

Congestion Severity Index

The lists on the following tabs are sorted by the Congestion Severity Index of the constraints. The Congestion Severity Index is based on the theoretical potential maximum number of dollars paid into the market by load serving entities due to congestion on the constraint in question. It is the maximum potential amount of money (in millions of dollars) that could have been saved over the course of this time period had the constraint not been bound. Both directions of the constraint are captured (there are a few constraints in ATC that have been bound in different directions at different times).

Hours

The "hours" measurements provided on the table is a measure duration of constraint binding. The number given is the total number of "hours" that the constraint occurred. RT data may have partial hours since RT constraints are bound in five minute intervals.

Day Ahead and Real Time

Day Ahead (DA) constraints indicate that MISO committed generation out of economic order in the Day Ahead market, meaning that more expensive generation is committed for the next day in order to avoid constraints that would occur if only the cheapest generation was scheduled to run. Real Time (RT) constraints show up when MISO did not anticipate overloads on the system in the Day Ahead market. Adjustments must be made to the generation mix during the operating day in order to mitigate constraints.

Potential Solution

Potential solutions have been provided for some constraints listed. These solutions may not have been designed for the sole purpose of alleviating the listed constraints and therefore will not necessarily fully mitigate the constraints, but will reduce the constraint's frequency and severity under normal operating conditions.

Severity Index	Hours	Constraint	Potential Solution
109.19	18,403	Total for all ATC Day Ahead constraints 1-1-2010 thru 12-31-2010	Solutions listed in ATC TYA unless otherwise noted
33.09	2,482	Pleasant Prairie - Zion 345 kV flo Cherry Valley - Silver Lake 345 kV (ComEd)	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
12.56	512	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
7.48	3,340	Nordic - Felch Tap 69 kV flo Chandler 138/69 kV Transformer T1	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014) Chandler 138/69 kV T2 (2012)
6.91	393	Granville - Butler 138 kV flo Granville - Tosa 138 kV	2010 Congestion Analysis
5.34	789	Oak Creek 345/230 kV Transformer T884 flo Oak Creek - Bluemound 230 kV	
4.68	93	Rocky Run 345/115 kV Transformer T1 flo Rocky Run 345/115 kV Transformer T4	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
4.49	493	Pleasant Prairie - Zion 345 kV flo Zion - Arcadian 345 kV	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
4.23	270	Spring Green - Arena 69 kV flo Wempletown - Paddock 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
3.69	977	Indian Lake 138/69 kV Transformer T2 flo Indian Lake 138/69 kV Transformer T1	Flow Control Device (Provisional, 2014)
3.04	1,441	Flow South PTDF	Flow Control Device (Provisional, 2014)
2.56	1,403	Chandler - Delta 69 kV CKT2 flo Chandler - Delta 69 kV CKT1	Chandler - Delta 69 kV Ckt 1 and Ckt 2 Line Uprate (Proposed, 2010)
1.53	143	Saukville - Edgewater 345 kV flo Point Beach - Sheboygan Energy Center 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
1.13	106	Arpin - Sigel 138 kV flo Arpin - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
1.05	56	Paddock 345/138 kV Transformer T21 flo Paddock - Rockdale 345 kV	Paddock - Rockdale 345 kV (Planned 2010)
1.02	226	McCue - REC Harmony Tap 69 kV flo Paddock - Rockdale 345 kV	Construct 69-kV double-circuit line between McCue and Lamar (Provisional, 2017)
0.92	61	Paddock - Town Line Road 138 kV flo Paddock - Blackhawk 138 kV	Paddock - Rockdale 345 kV (Planned 2010)
0.86	27	Arcadian 345/138 kV Transformer T3 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2015)
0.78	28	Arcadian 345/138 kV Transformer T3 flo Arcadian 345/138 kV Transformer T2	Replace Arcadian Transformers T2 and T3 (Provisional 2015)
0.63	53	Arpin 345/138 kV Transformer T21 flo Stone Lake - Gardner Park 345 kV	
0.62	22	Granville - Butler 138 kV flo Granville - Arcadian 345 kV	2010 Congestion Analysis
0.58	74	Albers - Kenosha 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.52	52	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.51	157	Verona - Oregon 69 kV flo Paddock - Rockdale 345 kV	
0.45	133	Nordic - Felch Tap 69 kV flo Plains - Arnold 138 kV ¹	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014) Chandler 138/69 kV T2 (2012)
0.40	31	Elkhart Lake - Forest Junction 138 kV flo Point Beach - Sheboygan Energy Center 345 kV +	Upgrades associated with G611 (Planned 2010) ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.40	65	Tecumseh Road 138/69 kV Transformer T1 flo Forest Junction - Glenview 138 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.40	211	New Holstein - St. Nazianz 69 kV flo Kewaunee - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.32	188	McGulpin - Straits 138 kV ckt 1 flo McGulpin - Straits 138 kV ckt 3	Flow Control Device (Provisional, 2014)
0.32	43	Spring Green - Arena 69 kV flo Columbia Unit #1	Rockdale - West Middleton 345 kV (Planned 2013)
0.32	246	M38 - Atlantic 69 kV flo Atlantic 138/69 kV Transformer TR1 ¹	ATC Michigan Energy Collaborative investigating potential solutions (2010)*

