

**Western Electricity Coordinating Council Guideline
 Unscheduled Flow Reduction Guideline**

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WECC Guideline: UNSCHEDULED FLOW REDUCTION GUIDELINE

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Introduction

The combination of Scheduled and Unscheduled Flows on a Transfer Path may exceed the transfer capability of that Transfer Path. This Unscheduled Flow (USF) Reduction Guideline will be utilized to reduce the USFs across a constrained Qualified Transfer Path.

Guideline

The WECC USF Reduction Guideline addresses the prescribed method of mitigation for USF and the details for its implementation. The entities that the guideline applies to are listed below:

Balancing Authority

Interchange Authority

Load-Serving Entity

Reliability Coordinator

Purchasing-Selling Entity

Transmission Operator

Transmission Service Provider

Guideline Details

The USF Reduction Guideline is in actuality a multi-faceted procedure involving many aspects of the problem. The aspects addressed by the Guideline are detailed below:

1. Transfer Path Qualification
2. Transfer Path Requalification
3. Transfer Path Deletion
4. Actions Required Following Addition of a New Qualified Transfer Path
5. Controllable Device Qualification
6. Controllable Device Deletion
7. Accommodation Limits
8. General Terms
9. General Action Rules
10. Action Steps
11. Rapid Advancement of the Steps
12. Competing Paths
13. Further Action
14. Term

This USF Reduction Guideline addresses the actions that are required by all applicable entities. This USF Reduction Guideline recognizes the effectiveness of coordinated control and operation of the Qualified Controllable Devices installed within the WECC systems. It is subject to modification as provided in Section 4.2 of the WECC Unscheduled Flow Mitigation Policy (the Policy).

When a Qualified Transfer Path is constrained by USF, the Transfer Path Operator will provide notice via the WECC communications system, and the applicable entities will take actions as required by this USF Reduction Guideline to reduce the effects of USF across the Qualified Transfer Path.

This USF Reduction Guideline is not intended to be prescriptive with regard to which Schedules are to be adjusted to effect the required USF Accommodation or Schedule reduction. Rather, when actions are required to reduce the effects of USF, it is expected that each applicable entity will select the most appropriate Schedule reduction that will satisfy the intended accommodation and curtailment responses required by this USF Reduction Guideline.

WECC UNSCHEDULED FLOW REDUCTION GUIDELINE

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The combination of Scheduled and Unscheduled Flows on a Transfer Path may exceed the System Operating Limit (SOL) of that Transfer Path. This Unscheduled Flow Reduction Guideline (USF Reduction Guideline) will be utilized to reduce the USFs across a constrained Qualified Transfer Path. The USF Reduction Guideline has the following parts:

1. Transfer Path Qualification
2. Transfer Path Requalification
3. Transfer Path Deletion
4. Actions Required Following Addition of a New Qualified Transfer Path
5. Controllable Device Qualification
6. Controllable Device Deletion
7. Accommodation Limits
8. General Terms
9. General Action Rules
10. Action Steps
11. Rapid Advancement of the Steps
12. Competing Paths
13. Further Action
14. Term

Terms that are initially capitalized in this USF Reduction Guideline refer to defined terms in the WECC Unscheduled Flow Mitigation Policy.

1. Transfer Path Qualification

Requests for Transfer Path qualification shall be made directly to the Unscheduled Flow Administrative Subcommittee (UFAS). To qualify a Transfer Path under this Plan, a Transfer Path Operator must specify the applicable direction and provide documentation to satisfy the requirements for qualification set forth below:

- a. The Transfer Path must be a transmission element or elements across which:
 - i. a Schedule (MW) can be established.
 - ii. actual flow (MW) is metered.
 - iii. an SOL has been established and published in WECC Planning Coordination Committee or WECC Operating Committee (OC) documents.
- b. A historical record exists to document that, at the same time:
 - i. for at least 100 hours in the most recent 36 months, actual flow across a Transfer Path (MW) has exceeded 97 percent of the SOL in MW.
 - ii. energy Schedules were curtailed because of USF.

- c. The Transfer Path Operator shall request to be included on the UFAS agenda at the next scheduled meeting to make a presentation on qualifying the Transfer Path.
- d. The prospective Transfer Path Operator will be expected to make a presentation to the UFAS explaining how the SOL was determined and how the historical actual flow and/or Schedule curtailment records were obtained.
- e. An incremental matrix for the current operating season and applicable to the proposed Transfer Path confirms that a feasible combination of Schedules between Sender and Receiver can create USF across the Transfer Path whose sum is equal to or greater than five percent of the SOL.
- f. Transfer Path Operator shall conduct the studies and provide supporting documentation as needed to satisfy the requirements for qualification defined in Section 1 of this Guideline.
- g. Sponsoring Transfer Path Operator shall provide the following documentation to UFAS:
 - i. Transfer Path Operator will provide a description of series connected Controllable Devices in the path which can be utilized to reduce USF as set forth in Section 10.b.i of the Guideline, which is quoted below:

