White Paper

Scheduling, System Control and Dispatch Rate Design Alternatives

August 22, 2018

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I. Introduction

As part of the Agency Strategy and Transmission Business Model, Bonneville Power Administration (BPA) is reviewing its rates and, where appropriate, looking to better align the rate designs with the function the service provides. Scheduling, System Control and Dispatch (SCD) was identified as a product that could be redesigned according to the Transmission Business Model Strategy. In addition to reviewing the SCD rate as part of the Transmission Business Model Strategy, some customers have asserted BPA's SCD rate is an economic obstacle for generators outside the Balancing Authority (BA) to wheel across BPA's transmission system, as well as for generators inside the BA that export out, creating a "pancake rate." For these reasons, BPA is exploring changes to the SCD rate design.

II. Background

Definition and Description of Scheduling, System Control and Dispatch

Scheduling, System Control and Dispatch service is an Ancillary Service required to schedule the movement of power through, out of, within, or into a Control Area. This service can be provided only by the operator of the Control Area in which the transmission facilities used for transmission service are located. BPA Transmission Customers must purchase this service from BPA.

BPA currently applies a SCD charge for all original transmission reservations and network transmission load. One implication of charging SCD this way is SCD is billed multiple times for transmission reservations on multiple transmission segments. For example, if a customer reserves transmission with the intention of scheduling energy from a resource to the California Oregon Border, that customer would be charged SCD on two reservations, once on the Network segment and once on the Southern Intertie segment.

SCD Cost Breakdown

SCD includes all activities associated with scheduling energy transactions, verifying available transmission capacity for the schedule period, controlling generation to ensure adequate generation to meet firm load and interchange schedules, meeting reliability standards, and evaluating performance adequacy. In 2017, Operations and Maintenance expenses for SCD were approximately $64M and Investments costs totaled approximately $212M. A more detailed cost breakdown can be seen in Tables 1 and 2 below, or found on the BP-20 Meetings and Workshops page under the July 18, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

Table 1: FY2017 Segmented SCD Investments

Segmented SCD Investment 2017													
FERC Code	3531								3912	3913	3970		Grand Total
Sub-FERC Code	3531.101	3531.102	3531.103	3531.104	3531.105	3531.106	3531.107	3531.108	3912.200	3913.200	3970.104	3970.108	
GPLNT Total									33,256,461	28,509,741	583,139	45,958,597	108,307,937
MLEAS-G Total												18,443,322	18,443,322
MLEAS-T Total	2,180,127					2,180,129							4,360,256
TPLNT Total	12,880,948	640,831	75,539	40,497,502	861,659	694,793	19,001,700	6,836,562					81,489,534
Grand Total	**15,061,075**	**640,831**	**75,539**	**40,497,502**	**861,659**	**2,874,922**	**19,001,700**	**6,836,562**	**33,256,461**	**28,509,741**	**583,139**	**64,401,918**	**212,601,049**
Total Investment	212,601,049												
Scheduling Component	40,497,502	FERC Code 3531.104 used for RODS											

Table 2: FY2011-2017 SCD O&M Costs

SCD O&M Costs 2011-2017									
Group	Category	2011	2012	2013	2014	2015	2016	2017	**Average**
SCHEDULING	SCHED-AFTER-THE-FACT	155,899	235,830	236,080	239,530	237,015	273,268	304,828	240,350
	SCHED-MANAGE SPRVISION & ADMIN	(10,948)							(1,564)
	SCHED-PRE-SCHEDULING	240,302	216,005	240,494	327,694	343,973	381,926	210,762	280,165
	SCHED-REAL-TIME SCHEDULING	3,950,070	3,758,396	3,879,142	4,055,506	4,323,358	4,739,134	5,062,256	4,252,552
	SCHED-RESERVATIONS	3,850,292	4,063,568	4,160,436	1,048,994	1,156,291	1,166,624	1,210,775	2,379,569
	SCHED-TECHNICAL SUPPORT	1,226,234	948,115	431,829	3,939,968	3,731,632	3,641,184	3,655,913	2,510,696
Total Scheduling		**9,411,848**	**9,221,913**	**8,947,981**	**9,611,692**	**9,792,268**	**10,202,136**	**10,444,535**	**9,661,768**
SYSTEM OPERATIONS	CONTROL CENTER SUPPORT	14,753,404	13,645,553	14,061,644	19,367,928	20,849,069	23,065,994	23,567,095	18,472,955
	INFORMATION TECHNOLOGY	6,768,154	9,097,766	9,114,520	12,522,118	8,102,648	9,435,780	9,902,553	9,277,648
	POWER SYSTEM DISPATCHING	11,648,816	12,088,991	12,154,914	12,259,798	13,209,406	13,912,852	13,721,727	12,713,786
	TECHNICAL OPERATIONS	4,724,968	3,816,151	4,409,714	5,854,247	6,287,617	7,648,033	6,691,442	5,633,167
Total System Ops		**37,895,340**	**38,648,462**	**39,740,792**	**50,004,092**	**48,448,739**	**54,062,659**	**53,882,817**	**46,097,557**

