



December 9, 2015

Mr. Will Rosquist
Montana Public Service Commission
1701 Prospect Ave.
P. O. Box 202601
Helena MT 59620-2601

RE: Docket D2015.8.64 – Greycliff Petition
PSC Set 2 Data Requests (012-029)

Dear Mr. Rosquist:

Enclosed for filing is one copy of NorthWestern Energy's responses to the PSC Set 2 Data Requests (012-029).

The responses will be hand delivered to the PSC and MCC, e-filed with the PSC, emailed to counsel of record and mailed to the service list.

If you have any questions, please call Joe Schwartzberger at (406) 497-3362.

Sincerely,

Pam LeProwse
Administrative Assistant
Regulatory Affairs

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of NorthWestern Energy's responses to PSC Set 2 Data Requests (012-029) in Docket No. D2015.8.64 has been hand delivered to the Montana Public Service Commission and the Montana Consumer Counsel this date. It has also been e-filed on the PSC website, emailed to counsel of record, and mailed to the remainder of the service list as follows:

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Date: December 9, 2015



Pam LeProwse
Administrative Assistant
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NorthWestern Energy
Docket No. D2015.8.64
Greycliff's Petition to Set Terms and Conditions

Public Service Commission (PSC)
Set 2 (012-029)

Data Requests received November 25, 2015

PSC-013 RE: Mid-C Prices
 Witness: LaFave, parts a, b / Hansen, part c

- a. With reference to Exhibit__(BJL-1), for the full year 2014 and the YTD 2015, please provide the published Intercontinental Exchange (ICE) Mid-C index price for Heavy Load Hours and Light Load Hours on as granular a time-step (e.g., hourly) as possible.
- b. With reference to Exhibit__(BJL-1), for the full year 2014 and the YTD 2015, please provide the published Powerdex Hourly Mid-C price for Heavy Load Hours and Light Load Hours on as granular a time-step (e.g. hourly) as possible.
- c. With reference to Table 1, LPH-7, please provide both the primary source documents that support the averages presented as well as the electronic files used to present the numerical inputs and calculate the averages presented.

RESPONSE:

- a. See the response to Data Request GWP-001.
- b. See the response to Data Request GWP-001.
- c. See the "PSC-013c" folder on the copyright-protected CD attached to Data Request PSC-012a. NorthWestern is relying on the "fair use" exemption of federal copyright law to provide this information for purposes of this docket only. No copies should be made, nor should the parties receiving this information use the copyrighted material for any purposes other than for this docket.

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Docket No. D2015.8.64
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Public Service Commission (PSC)
Set 2 (012-029)

Data Requests received November 25, 2015

PSC-014 RE: Valuing Intermittency
 Witness: LaFave

At 8:17-9:4 you describe the valuation of intermittency as the difference between day-ahead firm and real-time prices.

- a. Please provide a theoretical justification of this model, including its mathematical derivation, if available.
- b. Please provide references to support this model, if available.
- c. Please identify the market(s) you are referring to at 8:17-21. If it is not an organized market such as an RTO, please explain how it differs.
- d. Please identify the counterparties who “value” the non-dispatchable resource as you describe at 8:17-21, and explain whether they all necessarily participate in the market(s) identified in response to subpart (b).

RESPONSE:

- a. Power from a wind facility is delivered to the system when the wind blows. Wind does not usually blow consistently in any given hour/minute. Wind facilities cannot deliver a specific amount of energy at a certain time the next day.

Day-ahead commitments in any market require the generator to produce a specific amount of energy at a specific time for the next day. If more or less energy is produced, the variation is either made up to cover a shortfall or sold with excess delivery at real-time market rates and in certain cases at additional cost. The real time market pricing provides pricing when the power is delivered.

- b. None.
- c. The term “market” in that part of my testimony refers to transactions currently conducted by NorthWestern Energy for Montana customers.
- d. Counterparties are not valuing the non-dispatchable resource. As described in the testimony, the “value” is the real time price that is reflected when the energy is delivered.