If the Qualified Transfer Path contains series connected Controllable Devices, such as series capacitors, phase shifting transformers, and DC transmission lines, these elements will be used to the maximum extent practical in reducing the USF across the constrained Qualified Transfer Path to a level at or below the System Operating Limit. Operations of such Controllable Devices shall comply with the NERC and WECC criteria and standards.
 - ii. Description of any unique operating procedures or agreements affecting the WECC USF plan.
 - iii. Description of USF comparison to other paths available to Transfer Path Operator as per the Guideline, Section 9.c, which is quoted below:

The Transfer Path Operator will verify, if possible, the magnitude of USF across the Qualified Transfer Path by checking adjacent metered and scheduled values prior to requesting any other applicable entity to take actions under this USF Reduction Guideline.
- h. Sponsoring Transfer Path Operator, path operators with representation on UFAS, and WECC staff shall provide the following documentation to UFAS:

- i. Description of any known simultaneous operating conditions that may limit Controllable Device coordination as per the *Process for Controllable Devices Coordination: Loading Problems Elsewhere*, which is quoted below:

Loading Problems Elsewhere – Controllable Device operation will be limited so that it will not cause sufficient additional flow elsewhere on the interconnected system that will result in any overload, low voltage condition, or Schedule curtailments on those systems. Care should be exercised to avoid moving the problem from one place to another as Actual Flows are altered.

- i. WECC staff shall develop a sample analysis showing the impact of the proposed path on the compensation table.
- j. After the UFAS has reviewed the documentation and presentation, a recommendation will be forwarded to the WECC OC. The Transfer Path Operator may be requested to make a presentation to the WECC OC.
- k. A Transfer Path is normally qualified for USF reduction in only one direction. The Transfer Path may be qualified for USF reduction in both directions, but supporting data must be provided for each direction.
- l. After the UFAS has reviewed the documentation, it will make a recommendation to WECC OC. Upon approval by the WECC OC, the proposed Transfer Path will be added to the list of Qualified Transfer Paths on the effective date determined by the WECC OC. If this occurs during a Plan Year, the compensation to the qualified Controllable Device owners will be prorated accordingly.

2. Transfer Path Requalification

If there is a change in the SOL for an existing Qualified Transfer Path or the addition of a Controllable Device in the Qualified Transfer Path, the Transfer Path Operator shall make a presentation to the UFAS so that the UFAS can determine whether requalification of the Qualified Transfer Path is necessary.

3. Transfer Path Deletion

If the following conditions are maintained for 36 consecutive months, the UFAS shall make a determination as to whether the WECC system configuration has been altered sufficiently so that USF Schedule reductions or USF Accommodation on the Qualified Transfer Path would no longer be expected:

- If there have been no Schedule reductions or USF Accommodations.
- The actual flow across a Qualified Transfer Path has not exceeded 97 percent of the SOL.

An affirmative finding of the UFAS and approval by the WECC OC will be required to delete a Qualified Transfer Path.

4. Actions Required Following Addition of a New Qualified Transfer Path

- a. A new Transfer Path will be added to the list of Qualified Transfer Paths, attached as Exhibit A, on approval of the WECC OC.
- b. Owners of facilities making up a Qualified Transfer Path will designate a Transfer Path Operator.
- c. Incremental power flow matrices will be prepared for the current summer and winter seasons, based on appropriately modified operating base cases for each Qualified Transfer Path and provided to the WECC OC members. The matrices will be based on an incremental Schedule of 100 MW and express results in units of MW (equivalent to percent of individual Schedule). They will be used to determine the magnitude of each Contributing Schedule's contribution to USF. A "Contributing Schedule" is defined as the net Schedule between individual Senders and Receivers that contributes USF across a Qualified Transfer Path in the same direction as the actual flow across that Qualified Transfer Path.
- d. The effectiveness factors and compensation for the Qualified Controllable Devices will be recalculated.

5. Controllable Device Qualification

- a. Any applicable entity wishing to qualify a Controllable Device to receive compensation for coordinated operation under the Policy shall present a plan for coordinated operation to the UFAS. This plan should include the following elements:
 - i. The procedures developed to ensure that adequate communication and coordination occurs between the applicable entity's Controllable Device and other Qualified Controllable Devices to achieve the desired coordination.
 - ii. The sponsoring applicable entity and/or WECC staff shall conduct studies to demonstrate the proposed Controllable Device USF effectiveness and impacts on the WECC system, and present these results to UFAS, demonstrating that the applicable entity's Controllable Device meets the criteria specified below:

A demonstration that by adding the applicable entity's controllable Device to the overall coordinated Controllable Device control strategy, using the methodology in the USF Mitigation Criteria for Controllable Devices Compensation, the proposed Controllable Device will reduce USF:

- (1) *by an average over all of the then Qualified Transfer Paths of at least one percent of the respective Qualified Transfer Path limits, (which corresponds to average percent control of 6.7 percent in Table 1 of the Controllable Devices Compensation Guideline), and*

(2) *for more than half of the Qualified Transfer Paths, by at least one percent of each of the respective Qualified Transfer Path limits.*

