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January 4, 2010

VIA HAND DELIVERY AND U.S. MAIL

Terry J. Romine
Executive Secretary
Public Service Commission
6 Saint Paul Street
Baltimore, Maryland 21202

Re: The Potomac Edison Company's Application for a Certificate of Public Convenience and Necessity To Construct the Maryland Segments of a 765 kV Electric Transmission Line and a Substation in Frederick County, Maryland

Dear Ms. Romine:

On December 21, 2009, The Potomac Edison Company ("Potomac Edison") filed an Application to Construct the Maryland Segments of a 765 kV Electric Transmission Line and a Substation in Frederick County, Maryland (the Maryland Segments of the "PATH Project")[1]. On that same date, PATH Allegheny Virginia Transmission Corporation ("PATH-VA") filed a Motion to Withdraw Application and Terminate Proceeding ("Motion") with the Virginia State Corporation Commission in which PATH–VA requested approval to withdraw its application for authorization to construct those segments of the PATH Project in Virginia. In its December 21, 2009 Motion, PATH–VA stated its intention was to file a new application in 2010 based on the most current information then available with regard to the PATH Project and to propose a procedural schedule for the Commission's consideration that would be aligned with the existing procedural schedule for the pending application in West Virginia and the recently-filed

[1] The PATH Project is an approximately 276 mile transmission line stretching from West Virginia, into Virginia, and into Maryland where it is proposed to connect with the existing 500 kV transmission system in Maryland at the proposed Kemptown Substation.

application in Maryland for the portions of the PATH Project that will be constructed in those states.[2]

On December 29, 2009, PATH-VA amended its Motion to Withdraw to provide information regarding the sensitivity analyses ordered by the Virginia Hearing Examiner on December 4, 2009.[3] In the amendment, PATH-VA quoted a letter from PJM Interconnection, L.L.C. ("PJM") stating that the analyses "suggest that the PATH Project appears not to be needed in 2014." PATH-VA stated that PJM's full 2010 RTEP process will dictate when a future application for the PATH Project would be filed in Virginia but that it is not expected to be filed earlier than the third quarter of 2010.[4]

The West Virginia Commission's procedural schedule for consideration of the PATH Project sets June 29, 2010 as the date for the filing of supplemental direct testimony regarding electrical need. This schedule will permit the West Virginia case to be updated with information on electrical need and a new projected in-service date after the results of a comprehensive analysis in the context of the 2010 RTEP process are known.

In Maryland, Potomac Edison will request that the Commission follow a similar procedural process as has been adopted in West Virginia. Potomac Edison will work with entities that wish to participate in the review of the PATH Project in Maryland to develop a schedule in Maryland that will permit the review of non-need issues associated with the project to proceed while accommodating the filing of supplemental electrical need testimony reflecting the outcome of the 2010 RTEP.[5] Potomac Edison believes this supplemental testimony should

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[2] In November 2009, the West Virginia Public Service Commission granted a motion for modification of the procedural schedule for consideration of the PATH Project and the Virginia Commission denied a similar motion.

[3] The sensitivity analyses ordered by the Virginia Hearing Examiner were filed on January 4, 2010 and a copy of the filing is enclosed. These sensitivity analyses also relate to the timing of the electrical need for the PATH Project in Maryland and West Virginia.

[4] On December 30, 2009 at the conclusion of oral argument on the Motion to Withdraw, the Virginia Hearing Examiner suspended the procedural schedule with regard to the filing of rebuttal testimony by PATH-VA, discovery and the start of the evidentiary hearing on January 19, 2010 pending the Virginia Commission's consideration of the motion to withdraw.

[5] Potomac Edison recognizes that the Federal Energy Regulatory Commission ("FERC") backstop permitting authority could cause concern with the scheduling discussed above. At this time, Potomac Edison is willing to commit to the Commission that it would not seek FERC backstop siting authority under Section 216(b)(1)(C) of the Federal Power Act prior to June 29,

be filed contemporaneously with supplemental testimony in West Virginia. In addition, assuming the Motion to Withdraw is granted in Virginia, a new application for authorization to construct the PATH Project in that state would be expected to be filed shortly after supplemental need testimony is filed in West Virginia and Maryland, thereby further aligning consideration of the PATH Project in all three states where it is proposed to be constructed.

Potomac Edison will be available at the January 6, 2010 Administrative Meeting to provide the Commission with additional information on the procedural issues associated with this Application, including the tolling of the date when an application for the PATH Project could be filed with FERC.

Respectfully submitted,

J. Joseph Curran, III
Mindy L. Herman
Saul Ewing LLP
500 East Pratt Street
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(410) 332-8600

Attachment
cc: Service List Attached

2011, a full year after the proposed filing date for the supplemental testimony on the need for the project.

HUNTON & WILLIAMS

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January 4, 2010

Via Electronic Filing

Hon. Joel H. Peck
Clerk
State Corporation Commission
Document Control Center
Tyler Building, 1st Floor
1300 East Main Street
Richmond, Virginia 23219

Application of
PATH Allegheny Virginia Transmission Corporation for
Certificates of Public Convenience and Necessity to Construct Facilities:
765 kV Transmission Line through Loudoun, Frederick, and Clarke Counties
Case No. PUE-2009-00043

Dear Mr. Peck:

Hearing Examiner Alexander F. Skirpan, Jr. issued a Ruling on December 4, 2009 ("Ruling") that directed PATH Allegheny Virginia Transmission Corporation ("PATH-VA") "to present the results of PJM's load deliverability and generator deliverability tests for 2014, 2015 and 2016" for 6 specified scenarios ("sensitivity analyses"). (Ruling at 2) In addition, the Hearing Examiner asked that, along with the results of those sensitivity analyses, PATH-VA submit a schedule of changes in generation from its April 2009 load flow analysis. (Ruling at 3) At PATH-VA's request, PJM Interconnection, L.L.C. prepared those sensitivity analyses and the results are enclosed with explanatory text along with a schedule of generation changes from the April 2009 load flow analysis.

Sincerely yours,

Richard D. Gary

RDG/tms

HUNTON & WILLIAMS

Enclosure
cc: Hon. Alexander F. Skirpan, Jr.
William H. Chambliss, Esq.
Service List
Randall B. Palmer, Esq.
Noelle J. Coates, Esq.

PATH-VA Response to

Hearing Examiner's Ruling of December 4, 2009

The Hearing Examiner's ruling of December 4, 2009 directed PATH-VA to present the results of several sensitivity analyses related to the need for the PATH Project. These analyses incorporate the assumptions set forth below but such analyses are not the equivalent of a comprehensive RTEP analysis. Only the results of a comprehensive analysis in the context of the 2010 RTEP Process can be used to determine and support a definitive assessment as to the future need and in-service date for the PATH Project. While the results of these sensitivity analyses apply directly to the need date for the PATH Project, they suggest the potential for delays to other projects as well. In addition, these sensitivity analyses did not integrate any of the transmission system upgrades approved as part of the RTEP during 2009. The interactions among any potentially delayed projects and the transmission system, including the 2009 RTEP projects, must be examined in detail to ensure that no violations of reliability criteria exist before delaying previously approved projects. Lastly, as the sensitivity results demonstrate, the timing of criteria violations related to load deliverability analyses is noticeably impacted by the amount of demand response resources in an area under test. If, as expected, some number of RTEP projects are to be delayed as a result of the comprehensive 2010 RTEP analysis, it will be critical to examine the results of the 2013/14 RPM Base Residual Auction in that analysis to ensure that the appropriate need dates are identified.

