# Operating Reserves

## BPA Transmission Business Practice

**Version ~~16~~17**

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# Operating Reserves

**Version ~~16~~17**

Pursuant to Schedules 5 and 6 of the BPA OATT, Operating Reserves are available to Customers to meet their Operating Reserve Requirement. This business practice describes the criteria a Customer must meet to fulfill its Operating Reserve Requirement.

Customers with load or generation located within the BPA Balancing Authority Area (BAA) must provide Operating Reserves in accordance with this business practice which follows applicable Western Electricity Coordinating Council (WECC) standards, North American Electric Reliability Council (NERC) standards, and North West Power Pool Reserve Sharing Group rules. Operating Reserves are referred to as Contingency Reserves in NERC and WECC documents.

BPA Policy Reference

- Open Access Transmission Tariff (OATT): Section 3; Schedules 5 and 6
- Transmission Rate Schedules/Provisions: Operating Reserve

For more information, visit the BPA Transmission Business Practices webpage or submit questions to techforum@bpa.gov.

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## A. General Criteria

1. Operating Reserve Requirements are identified in NERC standard BAL-002-WECC-3, Disturbance Control Standard Contingency Reserve for Recovery from a Balancing Contingency Event. The standard requires the greater of either three percent of hourly integrated load plus three percent of hourly integrated generation or the loss of the most severe single contingency (MSSC).
2. BPA participates in the NWPP Reserve Sharing Group (RSG) and the BPA Operating Reserve Requirements are as follows:
    a. The Operating Reserve - Spinning Requirement is equal to the sum of:
        i. One and one-half percent (1.5%) of hourly integrated load; and
        ii. One and one-half percent (1.5%) of hourly integrated generation.
    b. The Operating Reserve - Supplemental Requirement is equal to the sum of:
        i. One and one-half percent (1.5%) of hourly integrated load; and
        ii. One and one-half percent (1.5%) of hourly integrated generation.

## B. Customer Obligation to Provide Operating Reserves

1. Customers are required to provide and must make arrangements for the provision of Operating Reserve services to support their transmission transactions with BPA.
2. A Customer may meet its Operating Reserve Requirement under Schedules 5 and 6 of the BPA OATT through one of the following alternatives:
    a. The Customer may elect to purchase Operating Reserves from BPA. BPA is then the Operating Reserves Transmission Provider (Provider) and is responsible for meeting the Operating Reserve Requirements.
    b. Alternatively, the Customer may self-supply its Operating Reserve Requirements from:
        i. The Customer's own resources (the Customer and the Provider are the same); or
        ii. A single third party. In this case, the Customer and Provider are different. BPA will measure the compliance of the Provider; however, it is the Customer who is ultimately responsible for meeting the Operating Reserve Requirements.
3. A Customer may not obtain Operating Reserves from more than one third-party Provider.
4. If a Customer chooses BPA as its Provider, BPA will be the Customer's Provider through the next ~~two (2) year~~ rate period.
5. A Customer that self-supplies or third-party supplies may change their non-BPA Provider on an annual basis, but must make this election no later than May 1 prior to the start of each year during the rate period.

## C. Electing to Self-Supply

1. A Customer who elects to self-supply may provide either Spinning Reserve or Supplemental Reserve, or both.
    a. If the Customer elects to self-supply just one of these services, BPA will become the default Provider for the other service.
2. A Customer that elects to self-supply must:
    a. Establish supply arrangements that are comparable to purchasing Operating Reserves from BPA;
    b. Execute an operating agreement with BPA;
    c. Complete implementation and acceptance testing of the necessary interfaces, systems, Dynamic Schedules, or software required in order to comply with this business practice by the start of the ensuing fiscal year (October through September). See Section L;
    d. Comply with applicable WECC and NERC reliability standards;
    e. Provide sufficient Operating Reserves to meet applicable requirements at all times; and
    f. If the Customer is obtaining Balancing Reserves from a third-party, the Customer must also execute a three-party operating agreement among the Customer, its third-party Provider, and BPA.
3. BPA may require the Customer to provide copies of its filings with WECC, if any.
4. A Customer may not self-supply Operating Reserves from Slice.
5. A self-supplying Customer fails to meet its obligation if:
    a. Their Provider does not meet NERC or WECC reliability standards;
    b. Their Provider fails to comply with industry standards for communication or network security protocols;
    c. The ICCP link between BPA and their Provider fails;
    d. Their Provider's EMS status signal fails; or
    e. Their Provider does not complete implementation and acceptance testing as defined in Section C.2.c.
6. In the event the self-supplying Customer's Provider does not meet the obligations in this Section, BPA will become the Customer's default Provider until the Customer cures the deficiency.
7. A self-supplying Customer must supply Operating Reserves from its own resources or from a single third party. However, the Provider must have more than one generation resource available to supply the Operating Reserves.

