This business practice implements the two committed scheduling options that are available for customer election in the 2014-2015 rate period. They are Committed 30/30 Scheduling and Committed 30/60 Scheduling (both referred to as Committed Scheduling). Committed 30/30 must schedule in a way that meets or exceeds scheduling utilizing the 30 minute persistence signal for a 30 minute intra-hour schedule. Committed 30/60 must schedule in a way that meets or exceeds scheduling utilizing the 30 minute persistence signal for a 60 minute hourly schedule. Under the Initial Proposal wind generators that commit to submitting a committed schedule and 1) meet scheduling accuracy metrics every 30 minutes are eligible for a reduced Variable Energy Resource Balancing service (VERBS[1]) rate and are exempt from Persistent Deviation penalties or 2) every 60 minutes and meet scheduling accuracy metrics are exempt from Persistent Deviation penalties.

This business practice sets forth BPA's requirements for participation in Committed Scheduling and other details.

A. Eligible Committed Scheduling Participants and Resources

1. Any Customer[2] that operates a wind facility within BPA's Balancing Authority Area and meets the conditions outlined in this Business Practice may participate in Committed Scheduling. For a wind facility being developed in phases, any phase of a wind facility may participate in Committed Scheduling so long as the phases are each metered and scheduled independently and is not otherwise interdependent with any other phase. Each subsequent phase will need to prequalify independently if the phase is to be included in Committed Scheduling.

2. The mechanisms, if any, for a customer to move to a shorter scheduling interval will be discussed in the rate case.

B. Prequalifying Information Required

1. Potential Participants are required to:
   a. Notify their BPA Transmission Account Executive in writing of interest in participating.
   b. Identify the Committed Scheduling Resources and provide POR[3] for the wind energy and, if sinking internally to the BPA BAA, POD[4](s).

      If the POD for a Committed 30/30 Scheduling Resource is to load inside BPA's Balancing Authority Area, the potential participant must provide BPA with

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[1] "Variable Energy Resource Balancing Service" as described in the ACS-14 rate schedule and General Rate Schedule Provisions.
[2] Any customer taking service under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), Generation Integration Services, Part II or Part III of the OATT.
[3] Point of Receipt is an interconnection on the Transmission Provider's Transmission System where capacity and energy will be made available by the Delivering Party: An OASIS field on a TSR that is the scheduling POR.
[4] Point of Delivery is a point on the Transmission Provider's Transmission System where capacity and energy transmitted by the Provider will be made available to the Receiving Party; An OASIS field on a TSR that is the scheduling POD.

acknowledgement from the load that it has a Balancing Resource that it will schedule on each half hour to the load. The acknowledgement must include the resource name and POR. Participants may change the assigned Balancing Resource with thirty days notice to BPA.

c. Inform BPA about the methods by which the potential participant expects to achieve scheduling accuracy that is consistent with or superior to the schedule error metrics described below. BPA will apply the same performance metric regardless of the scheduling method used

d. Prior to BPA allowing a customer to receive a lower rate associated with Committed Scheduling, the potential participant must demonstrate for at least two weeks its ability to meet the scheduling accuracy metric, regardless or whether the resource is new or existing.

e. The Uncommitted Scheduling VERBS Base Rate (Section III.E. 2 of BPA's ACS-14 rate schedules) will apply during the period that the potential participant is providing prequalifying information to BPA and demonstrating the ability to meet the scheduling accuracy metric.

f. A resource planned to come on-line during the rate period that elects to participate in committed scheduling will have two weeks from their commercial operations date to test their ability to meet the scheduling accuracy metrics for their elected scheduling option. The Uncommitted Scheduling rate will apply until the customer receives Notification of Participation, as defined in Section G, below.

