

# MISO ICTE Reliability: TLR 5 Event Analysis Report



Event Date: 7/6/2013

Flowgate ID/Name: FG 6509 Nelson AT 1 500/230kV flo Hartburg-Cypress 500kV

**Metrics Tables:** TLR Date 7/6/2013 08:35  
Return to Zero 7/7/2013 04:30  
Duration 19 hours 55 minutes  
Hours in TLR 5 12 hours 35 minutes  
Highest Level 5B  
MW Cut 4144  
Firm 1703  
Non-Firm 2441

**NNL:**

EES	921	LEPA	
AECI		ONT	
AMIL		PJM	
CLEC	18	SMEE	
CSWS		SOCO	
EDE		SPA	
LAFA		TVA	
LAGN	93	WSCS	

**Flowgate information at the time of the TLR 5 issuance:**

Line Rating: 560 LODF: 0.6079 PC MVA: 555 Contingent Element: 587 Monitored Element: 199

**Root Cause:**

This event was caused by increasing flows north to south heading into the WOTAB load pocket. Contributing to the heavier load across the Nelson transformer AT1 was an increase in generation output that has lower sensitivities outside of the constrained area, unplanned outages and reduced generation in the WOTAB and Western load pockets.

**Planned or Unplanned Generation Outage(s): (none, if blank)**

Type:  
Unplanned Nelson Unit 4 on 7/1/13

**Planned or Unplanned Transmission Outage(s): (none, if blank)**

Type:  
Unplanned Nelson-Richard 500kV line on 7/1/13  
Unplanned Hartburg 500/230kV Xfmr on 7/3/13  
Unplanned Hartburg-Inland Orange 230kV line on 7/3/13

**Tags Excluded from the TLR** (The following tags were excluded for Reliability)

AECI\_EXGNPT187BRZ2\_BRAZ  
SOCO\_EXGNPT187BRZ3\_BRAZ

**Internal Non-Firm Tags that were curtailed:** No Internal Non-Firm tags were curtailed

**Non-Firm AFC's suspended:** from 11:00 EST on 7/6/2013 to 05:00 EST on 7/7/2013

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## AFC Limitations before, during and after the TLR Event:

		Firm AFC available on NELXF_HBCYP (MW)																							
AFC Initialization Summary Report Time Stamp (EST)		7/6												7/7											
		HB 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	HB 0	1	2	3	4			
Prior to Day Ahead	7/4/2013 17:51	494	438	480	446	418	452	459	453	457	475	470	469	446	386	388	409	457	500	503	528	539			
Day Ahead	7/5/2013 10:01	266	210	288	240	204	250	268	260	266	292	276	277	241	172	171	173	216	251	286	320	336			
Prior to Day Ahead	7/5/2013 17:56																	-74	-27	25	70	93			
Day Ahead	7/6/2013 9:59																	60	97	145	187	209			
		Sum of impact of firm reservations and rfcalc baseflow on NELXF_HBCYP (MW)																							
AFC Initialization Summary Report Time Stamp (EST)		7/6												7/7											
		HB 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	HB 0	1	2	3	4			
Prior to Day Ahead	7/4/2013 17:51	66	122	80	114	142	108	101	107	103	85	90	91	114	174	172	151	103	60	57	32	21			
Day Ahead	7/5/2013 10:01	294	350	272	320	356	310	292	300	294	268	284	283	319	388	389	387	344	309	274	240	224			
Prior to Day Ahead	7/5/2013 17:56																	634	587	535	490	467			
Day Ahead	7/6/2013 9:59																	500	463	415	373	351			
TFC of NELXF_HBCYP		560																							
AFC Initialization Summary Report Time Stamp (EST)		Average Firm AFC available on NELXF_HBCYP (MW)																							
Prior to Day Ahead	7/5/2013 5:56:25 PM, 7/4/2013 5:51:26 PM	239																							
Day Ahead	7/5/2013 10:01:43 AM, 7/6/2013 9:59:51 AM	195																							
		-44																							
AFC Initialization Summary Report Time Stamp (EST)		Average Sum of impact of firm reservations and rfcalc baseflow on NELXF_HBCYP (MW)																							
Prior to Day Ahead	7/5/2013 5:56:25 PM, 7/4/2013 5:51:26 PM	321																							
Day Ahead	7/5/2013 10:01:43 AM, 7/6/2013 9:59:51 AM	365																							
		44																							

