

APPENDIX I. COAL AND NUCLEAR DEACTIVATION SENSITIVITIES: S5A, S5B, S5C, AND S9

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1 S5A: ADDITIONAL COAL AND NUCLEAR DEACTIVATION WITH WIND REPLACEMENT

1.1 RGDS S5A WINTER 2018

Figure I1 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure I1. RGDS S5a Winter 2018: Peak Hour Affected Generation

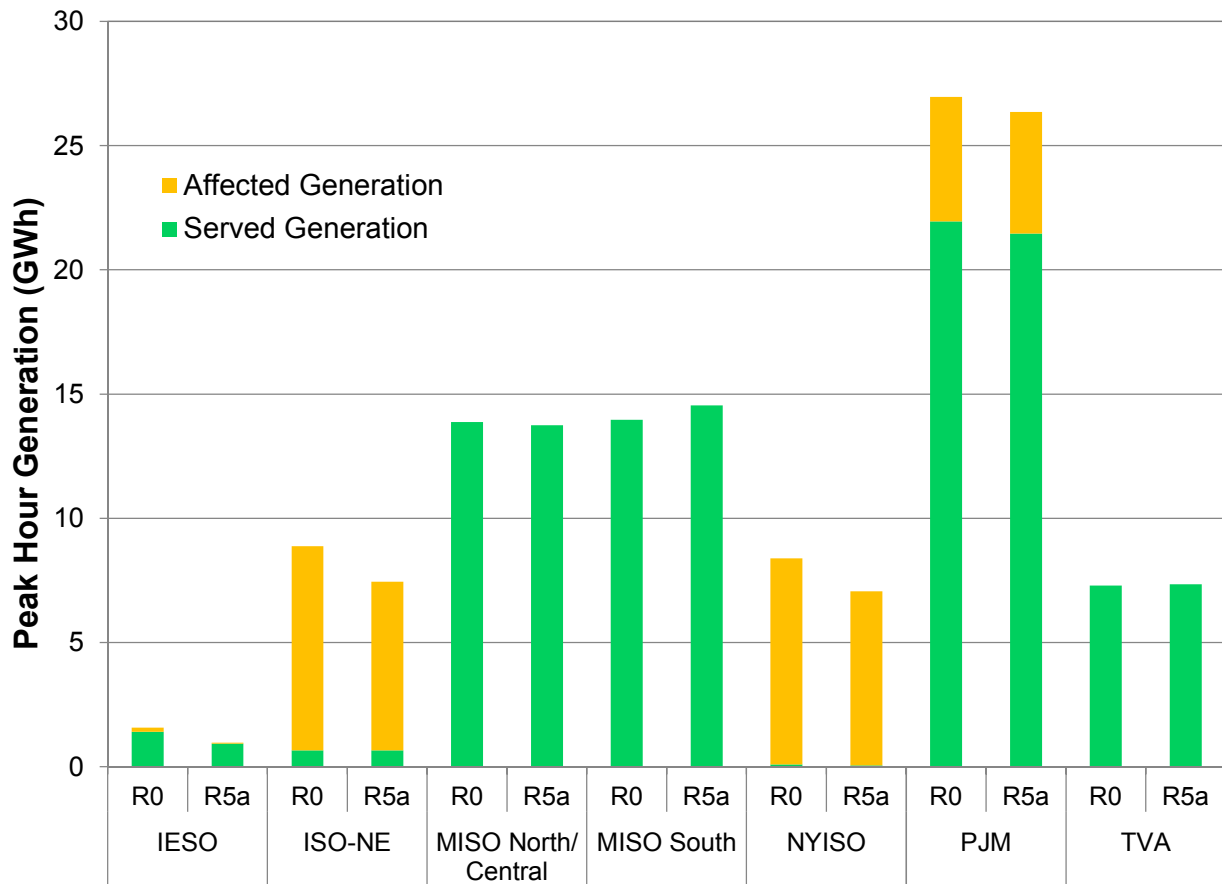


Figure I2 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I1.

Figure I2. RGDS S5a Winter 2018: Locations with Peak Hour Affected Generation

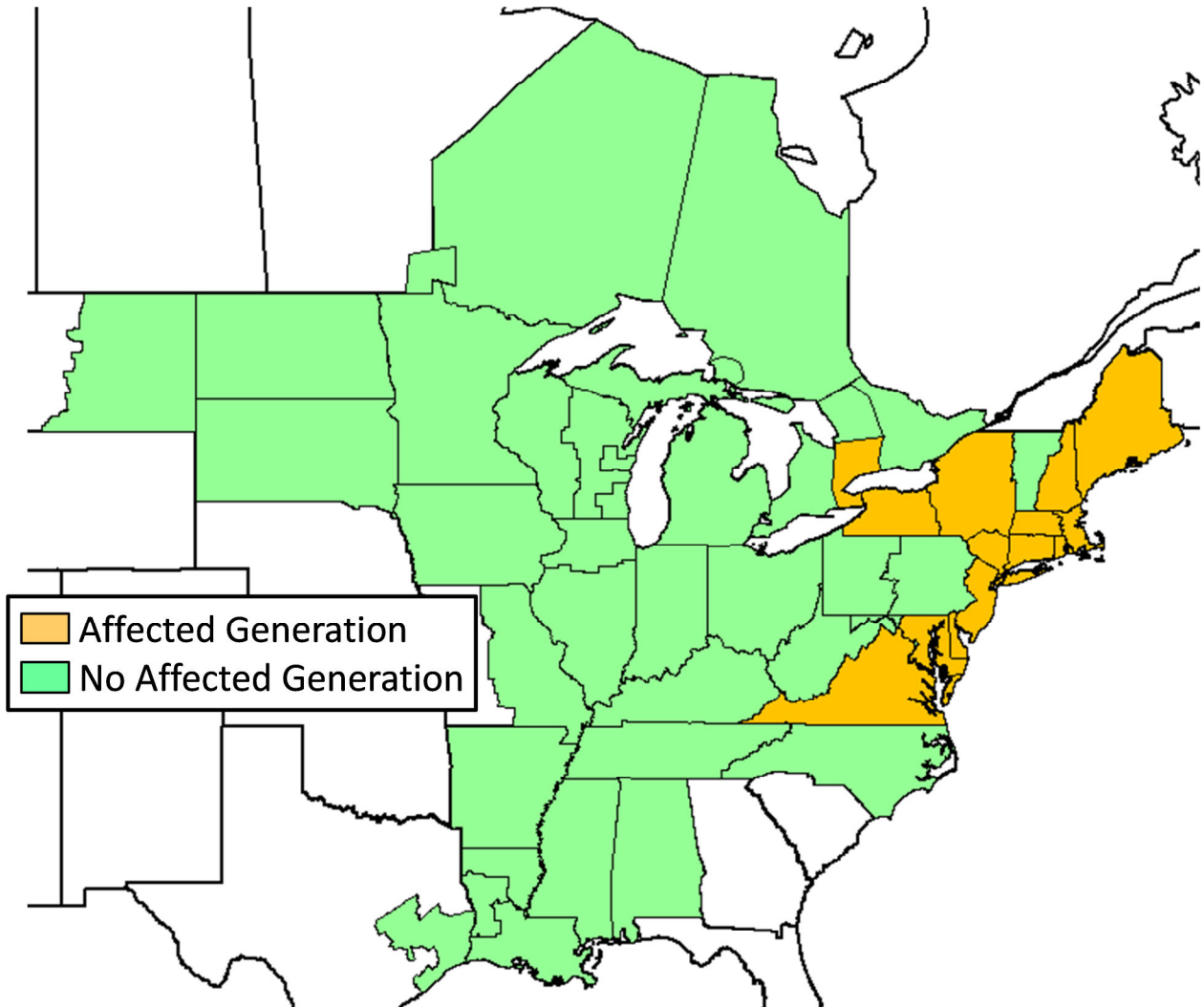


Table II. RGDS S5a Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	9.8	1,345
Delaware	1.4	176
Maine	5.5	759
Maryland Eastern	5.0	539
Massachusetts Eastern	10.9	1,525
Massachusetts Western	7.8	1,059
New Hampshire	8.4	1,120
New Jersey	12.4	1,551
New York Central Northern	20.5	2,887
New York City	14.2	1,729
New York Long Island	9.1	955
New York Southern	10.9	1,312
New York Western	1.2	132
Ontario (CDA)	0.2	28
Rhode Island	7.5	985
Virginia	20.0	2,635

Figure I3 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure II during the Winter 2018 peak hour.

Figure I3. RGDS S5a Winter 2018: Peak Hour Constraints

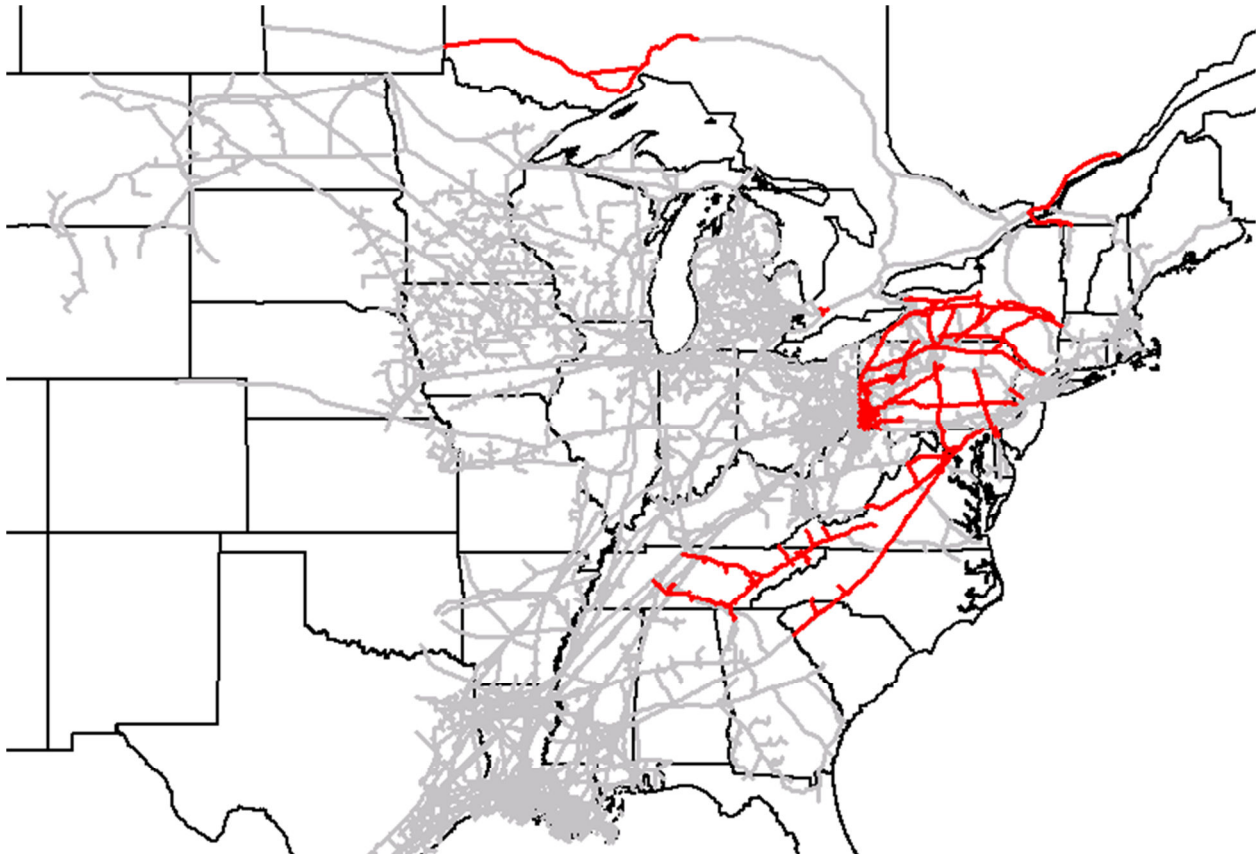


Table I2 summarizes the results of the frequency and duration analysis.

Table I2. RGDS S5a 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	9	1	3	14
Constitution	2	31	59	90
Dominion Eastern NY	3	1	6	9
Dominion Western NY	1	3	3	3
Dominion Southeast	3	1	2	4
East Tennessee Mainline	6	1	1	6
Eastern Shore	14	1	10	53
Empire Mainline	2	1	12	13
Millennium	7	1	38	69
NB/NS Supply	15	1	19	52
Tennessee Z4 PA	9	1	13	25
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	9	1	15	50
Texas Eastern M3 North	12	1	9	36
TransCanada Ontario West	5	1	4	10
TransCanada Quebec	7	1	7	21
Transco Leidy Atlantic	9	1	17	57
Transco Z5	5	1	2	7
Transco Z6 Leidy to 210	5	1	3	8
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 J1 and Figure J2 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 J3 and Figure J4 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 J5 and Figure J6 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 J7 and Figure J8 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 J9 and Figure J10 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 J11 and Figure J12 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 J13 and Figure J14 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 J15 and Figure J16 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 J17 and Figure J18 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 J19 and Figure J20 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 J21 and Figure J22 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 J23 and Figure J24 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 J25 and Figure J26 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 J27 and Figure J28 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 J29 and Figure J30 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 J31 and Figure J32 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 J33 and Figure J34 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 J35 and Figure J36 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 J37 and Figure J38 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 J39 and Figure J40 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 J41 and Figure J42 relative to the capacity of the segment.

1.2 RGDS S5A SUMMER 2018

Figure I4 summarizes the affected generation during the Summer 2018 peak hour by PPA.

Figure I4. RGDS S5a Summer 2018: Peak Hour Affected Generation

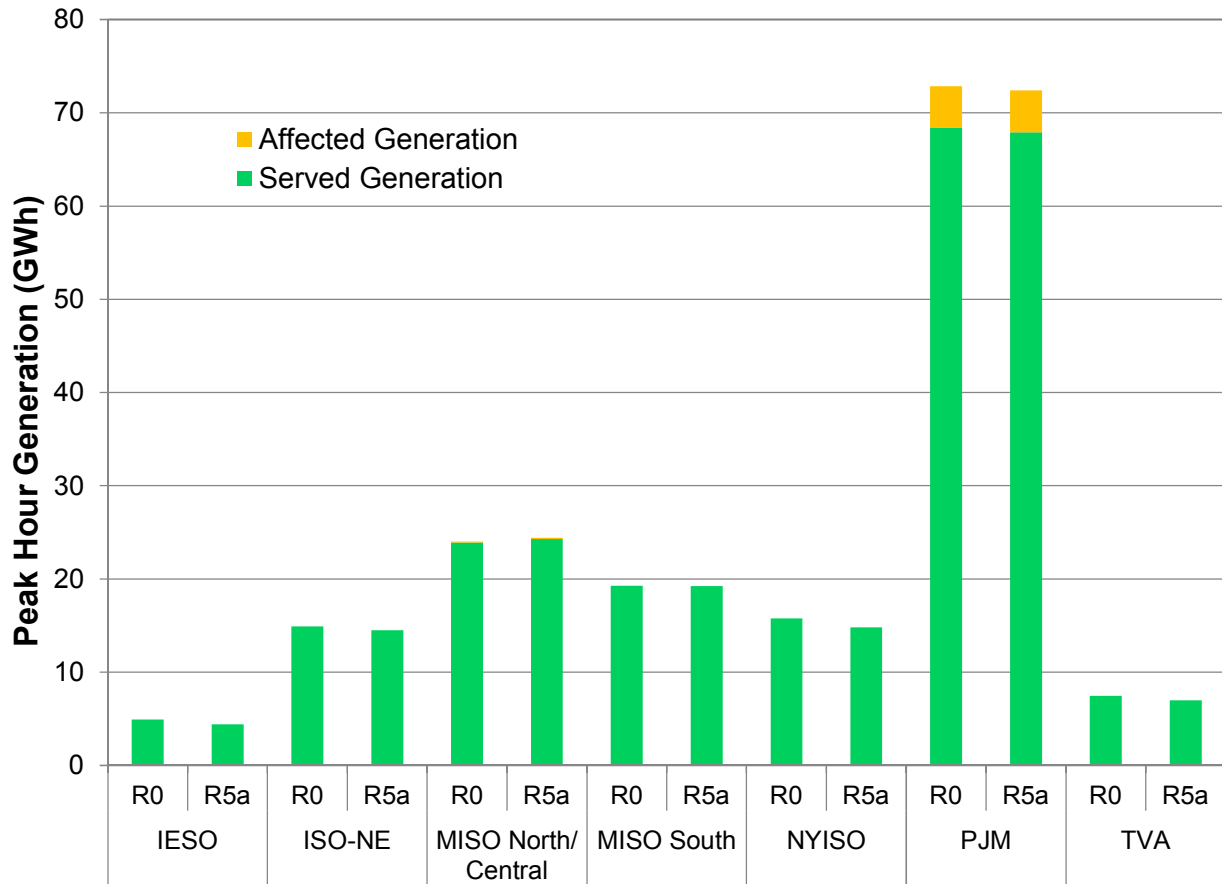


Figure I5 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I3.

Figure I5. RGDS S5a Summer 2018: Locations with Peak Hour Affected Generation

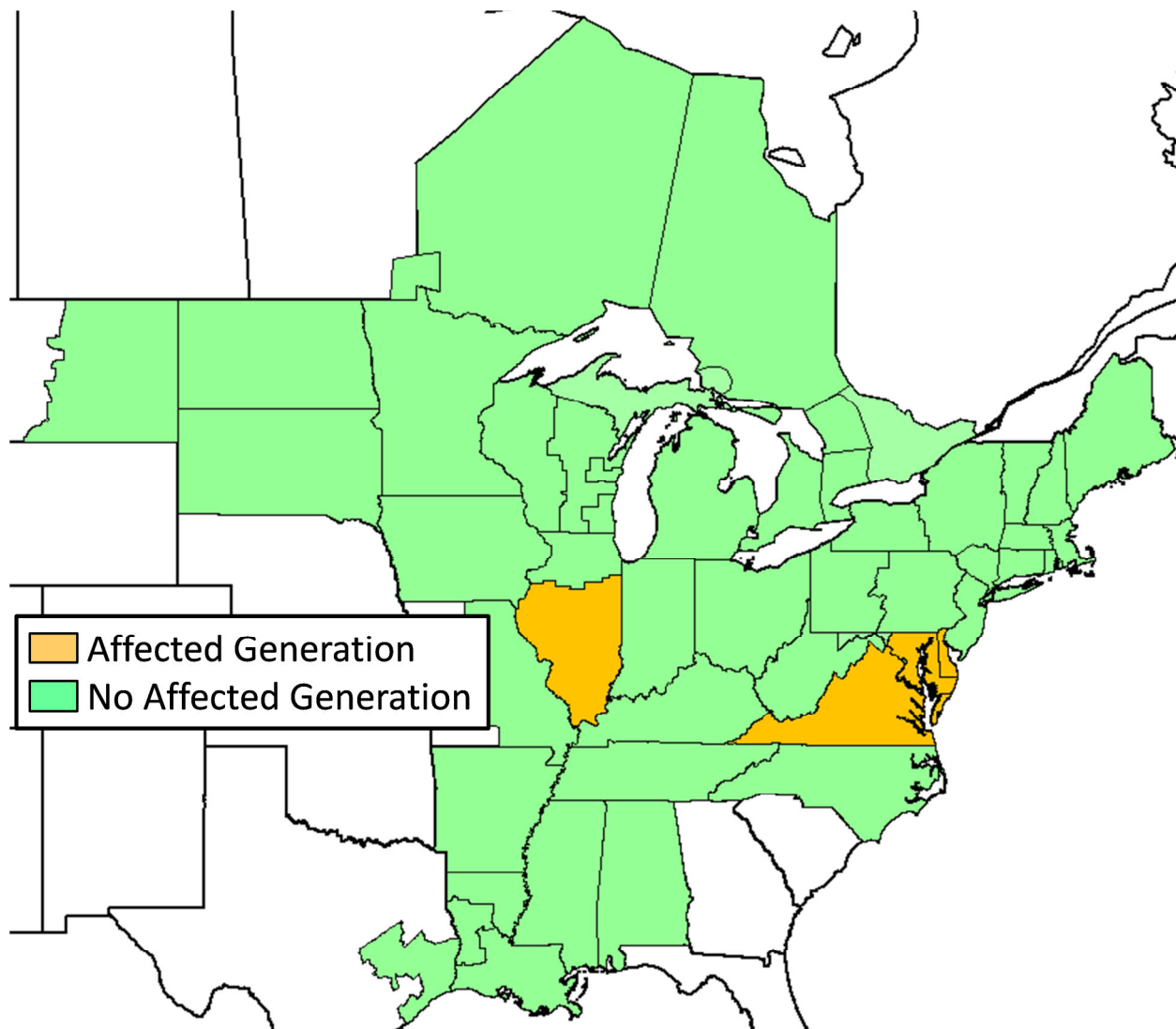


Table I3. RGDS S5a Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.3	1,149
Illinois Southern	1.0	110
Maryland Eastern	16.7	2,361
Virginia	9.1	1,001

Figure I6 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I4 during the Summer 2018 peak hour.

