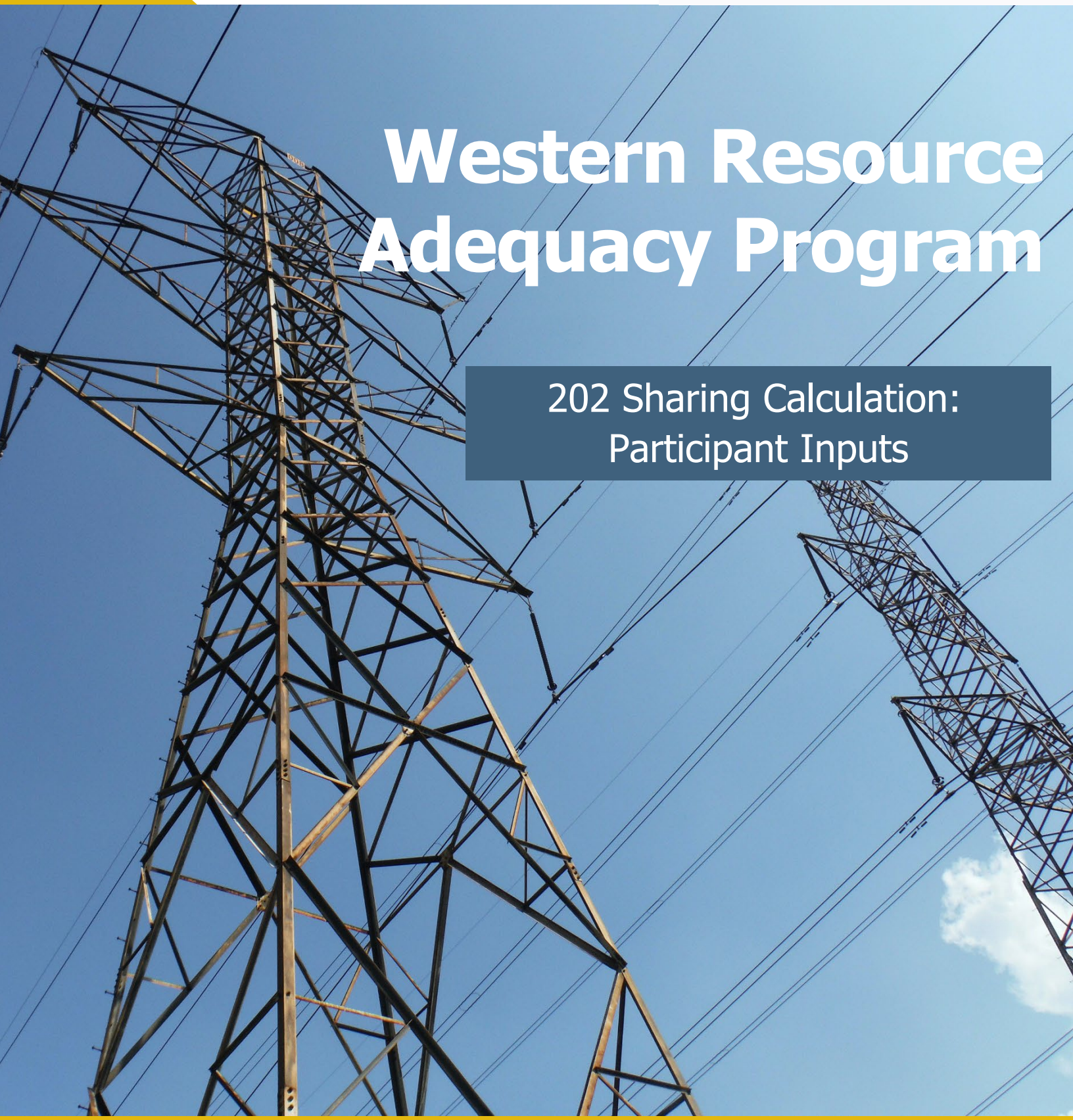
WESTERN POWERPOOL



Western Resource Adequacy Program

202 Sharing Calculation: Participant Inputs

200 – Operations

Revision History

Manual Number	Version	Description	Revised By	Date
202	0.1	RAPC Glance Version	Beau Beljean	7/5/2024
202	0.2	Public Comment	Beau Beljean	7/9/2024

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1. Introduction

The Participant Sharing Calculation Inputs Business Practice Manual (BPM) outlines data inputs submitted by Participants in the Operations Program and used in the Sharing Calculation to identify any hour in which a Participant is forecast to have a capacity deficit and other Participants are forecast to have a capacity surplus (a Sharing Event). BPM 202 describes each of these Participant inputs and explains the Sharing Calculation.

