



Anchor Data Set 2032 ADS

Dispatch Results _ Iteration 4

July 27, 2022

Jamie Austin, Chair

Overview

- **Status**
 - Loads
 - Resources
 - Hydro
- **Pending Issues**
- **Impact on Distpatch**

Data that impacts the full Dispatch

- All data in the 2032 ADS have been developed based on assumptions developed \ approved by PCDS - Have we made the right assumptions?
 - Loads – we start with L&R monthly loads (Peak and energy) we make assumption when developing the “hourly forecast”
 - Resources – we start with L&R resources and make assumptions on where to place the resource
 - Other data developed with major assumption: Fuel prices, Heat Rates, Maintenance, etc. (All the elements constituting the dispatch of the Western Interconnect)
- Do we need to tweak the assumptions to obtain reasonable results?
 - It has been just a couple of weeks since we’ve succeeded in running a full year
 - Just today we’re looking to see if the 2032 ADS Resources matches L&R resources by technology at the BAA level

Pending Issues

Loads

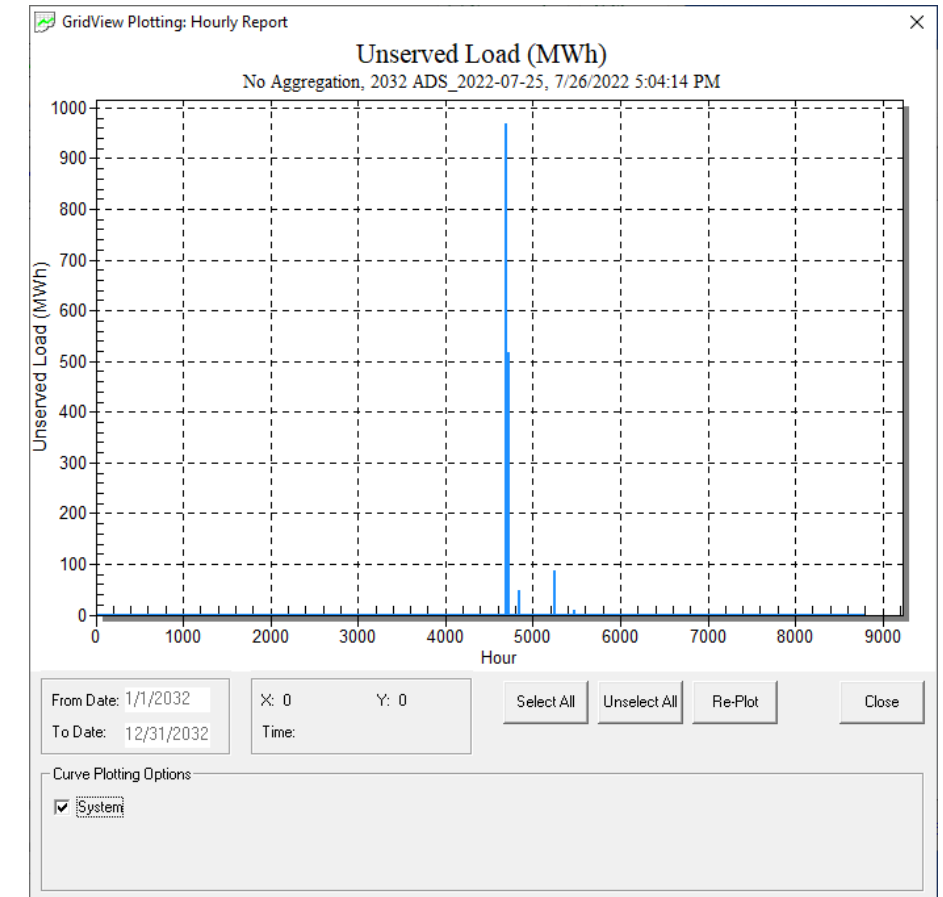
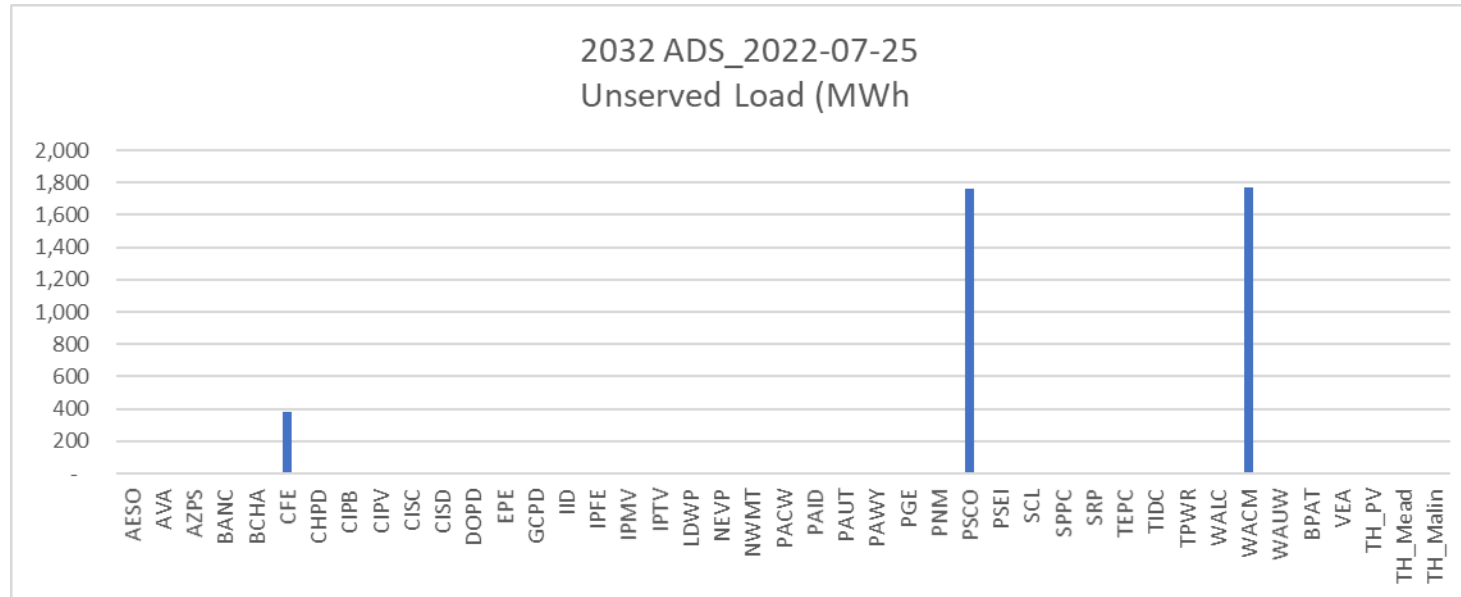
■ LA Loads Issue