## D. Changing a Provider

1. Start of the rate period:
    a. A Customer may change its Provider effective at the start of the next rate period, by providing notice to their assigned Transmission Account Executive in writing or by email no later than May 1 prior to the start of the next rate period.
    b. A notification of a change in Provider must state the Customer's election to (i) designate BPA as its Provider; (ii) self-supply Operating Reserves from its own resources; or (iii) self-supply Operating Reserve~~-~~s from a third party.
        i. If the Customer elects to self-supply Operating Reserves, BPA will notify the Customer no later than July 1 prior to the start of the next rate period, whether the proposed supply arrangements are comparable to purchasing Operating Reserves from BPA.
        ii. If the proposed supply arrangements are not comparable, BPA will not approve the requested change and provide an explanation to the Customer in writing.
            1. If the Customer wants to continue to pursue the self-supply of Operating Reserves, it will provide BPA with the date at which it expects to provide comparable arrangements.
            2. If the new date is after October 1st of the next rate period, BPA will remain the default Provider until the Customer is able to provide comparable arrangements.
2. During the rate period:
    a. A self-supplying Customer may change its Provider ~~for the second~~each year of the rate period by providing notice to BPA in writing or by email no later than May 1 prior to the year the Provider change would take place.~~ during the first year of a rate period.~~
        i. BPA will notify the Customer no later than July 1~~ prior to the start of year 2 of the rate period~~, whether the proposed supply arrangements are comparable to purchasing Operating Reserves from BPA.
        ii. If the proposed supply arrangements are not comparable to purchasing Operating Reserves from BPA, BPA will not approve the requested change and provide an explanation in writing.
            1. The self-supplying Customer will provide BPA with the date at which it expects to be able to meet the applicable standard of service.
            2. BPA will become the default Provider until the Customer is able to meet the applicable standard, unless the self-supplying Customer elects to continue obtaining Operating Reserves from its then-current Provider.
            3. BPA will provide the self-supplying Customer with an approximate date in which BPA will implement the Operating Reserves.

3. If the self-supplying Customer is no longer able to self-supply Operating Reserves, or otherwise unable to meet applicable standards, BPA will become the default Provider for remainder of the rate period.
4. If the Customer does not intend to change its Provider, no action is required.

## E. Calculating the Self-Supplying Customer's Operating Reserve Requirement

1. BPA will determine the self-supplying Customer's Operating Reserve Requirement for the current hour and an estimate for the next hour.
2. Each self-supplying Customer shall carry its proportionate share of BPA's total Operating Reserve obligation.
3. The amount of capacity that the self-supplying Customer must hold for Operating Reserves is the Spinning Reserve Requirement, the Supplemental Reserve Requirement, or both, depending on whether the self-supplying Customer has elected to supply Spinning Reserve, Supplemental Reserve, or both, respectively.
4. Calculating the self-supplying Customer's Operating Reserve Requirement:
    a. The Operating Reserve Requirement for a generator located within the BPA BAA is the sum of (a) the generator's hourly transmission schedules or (b) the generator's hourly generation estimate if the generator is a behind the meter resource operating in the BPA BAA, multiplied by the applicable percentage based on the Customer's self-supply election.
    b. The Operating Reserve Requirement for a load located within the BPA BAA is the sum of (a) generation scheduled to that load and (b) that Customer's load estimates, if any, multiplied by the applicable percentage based on the Customer's self-supply election.
    c. A Customer with unscheduled generation or load must submit a daily estimate of generation or load, as the case may be, to BPA during the preschedule window.
        i. If conditions change such that a self-supplying Customer's generation or load estimate is no longer valid, the Customer must update their estimate during the real-time window.
        ii. Additional information about generation and load estimates may be found in the Scheduling Transmission Service Business Practice.
    d. Loss return schedules are treated the same as normal schedules. The Sink (BPALOSS) is always in the BPA BAA so there will always be a minimum 3% requirement for the Transmission Contract Holder (TCH). If the Source is a generator in the BPA BAA, there will be an additional 3% requirement.
    e. A self-supplying Customer relying on a generator located outside the BPA BAA must demonstrate that it has adequate Firm transmission available to deliver Operating Reserves from that generator to BPA.