1.1. Intended Audience

BPM 202 is intended for individuals or entities that are interested in or currently participating in the Western Resource Adequacy Program (WRAP). This BPM is particularly useful for those that support and have responsibility for the Operations Program on a day-to-day basis. This could include trading and scheduling staff, front-office technology and systems support staff, or other similar roles.

1.2. What You Will Find in This Manual

This manual contains an explanation on all inputs to the Sharing Calculation that Participants submit for the Operations Program.

1.3. Purpose

The purpose of BPM 202 is to explain Participant-supplied inputs to the Sharing Calculation and how they are used in the Operations Program.

1.4. Definitions

All capitalized terms have the meaning as put forth in the Tariff definitions. Any capitalized terms not found in the Tariff that are specific to BPM 202 will be defined in this section:

Contingency Reserves Adjustment: As defined in *BPM 103 FS Capacity Requirement*.

Contingency Reserves Obligation (CRO): The amount of contingency reserves the Participant is carrying during the operating hour equal to:

i) 3% of Load Forecast for which the Participant is the WRAP LRE and maintains the contingency reserve requirement
ii) plus 3% of load for which the Participant is not the WRAP LRE but has assumed an obligation to carry Contingency Reserve through a contractual arrangement
iii) plus 3% of generation used to meet any load for which the Participant is the LRE and maintains its contingency reserve requirement
iv) plus 3% of generation utilized to meet WRAP Load for which the Participant is not the LRE but has assumed an obligation to carry Contingency Reserve through a contractual arrangement.

Forced Outage: A generating unit's immediate reduction in capacity, output, or removal of service due to an emergency, unanticipated failure, or other cause that is beyond the control of the owner or operator of the unit.

Operations Program Capacity Need: A Sharing Calculation component that refers to the total hourly capacity requirement a Participant has forecasted in the Operations Program. The Hourly Capacity Need is the sum of a Participant's Load Forecast adjusted for Demand Response Capacity Resource (i.e. load reduction) plus the hourly forecasted CRO and the Uncertainty Factor.

Performance Adjustments: A Sharing Calculation component that is the sum of variances of over and under performance for hourly forecasts of Run-of-River, wind and solar resources and the net hourly value of Forced Outages relative to the monthly value submitted in the Participant's FS Submittal.

Sharing Result: The result of the Sharing Calculation for any given hour and expressed in MW in the Operations Program horizon. If a Sharing Result is positive, this indicates a surplus and if the Sharing Result is negative, this indicates a deficit. If the Sharing Result is equal to zero, this indicates a neutral position that is neither a surplus nor a deficit.

2. Background

Participants are required to submit specific data for the Forward Showing (see *BPM 108 FS Submittal Procedure*). Some of these data are also used as inputs into the Operations Program. For example, VERs, ROR, Contingency Reserves, and Forced Outages in the FS Submittal are compared to nearer term forecasts submitted during the Operations Program. This leads to a comparison between near term forecast values in the Operations Program and the values submitted in the Forward Showing. This results in delta values for these various inputs that are used in the Sharing Calculation. BPM 202 describes the required Participant inputs to the Sharing Calculation.

3. Components of the Sharing Calculation equation

The Sharing Calculation compares each Participant's FS Capacity Requirement (see *BPM 103 FS Capacity Requirement*) - adjusted for Forced Outages and hourly forecasts of resource availability, resource performance, load, and Contingency Reserves relative to the FS Submittal - to each Participant's capacity need for each hour in the Multi-Day-Ahead Assessment, Preschedule Day, and Operating Day. The values submitted by the Participant for each hour are relative to the values submitted in the Forward Showing. For a given hour the Sharing Calculation identifies Sharing Events in which any Participants are forecast to have capacity deficits. Additional program (i.e. non-Participant) inputs to the Sharing

Calculation, such as the Uncertainty Factor, are described in *BPM 203 Program Sharing Calculation Inputs*. The Sharing Calculation is defined as:

Equation 1 – Simplified Sharing Calculation

$$\boldsymbol{Sharing\ Calculation = FS\ Capacity\ Requirement - Operations\ Program\ Capacity\ Need + Performance\ Adjustments}$$

where

$$\boldsymbol{FS\ \ Capacity\ Requirement} = (P50\ Peak\ Load\ Forecast - Demand\ Response\ Load\ Modifier) * (1 + FSPRM) + Contingency\ Reserve\ Adjustment$$

and

$$\boldsymbol{Operations\ Program\ Capacity\ Need = Load\ Forecast - Demand\ Response\ Capacity\ Resources + Contingency\ Reserve\ Obligation + Uncertainty\ Factor}$$

and

$$\boldsymbol{Performance\ Adjustments = \Delta Forced\ Outages + \Delta RoR\ Performance + \Delta VER\ Performance}$$

Where:

Demand Response Capacity Resource, as defined in the Tariff, refers to a capacity resource with a demonstrated capability to provide a reduction in load or otherwise control load. Its value is treated as a reduction to the hourly Load Forecast in the Operations Capacity Need component of the Sharing Calculation.

Demand Response Load Modifier, as described in the Tariff, refers to Demand Response that has not been incorporated into the load profile and is not intended to be used as a capacity resource to meet the FS Capacity Requirement.

Load Forecast is the hourly forecast of a Participant's WRAP load, expressed in MW, and to be submitted for each operating hour.

Uncertainty Factor, as described in the Tariff, is an input to the Sharing Calculation and is meant to account for the variances between forecasts of load, VERs, and Run-of-River Qualifying Resources for each operating hour on the Preschedule Day and the actual load and resource performance during such hour on the Operating Day. See *BPM 203 Program Sharing Calculation Inputs* for more details.

Δ Forced Outages refers, for any given operating hour, to the sum of:

(i) any change in Forced Outages of any of the thermal resources included in a Participant's Portfolio QCC, relative to the Forced Outages assumed in the FS Submittal by application of the Forced Outage Factor;
(ii) any change in Forced Outages of any of the Storage Hydro Qualifying Resources relative to the Forced Outages assumed in the calculation of a Participant's Resource QCC (expressed as forced QCC MWs);
(iii) any reduction in capacity of a Participant's Portfolio QCC resulting from constraints on firm transmission service rights.

Δ ROR Performance refers to any change, for any given operating hour, in expected performance of any of the ROR in the Participant's Portfolio QCC relative to the QCC of that Qualifying Resource.

Δ VER Performance refers to any change, for the subject hour, in expected performance of the VERs in the Participant's Portfolio QCC relative to the QCC of that Qualifying Resource. As defined in the Tariff, VERs are resources powered by a renewable energy source that cannot be stored by the facility owner or operator and that has variability that is beyond the control of the facility owner or operator, including but not limited to a solar or wind resource.

In summary:

Equation 2 – Detailed Sharing Calculation

$$\begin{aligned}&\textbf{\textit{Sharing Calculation}} = \\ &[(\textbf{\textit{P50 Peak Load Forecast}} - \textbf{\textit{Demand Response Load Modifier}}) * (1 + \textbf{\textit{FSPRM}}) \\ &\qquad + \textbf{\textit{Contingency Reserve Adjustment}}] \\ &- [\textbf{\textit{Load Forecast}} - \textbf{\textit{Demand Response Capacity Resource}} \\ &\qquad + \textbf{\textit{Contingency Reserve Obligation}} + \textbf{\textit{Uncertainty Factor}}] \\ &+ [\textbf{\textit{ΔForced Outages}} + \textbf{\textit{ΔRoR Performance}} + \textbf{\textit{ΔVER Performance}}]\end{aligned}$$

4. Inputs from Forward Showing Submittal

The Operations Program relies on data submitted in the Forward Showing that includes monthly values of the following:

(i) P50 Peak Load Forecast
(ii) FSPRM
(iii) Demand Response Load Modifier
(iv) Forced Outages
(v) ROR QCC

(vi) Solar QCC
(vii) Wind QCC
(viii) Contingency Reserves Adjustments

5. Inputs from the Operations Program

In the Operations Program, Participants will be required to prepare and provide data in a format specified by the Program Operator. These data must adhere to a submission schedule to allow the Sharing Calculations to run with as up-to-date and complete data as possible. The Program Operator will be responsible for the transfer of input data that will be processed according to a predefined schedule to inform Participants of any Sharing Events. A user interface will provide Participants the means to view input upload status and error details, notifications and alerts, and Sharing Calculation results.

