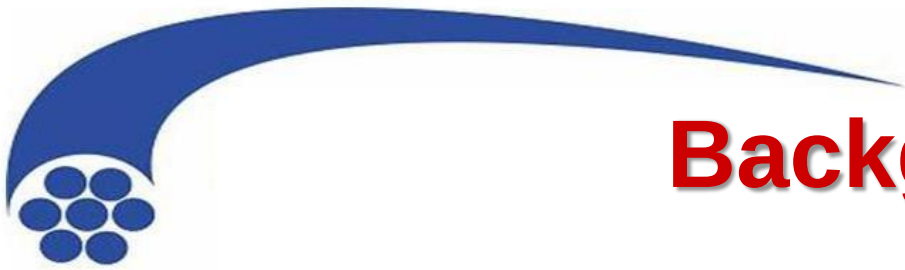


Stakeholder Comment Process: NTTG 2018-2019 Stressed Conditions and Proposed Change Case Matrix

August 15, 2018



Background

The NTTG Technical Workgroup is proposing the following for the 2018-2019 planning cycle :

1. Nine stressed conditions to study (slides 4-39)

- A. Heavy Summer Case
- B. Heavy Winter Case
- C. High B2H Import Case
- D. High B2H Export Case

- E. TOT2/COI/PDCI Case
- F. Heavy Wyoming Wind
- G. High Borah West Case
- H. Maximum NTTG Export
- I. High Aeolus South & West

2. A Change Case Matrix (slide 40-41) delineating the combination of projects and stressed conditions to be studied



Stakeholder Comments

Stakeholder comments on the system conditions and combinations of projects and flows to be studied for the NTTG 2018-2019 cycle are welcome

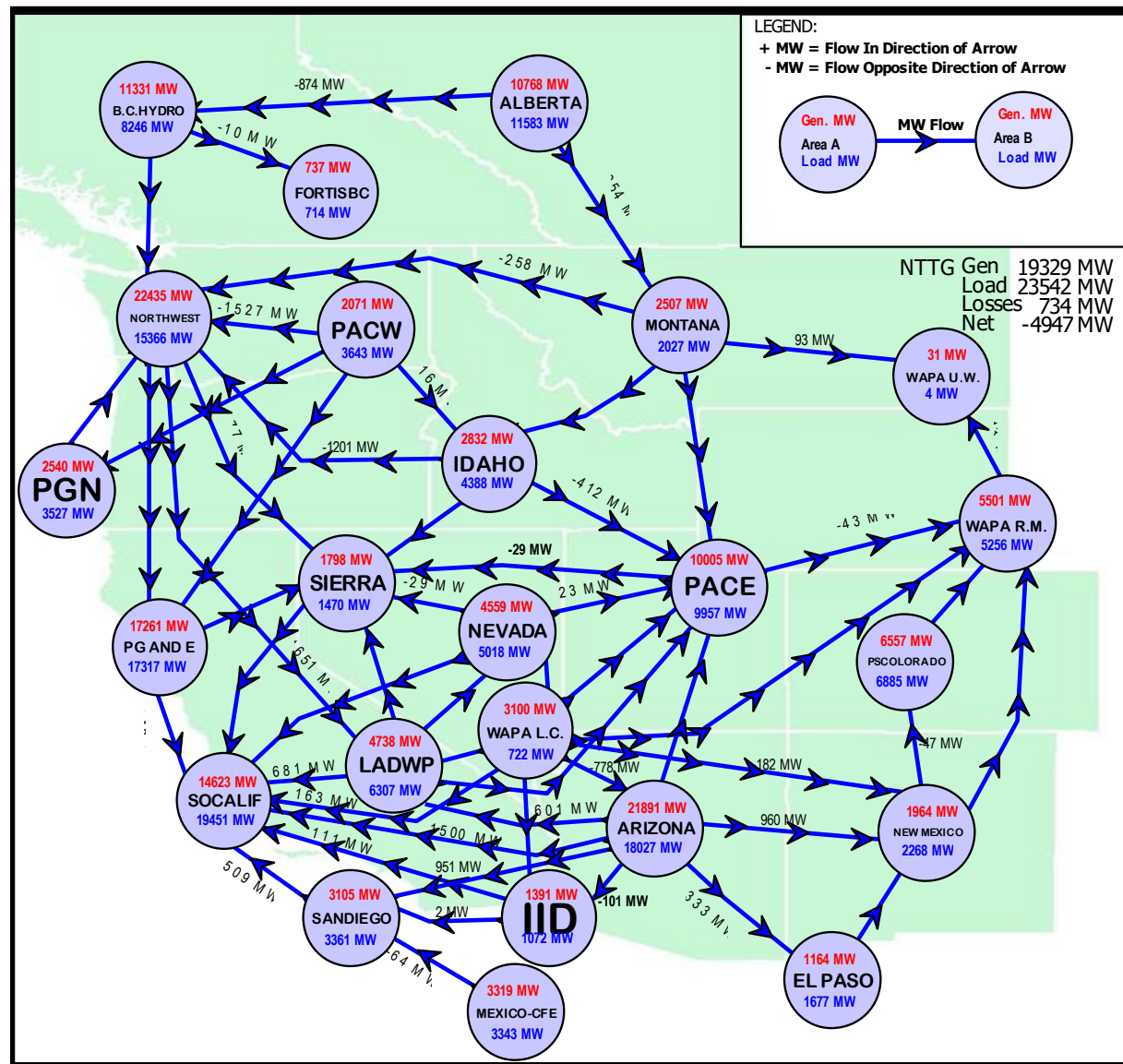
- Comments should be submitted using the NTTG Stakeholder Comment Form that is posted on the NTTG website
- Comment Deadline is Friday, August 24, 2018 @ 5:00 pm Mountain
- Comments will be considered and a vote on modifications, if any, will be conducted by the NTTG Planning Committee at the September Committee meeting



