

MISO Investigation Report on the NERC TLR Level 5 Event
Manitoba Hydro
Flowgate 6002: MHEX_S Interface
April 21, 2011

Report submitted to NERC on: June 2, 2011

This report is submitted in accordance with the NERC Transmission Loading Relief (TLR) Investigation Procedure for the TLR events that occurred on Flowgate 6002 on April 21, 2011. This event resulted in curtailment of Firm transactions.

1. Description of purpose/cause of hold/curtailment:

The definition of flowgate 6002 is listed below.

Monitored Facilities: Dorsey-Roseau 500kV line
Glenboro-Rugby 230kV line
Richer-Roseau 230kV line
Letellier-Drayton 230kV line

2. Facility/Flow gate limitations and flow at the time the TLR was initiated:

Midwest ISO, along with Manitoba Hydro has developed a standing operating guide to provide guidance for operators to manage real time flow on the MHEX_S Interface.

On April 21, 2011, a TLR 5 was required to reduce the scheduled flows across flowgate 6002 due to the Emergency outage of the Dorsey Transformer Bank 51 and associated PT. Interface FG 6002 must be operated to the scheduling limit = 985MW.

At 11:25 EST, MHEB informed MISO that they will need TLR on the MHEX_S flowgate 6002 to reduce the scheduled flows to 985MW on FG 6002 due to the reduced limits caused by the Emergency outage of the Dorsey Transformer Bank 51. TLR 5B was issued for across 11:50 EST so outage may proceed.

At 12:30 EST, MISO RC received new Temporary Operating guide from MHEB raising the scheduling limit to 1425MW.

At 12:35 EST, MISO re-issued the TLR-5B as a TLR-5A for across 13:00 EST on the MHEX_S flowgate 6002 to maintain the scheduled flows to within limits.

At 22:28 EST, MISO re-issued the TLR-5A to a TLR-1 for across 23:00 EST. Scheduled flows were within limits and TLR can be reduced accordingly.

At 01:41 EST, MISO re-issued the TLR-1 to a TLR-5A for across 02:00 EST. Schedules are again predicted to be above op-guide limits. MISO RC issued TLR to maintain scheduled flow limit.

At 18:58 EST, MHEB informed MISO that the Emergency outage of the Dorsey Transformer Bank 51 was complete and the bank was back in service. At 18:59 EST, MISO reduced to a TLR-0 across 19:15 EST, ending the TLR-5 event.

As the NERC IDC showed insufficient non-firm schedule curtailments to relieve flows to the necessary levels, TLR-5 was issued for 29 issuances over the duration of this event.

