



**BEFORE THE DEPARTMENT OF PUBLIC SERVICE REGULATION
MONTANA PUBLIC SERVICE COMMISSION**

DOCKET NO. D2012.5.49

ELECTRICITY SUPPLY TRACKER

COLSTRIP UNIT 4 GENERATION ASSET
Variable Cost/Adjustment

DAVE GATES GENERATING STATION
Variable Cost/Credit Adjustments

July 1, 2012 to June 30, 2013

SUPPLEMENTAL TESTIMONY

February 1, 2013

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PREFILED SUPPLEMENTAL TESTIMONY
OF CASEY E. JOHNSTON
ON BEHALF OF NORTHWESTERN ENERGY

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Q. Please state your name and business address.

A. My name is Casey E. Johnston, and my business address is 40 East Broadway, Butte, Montana 59701.

Q. By whom are you employed and in what capacity?

A. I am employed by NorthWestern Energy ("NWE" or "NorthWestern") as the Director of System Operation Control Center ("SOCC") Operations and Transmission Services in the Transmission Department.

Q. What are your responsibilities and duties in your current position?

A. I am responsible for the Transmission Marketing functions of NorthWestern's electric and natural gas transmission systems in Montana. I am also responsible for the activities related to transmission and transportation contracts, interconnection agreements, procurement of ancillary services products, and ensuring compliance to the applicable Federal Energy Regulatory Commission ("FERC") regulation and North American Electric Reliability Corporation ("NERC") reliability and security standards.

Q. Please summarize your educational and employment experiences.

A. I graduated from Montana State University ("MSU") in Bozeman, receiving a Bachelor of Science degree in Electrical Engineering in 1989 and a

1 Master of Science degree in Project Engineering and Management in
2 1999 from MSU and Montana Tech of the University of Montana. I have
3 been a NERC-Certified System Operator for 12 years. I am a registered
4 Professional Engineer in the State of Montana. I have worked in the
5 electric and natural gas utility industry for over 24 years, first employed by
6 The Montana Power Company ("MPC") and now by NorthWestern. My
7 experience is primarily in the areas of transmission operations,
8 maintenance, construction, generation interconnection, and tariff and
9 contract administration.

10
11 **Purpose of Testimony**

12 **Q. What is the purpose of your testimony?**

13 **A.** My testimony:

- 14 1. Describes the ability of NWE Balancing Authority ("BA") Operators
15 to monitor deviations from scheduled load and supply;
- 16 2. Describes the costs of such imbalances between scheduled load
17 and supply; and
- 18 3. Addresses the appropriateness of intra-hour schedule adjustments.

19
20 **BA's Ability to Monitor Deviations from Scheduled Load and Supply**

21 **Q. Please describe the ability of NWE BA Operators to monitor**
22 **deviations from scheduled load and supply.**

1 **A.** NorthWestern operates a BA on a 24-hour-per-day, 365-day-per-year
2 basis. One of the NERC requirements with which NWE is obligated to
3 comply is to balance load and supply for the entire BA. Within the
4 operating hour, the NWE BA Operators (“Operators”) monitor the sum of
5 the tie lines that exist between the NWE BA and other BAs to determine if
6 there is an imbalance between the associated Interchange Schedules and
7 actual tie line flow in real time. Any differences between scheduled and
8 actual aggregate loads/generation or individual loads or generators will be
9 reflected in the net intertie value. In turn, the net intertie value is reflected
10 in the BA Area Control Error (“ACE”), and regulation service will adjust
11 appropriately. For NWE, the Dave Gates Generating Station (“DGGS”) provides
12 regulation service. ACE reflects the total difference between
13 scheduled and actual generation and load values for the entire BA.