- Why are we adding the 500 MW demand response (non-firm) to firm loads? Chifong shared the concern “I thought usually utilities use DR as an extra added “insurance” when there is an issue with meeting the load.”
- Yi warned:
 - “It is true we need to include both firm and non-firm load to be consistent with other BAAs, but we may better to confirm if the 500 MW load available for DSM isn't already included, likely reason for higher-than-expected peak demand, compared to the CEC forecast?
 - Regarding the BTM PV peak impact, apparently LADWP's submitted data are the peak values of BTM PV output, which normally do not happen in the same hour when the load hits the peak.
 - LA has 500 MW 2-R load in every month, but SCE's 2-R value varies from month to month between about 10 MW to 100 MW. Considering the ratio of total load in LA and SCE is about 1:4, 500 MW 2-R load seems too high for LA.”

■ In addition, what are we doing to address the following pending issues?

- Unserved Load for three BAAs:
 - PSCO,
 - WACM
 - CFE?

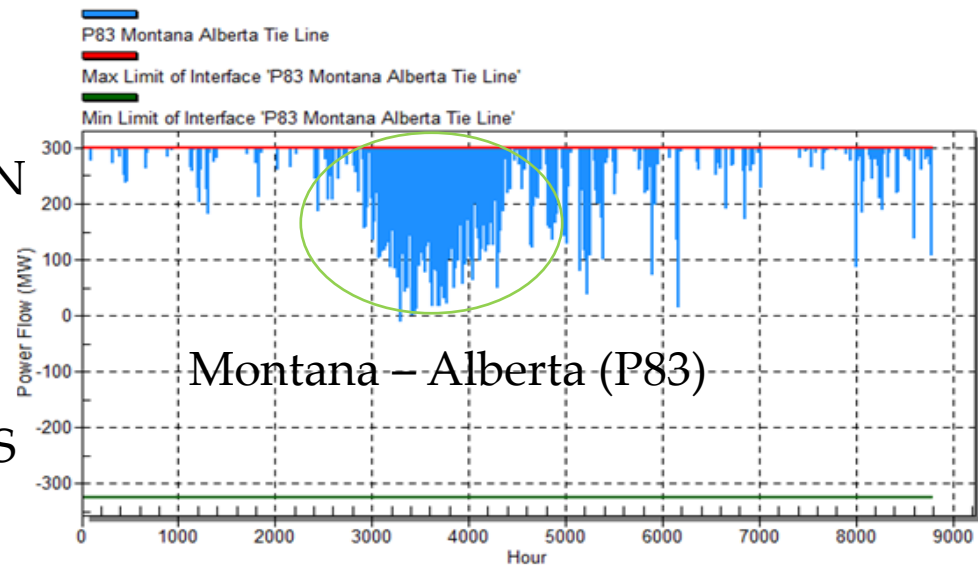
Load Validation



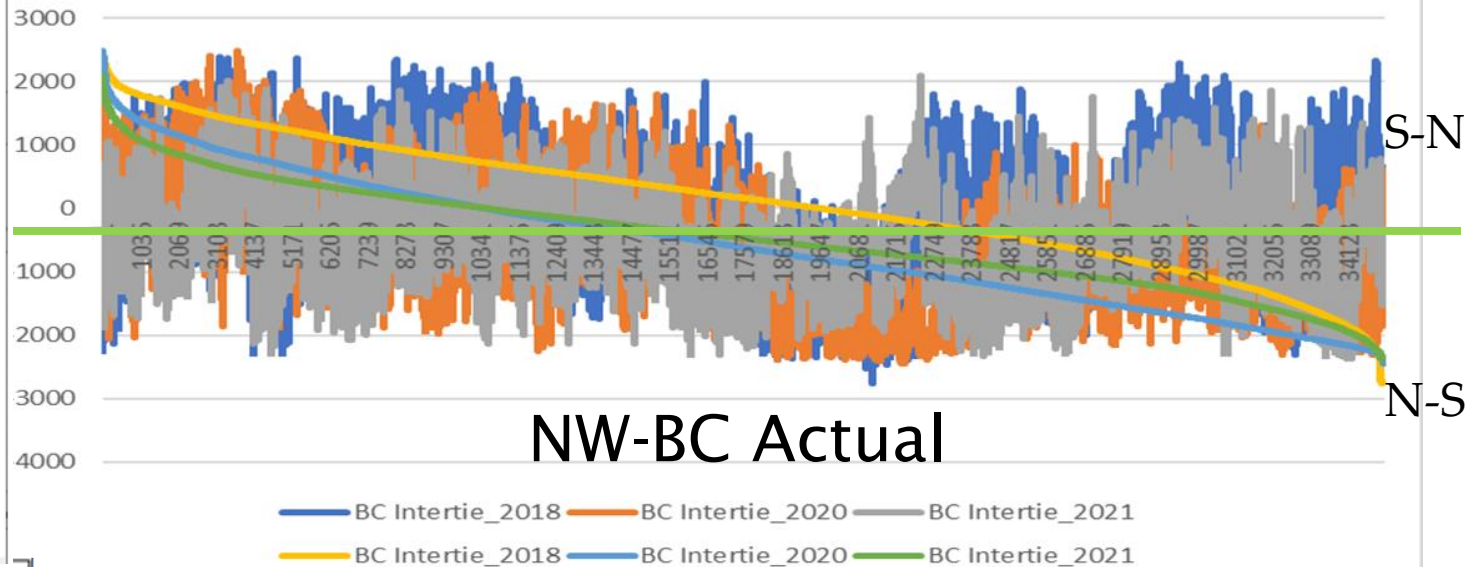
Addressing BC Hydro Modeling Issues

- Jin: “ Input Hydro Data
 - Maybe have missed some of BPA units
 - Monthly – Daily Operating Range is 3 times higher than Weekly – Daily operation range; 14,000 MW versus 4,000 MW in January
- The new data from Kevin for BC does change the results but sends excessive power from the US to BC.
 - We need to further discuss as proposed on Monday to allow for running additional analyses, before approving the case on Wednesday.
 - Again, how the proposal to increase BPA’s Daily Operating Range of the Weekly data to be consistent with the Daily Operating Range in Monthly data?
- Anders: “Could we also check if there are potential load / resource balance issues with Alberta, since we seemed to have a lot of power flowing through BC to Alberta?”

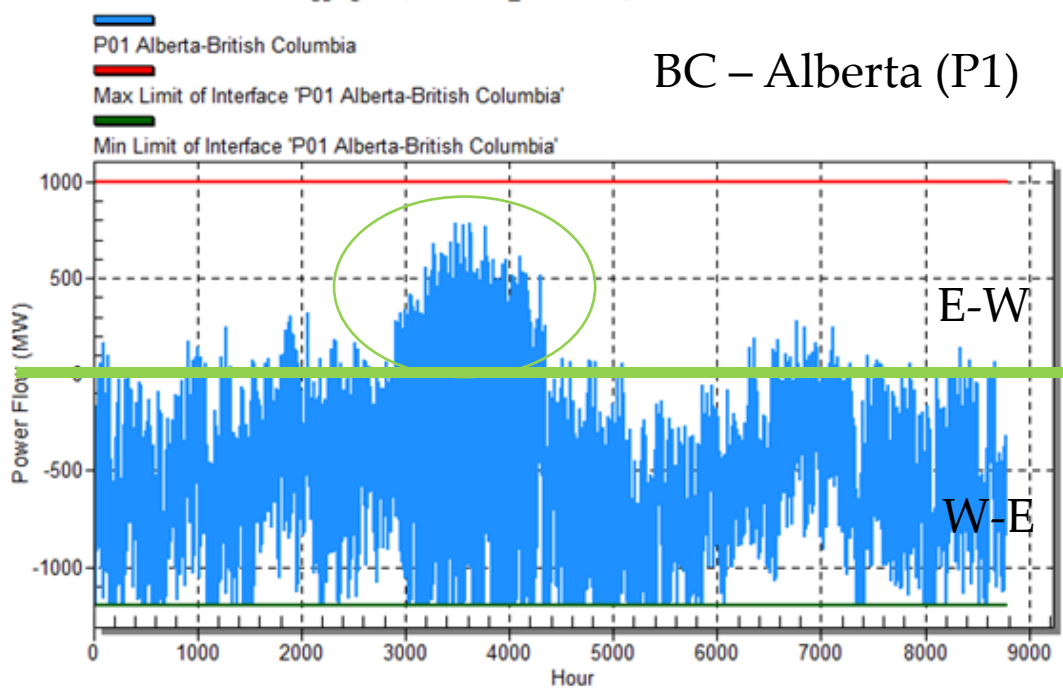
Power Flow (MW)
No Aggregation, 2032 ADS_2022-07-25, 7/26/2022 6:09:29 PM



BC Intertie (West + East)

