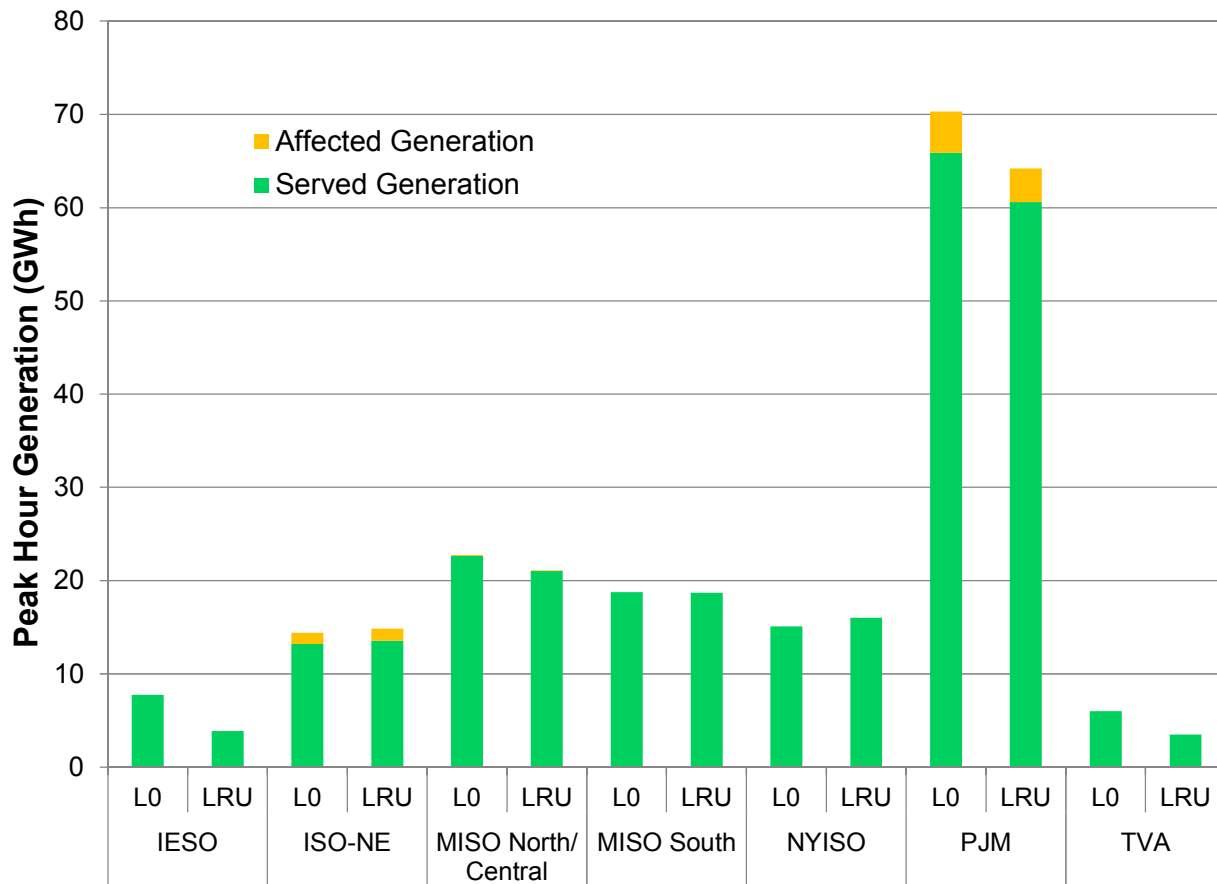


Figure T35 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table T23.

Figure T35. LGDS Roll-Up Summer 2023: Locations with Peak Hour Affected Generation

