

**MISO RESPONSE TO ITC MIDWEST LLC  
REGARDING  
MINNESOTA PUBLIC UTILITIES COMMISSION  
ORDER REQUESTING DATA  
DATED MAY 15, 2012**

**A) Background Information**

The Minnesota Public Utilities Commission issued an order dated May 15, 2012 requesting data from ITC Midwest LLC regarding compliance with commitments in Docket E-001/PA-07-540 to improve the transmission system and relieve constraints. ITC Midwest LLC has requested MISO to assist in responding to Items 1a and 1d of this order. Below is the MISO response for Item 1a and Item 1d.

**B) Minnesota Data Request Item 1a and MISO Response:**

*“1. As a condition in the February 7, 2008 order and the Settlement Agreement it incorporates, ITC must resolve all system constraints in the IPL service territory as reported by the Midwest Independent Transmission System Operator (MISO) and comply with a directive from the Commission to invest in any project the Commission has determined is necessary to ensure safe, adequate, efficient, and reliable service. To determine which binding constraints still exist in the MN NCA and what projects are still needed to resolve these constraints, ITC shall file the following reports by June 30, 2012:*

*a. A report on the current state of the transmission system in IPL service territory, including all binding constraints, the current impact of these constraints on Minnesota in terms of annual cost differential for energy flow into Minnesota, the duration of the constraint if no longer 500 hours or no longer fully mitigated, as well as the magnitude of that constraint in MWs that are not getting to Minnesota.”*

**MISO’s response:**

The Minnesota PUC requests a report of the current state of the transmission system in the ITC Midwest service territory. Following receipt of the request from ITCM, MISO performed a historical review of the ITC Midwest transmission system from January 1<sup>st</sup> 2011 to 2012 year-to-date. The review consisted of analyzing ITC Midwest binding constraints which impacted Minnesota load and generation in MISO’s Day-Ahead Energy Market. A total of 261 binding constraints were identified, which are listed in the table below. These constraints resulted in a net congestion cost of \$46.78 million in 2011 and \$35.37 million in 2012 year to date.

**ITC Midwest Binding Constraints Impacting Minnesota Nodes**

<b>Year</b>	<b>CONSTRAINTNAME</b>	<b>Binding Hours</b>
2011	FXLAKE_RTLND FLO LKFLDGS_FLDN_WLMRTH	1412
2011	LIME CRK_EMRY_1 FLO LIME_CK TR92 161/69	617
2011	LIME CRK_EMERY_1 FLO LIME_CK TR92 161/69	340

Year	CONSTRAINTNAME	Binding Hours
2011	STILLWL_DUMNT FLO WLTN_DMNT	337
2011	ARNOLD TR 1 FLO ARNOLD UNIT 1	299
2011	HODEN_TIPPY FLO LUDINGTN_KEYSTONE	288
2011	CHARILUCAS FLO OTTUMWA-WAPELLO	279
2011	LIME CRK_BARTN FLO HAYWARD 161/69 TR2	262
2011	8TH ST_KERP FLO LORE_ASHBRY_LULN_SALEM	244
2011	8TH ST TR91 FLO LORE 161/69 TR2	226
2011	FXLAKE_RTLND FLO LKFLD_FLDN_WLMRTH+SPS	203
2011	ADAMS_STWRTVL FLO BVR_HRMY_ADMS_RICE	201
2011	LORE TR1 FLO LORE 161/69 TR2	187
2011	HAZLTN-DNDEE FLO HILS_TIFIN+TIFIN TR1	181
2011	WELSBGCB TR1 FLO DYSART-TRAER-M TOWN	157
2011	WAPELLO_ELDON FLO JEFF CO_WAPELLO	151
2011	FXLAKE_RTLND FLO LAKEFIELD_LAKEFIELD JCT	146
2011	DRAGEGR_JC16 FLO LEHIGH-RAUN_345	138
2011	BURNHM_MUNSTER FLO WLTN_DMNT 765	129
2011	BUTLER_GRNVL FLO GRNVIL_ARCDN (9911)	129
2011	LORE_SEIP FLO DUNDEE-LIBERTY-LORE 161	128
2011	ADAMS_I TR91 FLO BVR CRK_HRMNY_ADMS_RCE	127
2011	DRAGEGR_JC16 FLO DENISON KV1A_230/161	121
2011	MADLIAJ_MAD FLO LAKEFIELD-FIELDON-WILMAR	96
2011	DRAG-GRJCT FLO CBLUFF-GRIMES	96
2011	RICE2 TR91 FLO BVR CRK_HRMNY_RICE	91
2011	BRLGTN TR91 FLO NIOTA-BURLINGTON 161	87
2011	HAZLTN-DNDEE FLO CDV-NLSN Q2 CRD U2 U3-S	84
2011	MTOWN_WELSBRG FLO MTOWN XFMR 5	83
2011	STNEMN_TRKRVR FLO GENOA_SENCA 161	80
2011	FXLAKE_RTLND FLO NOBLES-SPLIT ROCK 345	80
2011	DRAGEGR_JC16 FLO GRIMES-COUNCIL BLUFF	78
2011	MADLIAJ_MADV FLO LKFLD-FLDN-WLMRTH + SP	74
2011	CHARILUCAS FLO SCNTRVL_APANOSE	71
2011	E_CALMS TR91 FLO ARNOLD 345/161 TR1	69
2011	AGENCY_4TH FLO BURLNGTN_NIOTA	68
2011	LIME CRK TR91 FLO LIME CRK TR92	67
2011	BVR_CH TR93 FLO TR91+TR92+LINE	66
2011	E CALMS_DAVENPRT FLO QD CTY_ROCK CRK	60
2011	RUDYARD 6923-4 FLO PNE RIVR-NINE ML 6921	59
2011	E_CALMS TR91 FLO ARNOLD UNIT 1	54
2011	LIBERTY DUNDEE FLO HILLS-TIFFIN 345	54
2011	ADAMS_I TR2 FLO BVR CRK_HRMNY_ADMS_RCE	52