14
15 For previous hours, the Operators are able to determine the actual control
16 area load by calculating the difference between metered generation online
17 and the intertie flows. This allows the Operator to ascertain the precision
18 of previous hours’ forecasts. This information may then be used by the
19 Operator to reduce imbalance in future hours by adjusting the load
20 forecast or buying or selling imbalance energy from NWE’s imbalance
21 provider. The Operators will compare the total of all schedules (for load
22 and generation) for the next hour to the estimated BA load for the next
23 hour. Any estimated difference will be scheduled to or from the off-system

1 imbalance provider for the BA. Once the hour begins, the Operators
2 monitor the ACE equation and tie line flows to determine if there is an
3 imbalance between the associated intertie schedules and the actual tie
4 line flows in real time.

5
6 NWE's BA includes many individual customers and generators. Although
7 interval metering is available for some large loads, there is very little real-
8 time meter data brought into the SOCC for individual loads within the BA.
9 Therefore, NWE does not have the ability to accurately determine which
10 load or generator is causing an imbalance on a real-time (as it occurs)
11 basis nor, as explained above, is it necessary for NWE to be able to do so
12 in order to comply with its NERC balancing obligations.

13
14 **The Costs of Imbalances between Scheduled Load and Supply**

15 **Q. Please describe the costs of such imbalances between scheduled**
16 **load and supply.**

17 **A.** The costs of any load imbalances are calculated according to the NWE
18 FERC Tariff, Schedule 4. At the end of the month, the imbalances for
19 each hour for the schedules and loads for all BA network load customers
20 are calculated by NWE and the imbalances are administered to the
21 appropriate customers. For most generator owners/operators, the
22 generation imbalance is calculated for each hour of the month for each
23 month. If there is a generation imbalance, the appropriate imbalance

1 charges and applicable penalty are assessed to the generator
2 owner/operator per NWE's FERC Tariff, Schedule 9. Several
3 generator/operators on the NorthWestern system have an alternative
4 arrangement to Schedule 9 charges. Hourly energy imbalance is
5 calculated for the NWE Energy Supply aggregate schedule and total loads
6 per Schedule 4. The NWE Energy Supply imbalance amounts can be
7 found in Frank V. Bennett's Exhibit__(FVB-1) as referenced on the top of
8 page 8 of his Prefiled Direct Testimony. Imbalance accounting and BA
9 expenses not directly assigned through the Schedule 4 and Schedule 9
10 charges are also shown.

11
12 For variable energy generation like wind or solar, NWE does not have a
13 FERC tariff schedule to charge the generation owner for intra-hour
14 regulation service imbalances if they are not serving load in the NWE BA.
15 FERC recently issued Order No. 764 on Variable Energy Resource
16 Integration ("Order No. 764") allowing a transmission provider, like NWE,
17 to submit a Schedule 10 filing designed to recover any imbalance costs
18 from variable energy resources.

19
20 **The Appropriateness of Intra-Hour Schedule Adjustments**

21 **Q. Please address the appropriateness of intra-hour schedule**
22 **adjustments.**

1 **A.** Intra-hour schedules are currently allowed by NWE on a 30-minute basis,
2 in accordance with its Open Access Transmission Tariff. The
3 appropriateness of the intra-hour schedules depends on the need of the
4 customers to adjust hourly schedules for known changes and is driven by
5 the customer's request. The value of schedule changes within the hour is
6 dependent on an intra-hour market for energy sales and purchases. If
7 there is no active market available for intra-hour transactions, intra-hour
8 scheduling capability will not be used by the customers. This, in general,
9 has been NWE's experience to date.

10
11 In Order No. 764 FERC mandated that all transmission providers offer
12 intra-hour scheduling on a 15-minute timeframe. NWE will be ready to
13 offer customers the ability to schedule on a 15-minute basis within the
14 hour by November 2013, as required by Order No. 764. A 15-minute
15 scheduling environment is still dependent on the same constraints that the
16 current 30-minute scheduling environment faces. If a sales and purchase
17 market for intra-hour transactions develops and purchasing and selling
18 entities and load serving entities utilize the ability to make intra-hour
19 schedule changes to reduce any hourly imbalances, NWE would expect
20 that the BA imbalances would be less overall.

21
22 **Q.** Does this complete your testimony?

