UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
BEFORE THE
BONNEVILLE POWER ADMINISTRATION

2022 Tariff Proceeding	**)**	**Docket Number: TC-22**

DIRECT TESTIMONY OF:
Public Power Council

SUBJECT:
Network Real Power Loss Factor
BPA OATT Reference: Schedule 11, TC-22-E-BPA-01

WITNESSES:
Michael Linn
Michael Deen

January 29, 2021

TC-22-E-PP-01

SECTION 1: INTRODUCTION AND PURPOSE

Q: Please state your name and qualifications.

A: My name is Michael Linn. My qualifications are shown at TC-22-Q-PP-02.

A: My name is Michael Deen. My qualifications are shown at TC-22-Q-PP-01.

Q: What is the purpose and organization of your testimony?

A: This testimony addresses BPA's proposed update to the Network segment real power loss factor. We support BPA staff's proposal to update the Network segment real power loss factor. However, we urge BPA to revise its Network segment power loss factor to a two-season factor instead of the proposed monthly factor. This testimony is comprised of three sections. The first section is this introduction. The second section is an overview of BPA's proposed revision to the Network loss factor. The third section describes PPC's proposal for a two-season Network loss factor.

Q: What section of BPA's proposed tariff does this testimony apply to?

A: Pursuant to TC-22-HOO-04, this testimony applies to the terms and conditions proposed by BPA in Schedule 11 of its Open Access Transmission Tariff (OATT or "tariff") at TC-22-E-BPA-01.

SECTION 2: NETWORK TRANSMISSION LOSS FACTORS

Q: What are Network transmission loss factors?

A: Real power losses are the loss of power that occurs over the transmission system when power moves between a generator and load. The BPA tariff requires that point-to-point and network integration transmission service customers replace the real power losses associated with the use of transmission service. BPA uses a loss factor to calculate a transmission customer's real power loss obligation, the amount of energy that the

customer must return to BPA. The Network transmission loss factor is the loss factor that is applicable to the BPA Network segment.

Q: *Why is BPA staff proposing to update the Network Transmission Loss factors?*

A: The current Network transmission loss factor of 1.9 percent has been in place for over 20 years. BPA staff's review indicated that this annual loss factor was no longer an accurate estimate of real power losses due to significant changes in system topology, the regional generation mix and the geographic diversity of load growth.

Q: *How does BPA staff propose to set Network Loss factors in the TC-22 tariff?*

A: BPA staff proposes to change the Network loss factor from an annual loss factor to a monthly loss factor. A different loss factor would be used each month to calculate a customer's real power loss obligations on the BPA Network segment.

Q: *Did BPA staff analyze other loss factors?*

A: Yes. BPA staff calculated an updated annual loss factor and loss factors for each of the four seasons of the year. BPA staff also calculated heavy load hour (HLH) and light load hour (LLH) annual and seasonal loss factors. Additionally, in response to a customer request, BPA staff analyzed a two-season loss factor that included a non-summer season (September through May) and a summer season (June, July and August). The summer loss factor was 2.31 percent, and the non-summer loss factor was 1.94 percent.

Q: *How does BPA staff justify the choice of monthly Network Loss factors?*

A: BPA staff explained that the monthly loss factors were more granular than the annual loss factors. Staff argued that the increased granularity would lead to more accuracy. BPA staff explained an annual loss factor can lead to periods within the year where BPA over-collects losses and periods in the year where BPA under-collects losses. BPA staff

argues that losses under-collection coincides with time periods with higher energy prices and over-collection coincides with time periods with lower energy prices. Finally, BPA staff argues that the monthly loss factor will collect more losses than the annual factor or two-season loss factor. BPA staff analyzed historical Total Transmission System Load (TTSL) data from 2017 to 2019 and found that the monthly loss factor collected more MWhs than the annual loss factor. BPA also found the monthly loss factor collected an additional 21,821.56 MWhs more than the customer recommended two-season loss factor. On this basis, BPA staff found the monthly loss factor to be superior to the two-season loss factor.

SECTION 3: MODIFICATIONS TO NETWORK LOSS FACTOR GRANULARITY

Q: Please summarize your recommendations regarding Network Loss granularity.