Case A - Heavy Summer seed case

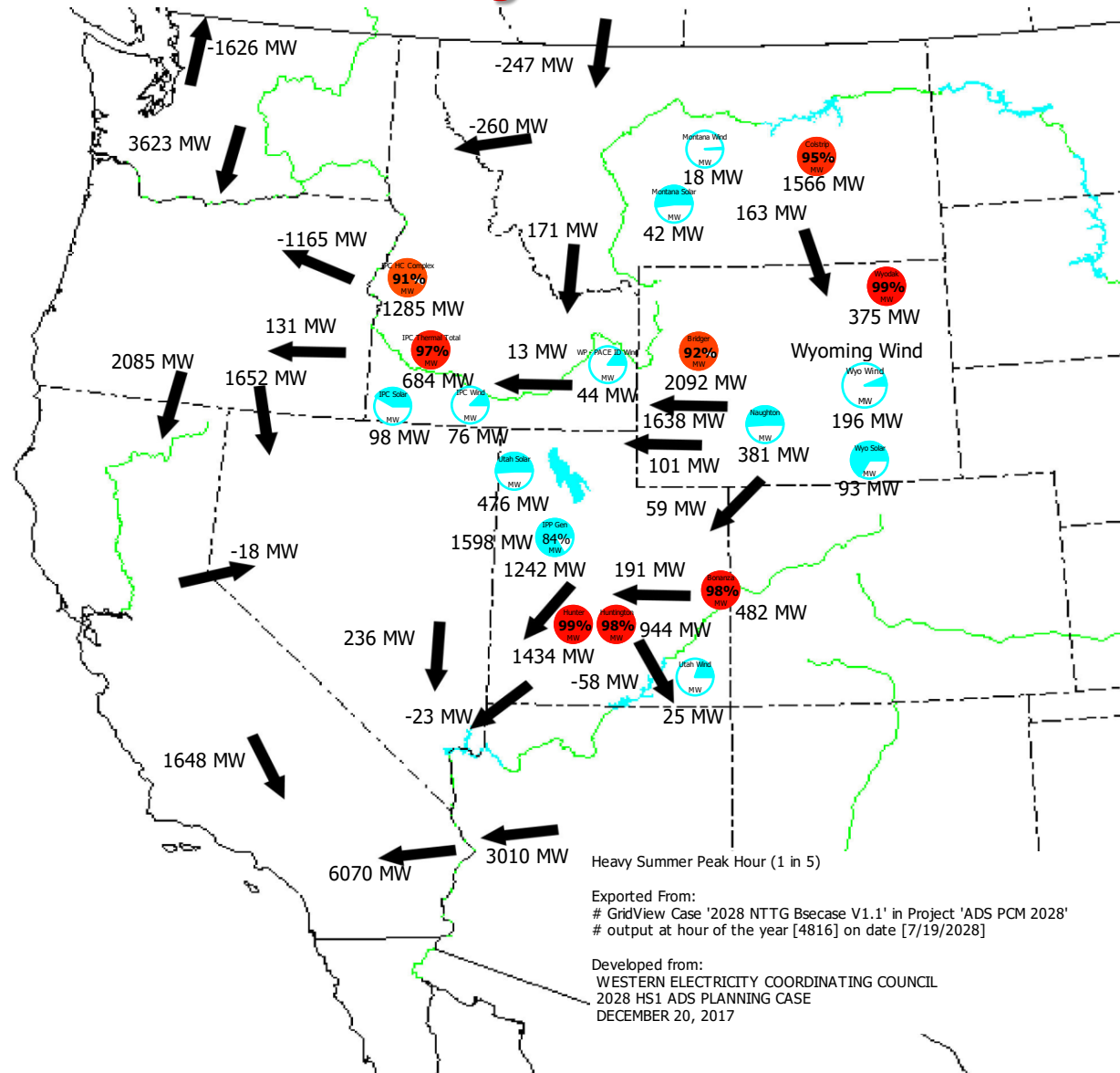
- Heavy Summer seed case, adjusted to 1 in 5 conditions. Seed case from the peak hour, July 19th @ 4PM
- Adjusted from 1 in 2 peak
 - Idaho – 104.4%
 - Northwestern – 104.7%
 - PACW – 113.2%
 - PACE – 102.0%
 - PGE – 125%

Case A - Heavy Summer seed case





Case A - Heavy Summer seed case





Case A - Heavy Summer seed case

Interface Number	Name	Interface MW Flc	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-858.6	-85.86	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.07	150	-150
3	NORTHWEST - CANADA	-1625.7	-54.19	3000	-3150
4	WEST OF CASCADES - NORTH	3028.2	29.69	10200	-10200
5	WEST OF CASCADES - SOUTH	3188	44.28	7200	-7200
6	WEST OF HATWAI	-474.7	-11.1	4277	0
8	MONTANA - NORTHWEST	-259.9	-11.82	2200	-1350
9	WEST OF BROADVIEW	895.8	34.82	2573	0
10	WEST OF COLSTRIP	1579.2	60.78	2598	0
11	WEST OF CROSSOVER	1597.3	61.48	2598	0
14	IDAHO - NORTHWEST	-1164.6	-34.25	3400	-2250
15	MIDWAY - LOS BANOS	-118	-2.46	4800	-2000
16	IDAHO - SIERRA	-113.8	-22.77	500	-360
17	BORAH WEST	13.2	0.3	4450	-1600
18	MONTANA - IDAHO	171.4	44.75	383	-256
19	BRIDGER WEST	1638.2	68.26	2400	-600
20	PATH C	1351.4	84.46	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	827.7	35.6	2325	0
23	FOUR CORNERS 345/500	-152.7	-15.27	1000	-1000
24	PG&E - SPP	-18.5	-11.56	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	60.9	60.87	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	1648.2	41.2	4000	-3000
27	IPP DC LINE	1242.1	51.76	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	390.7	27.9	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	-35.5	-17.77	200	0
30	TOT 1A	-8.6	-1.32	650	0
31	TOT 2A	108.5	15.72	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	-65.4	-14.86	440	-235
33	BONANZA WEST	-219.7	-27.98	785	0
34	TOT 2B	-58.3	-7.47	780	-850
35	TOT 2C	-22.6	-3.77	600	-580
36	TOT 3	913.8	54.39	1680	0
37	TOT 4A	-115.1	-14.21	810	0
38	TOT 4B	17.1	2.52	680	0