23 **A.** Yes, it does.

9 **PREFILED SUPPLEMENTAL TESTIMONY**
10 **OF KEVIN J. MARKOVICH**
11 **ON BEHALF OF NORTHWESTERN ENERGY**
12

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23		

1 **Witness Information**

2 **Q. Please state your name and business address.**

3 **A.** My name is Kevin J. Markovich and my business address is 40 East
4 Broadway, Butte, Montana 59701.

5
6 **Q. Are you the same Kevin J. Markovich who previously submitted pre-
7 filed testimony in this proceeding?**

8 **A.** Yes, I am.

9
10 **Purpose of Testimony**

11 **Q. What is the purpose of your supplemental testimony?**

12 **A.** My testimony will discuss the Intra-Hour Transaction Accelerator Program
13 ("I-TAP"), the feasibility and economic considerations of using
14 NorthWestern Energy's ("NorthWestern" or "NWE") Basin Creek
15 generating plant on an intra-hour basis, and the methods used to forecast
16 production from wind facilities.

17
18 **I-TAP**

19 **Q. What is I-TAP?**

20 **A.** I-TAP began as an initiative amongst ColumbiaGrid, Northern Tier
21 Transmission Group, and WestConnect to develop a platform to make
22 intra-hour scheduling and trading easier and more efficient. NWE was an
23 original member of the group that developed I-TAP (for additional

1 information see the I-TAP Business Case dated September 10, 2009
2 attached to this testimony as Exhibit__(KJM-1)).

3
4 On November 14, 2011, I-TAP was implemented, and the electronic
5 trading platform (designated WebExchange) achieved commercial
6 operation. Activity on WebExchange has been extremely limited as the
7 market has not developed as planned. The utilities that participated in the
8 development of this system, including NWE, are continuing efforts to
9 increase participation in the hope of developing a liquid and transparent
10 intra-hour market. A technical steering committee has been formed and is
11 working on enhancements to WebExchange. NWE Energy Supply has a
12 representative on this committee and is committed to the development of
13 an intra-hour market.

14
15 **Q. Why has I-TAP not developed as planned?**

16 **A.** Section IV of the I-TAP Business Case lists three elements necessary for
17 any market:

- 18 1. Ease of trading and low cost of trading;
- 19 2. Diverse group of buyers and sellers to produce liquidity and
20 volatility; and
- 21 3. Price transparency and price discovery.

22

1 The I-TAP platform has not developed mainly because of problems
2 accomplishing the second element, and partly due to issues with the first
3 element. While intra-hour scheduling is allowed, the need or demand for it
4 has not materialized and thus there is not a diverse group of buyers and
5 sellers interested in participating in that market. Hourly scheduling is still
6 the norm, and the benefits associated with intra-hour scheduling are not
7 great enough to move market participants into the intra-hour timeframe. In
8 addition, there have been technical hurdles with WebExchange, impacting
9 its planned comprehensiveness and efficiency, which has further limited
10 its usefulness.

11

12 **Q. Will I-TAP eventually become a tool that is widely used throughout**
13 **the western United States?**

14 **A.** Time will tell, but it is too early to make that determination. As discussed
15 in the Prefiled Supplemental Testimony of Casey Johnston (“Johnston
16 Supplemental Testimony”), the FERC mandate requiring Balancing
17 Authorities (“BA”) to be capable of accepting 15-minute schedule changes
18 could certainly help, but it is not a guarantee that the 15-minute market or
19 I-TAP will be fully utilized. Regardless, NWE continues to support the
20 I-TAP initiative and will work to further develop its applicability.