## F. Calculating the Self-Supplying Customer's Deployment Obligation

1. Calculation of the self-supplying Customer's reserve deployment obligation:
    a. The Operating Reserve Requirement will be used to calculate the self-supplying Customer's Allocation Ratio and will change as transmission schedules are changed or generation output varies.
    b. The self-supplying Customer's Operating Reserve Requirement divided by the BPA BAA's Operating Reserve Requirement is the self-supplying Customer's Allocation Ratio.
    c. The Allocation Ratio is multiplied by the BPA BAA's energy deployment for the contingency event to establish the self-supplying Customer's reserve energy delivery obligation.
2. The reserve deployment must be fully delivered within 10-minutes after BPA sends a signal for Operating Reserves; and sustained for 60 minutes unless otherwise requested by BPA.
3. If the self-supplying Customer plans to distribute its contingency response to multiple resources within the BPA BAA, a signal corresponding to the Participation Factor of each plant must be specified.
    a. The Participation Factor of each resource denotes the percentage that the self-supplying Customer wishes that resource to deploy when Operating Reserves are called upon.
    b. The total of all Participation Factors must equal 100%.
    c. A zero Participation Factor indicates the resource is not available for Operating Reserve deployment.

## G. Measuring Compliance

1. In the event of a contingency, the megawatt amount of reserve energy the self-supplying Customer must deliver will be sent from BPA over a data link to the Provider's resources or through the Provider's control center. If the resource is outside of the BPA BAA, the megawatt amount of reserve energy that the self-supplying Customer must deliver will be sent from BPA to the Provider's control center.
2. BPA will send a signal and status verification flag to the self-supplying Provider's Operating Reserve resource for up to 65 minutes. This signal is zero and a status verification flag is not set when there is no contingency reserve event and no testing. The self-supplying Provider's Operating Reserve resource will use the signal to deliver Operating Reserves as follows:
    a. Plant request or Setpoint = Basepoint + (Transmission Services deployment requirement (or MW loss)) * (Plant Participation Factor)* (Operating Reserves Allocation Ratio); or

b. A Dynamic Schedule for the self-supply Provider's system resources. Dynamic Schedule = (Transmission Services deployment requirement (MW loss))*(Operating Reserves Allocation Ratio).

3. The self-supplying Provider's recovery error must reach zero or positive MW prior to 10-minutes after receiving the Plant Request or Dynamic Schedule and continuing through the end of the Contingency Reserve Restoration Period.
    a. The self-supplying Provider's recovery error equals actual generation in MW, minus the Setpoint in MW, measured over the Contingency Event Recovery Period.
        i. Recovery error = actual generation (MW) - Setpoint (MW)
    b. The Load recovery error, in MW, equals:
        i. The scheduled load minus abs (Dynamic Schedule) minus actual load, if the self-supplying Provider's Operating Reserve resource is receiving a Dynamic Schedule, or;
        ii. The load Setpoint minus actual load of plant if the self-supplying Provider's Operating Reserve resource is receiving the plant Setpoint.
    c. If the recovery error does not reach zero within 10 minutes or remains at or above zero for the remainder of the Contingency Reserve Restoration Period, it will be counted as a strike.
4. For circumstances where system resources are used, the ACE and net interchange deviation will be used as the self-supplying Provider's recovery error.