- b. The sponsoring applicable entity shall provide the following documentation to UFAS:
 - i. Brief written description including simplified one-line diagram(s) for project/substation.
 - ii. Commercial operation date for the new device and a proposed date of availability for USF mitigation.
 - iii. Description of typical operating modes.
 - iv. Description of any unique operating agreements or issues affecting the WECC USF plan.
 - v. Description of device capital cost, percent of ownership breakdown if multiple owners, and annual fixed charge rate(s).
- c. Describe existing or planned communication facilities and procedures that will be used to ensure operation of the applicable entity's Controllable Device in a coordinated fashion with other WECC Qualified Controllable Devices per Section 5.a.i of the USF Guideline, which is quoted below:

The procedures developed to ensure that adequate communication and coordination occurs between the applicable entity's Controllable Device and other Qualified Controllable Devices to achieve the desired coordination.
- d. WECC staff shall develop sample analyses showing impacts of the proposed Controllable Device on the USF compensation table.
- e. After the UFAS has reviewed the documentation and presentation, it will make a recommendation to the WECC OC. Upon approval by the WECC OC, the proposed Controllable Device will be added to the list of Qualified Controllable Devices. If this occurs during a Plan Year, the compensation for the new device will be prorated accordingly.

6. Controllable Device Deletion

- a. A Qualified Controllable Device shall be considered by UFAS for deletion from the list of Qualified Controllable Devices if the Controllable Device is no longer capable of reducing USF over all of the current Qualified Transfer Paths by the criteria specified in Section 5.a above. Approval of the WECC OC will be required to delete a Controllable Device. The Controllable Device will no longer be required to participate in coordinated operation. However, its continued participation is encouraged.

7. Accommodation Limits

- a. During normal operating conditions, when actual flow is not exceeding the SOL and desired Schedules are not being curtailed, the Qualified Transfer Path(s) will accommodate 100 percent of the USF.
- b. During those times when there is or it is anticipated that there will be a scheduling limitation on a Qualified Transfer Path due to USF, the Transfer Path Operator and those scheduling across the Qualified Transfer Path are required to accommodate a minimum level of USF. Such USF Accommodation will be achieved by ensuring that the net Schedules across the Qualified Transfer Path are reduced below the then available SOL by the following amount:
 - i. The greater of 50 MW or 5 percent of the SOL.
- c. If net Schedules are reduced below the SOL by the amounts specified above, then the Transfer Path Operator has met the USF Accommodation requirement and may request additional relief under the Policy, including the coordinated operation of Qualified Controllable Devices or curtailments by other Receivers who are scheduling across other Transfer Paths.
- d. It is intended that the Qualified Controllable Devices shall not be requested to operate in a coordinated manner in response to requests under this USF Reduction Guideline in excess of 4000 hours per year. If operation exceeds or is forecast to exceed that level, then the level of Transfer Path USF Accommodation shall be increased so that coordinated operation shall not exceed 4000 hours annually. The UFAS shall monitor the coordinated operation of the Qualified Controllable Devices and make recommendations to the WECC OC for adjustments to the level of USF Accommodation as needed to meet this objective.

8. General Terms

- a. All applicable entities shall cooperate with the Transfer Path Operator by reducing Schedules as requested to achieve the appropriate reduction in USF. Schedule reductions required by this USF Reduction Guideline may be taken in either the Contributing Schedule, or any other Schedule, the reduction of which achieves the equivalent effect on reducing USF on the affected Transfer Path.
- b. Applicable entities having Controllable Devices in series or parallel — such as series capacitors, phase shifting transformers, and DC transmission lines — shall cooperate with the Transfer Path Operator to the extent practical by using these elements to reduce USF across the constrained Qualified Transfer Path. Operation of such Controllable Devices shall be required where the Controllable Devices are being operated in a coordinated manner pursuant to the Policy. Operation of Controllable Devices that have not been Qualified shall be at the discretion of and consistent with the normal practice of the applicable entity. Schedule reductions shall not be required by the applicable entity to the extent that controllable elements (which are not

operated in a coordinated manner) are incrementally operated during the USF event to achieve an equivalent reduction in USF across the constrained Qualified Transfer Path. The applicability entity shall be able to document and demonstrate that an equivalent USF reduction has been achieved through the use of the controllable element(s).

- c. To the extent that a Qualified Controllable Device is capable of operating to achieve actual flows through the Controllable Device equal to Scheduled Flows, such Schedules shall be deemed to be 100 percent effective through the Controllable Device, and thus shall be exempt from the Schedule reductions required under this USF Reduction Guideline. A Phase Shifting Transformer (PST) operator has the option to utilize the operation of that device to satisfy some or all of their path flow relief obligation under the Schedule Curtailment phase of the Policy. The curtailment phase of the Guideline specifies that applicable entities shall make adjustments to contributing import Schedules in accordance with a set of matrices to provide a reduction in USF to the constrained path. In certain circumstances, it may be desirable for an applicable entity to provide some or all of the prescribed flow reduction through the operation of Controllable Devices (PSTs) such that the combined action would provide equivalent flow relief to the path. The following explains how that is accomplished:

An applicable entity who owns/operates a PST that has been formally Qualified under the Policy (Qualified PST) shall not be granted exemption from his obligation to provide the additional relief prescribed in the Schedule Curtailment phase of the Guideline. Under the Guideline, Qualified PSTs are utilized to the maximum extent possible for mitigating USF on a constrained path. If the collective relief provided by these Qualified PSTs is insufficient, thus requiring advancement to the Schedule curtailment phase of the Guideline, then all applicable entities (including the Qualified PST owners) are required to provide additional relief, typically in the form of Schedule curtailments. While the Qualified PSTs are providing relief to the constrained path, compensation is already allocated to the Qualified PST owners through the financial provisions of the Policy.