1 Use of Basin Creek for Intra-hour Scheduling

2 **Q. Is it possible to dispatch the Basin Creek plant on an intra-hour basis**
3 **to correct deviations from scheduled load and supply?**

4 **A.** The simple answer is “yes,” but a number of issues and factors must be
5 addressed. First, refer to the Johnston Supplemental Testimony regarding
6 technical and operational issues involved with intra-hour scheduling and
7 imbalance. In addition to the issues identified by Mr. Johnston, the Basin
8 Creek plant is not capable of being on Automatic Generation Control
9 (“AGC”), and thus all dispatch would have to be done manually. Also,
10 there is no way the BA can determine which load or generation is causing
11 an imbalance on a real-time basis. Hence, if the NWE BA were to
12 become out of balance, there would be no way to determine if NWE
13 Energy Supply was the cause of the problem; as a result moving the Basin
14 Creek output could make the NWE Energy Supply imbalance greater than
15 if it had done nothing. Finally, as the Johnston Supplemental Testimony
16 notes, balancing the NWE control area is the responsibility of the NWE
17 Transmission function (and not NWE Energy Supply). Any efforts by NWE
18 Energy Supply to help in balancing the control area must be done with
19 complete knowledge of NWE Transmission and not done independently
20 so that actions being taken are helping rather than hindering the cause.

21
22 **Q. Are there any economic considerations related to dispatching the**
23 **Basin Creek resource on an intra-hour basis?**

1 **A.** The overriding economic issue would be determining how to allocate the
2 costs of this service to the appropriate customers. The Basin Creek plant
3 is an NWE Energy Supply asset whose costs are borne entirely by
4 regulated supply customers of NWE. If the Basin Creek plant was
5 dispatched on an intra-hour basis for the benefit of the entire BA, then the
6 associated costs should be allocated to all customers who received the
7 benefit. There is currently no mechanism in place to capture and allocate
8 these costs to choice customers. The NWE BA accumulates all load and
9 supply information on an hourly basis and approximately 45 days after the
10 end of each month allocates the appropriate costs to customers. These
11 additional costs would have to be included in that allocation. NWE Energy
12 Supply is a customer on the NWE transmission system; to incur costs that
13 benefit the entire system without receiving adequate compensation would
14 not be fair to the regulated, non-choice customers that NWE Energy
15 Supply serves.

16

17 **Wind Forecasting**

18 **Q.** Please describe the various methodologies used to forecast wind
19 production.

20 **A.** For long-term planning purposes, NWE uses historical production volumes
21 from wind resources, including Qualifying Facilities, to determine the
22 necessary procurement and hedge levels.

23

1 On a day-ahead basis, NWE uses forecasts generated from 3TIER, a
2 forecasting service subscribed to by NWE. When wind facilities consisted
3 of only Judith Gap and other small wind resources, a floor of 20 MW and a
4 cap of 90 MW were placed on all day-ahead hourly schedules as actual
5 wind production can vary greatly from prior day forecasts and this reduced
6 the margin of error that could occur. With the addition of Spion Kop,
7 Gordon Butte, and Musselshell I and II, making the total wind capacity
8 over 200 MW, we now use a 28 MW floor and a 138 MW cap on day-
9 ahead hourly schedules. The new floor and cap numbers are still being
10 analyzed and they will be adjusted if it is determined that different values
11 should be used.

12
13 On an hourly basis, NWE uses a combination of actual (current) wind
14 production and an updated 3TIER forecast. The real-time scheduler
15 analyzes the 3TIER forecast and looks at past hours' production trends to
16 prepare the next hourly projection. The scheduler continually monitors
17 actual wind production and if there are significant changes in production
18 prior to the deadline for the next hour's scheduling window, the scheduler
19 will adjust the projection and either purchase additional energy or sell any
20 excess.

21
22 Since the Judith Gap facility came online in 2005, NWE has tried a
23 number of different wind forecasting methodologies including persistence,

1 straight 3TIER, and other hybrid approaches. NorthWestern believes the
2 current system is appropriate because it provides the necessary flexibility,
3 structure, and subjectivity needed to make an informed projection. Wind
4 forecasting is as much art as it is science, and the experienced real-time
5 schedulers we have in place are instrumental in producing good
6 production forecasts.

7

8 **Q. Does this complete your testimony?**

9 **A.** Yes, it does.