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1. This constraint may have been bound for other contingencies as well.

0.32	100	Watson Tap - Forsyth 69 kV flo Chandler 138/69 kV Transformer T1	Chandler 138/69 kV T2 (2012)
0.31	66	McCue - REC Harmony Tap 69 kV flo Christiana - Kegonsa 138 kV	Construct 69-kV double-circuit line between McCue and Lamar (Provisional, 2017)
0.30	31	Dewey - Norwich 138 kV flo Norwich - Harbor 138 kV	
0.28	119	Sheepskin - Stoughton 69 kV flo Paddock 345/138 kV Transformer T21	Rockdale - West Middleton 345 kV (Planned 2013)
0.24	19	Granville - Tosa 138 kV flo Granville - Arcadian 345 kV	
0.24	23	Kansas - Harbor 138 kV flo Kansas - Norwich 138 kV	
0.24	15	Rocky Run 345/115 kV Transformer T1 flo Werner West - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.24	10	Ellington - Hintz 138 kV flo North Appleton - Werner West 345 kV	
0.23	43	Kansas - Harbor 138 kV flo Norwich - Harbor 138 kV	
0.23	35	Darlington - North Monroe 138 kV flo Cordova - Nelson 345 kV	
0.21	9	Rocky Run 345/115 kV Transformer T4 flo Werner West Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.21	82	Verona - Oregon 69 kV flo Paddock 345/138 Transformer T21	
0.20	75	Indian Lake 138/69 kV Transformer T1 flo Indian Lake 138/69 kV Transformer T2	Flow Control Device (Provisional, 2014)
0.17	15	Rocky Run 345/115 kV Transformer T1 flo Rocky Run 345/115 kV Transformer T2	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.17	85	Mass - Bruce Crossing 69 kV flo M-38 - North Lake 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.16	207	Evergreen - Pine River 69 kV flo Straits - Hiawatha 138 kV + Hiawatha 138/69 kV Transform	Flow Control Device (Provisional, 2014)
0.16	8	Albers - Bain 138 kV flo Pleasant Prairie - Racine 345 kV	Upgrade of Bain - Albers 138 kV (Provisional 2010)
0.15	9	Monticello - New Glarus 69 kv - Rockdale - Paddock 345 kV	
0.14	21	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV + Zion -Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.13	10	Edgewood - St. Martins 138 kV flo Wempletown - Paddock 345 kV	
0.13	12	Bluemound - Butler 138 kV (5051) flo Granville - Arcadian 345 kV	
0.13	34	Montana - Valley 138 kV flo Norwich - Harbor 138 kV	
0.13	166	Straits - Pine River 69 kV flo Straits - Hiawatha 138 kV + Hiawatha 138/69 kV Transformer T	Flow Control Device (Provisional, 2014)
0.12	9	North Appleton - Werner West 345 kV	
0.12	25	Elm Road 345/230 kV Transformer T895 flo Oak Creek 230/138 kV Transformer T851	
0.11	78	Finger Road - Bluestone 69 kV flo Shoto 138/69 kV Transformer T1	
0.11	37	Nordic 138/69 kV Transformer T8 flo Armory - Big Quin Falls 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.10	24	Morgan - Falls 138 kV flo White Clay - Morgan 138 kV	
0.10	165	Manrap - Custer 69 kV	Shoto - Custer 138 kV line (Provisional, 2020)
0.09	18	University - Whitewater 138 kV	
0.09	26	Nordic - Perch Lake 138 kV flo Empire - Forsyth 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.09	99	New Holstein - St. Nazianz 69 kV flo Glenview - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.09	9	Nordic 138/69 kV Transformer T8 flo Plains 138/69 kV Transformer T8	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.08	15	Elm Road 345/230 kV Transformer T895 flo Oak Creek 345/230 Transformer T884	
0.08	67	New Holstein - St. Nazianz 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.08	7	Rocky Run - Plover 115 kV flo Rocky Run - Whiting Avenue 115 kV	
0.08	11	Rocky Run - North Point 115 kV flo Rocky Run - Gardner Park 345 kV	
0.08	72	Indian Lake 138/69 kV Transformer T1	Flow Control Device (Provisional, 2014)
0.07	6	Arcadian 345/138 kV Transformer T2 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2015)
0.07	5	Rocky Run 345/115 kV Transformer T4 flo Rocky Run 345/115 kV Transformer T2	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)