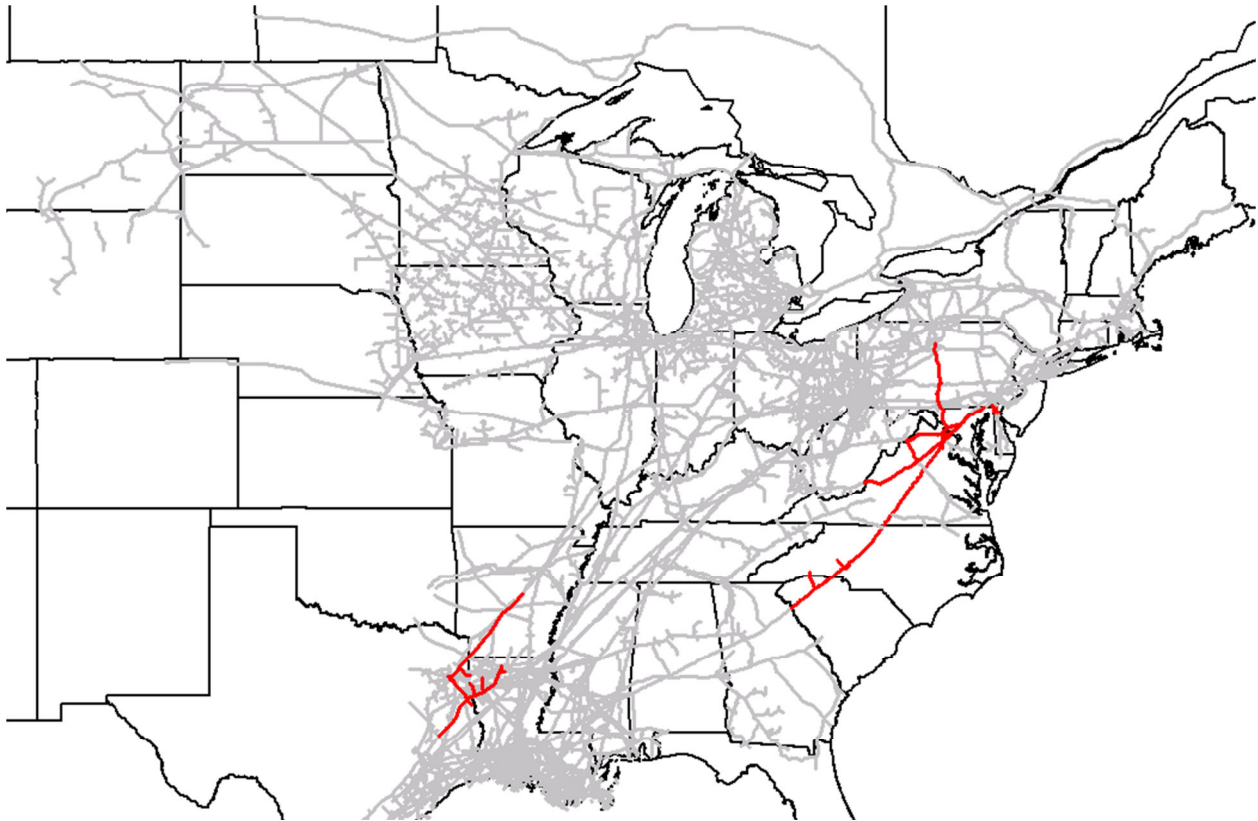
Figure I6. RGDS S5a Summer 2018: Peak Hour Constraints

Table I4 summarizes the results of the frequency and duration analysis.

Table I4. RGDS S5a Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	1	1	1	1
Dominion Southeast	3	1	2	5
Eastern Shore	12	1	6	25
Texas Eastern Zone ETX	6	1	6	14
Transco Z5	7	1	6	18

1.2.1 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 J43 and Figure J44 relative to the capacity of the segment.

1.2.2 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 J45 and Figure J46 relative to the capacity of the segment.

1.2.3 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 J47 and Figure J48 relative to the capacity of the segments.

1.2.4 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 J49 and Figure J50 relative to the capacity of the segment.

1.2.5 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 J51 and Figure J52 relative to the capacity of the segment.

1.3 RGDS S5A WINTER 2023

Figure I7 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure I7. RGDS S5a Winter 2023: Peak Hour Affected Generation

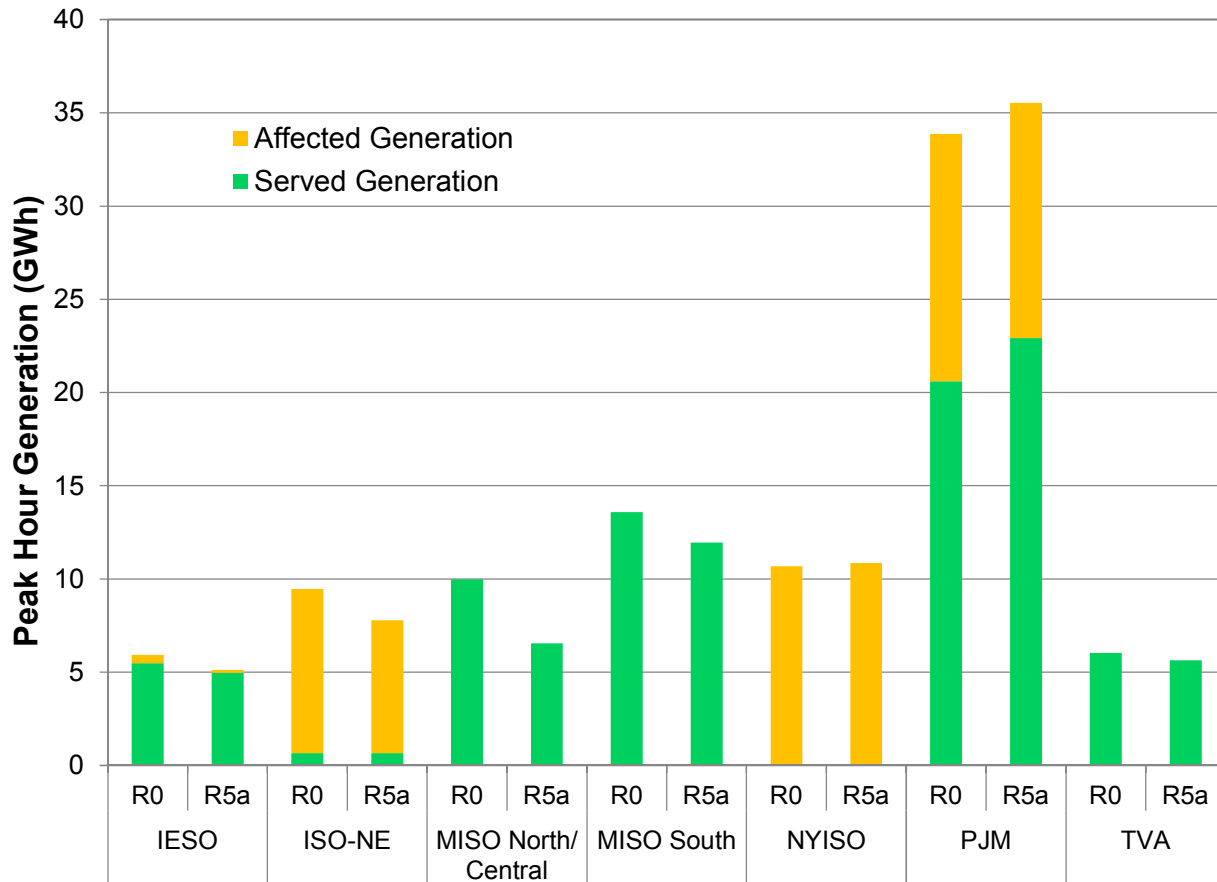


Figure I8 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I5.

Table I5. RGDS S5a Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	10.1	1,345
Delaware	5.8	664
Maine	7.6	1,045
Maryland Eastern	8.5	869
Massachusetts Eastern	10.2	1,416
Massachusetts Western	10.7	1,399
New Hampshire	7.5	1,003
New Jersey	30.9	3,504
New York Central Northern	39.9	4,734
New York City	20.0	2,504
New York Long Island	12.4	1,187
New York Southern	13.8	1,503
New York Western	1.7	196
Ontario (CDA)	0.2	28
Ontario (EDA)	0.1	7
Ontario (NDA)	0.8	114
Pennsylvania Eastern	26.4	3,357
Pennsylvania Western	2.0	288
Rhode Island	7.1	921
Virginia	37.7	4,581

Figure I9 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I7 during the Winter 2023 peak hour.

Figure I9. RGDS S5a Winter 2023: Peak Hour Constraints

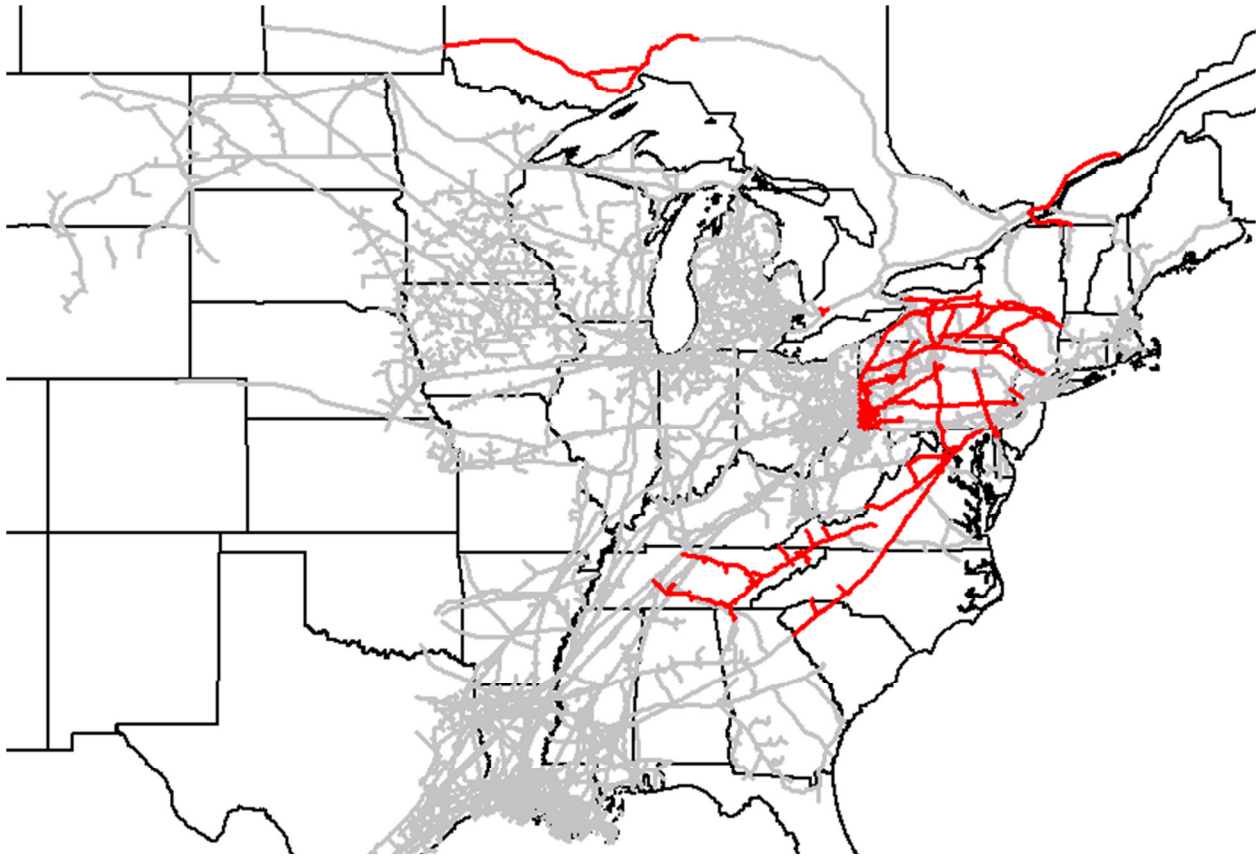


Table I6 summarizes the results of the frequency and duration analysis.

Table I6. RGDS S5a Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	7	1	59	79
Columbia Gas W PA/NY	16	1	6	32
Constitution	2	31	59	90
Dominion Eastern NY	9	1	16	52
Dominion Western NY	1	5	5	5
Dominion Southeast	6	1	31	64
East Tennessee Mainline	4	1	4	8
Eastern Shore	9	1	26	74
Empire Mainline	5	1	42	55
Millennium	7	1	38	69
NB/NS Supply	2	31	59	90
Tennessee Z4 PA	11	1	13	35
Tennessee Z5 NY	4	1	48	88
Texas Eastern M2 PA South	8	1	17	62
Texas Eastern M3 North	12	1	10	50
TransCanada Ontario West	4	1	5	9
TransCanada Quebec	6	1	14	29
Transco Leidy Atlantic	10	1	28	69
Transco Z5	8	1	2	9
Transco Z6 Leidy to 210	3	3	55	89
Union Gas Dawn	2	1	2	3

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 J53 and Figure J54 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 J55 and Figure J56 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 J57 and Figure J58 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 J59 and Figure J60 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 J61 and Figure J62 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 J63 and Figure J64 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 J65 and Figure J66 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 J67 and Figure J68 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 J69 and Figure J70 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 J71 and Figure J72 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 J73 and Figure J74 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 J75 and Figure J76 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 J77 and Figure J78 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 J79 and Figure J80 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 J81 and Figure J82 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 J83 and Figure J84 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 J85 and Figure J86 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 J87 and Figure J88 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 J89 and Figure J90 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 J91 and Figure J92 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 J93 and Figure J94 relative to the capacity of the segment.

1.4 RGDS S5A SUMMER 2023

Figure I10 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure I10. RGDS S5a Summer 2023: Peak Hour Affected Generation

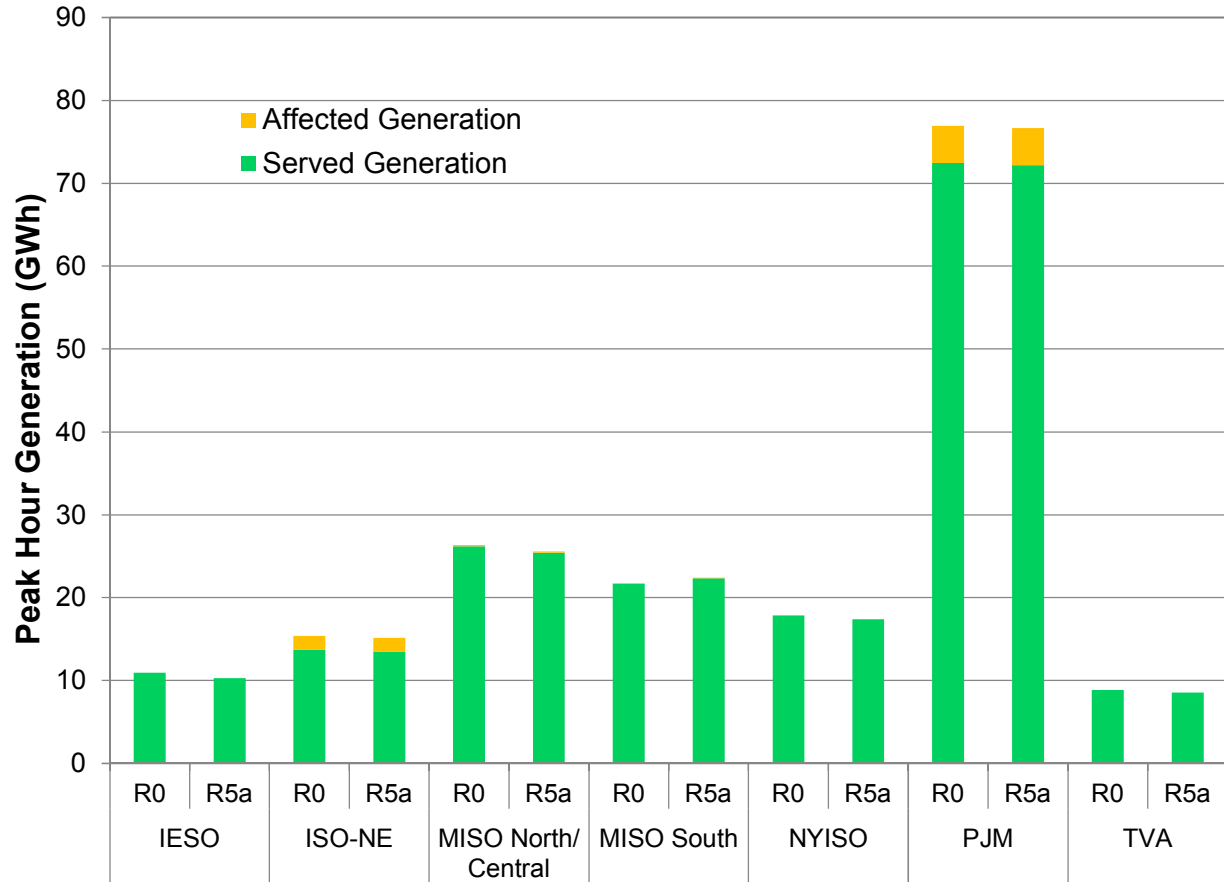


Figure I11 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I7.

Figure I11. RGDS S5a Summer 2023: Locations with Peak Hour Affected Generation

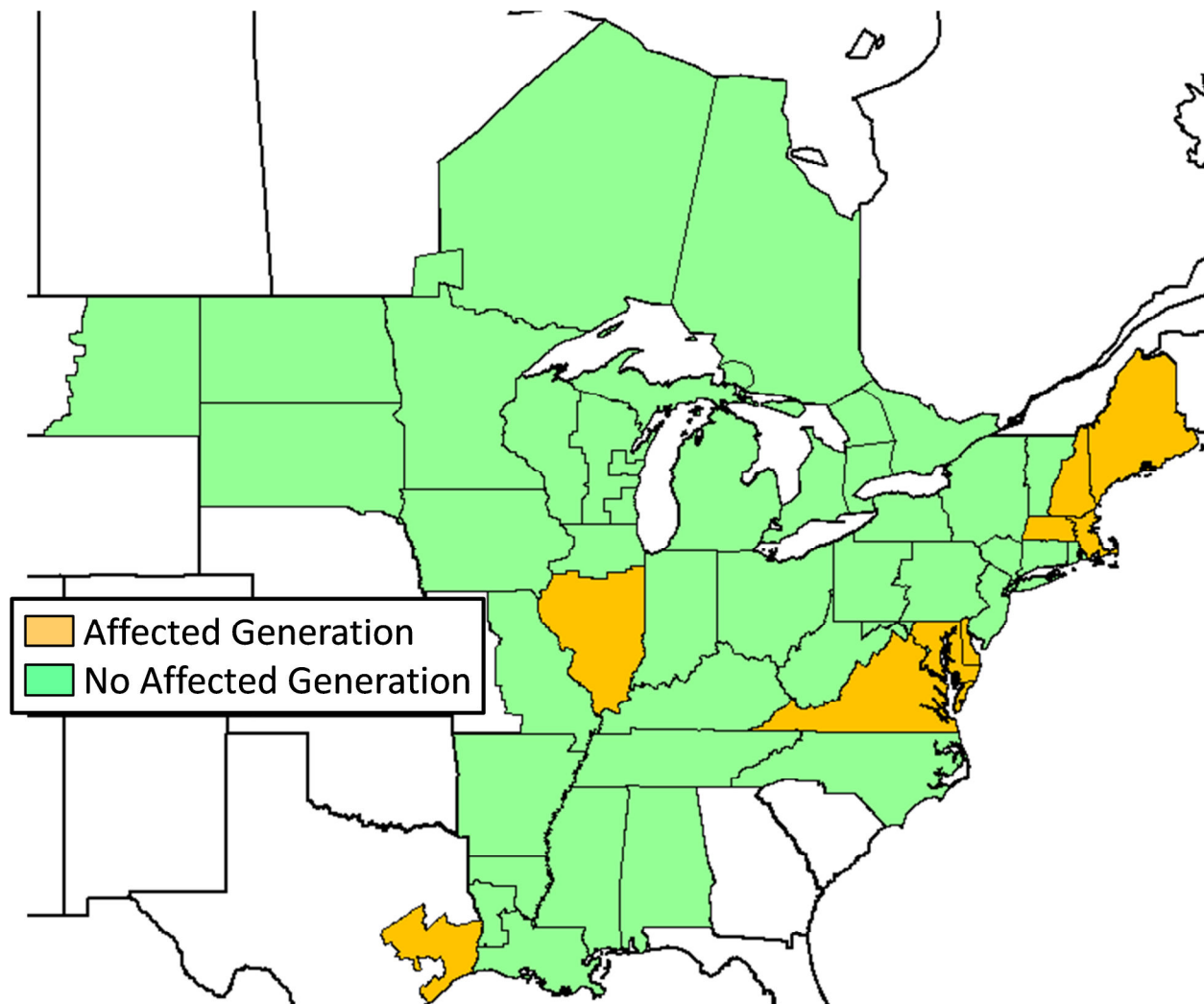


Table I7. RGDS S5a Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.5	1,175
Illinois Southern	1.0	112
Maine	5.8	785
Maryland Eastern	16.7	2,361
New Hampshire	7.7	863
Texas East (SERC)	0.6	81
Virginia	8.4	936

Figure I12 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I10 during the Summer 2023 peak hour.

