Operating Reserves

Version ~~11~~12 Effective: ~~12/9/2015~~DRAFT

Pursuant to its Tariff, BPA makes Operating Reserves available to Customers to meet the Customer's Operating Reserve Requirement. This Business Practice describes the criteria the Customers must meet to fulfill both the Operating Reserves Requirement and to be a self or third party supplier.

Changes

Revised section A.9 to clarify the period a wind generator can requests operating reserves for a hi-speed cut out event,

Updated section C.7 to clarify the minimum average obligation that a supplier must provide to qualify to self and/or third party supply.

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BPA Policy Reference

- Open Access Transmission Tariff (OATT): Section 3; Schedules 5 and 6
- Transmission Rate Schedules/Provisions: Ancillary and Control Area Service Rates, Operating Reserve

A. General Criteria

1. A Customer may purchase Operating Reserves to cover its Operating Reserve Requirement from BPA Transmission Services pursuant to its Tariff. Note: Operating Reserves are referred to as contingency reserve in WECC and NERC documents.
2. Operating Reserves applies to either Ancillary Services or Control Area Services whereby the Customers with load or generation located within BPA's metered Control Area that have a reserve requirement determined in accordance with applicable WECC and NERC standards are required to obtain such service.
3. BPA Transmission Services is obligated by the Western Electric Coordinating Council's (WECC) standard for contingency reserves to carry reserves for contingencies within its Control Area boundaries.
4. Generators operating in the BPA Control Area that provide power through an interconnected system without a BPA Transmission Services transmission agreement must obtain the Control Area Services of Operating Reserves Services

and supply BPA Transmission Services with a Generation Estimate schedule during the Pre-Schedule time window.

5. Real-time changes to the Generation Estimate schedule should be made during the Real-Time scheduling window. See BPA Transmission Services Scheduling Transmission Service Business Practice.
6. Customers must make arrangements for the provision of Operating Reserves Services to support their transmission transactions. Generators pay for Control Area Services of Operating Reserves when the Operating Reserves Services are not otherwise provided.
7. If the Customer chooses to Self-Supply or third-party supply its Operating Reserves Services, the resource(s) supplying such services must respond to automated signals sent from BPA's Control Area calling upon the resource(s), and an observable response must occur.
8. A Third Party Supplier may provide Operating Reserves Services to more than one Customer. Such supplier must provide the aggregate total requirement of all its Customers for every hour of the year.
9. Plant operators with generation operating in the BPAT Control Area must notify BPA Transmission Services' generation dispatcher (dispatcher) of any contingencies due to equipment problems that result~~s~~ in partial or total reduction of the generator's scheduled energy delivery for the hour, within four minutes of the occurrence of the contingency Qualifying E~~e~~vent. The notification provisions coincide with the Northwest Power Pool (NWPP) Reserve Sharing Procedures (RSP).
   a. The plant operator shall provide the following minimum information to the dispatcher:

      i. The name of the plant
      ii. What resources(s) is/are suffering a contingency, unit number or name
      iii. The time of the contingency
      iv. The reason for the contingency
      v. The amount of reserves required (in MW) reflecting the actual amount of generation lost. See Appendix B below to determine the amount of generation lost
      vi. How long the reserves are required (up to the remainder of the current hour and including the next hour if the event occurs after HH:30)
      vii. Other information as may be requested by the dispatcher

   b. A plant operator requesting reserves for a Qualifying Event will receive reserves from BPA for the remainder of the current hour the Qualifying Event occurs in and for the next hour if the Qualifying Event occurs after HH:30. Reserves can not be requested again for the same Qualifying Event. Wind generators requesting reserves for a hi-speed cutout event can not request reserves again within two hours from the start of the hi-speed cutout event.
10. Prior approval for alternative methods of notification, other than by plant operators, may be granted by the dispatcher only after a site visit.
11. If a dispatcher is unable to perform its reliability duties for an approved alternative, BPA Transmission Services may revoke the method of notification.

12. If a plant operator does not report a contingency within the specified time, the dispatcher may deliver the contingency energy at its discretion. Generation Imbalance or Energy Imbalance charges may apply.