At the request of PATH-VA as directed by the Hearing Examiner's December 4 ruling, PJM performed additional generation deliverability and load deliverability testing for the scenarios listed below:

1. PATH's April 2009 load flow analyses updated to reflect the following changes in generation: (i) all existing generation as of December 7, 2009, which is not scheduled to be retired before 2014; (ii) all proposed generation that cleared the May 2009 RPM Auction; and (iii) all proposed generation with a signed ISA as of December 7, 2009 ("Scenario 1 generation");

2. PATH's April 2009 load flow analyses updated for the changes in Scenario 1 generation, and updated to reflect PJM's 2010 load forecast;

3. PATH's April 2009 load flow analyses updated for the changes in Scenario 1 generation, and updated to reflect the demand response and energy efficiency resources that cleared the May 2009 RPM Auction;

4. PATH's April 2009 load flow analyses updated for the changes in Scenario 1 generation, and PJM's 2010 load forecast (*i.e.*, Scenario 2) and updated to

reflect the demand response and energy efficiency resources that cleared the May 2009 RPM Auction;

5. PATH's April 2009 load flow analyses updated for the changes in Scenario 1 generation, PJM's 2010 load forecast, and to reflect the demand response and energy efficiency resources that cleared the May 2009 RPM Auction (*i.e.*, Scenario 4), and updated to reflect the forecasted additional demand response and energy efficiency resources for Virginia shown in Table 6 on page 25 of Sierra Club witness Fagan's pre-filed direct testimony. The amounts for years 2014, 2015, and 2016 are shown as 367, 420, and 469, respectively, and

6. PATH's April 2009 load flow analyses updated for the changes in Scenario 1 generation, PJM's 2010 load forecast, the demand response and energy efficiency resources that cleared the May 2009 RPM Auction, and the forecasted additional demand response and energy efficiency resources for Virginia shown in Table 6 on page 25 of Sierra Club witness Fagan's pre-filed direct testimony (*i.e.*, Scenario 5) and updated to reflect the forecasted additional demand response and energy efficiency resources for the Mid-Atlantic shown in Table 6 on page 25 of Sierra Club witness Fagan's pre-filed direct testimony. The amounts for years 2014, 2015, and 2016 are shown as 1,825, 2,140, and 2,403, respectively.

The April 2009 study and the December 2009 sensitivity analyses started with the same base case and transmission topology. The April 2009 study used the PJM 2009 Load Forecast which included the demand response that cleared in the 2011/12 RPM base residual auction held in May 2008. The December 2009 sensitivity analyses used load forecast, demand response and energy efficiency assumptions consistent with the scenarios defined above. In addition, the December 2009 sensitivity analyses included updated generation information. All existing generation expected to be in-service beginning in June 2014 was included. Generation from recently announced retirements such as Eddystone 1 & 2, Cromby 1 & 2, Vineland 8, Kearny 11 & 12, Benning, Buzzard, Indian River 1 & 2 and Hudson 1 were all off-line in the case used for the December 2009 sensitivity analyses. New generation which had progressed to the point of executing an ISA as well as new generation that cleared in the May 2009 RPM base residual auction for 2012/13 were included in the case along with all of their associated network upgrades. Attachment A includes a table identifying these new generation resources, added to the analysis since the April 2009 study.

New Capacity Emergency Transfer Objectives (CETO) were calculated for each of the locational deliverability areas (LDA) that were tested under each scenario. The calculated CETOs are shown in the following table.

Scenario	Dominion	Mid-Atlantic	Southern Mid-Atlantic	Eastern Mid-Atlantic
S1	1340	8510	6890	9210
S2	2310	8160	6930	8790
S3	960	5460	5900	8100
S4	1930	5130	5950	7690
S5	1530	NA	NA	NA
S6	NA	3120	5670	6460

Table 1 – CETO Values Used in the December 2009 Sensitivity Analyses

The detailed results of the thermal analyses are shown in the attached spreadsheets, included in Attachment B. Each spreadsheet is labeled corresponding to the scenario that was tested. The results of the analyses from Scenario 5 and Scenario 6 were combined into a single table.

The detailed results of the reactive analyses are shown in the Table 2 below. Note that there were no voltage criteria violations identified for Scenarios 3 through 6 that would require the PATH Project in 2014. Although there are no voltage criteria violations in 2014 for Scenarios 3 through 6, the additional analysis that is described below suggests voltage criteria violations could occur as early as 2016, based on observed CETO margins and forecasted load growth. A more comprehensive analysis of these issues will be completed as part of the 2010 RTEP.

Item #	Contingency	Scenario 1 Mid-Atlantic Load Deliverability	Scenario 2 Mid-Atlantic Load Deliverability	Scenario 1 Eastern Mid-Atlantic Load Deliverability	Scenario 2 Eastern Mid-Atlantic Load Deliverability	Scenario 2 Southern Mid-Atlantic Load Deliverability
1	Bedington - Black Oak	Collapse	Collapse			Collapse
2	Bedington 500 kV capacitor	Collapse				
3	Doubs 230 kV capacitor	Collapse				
4	Keystone - Jacks Mountain	Collapse	Collapse			
5	Hunterstown - Conastone	Collapse	Collapse	Collapse	Collapse	
6	Conemaugh - Hunterstown	Collapse	Collapse	Collapse	Collapse	
7	South Bend - Keystone	Collapse	Collapse			
8	Doubs - Brighton	Collapse	Collapse			
9	Conastone - Brighton	Collapse				
10	Conemaugh - Keystone	Collapse	Collapse			
11	Black Oak - Hatfield	Collapse	Collapse			
12	Conemaugh - Jacks Mountain	Collapse	Collapse			
13	Jacks Mountain - Juniata #2	Collapse	Collapse			
14	Jacks Mountain - Juniata #1	Collapse	Collapse			
15	Mt. Storm - T157	Collapse				
16	Doubs - T157	Collapse	Collapse			
17	Calvert Cliffs Generator #1	Collapse				
18	Calvert Cliffs Generator #2	Collapse				
19	Calvert Cliffs - Waugh Chapel # 1	Collapse				
20	Calvert Cliffs - Waugh Chapel # 2	Collapse	Collapse			
21	Bedington - Doubs	Collapse			Collapse	
22	Conastone - Peach Bottom	Collapse	Collapse	Collapse	Collapse	
23	South Bend - Yukon	Collapse	Collapse			
24	Susquehanna Generator # 2	Collapse	Collapse	Collapse	Collapse	
25	Bethlehem Steel generators	Collapse	Collapse	Collapse	Collapse	
26	Rock Spring CT 3 & CT 4	Collapse			Collapse	
27	Rock Spring CT 1 & CT 2	Collapse			Collapse	
28	Juniata - Sunbury - Susquehanna	Collapse				
29	Limerick Generator # 2	Collapse		Collapse	Collapse	
30	Limerick Generator # 1	Collapse	Collapse			
31	Mt. Storm - Meadow Brook # 2	Collapse				
32	Conastone 500 kV capacitor	Collapse			Collapse	
33	Juniata - TMI	Collapse		Collapse	Collapse	
34	TMI 500 kV capacitor	Collapse			Collapse	
35	Susquehanna 500 kV capacitor	Collapse		Collapse	Collapse	
36	Jacks Mountain capacitor	Collapse	Collapse		Collapse	
37	Alburtis 500 kV capacitor	Collapse		Collapse	Collapse	
38	Juniata 500 kV capacitor	Collapse	Collapse		Collapse	
39	Hunterstown Generator S1	Collapse				
40	Peach Bottom Generator # 3	Collapse				
41	Yukon - T174 Tap	Collapse	Collapse			
42	Limerick 500 kV capacitor	Collapse		Collapse	Collapse	
43	Peach Bottom P04 generators	Collapse	Collapse		Collapse	