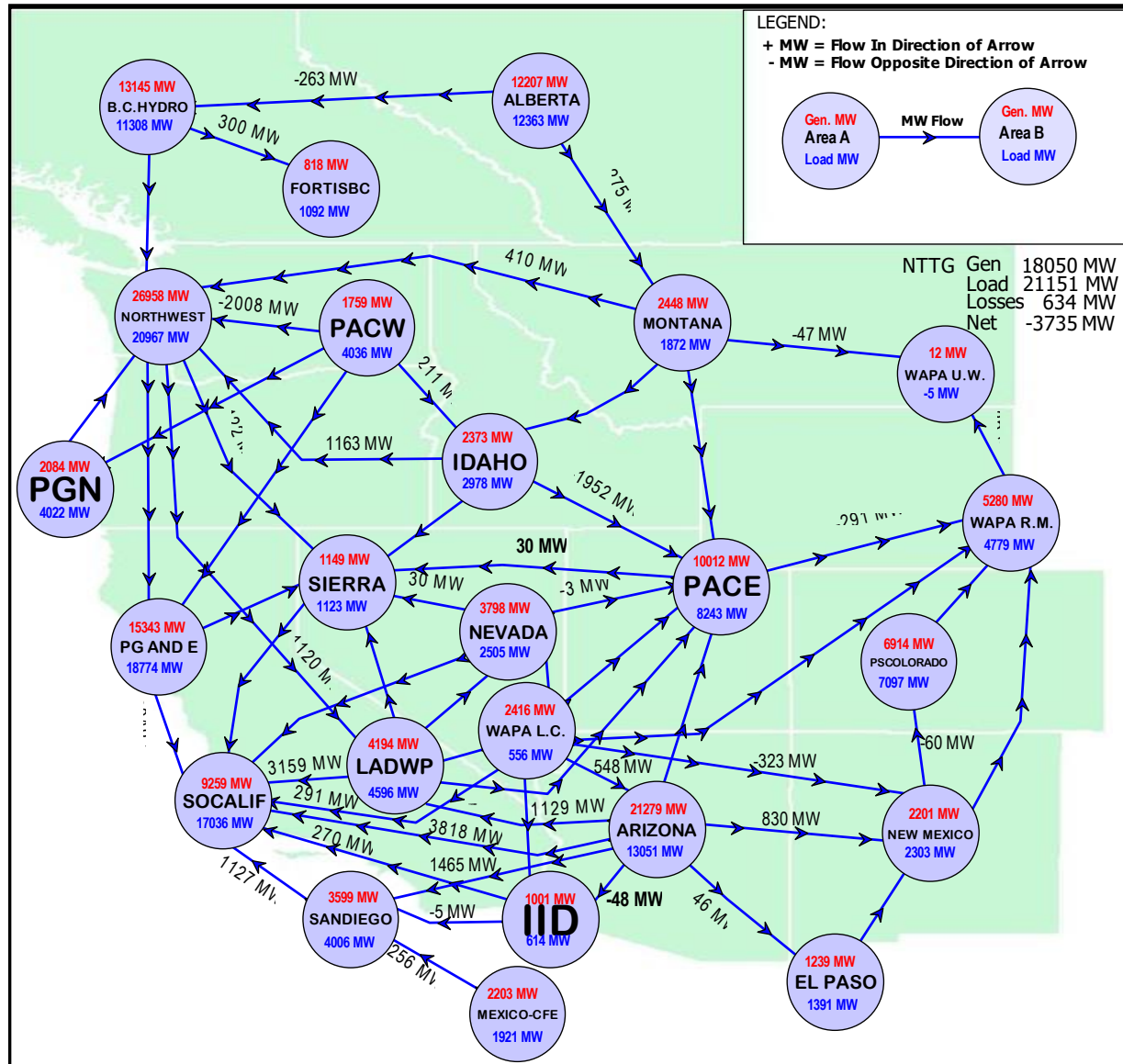
39	TOT 5	466.9	27.79	1680	0
40	TOT 7	221.2	24.85	890	0
41	SYLMAR - SCE	-271.6	-16.98	1600	-1600
42	IID - SCE	111.2	18.53	600	0
43	NORTH OF SAN ONOFRE (Retired)	508.9		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-685.2	-31.15	2200	0
45	SDG&E - CFE	-62.7	-15.36	408	-800
46	WEST OF COLORADO RIVER (WOR)	6070.4	54.2	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	197.3	18.83	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	1571.8	79.79	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	3009.9	29.8	10100	0
50	CHOLLA - PINNACLE PEAK	485.2	40.43	1200	0
51	SOUTHERN NAVAJO	620.1	22.15	2800	0
52	SILVER PEAK - CONTROL 55 KV	1.9	11.39	17	-17
54	CORONADO - SILVER KING - KYRENE	795.9	53.27	1494	0
55	BROWNLEE EAST	1411.9	73.73	1915	0
58	ELDORADO - MEAD 230 KV LINES	-27.7	-2.43	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	24.9	11.41	218	0
60	INYO - CONTROL 115 KV TIE	2.5	4.43	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	395	16.46	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	216.2	8.32	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	271.6	20.89	1300	0
65	PACIFIC DC INTERTIE (PDCI)	1651.7	53.28	3100	-3100
66	COI	2084.8	43.43	4800	-3675
71	SOUTH OF ALLSTON	2317.3	58.22	3980	-1115
73	NORTH OF JOHN DAY	3622.9	47.05	7700	-7700
75	MIDPOINT - SUMMER LAKE	-130.9	-8.73	1500	-550
76	ALTURAS PROJECT	177.2	59.06	300	-300
77	CRYSTAL - ALLEN	131.5	13.84	950	0
78	TOT 2B1	-6.2	-1.04	600	-600
79	TOT 2B2	-64.5	-24.34	265	-300
80	MONTANA SOUTHEAST	162.6	27.1	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-1181.8	-26.07	4533	-3790
82	TOTBEAST	1542.8	43.89	3515	0
83	MATL	-247	-76	325	-300
450	Wyoming Wind	195.6	6.11	3200	0



Case B - Heavy Winter seed case

- Heavy Winter seed case, adjusted to 1 in 5 conditions. Seed case from the peak hour, 12/5 @ 7PM
- Adjusted from 1 in 2 peak
 - Idaho – 115.8%
 - Northwestern – 102.8%
 - PACW – 111.4%
 - PACE – 103.3%
 - PGE – 106.5%