In the situation where a PST is being operated so that actual flow equals Scheduled flow (holding Schedule), there will be zero USF on the path that is directly controlled by the PST. However, there will generally be USF created at other points in the network due to the various parallel paths that exist between the sending area and the controlled transmission element. The exception to this will be the case where the sending and receiving areas are located immediately adjacent to one another. In this instance, if the flows are being held equal to Schedule, then no other USF is being generated by that Schedule. As such, the following rule applies:

Interchange Schedules between immediately adjacent Balancing Authorities through a phase shifting transformer or other Controllable Device shall be exempt from contributing Schedule curtailments under

the Unscheduled Flow Mitigation Policy when the actual flow is controlled equal to the Scheduled amount.

The above language applies to both Qualified and non-Qualified PSTs. Therefore, while an owner/operator of a Qualified PST is not exempt from the Schedule curtailment phase of the Guideline, those *Import Schedules* from adjacent Balancing Authorities that are being controlled by the PST to yield zero USF *are* exempt from consideration for curtailment.

- d. The WECC Staff will provide the WECC OC with a summary of all qualified controllable elements that are being operated in a coordinated manner pursuant to the Policy, whenever a new Controllable Device is qualified.

9. General Action Rules

- a. This Guideline applies to all applicable entities.
- b. The UFAS shall develop guidelines to enable the Transfer Path Operators to implement actions under this USF Reduction Guideline that will achieve the desired accommodation/control/curtailment results in the scheduling hour immediately following the request. Furthermore, these guidelines shall enable the Transfer Path Operators to make an initial request for any step in the Guideline up through the NINTH STEP, provided that the guidelines shall ensure that neither over-control nor over-curtailment shall be expected. Until such guidelines are developed, the following action limits shall apply:
 - i. The Transfer Path Operator may request actions through the FOURTH STEP in the first hour, if experience indicates that such action will be needed to achieve the required reduction in USF.
 - ii. For requests beyond the FOURTH STEP, no more than three requests may be initiated in any clock hour. The notice must specify whether this is a FIFTH, SIXTH, SEVENTH, EIGHTH, or NINTH STEP request. The request must be transmitted to all applicable entities at least 30 minutes prior to the hour to ensure implementation for the following Schedule hour.
- c. The Transfer Path Operator will verify, if possible, the magnitude of USF across the Qualified Transfer Path by checking adjacent metered and Scheduled values prior to requesting any other applicable entities to take actions under this USF Reduction Guideline.
- d. As to the actions to be taken in accordance with this Policy for each hour of a curtailment period, each applicable entity shall promptly provide documentation, as requested by UFAS and/or WECC staff, of all such accommodation, control or curtailment actions taken by its dispatchers or real-time schedulers.
- e. Operation of Qualified Controllable Devices will be monitored by the UFAS for compliance with the NERC and WECC standards and criteria and the WECC Controllable Devices Coordinated Operating Process. Results will be distributed to the WECC OC members.

- f. The UFAS shall monitor major loop USF in a minimum of two locations during hours in which any USF Accommodation or coordinated operation of the Qualified Controllable Devices or curtailments are occurring under this USF Reduction Guideline.
- g. The Transfer Path Operator and those scheduling across the constrained Qualified Transfer Path will continue to take actions necessary to reduce actual flow to a level at or below the SOL of the Qualified Transfer Path.
- h. Upon receipt of a curtailment request, Contributing Schedules that are subject to curtailments will be reduced (or equivalent alternative Schedule adjustments will be effected) in accordance with the following actions:
 - i. Receivers of Contributing Schedules will initiate the requested Schedule reductions unless an otherwise agreed upon procedure for Schedule reduction achieving the equivalent effect on the Qualified Transfer Path is established by the Receiver and/or the Sender.
 - ii. Applicable entities may arrange among themselves to make curtailments called for by this USF Reduction Guideline in a manner other than prescribed provided that the arrangements are as effective as the identified Schedule curtailment in reducing USF across the Qualified Transfer Path. Applicable entities may make bilateral arrangements that will enable an applicable entity with Schedules on the affected Qualified Transfer Path to make the required curtailments in lieu of making larger curtailments in Schedules over other parallel paths. Where alternative Schedule adjustments are utilized, it is the Receiver's responsibility to cause Schedule adjustments to be effected that provide the same reduction in flow across the Qualified Transfer Path as would have been achieved by the prescribed reduction in the Contributing Schedule.
 - iii. The total amount of requested Schedule reduction may be apportioned to the applicable Schedules at the discretion of the Receiver subject to item iv. below.
 - iv. Irrespective of the Schedules altered or the manner in which they are altered, each applicable entity's overall net reduction in actual flow across the constrained Qualified Transfer Path must be equivalent to or greater than the reduction that would have been achieved had the identified Schedule reduction occurred as requested.
 - v. System dispatchers or real-time schedulers should identify in advance those Schedules that qualify for curtailment requests for all Qualified Transfer Paths. This will expedite implementation of this USF Reduction Guideline when requested.