FINAL DRAFT
Intra-Hour Transaction Accelerator Platform
Business Case

September 10, 2009

Developed by:
Joint Initiative Products and Services Strike Team

Intra-Hour Transaction Accelerator Platform

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Intra-Hour Transaction Accelerator Platform

I. Background

In the summer of 2008, representatives from ColumbiaGrid, Northern Tier Transmission Group, and WestConnect joined forces to pursue a number of projects that would 1) benefit from a broad reach of expertise and geography, and 2) provide opportunities for extracting more efficiency and capacity out of the existing electric system. This collaboration is referred to as the "Joint Initiative".

As part of this Initiative, the Joint Initiative Products and Services Strike Team has explored a tool to facilitate and reduce the workload burden and time required to initiate and finalize within-hour and other transactions.¹ This business case contains their proposal and justification for such a product.

II. Current Environment

Currently, within-hour transactions, to the extent they occur in the Western Interconnection, are not transparent or automated.² There is no visibility as to resource opportunities; in most instances a market participant with a real-time need must identify a willing and acceptable seller by making a series of telephone calls. After locating a willing seller, the deal must be put together, and the parties must determine whether there is available transmission and whether that transmission can be scheduled in the required timeframe. Because there may not be sufficient time to identify and finalize transactions, opportunities may be lost.

¹ The use of I-TAP is not limited to within-hour transactions; however, as this is where it is anticipated to bring the greatest value, these types of transactions are the focus of the business case.

² Opportunities for within-hour transactions are also constrained by the lack of a within-hour delivery mechanism. As a general proposition, until very recently, within-hour transmission schedules were only permitted to address Balancing Authority "Emergencies". In 2008, NV Energy adopted a business practice providing for within-hour transmission schedules for any purpose. In February, 2009, the Joint Initiative Products and Services Strike Team recommended that Transmission Service Providers in the Western Interconnection, to the extent that they can do so within their scheduling infrastructure and without negatively impacting reliability, offer within-hour transmission scheduling. Following from that recommendation, PacifiCorp, Puget Sound Energy, and Avista have posted draft within-hour transmission business practices. Bonneville Power Administration has announced a pilot project through which they will accept new schedules on the half hour for increases in wind generation. WestConnect Transmission Service Providers and other Transmission Service Providers have indicated they are moving forward with such practices. It should be noted, however, that the Products and Services Strike Team recommended practices with a "fill-in-the-blank" approach to accommodate the individuality of each Transmission Service Provider's system, and business practices will vary from provider to provider.

Need for I-TAP

Market Participants need to be able to identify and enter into real-time transactions faster and more easily than they can today in order to:

1. Better use the existing system by optimizing existing capacity;
2. Manage the integration (and integration cost) of variable renewable generation (in particular, tools are needed to address significant unexpected ramps in generation within an operating hour);
3. Meet reliability standards, including recovering from an ultimate contingency event within the prescribed timeframe when there are not sufficient reserves avoiding expensive sanctions;
4. Mitigate the need for imbalance energy and minimize imbalance energy charges; and
5. Fully use other Joint Initiative Products (Dynamic Scheduling System and Within-Hour Transmission Purchase and Scheduling Business Practices).

III. I-TAP Proposal

In simple terms, I-TAP will be an internet accessible bulletin board 'hub', or meeting place, that links existing systems (e.g. OASIS, e-tag author, e-tag approval, deal-capture, trading platforms, etc.) as spokes, via the new I-TAP hub software and hardware, to enable high-speed real-time transactions via a single port of entry. While individual market participants may already have trading systems with many of the I-TAP features (except for the power products bulletin board), the I-TAP system will provide an enhanced level of transaction speed and efficiency while providing a unique and broad view of power products available throughout the Western Interconnection.

While I-TAP will coordinate and cooperate with existing systems by linking them together via the I-TAP hub and providing a new electronic bulletin board for the posting of power products available throughout the Western Interconnection, I-TAP is not intended to be a centralized market. All participation would be voluntary, and all transactions would be bi-lateral deals between the individual parties.