SCD Cost Recovery and Current SCD Rates

BPA's current SCD rate methodology was established as part of the TR-02 Settlement. The SCD rates apply to both firm and non-firm transmission service arrangements on the Network, Southern Intertie, and Montana.

The calculation of the SCD rate starts with the segmented revenue requirement. This revenue requirement is adjusted by applying revenue credits and other adjustments as described in the Transmission Rate Study and Documentation. The adjusted revenue requirement is allocated to NT, PTP and IR service based on the ratio of the sales forecast for each service to the total forecast average annual sales of NT, PTP and IR. The allocated revenue requirements are divided by the applicable billing factor to determine SCD rates for NT, PTP and IR. A more in depth description of the SCD rate design can be found in the BP-18 Transmission Rates Study and Documentation (BP-18-FS-BPA-08).

The current (BP-18) SCD rates are:

- NT Service: $0.376 per kilowatt per month
- PTP Long-Term Firm: $0.322
- PTP Short Term Firm and Non-Firm:
    - Monthly, Weekly and Daily Firm and Non-Firm Service
        - Days 1-5: $0.015 per kilowatt per day
        - Days 6 and beyond: $0.011 per kilowatt per day
    - Hourly Firm and Non-Firm Service
        - 0.93 mils per kilowatt hour

For Transmission Customers taking Point-to-Point Transmission Service (PTP, IS, and IM rates), the Billing Factor is based on Reserved Capacity, and applies to all PTP transmission service under BPA's OATT regardless of whether the Transmission Customer schedules the transmission. For Transmission Customers taking Network Integration Transmission Service, the Billing Factor is the customer's load on the hour of the Monthly Transmission System Peak Load (TTSL).

Connection to Agency Strategy and Transmission Business Model

As part of the Agency Strategy and Transmission Business Model, BPA is in the process of reviewing its rates and exploring whether its products are priced at the appropriate level for the value of the services provided. In addition to the Agency Strategy and Transmission Business Model, there was an effort to review the Montana Intertie rate, which culminated with the publication of the Montana Renewable Action Plan (Montana Plan).

Industry Scan

BPA reviewed 29 Transmission Providers' Scheduling, System Control and Dispatch Rate designs. Specifically, BPA reviewed their PTP billing determinant, whether they have multiple transmission segments and whether they charge SCD for multiple segments.

Table 3: PTP SCD Billing Determinants Benchmarking

SCD Billing Determinant	Count of Transmission Providese
Count of Schedules	3
N/A	5
Reserved Capacity	20
Schedules	1
Total	**29**

Roughly two thirds of the Transmission Providers BPA reviewed use a reserved capacity billing determinant. Five of the Transmission Providers appear to not have a separate charge for SCD, three use a $/schedule billing determinant for SCD and one bills SCD on scheduled energy.

