



Western Area Power Administration Upper Great Plains Region (Western-UGP)

WAUW Balancing Authority Area Miles City DC Tie Tag Curtailments due to Deadband Business Practice

This Business Practice outlines Western-UGP's energy tag curtailment process and requirements in its Western Interconnection Balancing Authority Area ("WAUW"). Effective on October 1, 2015, when Western-UGP joined the Southwest Power Pool, Inc. (SPP) as a transmission owning member and transferred functional control of its eligible transmission facilities, including the Miles City DC Tie (also referred to as the "Miles City Converter Station" or "MCCS"), to SPP, transmission service on Western-UGP's facilities located in WAUW is provided by SPP under the SPP Open Access Transmission Tariff ("SPP Tariff"). Western-UGP is still the Balancing Authority ("BA") for its WAUW Balancing Authority Area ("BAA").

The coordination between Western-UGP as the Balancing Authority and SPP as the Transmission Provider in the Western Interconnection is described in Attachment AS of the SPP Tariff entitled "Contract Services Agreement between Western Area Power Administration and Southwest Power Pool, Inc."

Background on Miles City DC Tie (MCCS) and Operating Limits due to Deadband:

The Miles City DC Tie is a 200 MW nominally rated back-to-back DC Tie between the Eastern and Western Interconnections located near Miles City, Montana. It is a Tie Line between the SPP Balancing Authority Area and the WAUW BAA. The current system-intact directional transfer capabilities of the MCCS are 200 MW East-to-West and 150 MW West-to-East. Based upon the DC technology installed at the MCCS, the minimum power operating level for the MCCS is 20 MW in either direction. Therefore, the MCCS cannot be operated in the power transfer range between 20 MW East-to-West and 20 MW West-to-East. This 40 MW transfer range between the minimum power transfer level in each direction is referred to as the "Deadband".

Transmission service is sold across the MCCS by SPP, as the Transmission Provider, under the SPP Tariff. This transmission service is sold in either direction. Similar to Western-UGP's historic practice, SPP grants transmission service without regard to the potential Deadband operating issue, given that until near the actual operating hour, neither the net of the Transmission Service Reservations ("TSRs") nor the scheduled energy tags across the MCCS is known. Also, given the uncertainty of the amount of energy that will actually be scheduled, if any, on the TSRs that are granted transmission service, the accumulation of net capacity amounts on the TSRs cannot be relied upon to predict whether the Deadband operating issue will occur. Therefore, SPP, as the Transmission Provider, cannot predict, nor prevent, the Deadband operating issue from occurring when it grants transmission service across the MCCS.



At the time that final energy tags in each direction on the MCCS are submitted on the TSRs for the next operating hour, Western-UGP as the WAUW BA Operator can determine if the NET of the scheduled energy tags will result in a NET MCCS power transfer that falls into the Deadband where the MCCS cannot be operated. The following example illustrates the issue:

Example #1 - Schedules for Next Operating Hour

Scheduled energy tag #1 = 50 MW East-to-West

Scheduled energy tag #2 = 40 MW West-to-East

NET of scheduled energy tags = 10 MW East-to-West (*Invalid MCCS Operating Condition*)

In this example, either the West-to-East energy tag #2 needs to be reduced by 10 MW to achieve a NET valid MCCS Power Transfer level of 20 MW East-to-West, OR the East-to-West energy tag #1 needs to be reduced by 30 MW to achieve a NET valid MCCS Power Transfer level of 20 MW West-to-East. Reductions of the energy tags in both directions on the MCCS does not address the Deadband issue (e.g. 1 for 1 reductions in the scheduled MW on tags in opposite directions just maintains the same NET of scheduled energy tags and the same Invalid MCCS Power Transfer level.)

In the event that Western-UGP determines that the NET MCCS schedule will fall within the Deadband, Western-UGP must take action to adjust/curtail the scheduled energy tags to obtain a valid MCCS Power Transfer level. This Business Practice outlines the process utilized by Western-UGP, as the WAUW BA Operator, to select and curtail scheduled energy tags across the MCCS to achieve a valid MCCS Power Transfer level. The selection of the scheduled energy tag(s) to be curtailed seeks to minimize the total scheduled energy (MW) curtailed, and also relies upon the relative priorities of the TSRs granted by SPP, as the Transmission Provider. Western-UGP will coordinate with and immediately notify SPP, as the Transmission Provider, of any necessary curtailments of scheduled energy tags submitted on TSRs granted by SPP.

WAUW MCCS Tag Curtailment Procedure due to Deadband:

In the event that scheduled energy tags on the MCCS need to be curtailed to achieve a valid MCCS Power Transfer level (i.e. ≥ 20 MW in either direction), the following process will be followed.

- A. Curtailments to scheduled energy tags will be made on a non-discriminatory basis to the transaction(s) that effectively and most efficiently relieve the constraint (i.e. move the NET MCCS schedule out of the Deadband, where the MCCS cannot reliably or physically operate) relying upon the relative priorities of the associated TSRs as set forth in Section 13.6 "Curtailment of Firm Transmission Service" and Section 14.7 "Curtailment or Interruption of Service" (*Non-Firm*) of the SPP Tariff, and associated SPP Business Practices defining the relative priorities of TSRs under the SPP Tariff, if applicable.