NorthWestern Corporation, NorthWestern Corporation
Filing Category: Compliance
FERC Docket: ER14-02546-000
FERC Order: Delegated Letter Order
Effective Date: 10/01/2014
Schedule 5, Operating Reserve - Spinning Reserve Service, 1.0.0

Filing Date: 07/31/2014
FERC Action: Accept
Order Date: 09/19/2014
Status: Accepted

SCHEDULE 5

Operating Reserve - Spinning Reserve Service

Spinning Reserve Service is needed to serve load immediately in the event of a system contingency. Spinning Reserve Service may be provided by generating units that are on-line and loaded at less than maximum output and by non-generation resources capable of providing this service. The Transmission Provider must offer this service when the transmission service is used to serve load within its Control Area. Transmission Provider is not obligated to provide operating reserve service under Schedule 5 to load and/or generation when the transmission service is used to serve load located outside of the Transmission Provider's Control Area. The Transmission Customer must either purchase this service from the Transmission Provider or make alternative comparable arrangements to satisfy its Spinning Reserve Service obligation. To the extent the Control Area operator performs this service for the Transmission Provider, charges to the Transmission Customer are to reflect only a pass-through of the costs charged to the Transmission Provider by that Control Area operator.

The Transmission Provider shall not be obligated to acquire products to provide this service in connection with transmission service used to serve load within Transmission Provider's control area in advance of a Transmission Customer request for such service. Existing (as of February 15, 2008) Transmission Customers' service agreements indicate whether the Transmission Customer has made alternative comparable arrangements to satisfy operating reserves obligations. If alternative arrangements have been made, Transmission Provider shall not be obligated to provide such Transmission Customer with operating reserve service until the terms of the transmission service agreement have been modified. If Transmission Provider receives a request to modify the comparable arrangement provisions of a service agreement, Transmission Provider and the Transmission Customer will negotiate in good faith to modify the terms of the service agreement. Upon receiving a request for this service from either a new Transmission Customer or an existing Transmission Customer (after agreement has been reached to modify the transmission service agreement), Transmission Provider will solicit offers for the products needed to provide this service, unless the request involves a term for which Transmission Provider can provide the service through purchases under an existing power purchase agreement, such as the Western Systems Power Pool Agreement. The individual Transmission Customer(s), for whom the products needed to provide this service have been procured, shall bear the costs of such service. Transmission Customers with alternate comparable arrangements will not be responsible for the costs incurred to provide this service requested by one or more customers. Transmission Provider shall not post on its OASIS any agreement (or summary of terms) for products needed to provide this service.

Transmission Provider will maintain, for a minimum period of three years, a complete and accurate record of all capacity and energy purchases made to provide this ancillary service.

For a Transmission Customer's load and/or generation located in the Transmission Provider's Control Area, the Transmission Customer's Operating Reserve Requirement shall be determined in accordance with applicable WECC and Northwest Power Pool (NWPP) guidelines. Currently, these guidelines require minimum operating reserves equal to the sum of (i) three percent (3%) of the hourly integrated generation (serving load or selling off-system) and (ii) three percent (3%) of the Transmission Customer's hourly integrated load. The Transmission Customer's Spinning Reserve Requirement (Schedule 5) and Supplemental Reserve Requirement (Schedule 6) shall also be determined in accordance with the applicable WECC and NWPP guidelines. Currently, these guidelines require minimum spinning reserves (Schedule 5) equal to fifty percent (50%) of the minimum operating reserve requirement. The balance of the minimum operating reserve requirement may be met by supplemental reserves (Schedule 6).

For Operating Reserve Service provided by the Transmission Provider for load and/or generation located outside the Transmission Provider's Control Area, the Transmission Customer's Spinning Reserve Requirement and Supplemental Reserve Requirement shall be specified in the Service Agreement. However, Transmission Provider is not obligated to provide such service.

No energy imbalance charge will be imposed as a result of a Transmission Customer's use of Spinning Reserve Service.

If the WECC or NWPP revise the Operating Reserve guidelines such that the Spinning Reserve Requirement changes, the Transmission Provider shall file a revised Schedule 5 with the Commission depicting the appropriate Spinning Reserve Requirement.

NorthWestern Corporation, NorthWestern Corporation
Filing Category: Compliance
FERC Docket: ER14-02546-000
FERC Order: Delegated Letter Order
Effective Date: 10/01/2014
Schedule 6, Operating Reserve - Supplemental Reserve Service, 1.0.0

Filing Date: 07/31/2014
FERC Action: Accept
Order Date: 09/19/2014
Status: Accepted

SCHEDULE 6

Operating Reserve - Supplemental Reserve Service

Supplemental Reserve Service is needed to serve load in the event of a system contingency; however, it is not available immediately to serve load but rather within a short period of time. Supplemental Reserve Service may be provided by generating units that are on-line but unloaded, by quick-start generation or by interruptible load or other non-generation resources capable of providing this service. The Transmission Provider must offer this service when the transmission service is used to serve load within its Control Area. Transmission Provider is not obligated to provide operating reserve service under Schedule 6 to load and/or generation when the transmission service is used to serve load located outside of the Transmission Provider's Control Area.