Deleted: <#>If the POD for the CIH Pilot Resource is to load outside BPA's Balancing Authority Area, BPA will ensure the Sink Balancing Authority and any intermediate Balancing Authorities have business practices that support changes in schedules from 0 MW to nameplate prior to approving participation.¶

C. Generation Imbalance and Energy Imbalance

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Deleted: <#>Reserve Allocation: The reserve allocation for a CIH Pilot Resource that BPA will use for DSO 216 limits will be reduced by 34% from the base VERBS level.¶

1. Energy Imbalance[5] risk: For Committed 30/30 Scheduling Resources with wind energy sinking to loads within the BPA BA, a Balancing Resource [6] must be identified, as noted above in B.1.b above. If the intra-hour schedule is adjusted for the wind plant but Energy Imbalance was increased instead of adjusting the Balancing Resource output, such increases or patterns of imbalance could result in Persistent Deviation Penalties for Energy Imbalance.
2. Committed Scheduling Resources and Balancing Resources are subject to Generation Imbalance. Generation Imbalance accounting for Committed Scheduling Resources and Balancing Resources is on the actual schedule interval, 30 minute or 60 minute.. (See the Generation Imbalance Business Practice).
3. Committed Scheduling Resources are exempt from Persistent Deviation Penalties for Generation Imbalance.
4. Balancing Resources are subject to Persistent Deviation Penalties.

[5] Difference occurring between hourly scheduled amount and hourly metered (actually-delivered) amount associated with transmission to a load located in the BPA Balancing Authority area or from a generation resource located within BPA's Balancing Authority Area.
[6] A dispatchable resource within or outside of BPA Balancing Authority that is available to the load served by the Committed Scheduling Resource on the half hour.

D. Compliance with Dispatch Orders

1. Committed Scheduling participants are subject to Dispatch Orders, including Curtailments, generation limits and Dispatch Standing Order No. 216.

2. A Committed Scheduling participant that does not respond appropriately to a Dispatch Order[7] is subject to a Failure to Comply Penalty[8].

E. Committed Resource Scheduling for DSO-216, Curtailments, and iCRS System Failures

1. During a DSO-216 limit generation event, the Committed Scheduling Resource is expected to comply with the limit while the DSO-216 is in effect. For the subsequent scheduling interval, the Customer should schedule as accurately as possible. In recognition that inaccuracy could result from using the generation value during the DSO-216 limit generation event, BPA will exclude the subsequent schedule interval from scheduling accuracy metrics.
2. During a DSO-216 schedule curtailment the generator does not need to limit their generation in response to the DSO-216 schedule curtailment if there are no other transmission curtailments affecting e-Tags sourced at the Committed Scheduling Resource. In recognition that inaccuracy could result from using the generation value during a DSO-216 schedule curtailment event, BPA will exclude that interval in scheduling accuracy metrics.
3. During a transmission curtailment, Customers are expected to comply and limit generation to not exceed the sum of remaining approved e-Tags during the curtailment. In recognition that scheduling inaccuracy in subsequent intervals could result from using the generation value during the transmission curtailment, BPA will exclude the period of curtailment and subsequent schedule interval from scheduling accuracy metrics.
4. During an iCRS[9] Generation Advisor System Failure whereby iCRS ceases to produce the average generation value that we will use for determining scheduling accuracy performance (as explained further in Section F below), the Customer should schedule the subsequent scheduling interval as accurately as possible. In recognition that inaccuracy could result from unavailability of the average generation value, BPA will exclude the subsequent schedule interval from scheduling accuracy metrics.

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Deleted: The DSO-216 schedule curtailment will decrease the station control error for the scheduling interval and BPA will include exclude that interval in scheduling accuracy metrics.

[7] An order or directive from Transmission Services to dispatch, curtail, redispatch, limit output, or shed load. Dispatch orders may be communicated by various methods including, but not limited to : phone call (e.g. to redispatch generation up or down); electronic signal (e.g. via direct telemetry or private web application to limit generation according to DSO216); or NERC e-tagging system (e.g. to curtail transmission schedules and the generation using those schedules).

[8] The consequences of non-compliance as defined in the Failure to Comply Business Practice in effect at the time.

[9] BPA's Integrated Curtailment and Redispatch System, as implemented through BPA's Generation Advisor web application.