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	AFC Initialization Summary Report Timestamp (EST)	AFC available on NELXF_HBCYP (MW)																								
		7/6												7/7												
		HB 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	HB 0	1	2	3	4				
Prior to Day Ahead	7/4/2013 17:51	494	438	480	446	418	452	459	453	457	470	469	446	386	388	409	457	500	503	528	539	Firm				
Day Ahead	7/5/2013 10:01	266	210	288	240	204	250	268	260	266	292	276	277	241	172	171	173	216	251	286	320	336	Firm			
Prior to Day Ahead	7/5/2013 17:56																-74	-27	25	70	93	Firm				
Operating Horizon	7/6/2013 0:11	221	139	106	-2	-40	-54	-72	-83	-84	-81	-53	27	33	17	79	125						Non-Firm			
Operating Horizon	7/6/2013 1:12	229	148	115	8	-30	-43	-61	-71	-73	-69	-42	38	44	28	89	134						Non-Firm			
Operating Horizon	7/6/2013 2:11	225	144	112	5	-32	-46	-63	-74	-75	-72	-44	36	41	25	86	131						Non-Firm			
Operating Horizon	7/6/2013 3:11	234	154	123	16	-21	-34	-51	-62	-63	-60	-33	47	52	36	97	141						Non-Firm			
Operating Horizon	7/6/2013 3:41	234	154	123	16	-21	-34	-51	-62	-63	-60	-33	47	52	36	97	141						Non-Firm			
Operating Horizon	7/6/2013 4:10	226	143	114	4	-33	-47	-64	-75	-76	-73	-45	35	41	25	84	129						Non-Firm			
Operating Horizon	7/6/2013 5:09	252	175	146	146	146	-8	-25	-35	-36	-33	-6	-6	61	120	162							Non-Firm			
Operating Horizon	7/6/2013 6:11	332	194	166	62	28	16	0	-10	-12	-8	18	96	100	84	141	182						Non-Firm			
Operating Horizon	7/6/2013 7:09	313	258	150	45	8	-2	-21	-31	-31	-24	4	83	90	71	151	192						Non-Firm			
Operating Horizon	7/6/2013 8:09	528	270	274	66	31	21	3	-6	-6	0	28	106	111	93	170	210						Non-Firm			
Operating Horizon	7/6/2013 9:09		566	261	181	22	13	-5	-15	-15	-9	19	98	103	84	163	203						Non-Firm			
Day Ahead	7/6/2013 9:59																60	97	145	187	209	Firm				
Operating Horizon	7/6/2013 10:08			552	194	191	24	17	7	7	14	35	115	124	105	183	222						Non-Firm			
Operating Horizon	7/6/2013 11:09				332	203	217	44	35	35	41	62	140	148	129	205	243						Non-Firm			
Operating Horizon	7/6/2013 12:17					0	0	0	0	0	0	0	0	0	0	0	0	304	321	329	361	377	Non-Firm			
Operating Horizon	7/6/2013 13:12						0	0	0	0	0	0	0	0	0	0	0	233	253	263	297	314	Non-Firm			
Operating Horizon	7/6/2013 14:12							0	0	0	0	0	0	0	0	0	0	242	261	271	305	321	Non-Firm			
Operating Horizon	7/6/2013 15:12								0	0	0	0	0	0	0	0	0	231	251	261	296	313	Non-Firm			
Operating Horizon	7/6/2013 16:11									0	0	0	0	0	0	0	0	21	43	54	90	107	Non-Firm			
Operating Horizon	7/6/2013 17:11										0	0	0	0	0	0	0	200	221	232	267	285	Non-Firm			
Operating Horizon	3/7/2006 18:11											0	0	0	0	0	0	187	209	220	256	273	Non-Firm			
Operating Horizon	7/6/2013 19:12												0	0	0	0	0	13	35	47	82	100	Non-Firm			
Operating Horizon	7/6/2013 20:12													0	0	0	0	199	220	231	266	284	Non-Firm			
Operating Horizon	7/6/2013 21:11														0	0	0	246	263	272	306	323	Non-Firm			
Operating Horizon	7/6/2013 22:10															0	0	228	99	108	142	158	Non-Firm			
Operating Horizon	7/6/2013 23:10																0	366	378	286	319	335	Non-Firm			
Operating Horizon	7/7/2013 0:11																	0	0	0	0	0	Non-Firm			
Operating Horizon	7/7/2013 1:11																		0	0	0	0	Non-Firm			
Operating Horizon	7/7/2013 2:11																			0	0	0	Non-Firm			
Operating Horizon	7/7/2013 3:11																				0	0	Non-Firm			
Operating Horizon	7/7/2013 3:41																				0	0	Non-Firm			
Operating Horizon	7/7/2013 4:10																				0	0	Non-Firm			

