

**MISO Investigation Report on the NERC TLR Level 5 Event**  
**Manitoba Hydro**  
**Flowgate 6002: MHEX\_S Interface**  
**April 11, 2010**

Report submitted to NERC on: May 12, 2010

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 11, 2010. 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 11, 2010, a TLR 5 was required to reduce the real-time south flows across the MHEX\_S Interface. The Dorsey-Forbes 500kV (D602F) line was returning from a maintenance outage and the phase angle was too great to synchronize the line, this line is one element of the MHEX\_S Interface into the USA.

At 22:55 EST, MHEB informed MISO that they needed TLR the MHEX\_S flowgate 6002 to reduce the real-time schedules, thus reducing the phase-angle for returning the D602F line to service.

At 23:01 EST, MISO issued a TLR-5B for across 23:15 EST on the MHEX\_S flowgate 6002 to reduce the real-time flows and thus the phase angle on D602F.

At 23:19 EST, MHEB restored the D602F to service.

At 23:20 EST, MISO issued a TLR-0 for across 23:30 EST on FG 6002 thus ending the TLR.

As the NERC IDC showed insufficient non-firm schedule curtailments to relieve flows to the necessary levels, TLR-5 was issued for 1 issuance over the duration of this event.

**3. TLR Level 5 issuance information, timing (EST), firm tag information obtained for flow gate #6002 April 11, 2010:**

<b>TLR LEVEL</b>	<b>TIME (EST)</b>	<b>Firm Transaction / Curtailment Information</b>	<b>NNL Reduction Requirement</b>
5B	23:15	5 tags of (7-F & 7-FN) = 151 MW schedules curtailed to provide 151 MW relief	None
0	23:30	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 Forced Transmission Outages:**

Prairie-Winger 230kV

**Significant Generator Outages:**

Coal Creek 2	550
King 1	611
Sherburne County 2	769
Bigstone	495
Laramie River 1	585
	=====
	3010

**System Condition Summary:**

D602F was returning from a maintenance outage. The phase-angle for return was too great due to heavy North-South flows on the MHEX\_S interface.

**5. Procedures implemented prior to hold/curtailment:**

None – this issue is covered by the Standing op-guide

**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 MCN 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 Standing op-guide