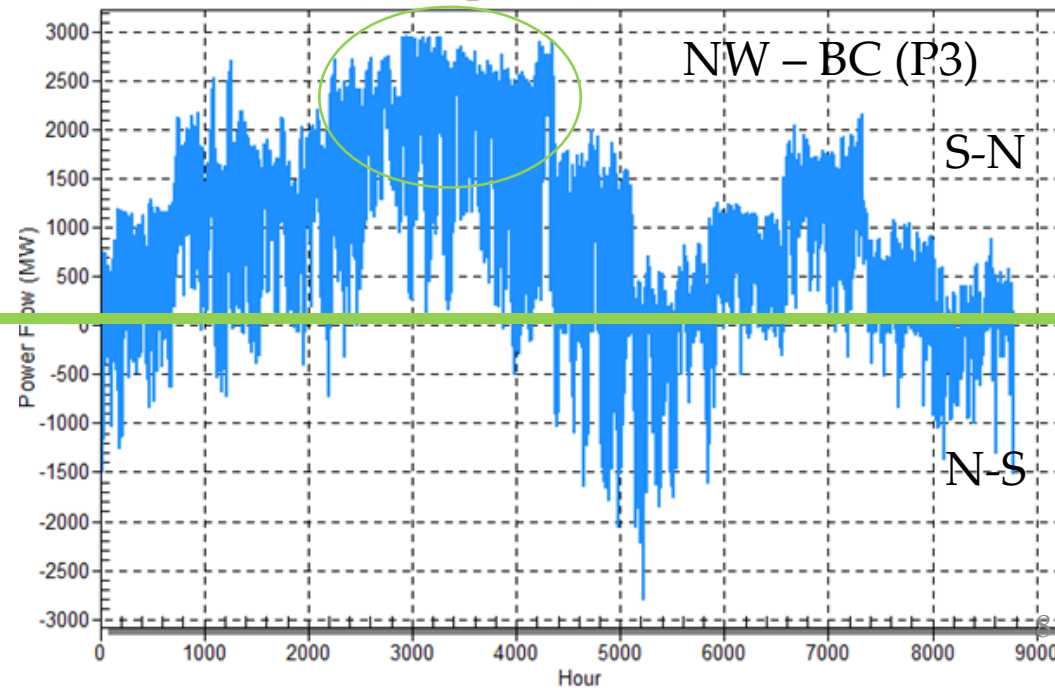


Power Flow (MW)
No Aggregation, 2032 ADS_2022-07-25, 7/26/2022 6:10:26 PM