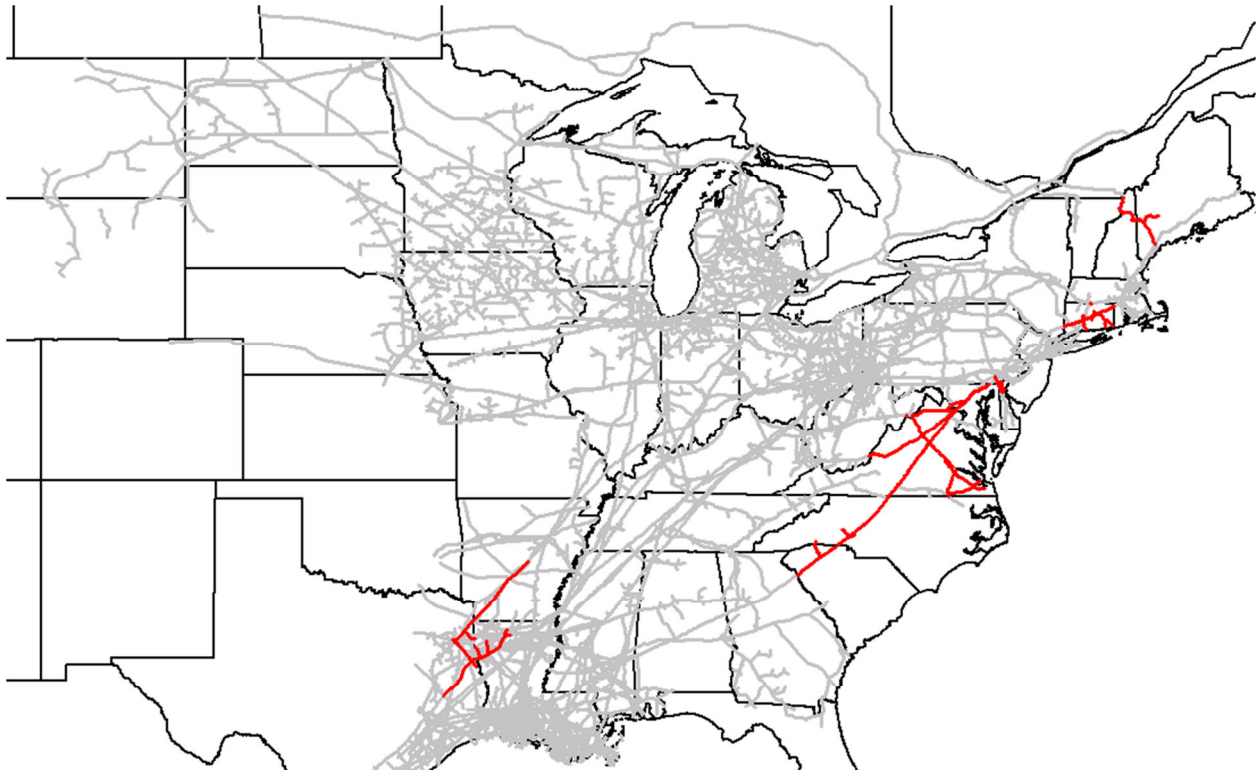
Figure I12. RGDS S5a Summer 2023: Peak Hour Constraints

Table I8 summarizes the results of the frequency and duration analysis.

Table I8. RGDS S5a Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	5	1	3	11
Columbia Gas VA/MD	2	1	3	4
Dominion Southeast	12	1	7	30
Eastern Shore	9	1	7	30
NB/NS Supply	4	2	34	70
PNGTS N of Westbrook	11	1	8	38
Texas Eastern Zone ETX	8	1	6	19
Transco Z5	7	1	6	17

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 J95 and Figure J96 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 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 J97 and Figure J98 relative to the capacity of the segment.

1.4.3 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 J99 and Figure J100 relative to the capacity of the segment.

1.4.4 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 J101 and Figure J102 relative to the capacity of the segments.

1.4.5 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 J103 and Figure J104 relative to the total production capacity.

1.4.6 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 J105 and Figure J106 relative to the capacity of the segment.

1.4.7 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 J107 and Figure J108 relative to the capacity of the segment.

1.4.8 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 J109 and Figure J110 relative to the capacity of the segment.

2 S5B: ADDITIONAL COAL AND NUCLEAR DEACTIVATION WITH QUEBEC IMPORTS

2.1 RGDS S5B WINTER 2023

Figure I13 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure I13. RGDS S5b Winter 2023: Peak Hour Affected Generation

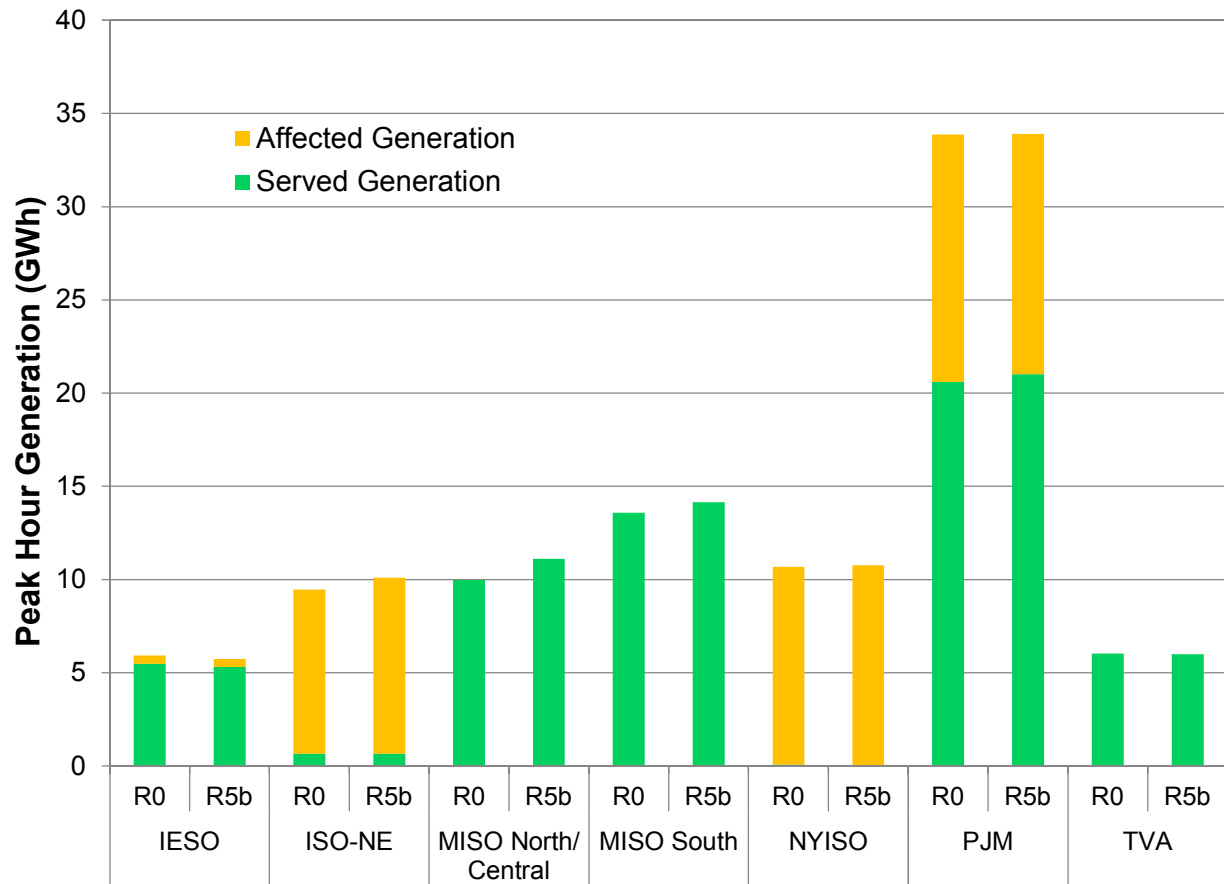


Figure I14 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I9.

Table I9. RGDS S5b Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	17.5	2,408
Delaware	1.3	173
Maine	9.5	1,292
Maryland Eastern	5.0	543
Massachusetts Eastern	16.4	2,279
Massachusetts Western	9.3	1,239
New Hampshire	9.4	1,245
New Jersey	7.8	1,044
New York Central Northern	44.9	5,462
New York City	16.8	2,225
New York Long Island	11.4	1,166
New York Southern	15.1	1,629
New York Western	2.1	235
Ontario (CDA)	0.5	55
Ontario (EDA)	2.1	249
Ontario (NDA)	0.8	114
Pennsylvania Eastern	43.0	5,938
Pennsylvania Western	6.7	961
Rhode Island	7.5	984
Virginia	35.4	4,237

Figure I15 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I13 during the Winter 2023 peak hour.

Figure I15. RGDS S5b Winter 2023: Peak Hour Constraints

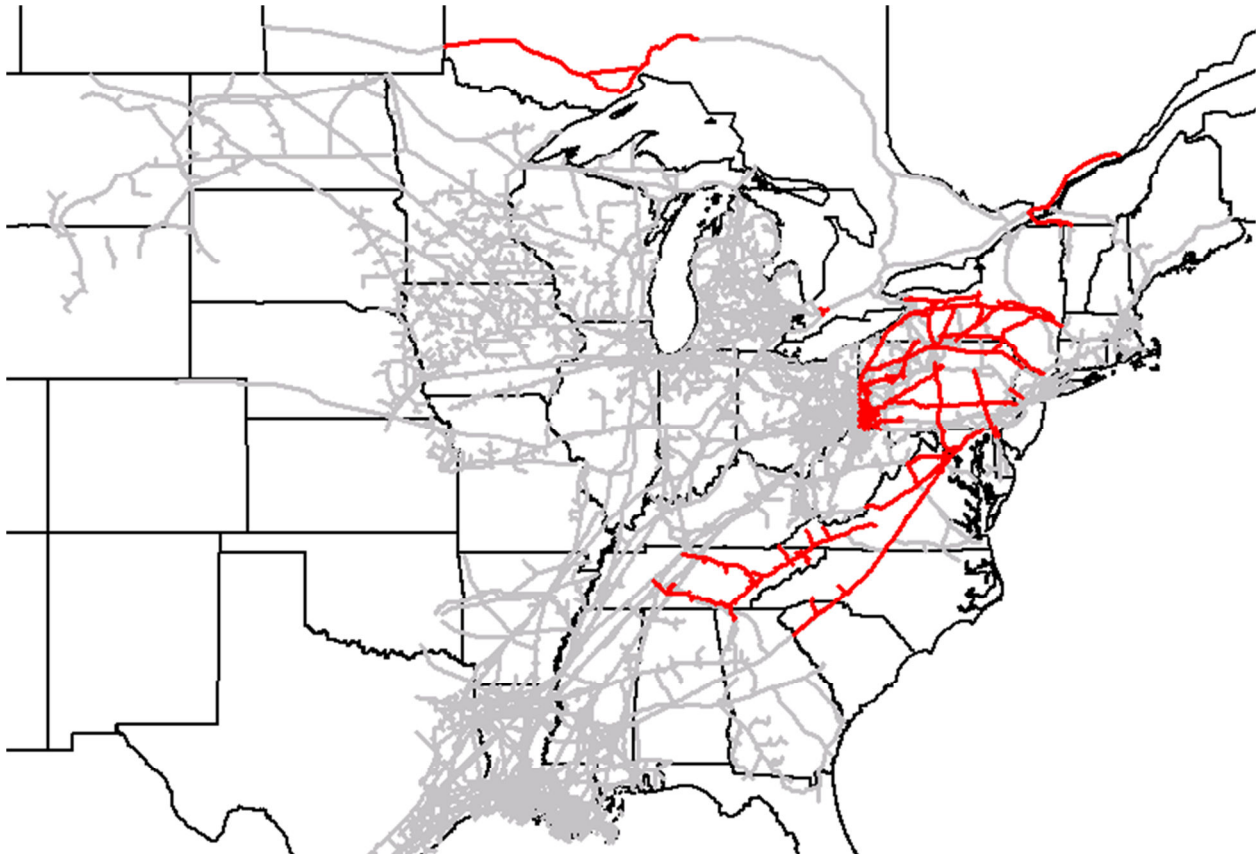


Table I10 summarizes the results of the frequency and duration analysis.

Table I10. RGDS S5b Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	6	1	52	81
Columbia Gas W PA/NY	12	1	3	18
Constitution	2	31	59	90
Dominion Eastern NY	8	3	19	62
Dominion Western NY	5	1	1	5
Dominion Southeast	5	4	31	69
East Tennessee Mainline	4	1	4	4
Eastern Shore	12	1	16	64
Empire Mainline	6	1	54	65
Millennium	7	1	38	69
NB/NS Supply	2	31	59	90
Tennessee Z4 PA	7	1	26	48
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	6	1	27	64
Texas Eastern M3 North	12	1	12	47
TransCanada Ontario West	5	1	6	12
TransCanada Quebec	7	1	14	33
Transco Leidy Atlantic	8	1	27	60
Transco Z5	7	1	2	8
Transco Z6 Leidy to 210	5	1	55	86
Union Gas Dawn	3	1	2	4

2.1.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,679 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 Figure J111 and Figure J112 relative to the capacity of the segment.

2.1.2 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 J113 and Figure J114 relative to the capacity of the segment

2.1.3 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 J115 and Figure J116 relative to the capacity of the segment.

2.1.4 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 J117 and Figure J118 relative to the capacity of the segment.

2.1.5 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 J119 and Figure J120 relative to the capacity of the segment.

2.1.6 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 Figure J121 and Figure J122 relative to the capacity of the segment.

2.1.7 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 J123 and Figure J124 relative to the capacity of the segment.

2.1.8 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 J125 and Figure J126 relative to the capacity of the segments.

2.1.9 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 J127 and Figure J128 relative to the capacity of the segment.

2.1.10 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 J129 and Figure J130 relative to the capacity of the segment.

2.1.11 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 J131 and Figure J132 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

2.1.12 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 J133 and Figure J134 relative to the capacity of the segment.

2.1.13 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 J135 and Figure J136 relative to the capacity of the segment.

2.1.14 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 J137 and Figure J138 relative to the capacity of the segment.

2.1.15 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 J139 and Figure J140 relative to the capacity of the segment.

2.1.16 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 J141 and Figure J142 relative to the capacity of the segment.

2.1.17 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 J143 and Figure J144 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.

2.1.18 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 J145 and Figure J146 relative to the capacity of the segment.

2.1.19 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 J147 and Figure J148 relative to the capacity of the segment.

2.1.20 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 J149 and Figure J150 relative to the capacity of the segment.

2.1.21 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 J151 and Figure J152 relative to the capacity of the segment.

2.2 RGDS S5B SUMMER 2023

Figure I16 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure I16. RGDS S5b Summer 2023: Peak Hour Affected Generation

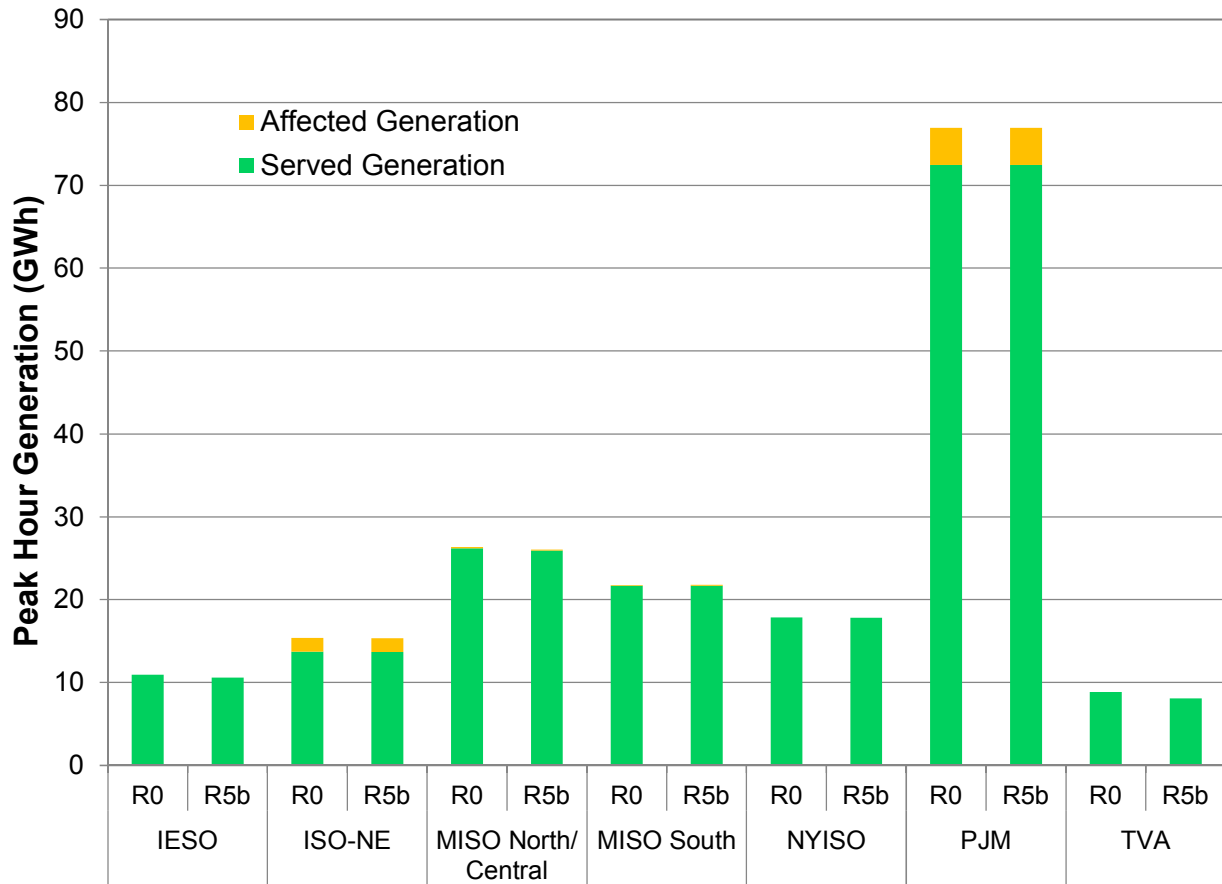


Figure I17 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I11.

Figure I17. RGDS S5b Summer 2023: Locations with Peak Hour Affected Generation

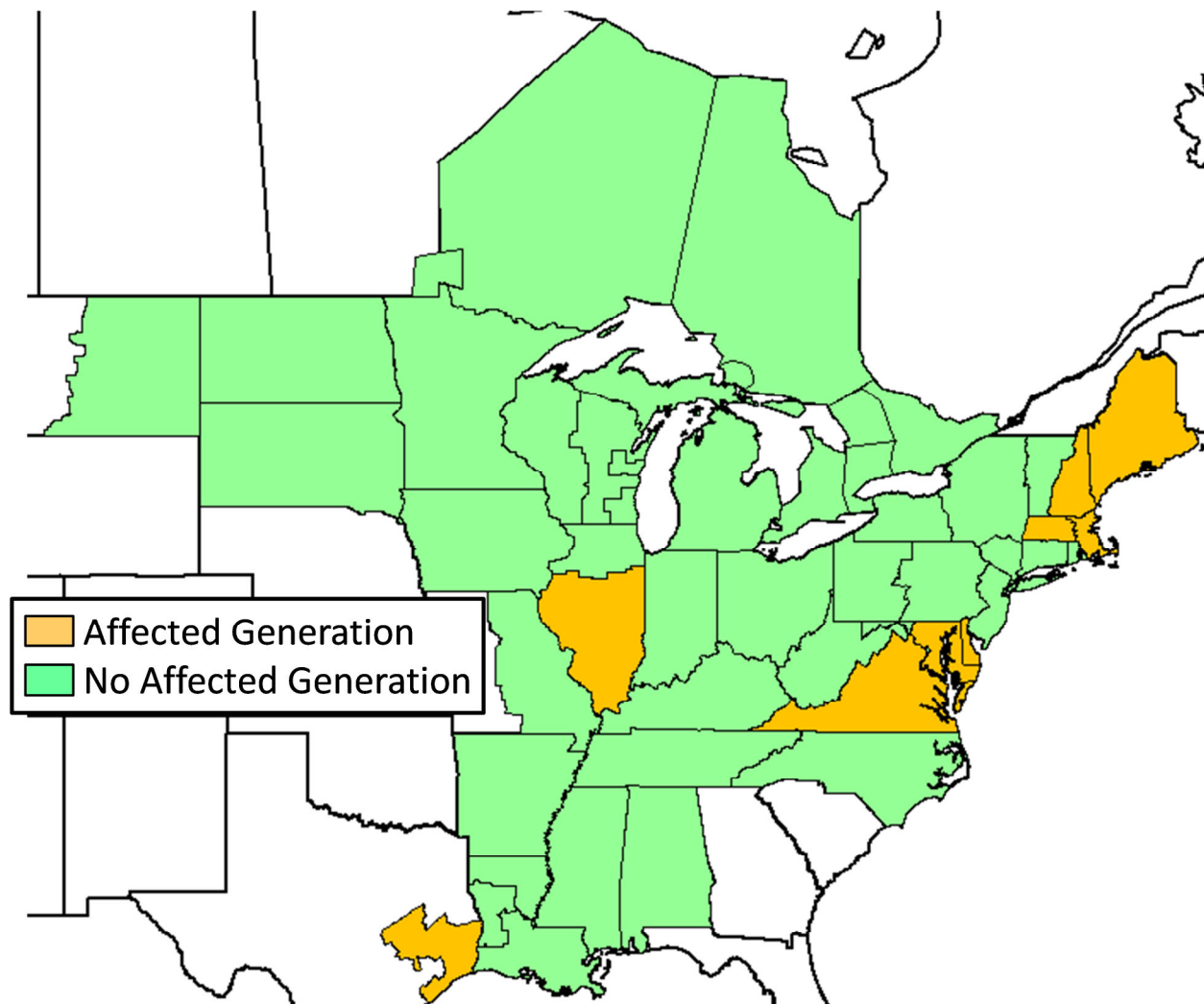


Table I11. RGDS S5b Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.5	1,175
Illinois Southern	1.0	111.5
Maine	6.0	804
Maryland Eastern	16.7	2,361
New Hampshire	7.6	857
Texas East (SERC)	0.6	81
Virginia	8.4	936

Figure I18 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I16 during the Summer 2023 peak hour.