Table 4: Transmission Providers with Multiple Segments

Transmission Provider	Separate Transmission Rate(s) for use of Specific "Segments"?	Is SCD applied on each "Segment(s)"?
Avista	Yes - Colstrip Direct Assignment rate	N/A
PGE	Yes - Colstrip Direct Assignment rate	Yes
PSE	Yes -COI and Colstrip Direct Assignment rates	Yes
SMUD	Yes -COTP rate and SMUD System rate	Yes
WAPA - Sierra Nevada	Yes - Separate rates for PACI, COTP, CVP transmission	N/A
WAPA - DSW	Yes	No

The majority of the Transmission Providers BPA reviewed do not have distinct transmission segments. Of the Transmission Providers BPA reviewed, seven have distinct transmission rates for different segments of their transmission system. PGE, PSE and SMUD have direct assignment rates for the COI and/or Colstrip line and charge SCD on each reservation when a customer reserves transmission on multiple segments. Avista has a Colstrip direct assignment rate, but does not have any costs identified for SCD. WAPA – Sierra Nevada has different transmission rates for different transmission segments, but BPA was unable to find a SCD rate. WAPA – DSW has different transmission rates for different segments and charges SCD based on a $/tag billing determinant.

Key Findings

- The majority of Transmission Providers charge SCD similarly to BPA's status quo.
- Most Transmission Providers do not have multiple transmission segments; therefore, "pancaking" of SCD costs is not an issue.
- Typically, Transmission Providers that do have distinct transmission rates for different segments charge SCD for each segment. This is how BPA currently charges SCD.

BPA's Rate Principles

BPA developed principles for the SCD rate design analysis which were used to evaluate the rate proposals. Those principles are the following:

Set rates consistent with ratemaking principles

a. Cost causation
b. Full and timely cost recovery
c. Simplicity, understandability, public acceptance and feasibility of application
d. Avoidance of rate shock
e. Rate stability from rate period to rate period
f. Equitable cost allocation between Federal and non-Federal uses of the transmission system

Initial Customer Reactions to Proposed SCD Rate Change

During the BP-20 pre-rate case workshops, BPA staff shared with customers a proposal to explore two SCD rate designs and requested customers submit other alternative rate designs for staff to evaluate. Initial feedback from customers was largely negative. Only Renewables NW expressed interest in exploring a rate design change in BP-20. Primarily, customers expressed BPA has not made a sufficient business case that the current rate design is deficient or is in need of change. Many customers also expressed concern over the possible cost shifts associated with a methodology change.

At the July 18, 2018 BP-20 Rate Case Workshop, staff shared an initial evaluation of two rate design alternatives (Alternatives 1 and 2 in this document). Staff also shared its leaning to recommend charging the SCD rate based on use of the scheduling system (Alternative 2 in this document). With the exception of Montana parties, customers again expressed significant opposition to the proposal and concern over the motives for changing the SCD rate design. At the same time, customers offered two additional alternatives and requested staff evaluate them (Alternatives 4 and 5 in this document).

III. Proposed Alternatives

Status Quo

Description

BPA would make no changes to its current SCD rate methodology.

BPA Initial Evaluation

Pros:

- SCD is billed on the same billing determinants as transmission reservations, which simplifies billing and customer understanding of bills
- Rate design uses billing determinants that largely align with industry standard across WECC
- Does not require development of new forecasting methodologies
- Does not result in costs shifts

Cons:

- Does not eliminate the "pancaking" of SCD charges

Possible Rate Range

Please see the supplemental workbook which includes possible rate ranges for this alternative. The workbook is located on the BP-20 Meetings and Workshops page under the August 22, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

Alternative #1 – Do not allocate SCD costs to the Southern Intertie or Montana Intertie.

Description

All SCD costs would be recovered by Network Load Service and Network Point-to-Point reservations. The SCD billing determinant would remain the same. A more detailed description of this alternative is available in the "SCD Rate Alternatives Description" document, which is posted on the BP-20 Meetings and Workshops page under the June 14, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

BPA Initial Evaluation

Pros:

- Simple to implement
- Uses the same billing determinants as the status quo rate design
- Eliminates the "pancaking" of SCD charges

Cons:

- Creates large cost shifts. Customers that only have network transmission will see a l-3% rate increase in their overall transmission costs in addition to any upcoming rate pressure.
- It is possible to use Intertie transmission without using Network transmission, which may lead to free-rider issues.

Possible rate range

Please see the supplemental workbook which includes possible rate ranges for this alternative. The workbook is located on the BP-20 Meetings and Workshops page under the August 22, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

Alternative #2 – Base the SCD billing determinant on schedules and metered load, and charge SCD only once across BPA's system.