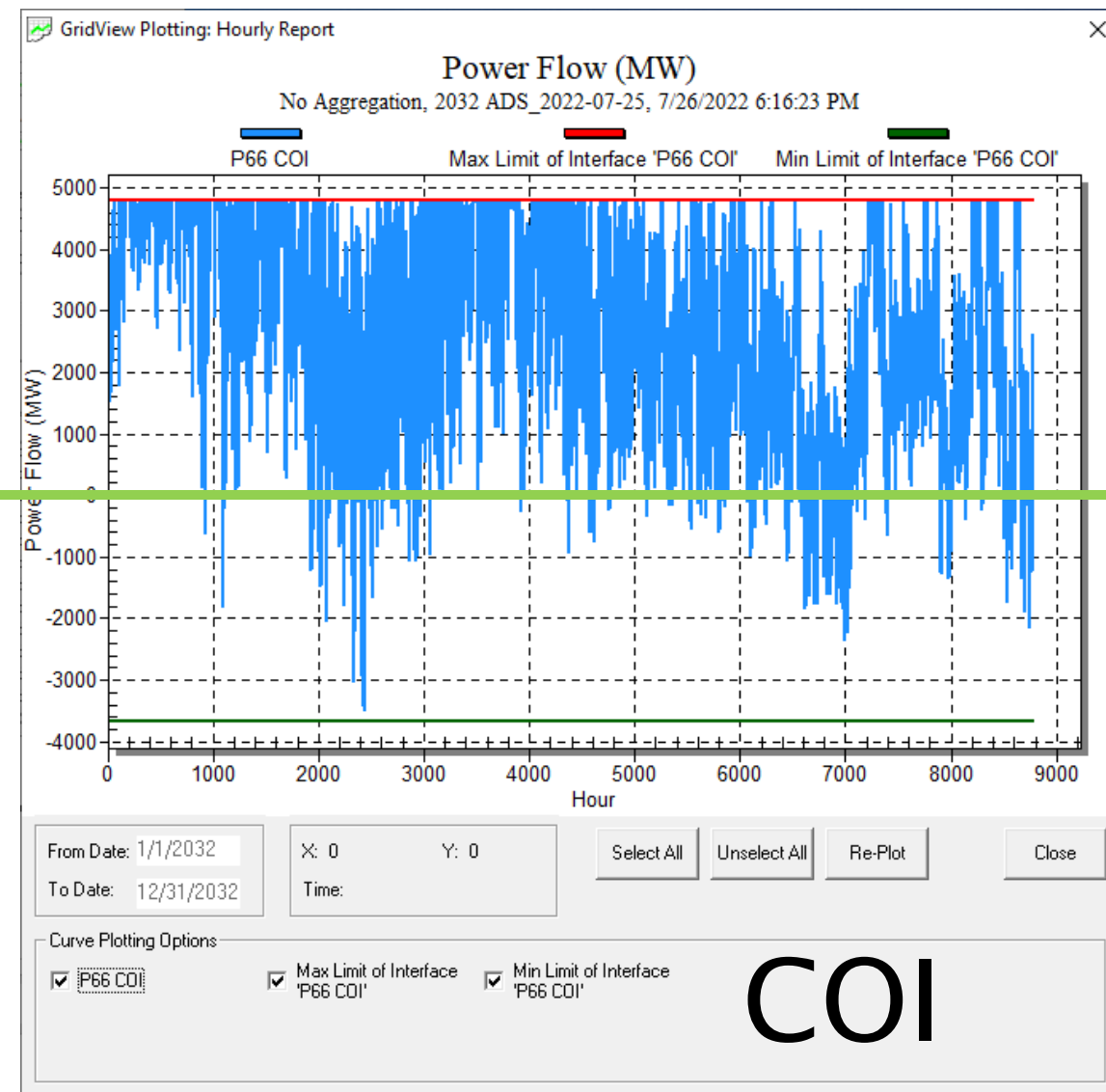
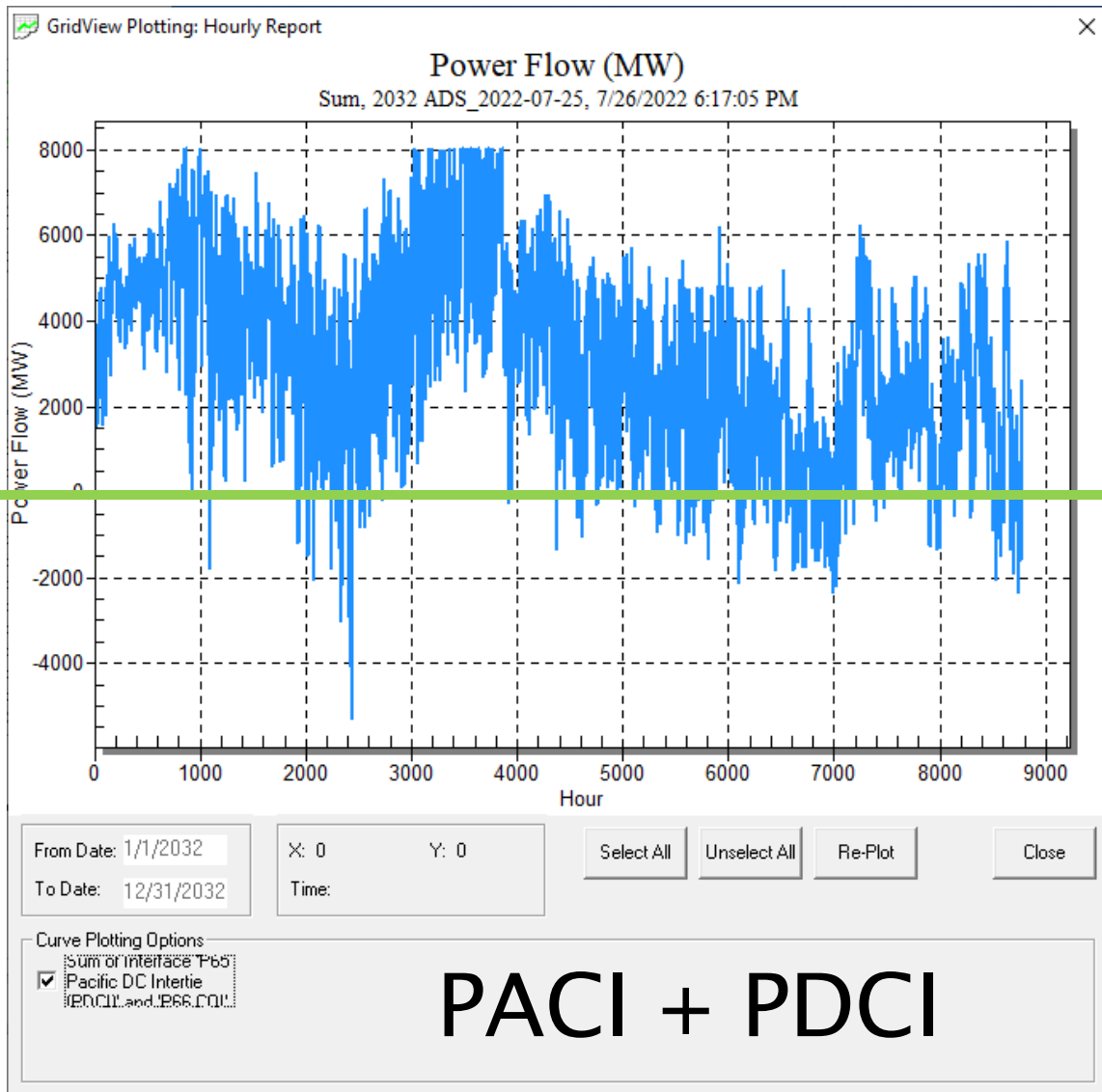
Power Flow (MW)