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1. This constraint may have been bound for other contingencies as well.

0.07	12	Saukville - Port Washington 138 kV flo Saukville - Port Washington 138 kV	
0.07	5	Danz Ave - Pulliam 69 kV flo Highway V 138/69 kV Transformer T1	
0.07	33	Tecumseh Road 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.06	52	Sheepskin - Stoughton 69 kV flo Rockdale - Russell 138 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.06	14	Hillman 138/69 kV Transformer T31 flo Eden 138/69 kV Transformer T31	
0.06	1	Granville 345/138 kV Transformer T3 flo Saukville 345/138 kV Transformer T1	
0.06	10	Nordic 138/69 kV Transformer T8 flo Dead River - Plains 345 kV + Mine Load	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.06	64	Cedar Ridge - Ohmstead 138 kV flo Edgewater - Saukville 345 kV	
0.06	69	Petenwell - Saratoga 138 kV flo Rocky Run - Werner West 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.05	10	Timberlane - West Middleton 69 kV flo Rockdale - Paddock 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.05	31	New Holstein - St. Nazianz 69 kV flo Shoto 138/69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.05	3	Platteville Tap - Hillman 69 kV flo Nelson Dewey Hillman 138 kV	
0.05	18	Hiawatha - Engadine Tap 69 kV flo Pine River - Nine Mile 69 kV	
0.05	14	Gateway - Blount 69 kV flo Sycamore - Blount 138 kV	West Middleton - Blount 138 kV (Provisional 2020)
0.04	50	Masonville - Lakehead Rapid River 69 kV flo Chandler - Delta 69 kV	
0.04	60	Hulbert Tap - Eckerman Tap 69 kV flo Hiawatha - Roberts 69 kV	
0.04	8	Saukville - Port Washington 138 kV	
0.04	6	Paddock 345/138 kV Transformer T21 flo Wempletown - Rockdale 345 kV	Paddock - Rockdale 345 kV (Planned 2010)
0.04	59	Atlantic 138/69 kV Transformer T1 flo M38 138/69 kV Transformer T1	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.03	22	McGulpin - Straits 138 kV ckt 1	Flow Control Device (Provisional, 2014)
0.03	30	Chandler 138/69 kV Transformer T1 flo Plains 345/138 kV Transformer TR1 ¹	Add second Chandler 138/69 kV Transforemer (Proposed, 2012)
0.03	14	Norwich - Harbor 138 kV flo Bluemound - Parkhill 138 kV	
0.03	4	Kenosha - Lakeview 138 kV flo Arcadian - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.03	5	Elkhart Lake - Forest Junction 138 kV flo Arcadian - Forest Junction 345 kV ¹	Upgrades associated with G611 (Planned 2010) ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.03	43	New Holstein - St. Nazianz 69 kV flo North East - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.03	22	Eden - Mineral Point 69 kV flo Eden 138/69 kV Transformer T31	
0.03	18	Rosiere - Canal 138 kV flo Kewaunee - North Appleton 345 kV	
0.03	26	Hiawatha - Roberts 69 kV flo Pine River - Nine Miles 69 kV	
0.03	16	Manrap - Custer 69 kV flo Dewey - Lakefront 69 kV	Shoto - Custer 138 kV line (Provisional, 2020)
0.03	34	Winona - Twin Lakes 69 kV flo Atlantic 138/69 kV Transformer T1	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.03	36	Indian Lake - Manistique 69 kV	Flow Control Device (Provisional, 2014)
0.02	22	McGulpin - Straits 138 kV ckt 3 flo McGulpin - Straits 138 kV ckt 1	Flow Control Device (Provisional, 2014)
0.02	1	Arpin - Sigel 138 kV flo Rocky Run - Gardner Park 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) Garnder Park - Highway 22 - Werner West 345 kV (Planned 2009)
0.02	10	Gateway - Sycamore SW YD 69 kV flo Huislamp Ruskin 69 kV	
0.02	9	Cornell - Chandler 69 kV flo Empire - Forsyth 138 kV + MINE LOAD	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014)
0.02	3	Stiles - Pulliam 138 kV (64441) flo Stiles - Pulliam 138 kV (64451)	
0.02	1	Casaloma - Butte des Morts 138 kV flo North Appleton - Werner West 345 kV	

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1. This constraint may have been bound for other contingencies as well.