B. Spinning and Supplemental Services

1. A Customer's Operating Reserve Requirement for Spinning and Supplemental Services for all of its agreements with BPA Transmission Services must be supplied by one of the following alternatives:
   a. Purchase from BPA Transmission Services
   b. Self-Supply
   c. Third Party Supply
2. A Customer must have the same Supplier for all agreements with BPA Transmission Services. However, the Supplier does not have to necessarily use the same resource to supply the reserves for all agreements. A supplier may provide either Spinning or Supplemental Reserve, or both.
3. Selection of an Operating Reserves Supplier
   a. At the time a Customer makes its initial request for transmission service with BPA Transmission Services, it must indicate its provider for Operating Reserves Services.
   b. BPA Transmission Services is the default provider under any of the following conditions:

      i. No election was made by the Customer
      ii. The designated Supplier fails to perform to its obligation
      iii. The supply arrangements the Customer has made are not comparable to purchasing Operating Reserve Services from the BPA Transmission Services
      iv. The designated Supplier or BPA Transmission Services have not completed implementing and testing the necessary interfaces, systems, or software required in order to comply with this Business Practice by the start of the ensuing FY (FY) (October through September).
   c. For the two-year election period beginning at the start of the next Rate Period, a Customer desiring to change its Operating Reserve Service provider must make its two-year election in writing or by email to BPA Transmission Services no later than May 1 prior to the start of the next Rate Period, and stating whether the customer intends to: (i) obtain Operating Reserve Services from a Third Party; (ii) self-supply Operating Reserve Services; or (iii) cease self-supply or third party supply of Operating Reserve Services and designate BPA Transmission Services as the Operating Reserve Services provider.

      i. If the Customer does not intend to change its Operating Reserve Service provider, no action is required.
      ii. If the Customer chooses BPA Transmission Services as their Operating Reserve provider for two-year election period, the Customer may not change their Operating Reserve provider until the following two-year election period, when Customers will be able to select their Operating Reserve provider for the two-year period commencing at the beginning of the subsequent Rate Period.

iii. A Customer that self-supplies or third party supplies may change their non-BPA Transmission Services 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.

iv. If the Customer elects to change its Operating Reserve provider from BPA Transmission Services, BPA Transmission Services 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 Reserve services from BPA Transmission Services.

v. For Customers that elect self-supply or third party supply of Operating Reserve Services, if the Customer elects to change its non-BPA Transmission Services provider in accordance with d.ii below, BPA Transmission Services will notify the Customer no later than September 1 of the FY in which they Customer's election is made whether the proposed supply arrangements are comparable to purchasing Operating Reserve Services from BPA Transmission Services.

vi. BPA Transmission Services will provide the Customer with an approximate date in which BPA Transmission Services will implement the Operating Reserves Services. See d below.

vii. If conditions change such that the Customer is no longer able to Self-Supply or Third-Party Supply Operating Reserves, or if a Supplier is no longer eligible pursuant to the Eligibility Criteria for Suppliers section below, BPA Transmission Services will notify the Customer that BPA Transmission Services will be the default provider for the time remaining in the election period.

d. The Customer is responsible for the costs associated with the placement of the required communications and control equipment and systems.

i. If the provisions for Dynamic Schedules of the resource by BPA Transmission Services do not exist, the infrastructure may take more than a year to put in place.

ii. BPA Transmission Services must approve the Customer's provision plans to assure that North America Electric Reliability Council (NERC) and the WECC reliability requirements can be met when the plan is implemented.

4. The Customer may use a resource in another control area to supply Operating Reserves Services provided that the resource's deployment signal is automated and that BPA Transmission Services can observe a distinct measurable response.
5. The generator having the contingency is responsible for the costs associated with the energy delivered from Operating Reserves Services on behalf of resources inside of the BPA Control Area, consistent with the applicable ACS Rate Schedule.
6. BPA Transmission Services will determine the amount of energy delivered when Operating Reserves Services is called upon using one of the following methods:
   a. Using the MWh meter readings from the resource declaring the contingency as given to BPA Transmission Services at the end of the hour, or by direct telemetry, and subtracting that amount from the scheduled amount of energy delivery (Scheduled Generation used for Generation Imbalance Service) for the hour;

b. Station Control Error (SCE) if the generation has a variable schedule and BPA Transmission Services determines the MWh contingency energy by continuously integrating the telemetered actual generation minus the variable schedule;
c. If the MWh meter reading is not available, BPA Transmission Services will calculate the energy delivered using the generation capacity lost each hour multiplied by the number of minutes remaining in the hour divided by 60;
d. The Operating Reserves energy delivery is the difference between the Scheduled Generation for the hour and the energy produced by the resource that had the contingency;

    i. 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;
    ii. If the energy supplied by the Supplier's resources in response to BPA Transmission Services' request is greater than the amount needed for the contingency, the resource declaring the contingency will be charged for this energy.