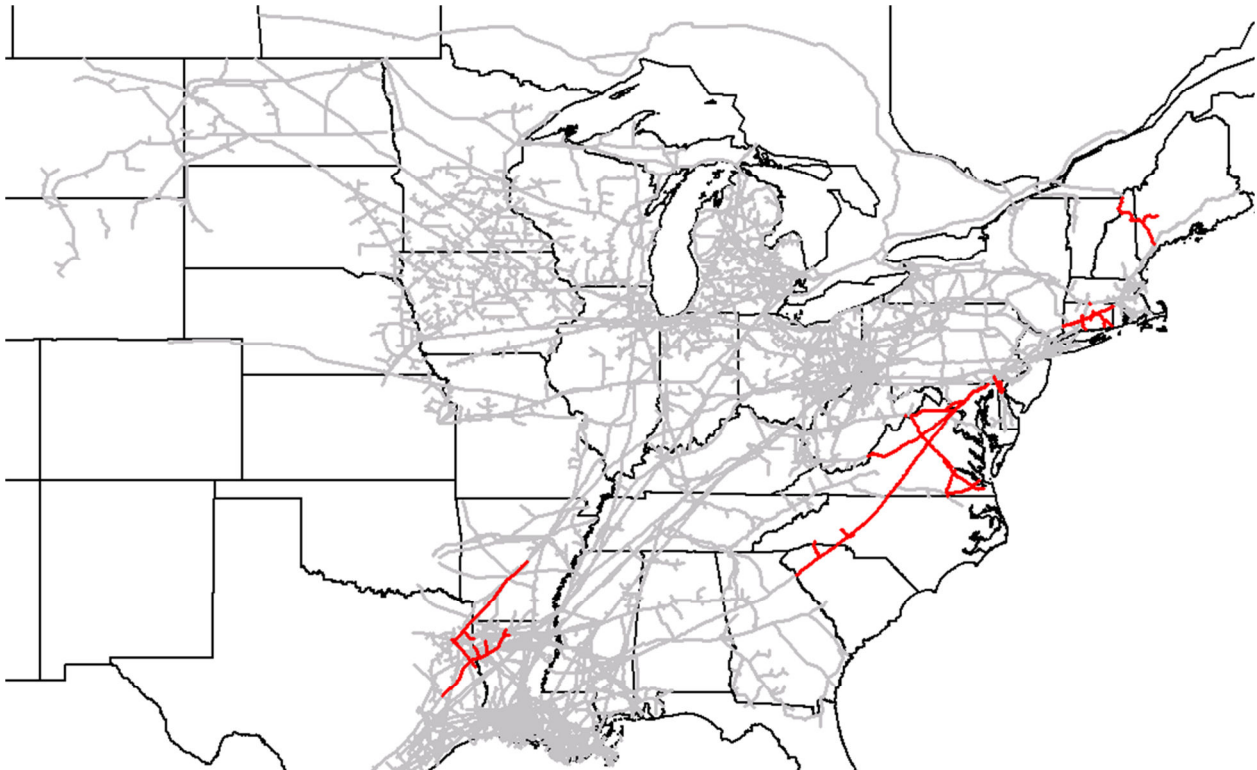
Figure I18. RGDS S5b Summer 2023: Peak Hour Constraints

Table I12 summarizes the results of the frequency and duration analysis.

Table I12. RGDS S5b Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	6	2	3	15
Columbia Gas VA/MD	2	1	3	4
Dominion Southeast	8	1	7	26
Eastern Shore	10	1	7	29
NB/NS Supply	5	3	33	72
PNGTS N of Westbrook	10	1	9	44
Texas Eastern Zone ETX	7	1	10	20
Transco Z5	6	1	6	16

2.2.1 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 J153 and Figure J154 relative to the capacity of the segment.

2.2.2 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 J155 and Figure J156 relative to the capacity of the segment.

2.2.3 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 J157 and Figure J158 relative to the capacity of the segment.

2.2.4 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 J159 and Figure J160 relative to the capacity of the segments.

2.2.5 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 J161 and Figure J162 relative to the total production capacity.

2.2.6 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 J163 and Figure J164 relative to the capacity of the segment.

2.2.7 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 J165 and Figure J166 relative to the capacity of the segment.

2.2.8 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 J167 and Figure J168 relative to the capacity of the segment.

3 S5C: ADDITIONAL COAL AND NUCLEAR DEACTIVATION WITH EE/DR

3.1 RGDS S5C WINTER 2018

Figure I19 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure I19. RGDS S5c Winter 2018: Peak Hour Affected Generation

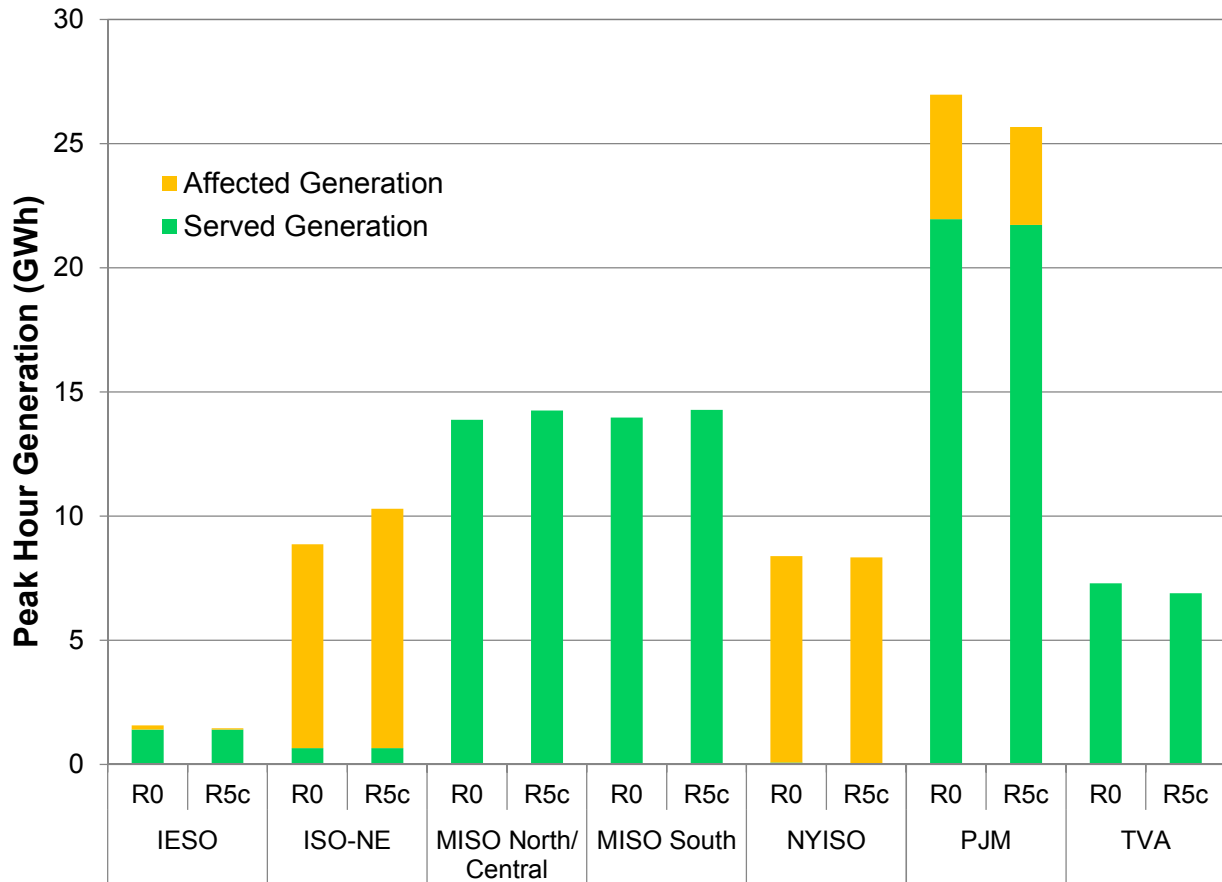


Figure I20 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I13.

Figure I20. RGDS S5c Winter 2018: Locations with Peak Hour Affected Generation

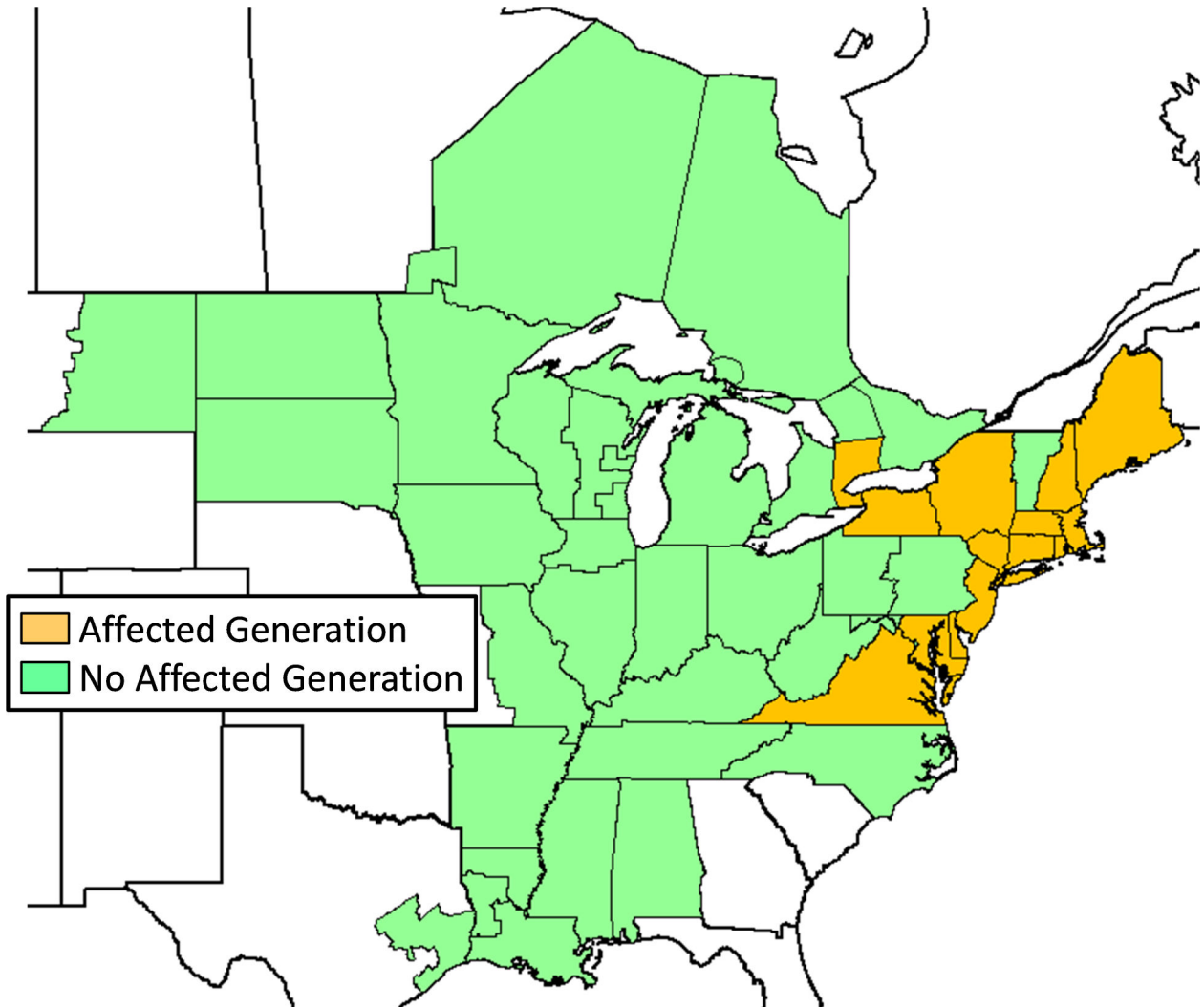


Table I13. RGDS S5c Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	21.1	2,756
Delaware	1.3	173
Maine	9.5	1,292
Maryland Eastern	2.4	295
Massachusetts Eastern	14.3	1,989
Massachusetts Western	9.1	1,219
New Hampshire	9.4	1,245
New Jersey	9.2	1,162
New York Central Northern	23.1	3,242
New York City	16.0	2,094
New York Long Island	9.2	1,030
New York Southern	10.9	1,312
New York Western	1.6	179
Ontario (CDA)	0.5	55
Rhode Island	8.8	1,145
Virginia	21.0	2,748

Figure I21 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I19 during the Winter 2018 peak hour.

Figure I21. RGDS S5c Winter 2018: Peak Hour Constraints

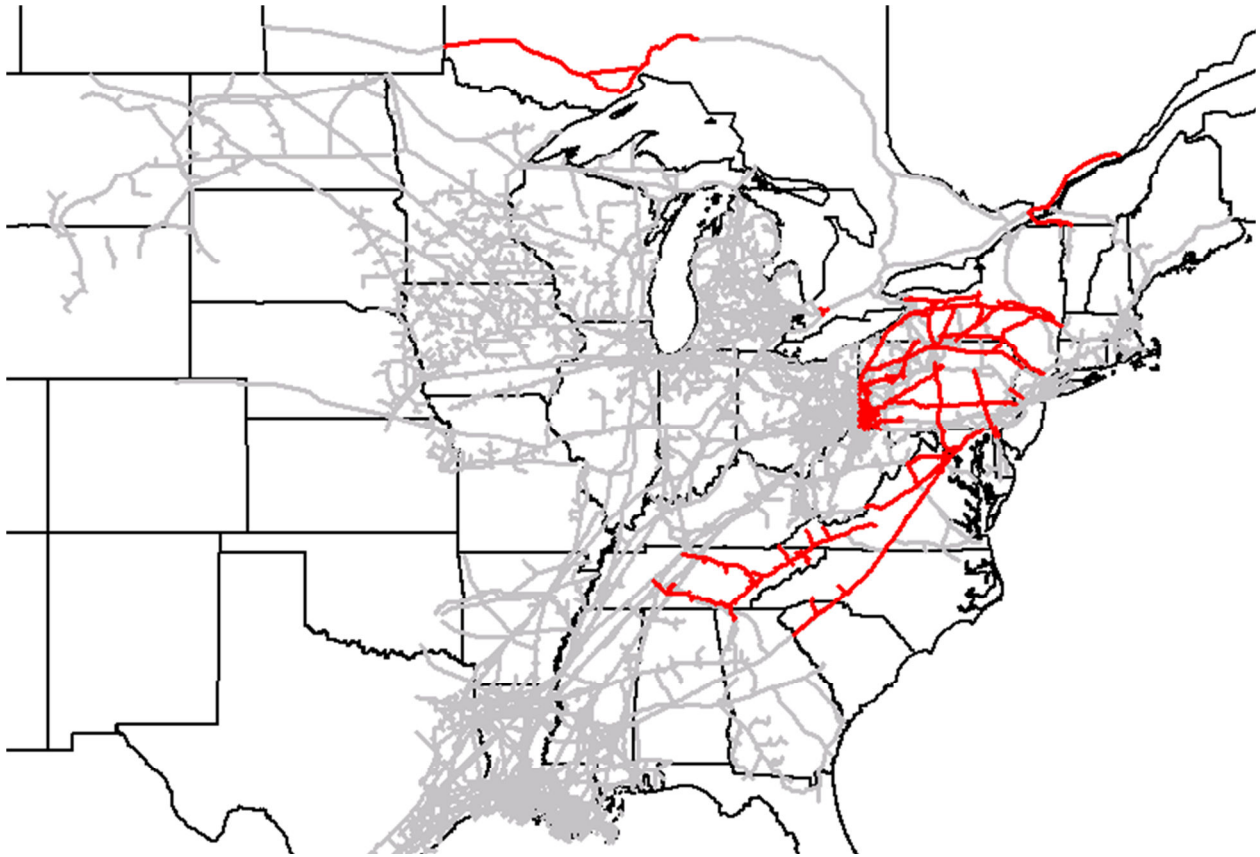


Table I14 summarizes the results of the frequency and duration analysis.

Table I14. RGDS S5c Winter 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	13	1	5	23
Columbia Gas W PA/NY	9	1	3	14
Constitution	2	31	59	90
Dominion Eastern NY	5	1	9	15
Dominion Western NY	1	4	4	4
Dominion Southeast	2	1	2	3
East Tennessee Mainline	5	1	2	6
Eastern Shore	12	1	9	49
Empire Mainline	5	1	12	19
Millennium	7	1	38	69
NB/NS Supply	10	1	20	57
Tennessee Z4 PA	9	1	14	34
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	9	1	15	51
Texas Eastern M3 North	12	1	12	42
TransCanada Ontario West	6	1	5	10
TransCanada Quebec	9	1	16	31
Transco Leidy Atlantic	10	1	17	58
Transco Z5	3	1	5	7
Transco Z6 Leidy to 210	5	1	3	9
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 J169 and Figure J170 relative to the capacity of the segment.

3.1.2 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 J171 and Figure J172 relative to the capacity of the segment

3.1.3 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 J173 and Figure J174 relative to the capacity of the segment.

3.1.4 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 J175 and Figure J176 relative to the capacity of the segment.

3.1.5 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 J177 and Figure J178 relative to the capacity of the segment.

3.1.6 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 J179 and Figure J180 relative to the capacity of the segment.

3.1.7 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 J181 and Figure J182 relative to the capacity of the segment.

3.1.8 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 J183 and Figure J184 relative to the capacity of the segments.

3.1.9 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 J185 and Figure J186 relative to the capacity of the segment.

3.1.10 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 J187 and Figure J188 relative to the capacity of the segment.

3.1.11 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 J189 and Figure J190 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

3.1.12 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 J191 and Figure J192 relative to the capacity of the segment.

3.1.13 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 J193 and Figure J194 relative to the capacity of the segment.

3.1.14 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 J195 and Figure J196 relative to the capacity of the segment.

3.1.15 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 J197 and Figure J198 relative to the capacity of the segment.

3.1.16 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 J199 and Figure J200 relative to the capacity of the segment.

3.1.17 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 J201 and Figure J202 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.

3.1.18 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 J203 and Figure J204 relative to the capacity of the segment.

3.1.19 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 J205 and Figure J206 relative to the capacity of the segment.

3.1.20 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 J207 and Figure J208 relative to the capacity of the segment.

3.1.21 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 J209 and Figure J210 relative to the capacity of the segment.

3.2 RGDS S5c SUMMER 2018

Figure I22 summarizes the affected generation during the Summer 2018 peak hour by PPA.

Figure I22. RGDS S5c Summer 2018: Peak Hour Affected Generation

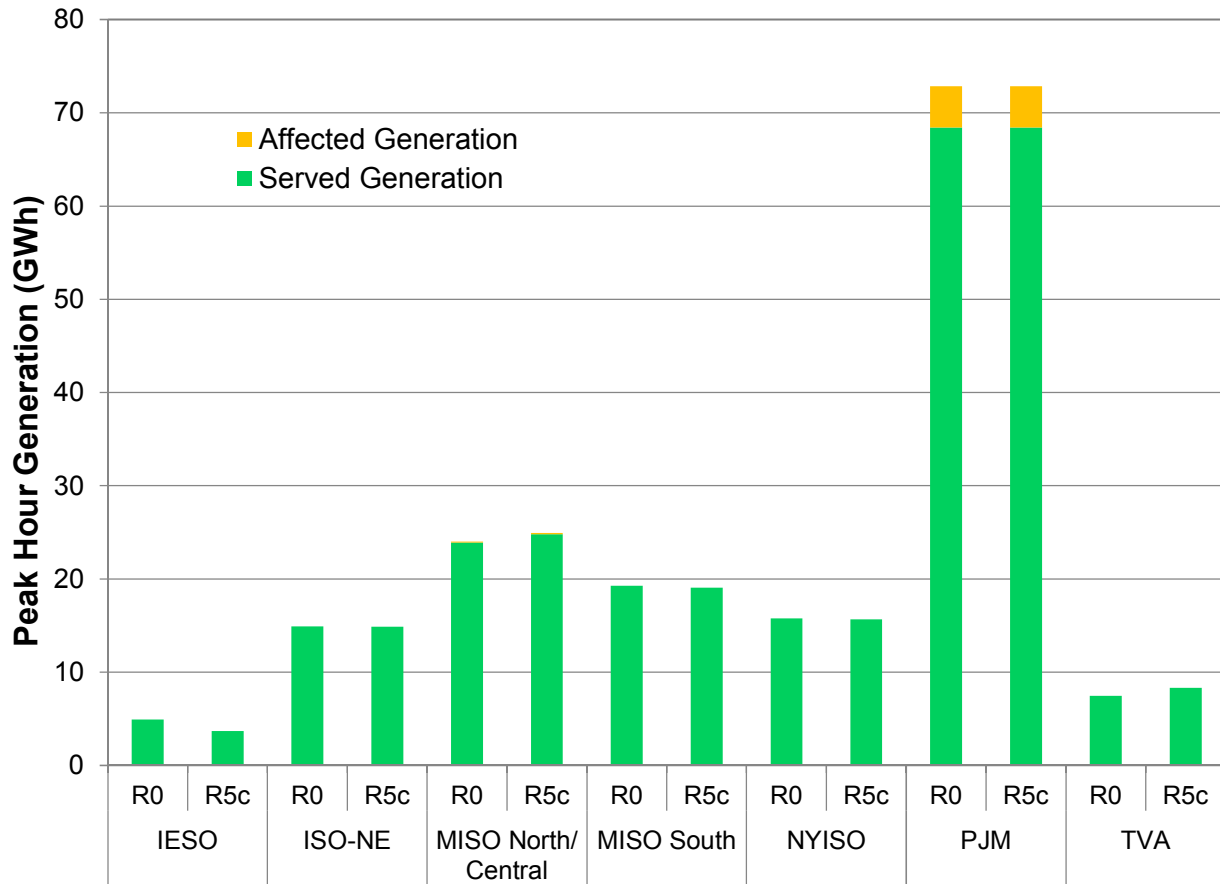


Figure I23 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I15.

