



Hourly Firm Monitoring and Evaluation Plan

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Hourly Firm Monitoring and Evaluation Plan Overview

The Hourly Firm Monitoring and Evaluation Plan (M&E Plan) is structured to parallel the TC-20 Settlement and provide the data and analysis specified in the TC-20 Settlement, Attachment 1, Paragraph 2.d. The Evaluation Methodology section provides an overview on how Bonneville plans to gather, compile, and synthesize the data. Bonneville has included customer comments and feedback as part of this plan. Per the TC-20 Settlement Agreement, Bonneville held workshops and collaborated with customers to develop the M&E Plan starting in mid-January 2019. This Draft M&E Plan, including the process flow in Attachment 1, is a result of those discussions.

Development of the M&E Plan

In creating the M&E Plan consistent with the TC-20 Settlement, BPA will:

1. Hold workshops and collaborate with customers to develop the M&E Plan starting in mid-January 2019.
2. Post a draft of the M&E Plan.
 - a. Consider comments from customers before finalizing the plan.
3. Share the results of the evaluation with customers at least twice before July 1, 2020.

Monitoring and Evaluation of the Hourly Firm Product

Consistent with the TC-20 Settlement Agreement, Bonneville will provide the data and analysis as outlined in the TC-20 Settlement as defined in [2.d.ii and 2.d.iii of the TC-20 Settlement Agreement \(Page 11 Appendix 1\)](#), and is outlined below in the Data and Analysis sections. The Evaluation section describes how Bonneville plans to evaluate the information and data it has gathered.

Monitoring and Evaluation Period

Bonneville will conduct monitoring and evaluation of the Hourly Firm product for three time horizons:

- Mid-January 2018 to June 30, 2019 (unlimited sales of the Hourly Firm Product).
- July 1, 2019 through December 31, 2019.
 - Hourly Firm sales will be limited to Bonneville's posted available transfer capability (ATC) calculated in accordance with Bonneville's short-term ATC methodology.
- January 1, 2020 – September 30, 2021
 - Hourly Firm sales will be limited to Bonneville's posted ATC. Hourly firm reservations will not be available in real-time. Hourly firm may only be reserved until the day prior to the operating day at 2340.

Data

Per the TC-20 Settlement, Bonneville has agreed to provide the following information:

1. Product usage
 - a. Type of service: Firm; Conditional Firm; Non-Firm
 - b. Products used: Long-term; Monthly; Weekly; Daily Hourly
 - c. Timing of reservations (How far ahead of the reservation start time)
 - d. Timing of schedules (How far ahead of flow)
 - e. Point of Receipt ("POR") and Point of Delivery ("POD")
 - i. Load service v. marketing (POD analysis)

- ii. Resources used (POR analysis)
 - iii. POR/POD combinations
- 2. Transaction Type
 - a. Redirects
 - b. Original requests
 - c. Resales
 - d. Reassignments
 - e. Transfers
- 3. Curtailment events initiated by Bonneville on the network
 - a. Identify the products that are curtailed
 - b. Megawatt ("MW") amount of curtailment
 - c. Percentage of total schedules curtailed
 - d. Analysis of schedules curtailed based on NERC priority level
- 4. Identify the amounts of short-term ATC during:
 - a. Congestion events – determined on a flowgate by flowgate basis.
Depending on the flowgate, a congestion event is when actual flows are within 15-20% of total transfer capability ("TTC").
 - b. When dispatchers log actions
 - c. Curtailment events
- 5. Designation of Network Resources
 - a. Seller's choice impacts
- 6. Preemption/Competition data
- 7. System data during congestion and curtailment events
 - a. Impactful outages
 - b. TTC impacts
 - c. System Operating Limits and/or Real Time Contingency Analysis
 - d. Significant forecast errors

Analysis

Per the TC-20 Settlement (para. 2.d.iii), Bonneville has agreed to doing the following analysis.

- 1. Firm v. non-firm total usage
 - a. Flow based analysis by NERC curtailment priority – can also show unscheduled flows.
- 2. Change in customer use of products
 - a. Shift from long-term to short-term products
 - b. Shift from Firm to Conditional Firm ("CF")
 - c. Shift from Firm to Non-Firm
 - d. Increase in usage of 6NN
 - e. Increase in usage of PTP non-firm curtailment priority of 1-5
- 3. Make up of curtailments:
 - a. Firm curtailments (NT and PTP)
 - b. NT Redispatch
 - c. Hourly Firm
 - d. NT and PTP
 - i. System conditions CF – system condition has not occurred
 - ii. Number of Hours CF – firmed up

- e. Conditional Firm curtailments
 - i. System conditions CF – system condition has occurred
 - ii. Number of Hours CF – not firmed up
 - f. Non-firm curtailments
 - i. 6NN and 1-5
4. Redispatch
 - a. Emergency
 - b. NT redispatch
 - c. Discretionary redispatch
 - i. If discretionary redispatch is granted, identify which flowgate was affected
 - ii. Identify if a curtailment was avoided
 5. Bonneville reserves the right to conduct any analysis it deems necessary to evaluate hourly firm service.