Case B - Heavy Winter seed case





Case B - Heavy Winter seed case

Interface					
Number	Name	Interface MW Fld	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-261.2	-26.12	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.07	150	-150
3	NORTHWEST - CANADA	-430.7	-14.36	3000	-3150
4	WEST OF CASCADES - NORTH	6545.2	64.17	10200	-10200
5	WEST OF CASCADES - SOUTH	4842.1	67.25	7200	-7200
6	WEST OF HATWAI	-160.4	-3.75	4277	0
8	MONTANA - NORTHWEST	409.2	18.6	2200	-1350
9	WEST OF BROADVIEW	1146.5	44.56	2573	0
10	WEST OF COLSTRIP	1581.7	60.88	2598	0
11	WEST OF CROSSOVER	1646.6	63.38	2598	0
14	IDAHO - NORTHWEST	1374	40.41	3400	-2250
15	MIDWAY - LOS BANOS	2359.6	49.16	4800	-2000
16	IDAHO - SIERRA	-110.7	-22.14	500	-360
17	BORAH WEST	1631.2	36.66	4450	-1600
18	MONTANA - IDAHO	-37.1	-9.67	383	-256
19	BRIDGER WEST	1671.2	69.63	2400	-600
20	PATH C	102	6.37	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1140.4	49.05	2325	0
23	FOUR CORNERS 345/500	54.9	5.49	1000	-1000
24	PG&E - SPP	-31.4	-19.63	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	59.1	59.1	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	-2048.1	-51.2	4000	-3000
27	IPP DC LINE	1288.2	53.68	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	263.5	18.82	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	42.5	21.27	200	0
30	TOT 1A	143.8	22.12	650	0
31	TOT 2A	124.7	18.07	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	71.6	16.26	440	-235
33	BONANZA WEST	-316.3	-40.29	785	0
34	TOT 2B	-61.8	-7.93	780	-850
35	TOT 2C	2.7	0.45	600	-580
36	TOT 3	661.3	39.37	1680	0
37	TOT 4A	-37	-4.56	810	0
38	TOT 4B	135.4	19.9	680	0

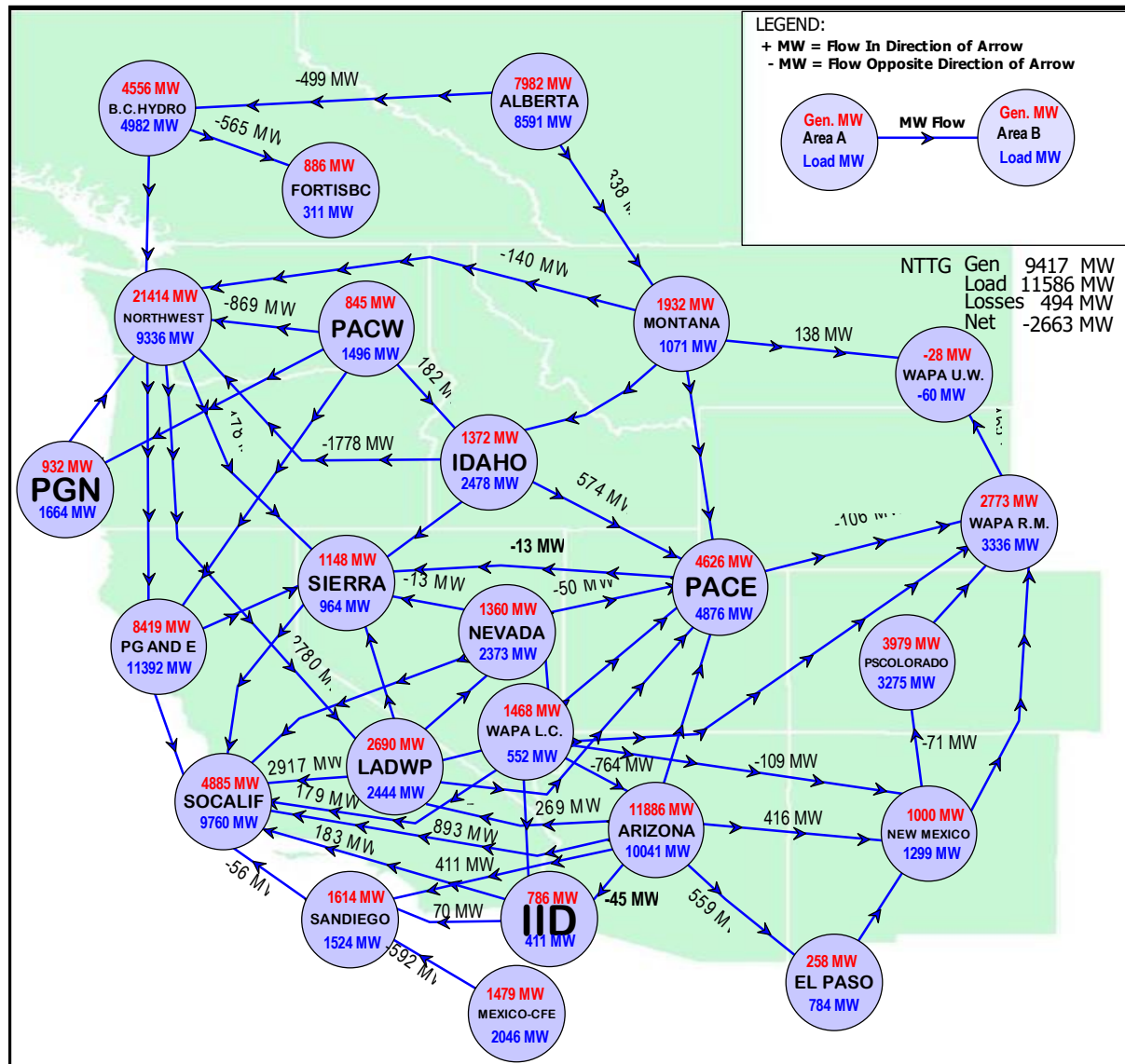
39	TOT 5	389.6	23.19	1680	0
40	TOT 7	174.6	19.62	890	0
41	SYLMAR - SCE	1422.4	88.9	1600	-1600
42	IID - SCE	269.9	44.98	600	0
43	NORTH OF SAN ONOFRE (Retired)	1127.3		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-1299.3	-59.06	2200	0
45	SDG&E - CFE	258.1	63.25	408	-800
46	WEST OF COLORADO RIVER (WOR)	10257.6	91.59	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	-203.9	-19.46	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	1339.5	67.99	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	6568.7	65.04	10100	0
50	CHOLLA - PINNACLE PEAK	560.3	46.69	1200	0
51	SOUTHERN NAVAJO	-166.1	-5.93	2800	0
52	SILVER PEAK - CONTROL 55 KV	0.8	4.89	17	-17
54	CORONADO - SILVER KING - KYRENE	815.7	54.6	1494	0
55	BROWNLEE EAST	840.9	43.91	1915	0
58	ELDORADO - MEAD 230 KV LINES	-110.1	-9.66	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	50.8	23.32	218	0
60	INYO - CONTROL 115 KV TIE	5.2	9.37	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1558.2	64.93	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-173.3	-6.67	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	1061	81.62	1300	0
65	PACIFIC DC INTERTIE (PDCI)	1120.9	36.16	3100	-3100
66	COI	1796.8	37.43	4800	-3675
71	SOUTH OF ALLSTON	1429.8	35.92	3980	-1115
73	NORTH OF JOHN DAY	3200.9	41.57	7700	-7700
75	MIDPOINT - SUMMER LAKE	953.8	63.58	1500	-550
76	ALTURAS PROJECT	121.6	40.55	300	-300
77	CRYSTAL - ALLEN	17.6	1.85	950	0
78	TOT 2B1	91.9	15.31	600	-600
79	TOT 2B2	30	11.33	265	-300
80	MONTANA SOUTHEAST	-190.9	-31.82	600	-600
81	SNIT-S.NEVADA TRAN INTERFACE	-90.1	-1.99	4533	-3790
82	TOTBEAST	-112.8	-3.21	3515	0
83	MATL	-265.9	-81.82	325	-300
450	Wyoming Wind	1104.8	34.53	3200	0