e. Settlement covers reserve energy delivery for the remainder of the current hour; and includes the next hour if the event occurs after 30 minutes into the current hour.
f. BPA Transmission Services will determine how much energy each Supplier delivered and the settlement obligation of the generator experiencing the contingency event.
g. The settlement will be a bill to the generator receiving reserve energy and a credit to each Supplier of reserve energy. Monetary settlement for the energy delivered will be based on the energy index price. One or more indices will be posted on the OASIS specifying the season or month each index will be used.
h. The Energy Return Option will be suspended for the following reasons:

    i. Applying the Operating Reserve Requirement to small schedules will result in numerous return obligations of less than one MW. Current practice does not allow scheduling energy of less than one MW.
    ii. The methodology for determining the return obligation and notifying the generator of return hours and amounts is not available.

7. BPA Transmission Services follows the NWPP RSP for energy settlement of exchanges outside of BPA's Control Area. This document is available at the following web address: http://www.nwpp.org/.
8. The most recent NWPP RSP settles all transactions for reserve deliveries financially. BPA Transmission Services will use the market index described in the NWPP Procedures.

C. Eligibility Criteria for Suppliers

1. The amount of capacity that the Supplier must deliver for Operating Reserves Services is the Spinning Reserve requirement, the Supplemental Reserve requirement, or both, depending on whether the supplier has elected to supply Spinning Reserve, Supplemental Reserve, or both, respectively.
2. NOTE: The ability to self-supply from Slice will not be available beginning October 1, 2011 due to changes in the Slice product.

3. The supply of Operating Reserves Services requires BPA Transmission Services' Dittmer Control Center (DCC) and Munro Control Center (MCC) to communicate with the Supplier's Energy Management System (EMS) for deployment of reserves.
4. The Supplier's EMS must be staffed 24 hours a day, 7 days a week to assure dispatch contact is available.
5. The Supplier will pay all installation costs incurred by BPA Transmission Services for telemetry and monitoring. Costs will include labor, software for AGC, communication, as well as upgrade of both the Customer and BPA Transmission Services facilities.
6. The Supplier will be responsible for the ongoing maintenance costs of its equipment.
7. The Supplier must have deliveries from resources or to loads in the BPA Control Area that provide an ~~equal~~annual average obligation equal to or exceeding ~~150~~ 8 annual aMW so that BPA Transmission Services is able to measure and verify the Supplier's response. This requirement assures that reserve deployment, which is based on the Allocation Ratio of BPA's Control Area requirements, results in whole megawatt dispatch orders being sent to Suppliers when reserve energy is called upon. It is common for reserve energy requirements to be a fraction of the total reserve requirement. For instance, a 10% reserve energy requirement is deployed when a contingency of 10% of the total reserve requirement occurs.
   a. When submitting a request to supply Operating Reserves Services the Supplier must provide a demonstration that it will have schedules that will result in an obligation of at least ~~150~~ 8 aMW ~~of deliveries~~. The demonstration may be based on long-term contracts, reasonably expected short-term use, or a combination of both.
   b. To continue to supply Operating Reserves Services, the Supplier must have an obligation of ~~150~~ 8 ~~aMW~~ aMW~~of deliveries~~ ~~during~~during the FY. BPA Transmission Services will periodically check the Supplier's deliveries.
   c. If the Supplier's ~~use~~ average obligation is not at least ~~150~~ 8 aMW for the nine month period October 1 to June 30 in any FY during the two-year election period, it will not be allowed to supply for the remainder of the two-year election period.
8. The Supplier must comply with applicable WECC or NERC (or successor organizations) standards except where the WECC standards are in conflict with local regulatory requirements. The applicable WECC or NERC (or successor organizations) standards include but are not limited to the following:
   a. ~~WECC~~ NERC Standard BAL-002-WECC-2 - Contingency Reserves or its successor
   b. NERC BAL-002-~~1~~ 2 or its successor
9. BPA Transmission Services may require the Supplier to provide copies of its filings with WECC, if any.
10. The Supplier must have an executed operating agreement with BPA Transmission Services prior to becoming a Supplier.
11. The Supplier who is providing reserves for a third party Customer must have a written agreement between BPA Transmission Services, the third party Customer, and itself.
12. If a Supplier receives six strikes during a single FY in a Customer's two-year election period because of the Supplier's failure to provide BPA Transmission

Services the amount of capacity or energy needed to meet the Supplier's Operating Reserve Requirement for any hour, the Supplier's ability to supply Operating Reserve Services will be suspended for the remainder of the two-year election period.