A: PPC recommends BPA adopt a two-season loss factor with a summer (June, July, and August) loss factor and a non-summer (September through May) loss factor. The summer loss factor would be 1.95 percent and the non-summer loss factor would be 2.31 percent. A two-season loss factor is an important improvement over the current annual loss factor and accomplishes many of the benefits associated with a more granular monthly loss factor without the degree of complexity associated with a monthly loss factor. The monthly loss factor granularity introduces additional complexity to BPA customers that must use different loss factors for each month when calculating real power loss obligations and all-in costs of economic transactions. In addition to the increased administrative burden potentially placed on customers, the additional complexity of a monthly loss factor granularity may result in additional errors in loss returns, which could increase the burden on BPA staff. Because the benefits of 12 monthly loss factors can be

substantially achieved with a two-season approach, the simpler approach is desirable, consistent with commonly accepted ratemaking principles.

Q: *How did PPC calculate the seasonal Network Loss factors?*

A: PPC relied upon the 2017 through 2019 Total Transmission System Load (TTSL) data BPA staff used in its Real Power Loss Study and the monthly loss factors calculated by BPA. First, PPC applied the monthly loss factors to the historical TTSL set to calculate hourly real power loss obligations. Second, PPC calculated the average TTSL and average real power loss obligation for the summer and non-summer periods. Third, PPC divided the average real power loss obligation by the average TTSL for each season to calculate the average loss factor for each season. The resulting summer loss factor is 1.95 percent, and the non-summer loss factor is 2.31 percent.

Q: *Do the Seasonal Network Loss factors result in reduction in loss obligations relative to the monthly Network Loss factors?*

A: No. PPC applied the monthly loss factors and the two-season loss factors the 2017 – 2019 TTSL data. The two-season loss factor collects 20,055 MWhs more than the monthly loss factor over the three-year period.

Q: *Please explain the magnitude of the additional MWhs of Real Power Loss obligations under the PPC two-season loss factors?*

A: The additional MWhs collected under the PPC two-season loss factors equate to only 0.76 aMWs over the three-year period.

Q: *Does the reduction in Network Loss granularity meaningfully alter the value of loss obligations because of seasonal under- and over-collection of losses?*

A: No. PPC used the BP-22 BPA Market Price Forecast to analyze the potential impacts of under-collection and over-collection from a less granular loss factor. PPC applied the FY 2021 and FY 2022 Mid-Columbia HLH and Mid-Columbia LLH price forecasts to the monthly average HLH and LLH losses collected under the monthly loss factors and the two-season loss factors. The two-season loss factor resulted in real power loss obligations that were valued at an average $324,681.40 more per year than the monthly loss factors.

Q: Do Seasonal Network Loss factors materially change the capacity cost of delayed loss return service?

A: No. PPC analyzed how a monthly and two-season loss factor shape would change the amount and value of capacity associated with delayed loss returns. First, PPC used the same historic financial, slice, in-kind and waived loss returns volumes BPA relied upon to replicate the analysis BPA performed in the Generation Inputs Study to quantify the capacity volume and value associated with delayed loss returns. *See* BP-22-E-BPA-06 and BP-22-E-BPA-06A-E01. Second, PPC applied monthly and two-season shaped loss factors to the historic loss returns and calculated new capacity volumes and values under different loss factor granularities. PPC found the two-season loss factor resulted in an annual capacity value of $101,438 more than the monthly loss factor granularity.

Q: Is PPC aware of similar analysis to analyze the effect of different loss factor granularities on capacity volume and value associated with delayed loss returns?

A: Yes. BPA staff adopted a similar approach to inform pre-rate case workshop materials and its Initial Proposal. BPA staff used the same methodology on a similar data set. The analysis BPA staff performed showed a very limited change in capacity and volume

between annual and monthly loss factor granularities. *See* BPA response to PPC's data request PP-BP-30-2, which is attached to this testimony as Exhibit 1.

Q: What conclusions does PPC draw from this analysis?

A: According to our analysis, there is a marginal increase in the volume and value of loss return obligations and its associated capacity from adopting PPC's two-season loss factor rather than the proposed monthly loss factor. However, the key takeaway from PPC's analysis is not that one method produces more value to BPA, but that there are minimal differences in the accuracy and financial impacts of the two methodologies while the two-season loss factor approach is simpler and less burdensome for the customers. Annual loss return obligations would be less than 1 aMW different and there would be limited impact to the value of those loss returns or amount and value of associated capacity. This analysis supports the conclusion that many of the benefits BPA staff is seeking with a more granular loss factor can be accomplished with a two-season factor with less administrative burden than a monthly loss factor.

Q: Does this conclude your testimony?

A: Yes.