The Transmission Customer must either purchase this service from the Transmission Provider or make alternative comparable arrangements to satisfy its Supplemental Reserve Service obligation. To the extent the Control Area operator performs this service for the Transmission Provider, charges to the Transmission Customer are to reflect only a pass-through of the costs charged to the Transmission Provider by that Control Area operator.

The Transmission Provider shall not be obligated to acquire products to provide this service in connection with transmission service used to serve load within Transmission Provider's control area in advance of a Transmission Customer request for such service. Existing (as of February 15, 2008) Transmission Customers' service agreements indicate whether the Transmission Customer has made alternative comparable arrangements to satisfy operating reserves obligations. If alternative arrangements have been made, Transmission Provider shall not be obligated to provide such Transmission Customer with operating reserve service until the terms of the transmission service agreement have been modified. If Transmission Provider receives a request to modify the comparable arrangement provisions of a service agreement, Transmission Provider and the Transmission Customer will negotiate in good faith to modify the terms of the service agreement. Upon receiving a request for this service from either a new Transmission Customer or an existing Transmission Customer (after agreement has been reached to modify the transmission service agreement), Transmission Provider will solicit offers for the products needed to provide this service, unless the request involves a term for which Transmission Provider can provide the service through purchases under an existing power purchase agreement, such as the Western Systems Power Pool Agreement. The individual Transmission Customer(s), for whom the products needed to provide this service have been procured, shall bear the costs of such service. Transmission Customers with alternate comparable arrangements will not be responsible for the costs incurred to provide this service requested by one or more customers.

Transmission Provider shall not post on its OASIS any agreement (or summary of terms) for products needed to provide this service.

Transmission Provider will maintain, for a minimum period of three years, a complete and accurate record of all capacity and energy purchases made to provide this ancillary service.

For a Transmission Customer's load and/or generation located in the Transmission Provider's Control Area, the Transmission Customer's Operating Reserve Requirement shall be determined in accordance with applicable WECC and Northwest Power Pool (NWPP) guidelines. Currently, these guidelines require minimum operating reserves equal to the sum of (i) three percent (3%) of the hourly integrated generation (serving load or selling off-system) and (ii) three percent (3%) of the Transmission Customer's hourly integrated load. The Transmission Customer's Spinning Reserve Requirement (Schedule 5) and Supplemental Reserve Requirement (Schedule 6) shall also be determined in accordance with the applicable WECC and NWPP guidelines. Currently, these guidelines require minimum spinning reserves (Schedule 5) equal to fifty percent (50%) of the minimum operating reserve requirement. The balance of the minimum operating reserve requirement may be met by supplemental reserves (Schedule 6).

For Operating Reserve Service provided by the Transmission Provider for load and/or generation located outside the Transmission Provider's Control Area, the Transmission Customer's Spinning Reserve Requirement and Supplemental Reserve Requirement shall be specified in the Service Agreement. However, the Transmission Provider is not obligated to provide such service.

No energy imbalance charge will be imposed as a result of a Transmission Customer's use of Supplemental Reserve Service.

If the WECC or NWPP revise the Operating Reserve guidelines such that the Supplemental Reserve Requirement changes, the Transmission Provider shall file a revised Schedule 6 with the Commission depicting the appropriate Supplemental Reserve Requirement.

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Greycliff's Petition to Set Terms and Conditions

Public Service Commission (PSC)
Set 2 (012-029)

Data Requests received November 25, 2015

PSC-018 RE: Transmission Upgrade Costs
 Witness: Casey Johnston, parts a-d / LaFave, part c

At 10:18-20 you state that a PPA should reflect that any transmission upgrade costs associated with the project will be paid by Greycliff.

- a. If Greycliff interconnects to NorthWestern's system, please describe the FERC orders or other authorities that will govern the interconnection agreement between NorthWestern and Greycliff, and provide a copy of a standard agreement, if available.
- b. If Greycliff interconnects to NorthWestern's system, will the procurement of network service be the responsibility of NorthWestern Energy Supply, or Greycliff?
- c. Please describe in detail any credits associated with reimbursement of transmission upgrade costs, and how the credits will be distributed between parties.
- d. If NorthWestern customers will ultimately be responsible for upgrade costs, please describe the tariffs and rates through which NorthWestern will recover the costs.