13. The following examples constitutes a strike:
    a. One strike: the Supplier failed to provide its capacity requirement to BPA Transmission Services for one hour in a given day, the Supplier failed to deliver and /or sustain the capacity requirement to BPA Transmission Services when a contingency response or test signal was requested, or the Supplier failed to comply with the performance standards.
    b. Three strikes: the Supplier failed to provide its capacity requirement to BPA Transmission Services for three different hours in a given day.
14. BPA Transmission Services will notify the Supplier of a strike by letter, email, or phone call.
15. The Supplier will be notified in writing of the effective date of the suspension of its right to supply Operating Reserves Services.
16. The Operating Reserve Requirement that a Supplier must provide is based on the sum of the Supplier's hourly transmission schedules from generators, or to load in BPA's Control Area, plus the hourly requirements service from BPA's generators, plus the on-line internal generation (behind the Customer's meter) in the BPA Control Area.
17. Each Supplier of Operating Reserves shall carry its proportionate share of the Operating Reserve Requirement.
18. The Supplier's Operating Reserve Requirement divided by the BPA Control Area's Operating Reserve Requirement, as defined by WECC and NERC, is the Supplier's Allocation Ratio.
19. Present BPA Transmission Services Operating Reserve Requirements are identified in the ~~WECC~~ NERC standard BAL-002-WECC-2 or its successor. The current standard is "the hourly amount of contingency Reserve equal to the sum of three percent of hourly integrated Load plus three percent of hourly integrated generation."
20. This Allocation Ratio is multiplied by the BPA Control Area's energy deployment for the contingency event to establish the Supplier's reserve energy delivery for each hour.
21. Resources or loads in the BPA Control Area that are delivering or receiving firm power but do not have all the necessary Operating Reserve Requirement provided by BPA Transmission Services' Ancillary Services will supply Operating Reserves as Control Area Services.
22. If the Supplier providing the Operating Reserves Services is: 1) a member of the NWPP and 2) a participant in the Reserve Sharing Group (RSG), then settlement procedures for reserve deliveries required under the RSG agreement will follow that agreement.
23. If the Supplier is not a member of the RSG, then BPA Transmission Services will administer the Supplier's contribution and its obligation to Reserve Sharing as billing credits or debits.
24. Supply of Operating Reserves Services outside of BPA's one Control Area concept as described in 16-19 above requires the Supplier to request an exemption from BPA Transmission Services.
25. To independently supply Operating Reserves Services for only the Supplier's contingency events, the Supplier must provide reserves for the full amount of its

prospective resource loss and meet the requirements listed below. In all cases, no residual obligation shall be placed on the BPA Control Area.

a. Submit a written request to the Transmission Account Executive expressing its desire to independently supply Operating Reserves Services
b. Provide physical evidence, which may include metering, that demonstrates total independence from BPA Transmission Services support
c. Install equipment necessary for BPA Transmission Services to determine if the estimated schedules for resources and deliveries to loads stayed within the net schedules submitted to BPA Transmission Services