Moreover, it is the responsibility of the Program Operator to develop, test, implement and maintain the form and format of all inputs and to ensure the latest version of these are made available to Participants. The Program Operator will also ensure that Participants are given access to portals, links, and/or any other data upload protocols prior to the start of any Binding Season to allow successful participation in the Operations Program. Any procedures, guides or reference materials related to the input and data file specification is posted on the WPP website.

The Sharing Calculation, which is the mechanism to determine whether a participant is surplus or deficit on any given hour of the operating day, relies on data submitted in the Operations Program by the Participant which includes hourly values of the following:

(i) Load Forecast
(ii) Forced Outages
(iii) Forecasted ROR output
(iv) Forecasted wind output
(v) Forecasted solar output
(vi) Contingency Reserves Obligation
(vii) Uncertainty Factor

5.1. Load Forecast

This is the Participant's hourly forecast of its WRAP load, expressed in MW, submitted for each operating hour. The data submitted for Load Forecasts shall account for the total load/demand the Participant is responsible for serving under WRAP and be sourced from the same data that was utilized in the FS Submittal. If there are additional third-party loads or excluded loads within a Participant's Balancing Authority Area (BAA), these shall not be accounted for in the Load Forecasts submitted in the Operations Program.

Participants shall determine their Load Forecast using either:

(i) a third-party forecasting tool/software or
(ii) a proprietarily developed algorithmic forecasting tool.

Participants shall validate the methodology of their forecasting tools with the Program Administrator in advance of the Binding Season. The methodology shall include provisions demonstrating how the forecasts are calculated and the Participant shall attest that (i) data submitted in the Operations Program is true and accurate given the information a Participant has available at the time of submission, and (ii) that the data and inputs necessary to run the Sharing Calculation have not been modified with the intent of increasing a Participant's access to Holdback Capacity in the Operations Program or limiting their requirement to provide Holdback Capacity in the Operations Program (see Appendix A).

The Program Administrator/Program Operator will evaluate on a regular basis forecast performance and deviations to identify and mitigate inaccurate data.

5.2. Forced Outage Forecast

This is the hourly forecast of a Participant's Forced Outage (including derate), expressed in MW, and to be submitted for each operating hour. The data submitted for Forced Outage forecasts shall account for MW reduction in:

1. **Total portfolio generating capability** where the portfolio is defined as:
    a. Any resource in the Forward Showing for which the Program Operator has calculated an Equivalent Forced Outage Factor (EFOF) or the Participant has supplied a Forced Outage Factor.
    b. Any purchase contract in the Forward Showing where the Participant has assumed the outage risk as the purchaser. It is the responsibility of the Participant to work with the seller to determine how much of an outage is attributable to the Participant's contract.
2. **A curtailment or derate of network service, firm or conditional firm transmission** being utilized to bring resources and/or contracts shown in the Forward Showing Submittal to load. Curtailments and derates to non-firm transmission shall not be accounted for in the Forced Outage forecasts.

For an outage or derate to be claimed in the Operations Program for a given hour it must be due to an event type as defined in NERC's Generation Availability Data System (GADS).

Additionally, the Forced Outage or derate must result in an actual loss of generating capability. If, for example, the outage is on a hydro unit and there is insufficient water in storage or inflow to utilize the lost capacity then the outage may not be claimed.

NOTE: Specific consideration for must-take Thermal Resources:

> Due to limited dispatchability and dependency on fuel supply, must-take Thermal Resources are not given a Forced Outage Factor. Any derate, outage, or transmission curtailment resulting in a reduction of generation capability for must take resources, shall not be accounted for and excluded from Forced Outage forecasts.

5.3. Forecasted ROR

This is the hourly forecast of a Participant's ROR performance, expressed in MW, and to be submitted for each operating hour. The data submitted for ROR forecasts shall account for the forecasted MW output on any given operating hour for the Participants' ROR included in the FS Submittal.

Participants shall determine their ROR performance forecast using either:

(i) a third-party forecasting tool/software or
(ii) a proprietarily developed algorithmic forecasting tool

The Program Administrator/Program Operator will evaluate on a regular basis forecast performance and deviations to identify and mitigate inaccurate data.