0.02	3	Albers - Paris 138 kV flo Granville 345/138 kV Transformer T3	
0.02	2	Sheepskin - Stoughton 69 kV flo Paddock - Rockdale 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.02	21	Richland Center - Dayton 69 kV flo Wempletown - Paddock 345 kV	
0.02	27	Finger Road - Bluestone 69 kV flo Kewaunee - Shoto 138 kV	
0.02	16	Ryan Street - Glenview 69 kV flo Kewaunee - Shoto 138 kV	
0.02	85	Ontonagon 138/69 kV Transformer flo Mass - Victoria 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.02	2	Paddock 345/138 kV Transformer T21 flo Rockdale 345/138 kV Transformer T22	Paddock - Rockdale 345 kV (Planned 2010)
0.01	3	Sherman Street - Sunnyvale 115 kV flo King - Eau Claire - Arpin 345 kV + Op. Guide ¹	
0.01	4	Presque Isle - Tilden 138 kV flo Presque Isle - National 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	48	Atlantic - Portage 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	1	Pleasant Prairie - Arcadian 345 kV flo Zion - Arcadian 345 kV	
0.01	58	Nine Mile - Kincheloe Main Tap 69 kV	
0.01	29	Straits - Evergreen 69 kV flo Straits - Pine River 69 kV	Flow Control Device (Provisional, 2014)
0.01	8	Elkhart Lake - Forest Junction 138 kV flo Sheboygan Energy Center - Granville 345 kV	Upgrades associated with G611 (Planned 2010) ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.01	30	M38 - North Lake 138 kV flo M-38 - Perch Lake 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	44	Brimley Tap - Raco Tap 69 kV flo Hiawatha - Roberts 69 kV	
0.01	11	Atlantic - Portage 69 kV flo M38 - Winona 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	4	Werner West - Rocky Run 345 kV flo Highway 22 - Gardner Park 345 kV	
0.01	87	Blackhawk 138/69 kV Transformer T33 flo Rockriver 138/69 kV Transformer T32	
0.01	14	North East - Revere Drive 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2020)
0.01	2	Arpin - Sigel 138 kV flo Stone Lake - Gardner Park 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.01	15	Rudyard Tap - Pine River 69 kV flo Pine River - Nine Mile 69 kV	
0.01	9	M38 - Atlantic 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	10	Straits - Pine River 69 kV flo Straits - Hiawatha 138 kV + Hiawatha 138/69 kV Transformer T	Flow Control Device (Provisional, 2014)
0.01	1	Elkhart Lake - Forest Junction 138 kV flo Arcadian - Cypress 345 kV	
0.01	2	East Krok - Kewaunee 138 kV flo Morgan - Plains 345 kV	
0.01	29	Lanse - JH Warden 69 V	
0.01	26	Roberts - Newberry 69 kV	
0.01	14	Bluestone - Wesmark 69 kV flo Glenview 138/69 kV Transformer T69	
0.01	3	Plains - Nordic 138 kV flo Dead River - Presque Isle 138 kV	Arnold 345/138 kV Transformer (Provisional, 2015)
0.01	33	Mass - Rockland 69 kV	
0.01	9	Hiawatha 138/69 kV Transformer T3 flo Straits 138/69 kV Transformer T1	
0.01	4	Harrison Tap - Harrison 69 kV flo North Appleton - Werner West 345 kV	
0.01	16	Nine Mile - Pickford Tap 69 kV	
0.01	3	Gran Grae - Boscobel 69 kV flo Nelson Dewey - Hillman 138 kV	Uprate Y-40 Gran Grae-Boscobel 69-kV line (Provisional 2012)
0.01	7	Sheepskin - Stoughton 69 kV flo Columbia Unit #1	Rockdale - West Middleton 345 kV (Planned 2013)
0.01	7	Winona - Twin Lakes 69 kV flo Atlantic - M38 69 kV	
0.01	11	Hiawatha - Rexton Tap 69 kV flo Straits 138/69 kV Transformer T1	Pine River-Straits 69kV rebuild (Proposed 2014) Control Device (Provisional, 2014) Flow