- vi. While this USF Reduction Guideline does not expect Receivers to curtail Schedules that would result in loss of firm load, nothing in this USF Reduction Guideline shall relieve the Receiver of the obligation to achieve the required reduction in USF across the constrained Qualified Transfer Path.
- i. In the event of a transmission system emergency on any applicable entities' system, such applicable entity may request coordinated operation of the Qualified Controllable Devices if such operation is reasonably expected to assist in relieving the emergency condition.
- j. During a USF Event, all applicable entities are required to cooperate with the Transfer Path Operator to reduce Schedules as requested to achieve a reduction in USF on the Qualified Path. While this Guideline is in progress, creation of new transactions or increases in existing transactions may have an adverse impact on USF on the Qualified Path and reduce the effectiveness of any curtailments designated for contributing Schedules. It is recognized that complete prohibition of scheduling during a USF Event regardless of the minor impact on the Qualified Path is not desired. The following is intended to identify when changes to Schedules may be allowed during a USF event:
 - i. Identification of Pre-Event Schedules

Contributing Schedule curtailments apply to Schedules in place before initiation of the USF Guideline at Step 4 (see Summary of Curtailment Actions table on page 22). At the time a Step 4-Level 1 USF Action is initiated, Schedules are established by the existence of an "Implemented" NERC Transaction Tag.
 - ii. Restricted Transactions

Changes to Restricted Transactions, other than the specific curtailments used to comply with relief obligations, cannot be made unless some alternative action is taken to compensate for the full impact on the Qualified Path. This applies to New Tag Creations and to Extensions or Adjustments to existing tags. New tags or changes to existing transactions with Transfer Distribution Factors less than or equal to five percent are permitted. Transactions with tags that were "Implemented" prior to the Step 4-Level 1 action, that do not incur specific curtailment obligations established by the USF Guideline, will be allowed to increase or decrease as established by their pre-event energy profile. Transactions Tags that expire during a USF Event may not be replaced if they will contribute greater than five percent of their flow to the Qualified Path.

iii. Duration Of Limitations On Restricted Transactions

This limitation will remain in effect as long as the USF event remains at Step 4-Level 1 curtailment or above. Termination of the USF Event or reduction of the USF Guideline to Step 3 or below will remove the limitations on changes to “Restricted Transactions.”

10. Action Steps

a. Action Taken by the Transfer Path Operator - Notification of Curtailment Period

- i. The Transfer Path Operator shall advise the applicable entities, via the WECC communications system, of a current or an impending curtailment period, and may request assistance in mitigating the curtailment.

When assistance is requested in mitigating a curtailment, the following actions shall become effective at the start of the next scheduling hour following the request.

b. Action Taken by the Transfer Path Operator - Controllable Devices

1. **FIRST STEP:** If the Qualified Transfer Path contains series-connected Controllable Devices — such as series capacitors, phase shifting transformers, and DC transmission lines — these elements will be used to the maximum extent practical in reducing the USF across the constrained Qualified Transfer Path to a level at or below the SOL. Operations of such Controllable Devices shall comply with the NERC and WECC standards and criteria.

c. Action Taken by the Transfer Path Operator - Accommodation

1. **SECOND STEP:** USF across a Qualified Transfer Path will be accommodated up to the greater of 50 MW or five percent of the SOL for that Qualified Transfer Path. USF Accommodation will be executed by the Transfer Path Operator causing the net Schedules across the Qualified Transfer Path to be reduced to not more than 95 percent of the SOL for that Qualified Transfer Path. The Transfer Path Operator shall not be expected to reduce net Schedules across the Qualified Transfer Path in this step if the Schedules are already below the appropriate USF Accommodation level (95 percent of the SOL).
2. Before invoking Step 3 or higher of the Unscheduled Flow Reduction Guideline, a Qualified Path Operator must ensure the following conditions are met:
 - i. The actual flow on the Qualified Path is equal to or greater than 95% of the current SOL.
 - ii. The net Schedule on the Qualified Path is less than the current SOL by at least the amount of the required USF Accommodation level.

d. Actions Taken by Controllable Device Owners

1. **THIRD STEP:** At the request of the WECC Reliability Coordinator and in coordination with the Transfer Path Operator, the Qualified Controllable Device owners shall operate their Controllable Devices in a coordinated manner so as to minimize the USF on the constrained Qualified Transfer Path, consistent with the NERC and WECC standards and criteria.

In an effort to provide maximum practical relief of USF using the Qualified Devices of TOT2A, TOT2B, and TOT2C, the entire cut-plane of TOT2 can be considered as a single path with a total Schedule and a total metered actual flow. Using this approach, the individual Scheduled flows on the three paths are summed to obtain the cut-plane Schedule, and the individual metered actual flows are similarly combined to arrive at the cut-plane actual flow. The Minimum Operating Reliability Criteria provision for the control of transmission power flows may then be applied to the entire cut-plane. The Qualified Controllable Devices in these three paths can be operated in any combination such that the total actual flow is controlled between the limits of unaltered and Scheduled flow for the entire TOT2 path.