26. BPA Transmission Services will provide a written response to the Customer no later than 60 days after receipt of a written request to independently supply Operating Reserves Services.
27. The following are examples of when the Supplier may request an exemption be made to supply Operating Reserves Services outside the one Control Area concept:
    a. A Supplier that trips load greater than or equal to the resource loss; or
    b. The load and resource are part of an integrated process where load and generation directly track each other.
    c. Interruptible Exports such that the receiving system provides Operating Reserves Services for 100% of the transmission schedule. Prior to implementation, BPA Transmission Services must approve fully automated systems and detailed design considerations.
28. The Operating Reserve Requirement must be available at all times; fully delivered within 10-minutes after BPA Transmission Services sends a signal for Operating Reserves; and sustained for the remainder of the current hour and including the next hour if the event occurs after HH:30 unless otherwise requested by BPA Transmission Services.
29. BPA Transmission Services will perform unannounced capability tests to assure that capacity is fully available within 10-minutes.
    a. BPA Transmission Services will work with the Supplier, when necessary, to establish acceptable time frames when the Supplier's system cannot accept energy.
    b. The capacity test(s) will net to zero integrated MWs within the current minimum schedule granularity unless a real time disturbance occurs which will require the integrated MW to be zeroed out in the next hour. This includes a signal to the Supplier's system.
30. If the Supplier fails the capability test, a strike is assessed.
31. If the strike is due to the Supplier not carrying the full amount of its Operating Reserve Requirement, BPA Transmission Services will pass on to the Supplier, and the Supplier or Customer shall be obligated to pay any penalties BPA Transmission Services may incur due to violation of WECC or NERC standards.
32. If the strike is due to the Supplier's failure to fully meet its Operating Reserve Deployment requirement, BPA Transmission Services will pass on to the Supplier, and the Supplier or Customer shall be obligated to comply with, any penalties imposed under NERC Distribution Control Standards.
33. The Supplier shall be required to demonstrate that it has adequate, firm, transmission available to deliver the reserves to BPA Transmission Services across posted Network Flowgates or External Interconnections. If the Supplier does not have firm transmission available to deliver its reserves obligation, it will be assessed a strike for each hour it can not do so.

34. If transmission is not available, the Supplier must arrange an alternative delivery to BPA Transmission Services. These alternatives include the following:
    a. Carrying reserves on resources not affected by the posted constrained path
    b. Using transmission capability from the Supplier's existing rights
    c. Acquiring transmission rights
35. The BPA Transmission Services ATC Methodology can be found on BPA Transmission Services' public web site at http://www.transmission.bpa.gov/business/atc_methodology/

D. Communication to BPA Control Centers

1. Deployment of the Supplier's resources must be accomplished using automated response to electronic signals from BPA Transmission Services.
    a. The resource(s) may be system rather than individual resources.
    b. System resources require independent response verification information.
2. The Supplier shall exchange real-time data with BPA Transmission Services using the ICCP data link between BPA's two control centers, DCC and MCC, and the Supplier's EMS (or resource).
3. The Supplier shall exchange other types of data, such as schedules, generation estimates, meter readings, etc., with BPA Transmission Services using the WECC Electronic Industrial Data Exchange (EIDE) protocol or Customer Data Entry (CDE).
4. Real-time data exchange shall conform to WECC standards for inter-utility data exchange, including availability, bandwidth, security, and reliability.
5. Real-time data exchange and control signals must have a periodicity of 10 seconds or less.
6. The Supplier shall provide the following data to BPA Transmission Services for its resources internal to the BPA Control Area:
    a. Instantaneous net hydro generation. This information determines the hydro portion for establishing deployment of Operating Reserves.
    b. Instantaneous non-hydro generation. This information determines the thermal portion for establishing deployment of Operating Reserves.
    c. Generation Estimates of scheduled generation for each Supplier's resource (or system) for the current hour and the next hour, plus the instantaneous Generation Estimates for the Supplier's resource (or system).
    d. The maximum, minimum, and spinning capability available within the NERC defined Disturbance Recovery Time Period refreshed (updated) every five minutes. Operating Reserves shall be held available at all times until a contingency occurs.
    e. The Participation Factors of each resource that the Supplier wishes to have deployed when reserves are called upon in order to distribute the response to multiple resources. The total of all Participation Factors equals 100% (1.00 per unit from definition). BPA Transmission Services must know where reserve supplies are coming from. A zero Participation Factor means the resource is not available for operating reserves deployment.
    f. The actual instantaneous generation, in MW, of each resource that is providing reserves.
    g. Status of the Supplier's EMS or equivalent, if a load. (An EMS that is out of service usually means the supply cannot be provided so BPA Transmission

Services will automatically default to BPAP for additional Operating Reserves.)