Description

Charge SCD once and base the billing determinant on schedules and metered load (i.e. use a $/MWh access charge). A more detailed description of this alternative is available in the "SCD Rate Alternatives Description" document, which is posted on the BP-20 Meetings and Workshops page under the June 14, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

BPA Initial Evaluation

Pros:

- Eliminates "pancaking" of SCD charges

Cons:

- Methodology creates large cost shifts across customers
  - NT customers may see a 2%-7% increase in their transmission costs in addition to any upcoming rate increase
- Methodology is more complicated and less transparent than the status quo.
  - To validate a monthly transmission bill a customer would have to check the schedules associated with all of its tags. For active PTP customers this could exceed thousands of tags every month, which could lead to more billing disputes with customers.
- Customers have raised concerns whether moving to scheduled energy and metered load is better aligned to the costs of providing SCD.
  - Control and Dispatch costs may better align with the capacity of a reservation and peak load and not how a customer is actually scheduling its transmission. Moving to actual usage may not reflect this.
  - Scheduling costs may not align to the actual scheduled volume of energy. For example is it more expensive to schedule 50 MWs than 1 MW?
  - Customers have asked about the costs associated with customers that frequently use the system for redirects. This rate does not address that type of usage.
- Would require the development of new forecasting models and methodologies.

Possible rate range

Please see the supplemental workbook which includes possible rate ranges for this alternative. The workbook is located on the BP-20 Meetings and Workshops page under the August 22, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

Alternative #3 – Base the SCD billing determinant on schedules and metered load, and continue to charge SCD on each segment.

The rate impact of this alternative was conducted per customer request and can be found in the supplemental workbook; however, this alternative was not considered as one of the proposed alternatives to the SCD rate design.

Alternative #4 – "Roll-in" the SCD rate.

Description

Eliminate the SCD rate and allocate the costs across the Network, Intertie and Utility Delivery segments.

BPA Initial Evaluation

Pros:

- Simple to implement
- Uses the same billing determinants as the status quo rate design
- Customers see something close to actual price on OASIS

Cons:

- Methodology creates large cost shifts across customers
- Does not actually eliminate the "pancaking" of SCD charges
  - The costs associated with SCD still show up in both the network and intertie transmission charges, so customers are still charged twice, or more, for a wheel across multiple segments
- This alternative would allocate SCD costs based on "net plant" instead of sales and it is unclear if there is a strong cost based reasoning to do so
- Utility Delivery is not currently charged SCD costs

Possible rate range

Please see the supplemental workbook which includes possible rate ranges for this alternative. The workbook is located on the BP-20 Meetings and Workshops page under the August 22, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx

Alternative #5 – Base the SCD billing determinant on e-tags and charge SCD only once across BPA's system

Description

Charge SCD based on the count of e-tags. This alternative would charge a $/e-tag for each transmission customer on a tag.

BPA Initial Evaluation

Pros:

- Eliminates "pancaking" of SCD charges
- E-tags may more closely align with the scheduling costs of SCD

Cons:

- Methodology creates large cost shifts across customers
- The majority of NT service is not tagged, so BPA would need to develop a different way to allocate costs between customers that have scheduled tags and customers that have unscheduled service
- E-tags may align closer to the usage of the scheduling portion costs of SCD, but not the control and dispatch aspect
- BPA is still analyzing the costs associated with providing SCD and whether e-tags are the proper metric to measure use of the systems and costs associated with SCD.
    - For example, e-tags would not capture use of the system such as redirects. E-tags are often adjusted multiple times throughout the day and billing on e-tags does not reflect this type of usage of the scheduling system.
- Methodology is more complicated and less transparent than the status quo
    - To validate a monthly transmission bill a customer would have to possibly match thousands of tags. This could lead to more billing disputes with customers.
- This alternative would require the development of new forecasting models and methodologies.

Possible rate range

Please see the supplemental workbook which includes possible rate ranges for this alternative. The workbook is located on the BP-20 Meetings and Workshops page under the August 22, 2018 workshop heading at: https://www.bpa.gov/Finance/RateCases/BP-20/Pages/Meetings-and-Workshops.aspx