Recognizing that the combined control of flow on the major loop for the TOT2 phase shifters is about 24-MW-per-tap, the WECC Reliability Coordinators can determine the desired tap settings of these devices by dividing the major loop USF magnitude by 24. This applies to instances of coordinated operations for the mitigation of USF on a Qualified Path located on the major loop.

For coordinated operation of the Qualified Devices for paths located off of the major loop, the WECC Reliability Coordinators will exercise judgment in determining the desired tap settings of the TOT2 phase shifters, recognizing that the relative effectiveness of these Devices differs from path to path. In doing so, the WECC Reliability Coordinators may resort to coordinated cut-plane operation of the devices if it is helpful in providing additional flow relief.

While this mode of cut-plane operation for the TOT2 Devices is intended to maximize the efficiency of the USF relief provided by the devices, it is understood that various operating constraints may impact the effectiveness of this Guideline from time to time. Some of these operating constraints are enumerated below:

1. The Harry Allen phase shifters, and Red Butte – Harry Allen line (TOT2C), are limited to an actual flow of 300 MW. Operating constraints exist with respect to voltage control in the NEVP system, and these constraints can impact the amount of allowable southbound flow as well as the speed at which the tap movements

can occur. The adjustment of flow on this line may have to be staged with the switching of various reactive devices before proceeding to the desired tap.

2. TOT2B and TOT2C are operated in accordance with an operating nomogram that depends on individual path flows and other localized variables. Operation near the diagonal of this nomogram will constrain the tap adjustments of these phase shifters.
3. Various local facilities can be impacted by the flows on the elements of TOT2. Examples include the loading of the Glen Canyon 345/230-kV transformers as a function of the Sigurd PST flow, and the correlation between TOT3 flows and the operation of the TOT2A phase shifters.

Other operating constraints will invariably present themselves. As is expected in any constraining situation, the WECC Reliability Coordinators in conjunction with the Transmission Operators will take necessary precautions to ensure that operational constraints are effectively managed.

e. Actions Taken by Others and the Transfer Path Operator - Curtailment of Schedules.

1. **FOURTH STEP:** Those Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of 50 percent or more will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would a 20 percent reduction in the Contributing Schedule. Those Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of from 30 percent to 49 percent will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would a 10 percent reduction in the Contributing Schedule. If the overload persists, then go to the next step.
2. **FIFTH STEP:** Those Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of from 20 through 29 percent will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would a 10 percent reduction in the Contributing Schedule, and Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of 30 percent or more will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would an additional five percent reduction in the Contributing Schedule. If the overload persists, then go to the next step.
3. **SIXTH STEP:** USF Accommodation on the Qualified Transfer Path will increase to the greater of 75 MW or six percent of the SOL for that

Qualified Transfer Path. Contributing Schedules will continue to be curtailed as described up through the FIFTH STEP. If the overload persists, then go to the next step.

4. **SEVENTH STEP:** Those Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of from 15 through 19 percent will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would a 10 percent reduction in the contributing Schedule, and Receivers with Contributing Schedules that result in USF across the constrained. A Qualified Transfer Path of 20 percent or more will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would an additional five percent reduction in the Contributing Schedule.
5. **EIGHTH STEP:** USF Accommodation on the Qualified Transfer Path will increase to the greatest of 100 MW or seven percent of the SOL for that Qualified Transfer Path. Contributing Schedules will continue to be curtailed as described up through the SEVENTH STEP. If the overload persists, then go to the next step.
6. **NINTH STEP:** Those Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of from 10-to-14 percent will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would a 10 percent reduction in the Contributing Schedule. Receivers with Contributing Schedules that result in USF across the constrained Qualified Transfer Path of 15 percent or more will effect a scheduling change that is intended to reduce the USF across the Qualified Transfer Path by the same amount as would an additional five percent reduction in the Contributing Schedule.

11. **Rapid Advancement of the Steps**

The effective management of USF in WECC can, at times, demand quick response and activation of the various steps of the Unscheduled Flow Reduction Guideline including Accommodation, Coordinated Operation of Controllable Devices, and Import Schedule Curtailments. The following general guidelines are provided for a Qualified Path Operator to use in making decisions regarding which steps of the Guideline should be used in the initial phases of USF reduction. Experience and identification of patterns with respect to Qualified Path overloading will affect the timing of the initiation of the Guideline by the Qualified Path Operator. The intent of these guidelines is to enable the Qualified Path Operators to more rapidly implement actions under the Guideline that will achieve the desired USF relief in the scheduling hour immediately following the request.

Guidelines

1. Based on previous and recent experience with Qualified Path USF, the Qualified Path Operator may initiate the Guideline at any step, up to and including step #9. The Path Operator must be able to demonstrate through recent experience or other equivalent judgment, that the overload of the Transfer Path is severe enough to warrant the actions of the particular step being requested.
2. Any step of the Guideline that is requested can only be called on if the Qualified Path Operator will meet the corresponding Accommodation and Controllable Device requirements specified in steps #1, #2, #6, or #8 of the Guideline. For example, a Qualified Path Operator could initially request step #9 of the Guideline, but could only do so if the Accommodation specified in step #8 will also be met prior to or concurrent with Schedule curtailments.
3. If Rapid Advancement is requested by the Qualified Path Operator, the coordinated operation of the Qualified Controllable Devices shall occur as soon as possible, but prior to the ramp for the next hour.
4. The UFAS will review, as necessary, the utilization of the rapid advancement practice to ensure that neither overuse of Coordinated PST Operation nor over-curtailment of contributing Schedules is occurring.
5. The request for USF reduction shall be issued at least 30 minutes before the start of the hour for which it is to be in effect.