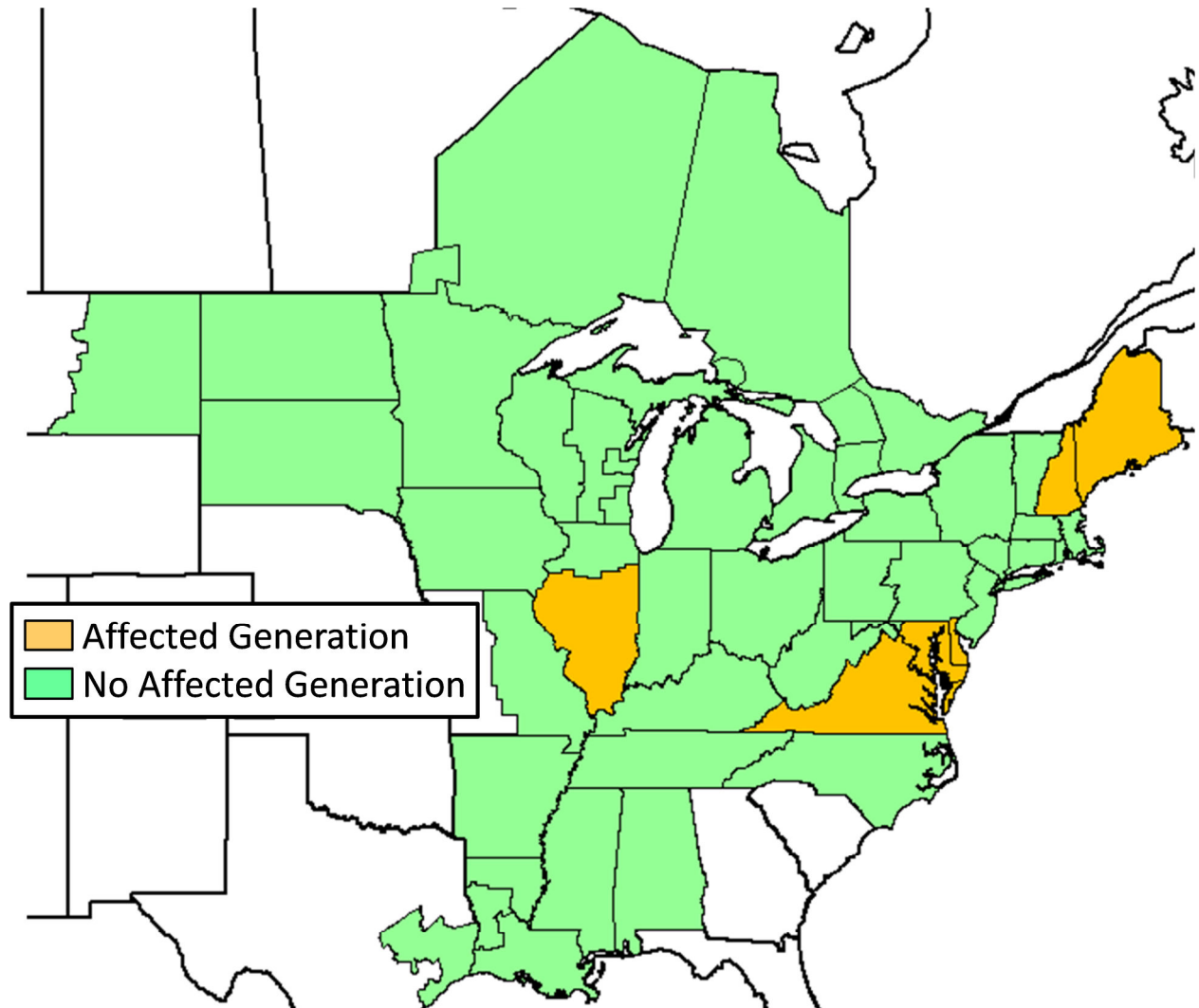


Table T23. LGDS Roll-Up Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	3.1	407
Illinois Southern	0.6	67
Maine	5.4	700
Maryland Eastern	15.9	2,256
New Hampshire	5.1	575
Virginia	8.4	936

Figure T36 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure T34 during the Summer 2023 peak hour.