Case C – High B2H Import seed case

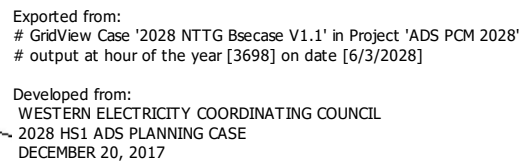
- High Flows from Northwest into Idaho, selected June 3rd at 2 AM

Case C – High B2H Import seed case



Case C – High B

The diagram shows a power system with a 510 MW generator connected to a bus. The bus is connected to a transmission line with a voltage of -325 MV. The diagram also shows a green line representing a transmission line and a black line representing a transmission line.





Case C – High B2H Import seed case

Interface Number	Name	Interface MW Flow	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-492.6	-49.26	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.05	150	-150
3	NORTHWEST - CANADA	509.8	16.99	3000	-3150
4	WEST OF CASCADES - NORTH	4811.8	47.17	10200	-10200
5	WEST OF CASCADES - SOUTH	2447.3	33.99	7200	-7200
6	WEST OF HATWAI	605.7	14.16	4277	0
8	MONTANA - NORTHWEST	-141.6	-6.44	2200	-1350
9	WEST OF BROADVIEW	180.9	7.03	2573	0
10	WEST OF COLSTRIP	857.4	33	2598	0
11	WEST OF CROSSOVER	715	27.52	2598	0
14	IDAHO - NORTHWEST	-1960.2	-57.65	3400	-2250
15	MIDWAY - LOS BANOS	-1442.4	-30.05	4800	-2000
16	IDAHO - SIERRA	118.8	23.76	500	-360
17	BORAH WEST	-829.6	-18.64	4450	-1600
18	MONTANA - IDAHO	165.7	43.26	383	-256
19	BRIDGER WEST	540.8	22.53	2400	-600
20	PATH C	1504.7	94.04	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1047.9	45.07	2325	0
23	FOUR CORNERS 345/500	-134.9	-13.49	1000	-1000
24	PG&E - SPP	-29.1	-18.17	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	61.1	61.15	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	938.9	23.47	4000	-3000
27	IPP DC LINE	2185.5	91.06	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	-489.5	-34.96	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	-38.3	-19.15	200	0
30	TOT 1A	13.4	2.06	650	0
31	TOT 2A	12.5	1.82	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	-52.5	-11.93	440	-235
33	BONANZA WEST	-229.1	-29.18	785	0
34	TOT 2B	105.4	13.52	780	-850
35	TOT 2C	49.5	8.25	600	-580
36	TOT 3	373.7	22.24	1680	0
37	TOT 4A	53.8	6.65	810	0
38	TOT 4B	-49	-7.2	680	0