12. Competing Paths

With the number and location of Qualified Paths within WECC, and the interrelation of power flows on these various paths, at times Coordinated Operation of Phase Shifting Transformers and import Schedule curtailments may be necessary for more than one Qualified Path at a time. The guidelines below provide direction for Coordinated Operation of Phase Shifting Transformers and outline actions to be taken by Receivers of Contributing Schedules on the competing paths.

i. Coordinated Operation of Phase Shifting Transformers

When encountering competing requests for Coordinated PST Operation, best efforts will be made by the WECC Reliability Coordinators to coordinate the tap settings of the available Qualified Devices in order to maximize the total USF relief to both competing Qualified Paths. Actions will not be directed by the WECC Reliability Coordinators without first considering the effects of those actions on the USF on each of the competing Qualified Paths, as well as the effects on other transmission facilities within the Interconnection.

Congestion of multiple Qualified Paths can occur either as a result of the operation of coordinated Controllable Devices for one path (which causes another path to exceed its flow limits), or may simply result from normal

system operation (two paths encounter congestion simultaneously as load and generation patterns change).

When two Qualified Paths become congested, the operators of those Paths are expected to coordinate their needs for relief with the WECC Reliability Coordinator (WECC RC) and with each other. The WECC RC, in monitoring the Qualified Paths, will generally be aware of Qualified Path flow interactions and the interactions between the Qualified Phase Shifters that are used to relieve congestion. As such, the WECC RC, through experience with coordinated operation, will coordinate PST operation at a pace that is slow enough and to a degree which is slight enough to minimize congestion on paths that are parallel to a given constrained path. The WECC RC will direct operation of the Qualified Phase Shifters so that the highest amount of flow relief that is practical may be achieved. Certain instances of path interaction will result in less than maximum relief for both of the constrained paths.

ii. Import Schedule Curtailments

In a situation where two Qualified Paths are competing for USF relief, certain curtailment prescriptions for Import Schedules to a given Receiver, if implemented, may cause USF *relief* for one path but result in an *increase* in USF on the other. As such, Receivers of contributing Schedules should implement Schedule adjustments in such a fashion that will generally result in reduced levels of USF for both paths. Due to the complex interaction of Schedules and flows on the competing paths, a new set of matrices, called “Competing Path Matrices,” have been developed to prescribe the actions to be taken when curtailments are requested for two competing paths. These Competing Path Matrices are nearly identical in appearance to the individual incremental flow matrices; however, these matrices incorporate logical tests to ensure that curtailment actions will only be advised for those instances where the curtailment will be significantly beneficial to one (or both) path(s) without being significantly detrimental to the other. The individual cells of the competing path matrices are populated with the “adjusted contribution percentages” according to the logic described below:

For a given import Schedule to a Receiver:

1. If the Schedule has a positive contribution (increasing) to the USF on both of the competing paths, this Schedule is subject to curtailment by an amount that corresponds to the larger of the two contribution percentages.
2. If the Schedule has a negative contribution (decreasing) to the USF on both of the competing paths, this Schedule should not be curtailed.
3. If the Schedule has a positive contribution to the first path, but a negative contribution to the second path, the Schedule is subject to curtailment only if the positive contribution percentage divided by the

rating of the first path is greater than two times the negative contribution percentage divided by the rating of the second path. If this is not true, the Schedule should not be curtailed.

The table below includes specific examples of typical Schedules, and the corresponding “adjusted contribution” percentages.

Schedule #	P-66 (4175 MW) Contribution %	P-36 (1424 MW) Contribution %	Adjusted Contribution %	Comment
1	40	15	40	Both are (+); curtail according to 40% contribution.
2	-18	-26	-26	Both are (-); no curtailment.
3	-20	18	18	18%/1424 is >2X 20%/4175; curtail according to 18% contribution.
4	-40	15	xx	15%/1424 is <2X 40%/4175; no curtailment.
5	35	-20	xx	35%/4175 is <2X 20%/1424; no curtailment.
6	40	-5	40	40%/4175 is >2X 5%/1424; curtail according to 40% contribution.

The Competing Path Matrices incorporate the above logic, and display simply the “adjusted contribution” percentages. The Receiver of import Schedules is to consult the competing path matrix in determining his curtailment requirements. For example, if both Path 36 and Path 66 were calling for Schedule curtailments, a system operator would consult the matrix entitled “Path 36/66 Competing Path Matrix” and determine Schedule adjustments based on the contribution percentages indicated in that matrix.