RESPONSE:

- a. The governing orders are FERC Order 2003, FERC Order 2003 A, FERC Order 2003 B and FERC Order 2003 C. Please see the "PSC-018a" folder on the CD attached to Data Request PSC-012a for a copy of a standard interconnection agreement.
- b. NorthWestern Energy Supply is the customer for network service on the NorthWestern Transmission system. NorthWestern Energy Supply needs to be the counter party to the network service agreement because the agreement has to be tied to the network customer load. Greycliff is not a NorthWestern network customer.
- c. Transmission response (Johnston): Greycliff would be responsible for the cost of the transmission upgrades associated with the generation interconnection request.

Greycliff will have the following two options for funding of the upgrades:

1. Greycliff can elect to fund the transmission upgrades up front. Greycliff would be reimbursed for the full cost of the upgrades, plus applicable interest. Greycliff would receive a monthly payment based on actual generation until the full amount of the upgrades has been refunded. The repayment shall not exceed 20 years. Under this

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PSC-018 cont'd

option, the parties (NWE Transmission and Greycliff) have the ability to develop an alternative schedule that is mutually agreeable and provides for the return of all amounts advanced for transmission upgrades.

2. Greycliff can elect to have NorthWestern Energy Supply fund the upgrades up front.

Supply response (LaFave): In order to maintain economic indifference for all NorthWestern customers, Greycliff would ultimately be responsible for the cost of the transmission upgrades for network service, if any, and for the interconnection request associated with the project. Accordingly, the cost of any transmission upgrades should be reflected in the calculation of the PPA rate.

- d. NorthWestern customers will not be responsible for these upgrade costs.

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PSC-019 cont'd

NorthWestern. Under PURPA, avoided costs are costs that can be avoided through service to NorthWestern's customers. Specifically, if the portfolio is long generation but the market price is higher than the generation's variable cost in a certain hour, the avoided cost is calculated using the generation's variable cost. The cost effective calculation would use the market price as a credit to the customers. The main reason for this difference is that PURPA was intended to enable small generators to supply utilities with power for load service; it was not intended to put customers in the position of being a market hedge for a QF contract, placing all of the market risk onto the customers.

- e. The products, services, and attributes would be the same. The difference would be in specific situations, as described in the response to part d above, where the rate is determined not by the costs which are actually avoided, but by the total portfolio value.

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PSC-023 cont'd

modeling that is based on the lesser of market or CU4 variable cost. If the market price is higher than CU4 it will value surplus at market, but if market is less than CU4 surplus is valued at CU4. The highest price variable purchase will be turned down first.

e. Yes.

2015 CO₂ Cost Forecasts

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
\$/Short Ton CO ₂ (Nominal \$)																	
Synapse 2015 High case	29.85	33.21	36.74	36.74	40.45	44.35	48.45	55.32	62.56	70.18	78.21	86.65	95.53	104.87	114.68	124.98	135.80
Pacificorp 2015 IRP (Advisory Group)	22.39	26.20	30.02	30.02	33.83	37.64	41.45	45.27	49.08	52.89	56.71	60.52	64.33	68.14	71.96	75.77	79.58
Synapse 2015 Low case	17.91	19.68	21.54	21.54	23.49	25.53	27.68	29.94	32.31	34.79	37.39	40.12	42.97	45.97	49.10	52.38	55.81
Synapse 2015 Medium case	23.88	26.44	29.14	29.14	31.97	34.94	38.07	41.35	44.79	48.40	52.19	56.16	61.98	68.61	75.31	82.36	89.76
Xcel Energy 2015 IRP (Preferred PF)	21.50	22.15	22.81	23.49	24.20	24.92	25.67	26.44	27.24	28.05	28.89	29.76	30.65	31.57	32.52	33.50	34.50

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PSC-029 RE: Contract Terms
 Witness: LaFave

You state that “[a]lthough this contract is similar to the CREP contract... there have been several changes made to the document...” Other than what you specifically identify in your additional response testimony filed on November 19, 2015, please list, describe and justify all changes in detail. BLJ 19:2-4.

RESPONSE:

Per the email received from the Commission’s Chief Counsel on December 9, 2015, NorthWestern is not required to respond to this question at this time.