## H. Evaluating the Self-Supplying Customer's Performance

1. The following examples constitute a strike(s) for the self-supplying Customer:
    a. One strike: the Provider failed to provide its capacity requirement for one hour in a given day or the Provider failed to sustain the capacity requirement for the duration of the contingency.
    b. Three strikes: the Provider failed to provide its capacity requirement to BPA for three different hours in a given day.
2. If the self-supplying Customer does not have Firm transmission available to deliver the Operating Reserves obligation, it will be assessed a strike for each hour it cannot do so.
3. BPA will notify the self-supplying Customer of a strike by letter, email, or phone call.
4. BPA will perform unannounced capability tests to assure that capacity is fully available within 10-minutes.
    a. BPA will work with the Provider, when necessary, to establish acceptable time frames when the Provider's system can accept energy.
    b. The capacity test will net to zero integrated MWs over the test duration.
    c. If the Provider fails the capability test, a strike is assessed to the self-supplying Customer.

5. If a self-supplying Customer receives six strikes during any consecutive 12 month period, the self-supplying Customer's ability to supply Operating Reserves will be suspended for the remainder of the rate period.
    a. The self-supplying Customer will be notified in writing of the effective date of the suspension of its right to supply Operating Reserves.
    b. A self-supplying Customer that receives six strikes may requalify to self-supply Operating Reserves at the beginning of the next rate period provided they meet the requirements of this business practice.

## I. Declaring a Contingency

1. Plant operators must notify the BPA generation dispatcher (dispatcher) of any contingencies due to equipment problems that result in partial or total reduction of the generator's scheduled energy delivery for the hour, within four (4) minutes of the occurrence of the contingency.
2. The plant operator shall provide the following minimum information to the dispatcher:
    a. The name of the plant.
    b. The unit number or name of resource(s) suffering the contingency.
    c. The time of the contingency.
    d. The reason for the contingency.
    e. The amount of reserves required (in MW) reflecting the actual amount of generation lost.
    f. How long the reserves are required (up to 60 minutes).
    g. Other information as may be requested by the dispatcher.
3. A plant operator requesting reserves for a contingency will receive reserves from BPA for 60 minutes with the amount received ramping to zero from 55 to 60 minutes following the request.
4. Reserves may not be requested twice for the same contingency event.
5. Wind generators requesting reserves for a hi-speed cutout event may not request reserves again within two (2) hours from the start of the hi-speed cutout event.
6. If a plant operator does not report a contingency within the specified time, the dispatcher may deliver the contingency energy at their discretion. Generation Imbalance or Energy Imbalance charges may apply.

## J. Contingency Energy Reserve Costs and Calculation

1. The generator having the contingency is responsible for the costs associated with the energy delivered from Operating Reserves on behalf of resources inside of the BPA BAA, consistent with the applicable ACS Rate Schedule.

2. BPA will determine how much energy each self-supply Customer delivered and the settlement obligation of the generator experiencing the contingency event.
3. The Operating Reserves energy delivered is the difference between the Scheduled Generation for the hour and the energy produced by the resource that had the contingency.
    a. Energy Delivered = Scheduled MWh – Actual MWh.
    b. If the amount of energy supply produced is equal to or greater than the Scheduled Generation for the hour, no settlement of Operating Reserves energy is required.
4. Settlement covers contingency energy delivered for 60 minutes.
5. BPA will notify each self-supply Customer of the MWh of reserve energy it delivered for each hour of contingency by creating an e-Tag with the MWh of delivered energy.
    a. The notification will occur shortly after the end of each hour in which the contingency reserve energy was delivered.
    b. BPA will coordinate settlement for reserve energy deliveries among responding self-supplying Customers.
    c. Each self-supplying Customer that responded to a request for reserve energy will receive a credit for reserve energy delivered up to the amount requested by BPA.
    d. If the self-supplying Provider's Operating Reserve resource providing the Operating Reserves is an NWPP RSG participant, then settlement procedures will follow those set forth in the NWPP RSG agreement.
        i. BPA follows the NWPP RSG agreement settlement procedures for reserve energy received from resources outside of the BPA BAA. This document is available at the following website address: https://www.westernpowerpool.org/.
        ii. The NWPP RSG agreement requires that all transactions for reserve deliveries be settled financially.
        iii. For these settlements, BPA will use the market index described in the NWPP RSG agreement procedures.