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0.01	13	Nine Mile - Kincheloe Main Tap 69 kV flo Hiawatha - Roberts 69 kV	
0.01	5	Presque Isle Output	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.01	11	Chandler 138/69 kV Transformer T1	Add second Chandler 138/69 kV Transforemer (Proposed, 2012)
0.01	4	Blackhawk - West Middleton 69 kV flo Kegonsa - Femrite 138 kV	West Middleton - Blount 138 kV (Provisional 2020)
0.01	17	Petenwell - Saratoga 138 kV flo Eau Claire - Arpin + Council Creek SPS	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.01	5	Oak Creek 345/230 kV Transformer T884 flo Elm Road 345/230 kV Transformer T895	
0.01	7	Chandler - Cornell 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV transformer (Proposed, 2012)
0.01	9	Glen Jenks Tap - Manistique 69 kV flo Indian Lake 138/69 kV Transformer	
0.00	15	Chandler - Delta 69 kV CKT 1 flo Chandler - Delta 69 kV CKT2	Chandler - Delta 69 kV Ckt 1 and Ckt 2 Line Uprate (Proposed, 2010)
0.00	4	Manrap - Custer 69 kV flo Rapids - Revere Drive 69 kV	Shoto - Custer 138 kV line (Provisional, 2020)
0.00	1	Blount - East Campus 69 kV (6907) flo Blount - East Campus 69 kV(6908)	Possible Blount Unit retirements by end 2011.
0.00	31	M-38 - Warden 69 kV	
0.00	5	Mirro - Northeast 69 kV	Shoto - Custer 138 kV line (Provisional 2020)
0.00	2	Gravesville - Glenview 69 kV flo Tecumseh Rd 138/69 kV Transformer T1	
0.00	2	Rocky Run - North Point 115 kV flo Rocky Run - Gardner Park 345 kV + Port Edwards SPS	
0.00	3	ACEC Quincy - McKenna 69 kV flo Eau Claire - Arpin 345 kV	
0.00	2	Chandler - Delta 69 kV CKT 1 flo Chandler 138/69 kV Transformer	Chandler - Delta 69 kV Ckt 1 and Ckt 2 Line Uprate (Proposed, 2010)
0.00	18	Brimley Tap - Raco Tap flo Hiawatha - Roberts 69 kV	
0.00	12	Rock River - Turtle 69 kV	
0.00	1	Hiawatha - Gould City Tap 69 kV	
0.00	2	Ryan Street - Glenview 69 kV flo Forest Junction - Glenview 138 kV	
0.00	4	Hiawatha 138/69 kV Transformer T1	
0.00	8	Chandler - Goodman SW STR flo Chandler - Delta 69 kV	
0.00	4	Lanse - Baraga VLG Tap 69 kV	
0.00	1	Arrowhead - Stone Lake 345 kV	Monroe County - Council Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.00	3	Nine Mile - Pine River 69 kV flo Hiawatha - Roberts 69 kV	
0.00	5	Watson Tap - Cornell Tap 69 kV flo Chandler 138/69 kV Transformer T1	Chandler 138/69 kV T2 (2012)
0.00	7	Pine Grove Tap - 3 Mile 69 kV	
0.00	3	Evergreen - Pine River 69 kV	
0.00	2	North Bluff - Gladstone 69 kV flo Chandler - Delta 69 kV ck1	
0.00	8	Nine Mile - Pine Grove 69 kV	
0.00	7	Kincheloe Main Tap - Nine Mile 69 kV flo Pine River - Nine Mile 69 kV (6921)	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.00	1	New Holstein - Gravesville 69 kV flo Forest Junction - Glenview 138 kV	
0.00	12	Ontonagon 138/69 kV Transformer	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.00	5	Masonville - Lakehead Rapid River 69 kV	
0.00	2	ACEC Quincy - Castle Rock 69 kV flo Eau Claire - Arpin 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.00	2	Cornell Tap - Harris Tap flo Chandler 138/69 kV Transformer T1	
0.00	1	Manrap - Custer 69 kV flo Lakefront - Revere 69 kV	
0.00	8	Ontonagon 138/69 kV Transformer flo Victoria - Mass 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*