F. Schedule Accuracy Metrics

1. Committed 30/30 Scheduling

a. BPA will verify on an ongoing basis that the intra-hour scheduling used is at least as accurate as 30-minute persistence scheduling. The baseline metrics for accuracy comparison include a capacity, energy, and accumulated energy component.

b. 30-Minute Persistence for 30 minute Scheduling (Committed 30/30): The generator's schedule for the next schedule interval is the generator's 1-minute average of the actual generation 30 minutes prior. For example, the generator's schedule for 2:00 to 2:30 is the generator's actual average generation from 1:29 to 1:30 and the generator's schedule for 2:30 to 3:00 is the generator's actual average generation from 1:59 to 2:00. Through iCRS Generation Advisor, BPA will provide the average generation value that we will use for determining scheduling accuracy performance. The average value will be updated within 1 minute after H-x:30 and H-x:00.

c. A 20 minute ramp duration is used to ramp from the second half of the hour schedule to first half of the hour schedule beginning at XX:50 and ending at XX:10. A 10 minute ramp duration is used to ramp from the first half of the hour schedule to the second half of the hour schedule beginning at XX:25 and ending at XX:35.

d. Capacity Component: For the capacity component, the largest absolute value of the actual 1-minute averaged station control error should be less than or equal to the largest absolute value of the 1-minute averaged station control error calculated from 30-minute persistence schedule plus a capacity component deadband over the last seven (7) days. The capacity component deadband is the greater of 1 MW or 2 percent of the largest absolute value of the 1-minute averaged station control error calculated from 30-minute persistence schedule over the last seven (7) days.

$$MAX\left(\left|SCE_{1\min Ave,Actual}\right|\right) \le MAX\left(\left|SCE_{1\min Ave,Persistence}\right|\right) + DB_{capacity}$$

$$DB_{capacity} = \text{Greater of 1 MW or 2\% of last 7 day's } MAX\left(\left|SCE_{1\min Ave,Persistence}\right|\right)$$

$$SCE_{1\min Ave,Actual} = \text{Last 7 day's actual 1 minute average SCE}$$

$$SCE_{1\min Ave,Persistence} = \text{Last 7 day's 30-minute persistence schedule's 1 minute average SCE}$$

Equation 1- Capacity Component

e. Energy Component: For the energy component, the sum of the absolute value of the actual integrated imbalance over each 30-minute schedule interval should be less than or equal to the sum of the absolute value of the integrated imbalance over each 30-minute schedule interval from a calculated 30-minute persistence schedule plus an energy component deadband over the last seven (7) days. The energy component deadband is the greater of 50MWh or 2 percent of the sum of the absolute value of the integrated imbalance over each 30-minute schedule interval from a calculated 30-minute persistence schedule over the last seven (7) days.

$$\sum \left| \frac{SCE_{30\min Ave,Actual}}{2} \right| \le \sum \left| \frac{SCE_{30\min Ave,Persistence}}{2} \right| + DB_{energy}$$

DB_{energy} = The greater of 50 MWh or 2% of last 7 day's $\sum \left| \frac{SCE_{30\min Ave,Persistence}}{2} \right|$

$SCE_{30\min Ave,Actual}$ = Last 7 day's actual 30 minute averaged SCE

$SCE_{30\min Ave,Persistence}$ = Last 7 day's 30 - minute persistence schedule's 30 minute avera

Equation 2 - Energy Component

f. Accumulated Energy Imbalance Component: In addition, the absolute value of the bias in energy imbalance accumulation over the last seven (7) days should be less than or equal to the bias resulting from 30-minute persistence scheduling plus an imbalance component deadband.

$$\left| \sum \frac{SCE_{30\min Ave,Actual}}{2} \right| \le \left| \sum \frac{SCE_{30\min Ave,Persistence}}{2} \right| + DB_{imbalance}$$

$DB_{imbalance}$ = The greater of 50 MWh or 2% of last 7 day's $\sum \left| \frac{SCE_{30\min Ave,Persistence}}{2} \right|$