<b>Year</b>	<b>CONSTRAINTNAME</b>	<b>Binding Hours</b>
2011	MQOKETA-WYOMIN FLO WALCOT-SUB92	51
2011	BURNHM_MUNSTER FLO CRETE-EFRNKFRT6607	49
2011	LIBERTY DUNDEE FLO CDV-NLSN Q2 CRD U2	45
2011	LUCAS_LUCAS TP FLO OTTUMWA-MONTEZUMA	44
2011	FERNALD TR2 FLO M TOWN WEST-TIMBRCK 161	42
2011	HIAWATA TR1 FLO PCI-BERTRAM_161	40
2011	OTTMWA_WAPLLO_2 FLO OTTMWA_WAPLLO_1	38
2011	CHARILUCAS FLO APANOSE-SCENTERVL	35
2011	ARNLD HAZELTON BASE	35
2011	WINBAGO_RUTLND FLO LKFLDGS_FLDN_WLMRTH	34
2011	HIAWATA-DRY CRK FLO ARNOLD 345/161 TR1	34
2011	LIBERTY DUNDEE FLO HILS_TIFIN+TIFIN TR1	33
2011	WAPELLO_ELDON FLO HILLS_MNTZUMA_345	33
2011	HAZLTN TR22 FLO D.A.E.C.-VINTON_161	32
2011	FXLAKE_RTLND FLO NOBLES-SPLIT ROCK_345	32
2011	FERNALD TR1 FLO STRY CO_MTWN_W MAIN	31
2011	DRAGER_JC16 FLO WEBSTER-LEHIGH+WBSTR T1	31
2011	LORE-TRKYRVR FLO BYRON_LEE CO 0627	31
2011	LIME CRK_BARTN FLO WORTH CO-GLENWTH	30
2011	GR_JCT TR 92 FLO WBSTR_LEHGH+WBSTR TR1	28
2011	LIME CRK-BARTN FLO LIME CREEK TR92	28
2011	HAZLTN_BLKHWK FLO HAZLTN_WSHBRN	27
2011	HARMONY-LANSING FLO GENOA-LNSNG-PVLTR	27
2011	6TH ST_ARNOLD FLO FAIRFAX-ARNOLD	25
2011	LORE-TRKYRIVR FLO NELSON DEWEY G2	25
2011	HIAWATA TR1 FLO ARNOLD-6_ST-DWNTIND 161	25
2011	HAZLTN_DUNDE FLO ARNOLD-HAZLETON	25
2011	FXLAKE_RTLND FLO LAKEFLD_LAKEFLD JCT	24
2011	PRAR CK_SUTLF FLO OAKGRV_LOUISA	24
2011	GR_JCT TR 93 FLO WBSTR_LEHGH+WBSTR TR1	24
2011	DUNEACRE 13839 FLO BBCK-STLWL+MCHCY_DNE	24
2011	WELCMT_FXLAKE FLO LKFLD_FLDN_WLMRTH	24
2011	HAZLTN TR22 FLO MITCHLCO-ADAMS N345	23
2011	OTTUMWA-WAPLO 161 FLO OTTMWA-MNTZM 345	23
2011	ADAMS_I TR91 FLO EAU CL T9+ KING_ECL_ARP	21
2011	MTOWN_BLRST FLO HILLS_MNTZUMA	21
2011	LUCAS-LUCASTP FLO OTTUMWA XFMR 21	21
2011	IAFI_IAFALLS FLO W SHFFLD_HMPTN-FRNKLN	20
2011	MTOWN_BLRST FLO DYSART_TRAER_M TOWN	20
2011	8THST TR91 FLO 8THST_GALENA	20