Table 2 – Voltage Violations Identified in the December 2009 Sensitivity Analyses

In addition to the voltage studies noted above, PJM was able to do limited "PV" or "power-voltage" analysis for Scenario 3 to evaluate the impact of critical contingencies on system voltages as power transfers are increased across the system. The results of the PV analysis are shown in the following figures. Figure 1 below shows the voltage magnitude at the Meadow Brook 500 kV Substation as transfers into the Mid-Atlantic LDA increase, for the contingency loss of the Bedington – Black Oak 500 kV line. Figure 1 shows that, with increasing levels of megawatt (MW) transfers to the Mid-

Atlantic LDA, the voltage at the Meadow Brook 500 kV Substation drops reaching a 5% voltage drop limit at 6,260 MW, the steady state stability limit at transfer levels of approximately 6,790 MW, and a voltage collapse at a transfer level of approximately 6,830 MW. The CETO for the Mid-Atlantic LDA for this scenario is shown at 5,460 MW.

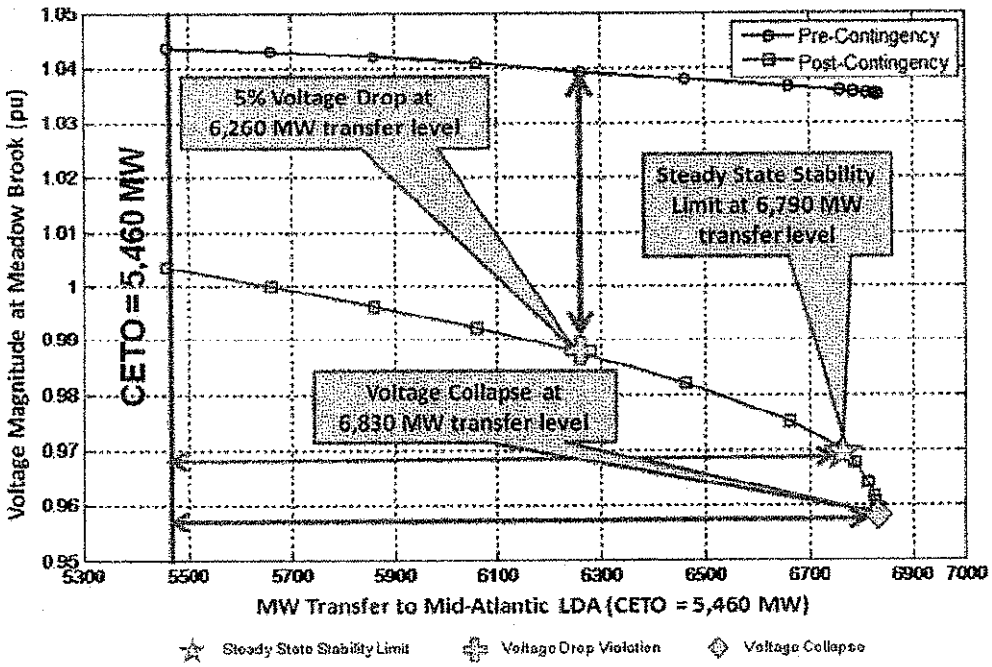

Figure 1. Voltage Magnitude at Meadow Brook 500 kV vs. MW Transfer to Mid-Atlantic LDA for Scenario 3. (Contingency: Loss of Bedington to Black Oak 500 kV)

Figure 2 shows the post contingency voltage at the Meadow Brook 500 kV Substation versus the post contingency flow on the Meadow Brook – Loudoun 500 kV line. The steady state stability limit is indicated at the "knee of the curve" where the flow on the line reduces as transfers into the Mid-Atlantic LDA are increased. The knee of the curve is reached when the transfers into the Mid-Atlantic LDA are approximately 6,790 MW. Recall the CETO for the Mid-Atlantic LDA for this scenario is 5,460 MW.

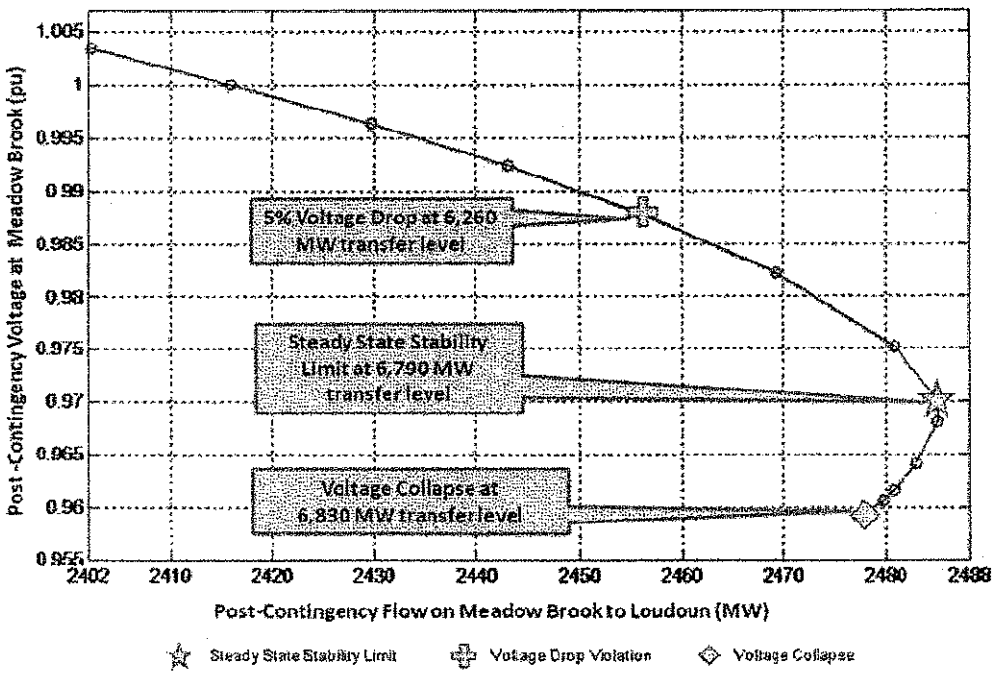

Figure 2. Voltage Magnitude at Meadow Brook 500 kV vs. Post-Contingency Flow on Meadow Brook to Loudoun 500 kV for Scenario 3. (Contingency: Loss of Bedington to Black Oak 500 kV)