$SCE_{30\min Ave,Actual}$ = Last 7 day's actual 30 minute average SCE

$SCE_{30\min Ave,Persistence}$ = Last 7 day's 30-minute persistence schedule's 30 minute average SCE

Equation 3 - Accumulated Energy Imbalance

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g. A Committed 30/30 Scheduling Participant scheduling to the BPA-provided 30-minute persistence value for every 30-minute schedule interval will satisfy the schedule accuracy metrics for capacity, energy, and accumulated energy imbalance.

h. For Committed 30/30 Resources scheduling generation to loads within the BPA BA, BPA will also verify that the Balancing Resource is adjusting in conjunction with the wind resource schedule changes. BPA will check the intra-hour change in the sum of schedules for the Balancing Resource against the intra-hour change for the Committed 30/30 Scheduling Resource to ensure that use of FCRPS balancing reserve capacity is reduced.

Deleted: <#>Hours where an intra-hour schedule is not approved by an approval entity will be excluded from schedule accuracy analysis.¶

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2. Committed 30/60 Scheduling

a. BPA will verify on an ongoing basis that the hourly schedule used is at least as accurate as the 30-minute persistence signal. The baseline metrics for accuracy comparison shall include a capacity, energy, and accumulated energy component.

b. 30-Minute Persistence Signal for 60 minute Scheduling (Committed 30/60): The generator's schedule for the next schedule interval is the generator's 1-minute average of the actual generation 30 minutes prior to the hour. For example, the

generator's schedule for 2:00 to 3:00 is the generator's actual average generation from 1:29 to 1:30. Through iCRS Generation Advisor, BPA will provide the average generation value that we will use for determining scheduling accuracy performance. The average value will be updated within 1 minute after H-x:30.

c. A 20 minute ramp duration is used to ramp from the end of the previous hour schedule to the next hour schedule beginning at XX:50 and ending at XX:10.

d. Capacity Component: For the capacity component, the largest absolute value of the actual 1-minute averaged station control error should be less than or equal to the largest absolute value of the 1-minute averaged station control error calculated from 30-minute persistence schedule plus a capacity component deadband over the last seven (7) days. The capacity component deadband is the greater of 1 MW or 2 percent of the largest absolute value of the 1-minute averaged station control error calculated from 30-minute persistence schedule over the last seven (7) days.

$$MAX\left(\left|SCE_{1\,\min Ave,Actual}\right|\right) \leq MAX\left(\left|SCE_{1\,\min Ave,Persistence}\right|\right) + DB_{capacity}$$

$DB_{capacity}$ = Greater of 1 MW or 2% of last 7 day's $MAX\left(\left|SCE_{1\,\min Ave,Persistence}\right|\right)$

$SCE_{1\,\min Ave,Actual}$ = Last 7 day's actual 1 minute average SCE

$SCE_{1\,\min Ave,Persistence}$ = Last 7 day's 30-minute persistence schedule's 1 minute average SCE

Equation 1- Capacity Component

e. Energy Component: For the energy component, the sum of the absolute value of the actual integrated imbalance over each 60-minute schedule interval should be less than or equal to the sum of the absolute value of the integrated imbalance over each 60-minute schedule interval from a calculated 30-minute persistence schedule plus an energy component deadband over the last seven (7) days. The energy component deadband is the greater of 50MWh or 2 percent of the sum of the absolute value of the integrated imbalance over each 60-minute schedule interval from a calculated 30-minute persistence schedule over the last seven (7) days.

$$\sum\left|SCE_{60\,\min Ave,Actual}\right| \leq \sum\left|SCE_{60\,\min Ave,Persistence}\right| + DB_{energy}$$

DB_{energy} = The greater of 50 MWh or 2% of last 7 day's $\sum\left|SCE_{60\,\min Ave,Persistence}\right|$

$SCE_{60\,\min Ave,Actual}$ = Last 7 day's actual 60 minute average SCE

$SCE_{60\,\min Ave,Persistence}$ = Last 7 day's 30-minute persistence schedule's 60 minute average SCE