Figure I23. RGDS S5c Summer 2018: Locations with Peak Hour Affected Generation

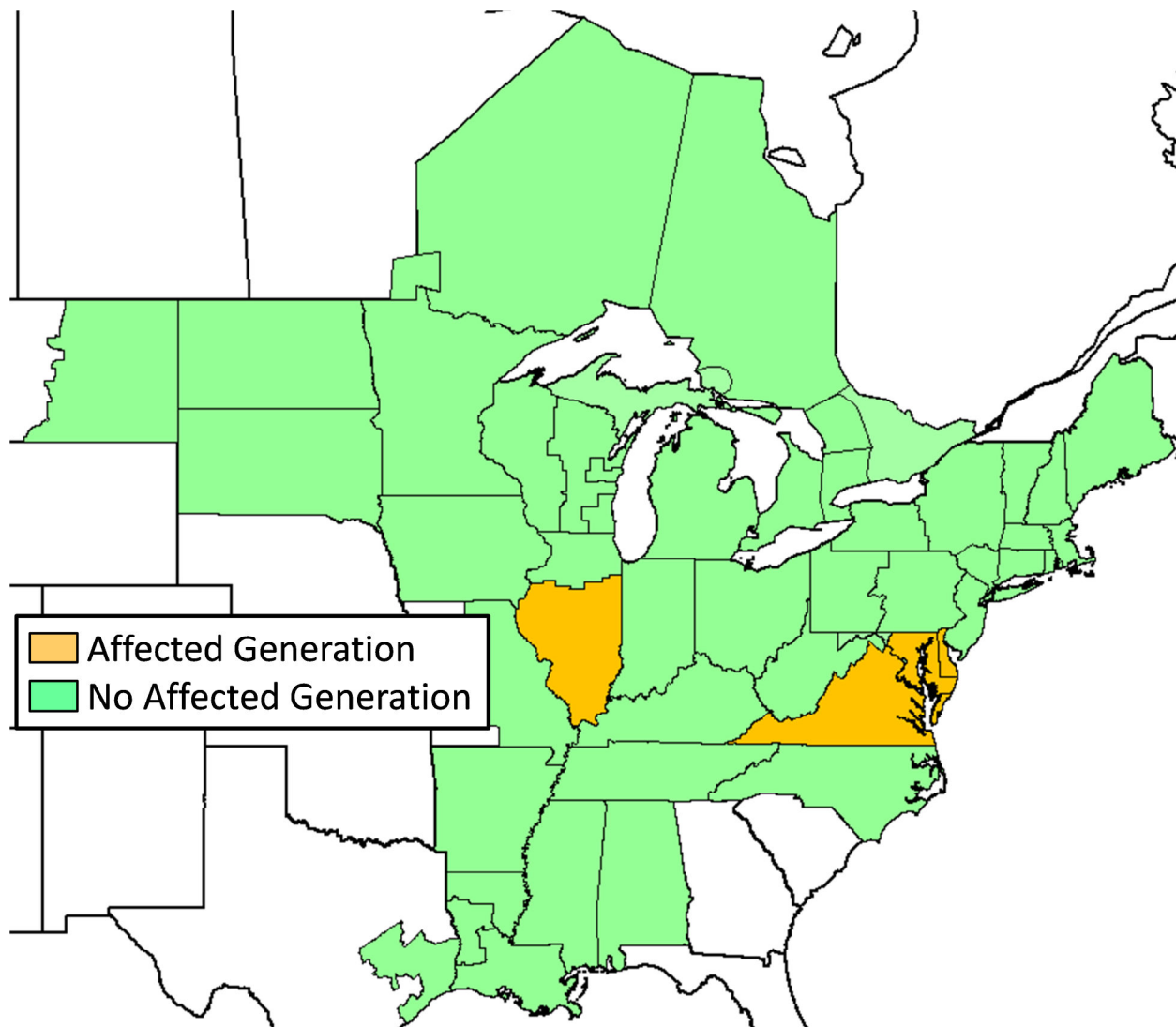


Table I15. RGDS S5c Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.3	1,149
Illinois Southern	1.0	110
Maryland Eastern	16.7	2,361
Virginia	8.4	936

Figure I24 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I22 during the Summer 2018 peak hour.

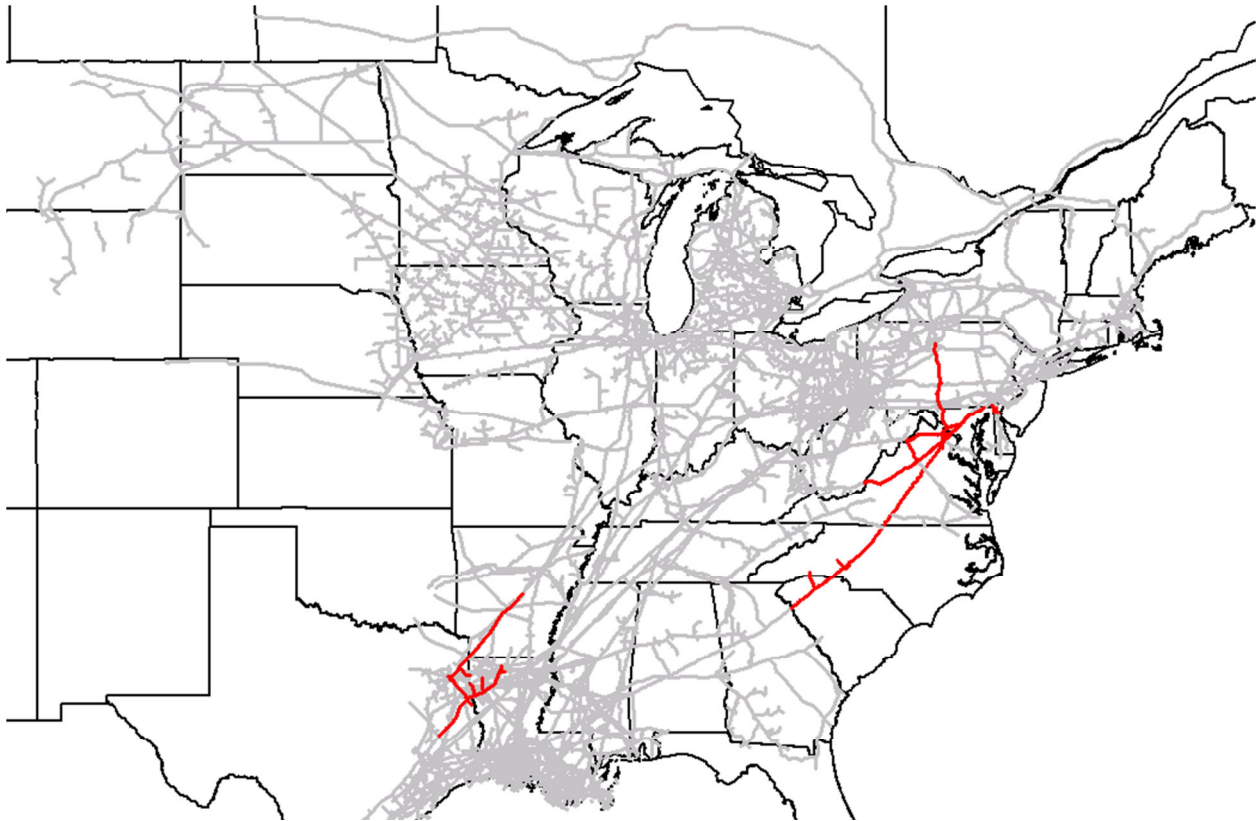
Figure I24. RGDS S5c Summer 2018: Peak Hour Constraints

Table I16 summarizes the results of the frequency and duration analysis.

Table I16. RGDS S5c Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	1	1	1	1
Dominion Southeast	4	1	3	7
Eastern Shore	10	1	6	23
Texas Eastern Zone ETX	6	1	6	14
Transco Z5	8	2	6	20

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 J211 and Figure J212 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 J213 and Figure J214 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 J215 and Figure J216 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 J217 and Figure J218 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 J219 and Figure J220 relative to the capacity of the segment.

3.3 RGDS S5c WINTER 2023

Figure I25 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure I25. RGDS S5c Winter 2023: Peak Hour Affected Generation

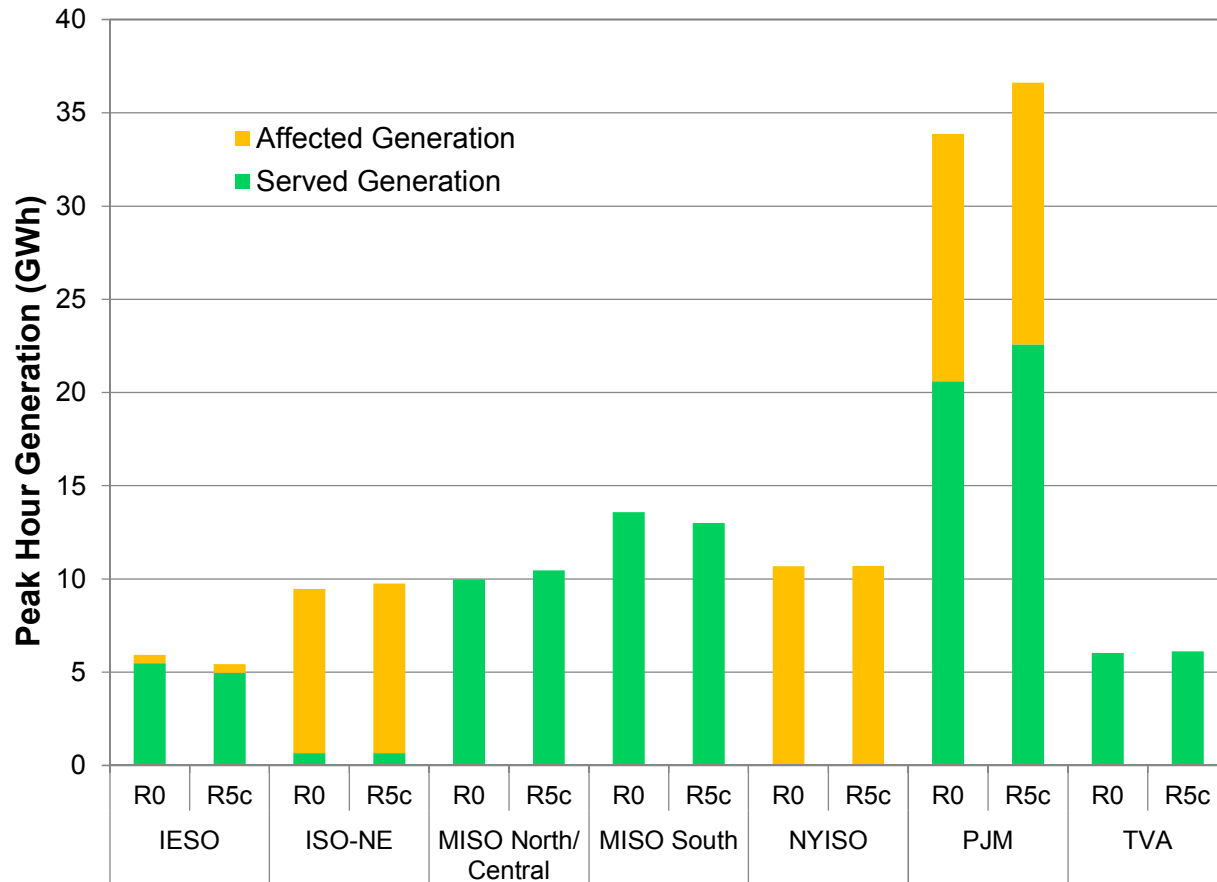


Figure I26 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I17.

Table I17. RGDS S5c Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	17.2	2,371
Delaware	1.3	173
Maine	9.5	1,292
Maryland Eastern	5.0	539
Massachusetts Eastern	14.6	2,025
Massachusetts Western	9.3	1,239
New Hampshire	9.4	1,245
New Jersey	25.7	3,261
New York Central Northern	41.0	4,875
New York City	18.1	2,317
New York Long Island	12.1	1,241
New York Southern	13.8	1,503
New York Western	2.2	247
Ontario (CDA)	0.5	55
Ontario (EDA)	2.1	249
Ontario (NDA)	1.2	155
Pennsylvania Eastern	39.9	5,296
Pennsylvania Western	6.7	961
Rhode Island	7.1	936
Virginia	35.4	4,237

Figure I27 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I25 during the Winter 2023 peak hour.

Figure I27. RGDS S5c Winter 2023: Peak Hour Constraints

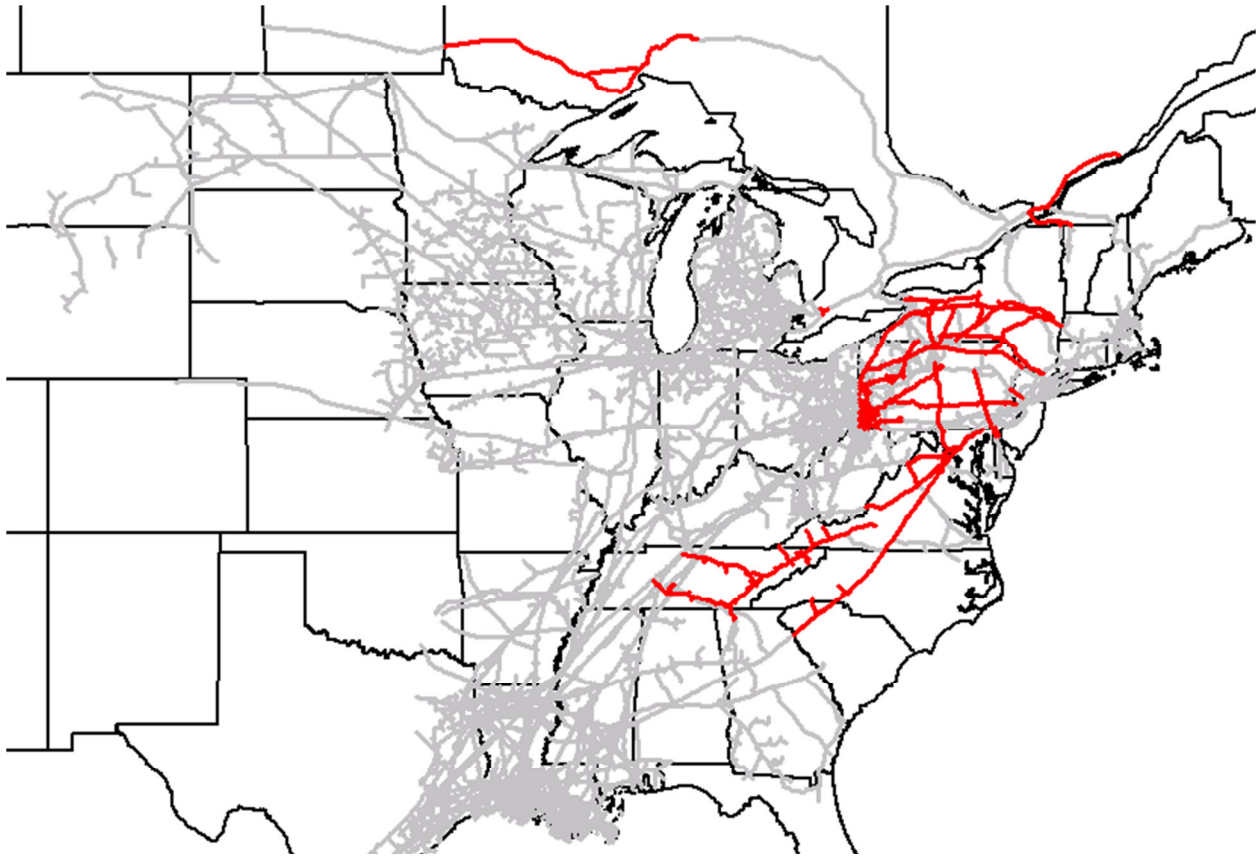


Table I18 summarizes the results of the frequency and duration analysis.

Table I18. RGDS S5c Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Columbia Gas VA/MD	6	1	52	81
Columbia Gas W PA/NY	9	1	3	16
Constitution	2	31	59	90
Dominion Eastern NY	8	1	16	58
Dominion Western NY	1	5	5	5
Dominion Southeast	5	3	31	68
East Tennessee Mainline	6	1	4	11
Eastern Shore	10	1	14	66
Empire Mainline	8	1	44	64
Millennium	7	3	38	69
NB/NS Supply	1	31	59	90
Tennessee Z4 PA	9	1	9	47
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	9	1	27	67
Texas Eastern M3 North	8	1	26	56
TransCanada Ontario West	5	1	3	8
TransCanada Quebec	7	1	14	33
Transco Leidy Atlantic	8	1	28	65
Transco Z5	10	1	4	14
Transco Z6 Leidy to 210	4	1	55	88
Union Gas Dawn	2	1	2	3

3.3.1 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas’s Virginia/Maryland segment, which is modeled with a capacity of 2,679 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 Figure J221 and Figure J222 relative to the capacity of the segment.

3.3.2 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 J223 and Figure J224 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 Figure J225 and Figure J226 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 Figure J227 and Figure J228 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 Figure J229 and Figure J230 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 Figure J231 and Figure J232 relative to the capacity of the segment.

3.3.7 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 J233 and Figure J234 relative to the capacity of the segment.

3.3.8 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 J235 and Figure J236 relative to the capacity of the segments.

3.3.9 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 J237 and Figure J238 relative to the capacity of the segment.

3.3.10 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 J239 and Figure J240 relative to the capacity of the segment.

3.3.11 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 J241 and Figure J242 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

3.3.12 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 J243 and Figure J244 relative to the capacity of the segment.

3.3.13 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 J245 and Figure J246 relative to the capacity of the segment.

3.3.14 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 J247 and Figure J248 relative to the capacity of the segment.

3.3.15 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 J249 and Figure J250 relative to the capacity of the segment.

3.3.16 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 J251 and Figure J252 relative to the capacity of the segment.

3.3.17 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 J253 and Figure J254 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.

3.3.18 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 J255 and Figure J256 relative to the capacity of the segment.

3.3.19 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 J257 and Figure J258 relative to the capacity of the segment.

3.3.20 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 J259 and Figure J260 relative to the capacity of the segment.

3.3.21 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 J261 and Figure J262 relative to the capacity of the segment.