Year	CONSTRAINTNAME	Binding Hours
2011	FXLAKE_RTLND FLO LKFLD_LKFLD JCT+SPS	19
2011	LIBERTY DUNDEE FLO ARNOLD-TIFFIN_345	19
2011	E_CALMS_DAVENPRT FLO QD CTY_ ROCK CRK	17
2011	LIBERTY DUNDEE FLO ARNOLD-TIFFIN_345	17
2011	FXLAKE_RTLND FLO LAKEFIELD-LAKEFIELD JCT	16
2011	LIBERTY-DUNDEE FLO ARNLD-HZLTN+SFOX BKR	16
2011	POWESHK TR1 FLO POWESHIEK-BEACON_161	16
2011	LUCAS-LUCASTP FLO BONDURANT-MONTEZUMA	15
2011	WAPELLO XF 92 FLO JEFFERSON CNTY 161/69	15
2011	CHARILUCAS FLO OTTUMWA-WAPELLO_2	15
2011	HERON LK TR1 FLO HERON LAKE 161/69 TR2	15
2011	CHARI-LUCAS FLO BRDGPT TR7	14
2011	FRDA_NOFM_CAPE_1_D FLO LTSVL_STFRAN	14
2011	WELSBGCB TR1 FLO M TOWN 161/115 TR5	14
2011	BVR_CH TR93 FLO TR91+TR92+LINES	14
2011	HIAWATA TR91 FLO FAIRFX-ARNOLD	14
2011	CARBIDE TR1 FLO OG PLMYRA-MRBLHD N 161+T	14
2011	LIME CRK_MANLY FLO HAYWARD TR2	13
2011	E_CALMS TR91 FLO ARNOLD-TIFFIN_345*	13
2011	FXLAKE_RTLND FLO PRAIRIE ISLD UNIT 1	13
2011	E_CALM-DWIT 161 FLO QUAD-ROCKCK 345	13
2011	HAZLTN TR22 FLO MITCHLCO-ADAMS	12
2011	8TH ST TR91 FLO 8TH ST-GALENA_161	12
2011	HBDSNVJ_DAVD J FLO GOSS-NELSON RD 345	12
2011	DUNEACRE 13839 FLO BABCK_STLWEL+STWEL XF	11
2011	6TH ST_ARNOLD FLO HIAWATA-ARNOLD	11
2011	DUNDEE-AURORA 69 FLO HAZLTN-WINDSR-PSTVL	11
2011	HAZLTN TR4 FLO HAZLETON 345/161 TR3	11
2011	DECORAH_MADISN FLO RICE_SARTGA_JERICO	11
2011	PCI_BERTRAM FLO ARNOLD UNIT	10
2011	TRK_RIV TRK_RLORE16_1 1 LN	10
2011	WINGER TR51 FLO WILTN_WINGR 230	10
2011	TRKYRVR TR91 FLO GENOA-SENECA_161	9
2011	ARNOLD TR 1 FLO ARNOLD-HAZLETON 345 *	9
2011	STATLIN_ROXANA FLO SHFFLD-GARYAVE	9
2011	HAZLTN TR21 FLO ARNOLD-HAZLETON 345	9
2011	WSHEFLD_EMERY FLO FLOYD-EMERY_161	9
2011	HZLTN XFMR 3 FLO MITCHL_CNTY-HZLTN 345	9
2011	STNEMN_TRKRVR FLO NELSON ELECTC JCT	8
2011	HIAWATA_ARNLD FLO FAIRFAX-ARNOLD	8