Equation 2 - Energy Component

f. Accumulated Energy Imbalance Component: In addition, the absolute value of the bias in energy imbalance accumulation over the last seven (7) days should be less than or equal to the bias resulting from 30-minute persistence scheduling plus an imbalance component deadband.

$$\left|\sum SCE_{60\,\text{min}\,Ave,Actual}\right| \leq \left|\sum SCE_{60\,\text{min}\,Ave,Persistence}\right| + DB_{imbalance}$$

$DB_{imbalance}$ = The greater of 50 MWh or 2% of last 7 day's $\sum\left|SCE_{60\,\text{min}\,Ave,Persistence}\right|$

$SCE_{60\,\text{min}\,Ave,Actual}$ = Last 7 day's actual 60 minute average SCE

$SCE_{60\,\text{min}\,Ave,Persistence}$ = Last 7 day's 30-minute persistence schedule's 60 minute average SCE

Equation 3 - Accumulated Energy Imbalance

g. A Committed 30/60 Scheduling Participant scheduling to the BPA-provided 30-minute persistence value for every 60-minute schedule interval will satisfy the schedule accuracy metrics for capacity, energy, and accumulated energy imbalance

G. Notification of Participant Qualification for Committed Scheduling VERBS Base Rate

1. BPA will notify a potential Committed Scheduling Participant when the potential participant has met the pre-qualification requirements and request written acknowledgment that the terms of this business practice will govern participation in Committed Scheduling. BPA must receive the written acknowledgement from the Committed Scheduling Participant no later than 5 business days before the end of a month for the Committed Scheduling VERBS Base Rate Section III.E.2 of BPA's ACS-14 rate schedules) to apply beginning on the first day of the next month.

Comment [CJG1]: Need to define for start of rate period.

H. Notification of Failure to Meet Scheduling Accuracy and Termination

1. If the Committed Scheduling Participant's schedule accuracy does not meet the Scheduling Accuracy Metrics, BPA will notify the Committed Scheduling Participant within 10 Business Days by written notice. Upon receipt of such notice, the Committed Scheduling Participant is expected to correct the scheduling accuracy within 1 business day.

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2. If the failure to meet the scheduling accuracy metrics was caused by factors outside the control of the participant, such as a failure of iCRS or other data acquisition system problems, the Customer may submit the reasons and documentation and request that BA waive the failure. If BPA grants the request for waiver, BPA will notify the customer within 10 business days of receipt of the request and the failure will not count against the Customer.
3. After BPA issues two such unwaived notices during the 2014-2015 rate period, the next notice will require the Committed Scheduling Participant to automate scheduling to the BPA-provided persistence value in a manner consistent with applicable DOE cyber security standards. Upon receipt of a notice with this requirement, the Committed Scheduling Participant must notify BPA of their intent to comply within two Business Days, and execute the change in their scheduling systems within two weeks of receiving BPA's new signal. During the intervening period the Committed Scheduling Participant is

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expected to exercise due diligence to continue to achieve the expected scheduling accuracy.

4. BPA may initiate moving a Committed Scheduling participant to a longer scheduling option as defined in VERBS Base Rate Section III.E.2 of the 2014-2015 ACS Rate Schedule upon 30 calendar days notice if any of the following conditions occur:
   a. The Committed Scheduling Participant has been provided with four or more unwaived notices of schedule error during the 2014-2015 rate period.
   b. Failure of the Committed Scheduling Participant to convert to automated scheduling to the BPA-provided persistence value within two weeks of receiving the new signal from BPA.