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0.00	1	St. Nazianz - Custer 69 kV flo Glenview - Shoto 138 kV	
0.00	1	Granville - Range line 138 kV flo Saukville 345/138 kV Transformer T1	
0.00	1	Brevort - Straits - McGulpin 138 kV flo Morgan - Plains 345 kV	Flow Control Device (Provisional, 2014)
0.00	3	Petenwell 138/69 kV Transformer T31	
0.00	1	Plains - Arnold 138 kV flo Dead River - Plains 345 kV + Mine Load	
0.00	1	Rockland Jct Sw Str - Victoria Hy 69 kV flo Mass - Victoria 69 kV	
0.00	1	Saukville - Edgewater 345 kV flo South Fond Du Lac - Fitzgerald 345 kV ¹	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.00	1	Rockland Jct Sw Str - UPSCO Tap 69 kV flo Mass - Victoria 69 kV	
0.00	2	Trout Lake Tap - Rexton Tap 69 kV flo Hiawatha - Roberts 69 kV	
0.00	2	Winona - Twin Lakes 69 kV flo M38 - Winona 138 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.00	7	Lone Rock 69 kV Phase Shifter	
0.00	1	Blount - East Campus 69 kV (6906) flo Blount - East Campus 69 kV(6907)	Possible Blount Unit retirements by end 2011.
0.00	1	Wautoma - ACEC Turtle Lake 69 kV flo Columbia - South Fond du Lac 345 kV	
0.00	1	Darlington - North Monroe 138 kV flo Wempletown - Rockdale 345 kV	
0.00	347	Detour Transformer T2	No solution - virtual activity causing congestion
0.00	172	Manistique Transformer T1	No solution - virtual activity causing congestion
0.00	2	Weston #4 GSU	No solution - virtual activity causing congestion
0.00	91	Weston Unit G31 Output	No solution - virtual activity causing congestion

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111.68	3,141	Total for all ATC Real Time constraints 1-1-2010 thru 12-31-2010	Solutions listed in ATC TYA unless otherwise noted
20.43	245	Pleasant Prairie - Zion 345 kV flo Cherry Valley - Silver Lake 345 kV (ComEd)	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
14.97	243	Pleasant Prairie - Zion 345 kV flo Zion - Arcadian 345 kV	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
8.24	82	Granville - Butler 138 kV flo Granville - Tosa 138 kV	2010 Congestion Analysis
7.97	979	Nordic - Felch Tap 69 kV flo Chandler 138/69 kV Transformer T1	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014) Chandler 138/69 kV T2 (2012)
6.63	87	Indian Lake 138/69 kV Transformer T2 flo Indian Lake 138/69 kV Transformer T1	Flow Control Device (Provisional, 2014)
6.27	7	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
6.00	34	Rocky Run 345/115 kV Transformer T1 flo Rocky Run 345/115 kV Transformer T4	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
4.43	95	Spring Green - Arena 69 kV flo Wempletown - Paddock 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
3.61	306	Oak Creek 345/230 kV Transformer T884 flo Oak Creek - Bluemound 230 kV	
2.95	273	Chandler - Delta 69 kV CKT2 flo Chandler - Delta 69 kV CKT1	Chandler - Delta 69 kV Ckt 1 and Ckt 2 Line Uprate (Proposed, 2010)
2.62	13	Rocky Run 345/115 kV Transformer T4 flo Rocky Run 345/115 kV Transformer T2	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
2.44	55	Nordic - Felch Tap 69 kV flo Plains - Arnold 138 kV ¹	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014) Chandler 138/69 kV T2 (2012)
1.70	24	Elkhart Lake - Forest Junction 138 kV flo Point Beach - Sheboygan Energy Center 345 kV +	Upgrades associated with G611 (Planned 2010) ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
1.49	33	Albers - Kenosha 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
1.24	18	Arpin - Sigel 138 kV flo Arpin - Rocky Run 345 kV + Op. Guide	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
1.06	33	Pleasant Prairie - Zion 345 kV	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
1.05	24	McCue - REC Harmony Tap 69 kV flo Paddock - Rockdale 345 kV	Construct 69-kV double-circuit line between McCue and Lamar (Provisional, 2017)
1.04	6	Arcadian 345/138 kV Transformer T3 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2015)
1.03	18	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV + Zion -Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.97	24	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.95	25	Sheepskin - Stoughton 69 kV flo Paddock - Rockdale 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.80	2	Paddock 345/138 kV Transformer T21 flo Paddock - Rockdale 345 kV	Paddock - Rockdale 345 kV (Planned 2010)
0.79	5	Arcadian 345/138 kV Transformer T2 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2015)
0.73	73	M38 - Atlantic 138 kV flo M38 138/69 kV Transformer T1	Used as a proxy for voltage issues and 69kV overloads. 69 kV capacitor bank installations at L'anse, Osceola (Provisional, 2009) 138 kV capacitor bank installation at M-38 (Provisional, 2009)
0.73	20	Sauville - Edgewater 345 kV flo Point Beach - Sheboygan Energy Center 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.72	9	Hiawatha 138/69 kV Transformer T1 flo Wilton Center 765/345 kV Transformer	
0.58	20	Sauville - Port Washington 138 kV flo Sauville - Port Washington 138 kV	