ATTACHMENT A

ID	Bus Name	Area #	Area Name	April 2009 GD PMAX (MW)	December 2009 GD PMAX (MW)	PMAX Change (MW)	Reason for change
1	HNSMLK 1	226	PENELEC	54	53.5	-0.5	CIR Changes
1	HNSMLK 2	226	PENELEC	54	53.5	-0.5	CIR Changes
1	HNSMLK 3	226	PENELEC	54	53.5	-0.5	CIR Changes
1	HNSMLK 4	226	PENELEC	54	53.5	-0.5	CIR Changes
1	HNSMLK 5	226	PENELEC	54	53.5	-0.5	CIR Changes
1	Q53C	226	PENELEC		10	10	Q53 ISA
1	TMI 1GEN	227	METED	786	810	24	T182 Interim ISA
1	CROMBY 1	230	PECO	144		-144	Deactivation
1	CROMBY 2	230	PECO	201		-201	Deactivation
1	EDDYSTN1	230	PECO	279		-279	Deactivation
1	EDDYSTN2	230	PECO	309		-309	Deactivation
1	FORDACT1	230	PECO	157	176	19	R81 ISA
1	FORDACT2	230	PECO	157	176	19	R81 ISA
1	FORDAST1	230	PECO	233.1	245	11.9	R81 ISA
1	FORDBCT1	230	PECO	157	176	19	R81 ISA
1	FORDBCT2	230	PECO	157	176	19	R81 ISA
1	FORDBST1	230	PECO	233	245	12	R81 ISA
1	KEARNY11	231	PSEG	130.3		-130.3	Deactivation
1	KRNY9&10	231	PSEG	126		-126	Deactivation
3	VNLD 8-9	234	AEP	11		-11	Deactivation
4	HR4	235	DP&L	189	187	-2	T51 ISA
1	HR1	235	DP&L	121	126	5	T51 ISA
2	HR2	235	DP&L	121	126	5	T51 ISA
3	HR3	235	DP&L	121	126	5	T51 ISA
5	HR5	235	DP&L	126	125	-1	T52 ISA
6	HR6	235	DP&L	126	125	-1	T52 ISA
7	HR7	235	DP&L	126	125	-1	T52 ISA
8	HR8	235	DP&L	187	190	3	T52 ISA
1	VAUGHN	235	DP&L	5	4	-1	T12 modification
1	05KEYSTN	205	AEP	50	55	5	Q10 ISA
2	05KEYSTN	205	AEP	50	55	5	Q10 ISA
3	05KEYSTN	205	AEP	50	55	5	Q10 ISA
4	05KEYSTN	205	AEP	50	54	4	Q10 ISA
1	05BSG1	205	AEP	260	280	20	R62 ISA
1	05SOLIDA	205	AEP	165		-165	P30 Suspended
5	09STUART	209	DAY	2.3	2.8	0.5	CIR Changes
2	DRESD;2U	222	CE	867	937	70	Q49 Interim ISA
3	DRESD;3U	222	CE	867	937	70	Q50 Interim ISA
1	QUAD ;1U	222	CE	867	937	70	Q51 Interim ISA
2	QUAD ;2U	222	CE	867	937	70	Q51 Interim ISA
1	EQUIS; B	222	CE	21.7	21	-0.7	CIR Changes
4	EQUIS; B	222	CE	32.4	44	11.6	CIR Changes
2	EQUIS; B	222	CE	23.2	21	-2.2	CIR Changes
3	EQUIS; B	222	CE	22.7	21	-1.7	CIR Changes
1	R35	222	CE		50	50	R35 ISA
1	O33C	222	CE		4	4	O33 FSA
1	O59C	226	PENELEC		19.8	19.8	O59 FSA
1	O59E	226	PENELEC		79.2	79.2	O59 FSA
1	P14C	222	CE		16	16	P14 FSA
1	P26C	222	CE		4	4	P26 FSA
1	P52C	201	AP		16	16	P52 FSA
1	P58C	201	AP		16	16	P58 FSA
1	P59C	201	AP		25	25	P59 Interim ISA
1	Q34C	226	PENELEC		20	20	Q34 ISA
1	Q36C	226	PENELEC		12	12	Q36 ISA

1	Q43	205	AEP		534	534	Q43 Interim ISA
1	Q55C	201	AP		20	20	Q55 FSA
1	Q57C	222	CE		50	50	Q57 ISA
1	Q63C	226	PENELEC		16	16	Q63 FSA
1	Q72C	226	PENELEC		12	12	Q72 FSA
1	U2-059C	228	JCP&L		0.8	0.8	U2-59 ISA
1	S06C	205	AEP		40	40	S06 ISA
1	R52A_C	209	DAY		20	20	R52 FSA
1	S41_69	229	PL	12.5		-12.5	S41 Suspended ISA
1	S45C	209	DAY		20	20	S45 FSA
1	S51_1C	209	DAY		9.9	9.9	S51 FSA
1	S51_2C	209	DAY		9.9	9.9	S51 FSA
1	S60	231	PSEG		63	63	S60 FSA
1	S61	231	PSEG		20	20	S61 FSA
1	S64	227	METED		18	18	S64 FSA
1	S67	232	BG&E		101	101	S67 ISA
1	S70_1	201	AP		18.2	18.2	S70 FSA
1	S70_2	201	AP		18.2	18.2	S70 FSA
1	S71C	205	AEP		24	24	S71 FSA
1	S-073C	205	AEP		20	20	S73 FSA
1	S72C_1	205	AEP		30	30	S72 FSA
1	S-073C	205	AEP		20	20	S73 FSA
1	S72C_2	205	AEP		30	30	S72 FSA
1	S17#1	233	PEPCO		112.5	112.5	S17 FSA
1	S17#2	233	PEPCO		112.5	112.5	S17 FSA
1	S103	226	PENELEC		57	57	S103 FSA
1	S107_CT1	234	AEP		160	160	S107 FSA
1	S107_CT2	234	AEP		160	160	S107 FSA
1	S107_ST	234	AEP		260	260	S107 FSA
1	S121	234	AEP		63	63	S121 ISA
1	U4-014C O	229	PL		3.8	3.8	U4-014 FSA
1	U4-030	222	CE		6	6	U4-030 FSA
1	U4-034C	205	AEP		5	5	U4-034 FSA
1	U4-035C	205	AEP		5	5	U4-035 FSA
1	U4-036C	231	PSEG		4.6	4.6	U4-036 FSA
1	U4-040C	227	METED		2	2	U4-040 FSA
1	U4-041C	227	METED		2	2	U4-041 FSA
1	U4-042C	227	METED		2	2	U4-042 FSA
1	U4-043C	227	METED		2	2	U4-043 FSA
1	U4-044C	227	METED		2	2	U4-044 FSA
1	U4-045C	226	PENELEC		2	2	U4-045 FSA
1	U4-046C	226	PENELEC		2	2	U4-046 FSA
1	U4-047C	226	PENELEC		2	2	U4-047 FSA
1	U4-048C	226	PENELEC		2	2	U4-048 FSA
1	V1-021C	234	AEP		1.7	1.7	V1-021 FSA
1	V1-030 11	231	PSEG		2.2	2.2	V1-030 FSA
1	V1-030 13	231	PSEG		1.6	1.6	V1-030 FSA
1	V1-030 1C	231	PSEG		0.9	0.9	V1-030 FSA
1	V1-030 2C	231	PSEG		2.4	2.4	V1-030 FSA
1	V1-030 4C	231	PSEG		0.6	0.6	V1-030 FSA
1	V1-030 5C	231	PSEG		1.5	1.5	V1-030 FSA
1	V1-030 6C	231	PSEG		0.6	0.6	V1-030 FSA
1	V1-030 7C	231	PSEG		0.5	0.5	V1-030 FSA
1	V1-030 8C	231	PSEG		0.6	0.6	V1-030 FSA
1	V1-030 10	231	PSEG		2.9	2.9	V1-030 FSA
1	V1-030 12	231	PSEG		2.8	2.8	V1-030 FSA
1	T-39C	201	AP		3.6	3.6	T39 FSA