7. A Supplier providing system responses shall provide the following data to BPA Transmission Services:
   a. Dynamic Schedule of its response to the BPA Transmission Services Operating reserve deployment
   b. Net interchange deviation
   c. System error signal, (for control areas, this is the Area Control Error (ACE))
   d. The status of the Supplier's EMS

E. Communication to the Supplier

1. BPA Transmission Services will determine the Supplier's Operating Reserve Requirement for the current hour and an estimate for the next hour.
2. The Operating Reserve Requirement will be used to calculate the Supplier's Allocation Ratio and will change as transmission schedules are changed or generation amounts vary (may vary within the hour).
3. In the event of a contingency, the megawatt amount of reserve energy the Supplier must deliver will be sent from BPA Transmission Services over a data link to the Supplier's resources or through the Supplier's control center. If the resource is outside of the BPA Control Area the megawatt amount of reserve energy that the Supplier must deliver will be sent from BPA Transmission Services to the Supplier's control center.
4. BPA Transmission Services will send a signal to the Supplier representing the Plant Request or Setpoint for the remainder of the current hour and including the next hour if the event occurs after HH:30 (or up to 65 minutes for a NWPP Reserve Sharing event). The Supplier will use the Plant Request or Setpoint to deliver Operating Reserves Services as follows:
   a. Plant Request or Setpoint = Basepoint + (Transmission Services deployment requirement (or MW loss)) * (Transmission Services normalized Participation Factor)* (Operating Reserves Allocation Ratio); or
   b. A Dynamic Schedule for the Supplier's system resources. Dynamic Schedule = (Transmission Services deployment requirement (MW loss))*(Operating Reserves Allocation Ratio).
   c. A verification status flag confirming that the new Setpoint represents a valid operating reserve delivery request. The Setpoint is limited to the Basepoint plus the Supplier's requirement.
5. During non-contingency conditions, BPA Transmission Services will send to the Supplier a Setpoint request signal with the BPA Transmission Services deployment requirement equal to zero except when testing.
6. The Supplier 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 Supplier Recovery Error equals Actual Generation in MW, minus the Setpoint in MW, measured over the Disturbance Recovery Time Period.
   b. The Supplier Recovery Error, in MW, will be recorded accurate to 1/10 MW. If the performance does not reach 100% Plant Compliance factor, then it will be counted as strike.

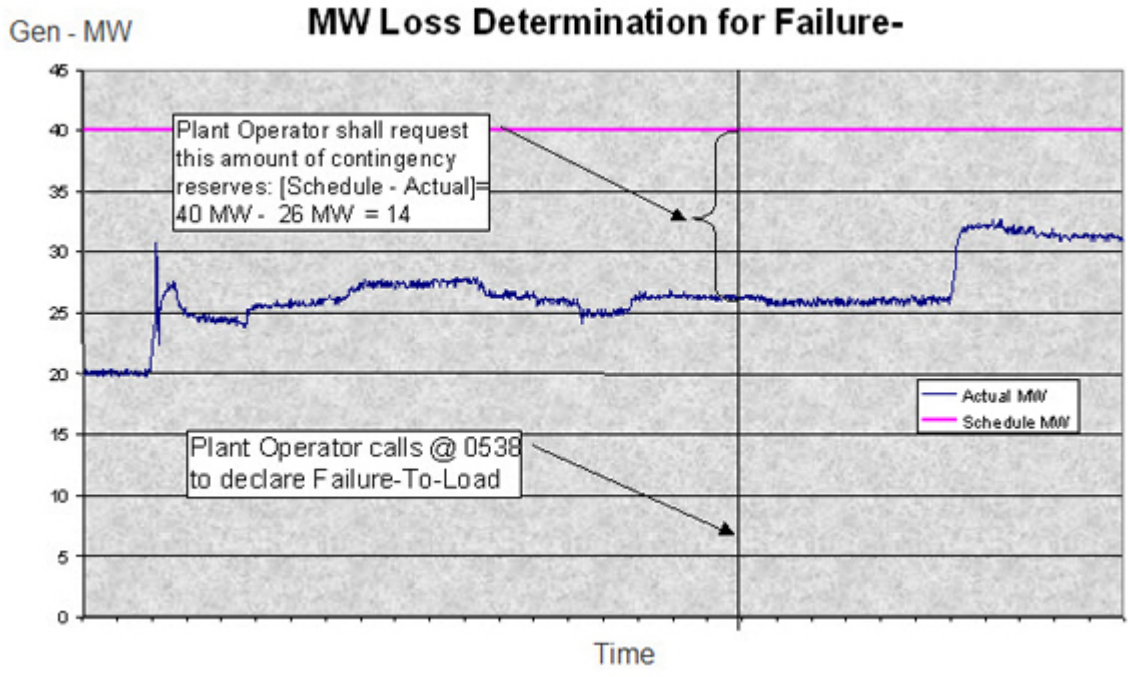
      i. For 0<t<10 min.