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0.54	2	Paddock 345/138 kV Transformer T21 flo Wempletown - Rockdale 345 kV	Paddock - Rockdale 345 kV (Planned 2010)
0.53	8	Pleasant Prairie - Zion 345 kV flo Nelson - Electric Junction 345 kV	Upgrade substation equipments at Zion substation in ComEd system (Planned, 2011) Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.53	68	New Holstein - St. Nazianz 69 kV flo Kewaunee - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.46	4	Rocky Run 345/115 kV Transformer T1 flo Werner West - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.46	21	Tecumsah Road 138/69 kV Transformer T1 flo Forest Junction - Glenview 138 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.42	8	Arpin 345/138 kV Transformer T21 flo Stone Lake - Gardner Park 345 kV	
0.40	6	Rocky Run 345/115 kV Transformer T1 flo Rocky Run - Gardner Park 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.39	6	Hillman 138/69 kV Transformer T31 flo Hillman - Darlington 138 kV	
0.38	14	Rocky Run - North Point 115 kV flo Rocky Run - Gardner Park 345 kV	
0.35	1	Saukville - Edgewater 345 kV flo Sheboygan - Granville 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.35	1	Edgewood - St. Martins 138 kV flo Wempletown - Paddock 345 kV	
0.34	14	Granville - Butler 138 kV flo Granville - Arcadian 345 kV	2010 Congestion Analysis
0.31	5	Lakeview - Zion 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line* (economic analysis 2010)
0.24	3	Enzyme Bio Systems - RCEC Clinton 69 kV flo Colley Road - Brick Church 138 kV	
0.24	2	Nordic - Perch Lake 138 kV flo Dead River - Plains 345 + Mine Load	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.23	3	Oak Creek 345/230 kV Transformer T88	
0.23	1	Flow South	Flow Control Device (Provisional, 2014)
0.22	3	Bunker Hill - Blackbrook 115 kV flo Pine - Highway 8 - Eastom 115 kV	
0.21	6	Tecumsah Road 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.20	23	Watson Tap - Forsyth 69 kV flo Chandler 138/69 kV Transformer T1	Chandler 138/69 kV T2 (2012)
0.19	0	Bain - Kenosha 138 kV flo Pleasant Prairie - Zion 345 kV	Upgrade of Bain - Kenosha 138 kV (Provisional 2013)
0.18	4	Darlington - North Monroe 138 kV flo Cordova - Nelson 345 kV	
0.18	9	New Holstein - St. Nazianz 69 kV flo Glenview - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.15	18	Masonville - Lakehead Rapid River 69 kV flo Chandler - Delta 69 kV	
0.15	2	Werner West - Rocky Run 345 kV flo Highway 22 - Gardner Park 345 kV	
0.15	15	Nordic 138/69 kV Transformer T8 flo Armory - Big Quin Falls 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.15	6	Arpin - Sigel 138 kV flo Stone Lake - Gardner Park 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.12	4	Danz Ave - Henry St Tap 69 kV flo Finger Road - Highway V 69 kV	
0.12	4	Elkhart Lake - Saukville 138 kV flo Sheboygan Energy Center - Granville 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.11	8	New Holstein - St. Nazianz 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.11	4	Gran Grae - Boscobel 69 kV flo Hillman - Darlington 138 kV	Uprate Y-40 Gran Grae-Boscobel 69-kV line (Provisional 2012)
0.10	0	North Appleton 345/138 kV Transformer T2 flo North Appleton - Werner West 345 kV	
0.10	27	Cedar Ridge - Ohmstead 138 kV flo Edgewater - Saukville 345 kV	
0.10	2	Forest Junction - Cypress 345 kV flo Point Beach - Sheboygan 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.09	1	Arrowhead - Stone Lake 345 kV	Monroe County - Council Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Provisional 2018)
0.08	1	Granville 345/138 kV Transformer T3 flo Saukville 345/138 kV Transformer T1	
0.08	2	Darlington - North Monroe 138 kV flo Wempletown - Paddock 345 kV	
0.07	6	Presque Isle Output	ATC Michigan Energy Collaborative investigating potential solutions (2010)*