1	T-41 1	231	PSEG		44.5	44.5	T41 cleared in 2012/13 RPM BRA
1	T-41 2	231	PSEG		44.5	44.5	T41 cleared in 2012/13 RPM BRA
1	T-41 3	231	PSEG		44.5	44.5	T41 cleared in 2012/13 RPM BRA
1	T-41 4	231	PSEG		44.5	44.5	T41 cleared in 2012/13 RPM BRA
1	T-42 O	231	PSEG		44	44	T42 FSA
1	T-42 O	231	PSEG		44	44	T42 FSA
1	T-43 1	231	PSEG		44.5	44.5	T43 FSA
1	T-43 2	231	PSEG		44.5	44.5	T43 FSA
1	T-43 3	231	PSEG		44.5	44.5	T43 FSA
1	T-43 4	231	PSEG		44.5	44.5	T43 FSA
1	T-45 1	231	PSEG		41	41	T45 FSA
1	T-45 2	231	PSEG		41	41	T45 FSA
1	T-45 3	231	PSEG		41	41	T45 FSA
1	T-45 4	231	PSEG		41	41	T45 FSA
1	T-45 5	231	PSEG		41	41	T45 FSA
1	T-48C	209	DAY		10	10	T48 FSA
1	T-54	234	AEP		6.6	6.6	T54 cleared in 2012/13 RPM BRA
1	V1-030 3C	231	PSEG		0.6	0.6	V1-030 FSA
1	T55	234	AEP	12.4	15.3	2.9	T55 cleared in 2012/13 RPM BRA
1	V1-030 9C	231	PSEG		0.6	0.6	V1-030 FSA
1	V1-030 14	231	PSEG		2.1	2.1	V1-030 FSA
1	T-59	234	AEP		12.9	12.9	T59 cleared in 2012/13 RPM BRA
1	T-76	226	JCP&L		27.3	27.3	T76 cleared in 2012/13 RPM BRA
1	T-84C	234	AEP		35	35	T84 FSA
1	T-84C	234	AEP		35	35	T84 FSA
1	T-94	205	AEP		1035	1035	T94 FSA
1	T-107	231	PSEG		312.5	312.5	T107 FSA
1	T-107	231	PSEG		156.2	156.2	T107 FSA
1	T-107	231	PSEG		156.2	156.2	T107 FSA
1	T-109	225	PJM 500		20	20	T109 FSA
1	T-110	225	PJM 500		20	20	T110 FSA
1	T-117C #	236	UGI		48	48	T117 ISA
1	T-117C #	236	UGI		48	48	T117 ISA
1	T-117E #	236	UGI		30	30	T117 ISA
1	T-126C	205	AEP		22.7	22.7	T126 cleared in 2012/13 RPM BRA
1	T-130C	205	AEP		60	60	T130 FSA
1	T-131C	205	AEP		30	30	T131 FSA
1	T-133	233	PEPCO		225	225	T133 FSA
1	T-134	233	PEPCO		325	325	T134 FSA
1	T-135	234	AEP		15	15	T135 FSA
1	T-142C	205	AEP		60	60	T142 FSA
1	T-146C	234	AEP		69.2	69.2	T146 FSA
1	CE23CL12	222	CE		4	4	L12_CE23 FSA
1	T-155	201	AP		6	6	T155 FSA
1	T-156	201	AP		20	20	T156 FSA
1	T-157C	201	AP		32	32	T157 FSA
1	T-167	345	VAP		120	120	T167 FSA
1	T-174	201	AP		185	185	T174 FSA
1	T-174	201	AP		185	185	T174 FSA
1	T-174	201	AP		185	185	T174 FSA
1	T-174	201	AP		375	375	T174 FSA
1	T-180	345	VAP		185	185	T180 FSA
1	T-180	345	VAP		185	185	T180 FSA
1	T-180	345	VAP		280	280	T180 FSA
1	U1-10	225	PJM 500		18	18	U1-10 ISA
1	U1-31 G	234	AEP		40	40	U1-031 FSA
1	U1-31 G	234	AEP		40	40	U1-031 FSA

1	U1-56C	234	AEP		45.5	45.5	U1-056 FSA
1	U1-59C O	205	AEP		6.5	6.5	U1-059 FSA
1	U1-66	234	AEP		9	9	U1-066 FSA
1	U1-66	234	AEP		9	9	U1-066 FSA
1	U1-69	215	DLCO		30	30	U1-069 FSA
1	U1-75	201	AP		12	12	U1-075 FSA
1	U1-76	205	AEP		12	12	U1-076 FSA
1	U1-80	215	DLCO		35	35	U1-080 FSA
1	U1-90	209	DAY		12	12	U1-090 FSA
1	U2-031C	345	VAP		24.8	24.8	U2-031 FSA
1	U2-041C	205	AEP		19.5	19.5	U2-041 ISA
1	U2-045C	234	AEP		2.6	2.6	U2-045 FSA
1	U2-041C	205	AEP		19.5	19.5	U2-041 ISA
1	U2-068C	345	VAP		16.9	16.9	U2-068 FSA
1	U2-069C	229	PL		7.3	7.3	U2-069 FSA
1	U2-074	201	AP		300	300	U2-074 FSA
1	U2-074	201	AP		175	175	U2-074 FSA
1	U2-074	201	AP		175	175	U2-074 FSA
1	U2-085	229	PL	11.4		-11.4	U2-085 Withdrawn
1	N24 C	222	CE		2.2	2.2	N24 FSA
1	N25 C	222	CE		2.2	2.2	N25 FSA
1	N33 C 1	201	AP	12		-12	N33 Suspended
1	O21C	209	DAY	9.6		-9.6	O21 Withdrawn
1	O52C	226	PENELEC	20	10	-10	O52 ISA
1	U1-54 A	222	CE		33.6	33.6	U1-54 cleared in 2012/13 RPM BRA
1	U1-54 B	222	CE		12.1	12.1	U1-54 cleared in 2012/13 RPM BRA
1	P23C	231	PSEG	45.5		-45.5	P23 Withdrawn
1	P30	205	AEP	20		-20	P30 Suspended
1	P45C1	226	PENELEC	24		-24	P45 Withdrawn
1	P47C_2	226	PENELEC		20	20	P47 ISA
1	P54_GEN1	205	AEP	517.5		-517.5	P54 in service date postponed
1	P54_GEN2	205	AEP	517.5		-517.5	P54 in service date postponed
1	P60C	226	PENELEC		10.5	10.5	P60 ISA
1	Q08_OPT1	228	JCP&L	45		-45	Q08 Withdrawn
1	P24C	222	CE		4	4	P24 FSA
1	P25C	222	CE		4	4	P25 FSA
1	Q28C_A	229	PL	17		-17	Q28 Suspended
1	Q28C_B	229	PL	17		-17	Q28 Suspended
1	Q46	226	PENELEC		10	10	Q46 FSA
1	Q80GEN8	201	AP	750		-750	Q80 Withdrawn
1	R48C	205	AEP		9.6	9.6	R48 ISA
1	R52_1C	209	DAY		20	20	R52 FSA
1	R-049C	205	AEP		30	30	R49 FSA
1	R52_2C	209	DAY		20	20	R52 FSA
1	R61C	205	AEP	70		-70	R61 Withdrawn
1	R57E	227	METED	2		-2	R57 ISA
1	R58	231	PSEG	55		-55	R58 Withdrawn
1	R60_1C	205	AEP		23.2	23.2	R60 FSA
1	R60_2C	205	AEP		23.2	23.2	R60 FSA
1	R60_3C	205	AEP		23.6	23.6	R60 FSA
1	R92C	226	PENELEC	14		-14	R92 no ISA/FSA
1	V2-002	226	PENELEC		2.7	2.7	V2-002 FSA
1	V2-009C 1	231	PSEG		0.9	0.9	V2-009 FSA
1	V2-009C 2	231	PSEG		1.9	1.9	V2-009 FSA
1	V2-009C 3	231	PSEG		2.4	2.4	V2-009 FSA
1	V2-009C 4	231	PSEG		1.4	1.4	V2-009 FSA
1	V2-010C	228	JCP&L		7.6	7.6	V2-010 FSA