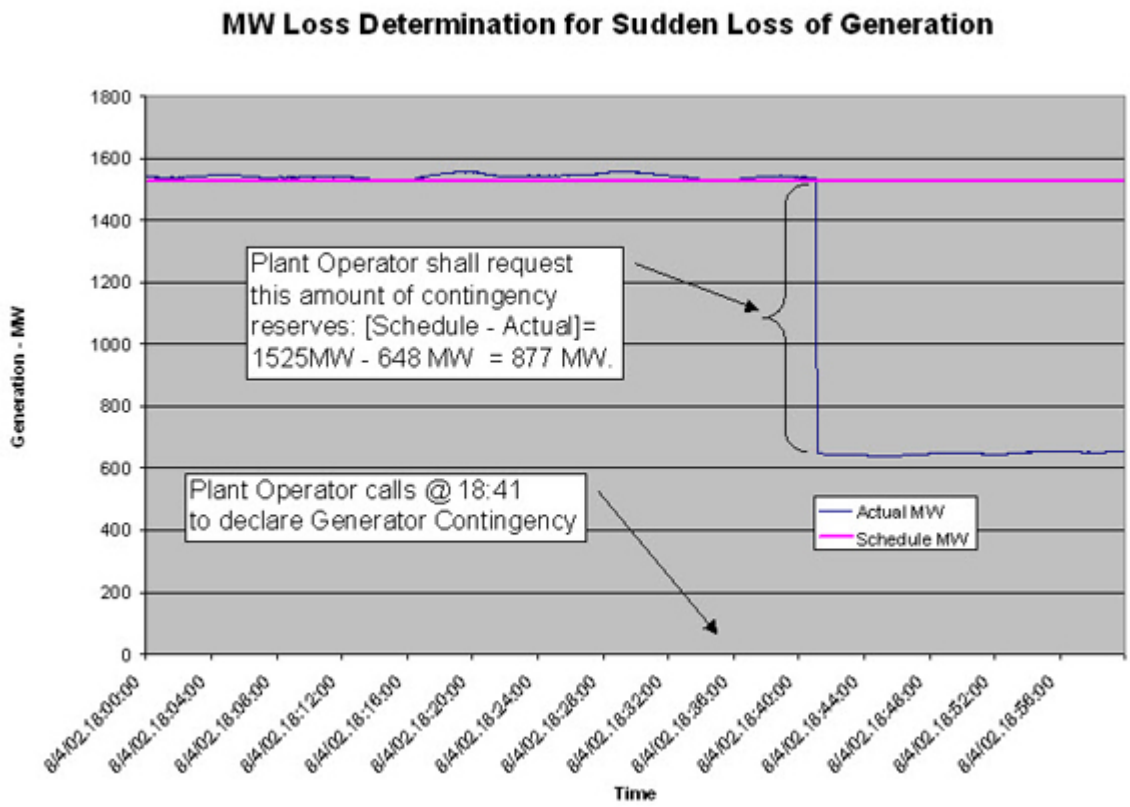
ii. Plant Compliance Factor (i) = [MW loss - max {0, or precontingency Supplier Recovery Error (i) - maximum Supplier Recovery Error (i)}/ MW loss] * 100%.
iii. Where (i) represents each resource beginning with the first resource continuing through n resources.
iv. Where (n) is the total number of resources the Supplier is using.

c. The Load Recovery Error, in MW, equals:
   i. The scheduled load minus abs (dynamic schedule) minus actual load, if the customer is receiving a dynamic schedule, or;
   ii. The load setpoint minus actual load of plant if the customer is receiving the plant setpoint.

7. For circumstances where system resources are used, the ACE and Net Interchange Deviation will be used as the Supplier Recovery Error.
8. BPA Transmission Services will notify each Supplier of the MWh of reserve energy, and any additional information that both parties agree to, it delivered for each hour of contingency either through the EIDE or the CDE.
   a. The notification will occur shortly after the conclusion of the hour of the contingency.
   b. BPA Transmission Services will coordinate the energy settlement for reserve energy deliveries among appropriate Suppliers.

F. Operating Reserves - Determination of MW Loss





G.Energy Indices

The energy index for energy settlement for Operating Reserves for both Spinning and Supplemental Reserves is the PowerDex Mid-Columbia Hourly Energy Index. For NWPP Reserve Sharing transactions the energy index described in the NWPP procedures will be used.