Figure T36. LGDS Roll-Up Summer 2023: Peak Hour Constraints

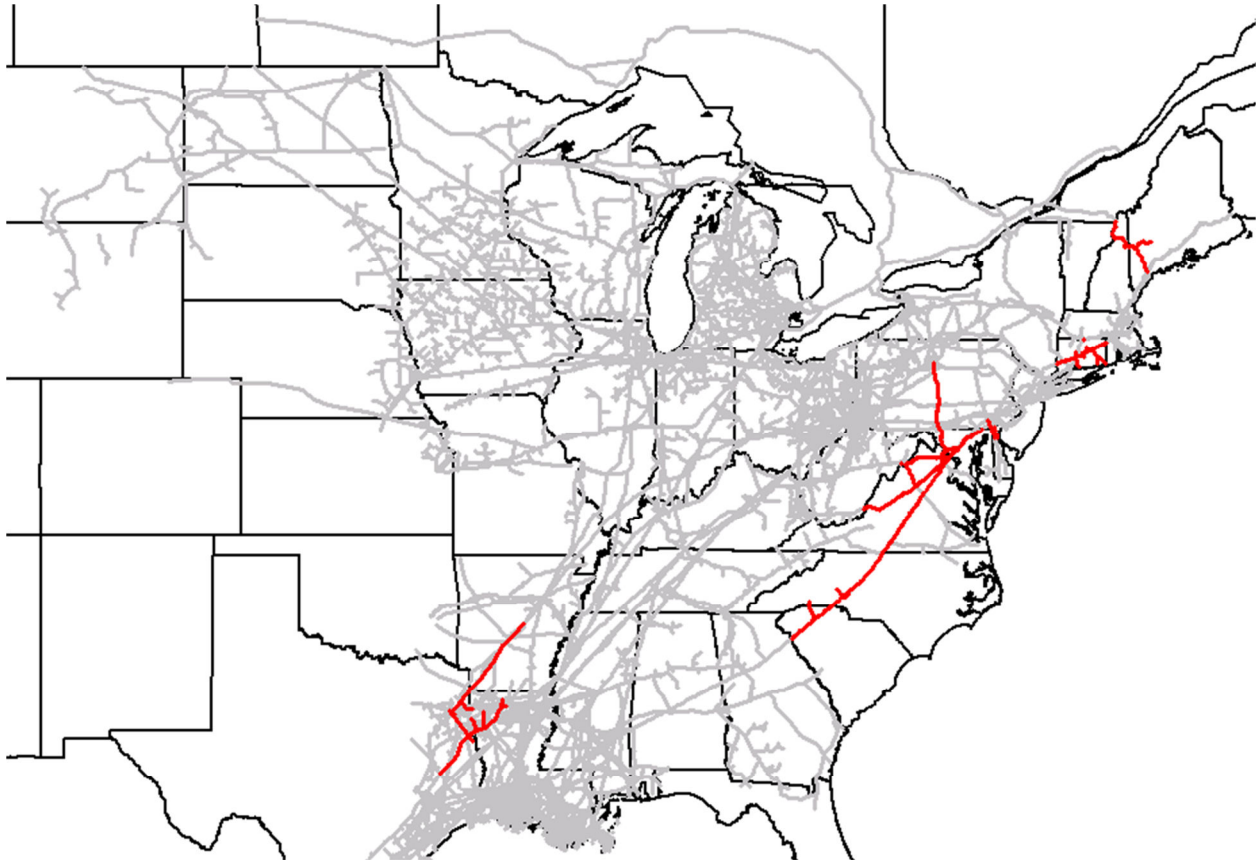


Table T24 summarizes the results of the frequency and duration analysis.

Table T24. LGDS Roll-Up Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	3	1	3	5
Columbia Gas VA/MD	1	1	1	1
Dominion Southeast	2	2	3	5
Eastern Shore	2	1	1	2
NB/NS Supply	7	1	26	66
PNGTS N of Westbrook	6	1	3	10
Texas Eastern ETX	5	1	6	13
Transco Z5	4	12	3	8

3.4.1 Algonquin Connecticut

The 100% peak hour utilization on Algonquin’s Connecticut segment, which is modeled with a capacity of 1,827 MDth/d, potentially affects generators directly connected to Algonquin in Connecticut, Massachusetts and Rhode Island, generators directly connected to M&N in Maine

and New Hampshire, and generators served by LDCs connected to Algonquin and M&N. The locations of these generators are shown in Figure 111 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U379 and Figure U380 relative to the capacity of the segment.

3.4.2 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment is modeled with a capacity of 2,679 MDth/d, an increase of 202 MDth/d for 2023 as compared with 2018. The locations of the potentially affected generators are shown in Figure 80 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U381 and Figure U382 relative to the capacity of the segment.

3.4.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 555 MDth/d, an increase over the capacity modeled for the summer 2018 of 15 MDth/d. The locations of the potentially affected generators are shown in Figure 85 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U383 and Figure U384 relative to the capacity of the segment.

3.4.4 Eastern Shore

Eastern Shore is modeled with a capacity of 203 MDth/d, the same as the capacity modeled for the summer of 2018. The locations of the potentially affected generators are shown in Figure 87 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segments are shown in Figure U385 and Figure U386 relative to the capacity of the segments.

3.4.5 New Brunswick Supply / Nova Scotia Offshore Supply

Production from Atlantic Canada is capped at approximately 40 MDth/d in New Brunswick and approximately 243 MDth/d for Nova Scotia Offshore. This supply limitation potentially affects generators directly connected to M&N in Maine and New Hampshire as well as generators located behind LDCs served by M&N in Maine. The locations of these generators are shown in Figure 90 of the report. Generators located in the Canadian Maritimes could also be affected by this supply constraint, but have not been included in the summary results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the supply limitation are shown in Figure U387 and Figure U388 relative to the total production capacity.

3.4.6 PNGTS North of Westbrook

The 100% peak hour utilization on PNGTS's North of Westbrook segment, which is modeled with a capacity of 223 MDth/d, potentially affects generators directly connected to PNGTS in New Hampshire in Maine, generators served by LDCs connected to PNGTS, and generators served by M&N either directly or via LDC. The locations of these generators are shown in Figure 112 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U389 and Figure U390 relative to the capacity of the segment.

3.4.7 Texas Eastern Zone ETX

The 100% peak hour utilization on Texas Eastern's East Texas segment is modeled with a capacity of 623 MDth/d, the same capacity as modeled for 2018. The locations of the potentially affected generators are shown in Figure 104 of the report.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U391 and Figure U392 relative to the capacity of the segment.

3.4.8 Transco Zone 5

Transco Zone 5 is modeled with a capacity of 3,967 MDth/d, the same capacity as modeled for 2018. The locations of the potentially affected generators are shown in Figure 98 of the report. Generators located in outside the Study Region in North Carolina and South Carolina could also be affected, but are not included in the results shown below.

The seasonal daily forecasts of RCI and generator gas demand downstream of the constrained segment are shown in Figure U393 and Figure U394 relative to the capacity of the segment.