- B. Western-UGP shall curtail scheduled energy tag(s) according the following NERC/NAESB and SPP Tariff priorities (listed from lowest to highest priority), based upon the priorities of the associated TSRs granted by SPP, as the Transmission Provider:
1. Priority 0: Non-firm NHM Service – NX (if offered by Transmission Provider)
 2. Priority 1: Service over secondary PORs and PODs – NS
 3. Priority 2: Non-Firm PTP Hourly Service – NH
 4. Priority 3: Non-Firm PTP Daily Service – ND
 5. Priority 4: Non-Firm PTP Weekly Service – NW
 6. Priority 5: Non-Firm PTP Monthly Service – NM
 7. Priority 6: NITS from sources not DNRs – NN and Long-Term Firm PTP subject to the Conditional Curtailment Priority Level – CF
 8. Priority 7: Firm PTP – F, NITS from DNRs – FN, *Firm under GFAs – FGFA (per SPP Tariff)*, and CBM – CB
- C. Using the relative priorities of the scheduled energy tags, based upon (B) above, and starting at the lowest priority tags first, Western-UGP shall curtail scheduled energy tags, as needed, to move the NET MCCS schedule out of the Deadband, according to the following procedure:
1. For EQUAL priorities, curtail only the tag(s) in the direction of flow across the MCCS that requires the LEAST amount of total curtailments, if possible. *[Example #2 – Scenario 1]* If multiple tags of EQUAL priority need to be curtailed in the same direction of flow across the MCCS, the curtailments on those tags will be based upon a PRO-RATA curtailment across all such tags. *[Example #2 – Scenario 2]*
 2. For EQUAL priorities, where the same amount of total curtailment would be required in tag(s) in either direction of flow across the MCCS, curtail the tag(s) in the direction of flow across the MCCS that is RANDOMLY selected. Western-UGP shall document the method utilized, and results of its random selections. *[Example #2 – Scenario 3]*

Example #2

Tag Direction/Priority (→ East to West) (← West to East)	Scenario 1 (MW) - PRE	Scenario 1 (MW) - POST	Scenario 2 (MW) - PRE	Scenario 2 (MW) - POST	Scenario 3 (MW) - PRE	Scenario 3 (MW) - POST
→ NH	10	10	20	7 #@	30	10 #@
→ NH	-	-	10	3 #@	-	-
← NH	20	10 #	50	50	50	50
→ FN	70	70	70	70	70	70
← FN	50	50	50	50	50	50
NET MCCS Schedule	10 →*	20 →	0*	20 ←	0*	20 ←

* Invalid MCCS Power Transfer level in the Deadband

Scheduled energy tag(s) that are curtailed

@ Randomly selected direction of flow across the MCCS



3. In situations where curtailment of the LOWER priority scheduled energy tags will not provide any benefit in moving the NET MCCS schedule out of the Deadband, HIGHER priority scheduled energy tags will be curtailed; however the LOWER priority scheduled energy tags will remain unchanged. *[Example #3 – Scenario 1]*
4. In situations where curtailment of the LOWER priority scheduled energy tags will successfully move the NET MCCS schedule out of the Deadband, HIGHER priority scheduled energy tags will remain unchanged. *[Example #3 – Scenario 2]*
5. The maximum possible amount and/or combinations of scheduled NON-FIRM energy tags will be curtailed to move the NET MCCS schedule in the desired direction to reduce the amount of FIRM energy tags that would otherwise need to be curtailed. In the event that curtailments of scheduled FIRM energy tags (with or without simultaneous curtailments of scheduled NON-FIRM energy tags) will be required to move the NET MCCS schedule out of the Deadband, curtail only the scheduled FIRM energy tag(s) in the direction of flow across the MCCS that requires the LEAST amount of total scheduled FIRM energy tag curtailments, if possible. *[Example #3 – Scenario 3]*

Example #3

Tag Direction/Priority (→ East to West) (← West to East)	Scenario 1 (MW) - PRE	Scenario 1 (MW) - POST	Scenario 2 (MW) - PRE	Scenario 2 (MW) - POST	Scenario 3 (MW) - PRE	Scenario 3 (MW) - POST
→ NH	10	10	30	10 #	5	5
← ND	20	10 #	50	50	-	-
→ FN	70	70	70	70	60	60
← FN	50	50	50	50	50	45 #
NET MCCS Schedule	10 →*	20 →	0 *	20 ←	15 →*	20 →

* Invalid MCCS Power Transfer level in the Deadband

Scheduled energy tag(s) that are curtailed

@ Randomly selected direction of flow across the MCCS

Questions concerning Western-UGP’s WAUW BAA Miles City DC Tie tag curtailments should be directed to the following Western-UGP contacts:

- Real-Time Generation/Scheduling Desk – 605-882-7584
- Scott Byer, Operations Specialist – 605-882-7551 (byer@wapa.gov)
- Craig Speidel, Transmission Scheduling and Generation Control Manager – 605-882-7541 (speidel@wapa.gov)

Coordination with SPP Tariff and related questions:

- Steve Sanders, Operations & Transmission Advisor – 406-255-2840 (office), 406-670-7436 (mobile) (sanders@wapa.gov)