1	V2-012C	231	PSEG		2.8	2.8	V2-012 FSA
1	V2-025C	231	PSEG		2.7	2.7	V2-025 FSA
1	V2-041C	234	AEP		1.5	1.5	V2-041 FSA
1	U3-032C	228	JCP&L		6.5	6.5	U3-032 FSA
5	1CHESTF5	345	VAP	329	349	20	S80 ISA
6	1CHESTF6	345	VAP	648	685	37	S79 ISA
1	1SURRY 1	345	VAP	817.2	907.2	90	S113 & S114 ISA
1	1N ANNA1	345	VAP	924.3	1009.3	85	S108 & S112 ISA
2	1N ANNA2	345	VAP	938	993.7	55.7	S109 & S110 ISA
2	1SURRY 2	345	VAP	820.1	910.1	90	S111 & S115 ISA
3	1MT STM3	345	VAP	506	550	44	S74 - S76 ISA
1	P08CT1	345	VAP	151		-151	P08 Withdrawn
1	P08CT2	345	VAP	151		-151	P08 Withdrawn
1	P08ST	345	VAP	273.8		-273.8	P08 Withdrawn
1	S82#3	345	VAP	20	19	-1	S82 ISA
1	S83#4	345	VAP	20	19	-1	S83 ISA
1	S84#5	345	VAP	20	19	-1	S84 ISA
1	S85#6	345	VAP	20	19	-1	S85 ISA
1	S99#5	345	VAP	20		-20	S99 Withdrawn
1	R19	345	VAP		340	340	R19 ISA
1	R63	345	VAP		19	19	R63 ISA
1	R80ST	345	VAP		10	10	R80 ISA
1	R80CT1	345	VAP		25	25	R80 ISA
1	R80CT2	345	VAP		25	25	R80 ISA
1	S102	345	VAP		170	170	S102 ISA
1	S81	345	VAP		22	22	S81 ISA
1	T-49 9	225	PJM 500		9	9	T49 ISA
1	T-49 2	225	PJM 500		6	6	T49 ISA
1	T-49 3	225	PJM 500		6	6	T49 ISA
1	T-49 4	225	PJM 500		9	9	T49 ISA
1	T-49 6	225	PJM 500		6	6	T49 ISA
1	T-49 7	225	PJM 500		6	6	T49 ISA
1	T75	228	JCP&L		20	20	T75 ISA
1	U2-30C	201	AP		7.8	7.8	U2-030 ISA
1	U2-61C	201	AP		6.5	6.5	U2-061 ISA
1A	05BEVERL	205	AEP	175	181	6	S35 ISA
1B	05BEVERL	205	AEP	175	181	6	S35 ISA
1S	05BEVERL	205	AEP	250	258	8	S35 ISA
P	FISK ;BP	222	CE		97.3	97.3	Units missing from model
P	FISK ;RP	222	CE		99.9	99.9	Units missing from model
W3	CAYUG;1U	222	CE		30	30	Capacity of O51 (30 of 60 MW)
W4	CAYUG;2U	222	CE		30	30	Capacity of O51 (30 of 60 MW)
W2	CRESC;2U	222	CE	48	0	-48	Wind Energy
A	1OMF A	345	VAP	40	49	9	S50 ISA
B	1OMF B	345	VAP	40	49	9	S50 ISA
H1	1MT STM1	345	VAP	262.5	279.5	17	S74 - S76 ISA
L1	1MT STM1	345	VAP	263.5	280.5	17	S74 - S76 ISA
H2	1MT STM2	345	VAP	263.5	279.5	16	S74 - S76 ISA
L2	1MT STM2	345	VAP	264.5	280.5	16	S74 - S76 ISA

ATTACHMENT B

Thermal Violations of NERC Reliability Standards Identified in the December 2009 Sensitivity Study

Scenario 1 Thermal

	Electrical Occurrence	Electrical Result	PJM Reliability Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Outage of Conemaugh - Keystone 500 kV	Keystone - Jacks Mtn 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	99.68	101.02	102.39	103.74	104.86	106.04	107.04	108.25	109.51	110.61	111.89
2	Outage of Kammer - South Canton 765 kV	Kammer - West Bellaire 345 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	98.89	100.34	101.81	103.46	104.82	106.21	107.73	109.26	110.81	112.42	114.01
3	Outage of Conemaugh - Juniata 500 kV	Jacks Mtn - Juniata 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	99.16	100.16	101.18	102.17	102.95	103.75	104.40	105.23	106.10	106.82	107.68
4	Outage of Juniata - Keystone 500 kV	Jacks Mtn - Juniata 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	99.14	100.14	101.16	102.16	102.94	103.75	104.40	105.23	106.10	106.84	107.70
5	Outage of Keystone - Jacks Mtn 500 kV	Keystone - Conemaugh 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	98.57	100.09	101.63	103.18	104.47	105.85	107.04	108.44	109.90	111.20	112.70
6	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2016)	MAAC Load Deliverability	97.37	98.96	100.53	102.27	103.87	105.72	107.55	109.36	111.22	113.08	115.10
7	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2017)	MAAC Load Deliverability	96.77	98.38	99.96	101.71	103.32	105.19	107.04	108.86	110.73	112.60	114.63
8	Outage of Conemaugh - Jacks Mtn 500 kV	Keystone - Jacks Mtn 500 kV exceeds its emergency rating and overloads (2018)	MAAC Load Deliverability	96.90	97.90	98.91	99.90	100.69	101.50	102.18	103.00	103.87	104.61	105.48
9	Outage of Black Oak - Hatfield 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2018)	MAAC Load Deliverability	94.38	95.90	97.39	99.04	100.56	102.31	104.06	105.77	107.52	109.28	111.18
10	Outage of Black Oak - Hatfield 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	93.31	94.81	96.29	97.93	99.43	101.17	102.90	104.60	106.35	108.09	109.98
11	Outage of Loudoun - Meadow Brook 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	93.08	94.61	96.12	97.79	99.33	101.11	102.86	104.59	106.37	108.15	110.08
12	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	91.48	93.08	94.77	96.67	98.42	100.49	102.54	104.62	106.80	109.00	111.35
13	Outage of Loudoun - Meadow Brook 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	92.05	93.57	95.06	96.72	98.25	100.01	101.75	103.46	105.23	107.00	108.92
14	Outage of Ft Martin-Harrison-Kammer 500 kV	Harrison - Pruntytown 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	86.87	88.56	90.40	92.53	94.48	96.84	99.22	101.70	104.36	107.08	110.00
15	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - My Storm 500 kV exceeds its emergency rating and overloads (2022)	VAP Load Deliverability	83.20	84.92	86.82	89.02	91.12	93.66	96.11	98.66	101.44	104.26	107.33