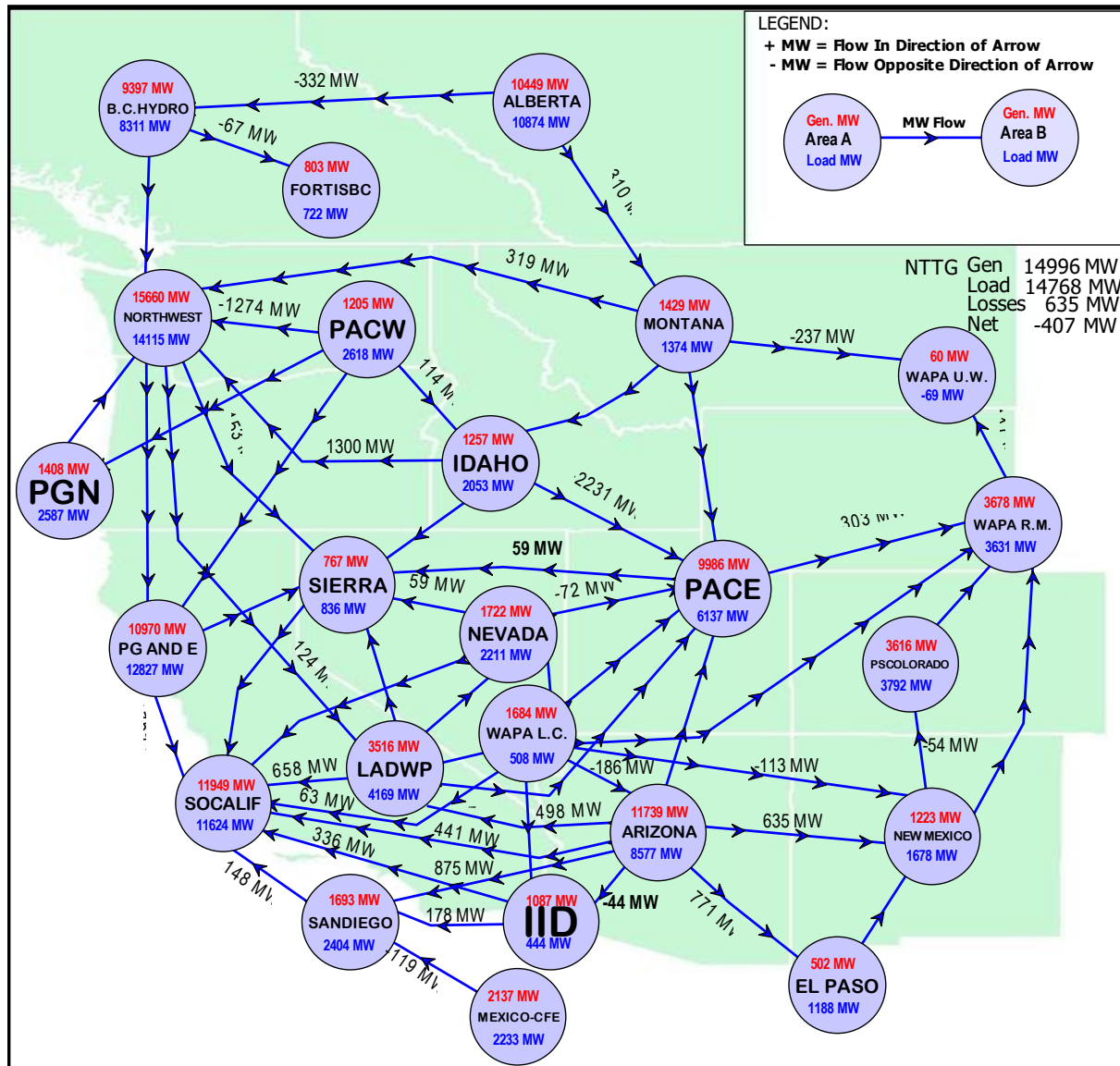
39	TOT 5	167.4	9.96	1680	0
40	TOT 7	102.9	11.57	890	0
41	SYLMAR - SCE	111.4	6.96	1600	-1600
42	IID - SCE	182.8	30.47	600	0
43	NORTH OF SAN ONOFRE (Retired)	-56.3		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-43.2	-1.96	2200	0
45	SDG&E - CFE	-590.3	-144.68	408	-800
46	WEST OF COLORADO RIVER (WOR)	1540	13.75	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	749.4	71.51	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	500.3	25.4	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	1220.6	12.08	10100	0
50	CHOLLA - PINNACLE PEAK	438.4	36.53	1200	0
51	SOUTHERN NAVAJO	961.4	34.34	2800	0
52	SILVER PEAK - CONTROL 55 KV	3.8	22.5	17	-17
54	CORONADO - SILVER KING - KYRENE	750.9	50.26	1494	0
55	BROWNLEE EAST	1308.6	68.34	1915	0
58	ELDORADO - MEAD 230 KV LINES	58.8	5.16	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	38.3	17.58	218	0
60	INYO - CONTROL 115 KV TIE	-0.7	-1.25	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1368.5	57.02	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-186.7	-7.18	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	-183.8	-14.14	1300	0
65	PACIFIC DC INTERTIE (PDCI)	2780.5	89.69	3100	-3100
66	COI	4278.5	89.14	4800	-3675
71	SOUTH OF ALLSTON	719.1	18.07	3980	-1115
73	NORTH OF JOHN DAY	4167.4	54.12	7700	-7700
75	MIDPOINT - SUMMER LAKE	-113.4	-7.56	1500	-550
76	ALTURAS PROJECT	178.3	59.42	300	-300
77	CRYSTAL - ALLEN	125.2	13.18	950	0
78	TOT 2B1	-105.4	-17.57	600	-600
79	TOT 2B2	0	0	265	-300
80	MONTANA SOUTHEAST	410.6	68.43	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-706.2	-15.58	4533	-3790
82	TOTBEAST	1422	40.46	3515	0
83	MATL	-325	-99.99	325	-300
450	Wyoming Wind	803.2	25.1	3200	0