Sum, 2032 ADS_2022-07-25, 7/26/2022 6:17:58 PM



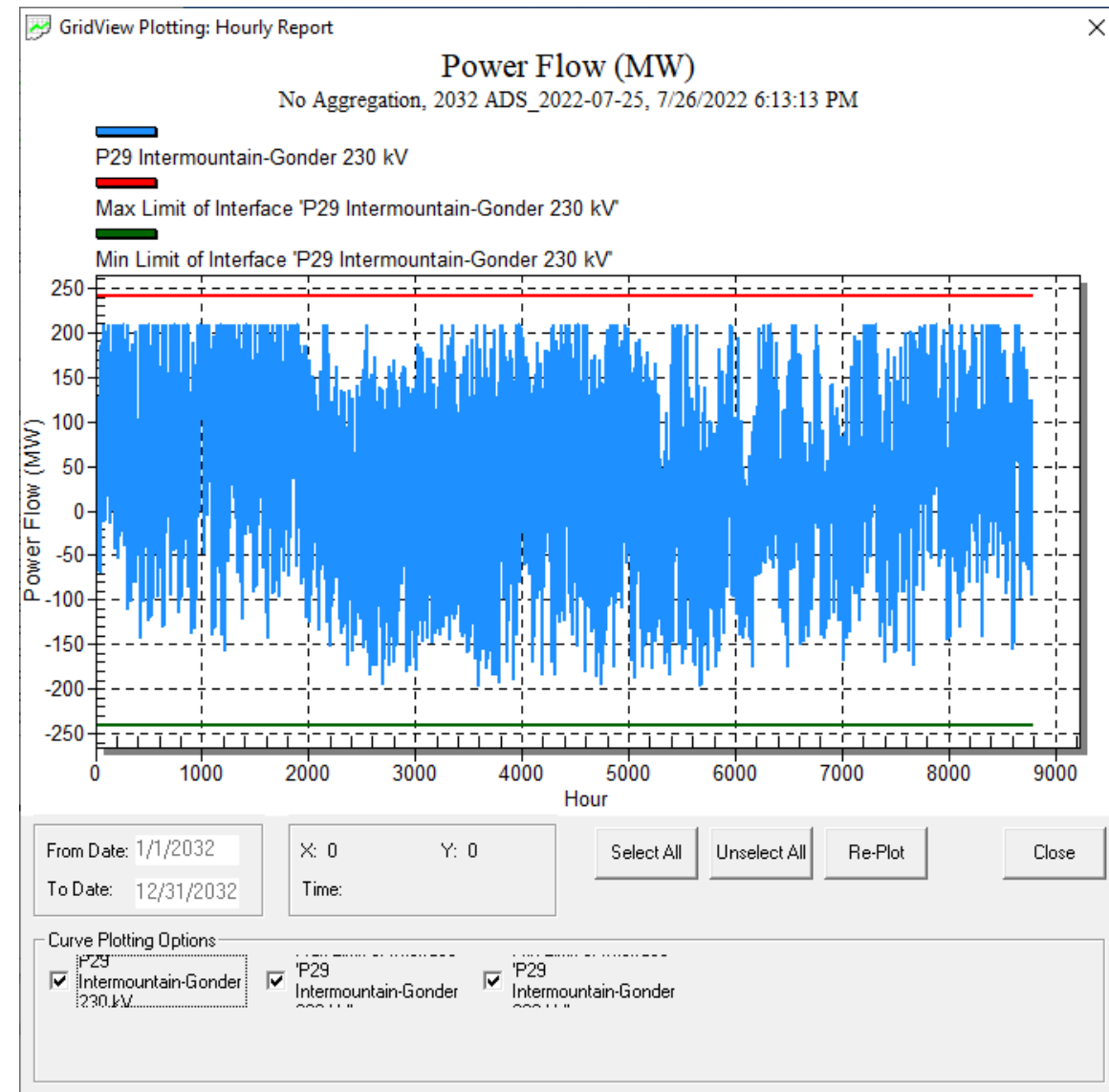
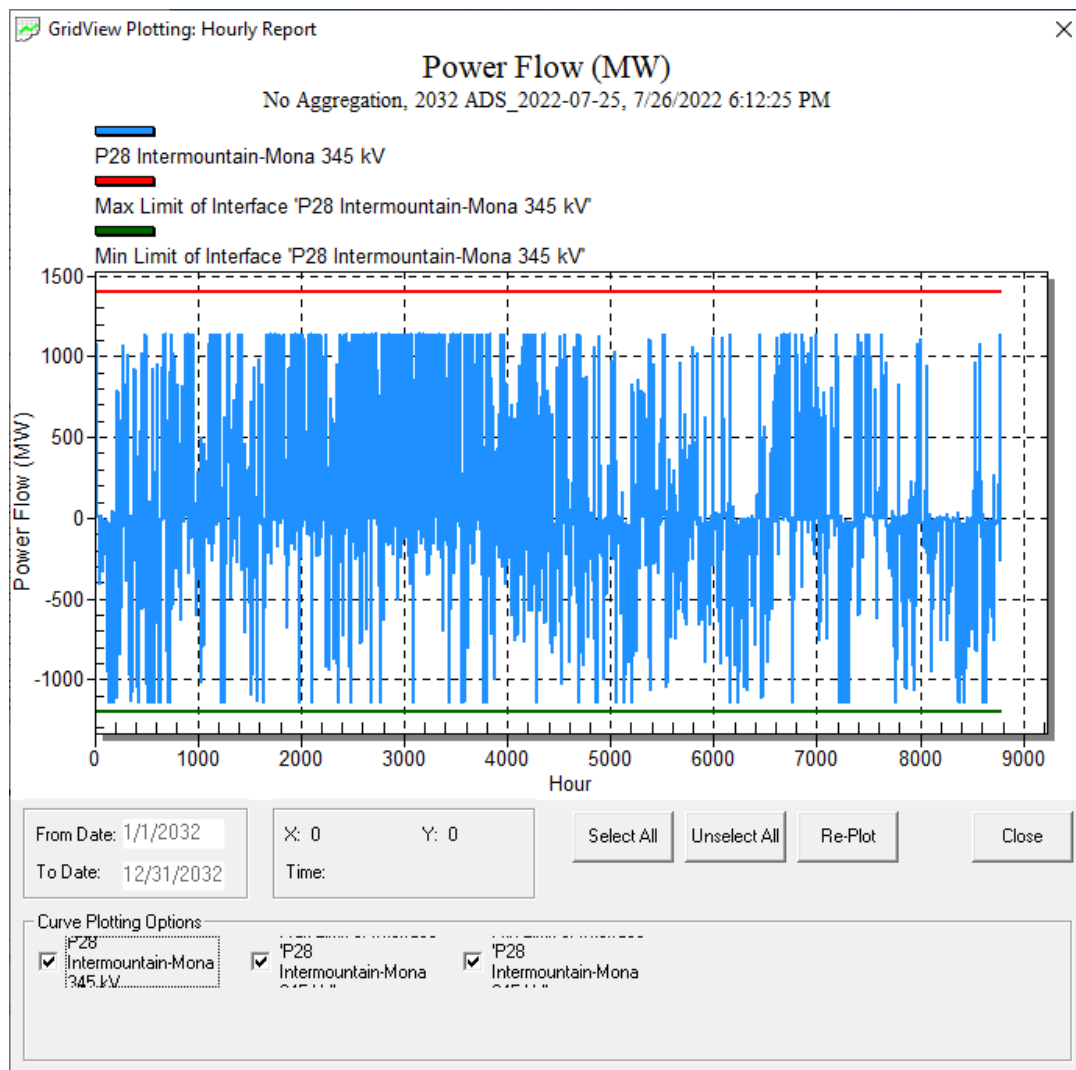
BC Hydro Dispatch

