

MISO Investigation Report on the NERC TLR Level 5 Event
Western Area Power Administrator (WAPA)
Flowgate 16230: Lewis and Clark - Dawson County 115kV (flo) Belfield – Medora -
Dawson County 230kV + SPS Flowgate
March 1-2, 2010

Report submitted to NERC on: April 14, 2010

This report is submitted in accordance with the NERC Transmission Loading Relief (TLR) Investigation Procedure for the TLR events that occurred on Flowgate 16230 on March 1-2, 2010. This event resulted in curtailment of Firm transactions.

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

The definition of flowgate 16230 is listed below.

Monitored Facility: Lewis and Clark - Dawson Co. 115kV
Contingent Facility: Belfield-Medora-Dawson County 230kV

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

Midwest ISO, along with WAPA & MDU, had developed a standing operating guide to provide guidance for operators to manage real time flow on the NDEX Interface. Following the forced outage of the Little Missouri-Bowman 230kV line, a temporary op-guide was used to manage flows more precisely in the area.

On March 1, 2010, a TLR 5 was required to reduce flows across the Lewis and Clark – Dawson Co. 115kV (flo) Belfield-Medora-Dawson County 230kV line due to the forced outage of the Little Missouri-Bowman 230kV line which resulted in high East-West transfers across the Miles City HVDC tie.

At 15:45 EST on 3/1, WAPA requested a TLR to reduce flows on flowgate 16230.

At 15:53 EST on 3/1, the MISO Reliability Coordinator issued a TLR-5A for across 16:00 EST on the flowgate to maintain flows at acceptable levels.

At 23:17 EST on 3/1, the MISO Reliability Coordinator issued a TLR 0 for across 23:30 EST due to flows subsiding on the constraint.

At 23:58 EST on 3/1, the MISO Reliability Coordinator issued a TLR-3A for across 00:00 EST on 3/2 on the flowgate as the flows started to again rise on the constraint.

At 01:27 EST on 3/2, the MISO Reliability Coordinator issued a TLR-5B for across 01:45 EST on the flowgate due to the flows continuing to rise and insufficient non-firm transactions to curtail.

At 02:35 EST on 3/2, the MISO Reliability Coordinator issued a TLR-5A for across 03:00 EST on the flowgate.

At 07:41 EST on 3/2, the MISO Reliability Coordinator issued a TLR-5B for across 07:45 EST on the flowgate due to additional relief required to maintain flows.

At 08:38 EST on 3/2, the MISO Reliability Coordinator issued a TLR-5B for across 08:45 EST on the flowgate due to additional relief required to maintain flows.

At 09:30 EST on 3/2, the MISO Reliability Coordinator issued a TLR-5A for across 10:00 EST on the flowgate.

At 15:38 EST on 3/2, the MISO Reliability Coordinator issued a TLR-0 for across 15:45 EST ending the TLR on the flowgate.

As the NERC IDC showed insufficient non-firm schedule curtailments to relieve schedules to the necessary levels, TLR 5 was issued for 22 issuances over the course of this 2 day event.

3. TLR Level 5 issuance information, timing (EST), firm tag information obtained for flow gate #16230

March 1, 2010:

TLR LEVEL	TIME (EST)	Firm Transaction / Curtailment Information	NNL Reduction Requirement
5A	16:00	5 tags of (7-F) = 37 MW schedules curtailed to provide 24 MW relief	MDU = 6.6 MWS
5A	17:00	5 tags of (7-F) = 47 MW schedules curtailed to provide 31 MW relief	MDU = 8.4 MWS
5A	18:00	5 tags of (7-F) = 16 MW schedules curtailed to provide 11 MW relief	MDU = 2.5 MWS
5A	19:00	5 tags of (7-F) = 11 MW schedules curtailed to provide 7 MW relief	MDU = 2.3 MWS
5A	20:00	5 tags of (7-F) = 14 MW schedules curtailed to provide 9 MW relief	MDU = 3.5 MWS
5A	21:00	5 tags of (7-F) = 25 MW schedules curtailed to provide 17 MW relief	MDU = 7.0 MWS
5A	22:00	5 tags of (7-F) = 43 MW schedules curtailed to provide 28 MW relief	MDU = 12.1 MWS
5A	23:00	5 tags of (7-F) = 37 MW schedules curtailed to provide 24 MW relief	MDU = 10.7 MWS
0	23:30	No Firm Curtailments	None
3A	00:00 3/2	No Firm Curtailments	None
3A	01:00	No Firm Curtailments	None
5B	01:45	5 tags of (7-F) = 62 MW schedules curtailed to provide 41 MW relief	MDU = 10.8 MWS
5A	03:00	5 tags of (7-F) = 16 MW schedules curtailed to provide 11 MW relief	MDU = 5.0 MWS
		Continued on next page	