Indicates TLR Avoidance (Non-sale of Non-Firm)

## Event History:

TLR Event History																	
6509 - Nelson AT1 500/230 (ftlo) Hartburg 500kv - Cypress																	
	Status	TLR	Effective Time	Confirmation Time	Run Time	Flow Change Requested	Requested Relief	Remaining Relief	Relief Provided	Total Cuts			RC Ack Cuts			MF	NNL
										Tags	MW	Relief	Tags	MW	Relief		
NH	SUPERSEDED	1	07/06/2013 08:35	07/06/2013 08:30	07/06/2013 08:30	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	
CH	SUPERSEDED	5B	07/06/2013 11:25	07/06/2013 11:05	07/06/2013 11:04	-60.0	60.0	0.0	0.0	62	35	155	17	35	155	17	
NH										71	34	320	27	34	320	27	0
NH	SUPERSEDED	5A	07/06/2013 13:00	07/06/2013 12:29	07/06/2013 12:29	-25.0	67.0	0.0	113	32	394	28	30	115	13	0	84
NH	SUPERSEDED	5A	07/06/2013 14:00	07/06/2013 13:38	07/06/2013 13:28	-30.0	68.0	0.0	154	33	281	26	33	281	26	0	128
NH	SUPERSEDED	5A	07/06/2013 15:00	07/06/2013 14:30	07/06/2013 14:25	0.0	52.0	0.0	182	37	279	29	37	279	29	0	152
NH	SUPERSEDED	5A	07/06/2013 16:00	07/06/2013 15:29	07/06/2013 15:25	0.0	49.0	0.0	203	36	252	30	36	252	30	0	173
NH	SUPERSEDED	5A	07/06/2013 17:00	07/06/2013 16:27	07/06/2013 16:25	+10.0	24.0	0.0	199	37	251	30	37	251	30	0	168
NH	SUPERSEDED	5A	07/06/2013 18:00	07/06/2013 17:29	07/06/2013 17:26	+25.0	0.0	0.0	164	34	213	25	34	213	25	0	139
NH	SUPERSEDED	5A	07/06/2013 19:00	07/06/2013 18:29	07/06/2013 18:26	+75.0	0.0	0.0	85	32	138	16	32	138	16	0	70
NH	SUPERSEDED	5A	07/06/2013 20:00	07/06/2013 19:28	07/06/2013 19:26	+100.0	0.0	0.0	2	2	11	2	2	11	2	0	0
NH	SUPERSEDED	5A	07/06/2013 21:00	07/06/2013 20:31	07/06/2013 20:26	-75.0	59.0	0.0	61	31	95	12	31	95	12	0	49
NH	SUPERSEDED	5A	07/06/2013 22:00	07/06/2013 21:30	07/06/2013 21:27	+5.0	0.0	0.0	44	29	237	20	29	237	20	0	24
NH	SUPERSEDED	5A	07/06/2013 23:00	07/06/2013 22:29	07/06/2013 22:28	+50.0	0.0	0.0	16	5	222	16	5	222	16	0	0
NH	SUPERSEDED	3A	07/07/2013 00:00	07/06/2013 23:31	07/06/2013 23:30	-70.0	40.0	8.7	31	8	463	31	8	463	31	0	0
NH	SUPERSEDED	3A	07/07/2013 01:00	07/07/2013 00:28	07/07/2013 00:26	-10.0	33.0	1.7	31	8	463	31	8	463	31	0	0
NH	SUPERSEDED	3A	07/07/2013 02:00	07/07/2013 01:27	07/07/2013 01:27	-10.0	37.0	8.5	28	7	454	28	7	454	28	0	0
NH	SUPERSEDED	3A	07/07/2013 03:00	07/07/2013 02:30	07/07/2013 02:27	+15.0	12.0	0.0	12	6	195	12	6	195	12	0	0
NH	SUPERSEDED	3A	07/07/2013 04:00	07/07/2013 03:30	07/07/2013 03:28	+10.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0
NH	TERMINATED	0	07/07/2013 04:30	07/07/2013 04:14	07/07/2013 04:14	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0

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## Event Summary:

### Event Summary

FILE SAVED AS: MISO\_6509\_20130706\_0735.htm

Incident:	MISO_6509_20130706_0735	Date:	07/06/2013 (EST)	Reliability Coordinator:	MISO
Initial Conditions:	N/A				
Flowgate:	6509 - Nelson AT1 500/230 (flio) Hart...	Rating:	0	LODF:	60.79%
TLR Direction:	Normal				
Effective StartTime:	07/06/2013 08:35 (EST)	Effective EndTime:	07/07/2013 04:30 (EST)	TLR Duration:	19 Hours and 55 Minutes