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16	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - My Storm 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	83.13	84.85	86.75	88.95	91.05	93.59	96.04	98.59	*101.37*	*104.19*	*107.26*
17	Outage of Mt Storm - Meadow Brook 500 kV	Greenland Gap - Meadow Brook 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	85.56	87.08	88.68	90.48	92.18	94.20	96.18	98.16	*100.26*	*102.38*	*104.66*
18	Outage of Ft Martin-Harrison-Kammer 500 kV	Pruntytown - My Storm 500 kV exceeds its emergency rating and overloads (2023)	VAP Load Deliverability	82.24	83.89	85.70	87.79	89.80	92.22	94.55	96.97	99.61	*102.27*	*105.18*
19	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2023)	SWMAAC Load Deliverability	85.18	86.79	88.37	90.12	91.73	93.60	95.45	97.27	99.14	*101.01*	*103.04*
20	Outage of Mt Storm - Meadow Brook 500 kV	Mt Storm - Greenland Gap 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	84.07	85.57	87.15	88.93	90.61	92.61	94.56	96.53	98.61	*100.72*	*102.99*
21	Outage of Ft Martin-Harrison-Kammer 500 kV	Pruntytown - My Storm 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	80.12	81.77	83.58	85.67	87.68	90.10	92.43	94.85	97.49	*100.15*	*103.06*
22	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - My Storm 500 kV exceeds its emergency rating and overloads (2024)	SWMAAC Load Deliverability	78.25	79.97	81.87	84.07	86.17	88.71	91.16	93.71	96.49	99.31	*102.38*
23	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2024)	VAP Load Deliverability	82.13	83.73	85.42	87.32	89.07	91.14	93.19	95.27	97.45	99.65	*102.00*
24	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2024)	SWMAAC Load Deliverability	84.06	85.65	87.22	88.96	90.56	92.41	94.24	96.05	97.91	99.77	*101.79*
25	Outage of Dooms - Lexington 500 kV	Bath County - Valley 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	82.62	84.05	85.56	87.23	88.77	90.58	92.39	94.20	96.09	98.00	*100.03*

Thermal Violations of NERC Reliability Standards Identified in December 2009 Study

Scenario 2 Thermal

	Electrical Occurrence	Electrical Result	PJM Reliability Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Outage of Kammer - South Canton 765 kV	Kammer - West Bellaire 345 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	99.28	100.35	101.35	102.37	103.43	104.50	105.73	106.53	107.78	108.94	110.20
2	Outage of Conemaugh - Keystone 500 kV	Keystone - Jacks Mtn 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	99.34	100.30	101.41	102.05	102.92	103.64	104.45	104.92	106.09	106.62	107.58
3	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2015)	MAAC Load Deliverability	98.54	100.12	101.41	102.90	104.41	106.04	107.81	109.17	110.88	112.58	114.34
4	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2016)	MAAC Load Deliverability	97.89	99.49	100.79	102.29	103.81	105.46	107.25	108.62	110.34	112.05	113.82
5	Outage of Conemaugh - Juniata 500 kV	Jacks Mtn - Juniata 500 kV exceeds its emergency rating and overloads (2016)	MAAC Load Deliverability	99.06	99.72	100.55	100.91	101.47	101.90	102.38	102.60	103.43	103.64	104.24
6	Outage of Juniata - Keystone 500 kV	Jacks Mtn - Juniata 500 kV exceeds its emergency rating and overloads (2016)	MAAC Load Deliverability	99.03	99.69	100.52	100.89	101.45	101.89	102.37	102.59	103.42	103.63	104.24
7	Outage of Keystone - Jacks Mtn 500 kV	Keystone - Conemaugh 500 kV exceeds its emergency rating and overloads (2016)	MAAC Load Deliverability	98.09	99.21	100.46	101.25	102.27	103.16	104.13	104.74	106.09	106.79	107.93
8	Outage of Black Oak - Hatfield 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2017)	MAAC Load Deliverability	96.41	97.91	99.13	100.53	101.95	103.48	105.16	106.43	108.04	109.63	111.27
9	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2018)	MAAC Load Deliverability	94.96	96.65	98.06	99.80	101.58	103.49	105.58	107.33	109.40	111.56	113.71
10	Outage of Black Oak - Hatfield 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2018)	MAAC Load Deliverability	95.31	96.79	98.00	99.38	100.79	102.31	103.97	105.23	106.83	108.41	110.04
11	Outage of Loudoun - Meadow Brook 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2018)	MAAC Load Deliverability	95.06	96.58	97.82	99.25	100.69	102.25	103.94	105.24	106.88	108.50	110.18
12	Outage of Loudoun - Meadow Brook 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	94.02	95.52	96.75	98.16	99.60	101.14	102.82	104.11	105.73	107.34	109.01
13	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	89.86	91.93	93.63	95.96	98.32	100.82	103.57	106.07	108.89	112.02	115.03

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Scenario 2 Thermal

14	Outage of Ft Martin - Harrison - Kammer 500 kV	Harrison - Pruntytown 500 kV exceeds its emergency rating and overloads (2019)	MAAC Load Deliverability	91.01	92.69	94.17	96.07	98.05	*100.15*	*102.50*	*104.54*	*107.07*	*109.71*	*112.35*
15	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2020)	VAP Load Deliverability	86.52	88.59	90.29	92.62	94.98	97.48	*100.23*	*102.73*	*105.55*	*108.68*	*111.69*
16	Outage of Conemaugh - Jacks Mtn 500 kV	Keystone - Jacks Mtn 500 kV exceeds its emergency rating and overloads (2020)	MAAC Load Deliverability	96.77	97.43	98.26	98.64	99.21	99.66	*100.15*	*100.39*	*101.22*	*101.46*	*102.08*
17	Outage of Mt Storm - Meadow Brook 500 kV	Greenland Gap - Meadow Brook 500 kV exceeds its emergency rating and overloads	MAAC Load Deliverability	89.89	91.66	93.05	94.87	96.69	98.65	*100.80*	*102.63*	*104.70*	*106.96*	*109.15*
18	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	86.52	88.54	90.17	92.43	94.70	97.11	99.76	*102.15*	*104.84*	*107.84*	*110.71*
19	Outage of Mt Storm - Meadow Brook 500 kV	Mt Storm - Greenland Gap 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	88.38	90.12	91.49	93.30	95.10	97.04	99.16	*100.98*	*103.04*	*105.28*	*107.45*
20	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	VAP	85.19	87.21	88.84	91.10	93.37	95.78	98.43	*100.82*	*103.51*	*106.51*	*109.38*
21	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	SWMAAC Load Deliverability	82.13	84.20	85.90	88.23	90.59	93.09	95.84	98.34	101.16	*104.29*	*107.30*
22	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	SWMAAC Load Deliverability	80.53	82.55	84.18	86.44	88.71	91.12	93.77	96.16	98.85	*101.85*	*104.72*
23	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2023)	VAP Load Deliverability	85.20	86.89	88.30	90.04	91.82	93.73	95.82	97.57	99.64	*101.80*	*103.95*
24	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	78.89	80.96	82.65	84.99	87.35	89.85	92.60	95.09	97.91	*101.05*	*104.06*
25	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2023)	SWMAAC Load Deliverability	86.71	88.31	89.61	91.11	92.63	94.28	96.07	97.44	99.16	*100.87*	*102.64*
26	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	78.71	80.73	82.36	84.62	86.89	89.29	91.94	94.34	97.03	*100.03*	*102.90*
27	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2024)	SWMAAC Load Deliverability	85.58	87.16	88.45	89.94	91.45	93.08	94.85	96.21	97.92	99.62	*101.38*
28	Outage of Dooms - Lexington 500 kV	Bath County - Valley 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	84.87	86.38	87.63	89.15	90.69	92.36	94.19	95.69	97.49	99.34	*101.19*
29	Outage of Mt Storm - Meadow Brook 500 kV	Greenland Gap - Meadow Brook 500 kV exceeds its emergency rating and overloads	SWMAAC Load Deliverability	81.46	83.23	84.62	86.44	88.26	90.22	92.37	94.20	96.27	98.53	*100.72*
30	Outage of Bedington - Black Oak 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	79.65	81.41	82.83	84.77	86.73	88.80	91.08	93.12	95.43	97.98	*100.44*