Year	CONSTRAINTNAME	Binding Hours
2011	STILWEL_DUMNT FLO WLTN_DMNT	8
2011	HBDSNVJ_DAVD J FLO NELSON RD_MURPHY	8
2011	LANSING TR91 FLO LANS-PSTVL 161	8
2011	HIAWATA TR1 FLO ARNLD_6TH_DWNTND	8
2011	BEHR_EMERY FLO LIME CREEK 161/69 TR91	7
2011	LORE-TRKYRVR FLO BYRON_CHERRYV 345B	7
2011	LIBERTY-LIBERTYTP FLO SUB92-HILLS	7
2011	ROQUETE_KEOKUK FLO PALMYRA -TWIN RIVER	6
2011	HAZLTN TR93 FLO HAZLETON 161/69 TR94	6
2011	DRAGER_GRJCT FLO POMRY-POCHNT	6
2011	8TH ST TR91 FLO LORE 161/69 TR91	6
2011	LANSING TR1 FLO GENOA-LANSING_161	6
2011	BEVRLY_PCI FLO ARNOLD_TIFFIN	6
2011	E_CALMS_DAVENPRT FLO QDCTY_RCK+ECALM	6
2011	HANCOCK TR91 FLO EMERY-WEST SHEFFIELD	5
2011	8TH_ST_TR91 FLO LORE TR2	5
2011	E_CALMS_GR_MND FLO ROCK CREEK-SALEM	5
2011	LIME CRK_EMRY_1 FLO WORTH CO-GLENWTH	5
2011	AEP-DOM FLO CULLODEN-WYOMING 765	5
2011	WAPELLO_RUTLDG FLO WAPELLO-EXCEL Y1187	5
2011	HAZLTN TR21 FLO HAZLTN TR22	4
2011	ARNOLD TR 1 FLO ROSEHOLLOW-BERTRAM	4
2011	CHARILUCAS FLO N_CENT-SOCTRVIL_69 (Y921)	4
2011	SALEM_JULIEN FLO BVR CHNL_SAVANNA	4
2011	HAZLTN TR22 FLO ARNLD_HAZLTN+SFOX 0420	3
2011	WYMG_MTVRN FLO QUD CTY-RCK CR+CORD SPS	3
2011	HAZLTN_BLKHWK FLO WASHBURN TR1 161/69	3
2011	CAYLER_WISDM FLO SPLIT ROCK-SIOUX CITY	3
2011	HAZLTN TR22 FLO DYSART-WASHBRN_161	3
2011	MTOWN_WELBRG FLO DYSRT_TRER_MTWN	3
2011	JEFF2 XF 1 FLO WAPELLO XF 92	2
2011	BRLGTN TR91 FLO DNMRK-BRLNGTN + BRKR	2
2011	GLENWTH GLENWHAYWA16_11 LN	2
2011	E_CALMS TR91 FLO HILLS-TIFFIN	2
2011	FXLAKE_RTLND FLO RAUN-LAKEFIELD 345	1
2011	HAZLTN TR22 FLO ARNOLD-HAZLETON 345	1
2011	FOXLK-RUTLND FLO SHERCO 3	1
2011	8TH ST_KERP FLO ARNLD_HAZLTN+ SFOX BKR	1
2011	LORESEIP 69 FLO DUNDEE-LIBERTY-LORE_161	1
2012	MADLIAJ-MADV L FLO LKFLD-FLDN-WLMRTH+SPS	1763