3. TLR Level 5 issuance information, timing (EST), firm tag information obtained for flow gate #6002 April 21, 2011:

TLR LEVEL	TIME (EST)	Firm Transaction / Curtailment Information	NNL Reduction Requirement
5B	11:50	14 tags of (7-F and 7-FN) = 316 MW schedules curtailed to provide 316 MW relief	None
5A	13:00	2 tags of (7-F and 7-FN) = 267 MW schedules curtailed to provide 267 MW relief	None
5A	14:00	No Firm Curtailments	None
5A	15:00	2 tags of (7-F and 7-FN) = 279 MW schedules curtailed to provide 279 MW relief	None
5A	16:00	2 tags of (7-F and 7-FN) = 230 MW schedules curtailed to provide 230 MW relief	None
5A	17:00	3 tags of (7-F and 7-FN) = 248 MW schedules curtailed to provide 248 MW relief	None
5A	18:00	No Firm Curtailments	None
5A	19:00	3 tags of (7-F and 7-FN) = 274 MW schedules curtailed to provide 274 MW relief	None
5A	20:00	15 tags of (7-F and 7-FN) = 320 MW schedules curtailed to provide 320 MW relief	None
5A	21:00	16 tags of (7-F and 7-FN) = 290 MW schedules curtailed to provide 290 MW relief	None
5A	22:00	1 tags of (7-F and 7-FN) = 50 MW schedules curtailed to provide 50 MW relief	None
1	23:00	No Firm Curtailments	None
5A	4/22 02:00	13 tags of (7-F and 7-FN) = 207 MW schedules curtailed to provide 207 MW relief	None
5A	03:00	13 tags of (7-F and 7-FN) = 218 MW schedules curtailed to provide 218 MW relief	None
5A	04:00	13 tags of (7-F and 7-FN) = 237 MW schedules curtailed to provide 237 MW relief	None
5A	05:00	12 tags of (7-F and 7-FN) = 164 MW schedules curtailed to provide 164 MW relief	None
5A	06:00	14 tags of (7-F and 7-FN) = 349 MW schedules curtailed to provide 349 MW relief	None
5A	07:00	1 tags of (7-F and 7-FN) = 50 MW schedules curtailed to provide 50 MW relief	None
5A	08:00	2 tags of (7-F and 7-FN) = 324 MW schedules curtailed to provide 324 MW relief	None
5A	09:00	2 tags of (7-F and 7-FN) = 336 MW schedules curtailed to provide 336 MW relief	None
5A	10:00	No Firm Curtailments	None
5A	11:00	2 tags of (7-F and 7-FN) = 315 MW schedules	None

		curtailed to provide 315 MW relief	
5A	12:00	No Firm Curtailments	None
5A	13:00	2 tags of (7-F and 7-FN) = 311 MW schedules curtailed to provide 311 MW relief	None
5A	14:00	2 tags of (7-F and 7-FN) = 313 MW schedules curtailed to provide 313 MW relief	None
5A	15:00	2 tags of (7-F and 7-FN) = 344 MW schedules curtailed to provide 344 MW relief	None
5A	16:00	1 tags of (7-F and 7-FN) = 50 MW schedules curtailed to provide 50 MW relief	None
5A	17:00	2 tags of (7-F and 7-FN) = 230 MW schedules curtailed to provide 230 MW relief	None
5A	18:00	1 tags of (7-F and 7-FN) = 50 MW schedules curtailed to provide 50 MW relief	None
5A	19:00	1 tags of (7-F and 7-FN) = 50 MW schedules curtailed to provide 50 MW relief	None
0	19:15	Terminated TLR	None

NNL Mitigation:

- There were no NNL obligations for this TLR 5.

4. Transmission and generation outage or changes from prediction that may have contributed:

Significant Transmission Outages:

Prairie Shunt Caps
Roseau Series Cap 2
Dorsey Transformer BK51

Significant Generator Outages:

JP Madgett	399
Coal Creek 1	575
Monticello	610
AS King	555
Sherburne County 3	934
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	3073

System Condition Summary:

The emergency outage of the Dorsey transformer bank 51 and associated PT caused a reduction in the scheduling limit on MHEX_S flowgate 6002 per the temporary op-guide. The scheduling flows needed to be reduced for the duration of the emergency outage.

5. Procedures implemented prior to hold/curtailment:

None – this issue is covered by the Temporary & Standing op-guides.

6. Compare Complete Transaction Curtailment List with the Whole Transaction List as generated by the IDC, before and after curtailments:

Firm transactions impacting the flow gate by 5% or greater were partially curtailed and reloaded.

7. Known Transactions not in the IDC and actions taken:

There were no known transactions not in the IDC at the time this TLR was in effect that were impacting this flow gate.

8. RCIS or other system messages:

Information was provided to NERC Reliability Coordinators via the NERC IDC. The IDC automatically sends TLR Level information to the RCIS. Curtailment information was communicated to the MISO control areas via the MISO MCS and ICCS messaging systems.

9. State estimator snapshots and security analysis including contingency analysis or stability analysis along with any other recorded data indicating the need for TLR:

None – this issue is covered by the Temporary & Standing op-guides.

10. ATC Limitations before, during, and after the event:

None – this was an emergency outage & scheduling limit event.