### TLR Actions

Confirm Time	Level	Effective Hour	Priority	Schedule						NNL Relief			Market Relief			Flow		TLR Action Comments	
				Total Tags Cut / Hold	IDC Cut	RC Cut Acknowledge		Hold		CA	IDC MW	RC Ackn MW	Type	Mkt	IDC MW	RC Ackn MW	Current		Post Cont.
Jul 06 08:30 (EST)	TLR 1	CURRENT		NONE						NONE			NONE			202	530	541	N/A
Jul 06 11:05 (EST)	TLR 5B	CURRENT	6-NN 3/0 7-F 32/0 Total 35 / 0	86 69 155	8.9 8.5 17.4	86 69 155	8.9 8.5 17.4	0 0 0	0.0 0.0 0.0	CLEC 1.0 EES 40.0 LAGN 4.0 Total 45.0	1.0 40.0 4.0 45.0	NONE			199	555	587	N/A	
		NEXT	1-NS 1/0 2-NH 1/1 6-NN 3/2 7-F 29/1 Total 34 / 4	8 100 140 72 266.6	2.4 6.3 8.0 9.9 26.6	8 100 140 72 320	2.4 6.3 8.0 9.9 26.6	0 26 150 2 178	0.0 1.4 14.8 0.6 16.8	NONE			NONE						
Jul 06 12:29 (EST)	TLR 5A	NEXT	6-NN 1/0 7-F 29/0 Total 30 / 0	5 110 115	0.4 12.3 12.7	5 110 115	0.4 12.3 12.7	0 0 0	0.0 0.0 0.0	CLEC 1.0 EES 75.0 LAGN 8.0 Total 84.0	2.0 75.0 8.0 85.0	NONE			195	529	550	N/A	
Jul 06 13:38 (EST)	TLR 5A	NEXT	1-NS 0/1 2-NH 0/1 6-NN 1/0 7-F 32/0 Total 33 / 2	0 0 5 276 281	0.0 0.0 0.4 26.0 26.3	0 0 5 276 281	0.0 0.0 0.4 26.0 26.3	25 25 0 0 50	1.3 1.3 0.0 0.0 2.6	CLEC 2.0 EES 114.0 LAGN 12.0 Total 128.0	2.0 114.0 12.0 128.0	NONE			212	552	560	N/A	
Jul 06 14:30 (EST)	TLR 5A	NEXT	1-NS 1/0 2-NH 1/0 6-NN 1/0 7-F 35/0 Total 38 / 0	25 25 5 224 279	1.3 1.3 0.4 26.4 29.3	25 25 5 224 279	1.3 1.3 0.4 26.4 29.3	0 0 0 0 0	0.0 0.0 0.0 0.0 0.0	CLEC 3.0 EES 135.0 LAGN 14.0 Total 153.0	3.0 135.0 14.0 153.0	NONE			202	519	523	N/A	
Jul 06 15:29 (EST)	TLR 5A	NEXT	6-NN 1/0 7-F 35/0 Total 36 / 0	5 247 252	0.4 29.6 29.9	5 247 252	0.4 29.6 29.9	0 0 0	0.0 0.0 0.0	CLEC 3.0 EES 154.0 LAGN 16.0 Total 173.0	3.0 154.0 16.0 173.0	NONE			208	513	503	N/A	
Jul 06 16:27 (EST)	TLR 5A	NEXT	6-NN 1/0 7-F 36/0 Total 37 / 0	5 246 251	0.4 29.7 30.1	5 246 251	0.4 29.7 30.1	0 0 0	0.0 0.0 0.0	CLEC 3.0 EES 150.0 LAGN 15.0 Total 168.0	3.0 150.0 15.0 168.0	NONE			218	557	558	N/A	
Jul 06 17:29 (EST)	TLR 5A	NEXT	6-NN 1/0 7-F 33/0 Total 34 / 0	5 208 213	0.4 24.5 24.8	5 208 213	0.4 24.5 24.8	0 0 0	0.0 0.0 0.0	CLEC 2.0 EES 124.0 LAGN 12.0 Total 138.0	2.0 124.0 12.0 138.0	NONE			207	526	526	N/A	
Jul 06 18:29 (EST)	TLR 5A	NEXT	6-NN 2/0 7-F 30/1 Total 32 / 1	11 127 138	2.2 13.7 15.9	11 127 138	2.2 13.7 15.9	0 65 65	0.0 6.3 6.3	CLEC 1.0 EES 62.0 LAGN 6.0 Total 69.0	1.0 62.0 6.0 69.0	NONE			201	512	512	N/A	
Jul 06 19:28 (EST)	TLR 5A	NEXT	6-NN 2/0 Total 2 / 0	11 11	2.2 2.2	11 11	2.2 2.2	0 0	0.0 0.0	NONE			NONE			228	565	556	N/A