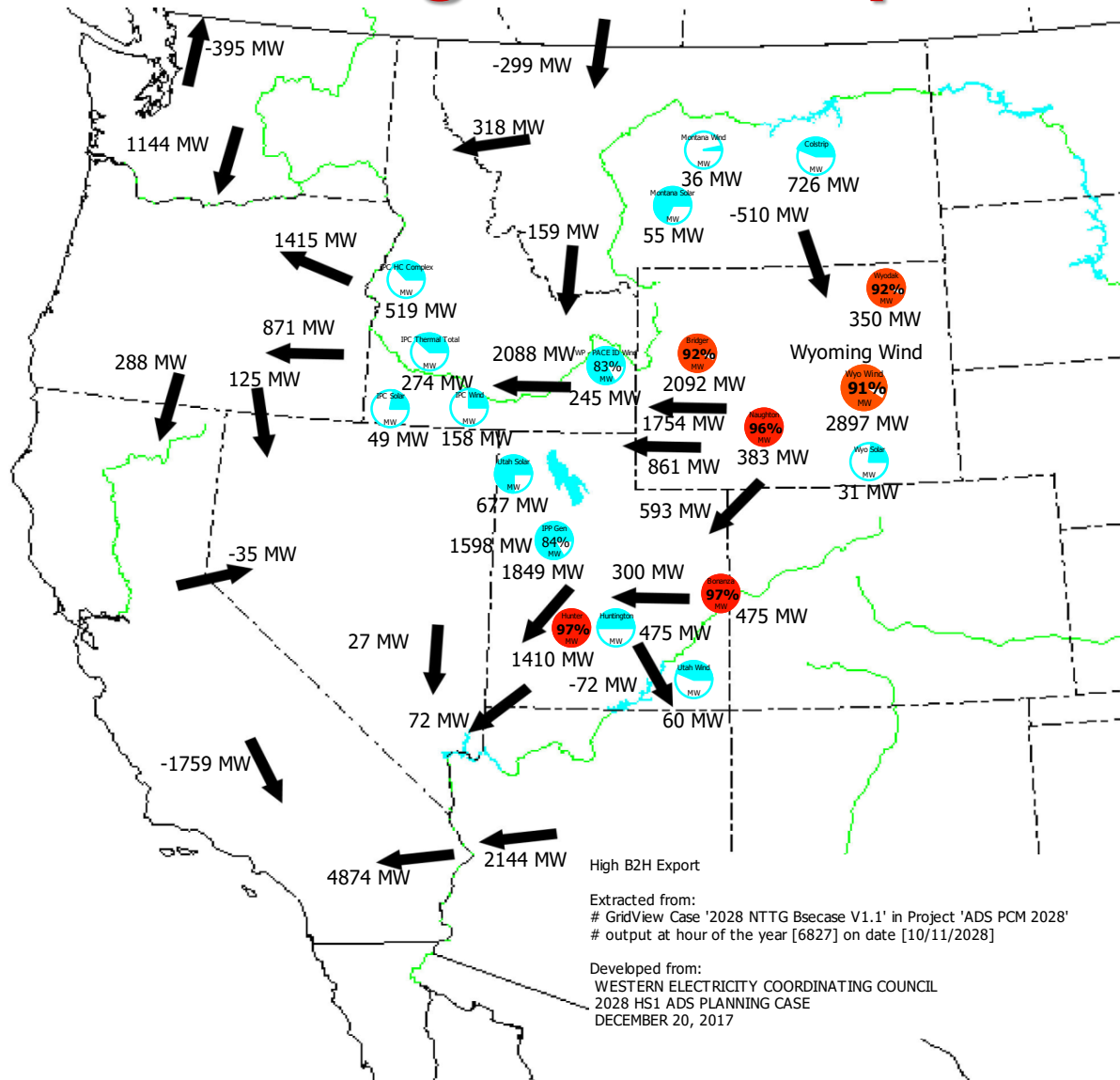
Case D – High B2H Export seed case

- High Flows from Idaho to Northwest, selected October 11th at 11 AM
- Hour not terribly stressed, will require tuning or selecting a new hour

Case D – High B2H Export seed case



Case D – High B2H Export seed case





Case D – High B2H Export seed case

Interface					
Numbe	Name	Interface MW Fl	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-329.3	-32.93	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.06	150	-150
3	NORTHWEST - CANADA	-395.3	-13.18	3000	-3150
4	WEST OF CASCADES - NORTH	3474.9	34.07	10200	-10200
5	WEST OF CASCADES - SOUTH	3424.8	47.57	7200	-7200
6	WEST OF HATWAI	-168.6	-3.94	4277	0
8	MONTANA - NORTHWEST	318.5	14.48	2200	-1350
9	WEST OF BROADVIEW	936.3	36.39	2573	0
10	WEST OF COLSTRIP	747.4	28.77	2598	0
11	WEST OF CROSSOVER	1099.2	42.31	2598	0
14	IDAHO - NORTHWEST	1414.6	41.61	3400	-2250
15	MIDWAY - LOS BANOS	2490.8	51.89	4800	-2000
16	IDAHO - SIERRA	-39.7	-7.93	500	-360
17	BORAH WEST	2088.5	46.93	4450	-1600
18	MONTANA - IDAHO	-158.6	-41.42	383	-256
19	BRIDGER WEST	1753.6	73.06	2400	-600
20	PATH C	507.4	31.71	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	879.3	37.82	2325	0
23	FOUR CORNERS 345/500	-111.1	-11.11	1000	-1000
24	PG&E - SPP	-35.2	-21.98	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	62.3	62.26	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	-1759.1	-43.98	4000	-3000
27	IPP DC LINE	1848.6	77.02	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	-253.1	-18.08	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	-0.4	-0.21	200	0
30	TOT 1A	51.8	7.96	650	0
31	TOT 2A	36.4	5.28	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	58.8	13.37	440	-235
33	BONANZA WEST	-342.5	-43.63	785	0
34	TOT 2B	-71.7	-9.19	780	-850
35	TOT 2C	72.2	12.03	600	-580
36	TOT 3	959.5	57.11	1680	0
37	TOT 4A	-17.6	-2.17	810	0
38	TOT 4B	154.1	22.66	680	0