Year	CONSTRAINTNAME	Binding Hours
2012	FXLAKE-RTLND FLO LKFLDGS-FLDN-WLMRTH	718
2012	FXLAKE_RTLND FLO LKFLDGS_FLDN_WLMRTH	446
2012	MTOWN-BLRST FLO ARNOLD UNIT 1	432
2012	ECALMS-DAVENPRT FLO QUAD CTY-ROCK CRK	417
2012	8TH ST-SO GVW FLO LRE-AHBRY-LULN-SALM	403
2012	BUTLER-GRNVIL FLO GRNVIL-ARCDN (9911)	395
2012	LIME CRK-EMERY 1 FLO LIME CK TR92 161/69	392
2012	8TH ST TR91 FLO LORE 161/69 TR2	375
2012	LIME CRK-BARTON FLO WORTH CO-GLENWTH	338
2012	8TH ST TR91 FLO LORE-ASHB-JULIEN-SALM	313
2012	MADLIAJ_MADVL FLO LKFLD-FLDN-WLMRTH + SP	313
2012	MTOWN-BLRST FLO JASPER-LAURELSS 161	288
2012	8TH ST TR91 FLO ARNOLD-TIFF+SALEM3 CB200	283
2012	LIME CRK-BARTN FLO WORTH CO-GLENWTH	277
2012	DUNDEE-AURORA 69 FLO HAZLTN-WINDSR-PSTVL	247
2012	GLENWRTH-HAYWARD FLO BARTONS-ADAMS	231
2012	RUDYARD 6923-4 FLO PNE RIVR-NINE ML 6921	213
2012	TIMBRCK-MTOWN FLO STORY CO-FERNALD 161	202
2012	OTTMWA-BRDGPRT FLO OTTUMWA-TRI CNTY 161	192
2012	WELSBGCB TR1 FLO DYSART-TRAER-M TOWN	175
2012	FERNALD TR1 FLO AMES-FERNALD	147
2012	LUCAS 161_69 XFMR FLO BEACON-TRICTY	147
2012	ARNOLD TR1 FLO ARNOLD UNIT 1	145
2012	DRAGE-GRJC16 FLO MONONA-CRFRDCO	142
2012	MANLY-LIMECK FLO WORTH CO-GLENWTH	136
2012	LIME CRK_BARTN FLO WORTH CO-GLENWTH	136
2012	ROCKCRK-DEWITT FLO SUB 91 345/161 TR1	127
2012	HIAWATA TR1 FLO ARNOLD-6_ST-DWNTIND 161	123
2012	GLENWTH TR1 FLO GLENWTH-HAYWARD	112
2012	ROQUETE-KEOKUK FLO CARBIDE 161/69 TR1	107
2012	ADAMS-STWERVILL FLO BEVR CK-HARM-ADM-RIC	107
2012	MADLIAJ_MADVL FLO LKFLD-FLDN-WLMRTH+SPS	101
2012	OTTMWA-WAPLLO 2 FLO OTTMWA-WAPLLO 1	101
2012	MTOWN-BLRST FLO 6TH ST-SANTSRN 115	99
2012	NEWTON TR91 FLO POWESHIEK-REASNOR	95
2012	HAZLTN-BLKHVK FLO HAZLTN-WSHBRN	91
2012	CREE-CRES2 FLO CRESTON-SLAK	74
2012	LANSING TR1 FLO LANS-PSTVL 161	74
2012	WELSBGCB TR1 FLO BLKHVK-UNTP-BUTLER	69
2012	GR JCT TR 92 FLO WBSTR-LEHGH	67