NOTE: Unless specified under a purchase contract listed in a Participant's FS Submittal per *BPM 106 Qualifying Contracts* (i.e. JCAF), a Participant with ROR will be responsible for over/under performance of ROR forecasts.

5.4. Forecasted wind output

This is the hourly forecast of a Participant's wind resources performance, expressed in MW, and to be submitted for each operating hour. The data submitted for wind resource forecasts shall account for the forecasted MW output on any given operating hour for the Participant's wind resources included in the FS Submittal.

Participants shall determine their wind resource performance forecast using either:

(i) a third-party forecasting tool/software or
(ii) a proprietarily developed algorithmic forecasting tool.

The Program Administrator/Program Operator will evaluate on a regular basis forecast performance and deviations to identify and mitigate inaccurate data.

NOTE: Unless otherwise specified under a purchase contract listed in the FS Submittal per *BPM 106 Qualifying Contracts* (i.e. JCAF), a Participant with wind resources will be responsible for over/under performance of wind resource forecasts.

5.5. Forecasted solar output

This is the hourly forecast of a Participant's solar resources performance, expressed in MW, and to be submitted for each operating hour. The data submitted for solar resource forecasts shall account for the forecasted MW output on any given operating hour for the Participants' solar resources included in the FS Submittal.

Participants shall determine their solar resource performance forecast using either:

(i) a third-party forecasting tool/software or
(ii) a proprietarily developed algorithmic forecasting tool.

The Program Administrator/Program Operator will evaluate on a regular basis forecast performance and deviations to identify and mitigate inaccurate data.

NOTE: Unless otherwise specified under a purchase contract listed in a Participant's FS Submittal per *BPM 106 Qualifying Contracts* (i.e. JCAF), a Participant with solar resources will be responsible for over/under performance of solar resources forecasts.

5.6. Contingency Reserves Obligation

As defined above, the CRO is the total amount of contingency reserves the Participant is carrying during the operating hour.

The data submitted for CRO is intended to help ensure that sufficient capacity is withheld to cover a Participant's CRO in MW for any given hour.

5.7. Uncertainty Factor

The Uncertainty Factor is meant to account for the variances between forecasts of load, VERs, and Run-of-River Qualifying Resources for each operating hour on the Preschedule Day and the actual load and resource performance during such hour on the Operating Day. The Uncertainty Factor helps ensure that Participants retain capacity to account for near-term forecast error that would underestimate capacity needs, overestimate generation capability/availability; i.e. variances in the upward direction for load and variances in the downward direction for resource performance. See more details in *BPM 203 Program Sharing Calculation Inputs.*

6. Input Data Files

6.1. Multi-Day file

The data requested in the Multi-Day (MD) file is necessary to run the Operations Program Sharing Calculation, which is the mechanism to determine whether a Participant is surplus or deficit on any given hour of the Operating Day.

MD files may include up to seven (7) Operating Days' worth of data (i.e. 168 operating hours of data).

Per *BPM 201 Operations Program Timeline*, Participants are required to submit a MD file no later than 05:20 AM Pacific Prevailing Time (PPT) on the Preschedule Day and according the WECC scheduling calendar.

6.2. Operating Day file

The data requested in the Operating Day files (OD) is mainly used for informational purposes in the Operations Program. As the binding obligations are set to the Preschedule Day under the Tariff, input data submitted in the OD files is used to post updated Sharing Results, hour by hour, for the Operating Day. These updated Sharing Results help inform a Participant about its position relative to the Sharing Result posted on the Preschedule Day,

OD files include at least twenty-four (24) operating hours' worth of data and are to be submitted every hour during the Operating Day.

Per *BPM 201 Operations Program Timeline*, Participants are required to submit an Operating Day file no later than one hundred and twenty (120) minutes prior to the start of any given operating hour.

6.3. Point Limit File

The data requested in the Point Limit (PL) files is to inform the Operations Program about the transmission points a Participant can deliver to and take receipt from other Participants. PL file inputs are essential to determine allocation and deliverability of any Holdback Requirement.

PL files may include up to twenty-four (24) operating hours' worth of data including but not limited to transmission points for delivery of any Holdback Requirement and order of priority.

Per *BPM 201 Operations Program Timeline,* Participants shall ensure the PL files are submitted after 5:20 AM (PPT) when the Sharing Results post and before 6:35 AM (PPT).

Data submitted in the PL files serve as input needed for optimization and validation in the Operations Program.