EXHIBIT 1

BPA response to PPC's data request PP-BP-30-2 and excerpt from BPA workbook

DATA RESPONSE
BONNEVILLE POWER ADMINISTRATION

BP-22 RATE CASE

DATA REQUEST NUMBER: PP-BPA-30-2

EFFECTIVE FILING DATE OF REQUEST: 12/22/20

DIRECTED TO: BP-22-E-BPA-**06**

REQUESTOR'S NAME: Michael Linn
COMPANY/ENTITY: Public Power Council

PAGE(S): 80
LINE(S): 1-11

DATA REQUEST:

Did BPA study the differences in delayed return capacity quantities associated with different granularities of loss factors (ie. Seasonal, annual)? If so, please provide the study and supporting data and documentation.

RESPONSE:

Yes. We calculated the capacity amounts and annual cost associated with providing the delayed loss return service assuming an annual loss factor and monthly loss factors. The spreadsheet is attached, PP-BPA-30-2.xlsx.

Please note, this is a preliminary analysis used to help inform our workshop materials and our Initial Proposal. While we still believe this analysis is indicative of the change different granularities of loss factors would have on the cost of providing delayed loss return services, several aspects would need to be updated to reflect new information, including a decision to use 3 years of loss data instead of 1, using NT and PTP data associated with financial, Slice, and In-Kind loss returns, and updating the unit costs of each type of capacity.

For technical questions about this response, please contact Rebecca Fredrickson by email refredrickson@bpa.gov.

Summary Tab

using 1.9% flat annual loss factor			
	Concurrent Losses MWh - flat annual loss factor	Max MW Concurrent Losses less Delayed Loss Returns (both flat annual loss factor)	Min MW Concurrent Losses less Delayed Loss Returns (both flat annual loss factor)
Oct-18	184,252	82	-157
Nov-18	198,821	153	-137
Dec-18	223,281	123	-119
Jan-19	249,700	166	-110
Feb-19	190,476	187	-176
Mar-19	209,156	158	-131
Apr-19	218,590	123	-117
May-19	225,764	146	-144
Jun-19	231,850	128	-112
Jul-19	272,577	188	-153
Aug-19	280,015	123	-106
Sep-19	262,718	91	-142

Capacity to support returned losses (flat annual loss factor)		
BPA provided INCs and DECs		
	INC $	DEC $
Oct-18	$477,240	$142,870
Nov-18	$890,460	$124,670
Dec-18	$715,860	$108,290
Jan-19	$966,120	$100,100
Feb-19	$1,088,340	$160,160
Mar-19	$919,560	$119,210
Apr-19	$715,860	$106,470
May-19	$849,720	$131,040
Jun-19	$744,960	$101,920
Jul-19	$1,094,160	$139,230
Aug-19	$715,860	$96,460
Sep-19	$529,620	$129,220
Total Dollars	$9,707,760	$1,459,640
Total Losses MWh	2,747,200	2,747,200
$/MWh	**$3.53**	**$0.53**

INCS:	$	5.82	kW-mo
DECS:	$	0.91	kW-mo

using monthly shaped loss factors (with an annual average of 1.9%)			
	Concurrent Losses MWh - monthly shaped loss factors	Max MW Concurrent Losses less Delayed Loss Returns (both monthly shaped loss factors)	Max MW Concurrent Losses less Delayed Loss Returns (both monthly shaped loss factors)
Oct-18	167,057	74	-142
Nov-18	179,323	138	-124
Dec-18	211,565	117	-113
Jan-19	252,034	168	-111
Feb-19	190,037	187	-176
Mar-19	198,168	150	-124
Apr-19	213,023	120	-114
May-19	219,100	142	-140
Jun-19	264,289	146	-128
Jul-19	313,205	216	-176
Aug-19	311,271	137	-118
Sep-19	247,940	86	-134

Capacity to support returned losses (monthly shaped loss factors)		
BPA provided INCs and DECs		
	INC $	DEC $
Oct-18	$432,702	$129,537
Nov-18	$803,135	$112,444
Dec-18	$678,298	$102,608
Jan-19	$975,152	$101,036
Feb-19	$1,085,832	$159,791
Mar-19	$871,251	$112,947
Apr-19	$697,627	$103,758
May-19	$824,638	$127,172
Jun-19	$849,190	$116,180
Jul-19	$1,257,247	$159,983
Aug-19	$795,767	$107,227
Sep-19	$499,829	$121,952
Total Dollars	$9,770,669	$1,454,634
Total Incurred MWh	2,767,013	2,767,013
$/MWh	**$3.53**	**$0.53**

CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the foregoing on January 29, 2021 by uploading it to the Bonneville Power Administration's secure website. Pursuant to Section 1010.10(a) of the Rules of Procedure of the Bonneville Power Administration, such filing constitutes service on all Litigants.

Submitted by,

/s/ Irene A. Scruggs
Irene A. Scruggs
General Counsel
Public Power Council