5. When a Committed 30/30 Scheduling Resource is sinking to load within the BPA BA and the Balancing Resource is not changing schedules in response to the intra-hour adjustments BPA may disqualify the Balancing Resource upon 30 days calendar notice.
   a. The Committed Scheduling Participant will have 30 calendar days from notifying the Balancing Resource to qualify a new balancing resource. Failure to bring a new resource will result in termination from participation in committed scheduling.
6. A Committed Scheduling Participant moved to a longer schedule interval option by BPA will receive the VERBS Base Rate for the level the Customer is scheduling to for the remainder of the rate period. If termination occurs mid-month, the participant will pay the appropriate VERBS BASE Rate for the scheduling option for the entire month during which the change occurs. For example, a Committed 30/30 scheduler moved to Committed 30/60 scheduling will pay the Committed 30/60 Base VERBS Rate or a Committed 30/60 scheduler moving to Uncommitted Scheduling will pay the Uncommitted Scheduling Base VERBS rate, for the whole month.
7. A change in a customers scheduling option will result in the direct assignment of the cost of acquisitions caused by the unplanned increase in the reserve requirements for the BPA BAA. See the Type 4 Acquisition Costs in Section III.E.6.4 of the 2014-2015 ACS Rate Schedule.

J. Additional Information

Policy Reference

- 2014-2015 Transmission and Ancillary Service Rates

Related Business Practices

- Redispatch and Curtailment
- Requesting Transmission Service
- Scheduling Transmission Service
- Generation Imbalance
- Failure to Comply
- On Demand Resource Scheduling
- Oversupply Management Protocol

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Deleted: <#>#A CIH Pilot Participant will have a one-time option for each of its resources participating in the CIH Pilot to terminate participation, with a minimum of 15 calendar day written notice to the CIH Pilot Participant's Transmission Account Executive. If such notice is received on or before the 10th of the month participation in the CiH Pilot will conclude on the last day of the month the termination notice was received in. If such notice is received after the 10th of the month participation in the CIH Pilot will conclude on the last day of the month following receipt of the termination notice. Upon cessation of participation in the CIH Pilot, BPA will provide and charge for standard VERBS for the remainder of the rate period. During the notice period, until the termination is effective, the CIH Pilot Participant must continue to schedule to the 30 minute persistence level of accuracy, using mechanical persistence scheduling if it has not met the scheduling accuracy requirement through other means. In addition, during the notice period, a CIH Pilot Resource's reserve allocation for DSO 216 limits will remain at the reduced amount associated with the Pilot. BPA will adjust the reserve allocation f... [1]

Deleted: **I. Procedure for Submitting CIH Pilot Schedules**¶
<#>A firm reservation is required to submit a schedule for a CIH Pilot Resource.¶
<#>The POR for a CIH Pilot Resource located within BPA's Balancing Authority Area is the point where the CIH Pilot Resource is connecte... [2]

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#A CIH Pilot Participant will have a one-time option for each of its resources participating in the CIH Pilot to terminate participation, with a minimum of 15 calendar day written notice to the CIH Pilot Participant's Transmission Account Executive. If such notice is received on or before the 10th of the month participation in the CiH Pilot will conclude on the last day of the month the termination notice was received in. If such notice is received after the 10th of the month participation in the CIH Pilot will conclude on the last day of the month following receipt of the termination notice. Upon cessation of participation in the CIH Pilot, BPA will provide and charge for standard VERBS for the remainder of the rate period. During the notice period, until the termination is effective, the CIH Pilot Participant must continue to schedule to the 30 minute persistence level of accuracy, using mechanical persistence scheduling if it has not met the scheduling accuracy requirement through other means. In addition, during the notice period, a CIH Pilot Resource's reserve allocation for DSO 216 limits will remain at the reduced amount associated with the Pilot. BPA will adjust the reserve allocation for a CIH Pilot resource to the level for standard VERBS on the first day of the first month beginning after the notice period.

#BPA may terminate the pilot with 30 calendar day notice for cause.

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I. Procedure for Submitting CIH Pilot Schedules

A firm reservation is required to submit a schedule for a CIH Pilot Resource.

The POR for a CIH Pilot Resource located within BPA's Balancing Authority Area is the point where the CIH Pilot Resource is connected to BPA's transmission system.

The POR for a CIH Pilot Balancing Resource located within BPA's Balancing Authority is the point where the CIH Pilot Balancing Resource is connected to BPA's transmission system. The POD for a CIH Pilot Balancing Resource is the same POD used for the Participant's CIH Pilot Resource.

Additional scheduling procedures are outlined in the Intra-Hour Scheduling Business Practice.