3.4 RGDS S5C SUMMER 2023

Figure I28 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure I28. RGDS S5c Summer 2023: Peak Hour Affected Generation

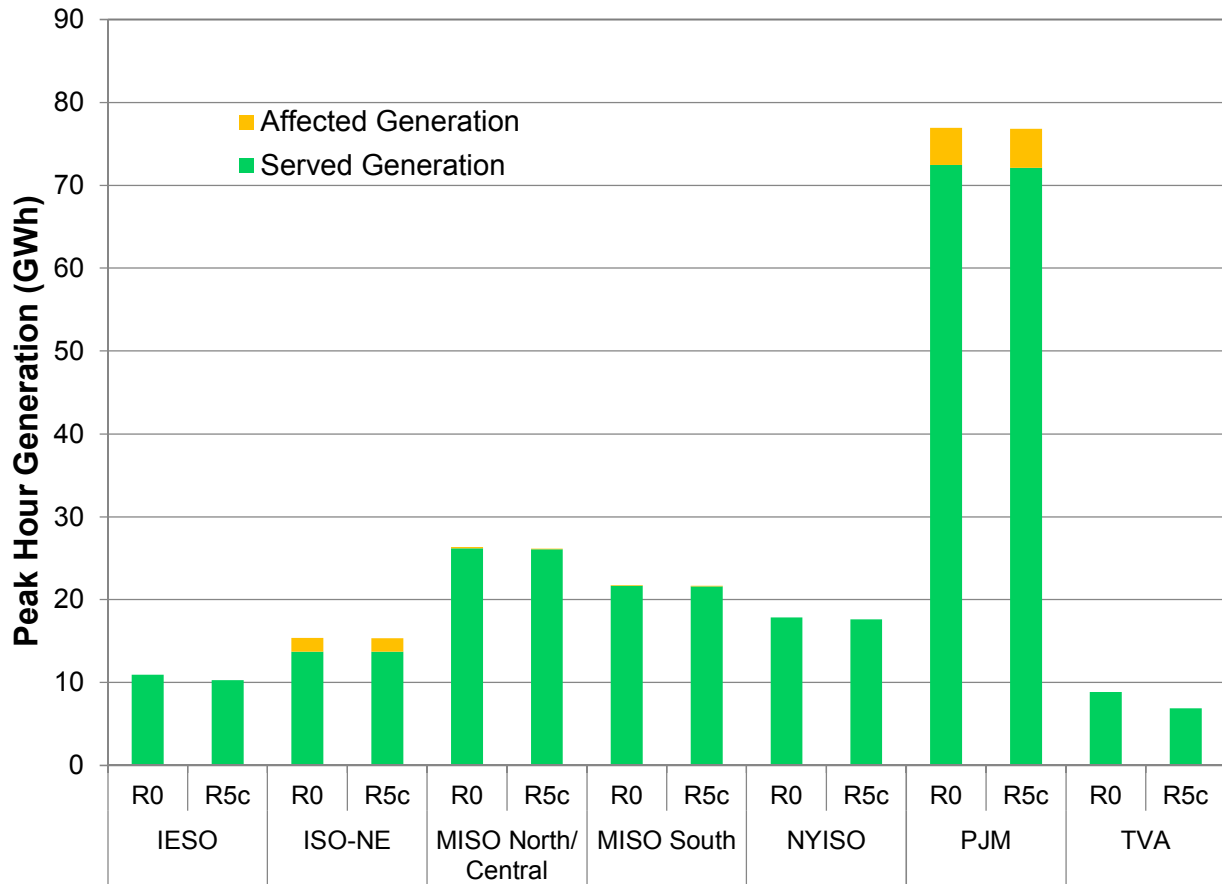


Figure I29 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I19.

Figure I29. RGDS S5c Summer 2023: Locations with Peak Hour Affected Generation

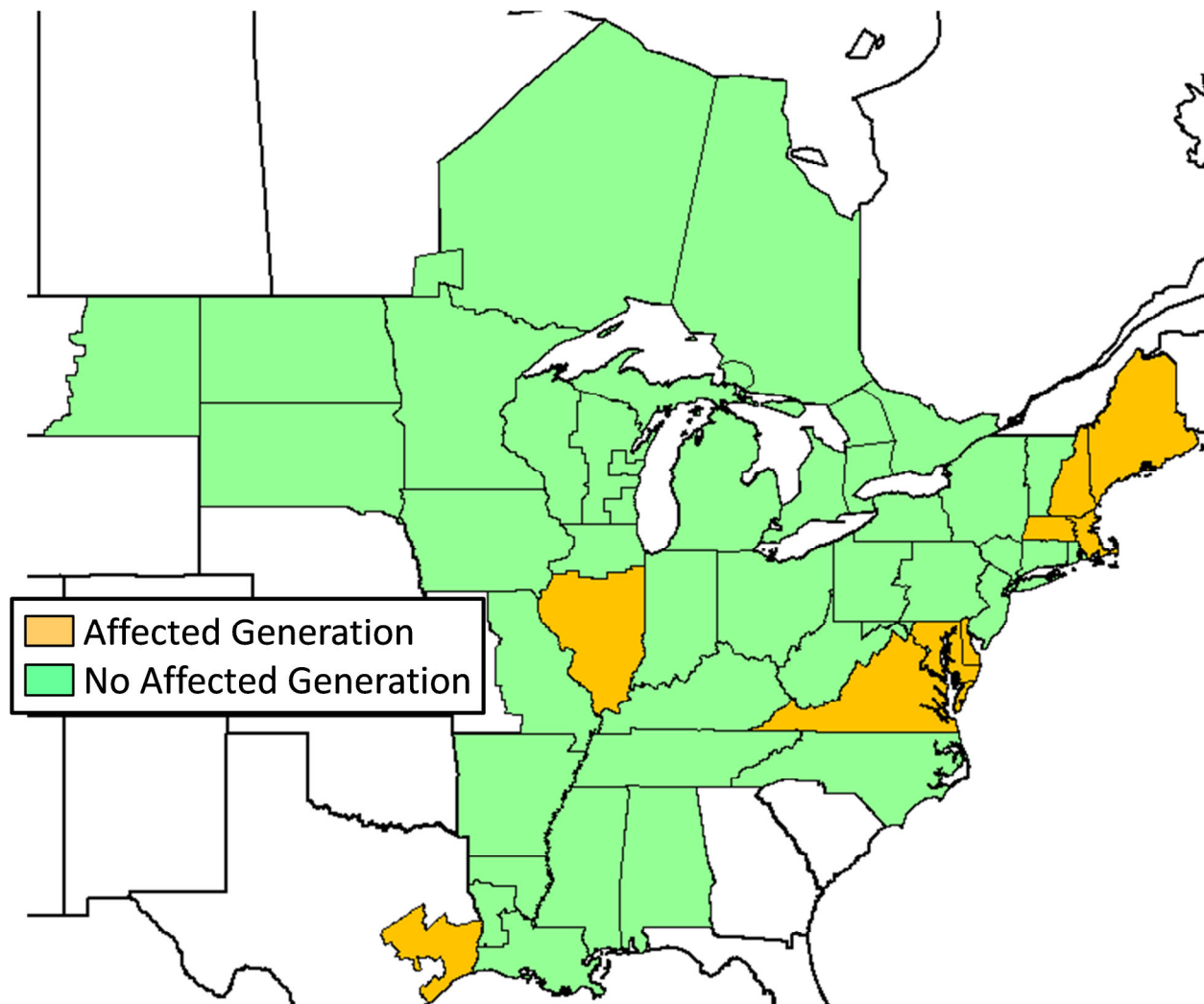


Table I19. RGDS S5c Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.5	1,175
Illinois Southern	1.0	112
Maine	5.8	776
Maryland Eastern	16.7	2,361
New Hampshire	7.6	857
Texas East (SERC)	0.6	81
Virginia	10.9	1,181

Figure I30 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I28 during the Summer 2023 peak hour.

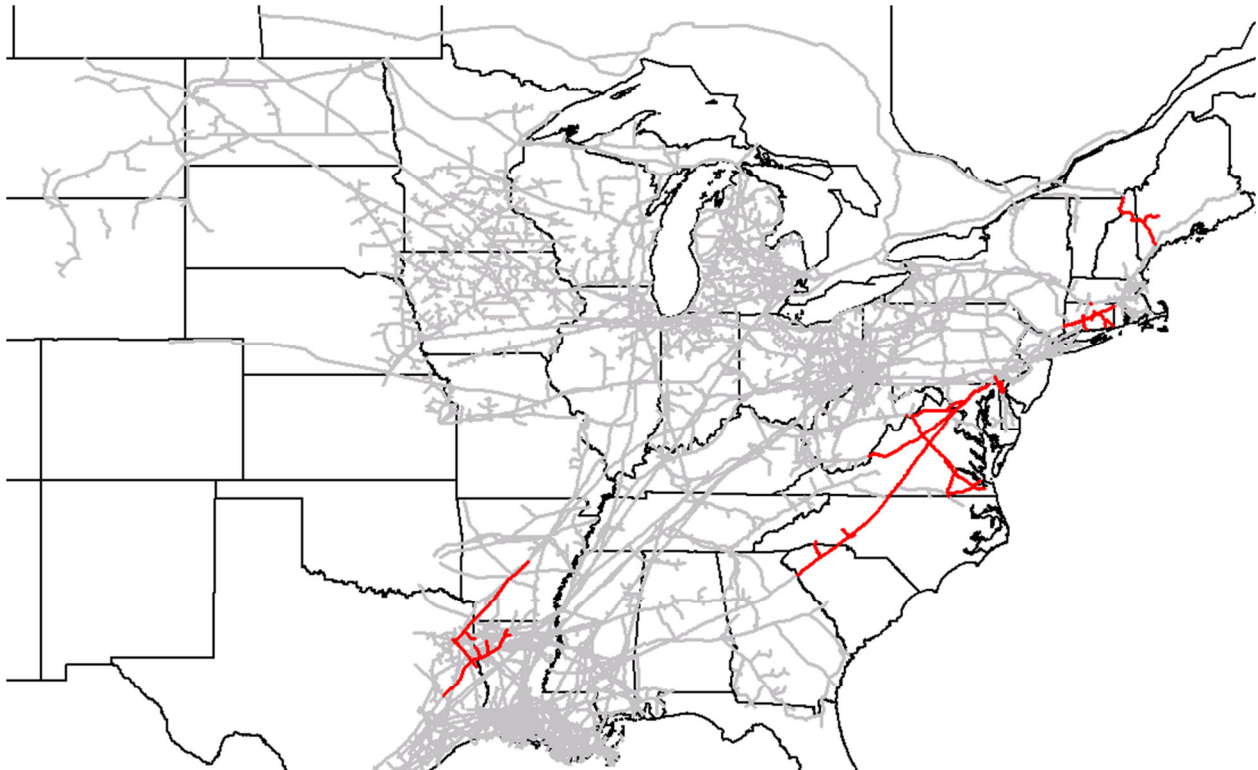
Figure I30. RGDS S5c Summer 2023: Peak Hour Constraints

Table I20 summarizes the results of the frequency and duration analysis.

Table I20. RGDS S5c Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	6	1	3	12
Columbia Gas VA/MD	2	1	4	5
Dominion Southeast	10	1	9	29
Eastern Shore	11	1	9	33
NB/NS Supply	5	2	27	69
PNGTS N of Westbrook	10	1	12	41
Texas Eastern Zone ETX	8	1	6	20
Transco Z5	9	1	6	20

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 J263 and Figure J264 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 J265 and Figure J266 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 J267 and Figure J268 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 J269 and Figure J270 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 J271 and Figure J272 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 J273 and Figure J274 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 J275 and Figure J276 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 J277 and Figure J278 relative to the capacity of the segment.

4 S9: RETIREMENT OF IESO AND NYISO NUCLEAR UNITS

4.1 HGDS S9 WINTER 2018

Figure I31 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure I31. HGDS S9 Winter 2018: Peak Hour Affected Generation

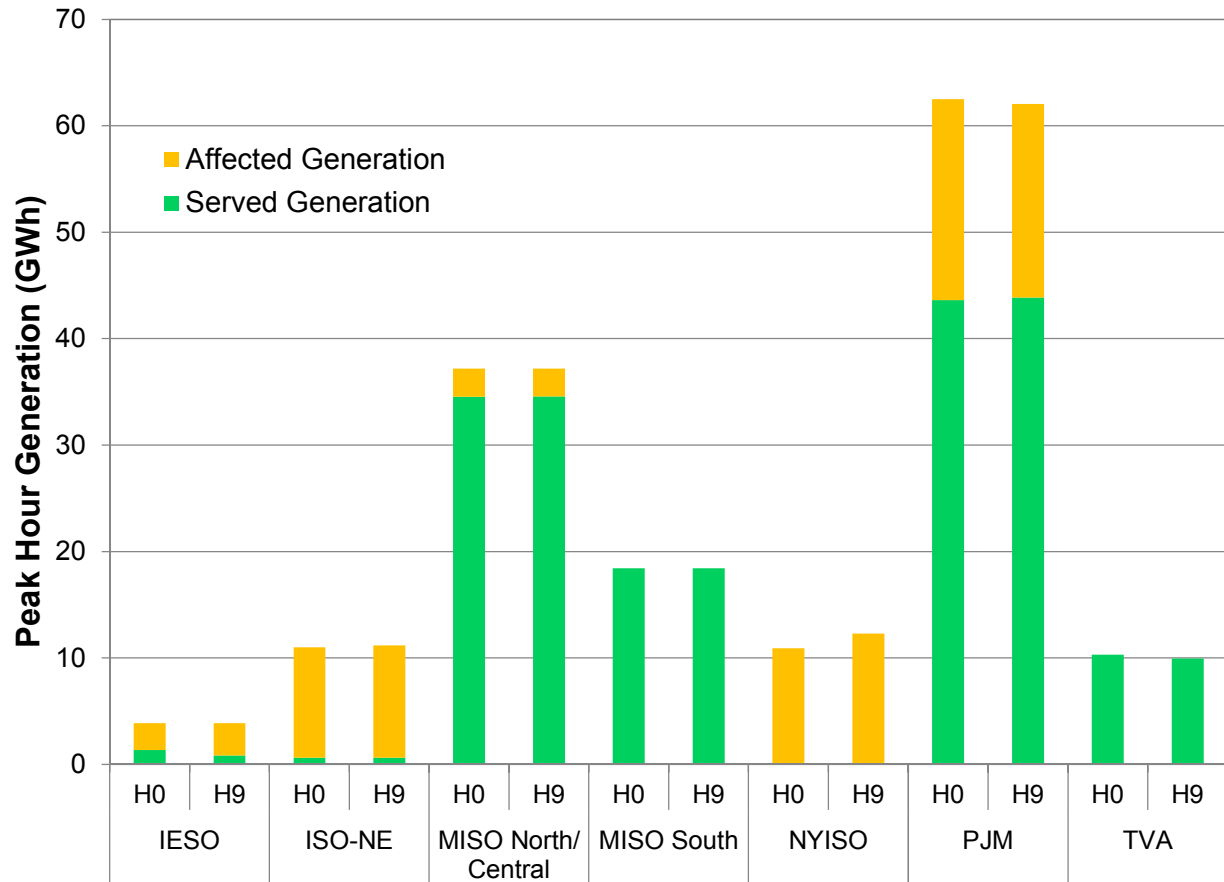


Figure I32 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I21.

Table I21. HGDS S9 Winter 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	24.1	3,216
Delaware	1.3	173
Maine	9.5	1,292
Maryland Eastern	5.0	539
Massachusetts Eastern	14.5	2,023
Massachusetts Western	7.8	1,059
New Hampshire	13.0	1,764
New Jersey	26.8	3,459
New York Central Northern	38.8	4,933
New York City	21.2	2,813
New York Long Island	8.9	1,048
New York Southern	17.5	2,257
New York Western	5.3	716
Ontario (CDA)	1.6	181
Ontario (EDA)	15.8	1,766
Ontario (NDA)	1.2	155
Ontario (StClair)	7.0	950
Pennsylvania Eastern	67.3	9,117
Pennsylvania Western	11.0	1,574
Rhode Island	9.2	1,194
Virginia	28.9	3,743
Wisconsin Eastern (RFC)	19.0	2,362
Wisconsin Western (MROE)	2.2	254

Figure I33 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I31 during the Winter 2018 peak hour.

Figure I33. HGDS S9 Winter 2018: Peak Hour Constraints

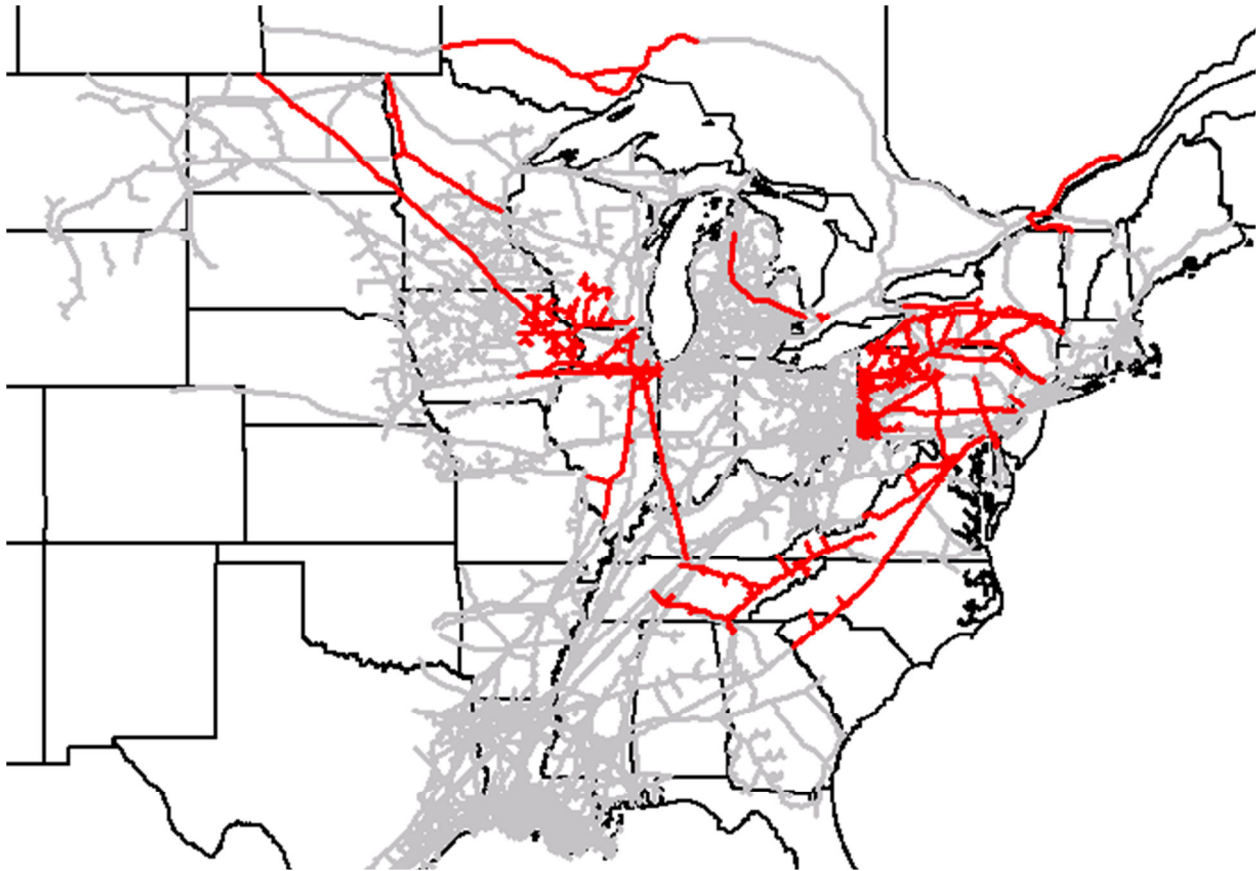


Table I22 summarizes the results of the frequency and duration analysis.

Table I22. HGDS S9 Winter 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Alliance	4	1	6	10
ANR Northern Illinois	10	1	35	59
Columbia Gas VA/MD	12	1	13	57
Columbia Gas W PA/NY	7	1	3	11
Constitution	2	31	59	90
Dominion Eastern NY	10	1	10	24
Dominion Western NY	6	1	12	34
Dominion Southeast	5	1	14	23
East Tennessee Mainline	6	2	8	26
Eastern Shore	13	1	31	61
Empire Mainline	8	1	13	33
Great Lakes East	12	1	30	66
Midwestern	17	1	12	58
Millennium	8	1	37	67
NB/NS Supply	15	1	19	56
NGPL IA/IL North	12	1	13	55
NGPL IA/IL South	11	1	11	48
Northern Border Chicago	14	1	10	45
Northern Natural D	1	4	1	8
Tennessee Z4 PA	7	1	47	72
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	2	31	59	90
Texas Eastern M3 North	4	1	57	83
TransCanada Ontario West	3	1	5	8
TransCanada Quebec	7	1	14	29
Transco Leidy Atlantic	3	3	55	89
Transco Z5	8	1	11	20
Transco Z6 Leidy to 210	2	31	59	90
Union Gas Dawn	4	1	3	6
Viking Z1	11	1	10	24

4.1.1 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 J279 and Figure J280 relative to the capacity of the segment.

4.1.2 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 J281 and Figure J282 relative to the capacity of the segment.

4.1.3 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 J283 and Figure J284 relative to the capacity of the segment.

4.1.4 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 J285 and Figure J286 relative to the capacity of the segment.

4.1.5 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 J287 and Figure J288 relative to the capacity of the segment.

4.1.6 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 J289 and Figure J290 relative to the capacity of the segment.

4.1.7 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 J291 and Figure J292 relative to the capacity of the segment.

4.1.8 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 J293 and Figure J294 relative to the capacity of the segment.

4.1.9 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 J295 and Figure J296 relative to the capacity of the segment.

4.1.10 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 J297 and Figure J298 relative to the capacity of the segments.

4.1.11 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 J299 and Figure J300 relative to the capacity of the segment.

4.1.12 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 J301 and Figure J302 relative to the capacity of the segment.

4.1.13 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 J303 and Figure J304 relative to the capacity of the segment.

4.1.14 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 J305 and Figure J306 relative to the capacity of the segment.

4.1.15 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 J307 and Figure J308 relative to the total production capacity. The generator gas demand in these figures only reflects generators located in the Study Region.

4.1.16 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 J309 and Figure J310 relative to the capacity of the segment.

4.1.17 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 J311 and Figure J312 relative to the capacity of the segment.

4.1.18 Northern Border Chicago

The 100% peak hour utilization on Northern Border's Chicago segment, 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. 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 J313 and Figure J314 relative to the capacity of the segment.

4.1.19 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 J315 and Figure J316 relative to the capacity of the segment.