5A	04:00	5 tags of (7-F) = 18 MW schedules curtailed to provide 12 MW relief	MDU = 5.5 MWS
5A	05:00	5 tags of (7-F) = 15 MW schedules curtailed to provide 10 MW relief	MDU = 4.7 MWS
5A	06:00	5 tags of (7-F) = 15 MW schedules curtailed to provide 10 MW relief	MDU = 4.7 MWS
5A	07:00	5 tags of (7-F) = 10 MW schedules curtailed to provide 7 MW relief	MDU = 2.3 MWS
5A	07:45	5 tags of (7-F) = 17 MW schedules curtailed to provide 11 MW relief	MDU = 7.7 MWS
5A	08:45	5 tags of (7-F) = 16 MW schedules curtailed to provide 11 MW relief	MDU = 13.3 MWS
5A	10:00	5 tags of (7-F) = 92 MW schedules curtailed to provide 61 MW relief	MDU = 16.3 MWS
5A	11:00	5 tags of (7-F) = 94 MW schedules curtailed to provide 62 MW relief	MDU = 16.8 MWS
5A	12:00	5 tags of (7-F) = 96 MW schedules curtailed to provide 63 MW relief	MDU = 17.0 MWS
5A	13:00	5 tags of (7-F) = 94 MW schedules curtailed to provide 62 MW relief	MDU = 16.6 MWS
5A	14:00	5 tags of (7-F) = 70 MW schedules curtailed to provide 46 MW relief	MDU = 12.5 MWS
5A	15:00	0 tags of (7-F) = 0 MW schedules curtailed to provide 0 MW relief	None
0	15:45	No Firm Curtailments	None

NNL Mitigation:

- MDU had NNL obligation for this TLR 5. MDU's NNL was mitigated through binding on the constraint in the MISO market. Glendive CT #1 was called on and Lewis & Clark generation was manually re-dispatched to its Dispatch minimum.

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

Significant Forced Transmission Outages:

Little Missouri-Bowman 230kV

Significant Generator Outages:

Coal Creek 1	550
Young 2	455
Sherburne County 2	769
Boswell 3	350
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	2124

System Condition Summary:

The forced outage of the Little Missouri-Bowman 230kV line resulted in high East-West transfers across the Miles City HVDC tie. This increased flow resulted in high post-contingent flows on the Lewis and Clark – Dawson Co. 115kV (flo) Belfield-Medora-Dawson County 230kV contingency.

5. Procedures implemented prior to hold/curtailment:

MISO Reliability Coordinator used MISO binding procedures for the duration of this TLR-5 event.

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 event was a result of a forced outage.

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

None – This event was a result of a forced outage.

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

None - event was a result of a forced outage.

12. Re-dispatch actions taken:

WAPA manually re-dispatched Fort Peck generation up 30mws.

MISO manually re-dispatched Lewis & Clark generation to their dispatch minimum.

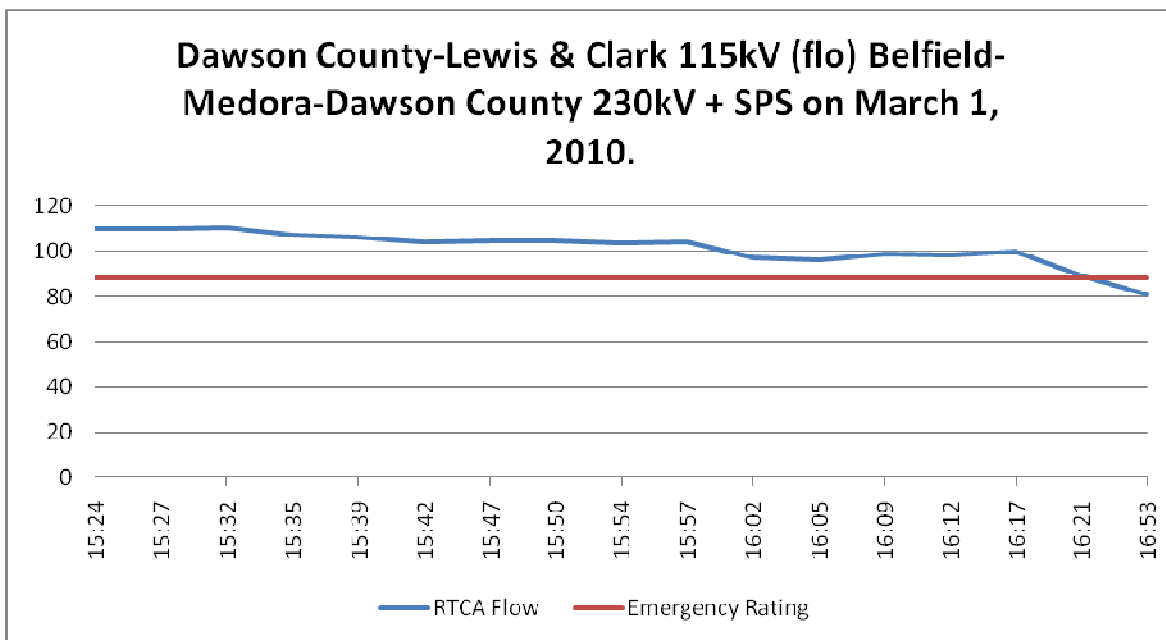
13. If Firm transaction curtailments took place, description of Transactional Contribution Factor calculation and results as well as how necessary relief was obtained through network service and native load contributions:

Firm schedules were curtailed as detailed in section 3 above.

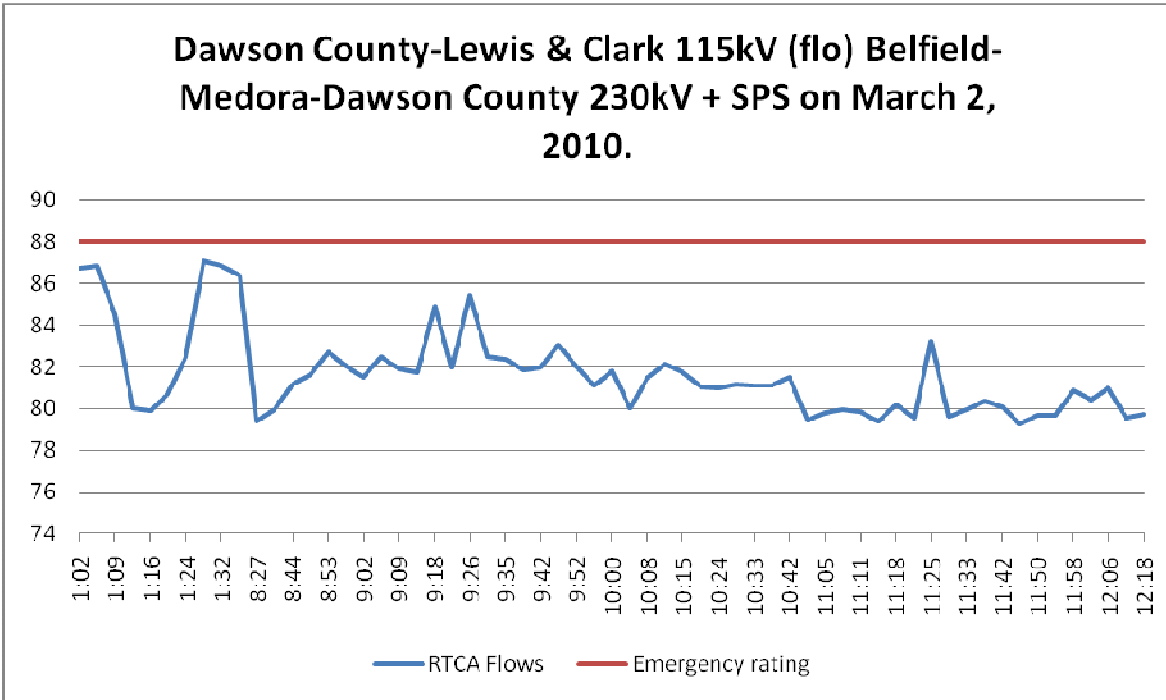
14. Other options considered before/during to avoid hold/curtailment:

WAPA & MISO were in conversations about curtailing the East-West flows across the Miles City HVDC tie.

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



Note: Prior to TLR 5 issuance, Operators were relying on running back Antelope Valley units and increasing generation from Fort Peck if contingency occurred. When studies indicated this would no longer solve the loading issue the TLR 5 was issued, soon after the loading dropped well below limits – graph ends at the point the contingency no longer showed up in RTCA.



Note: Higher EM rating given of 135MVA which ended the TLR 5 event.

16. Lessons Learned

There was a standing as well as a temporary operating guide in place to assist Operators with this interface which was followed by the MISO, WAPA, & MDU Operators. This event was caused by a forced outage of the Little Missouri-Bowman 230kV line. A higher emergency rating was provided on March 2nd which removed the need for the TLR 5.

MISO, WAPA, & MDU will continue to work closely to maintain the standing operating guide and its procedures and train its personnel to handle such unforeseen events.

The event was split across midnight on March 2nd to accommodate an IDC monthly scheduled model update.