<b>Year</b>	<b>CONSTRAINTNAME</b>	<b>Binding Hours</b>
2012	ECALMS-DVNPRT FLO QUAD CTY-RCK CRK+CORDV	64
2012	LORE-GRDNR LN FLO 8TH XF91	61
2012	WELSBGCB TR1 FLO FRANKLIN-BUTLER 161	60
2012	WYOMING-MT VERN FLO ARNOLD 345/161 TR1	59
2012	WINBAGO-RUTLAND FLO LKFLDGS_FLDN_WLMRTH	58
2012	8TH ST_SO GVW FLO LRE_AHBRY_LULN_SALM	58
2012	LUCAS-LUCAS FLO OTTUMWA-WAPELLO	56
2012	BLANEYPK-CURTIS FLO INDLK-HIAWATHA	53
2012	ECALMS-DAVENPRT FLO ROSEHOLLOW-BERT	53
2012	LIME CRK TR1 FLO LIMECRK TR92	41
2012	STILWEL_DUMNT FLO WLTN_DMNT	40
2012	LIMECRK TR1 FLO LIMECRK TR92	40
2012	HAZLTN-DUNDEE FLO RCKCRK-QUADDCTY	36
2012	STELCTR-PRAT FLO LKFLD-FLDN-WLMRTH+SPS	35
2012	LIME CRK-EMERY 1 FLO MITCHLCO-ADAMS_345	34
2012	SLAK-CREST FLO SLAK-CRES (Y1217)	32
2012	DRAGE-GRJC16 FLO LEHIGH-RAUN_345	32
2012	ECALMS TR91 FLO ARNOLD-TIFFIN 345*	32
2012	PCI-BERT FLO ARNLD-TIF+SALEM3 CB 200S	31
2012	POWERSHK TR1 FLO POWESHIEK-BEACON	31
2012	HIAWATA-SAINTRN FLO ARNOLD-6_ST 161	30
2012	MANLY-LIMECK FLO LIMECK-WORTH	30
2012	LUCAS-LUCAS TP FLO OTTUMWA-MONTEZUMA	28
2012	LUAN-MONON FLO LANSING 161/69 TR1	27
2012	E_CALMS TR91 FLO HILLS-TIFFIN	27
2012	LUCAS-LUCT FLO BEACON-TRICTY	27
2012	HODEN_TIPPY FLO LUDINGTN_KEYSTONE	27
2012	NEWTON2 TR1 FLO NEWTON - CASEY W	25
2012	MADLIAJ-MADV L FLO LAKEFIELD-LAKEFLD JCT	25
2012	ROQUETE_KEOKUK FLO CARBIDE 161/69 TR1	24
2012	STELCTR-PRAT BASE	24
2012	E_CALM-DAVNPRT FLO ROSEHOLLOW-BERT	24
2012	IAFI-IAFALLS FLO FRANKLIN-BUTLLER 161	24
2012	GLENWTH XF1 FLO GLENWTH-HAYWARD	23
2012	TOLEDO-MTOWN FLO ARNOLD UNIT 22	23
2012	MANLY-LIME FLO WORTH CO-GLENWTH 161	22
2012	WAPELLO_ELDN2 FLO JEFFRSN CO-WAPELLO_1	22
2012	WELSBGCB TR1 FLO WBSTR_LEHGH+WBSTR1	22
2012	CHARILUCAS FLO APANOSE-SCENTERVL	22
2012	ECALMS-DAVENPRT FLO BVR CH-ROCK CK	20

Year	CONSTRAINTNAME	Binding Hours
2012	BRLGTN TR91 FLO DNMRK-BRLNGTN_VLE	20
2012	8TH ST TR91 FLO 8TH ST-GALENA_161	18
2012	CAYLER-TRIBOJI FLO RAUN-LAKEFIELD 345	18
2012	CARBIDE TR1 FLO OG PLMYRA-MRBLHD N 161+T	18
2012	8TH ST-GALENA FLO MQOKETA-SALEM	17
2012	LIME-MANLY FLO LIME CREEK-BARTON	17
2012	HANCOCK XF3 FLO HANCOCK 161/69 TR1	17
2012	WYMG-MTVRN FLO ROCK CREEK-SALEM_345	16
2012	ECALMS-DAVENPRT FLO SUB 17 TR1 161/69	15
2012	TRK_RIV TR91 FLO ARNOLD-HAZLETON 345 *	15
2012	AMBER-WYOMING FLO LIBERTY 161/69 TR91	14
2012	ARNOLD TR1 FLO ARNOLD UNIT 1 (609MW)	14
2012	ARNLD HAZELTON BASE	13
2012	GLENWTH TR1 FLO LIME CREEK TR92	13
2012	OTTUMWA-WAPLO 161 FLO OTTMWA-MNTZM 345	12
2012	LIBERTY-LIBERTYTP FLO ROSEHOLLOW-BERTRAM	11
2012	OTTMWA_WAPLLO_2 FLO OTTMWA_WAPLLO_1	11
2012	HARMONY-LANSING FLO GENOA-LANSING	10
2012	LORE TR1 FLO LORE 161/69 TR2	10
2012	TRKYRIV TR91 FLO ARNOLD-HAZLETON 345	10
2012	ECALM-DAVENPRT FLO ARNOLD-TIFFIN_345*	9
2012	LIBRTY-DUNDEE 161 FLO WALCT-SUB 92 345	8
2012	CHARILUCAS FLO N_CENT-SOCTRVIL_69 (Y921)	7
2012	BLPLN-TOLEDO FLO ARNOLD XF1	6
2012	TURKEY RVR-STONE FLO ROCKDALE-PADDOCK	5
2012	SBRDWAY-ALEAWST FLO HAYWARD TR2	4
2012	TRKYRIV TR91 FLO ARNOLD-HAZLETON 345 *	4
2012	LANSING TR1 FLO GENOA-LANSING_161	4
2012	CHARILUCAS FLO OTTUMWA-WAPELLO	4
2012	PRAR_CK_TR1_TR1_XF	4
2012	ECALMS-DAVENPRT FLO ARNOLD-TIFFIN 345	4
2012	STON_PT-BL_PLN FLO MTOWN XFMR 5	4
2012	BL_PLN_BL_PLTOLED11_11 LN	3
2012	ATLNTC_M-38 FLO M-38 - WINONA 138	3
2012	LANSING LANSIPOSTV16_11 LN	2
2012	LANSING TR1 FLO LNSNG-HRMNY+GNOA-LNSG	2
2012	TOLEDO-MTOWN FLO HILLS-MNTZUMA	2
2012	LIME CRK_EMRY_1 FLO BARTONS-ADAMS_161	1
2012	E_CALMS TR91 FLO ARNOLD-TIFFIN_345*	1
2012	WYOMING-MT VERNON FLO ARNOLD-TIFFIN	1