Thermal Violations of NERC Reliability Standards Identified in December 2009 Study

Scenario 3 Thermal

	Electrical Occurrence	Electrical Result	PJM Reliability Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	88.17	89.78	91.36	93.11	94.72	96.59	98.44	*100.26*	*102.13*	*104.00*	*106.03*
2	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	87.16	88.75	90.32	92.06	93.66	95.51	97.34	99.15	*101.01*	*102.87*	*104.89*
3	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Sform 500 kV exceeds its emergency rating and overloads (2023)	VAP Load Deliverability	80.36	82.08	83.98	86.18	88.28	90.82	93.27	95.82	98.60	*101.42*	*104.49*
4	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	79.01	80.73	82.63	84.83	86.93	89.47	91.92	94.47	97.25	*100.07*	*103.14*
5	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2024)	VAP Load Deliverability	79.41	81.06	82.87	84.96	86.97	89.39	91.72	94.14	96.78	99.44	*102.35*
6	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	82.35	83.95	85.64	87.54	89.29	91.36	93.41	95.49	97.67	99.87	*102.22*
7	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2024)	VAP Load Deliverability	81.41	83.01	84.70	86.60	88.35	90.42	92.47	94.55	96.73	98.93	*101.28*
8	Outage of Black Oak - Hatfield 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	83.90	85.42	86.91	88.56	90.08	91.83	93.58	95.29	97.04	98.80	*100.70*
9	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2024)	SWMAAC Load Deliverability	76.46	78.18	80.08	82.28	84.38	86.92	89.37	91.92	94.70	97.52	*100.59*
10	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	77.09	78.74	80.55	82.64	84.65	87.07	89.40	91.82	94.46	97.12	*100.03*

Thermal Violations of NERC Reliability Standards Identified in December 2009 Study

Scenario 4 Thermal

	Electrical Occurrence	Electrical Result	PJM Reliability Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	VAP	85.11	87.18	88.88	91.21	93.57	96.07	98.82	*101.32*	*104.14*	*107.27*	*110.28*
2	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	84.63	86.70	88.40	90.73	93.09	95.59	98.34	*100.84*	*103.66*	*106.79*	*109.80*
3	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2021)	MAAC Load Deliverability	89.88	91.48	92.78	94.28	95.80	97.45	99.24	*100.61*	*102.33*	*104.04*	*105.81*
4	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	SWMAAC Load Deliverability	84.34	86.41	88.11	90.44	92.80	95.30	98.05	*100.55*	*103.37*	*106.50*	*109.51*
5	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2022)	VAP Load Deliverability	83.91	85.93	87.56	89.82	92.09	94.50	97.15	99.54	*102.23*	*105.23*	*108.10*
6	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2022)	SWMAAC Load Deliverability	83.10	85.12	86.75	89.01	91.28	93.69	96.34	98.73	*101.42*	*104.42*	*107.29*
7	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	88.85	90.43	91.72	93.21	94.72	96.35	98.12	99.48	*101.19*	*102.89*	*104.65*
8	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	82.51	84.53	86.16	88.42	90.69	93.10	95.75	98.14	*100.83*	*103.83*	*106.70*
9	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	84.91	86.60	88.01	89.75	91.53	93.44	95.53	97.28	99.35	*101.51*	*103.66*
10	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	79.20	81.28	82.97	85.31	87.67	90.16	92.92	95.41	98.23	*101.37*	*104.38*
11	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2023)	VAP Load Deliverability	83.74	85.43	86.84	88.58	90.36	92.27	94.36	96.11	98.18	*100.34*	*102.49*
12	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	78.95	80.97	82.60	84.86	87.13	89.54	92.19	94.58	97.27	*100.27*	*103.14*
13	Outage of Mt Storm - Meadow Brook 500 kV	Greenland Gap - Meadow Brook 500 kV exceeds its emergency rating and overloads	MAAC Load Deliverability	82.93	84.70	86.09	87.91	89.73	91.69	93.84	95.67	97.74	*100.00*	*102.19*
14	Outage of Ft Martin - Harrison - Kammer 500 kV	Harrison - Pruntytown 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	79.86	81.54	83.02	84.92	86.90	89.00	91.35	93.39	95.92	98.56	*101.20*
15	Outage of Mt Storm - Meadow Brook 500 kV	Mt Storm - Greenland Gap 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	81.50	83.24	84.61	86.42	88.22	90.16	92.28	94.10	96.16	98.40	*100.57*
16	Outage of Mt Storm - Meadow Brook 500 kV	Greenland Gap - Meadow Brook 500 kV exceeds its emergency rating and overloads	SWMAAC Load Deliverability	80.84	82.61	84.00	85.82	87.64	89.60	91.75	93.58	95.65	97.91	*100.10*

Thermal Violations of NERC Reliability Standards Identified in December 2009 Study

	Electrical Occurrence	Electrical Result	PJM Reliability Test	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2021)	VAP Load Deliverability	84.37	86.71	88.63	91.19	93.78	96.50	99.25	*101.74*	*104.56*	*107.69*	*110.70*
2	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2022)	VAP Load Deliverability	83.23	85.45	87.26	89.69	92.14	94.72	97.36	99.76	*102.44*	*105.44*	*108.31*
3	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2022)	MAAC Load Deliverability	81.23	83.57	85.49	88.05	90.64	93.36	96.11	98.60	*101.42*	*104.55*	*107.56*
4	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2022)	VAP Load Deliverability	84.01	86.27	88.15	90.35	92.60	94.98	97.08	98.82	*100.90*	*103.06*	*105.20*
5	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	79.71	81.93	83.74	86.17	88.62	91.20	93.84	96.24	98.92	*101.92*	*104.79*
6	Outage of Mt Storm - 502 Junction 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	79.20	81.28	82.97	85.31	87.67	90.16	92.92	95.41	98.23	*101.37*	*104.38*
7	Outage of Bedington - Black Oak 500 kV	T157_TAP - Doubs 500 kV exceeds its emergency rating and overloads (2023)	MAAC Load Deliverability	83.25	85.52	87.37	89.43	91.51	93.70	95.49	96.86	98.58	*100.29*	*102.06*
8	Outage of Ft Martin - Harrison - Kammer 500 kV	Pruntytown - Mt Storm 500 kV exceeds its emergency rating and overloads (2023)	PJM GD	78.95	80.97	82.60	84.86	87.13	89.54	92.19	94.58	97.27	*100.27*	*103.14*
9	Outage of Bedington - Black Oak 500 kV	Mt Storm - T157_TAP 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	82.25	84.49	86.34	88.38	90.44	92.62	94.39	95.76	97.46	99.17	*100.92*
10	Outage of Bath County - Valley 500 kV	Lexington - Dooms 500 kV exceeds its emergency rating and overloads (2024)	MAAC Load Deliverability	79.04	81.30	83.18	85.38	87.63	90.01	92.11	93.85	95.93	98.09	*100.23*