I-TAP will be administered/operated by a "Host."³ The Host will physically maintain the software, hardware, and telecommunications links within a secure facility. The Host will also administer the software, with respect to updates, upgrades, maintenance, backup, and security.

³ The Products and Services Strike Team has discussed the need for the Host to be sufficiently independent from market participants. Possible hosts discussed by the group have included the software vendor or other entities such as ColumbiaGrid.

It will manage the contract with software vendor and, depending upon the final payment arrangement with the software vendor, might also act as a payment agent for I-Tap users. It will act as the moderator amongst the I-TAP parties. Additional roles for the Host will be discussed and determined through the RFP process (including maintaining the enabling bilateral agreements amongst I-TAP users), and may evolve as I-TAP is implemented.

IV. Business Case

Infrastructure and Cost

The Products and Services Strike Team issued an I-TAP "Request for Information" in April, 2009. Multiple responses were received. The RFI responses confirmed that I-TAP is technically feasible, and can be accomplished either through the development of a new software platform or the integration and modification of existing vendor products. The estimated costs of I-TAP ranged significantly between the proposals, and were dependent upon whether the ultimate vendor recovered its costs through an up-front payment or through transaction fees. Categories of cost included software, hardware, and maintenance. Further discussion with potential vendors in a Request for Proposal process is required.

I-TAP will facilitate a needed market. In order to succeed, among other things, any market must have the following elements:

1. Ease of trading and low cost of trading;
2. Diverse group of buyers and sellers to produce liquidity and volatility; and
3. Price transparency and price discovery.

The ITAP platform, while not being directly responsible for ensuring these elements, will support them by having the following attributes. ITAP will allow users to easily:

1. Broadcast the availability and price of capacity and energy for both economic purposes and to address unexpected changes in loads or resources;
2. Identify the products they are looking to buy or sell, both the quantity and the quality;
3. View bids and offers, both quantity and price;
4. Post bids and offers with a minimum of keystrokes;
5. Ascertain the availability of transmission; and
6. Make the tagging process easier.

Value

As a value proposition, I-TAP's facilitation of within-hour transactions will likely (1) lower the cost of integrating variable generation, (2) help meet reliability standards and avoid expensive sanctions, and (3) lower the need for imbalance energy and associated charges.

Benefits

The following summarizes additional anticipated benefits of the I-TAP:

1. More efficient use of existing system resources;
2. Visibility of capacity and energy needs and availability of resources to meet those needs;
3. Greater ability to take advantage of load and resource diversity;
4. Provides access to more economical resources for balancing services;
5. Greater opportunity to use evolving within-hour transmission purchase and scheduling opportunities;
6. Possible lower portfolio costs as LSEs will naturally migrate to the lowest cost commodity available with increased market opportunities;
7. Permits more efficient dispatch of units;
8. Less reliance on Balancing Authority to provide energy for imbalance;
9. Scheduling efficiencies that maintain and enhance reliability based upon system conditions (cuts only done if necessary);
10. With respect to events which are non-DCS events but use reserves to respond, facilitates a market to respond in order to avoid ultimate contingency event;
11. Realization of some of the benefits of an RTO or centralized market without the structure and overhead of an RTO;
12. Provides information as to how market participants use the system and opportunities, informing NERC discussion (white paper) on the need for 10-minute markets;
13. Allows the market to determine the value of capacity; and
14. Facilitates the development of variable resources.

Time Frame

It is anticipated that the I-TAP development will take approximately six to eighteen months from the vendor contract signature.

V. Next Steps

Solicit broad stakeholder interest and assess sufficient regional interest and financial commitment to proceed with a Request for Proposal. Assuming sufficient interest to proceed, the Products and Services Strike Team anticipates finalizing the Request for Proposal by September 30, 2009, and assuming there is an acceptable response, the Participant Agreements and I-TAP contract award by early January, 2010.



Joint Initiatives I-TAP 2/18/2009