**C) Minnesota Data Request Item 1d and MISO Response:**

*d. Based on current data, an estimated projected savings over the next 15 years in Minnesota from the completions of (i) the Salem-Hazleton Project and (ii) the Arnold-Vinton Rebuild; and additionally, the extent to which constraints in the area are mitigated by these projects. If they are not fully mitigated, state by how many of the 500 hours annually this area will see constraints with and without the projects.”*

**MISO’s response:**

**Salem-Hazleton Project.** The Minnesota PUC requests an estimated projected savings over the next 15 years to Minnesota from the completion of the Salem-Hazleton Project, which was first analyzed for both reliability and economic benefit in the MTEP08 planning cycle. MISO does not have available an analysis of the cost savings specific to Minnesota of the specified project. However, MISO has reviewed the MTEP08 analysis and future scenarios and believes that the results of those analyses of the project benefits are still applicable, and that the benefits ascribed to the project in the 2008 analyses will be achieved or exceeded.

MISO analyzed the Salem-Hazleton project for both reliability benefit and economic benefit in the MTEP08 planning cycle. MISO found that the Salem-Hazleton project provided both reliability and net economic benefit.

With regard to economic benefits, the Salem-Hazleton project was simulated under a reference future case to determine eligibility for cost sharing. The results indicated a Benefit-to-Cost ratio of 1.23, which demonstrates positive economic benefit. Benefits estimated for the west sub region where the State of Minnesota is located were \$26 million as a net present value of benefits. In addition, about 12% of the ITC Midwest load is located in Minnesota which means that the benefits to Minnesota are expected to exceed the cost of the project to Minnesota load.

MTEP 08 also analyzed projected constraints for 2011, 2016 and 2021 and the project demonstrated benefits in relieving binding hours on numerous constraints. In 2011, with respect to the flow gates impacted by the Salem-Hazleton project, without the Salem-Hazleton project, there would be a total of 6,635 binding hours spread across 14 flow gates and with the Salem-Hazleton project there would be 6,386 binding hours spread across 9 flow gates, a reduction of 249 binding hours. In 2016, with respect to the flow gates impacted by the Salem-Hazleton project, without the Salem-Hazleton project, there would be a total of 15,237 binding hours spread across 18 flow gates and with the Salem-Hazleton project there would be 13,251 binding hours spread across 13 flow gates, a reduction of 1,986 binding hours. In 2021, with respect to the flow gates impacted by the Salem-Hazleton project, without the Salem-Hazleton project, there would be a total of 19,470 binding hours spread across 26 flow gates and with the Salem-Hazleton project

there would be 17,503 binding hours spread across 15 flow gates, a reduction of 1,967 binding hours.

In addition, MISO has evaluated the impact of the Salem-Hazleton project on loading levels and has identified numerous overloading conditions that would be relieved by the project, as demonstrated in the table below.