11. Description of actions taken to avoid future hold/curtailments:

None – this was an emergency outage & scheduling limit event

12. Re-dispatch actions taken:

None – this issue is covered by the Temporary & Standing op-guides.

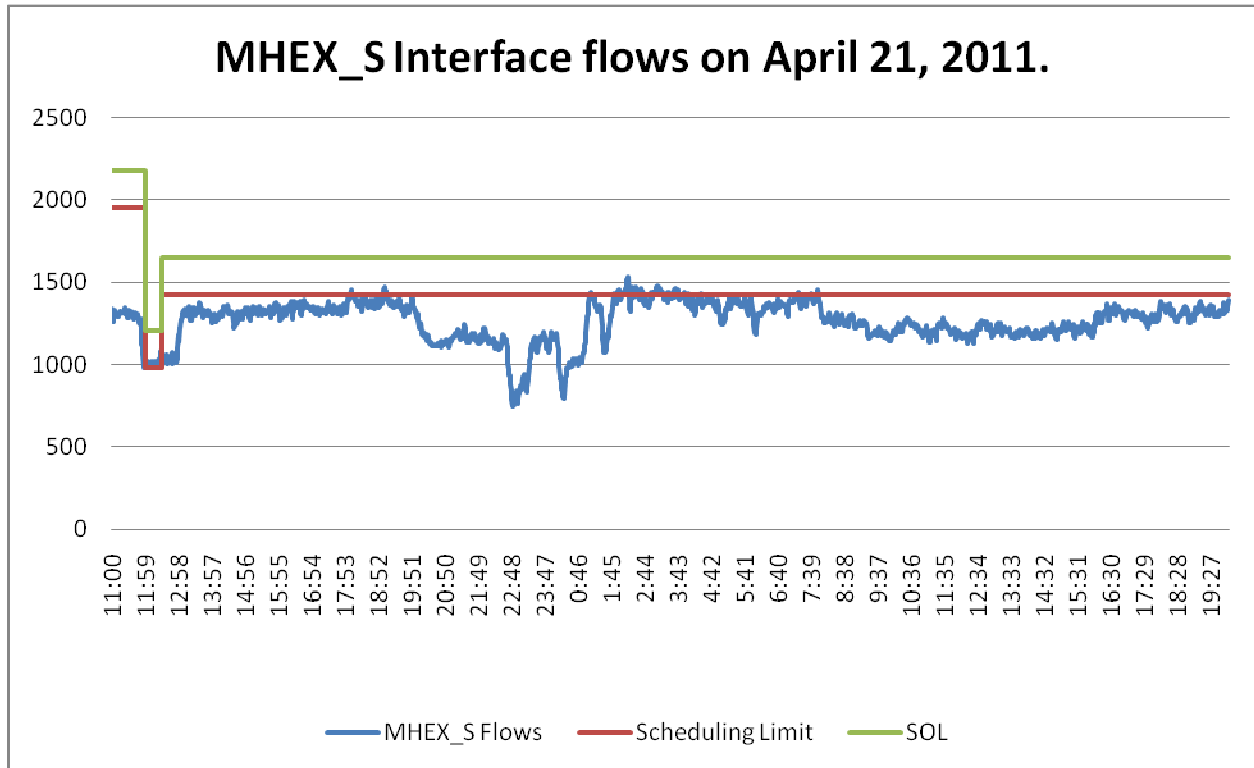
13. If Firm transaction curtailments took place, description of Transactional Contribution Factor calculation and results as well as how necessary relief was obtained through network service and native load contributions:

Firm schedules were curtailed as detailed in section 3 above.

14. Other options considered before/during to avoid hold/curtailment:

None – this issue is covered by the Temporary & Standing op-guides.

15. The following chart identifies the flowgate loading for the TLR level 5 event:



16. Lessons Learned

The MHEB and MISO Operators reacted appropriately to the emergency outage of the Dorsey transformer bank 51.

MHEB and MISO will continue to work closely to ensure the Interface limits are respected.