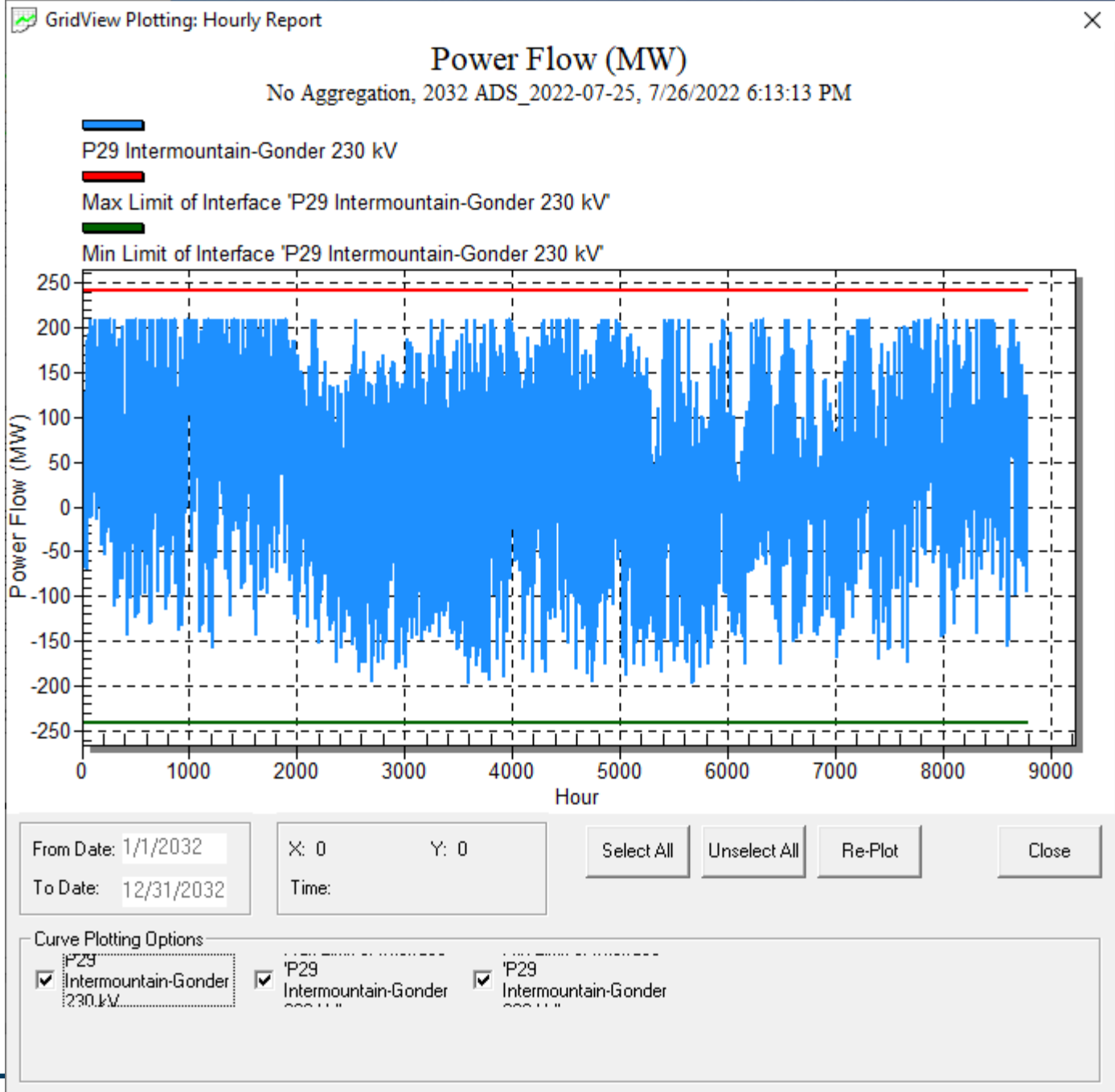
- Tyler on behalf of Kevin:
 - “...small units do not appear to have flexibility in the hourly data, leading to 0 MW operating range.
 - Also, the monthly data provided by Steven to Jin appears to have large operating ranges, many times, max – min.
 - We agreed that the BPA hydro weekly data in the 2032 ADS PCM is the best data and shouldn't be changed.”



Pending Issues _ 2022-07-25

- Yi: “Just noticed that many 230 kV and above transmission lines and transformers are not enforced in the ADS PCM. Can anyone help to double check this in case I missed anything?”
- Steven: “we should process the output of the Data Sanity Checking for the case” . . . Tyler, I think before we post this, we need to clean out all of the unreferenced DAT files, generators, and branches in Interfaces. Several bus connection problems, unit IDs and so on.”