Evaluation

Bonneville will perform the evaluation starting from a neutral position. Bonneville, in evaluating the data and analysis, will use the four criteria in the TC-20 Settlement, Attachment 1, paragraph 2.d.i which are:

1. Updates on any operational experience relating to the hourly firm product's impact on reliability, curtailments or other system operations.
2. Evaluations of hourly ATC that was available at the time of firm curtailments.
3. Any identifiable impacts of hourly firm curtailment priorities to customers that hold long-term firm transmission service agreements, including network integration transmission service ("NT") and long-term firm point-to-point transmission service ("PTP").
4. Customer experience with the hourly firm product regarding usage and marketing and load service impacts. This evaluation will be based on information provided to Bonneville from customers that use the hourly firm product during the monitoring period.

Bonneville will meet items 1-3 by focusing evaluation on time periods where the system has the following indicators of congestion such as:

1. Curtailments
2. TLR Avoidance events
3. Dispatcher actions
 - a. Configuration changes
 - b. Limiting wind generator output to schedules
 - c. Redispatch of federal generation
4. Real-Time Contingency Analysis (RTCA) tool notifications
5. Instances where actual flows were within 15% - 20% of Total Transfer Capability (TTC) for a network flowgate

For each identified event, Bonneville will evaluate:

1. System flows and operating limits:
 - a. Determine the amount of Hourly Firm during during congestion events and/or potential reliability events. Also look at flowgate impacts relative to other firm products and TTC.
2. State of the system
 - a. Outages – Planned and unplanned
 - b. Peak-load events
 - c. Generation contingencies
3. Posted Hourly Firm and Hourly Non-Firm TTC and ATC
 - a. Determine whether ATC calculation is giving the appropriate signal
 - b. Look at correlation between TTC, ATC and actual flows and the ability to accurately capture availability
4. Schedules by Product (Firm and Non-Firm Hourly, Daily, Monthly, long-term):
 - a. Look at relationship/volume of Hourly Firm usage; is it increasing during events. How is Hourly Firm being used during congestion/reliability events
5. Analysis on the type of Hourly Firm schedule (Original, Redirect, Resale)
 - a. Net new Impacts of Hourly Firm; redirects vs. parents vs. new
6. Hourly Firm schedules by Region
7. Timing of Hourly Firm reservations and schedules
8. In what ways is Hourly Firm contributing to dispatcher actions:
 - a. Contrast with dispatcher actions necessary during non-firm during the 3 monitoring time horizons
 - b. Has/will limiting Hourly Firm to ATC improve reliability?

Bonneville will monitor and evaluate the following during system events:

1. Curtailments – How were firm transmission schedules impacted by the curtailment and how did hourly firm contribute?
2. NT Redispatch – Was NT Redispatch impacted by the event and how did hourly firm contribute?
3. Firm TLR Avoidance events – What impacts did hourly firm have during this system event?

Bonneville will meet item 4 of the evaluation deliverables by:

1. Providing all customers a formal one-month window, prior to each evaluation results workshop, to submit comments, information, or data related to their experience with the Hourly Firm product.
 - a. This may include, but is not limited to business process uses of hourly firm, unique customer perspectives on how the hourly firm product is used, observations regarding value of hourly firm to business operations, observations of impacts of hourly firm on other firm service
2. Bonneville will consider this customer experience information during the evaluation of the hourly firm product.

Evaluation Methodology

During the evaluation periods, Bonneville will evaluate the Hourly Firm by utilizing a process for:

- Measuring risks to the transmission system and firm service
- Investigating these risks for impacts from various factors

The steps of the evaluation process are:

- Operationalize the risk concepts into numeric measures
 - Test the numeric measures for practicality
 - Associate the practical risk measures with external drivers
- 1) Gathering Data: The data for the analysis can be divided between: dependent variables, (the proposed reliability metrics), and independent variables (the data elements described in the Analysis section above).
 - 2) Test / Validate Reliability Measures: The dependent variables Bonneville believes will be potential measures of system reliability are chosen as potential numeric representations of how reliably the transmission system is operating. Each of these measures will be validated against known system events of decreased reliability. The goal of the testing will be to see if the measure is highly correlated with events such as transmission schedule curtailments, TLR Avoidance events, and the other types of events listed above.
 - 3) Statistical Modeling: In this modeling activity, the dependent variables measuring reliability are compared against the independent variables to see if there is any influence from the independent inputs to the model.
 - 4) Iterate on Modeling: Good statistical models will allow for interpretation of the effects of each of the independent variables on the dependent variable. It is BPA's plan to present the interim models as well as their interpretations so that we can go through the iterative effort in a collaborative way with customers.

It is intended that the in-depth details of this process will be iterative and in consultation with customers. (See process flow in Attachment 1)

Reporting

Bonneville will share its data, analysis, and evaluation results [here](#). Customers can view meeting notifications related to the hourly firm product [here](#).

Communications

Bonneville is committed to transparency and will share the results of its evaluations and analysis with customers at least **twice** before July 1, 2020.

- Tentative schedule:
 - September 2019
 - December 2019
 - March 2020
 - June 2020

Bonneville will share its data and analysis gathered as defined in [2.d.ii and 2.d.iii of the TC-20 Settlement Agreement \(Page 11 Appendix 1\)](#) to our external website.

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Attachment 1: HF Evaluatoin Process Chart