4.1.20 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 J317 and Figure J318 relative to the capacity of the segment.

4.1.21 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 J319 and Figure J320 relative to the capacity of the segment.

4.1.22 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 J321 and Figure J322 relative to the capacity of the segment.

4.1.23 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 J323 and Figure J324 relative to the capacity of the segment.

4.1.24 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 J325 and Figure J326 relative to the capacity of the segment.

4.1.25 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 J327 and Figure J328 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.

4.1.26 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 J329 and Figure J330 relative to the capacity of the segment.

4.1.27 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 J331 and Figure J332 relative to the capacity of the segment.

4.1.28 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 J333 and Figure J334 relative to the capacity of the segment.

4.1.29 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 J335 and Figure J336 relative to the capacity of the segment.

4.1.30 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 J337 and Figure J338 relative to the capacity of the segment.

4.2 HGDS S9 SUMMER 2018

Figure I34 summarizes the affected generation during the Winter 2018 peak hour by PPA.

Figure I34. HGDS S9 Summer 2018: Peak Hour Affected Generation

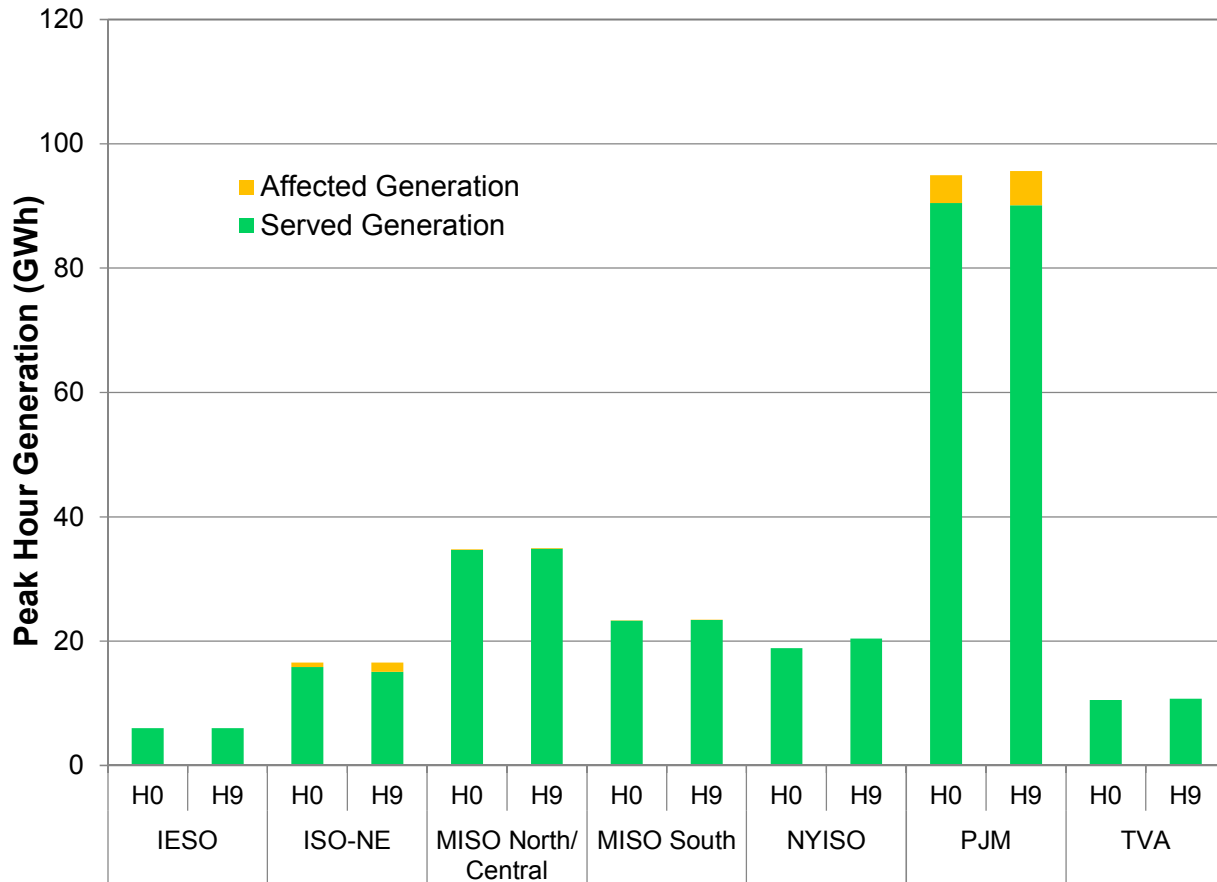


Figure I35 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I23.

Figure I35. HGDS S9 Summer 2018: Locations with Peak Hour Affected Generation

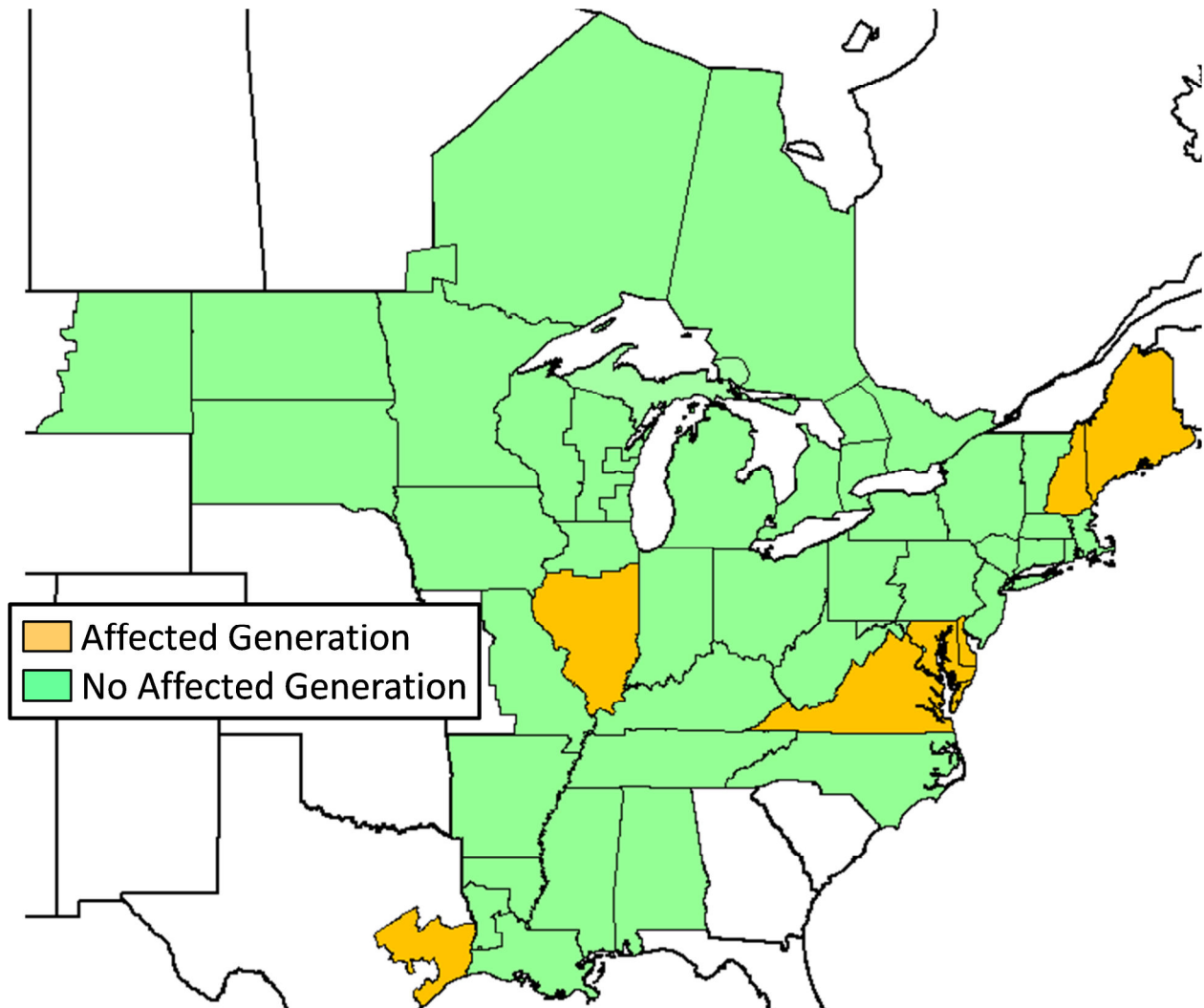


Table I23. HGDS S9 Summer 2018: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	9.0	1,223
Illinois Southern	1.0	112
Maine	4.0	540
Maryland Eastern	21.6	3,065
New Hampshire	7.2	933
Texas East (SERC)	0.5	70
Virginia	11.1	1,208

Figure I36 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I34 during the Summer 2018 peak hour.

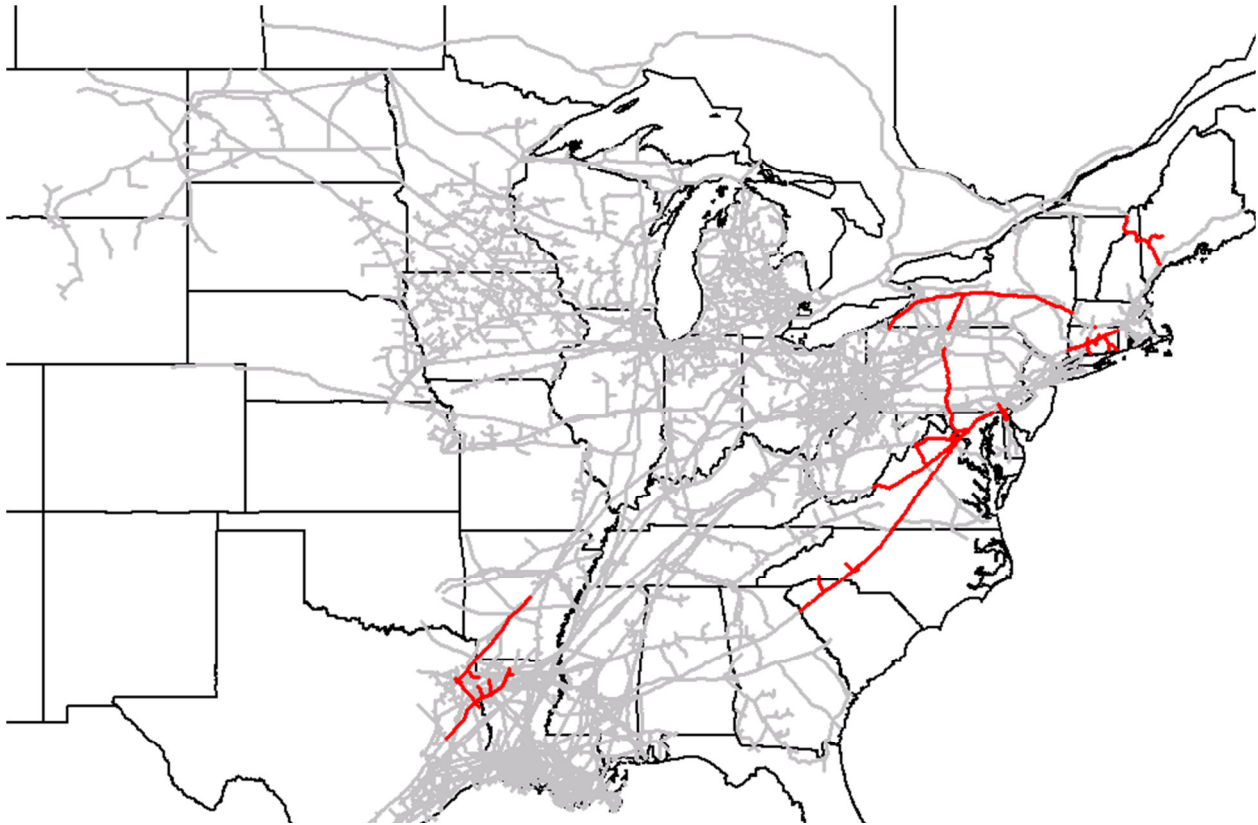
Figure I36. HGDS S9 Summer 2018: Peak Hour Constraints

Table I24 summarizes the results of the frequency and duration analysis.

Table I24. HGDS S9 Summer 2018: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	3	2	3	8
Columbia Gas VA/MD	8	1	16	42
Dominion Southeast	8	1	24	72
Eastern Shore	8	1	16	43
NB/NS Supply	2	5	74	79
PNGTS N of Westbrook	3	3	77	86
Texas Eastern Zone ETX	9	1	9	24
Transco Z5	7	1	40	70

4.2.1 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 J339 and Figure J340 relative to the capacity of the segment.

4.2.2 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 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 J341 and Figure J342 relative to the capacity of the segment.

4.2.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdt/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 J343 and Figure J344 relative to the capacity of the segment.

4.2.4 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 J345 and Figure J346 relative to the capacity of the segments.

4.2.5 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 J347 and Figure J348 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.

4.2.6 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 J349 and Figure J350 relative to the capacity of the segment.

4.2.7 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 J351 and Figure J352 relative to the capacity of the segment.

4.2.8 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 J353 and Figure J354 relative to the capacity of the segment.

4.3 HGDS S9 WINTER 2023

Figure I37 summarizes the affected generation during the Winter 2023 peak hour by PPA.

Figure I37. HGDS S9 Winter 2023: Peak Hour Affected Generation

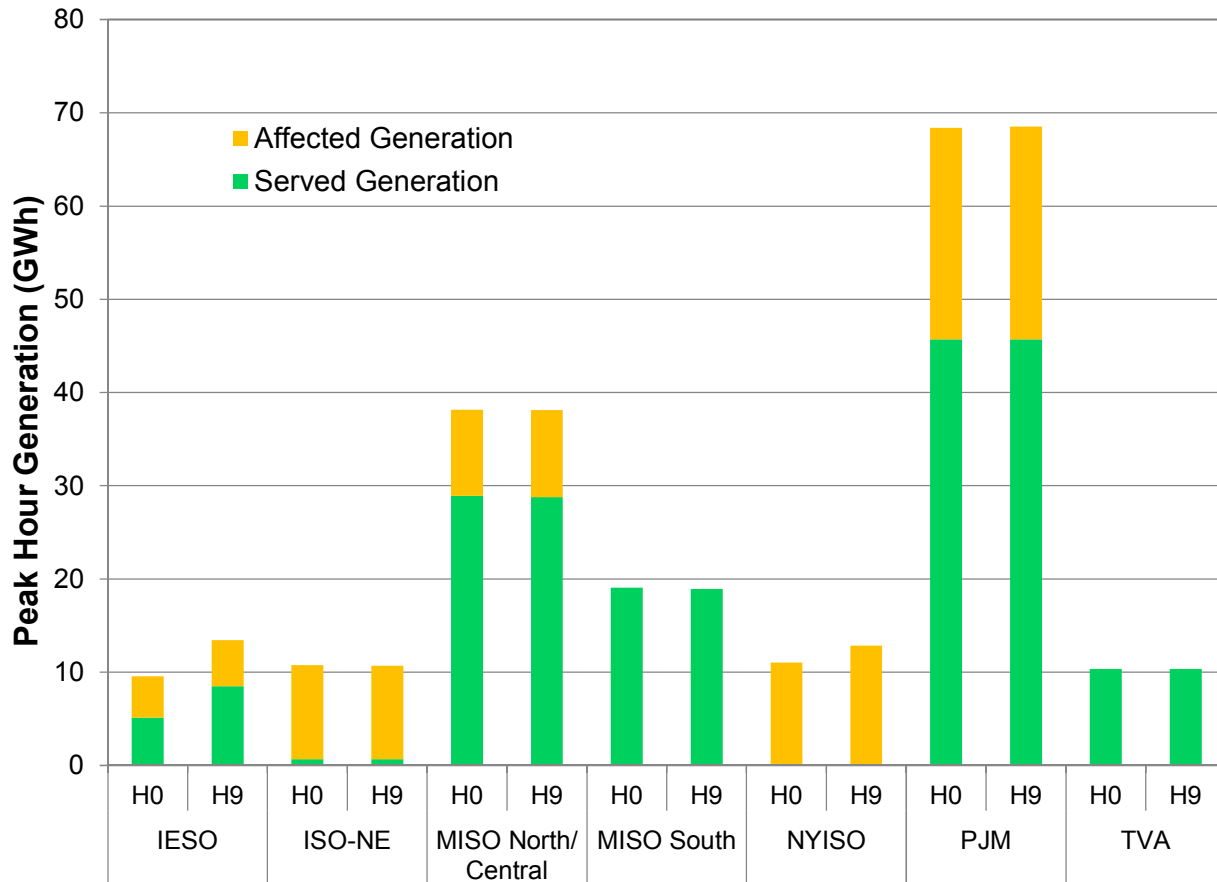


Figure I38 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I25.

Figure I38. HGDS S9 Winter 2023: Locations with Peak Hour Affected Generation

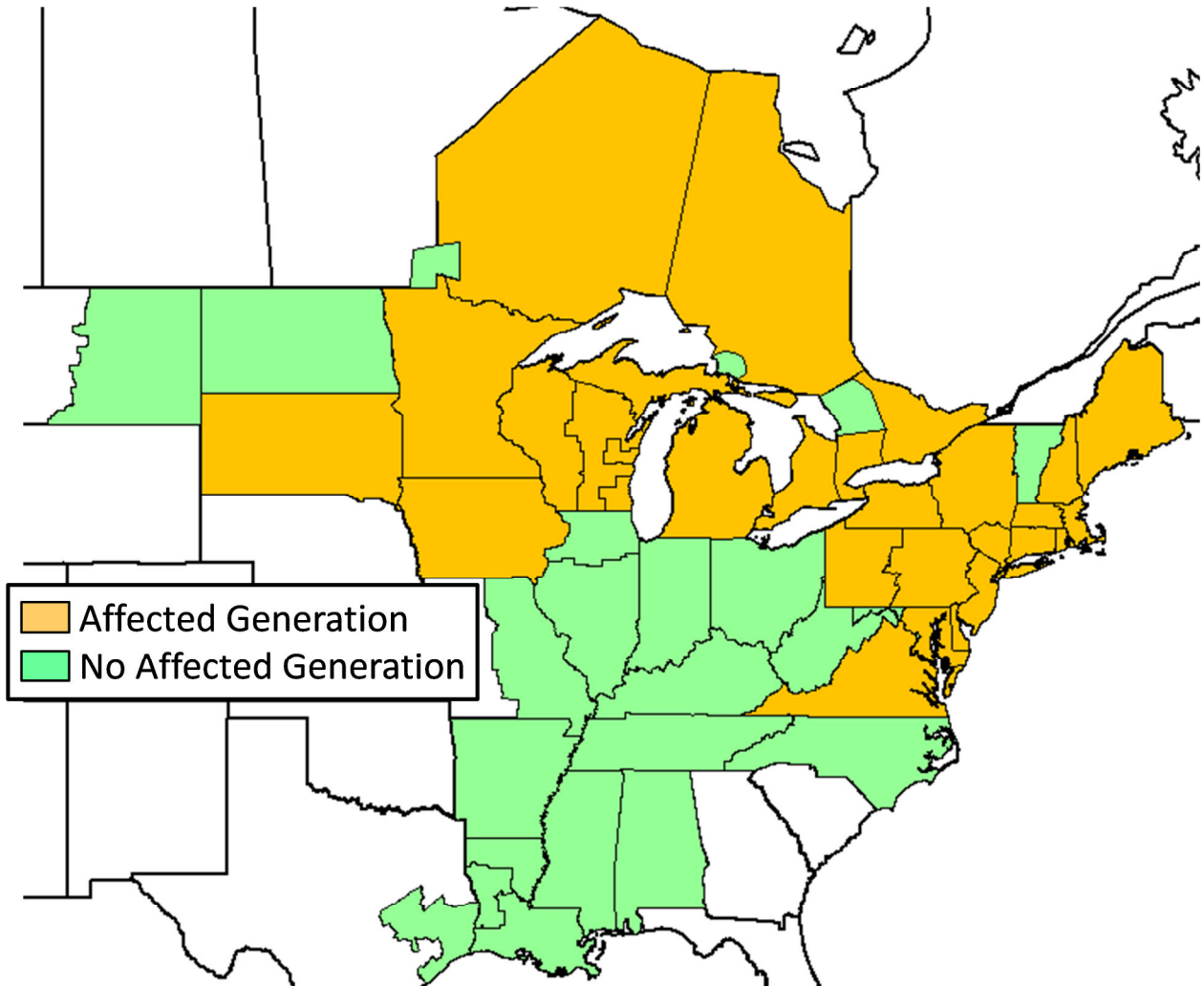


Table I25. HGDS S9 Winter 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Connecticut	17.1	2,385
Delaware	0.9	118
Iowa	12.6	1,716
Maine	12.7	1,799
Maryland Eastern	6.3	667
Massachusetts Eastern	13.8	1,927
Massachusetts Western	10.4	1,369
Michigan Lower Peninsula	0.1	11
Michigan Upper Peninsula	3.6	520
Minnesota	2.9	361
New Hampshire	16.7	2,284
New Jersey	17.2	2,387
New York Central Northern	42.4	4,958
New York City	19.8	2,628
New York Long Island	12.2	1,251
New York Southern	25.4	3,156
New York Western	5.9	774.9
Ontario (CDA)	1.6	181
Ontario (EDA)	15.8	2,172
Ontario (NDA)	1.2	155
Ontario (StClair)	17.2	2,410
Ontario (WDA)	0.4	38
Pennsylvania Eastern	93.3	12,864
Pennsylvania Western	11.0	1,574
Rhode Island	1.9	262
South Dakota	1.0	136
Virginia	42.3	5,181
Wisconsin Eastern (RFC)	30.3	3,921
Wisconsin Western (MROE)	20.2	2,467
Wisconsin Western (MROW)	2.0	204

Figure I39 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I37 during the Winter 2023 peak hour.