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Event Date	TLR	Category	6-NN	2/0	11	2.2	11	2.2	0	0.0	NONE			NONE			228	565	556	N/A
Jul 06 19:28 (EST)	TLR 5A	NEXT	6-NN Total	2 / 0 2 / 0	11 11	2.2 2.2	11 11	2.2 2.2	0 0	0.0 0.0	NONE			NONE			228	565	556	N/A
Jul 06 20:31 (EST)	TLR 5A	NEXT	6-NN 7-F Total	2/0 29/0 31 / 0	11 84 95	2.2 9.8 12.0	11 84 95	2.2 9.8 12.0	0 0 0	0.0 0.0 0.0	CLEC EES LAGN Total	1.0 44.0 4.0 49.0	1.0 44.0 4.0 49.0	NONE			252	626	616	N/A
Jul 06 21:30 (EST)	TLR 5A	NEXT	2-NH 6-NN 7-F Total	3/0 2/0 24/0 29 / 0	183 14 40 237	11.5 3.2 5.4 20.1	183 14 40 237	11.5 3.2 5.4 20.1	0 0 0 0	0.0 0.0 0.0 0.0	EES LAGN Total	22.0 2.0 24.0	22.0 2.0 24.0	NONE			198	563	601	N/A
Jul 06 22:29 (EST)	TLR 5A	NEXT	2-NH 6-NN Total	3/0 2/0 5 / 0	208 14 222	13.1 3.2 16.2	208 14 222	13.1 3.2 16.2	0 0 0	0.0 0.0 0.0	NONE			NONE			162	428	438	N/A
Jul 06 23:31 (EST)	TLR 3A	NEXT	1-NS 2-NH 6-NN Total	2/0 6/0 2/0 10 / 0	50 399 14 463	3.1 24.9 3.2 31.3	50 399 14 463	3.1 24.9 3.2 31.3	0 0 0 0	0.0 0.0 0.0 0.0	NONE			NONE			230	607	621	N/A
Jul 07 00:28 (EST)	TLR 3A	NEXT	1-NS 2-NH 6-NN Total	2/0 6/0 2/0 10 / 0	50 399 14 463	3.1 24.9 3.2 31.3	50 399 14 463	3.1 24.9 3.2 31.3	0 0 0 0	0.0 0.0 0.0 0.0	NONE			NONE			240	625	635	N/A
Jul 07 01:27 (EST)	TLR 3A	NEXT	1-NS 2-NH 6-NN Total	2/0 6/0 1/0 9 / 0	50 399 5 454	3.1 25.0 0.4 28.5	50 399 5 454	3.1 25.0 0.4 28.5	0 0 0 0	0.0 0.0 0.0 0.0	NONE			NONE			233	613	626	N/A
Jul 07 02:30 (EST)	TLR 3A	NEXT	1-NS 2-NH Total	2/0 6/0 8 / 0	50 145 195	3.1 9.1 12.2	50 145 195	3.1 9.1 12.2	0 0 0	0.0 0.0 0.0	NONE			NONE			219	558	559	N/A
Jul 07 03:30 (EST)	TLR 3A	NEXT	NONE							NONE			NONE			217	548	546	N/A	
Jul 07 04:14 (EST)	TLR 0	CURRENT	NONE							NONE			NONE			218	541	532	N/A	

### TLR Schedule Totals

Priority	Schedule			
	Total Tags Cut/Hold	IDC Cut MVV	RC Cut Acknowledge MVV	Hold MVV
0	0	0	0	0
1	10	233	233	25
2	32	1858	1858	51
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	27	350	350	150
7	344	1703	1703	67
<b>Total</b>	<b>413</b>	<b>4144</b>	<b>4144</b>	<b>293</b>

### TLR>NNL Totals

CA	NNL Relief	
	IDC MVV	RC ACRN MVV
CLEC	17.0	18.0
EES	921.0	921.0
LAGN	93.0	93.0
<b>Total</b>	<b>1031.0</b>	<b>1032.0</b>