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0.07	4	Kansas - Harbor 138 kV flo Kansas - Norwich 138 kV	
0.07	2	Forest Junction - Arcadian 345 kV flo Point Beach - Sheboygan 345 kV	
0.06	2	Nelson Dewey 138/69 kV Transformer T32 flo Nelson Dewey 138/69 kV Transformer T31	
0.06	1	Albers - Paris 138 kV	
0.06	1	Badger 138/115 kV Transformer T1 flo Highway22 - Gardner Park 345 kV	
0.05	8	Bluestone - Wesmark 69 kV flo Glenview 138/69 kV Transformer T69	
0.05	1	Danz Ave - Pulliam 69 kV flo Highway V 138/69 kV Transformer T1	
0.05	1	Albers - Bain 138 kV flo Pleasant Prairie - Zion 345 kV	
0.05	2	Oak Creek 345/230 kV Transformer T884 flo Elm Road 345/230 kV Transformer T895	
0.04	4	Finger Road - Bluestone 69 kV flo Shoto 138/69 kV Transformer T1	
0.04	5	New Holstein - St. Nazianz 69 kV flo Shoto 138/69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.04	6	Finger Road - Bluestone 69 kV flo Shoto 138/69 kV Transformer T2	
0.03	5	University - Whitewater 138 kV	
0.03	6	Ryan Street - Glenview 69 kV flo Kewaunee - Shoto 138 kV	
0.03	3	Dam Heights - Okee Tap 69 kV flo Columbia - North Madison 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.03	5	Chandler - Cornell 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV transformer (Proposed, 2012)
0.02	0	Bain 345/138 kV Transformer T4 flo Pleasant Prairie - Zion 345 kV	
0.02	4	Cedar Ridge - Ohmstead 138 kV flo Edgewater - South Fond Du Lac 345 kV	
0.02	0	Gran Grae - Boscobel 69 kV flo Nelson Dewey - Hillman 138 kV	Uprate Y-40 Gran Grae-Boscobel 69-kV line (Provisional 2012)
0.02	4	M38 - Atlantic 69 kV flo Atlantic - Winona 69 kV	ATC Michigan Energy Collaborative investigating potential solutions (2010)*
0.02	1	Chandler - Goodman SW STR flo Chandler - Delta 69 kV	
0.01	0	New Holstein - Gravesville 69 kV flo Forest Junction - Glenview 138 kV	
0.01	0	Straits - Evergreen 69 kV flo Straits - Pine River 69 kV	Flow Control Device (Provisional, 2014)
0.01	1	Glenview - Gravesville 69 kV flo Forest Junction - Tecumseh Road 138 kV	
0.01	6	Bluestone - Wesmark 69 kV flo Kewaunee - Shoto 138 kV	
0.01	1	Ellington - Hintz 138 kV flo North Appleton - Werner West 345 kV	
0.01	0	Eden - Mineral Point 69 kV flo Hillman - Darlington 138 kV	
0.01	0	Gravesville - Glenview 69 kV flo Tecumseh Rd 138/69 kV Transformer T1	
0.00	2	Nordic - Felch Tap 69 kV flo Chandler - Forsyth 69 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Provisional, 2014) Chandler 138/69 kV T2 (2012)
0.00	2	Gravesville - Glenview 69 kV flo New Holstein - Tecumseh RD 69 kV	
0.00	1	Blount - Ruskin 69 kV (6903) flo Blount - Ruskin 69 kV (6904)	Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line (Planned, 2011)
0.00	1	Winona - Twin Lakes 69 kV flo M38 138/69 kV Transformer T1	
0.00	0	ACEC Quincy - Castle Rock 69 kV flo Kilbourn - Hilltop 69 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2013)
0.00	0	Kansas - Harbor 138 kV flo Norwich - Harbor 138 kV	
0.00	0	Gravesville - Glenview 69 kV flo Shoto 138/69 kV transformer T1	
0.00	0	Forest Junction - Arcadian 345 kV flo Sheboygan Falls - Granville 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.00	0	New Holstein - St. Nazianz 69 kV	Shoto - Custer 138 kV line (Provisional 2022)

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