6.4. Point to Point Limit File

The Operations Program is designed to optimize allocation and deliverability of any Holdback Requirement. Given potential transmission constraints within a subregion and the desire to share as much diversity as possible, the data requested in the Point-to-Point Limit (PTPL) is to inform the Operations Program about the transmission points where wheeling capability may occur. Inputs from the PTPL files are essential to determine a Participant's ability and order of priority to deliver any Holdback Requirement on defined transmission wheeling paths and inter-region transmission connectivity.

PTPL files may include up to twenty-four (24) operating hours' worth of data including but not limited to point-to-point transmission wheeling paths and order of priority.

Per *BPM 201 Operations Program Timeline*, Participants shall ensure the PTPL files are submitted after 5:20 AM (PPT) when the Sharing Results post and before 6:35 AM (PPT). Data submitted in the PTPL files serve as input needed for optimization and validation in the Operations Program

6.5. Voluntary Holdback File

This data submission allows Participants to indicate to the WRAP the amount of holdback that they would like to make available in excess of the surplus resulting from the Sharing Calculation. The intent of this submission is to indicate the MW value that will be made available. The points at which the additional surplus / Voluntary Holdback would be made available would be found in the Point Limits File.

The data requested in the Voluntary Holdback (VH) files is to inform the Operations Program about any additional capacity made available to the subregion for any given hour. Input from the VH files is essential to determine allocation and prioritization of any Holdback Requirement.

Per *BPM 201 Operations Program Timeline*, Participants shall ensure the VH files are submitted after 5:20 AM (PPT) when the Sharing Results are posted and before 6:35 AM (PPT). Data submitted in the VH files serve as input needed for optimization and validation, particularly for any given Sharing Event.

6.6. Actuals file

The data requested in the Actuals (AC) files is after-the-fact in nature - equivalent to the data submitted in the MD and OD files - reflecting the actual values of forecasts. The data collected from AC files is not a Sharing Calculation input. The Program Administrator and Program Operator use AC files data for analysis and reporting, particularly for data accuracy and performance.

Participants shall ensure that AC files are submitted no later than seven (7) Days or 168 hours after any given operating hour.

7. Calculation of Sharing Results

The Sharing Calculation relies on inputs from both the Forward Showing and Operations Program. The Sharing Result for any operating hour is calculated using the Sharing Calculation equation and its inputs listed in the sections above.

If a Sharing Result for any given hour is positive, this indicates the Participant has surplus capacity.

Conversely, if a Sharing Result for any given hour is negative, this indicates the Participant is capacity deficient, and therefore would constitute a potential Sharing Event.

NOTE: It is important to remember that the forecast data submitted for each operating hour are calculated relative to the values assumed in the FS Submittal. This means the values submitted for each operating hour should use the same assumptions and the same general source data as the values submitted in the Forward Showing. Any mismatch can result in a Participant being erroneously identified as surplus or deficit. A Participant's ability to ensure that the Forward Showing and the Operations Program data submissions align with one another will streamline testing and trials and maximize both individual and group benefits.

8. Planned Outages

In the FS Submittal, Participants are required to provide information on all Qualifying Resources that are currently out of service with a scheduled return date that falls during or after the Binding Season. Capacity associated with such resources is then deducted from Participants' Portfolio QCC to ensure no credit is granted for such resources during the planned outage.

The aggregate of any additional outages that are planned to occur during the Binding Season but have not yet begun at FS Submittal deadline must be within the Participant's remaining surplus or replaced with other supply.

A planned outage shall not justify a waiver of or exception to a Participant's holdback or energy delivery obligations under the Tariff. Participants will procure the necessary capacity or energy to meet the Operations Program requirements, regardless of planned outage schedules or FS Submittal acceptance. In addition, planned outages MW amounts will not be included in the Forced Outage hourly data submitted in the Operations Program.

Appendix A – Data Attestation

I, the undersigned, who, as [title], serves as a senior official of [Participant], hereby attest that (i) data submitted in the Operations Program is true and accurate given the information [Participant] had available at the time of submission, (ii) the data provided in the Operations Program utilizes the same type of data and assumptions as the data provided for the Forward Showing Program, and (iii) that the data and inputs necessary to run the Sharing Calculation have not been modified with the intent of increasing [Participant]'s access to Holdback Capacity in the Operations Program or limiting their requirement to provide Holdback Capacity in the Operations Program.