## K. Communicating with BPA

1. A self-supplying Provider shall provide the following data to BPA for its resources internal to the BPA BAA:
    a. The maximum, minimum, and spinning capability available within the NERC defined Contingency Event Recovery Period refreshed (updated) continuously. Operating Reserves shall be held available at all times until a contingency occurs.
    b. The actual instantaneous generation, in MW, of each resource that is providing reserves.
    c. Status of the self-supply Provider's EMS or equivalent, if a load.

2. A self-supplying Provider's Operating Reserve resource providing system responses shall provide the following data to BPA:
    a. Dynamic signal of its response to the BPA operating reserve deployment.
    b. Net interchange deviation.
    c. System error signal (for BAA's, this is the Area Control Error (ACE)).
    d. The status of the self-suppling Provider's Operating Reserve resource's EMS.

## L. Technical Requirements for Self-Supplying Customer's Operating Reserve Resources

1. The Provider's Operating Reserves resources must respond to automated signals sent from BPA's BAA calling upon the resources. The response must be distinct and measurable.
2. The Provider may use a resource in another BAA to supply Operating Reserves provided that the resource's deployment signal is automated and that BPA can observe a distinct measurable response.
3. The supply of Operating Reserves requires the BPA Dittmer Control Center (DCC) and Munro Control Center (MCC) to communicate with the self-supplying Customer's Operating Reserve resource's EMS for deployment of reserves.
    a. The self-supplying Customer is responsible for the costs associated with the placement of the required communications and control equipment and systems.
        i. If the infrastructure for implementing a Dynamic Schedule for a self-supply resource does not exist, it may take more than a year to put in place.
        ii. BPA must approve the Provider's plans to assure that NERC and the WECC reliability requirements can be met when the plan is implemented.
    b. The self-supplying Customer must pay all installation costs incurred by BPA for telemetry and monitoring. Costs will include labor, software for AGC, communication, as well as upgrade of both the Customer and BPA facilities.
    c. The Provider's Operating Reserve resource's EMS must be staffed 24 hours a day, seven (7) days a week to assure dispatch contact is available.
    d. The Provider's Operating Reserve resources shall exchange real-time data with BPA using the ICCP or other BPA approved data link between BPA's two control centers, DCC and MCC, and the Provider's Operating Reserve resource's EMS (or resource).
        i. Real-time data exchange shall conform to WECC standards for inter-utility data exchange, including availability, bandwidth, security, and reliability.
        ii. Real-time data exchange and control signals must have a periodicity of 10 seconds or less.

e. Deployment of the Provider's Operating Reserve resources must be accomplished using automated response to electronic signals from BPA.

   i. The resources may be system rather than individual resources.

   ii. System resources require independent response verification information.

f. The Provider and its Operating Reserve resources shall exchange other types of data, such as schedules, generation estimates, meter readings, etc., with BPA using the WECC Electronic Industrial Data Exchange Protocol or Customer Data Entry.

4. A Provider must have an annual average Operating Reserve obligation of at least 8 MW so that BPA is able to verify the Provider's response.

   a. The demonstration may be based on long-term contracts, reasonably expected short-term use, or a combination of both.

   b. A Third-Party Provider may provide Operating Reserves to more than one self-supply Customer.

   c. If the Provider's Operating Reserve resources' average requirement is less than 8 MW for the nine (9) month period October 1 to June 30 in any fiscal year during the ~~two (2) year~~ election period, it will not be allowed to self-supply for the remainder of the ~~two (2) year~~ election period.

   d. BPA will periodically check the Provider's deliveries to verify compliance with this requirement.