Figure I39. HGDS S9 Winter 2023: Peak Hour Constraints

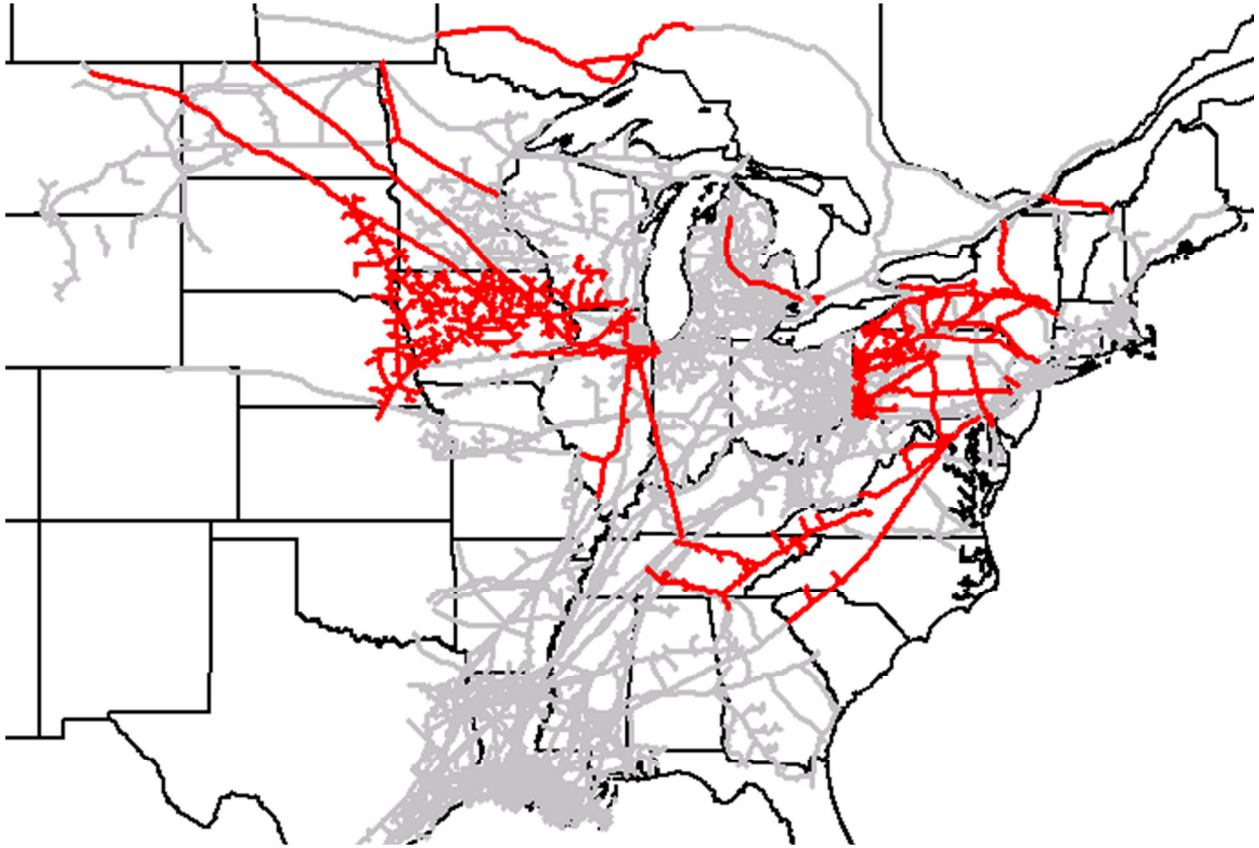


Table I26 summarizes the results of the frequency and duration analysis.

Table I26. HGDS S9 Winter 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Alliance	4	1	7	10
ANR Northern Illinois	11	1	17	55
Columbia Gas VA/MD	6	1	52	80
Columbia Gas W PA/NY	9	2	23	68
Constitution	2	31	59	90
Dominion Eastern NY	6	2	14	42
Dominion Western NY	7	1	15	37
Dominion Southeast	3	1	54	86
East Tennessee Mainline	6	2	8	26
Eastern Shore	5	1	3	9
Empire Mainline	7	1	16	41
Great Lakes East	3	13	59	89
Iroquois Zone 1	2	31	59	90
Midwestern	20	1	9	55
Millennium	2	31	59	90
NB/NS Supply	2	31	59	90
NGPL IA/IL North	11	1	19	54
NGPL IA/IL South	9	1	11	40
Northern Border Mainline	3	1	2	2
Northern Natural ABC	6	1	33	43
Northern Natural D	9	1	10	29
Tennessee Z4 PA	4	9	48	77
Tennessee Z5 NY	2	31	59	90
Texas Eastern M2 PA South	2	31	59	90
Texas Eastern M3 North	4	1	54	84
TransCanada Ontario West	5	2	11	22
TransCanada Quebec to PNGTS	2	31	59	90
Transco Leidy Atlantic	7	3	27	83
Transco Z5	7	1	14	28
Transco Z6 Leidy to 210	2	31	59	90
Union Gas Dawn	7	1	5	15
Vector Z1	4	1	8	12
Viking Z1	12	1	17	59

4.3.1 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 J355 and Figure J356 relative to the capacity of the segment.

4.3.2 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 J357 and Figure J358 relative to the capacity of the segment.

4.3.3 Columbia Gas Virginia / Maryland

The 100% peak hour utilization on Columbia Gas's Virginia/Maryland segment, which is modeled with a capacity of 2,867 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 J359 and Figure J360 relative to the capacity of the segment.

4.3.4 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 J361 and Figure J362 relative to the capacity of the segment.

4.3.5 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 J363 and Figure J364 relative to the capacity of the segment.

4.3.6 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 J365 and Figure J366 relative to the capacity of the segment.

4.3.7 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 J367 and Figure J368 relative to the capacity of the segment.

4.3.8 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 J369 and Figure J370 relative to the capacity of the segment.

4.3.9 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 J371 and Figure J372 relative to the capacity of the segment.

4.3.10 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 J373 and Figure J374 relative to the capacity of the segments.

4.3.11 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 J375 and Figure J376 relative to the capacity of the segment.

4.3.12 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 J377 and Figure J378 relative to the capacity of the segment.

4.3.13 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 J379 and Figure J380 relative to the capacity of the segment.

4.3.14 Midwestern

The 100% peak hour utilization on Midwestern's mainline segment, which is modeled with a capacity of 635 MDth/d, potentially affects generators 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 J381 and Figure J382 relative to the capacity of the segment.

4.3.15 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, 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 J383 and Figure J384 relative to the capacity of the segment.

4.3.16 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 J385 and Figure J386 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.

4.3.17 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 J387 and Figure J388 relative to the capacity of the segment.

4.3.18 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 J389 and Figure J390 relative to the capacity of the segment.

4.3.19 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 J391 and Figure J392 relative to the capacity of the segment.

4.3.20 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 J393 and Figure J394 relative to the capacity of the segment.

4.3.21 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 J395 and Figure J396 relative to the capacity of the segment.

4.3.22 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 J397 and Figure J398 relative to the capacity of the segment.

4.3.23 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 J399 and Figure J400 relative to the capacity of the segment.

4.3.24 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 J401 and Figure J402 relative to the capacity of the segment.

4.3.25 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 J403 and Figure J404 relative to the capacity of the segment.

4.3.26 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 J405 and Figure J406 relative to the capacity of the segment.

4.3.27 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 J407 and Figure J408 relative to the capacity of the segment.

4.3.28 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 J409 and Figure J410 relative to the capacity of the segment.

4.3.29 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 J411 and Figure J412 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.

4.3.30 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 J413 and Figure J414 relative to the capacity of the segment.

4.3.31 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 J415 and Figure J416 relative to the capacity of the segment.

4.3.32 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 J417 and Figure J418 relative to the capacity of the segment.

4.3.33 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 J419 and Figure J420 relative to the capacity of the segment.

4.4 HGDS S9 SUMMER 2023

Figure I40 summarizes the affected generation during the Summer 2023 peak hour by PPA.

Figure I40. HGDS S9 Summer 2023: Peak Hour Affected Generation

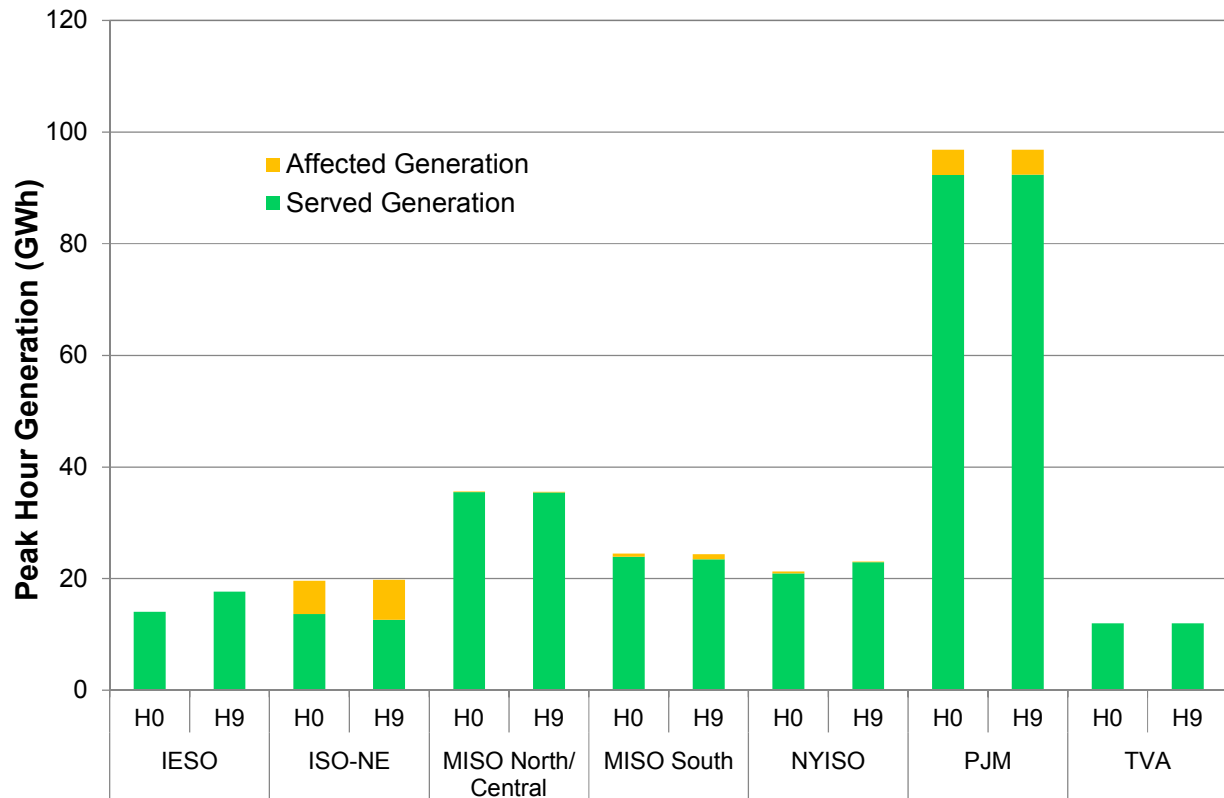


Figure I41 summarizes the unserved demand by GPCM location. The unserved demand and affected generation by location are quantified in Table I27.

Figure I41. HGDS S9 Summer 2023: Locations with Peak Hour Affected Generation

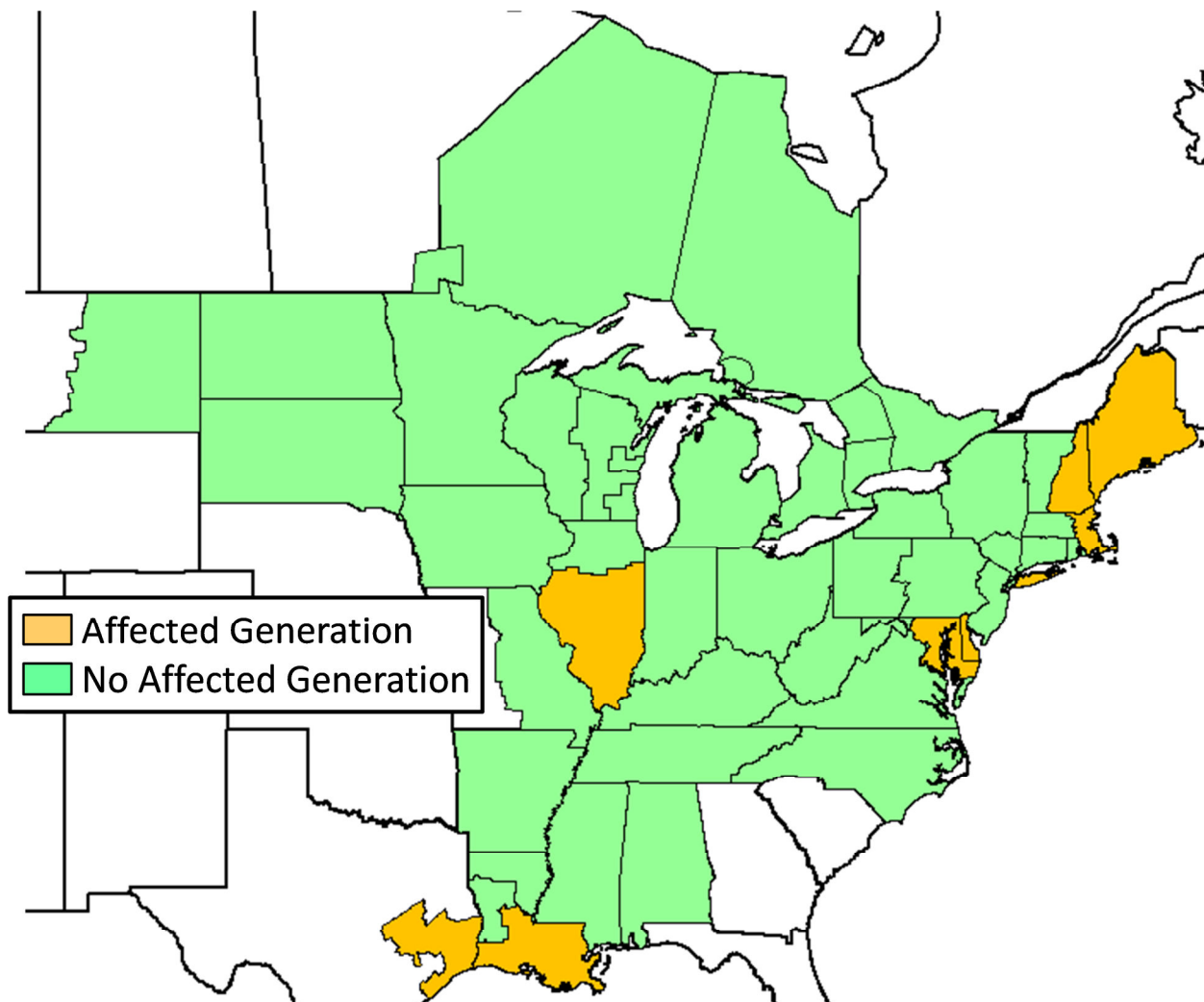


Table I27. HGDS S9 Summer 2023: Peak Hour Unserved Generation Demand and Affected Generation

Location	Unserved Generation Gas Demand (MDth)	Affected Generation (MWh)
Delaware	8.6	1,188
Illinois Southern	1.0	112
Louisiana Southern	3.2	416
Maine	17.3	2,335
Maryland Eastern	16.7	2,361
Massachusetts Eastern	20.7	2,780
New Hampshire	15.2	2,085
New York Long Island	0.8	81
Texas East (SERC)	3.6	511
Virginia	8.4	936

Figure I42 shows the constrained pipeline segments, in red, that result in the affected generation shown in Figure I40 during the Summer 2018 peak hour.

Figure I42. HGDS S9 Summer 2023: Peak Hour Constraints

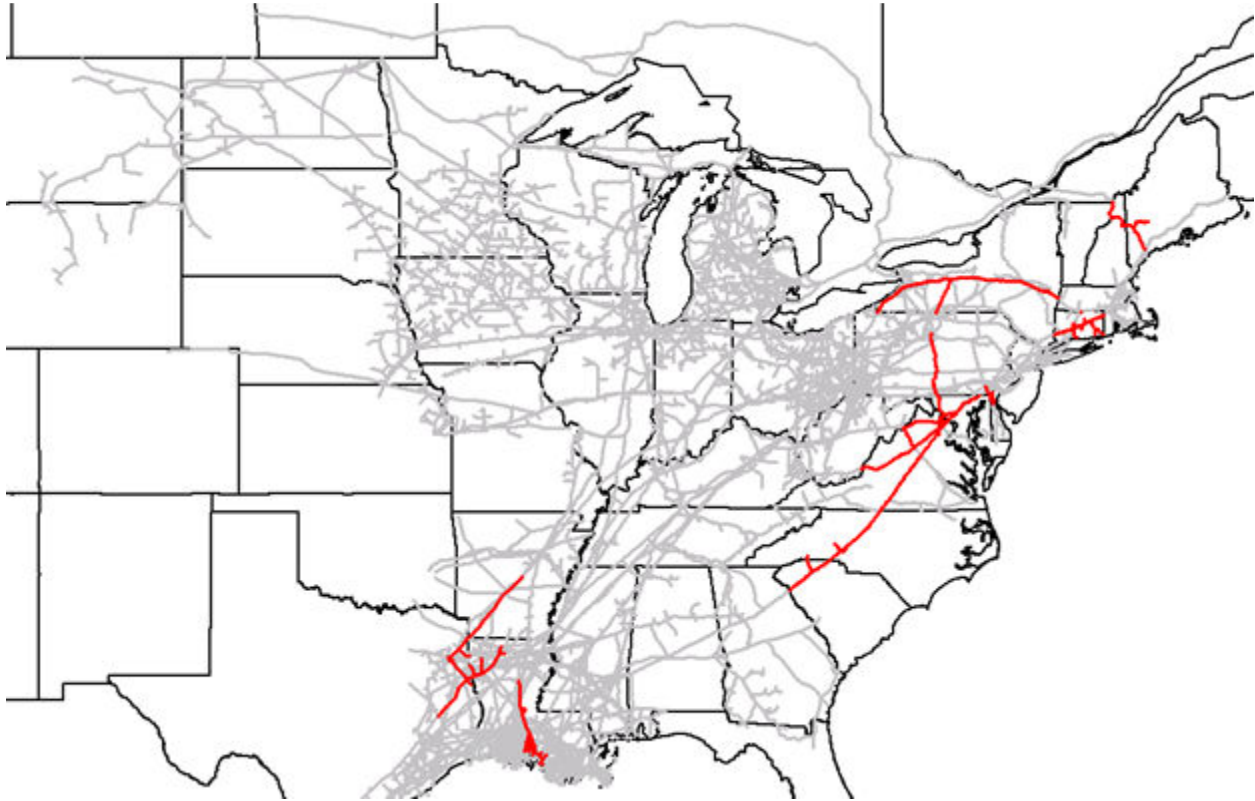


Table I28 summarizes the results of the frequency and duration analysis.

Table I28. HGDS S9 Summer 2023: Frequency and Duration of Constraints

Constraint	# of Events	Min. Duration (Days)	Max. Duration (Days)	Total # of Days
Algonquin Connecticut	10	1	23	59
Columbia Gas VA/MD	5	1	6	12
Dominion Southeast	9	2	19	67
Eastern Shore	9	1	15	40
Gulf South Zone 2 HH	7	2	6	29
Iroquois Z1 → Z2	8	1	8	34
NB/NS Supply	6	2	23	69
PNGTS N of Westbrook	6	2	23	69
Tennessee Z5 NY	1	92	92	92
Texas Eastern Zone ETX	10	1	17	42
Transco Z5	7	1	16	43

4.4.1 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 J421 and Figure J422 relative to the capacity of the segment.

4.4.2 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 J423 and Figure J424 relative to the capacity of the segment.

4.4.3 Dominion Southeast

Dominion Southeast is modeled with a capacity of 540 Mdt/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 J425 and Figure J426 relative to the capacity of the segment.

4.4.4 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 J427 and Figure J428 relative to the capacity of the segments.

4.4.5 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 J429 and Figure J430 relative to the capacity of the segment.

4.4.6 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 J431 and Figure J432 relative to the capacity of the segment.

4.4.7 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 J433 and Figure J434 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.

4.4.8 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 J435 and Figure J436 relative to the capacity of the segment.

4.4.9 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 J437 and Figure J438 relative to the capacity of the segment.

4.4.10 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 J439 and Figure J440 relative to the capacity of the segment.

4.4.11 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 J441 and Figure J442 relative to the capacity of the segment.