**Thermal Issues in MTEP10 2015 Shoulder (SH) and Summer Peak (SP) Models with (Yes) or without (No) P1340 Salem-Hazleton 345 kV line**

Limiting Element	2015 SH		2015 SP	
	No	Yes	No	Yes
630003 LANSING8 69.0 631053 LANSING5 161 1			131	130
630046 JASPER 8 69.0 631107 JASPER 5 161 1			102	
630053 NEWTON 8 69.0 630488 MAYTAG 8 69.0 1	101			
630053 NEWTON 8 69.0 631119 NEWTON 5 161 1	100			
630139 ADAMS 8 69.0 631122 ADAMS_N5 161 1	114	111		
630272 KNSASRT8 69.0 630647 TIFFFIN R 69.0 1			104	101
630272 KNSASRT8 69.0 630649 TIFFFIN 69.0 1			106	103
630297 SANDRDG8 69.0 680066 MENOMINE 69.0 1			119	106
630645 HRTLNDTP 69.0 630647 TIFFFIN R 69.0 1			101	
630679 ALTWTIF8 69.0 636421 TIFFFIN 5 161 1			135	128
630895 VINTON MUNI869.0 630902 VINTON 8 69.0 1	102			
631051 HAZL S 5 161 631101 DUNDEE 5 161 1	136			
631054 ASBURY 5 161 631055 CNTRGRV5 161 1			117	103
631054 ASBURY 5 161 631056 LORE 5 161 1			106	
631055 CNTRGRV5 161 631120 JULIAN 5 161 1			122	108
631056 LORE 5 161 631125 KERPER 5 161 1			107	
631057 SALEM N5 161 631120 JULIAN 5 161 1			110	
631058 SO.GVW.5 161 631059 8TH ST.5 161 1			105	
631058 SO.GVW.5 161 631061 SALEM S5 161 1			133	118
631059 8TH ST.5 161 631125 KERPER 5 161 1			113	
631095 E CALMS5 161 636616 SB 56 5 161 1			101	
631100 LIBERTY5 161 631101 DUNDEE 5 161 1	115			
631115 OTTUMWA5 161 631143 OTTUMWA3 345 1	101			
636640 LOUISA 3 345 636641 LOUIS31G 24.0 1			100	
698840 ACEC BADGERW 138 699240 SAR 138 138 1	117	113		
698840 ACEC BADGERW 138 699808 PETENWEL 138 1	119	115		

**Legend: Yellow are limiters mitigated by the Salem-Hazleton project. Green are limiters reduced by the Salem-Hazleton project.**

The effect of the project on clearing these loading limits not only demonstrates the reliability benefits of the project but contributes to the ability to serve load in the region without the need to incur congestion costs associated with redispatch.

Since MTEP08, MISO developed the Multi Value Project cost shared project type and conducted the Regional Generation Outlet Study and Candidate Multi Value Project Portfolio study. The results of this initiative were approval of a portfolio of 17 Multi Value Projects designed to enable enough renewable generation to meet all current RPS standards applicable to Load Serving Entities within the MISO footprint. These projects were based on simulating renewable generation throughout the MISO footprint, but with a bias in the wind-rich western areas of the footprint. The development of the Multi Value Project portfolio utilized the Salem-Hazleton line as an integral part in meeting the regional public policy and economic objectives. As stated in the MTEP11 report, the regional portfolio of Multi Value Projects is expected to provide benefit-to-cost ratios in the range of 1.6 to 2.9 in Local Resource Zone 1, which includes the State of Minnesota.

Therefore, MISO concludes that the economic benefits associated with the Salem-Hazleton project that MISO has demonstrated for the State of Minnesota continue to be valid and are likely even higher today.

**Arnold-Vinton Rebuild Project.** The Arnold-Vinton rebuild project has been completed and is currently in service. This project increased the capacity of the Arnold-Vinton-Dysart-Washburn 161 kV transmission line to 446 MVA. Prior to the rebuild, the Arnold-Vinton transmission line represented one of the most binding transmission constraints in the area and frequently required implementation of Transmission Loading Relief procedures. In addition, the Arnold-Vinton line represented one of the flowgates that defined the SE Minnesota / NE Iowa / SW Wisconsin Narrowly Constrained Area. MISO does not have available an analysis of the cost savings specific to Minnesota of the specified project. However, during the first three years of MISO energy market operation (April 2005 through April 2008), the line was a binding constraint for 456 hours. For the period prior to the start of the MISO energy market from January 2001 through March 2005, the flowgate contributed to enabling Transmission Loading Relief procedures a total of 781 hours. Today, following completion of the Arnold-Vinton rebuild project, this line is no longer a binding constraint, and therefore is not listed in the table under MISO's response to Item 1a which includes congested flowgates impacting Minnesota in 2011 and 2012. Together with the Salem-Hazleton project, the Arnold-Vinton project plays an important role in relieving transmission congestion in the area.