Paths

<i>Total Congestion Hours (Hr)</i>	<i>2032 ADS_2022-07-25</i>
P83 Montana Alberta Tie Line	7745
P42 IID-SCE	7190
P27 Intermountain Power Project DC Line	2090
P26 Northern-Southern California	936
P66 COI	900
P45 SDG&E-CFE	811
P01 Alberta-British Columbia	672
P30 TOT 1A	542
Pth BPA Net COB (NW AC Intertie)	519
P31 TOT 2A	519
P18 Montana-Idaho	440
P24 PG&E-Sierra	384
P16 Idaho-Sierra	341
Pth BPA Northwest AC Intertie (NWACI)	300
Pth ATC _IPP DC pole balancing	276
P75 Hemingway-Summer Lake	154
P48 Northern New Mexico (NM2)	151
P32 Pavant-Gonder InterMtn-Gonder 230 kV	136
P79 TOT 2B2	117
P08 Montana to Northwest	109

Branches

<i>Total Congestion Hours (Hr)</i>	<i>Type</i>	<i>2032 ADS_2022-07-25</i>
30948_34817_1	ELKHIL_G	5136
64095_64094_1	Silver Peak PS	4750
50784_50822_2	NLY PS	3679
18073_189101_1	IS TAP	3145
64905_38136_1	MARBLE XFMR	3026
18003_189001_1	AMARGOSA XFMR	2703
19020_24017_1	BLYTHE	2683
30879_30881_1	Branch	1880
12181_12101_1	Branch	1746
47844_40584_1	Branch	1709
72818_73009_1	Branch	1604
40537_640518_1	Branch	871
30470_30479_1	Branch	842
54232_50776_1	Branch	721
10292_10842_1	Branch	647
11014_11017_1	Branch	597
26043_65995_1	Branch	520
47844_47486_1	Branch	473
25406_24806_1	Branch	463
45337_45335_1	Branch	370
45162_45075_1	Branch	336
21690_21699_1	Branch	334
64025_64023_1	Branch	301
26041_64056_1	Branch	294
60150_60095_1	Branch	264
61850_60831_1	Branch	230
50830_54329_1	Branch	223
73192_70311_1	Branch	170

Gen_Avg_LMP (\$/MWh)

Simple Average LMP (\$/MWh)

MS_G2
Newman CC5b
Newman CC5a
MS_G1
RioGrande9
Hatch_Solar_EC
APT_DIST_PV
HECATE
Montana_3_G3
Montana_1_G1
Montana_4_G4
Montana_2_G2
PAT_DIST_PV
CHAP_DIST_PV
BV_PV2
BV_PV1
Newman_6GT5
FosterCreek2
FosterCreek1
DG-BTM_NEVP_NV_Nye
Primrose_1
Lowe1_1
Poplar_Hill_1
ElmworthG9_9
ElmworthG8_8
ElmworthG7_7
ElmworthG6_6
ElmworthG5_5
ElmworthG10_10
MAHKESESG2_2
MAHKESESG1_1
WeyerhaeuserBio

Area

EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
EPE
AESO
AESO
NEVP
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO
AESO

Fuel

Hourly
NG_West Texas_Waha
NG_West Texas_Waha
Hourly
NG_West Texas_Waha
Hourly
Hourly
Hourly
NG_West Texas_Waha
NG_West Texas_Waha
NG_West Texas_Waha
NG_West Texas_Waha
Hourly
Hourly
Hourly
Hourly
NG_West Texas_Waha
Hourly
Hourly
Hourly
Hourly
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
NG_Alberta_NOVA
Hourly
Hourly
Bio_Wood

2032 ADS_2022-07-25

326.64
275.96
275.96
187.43
177.53
177.48
177.06
176.97
176.85
176.83
176.82
176.80
176.70
176.65
176.53
176.52
175.97
79.67
79.67
77.28
76.94
76.53
76.51
76.37
76.37
76.37
76.37
76.37
76.37
75.89
75.89
75.46

What measures are necessary that determines Version 1.0 is “Credible?”

- Still working on addressing anomalies in Loads
- Still have Unserved Load
- We have Excessive Congestion on Transmission Paths, Branches
- Have not had time to check if multiple Generator Maintenance schedule fall in the same week \ month
- Have not investigated the reason for surges in LMP prices
- Have not had time to investigate the Operation of Phase Shifters, Pump Storage, Batteries, etc.
- We've seen discrepancies in capacity installed in the case vs. what's been submitted in the L&R. Still need to validate generator output by technology (e.g., acceptable capacity factor, number of starts); and if fuel prices are leading to acceptable dispatch.

Are we ready to approve the 2032 ADS - version 1.0 and call it Credible?

- We've made great advancement in the 2032 ADS with the help from DOE, National Labs, Subject Matter Experts. We've added new capabilities to the software... yet, we haven't had a chance to see the resounding impact on the dispatch.
- Is the case ready for NorthernGrid to Export multiple hours to build base cases for their Transmission System Plan analyses?
- We first need to answer: How many entities have signed-off on their respective system dispatch (regions, system owners, National Labs – users of the dataset)? The answer is none so far.
- Does compiling data in the dataset and succeeding in getting a run for a year's results lead to a *credible case*? My answer is **NO**



Contact:

Jamie Austin

Jamie.austin@pacificorp.com