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

None – this issue is covered by the Standing op-guide

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

None – this issue is covered by the Standing op-guide

**12. Re-dispatch actions taken:**

None – this issue is covered by the Standing op-guide

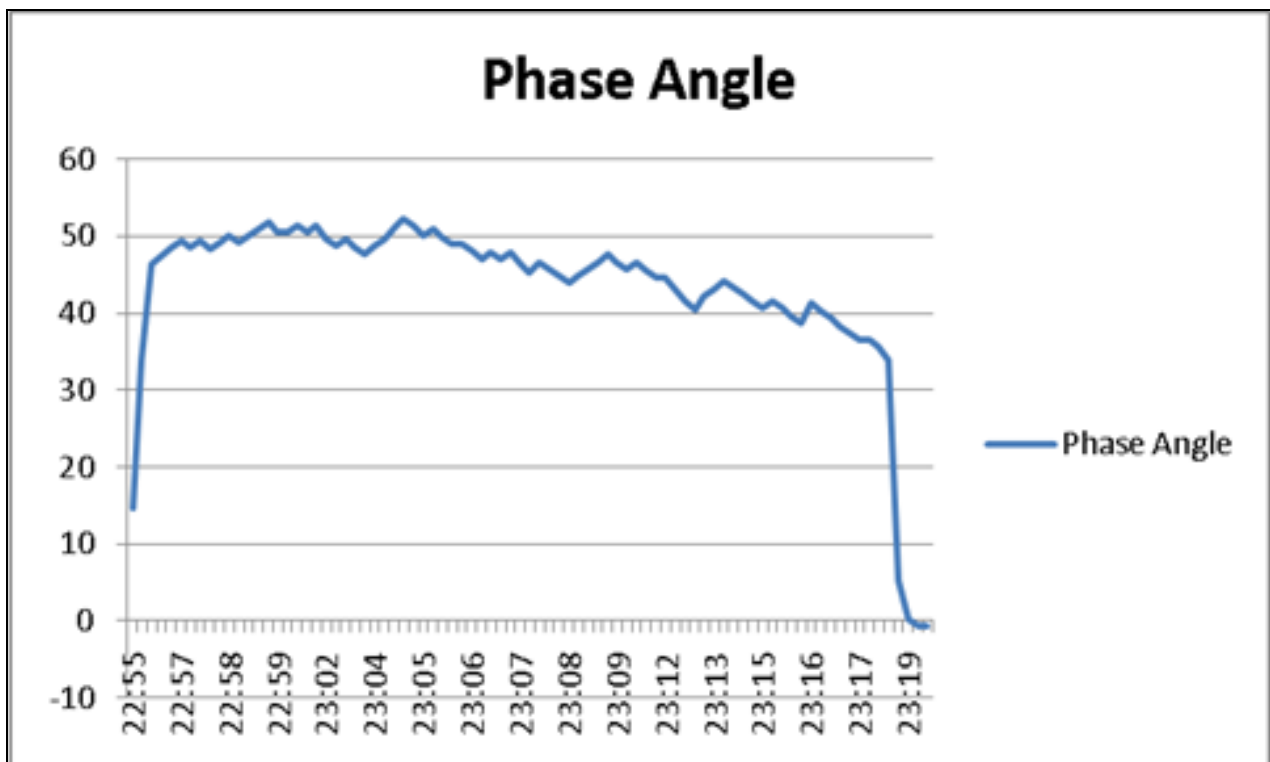
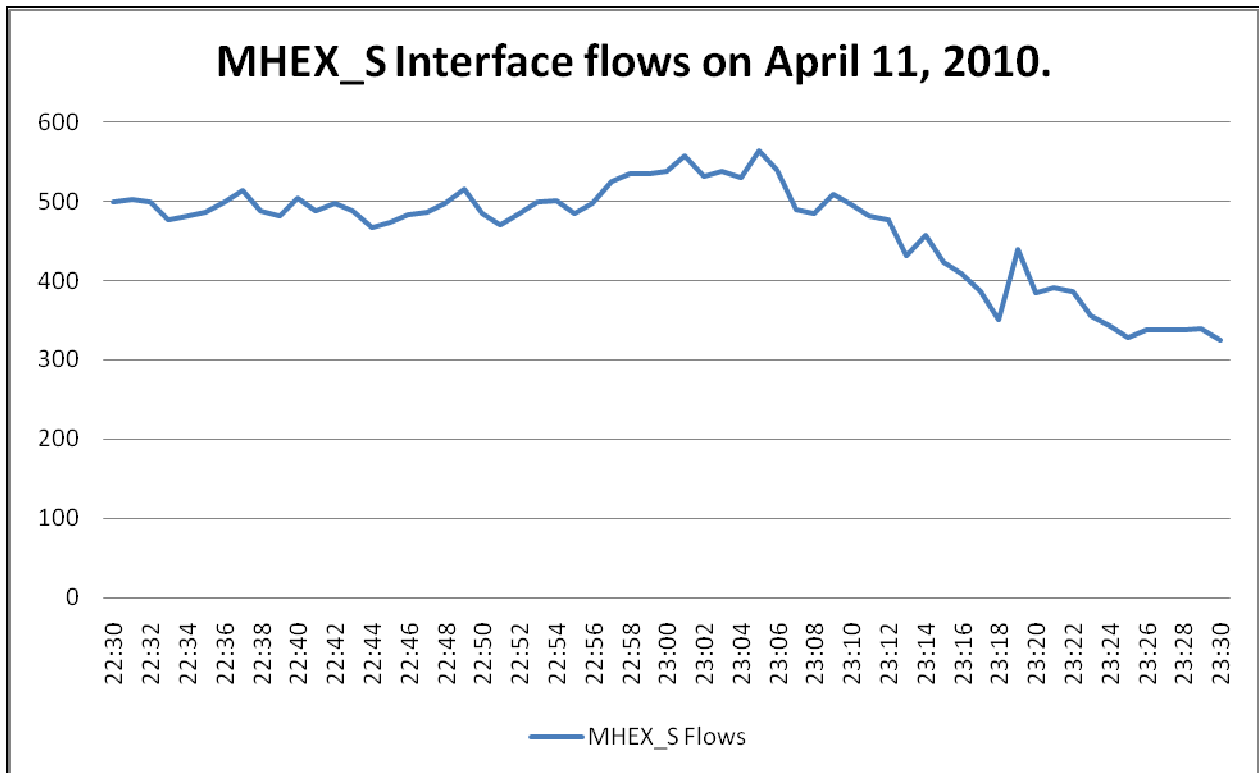
**13. If Firm transaction curtailments took place, description of Transactional Contribution Factor calculation and results as well as how necessary relief was obtained through network service and native load contributions:**

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 Standing op-guide

15. The following charts identify the flowgate loading for the TLR level 5 event:



## **16. Lessons Learned**

The MHEB and MISO Operators reacted appropriately to the phase-angle issue on the D602F circuit of the MHEX Interface and reduced flows across the area to reduce the angle which allowed the line to return from a planned outage.

MHEB and MISO will continue to work closely to ensure reliability in the area.