While it is possible that any two Qualified Paths may become simultaneously constrained to the point where the curtailment of contributing Schedules is necessary, recent experience with the patterns of USF has shown that the most likely pair is Path 36 and Path 66. As such, UFAS has only included a Competing Path Matrix for this particular combination. Additional pairings may be produced as experience dictates.

iii. General Guideline for Schedule Curtailments (two Qualified Paths constrained)

1. In instances where two paths are requesting contributing Schedule curtailment under the Unscheduled Flow Guideline, the WECC RC will send a message via WECC communication system alerting the applicable entities of this fact and advising them to consult the appropriate Competing Path Matrix to determine the necessary curtailment action. While the individual Path Operators are responsible for sending notification of Schedule curtailment requests, the WECC RC message will specifically enunciate that the situation is a “competing path” event, which requires a unique response from the applicable entities.
2. Applicable entities will consult the appropriate competing path matrix for the identification of contributing Schedules.
3. As long as both Qualified Paths are requesting any level of contributing Schedule curtailment, applicable entities are to base their curtailment actions on the Fourth Level Curtailment (Step 9) row of the Unscheduled Flow Guideline “Summary of Curtailment Actions” regardless of the curtailment levels being requested by the individual Path Operators. Similarly, the two Qualified Path Operators shall base their accommodation levels in accordance with Step 8 of the Summary of Curtailment Actions.
4. The Transfer Path Operator and those scheduling across the Qualified Transfer Path may resume some Schedules as curtailment steps are taken by others, provided the net Schedule remains at or below the amount that provides for USF Accommodation at the level specified above for the Qualified Transfer Path.
5. The Transfer Path Operator must reconfirm the need to continue the present level of Schedule reductions via WECC communication system every four hours by at least 30 minutes to the hour.
6. The Transfer Path Operator must provide notice via WECC communication system to reduce and or suspend Schedule curtailments when the actual flow on the Qualified Transfer Path is reduced below 92% of the SOL. Schedules should be resumed in the reverse order that Schedule curtailments were initiated. If conditions warrant, the Transfer Path Operator may notify all applicable entities to cease all curtailments at any time.

13. Further Action

The Transfer Path Operator and those scheduling across the constrained Qualified Transfer Path will continue to take actions necessary to reduce actual flow to a level at or below the Transfer Limit.

14. Term

This Guideline will remain in effect for the duration of the Policy.

WECC UNSCHEDULED FLOW GUIDELINE SUMMARY OF CURTAILMENT ACTIONS

Step	Action Description	Party(s) Affected	Unscheduled Flow Accommodation across Path (First Contract Year/Second Contract Year/Third and subsequent Contract Years)	Equivalent Percent Curtailment Required in Contributing Schedule -Based on amount of Unscheduled Flow across Path				
				10-14%	15-19%	20-29%	30-49%	50+%
1	Operate controllable devices in Path	Controllable Devices in transfer Path	NA					
2	Accommodation	Schedules across the Path	50 MW or 5% of maximum transfer limit					
3	Coordinated operation of qualified Controllable Devices	Qualified controllable devices	50 MW or 15% of maximum transfer limit					
4	First level curtailment	Schedules in other paths	50 MW or 5% of maximum transfer limit				10%	20%
5	Second level curtailment	Schedules in other paths	50 MW or 5% of maximum transfer limit			10%	15%	25%
6	Accommodation	Schedules across Path	75 MW or 6% of maximum transfer limit			10%	15%	25%
7	Third level curtailment	Schedules in other paths	75 MW or 6% of maximum transfer limit	10%	15%	20%	30%	
8	Accommodation	Schedules across Path	100 MW or 7% of maximum transfer limit		10%	15%	20%	30%
9	Fourth level curtailment	Schedules in other paths	100 MW or 7% of maximum transfer limit	10%	15%	20%	25%	35%

EXHIBIT A
LIST OF QUALIFIED TRANSFER PATHS

<u>Path Code</u>	<u>Path Opr</u>	<u>Qualified Transfer Path</u>	<u>Qualifying Direction *</u>	<u>Path Transfer Capability-MW**</u>
66	CISO	California-Oregon Intertie Malin-Round Mt. 500-kV lines 1&2 Captain Jack-Olinda 500-kV line	CCW (north-south)	4800
22	APS	Four Corners-Central Arizona Four Corners-Moenkopi 500-kV line Four Corners-Cholla 345-kV lines 1&2	CW (east-west)	2325
23	APS	Four Corners 345/500-kV Transformer with Four Corners Unit 5 out of service or at greatly reduced output	CW (low-high)	840
30	WACM	TOT 1A transmission path Hayden-Artesia-Vernal 138 kV Meeker-Rangely-Bonanza 138 kV Bears Ears-Bonanza-Mona 345 kV	CW (east-west)	550
31	WACM	TOT 2A transmission path Hesperus-San Juan 345 kV line Lost Canyon-Shiprock 230 kV line Durango-Shiprock 115 kV line	CW (north-south)	650
36	WACM	TOT 3 transmission path Laramie River-Ault 345-kV line Laramie River-Story 345-kV line Archer-Ault 230-kV line Sidney-N. Yuma 230-kV line Sidney-Sterling 115-kV line Cheyenne-Rockport 115-kV line	CW (north-south)	1605

* Direction in which the Path is qualified to request USF relief:

CCW = Counterclockwise direction

CW = Clockwise direction

** These values are nominal. The actual value may change with system conditions. Accommodation levels are based on the path transfer capability available at the time.

Approved By:

Approving Committee, Entity or Person	Date