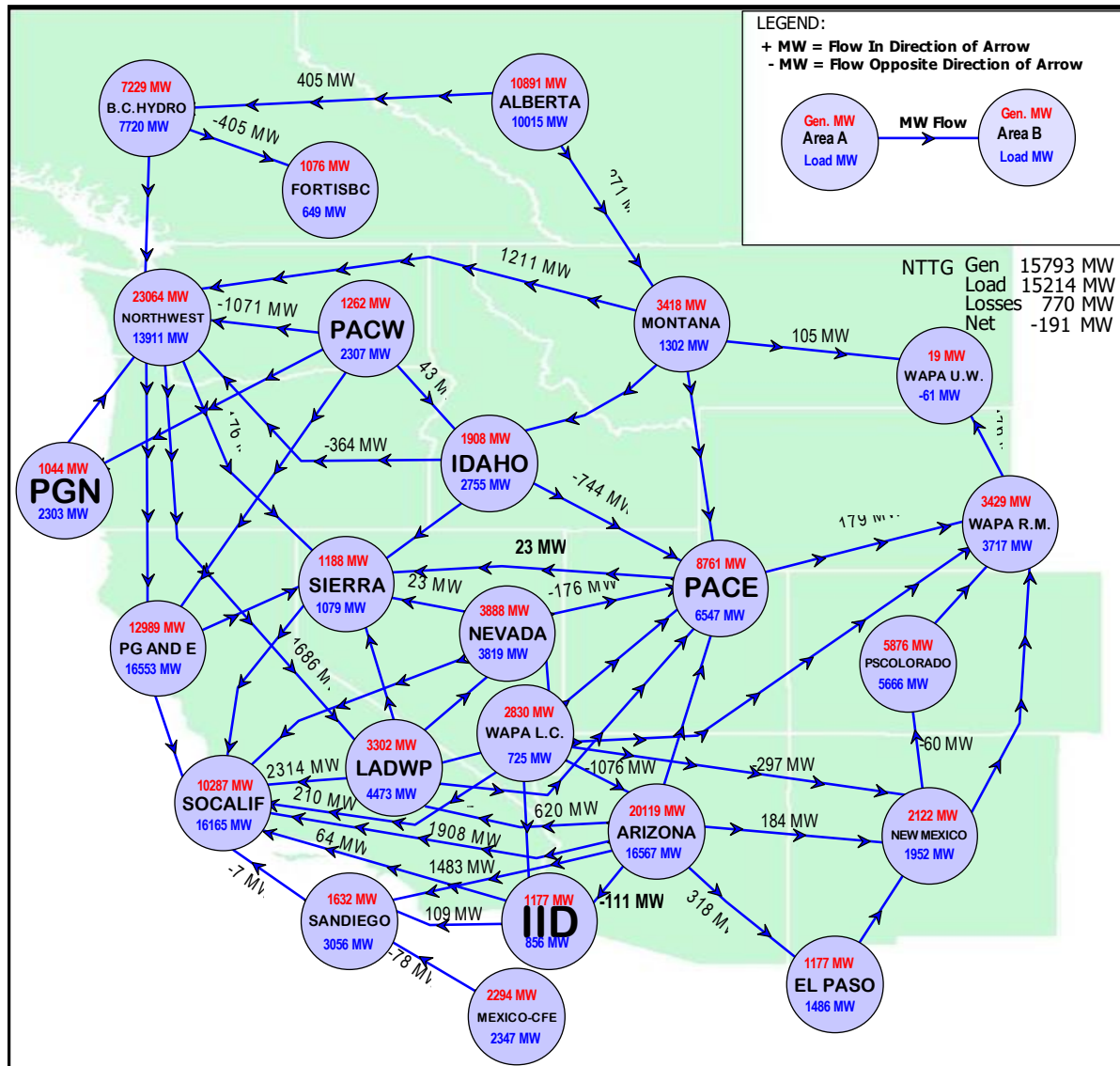
39	TOT 5	338.5	20.15	1680	0
40	TOT 7	232.6	26.14	890	0
41	SYLMAR - SCE	53.5	3.35	1600	-1600
42	IID - SCE	336.4	56.07	600	0
43	NORTH OF SAN ONOFRE (Retired)	147.8		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-285.5	-12.98	2200	0
45	SDG&E - CFE	-117.9	-28.9	408	-800
46	WEST OF COLORADO RIVER (WOR)	4874.4	43.52	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	958	91.41	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	845.8	42.93	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	2143.8	21.23	10100	0
50	CHOLLA - PINNACLE PEAK	376.9	31.41	1200	0
51	SOUTHERN NAVAJO	304.6	10.88	2800	0
52	SILVER PEAK - CONTROL 55 KV	0.5	2.86	17	-17
54	CORONADO - SILVER KING - KYRENE	670.8	44.9	1494	0
55	BROWNLEE EAST	292.3	15.26	1915	0
58	ELDORADO - MEAD 230 KV LINES	2.4	0.21	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	30.7	14.1	218	0
60	INYO - CONTROL 115 KV TIE	-22.9	-40.86	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	435.6	18.15	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-129.5	-4.99	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	356.9	27.46	1300	0
65	PACIFIC DC INTERTIE (PDCI)	124.9	4.03	3100	-3100
66	COI	287.9	6	4800	-3675
71	SOUTH OF ALLSTON	671.9	16.88	3980	-1115
73	NORTH OF JOHN DAY	1143.5	14.85	7700	-7700
75	MIDPOINT - SUMMER LAKE	870.5	58.03	1500	-550
76	ALTURAS PROJECT	152.8	50.92	300	-300
77	CRYSTAL - ALLEN	78.3	8.25	950	0
78	TOT 2B1	-19.2	-3.2	600	-600
79	TOT 2B2	-90.9	-34.3	265	-300
80	MONTANA SOUTHEAST	-510	-85	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-641.3	-14.15	4533	-3790
82	TOTBEAST	-578.2	-16.45	3515	0
83	MATL	-298.6	-91.87	325	-300
450	Wyoming Wind	2897.3	90.54	3200	0



Case E – Tot 2/COI/PDCI seed case

- Transfers to Desert SE and into California, selected May 16th at 7 PM
- High Wind in Wyoming
- To be used in evaluating ITP project exports

Case E – Tot 2/COI/PDCI seed case







Case E – Tot 2/COI/PDCI seed case

Interface Number	Name	Interface MW Flow	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	407.8	40.78	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.06	150	-150
3	NORTHWEST - CANADA	-12.2	-0.41	3000	-3150
4	WEST OF CASCADES - NORTH	6039.4	59.21	10200	-10200
5	WEST OF CASCADES - SOUTH	3688	51.22	7200	-7200
6	WEST OF HATWAI	2104.2	49.2	4277	0
8	MONTANA - NORTHWEST	1210.1	55.01	2200	-1350
9	WEST OF BROADVIEW	1295.9	50.36	2573	0
10	WEST OF COLSTRIP	1774.5	68.3	2598	0
11	WEST OF CROSSOVER	1705.7	65.65	2598	0
14	IDAHO - NORTHWEST	-406.7	-11.96	3400	-2250
15	MIDWAY - LOS BANOS	-1205.3	-25.11	4800	-2000
16	IDAHO - SIERRA	178.7	35.74	500	-360
17	BORAH WEST	518.4	11.65	4450	-1600
18	MONTANA - IDAHO	171.1	44.67	383	-256
19	BRIDGER WEST	1688.8	70.37	2400	-600
20	PATH C	1722.5	107.66	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1554.2	66.85	2325	0
23	FOUR CORNERS 345/500	52.2	5.22	1000	-1000
24	PG&E - SPP	-31.7	-19.79	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	59.8	59.81	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	592.2	14.81	4000	-3000
27	IPP DC LINE	2405.9	100.25	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	-812.3	-58.02	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	0.9	0.44	200	0
30	TOT 1A	-106.8	-16.43	650	0
31	TOT 2A	17.2	2.5	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	24	5.45	440	-235
33	BONANZA WEST	-302.4	-38.53	785	0
34	TOT 2B	43.7	5.6	780	-850
35	TOT 2C	176.1	29.34	600	-580
36	TOT 3	1238.6	73.73	1680	0
37	TOT 4A	110.1	13.59	810	0
38	TOT 4B	-94.6	-13.91	680	0

39	TOT 5	133.1	7.92	1680	0
40	TOT 7	231.2	25.97	890	0
41	SYLMAR - SCE	249.2	15.58	1600	-1600
42	IID - SCE	63.9	10.65	600	0
43	NORTH OF SAN ONOFRE (Retired)	-7.4		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-199.3	-9.06	2200	0
45	SDG&E - CFE	-77.1	-18.91	408	-800
46	WEST OF COLORADO RIVER (WOR)	6085.5	54.33	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	318	30.34	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	607	30.81	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	3588.1	35.53	10100	0
50	CHOLLA - PINNACLE PEAK	671.4	55.95	1200	0
51	SOUTHERN NAVAJO	1014.5	36.23	2800	0
52	SILVER PEAK - CONTROL 55 KV	-1.5	-8.73	17	-17
54	CORONADO - SILVER KING - KYRENE	871.4	58.32	1494	0
55	BROWNLEE EAST	1367.2	71.4	1915	0
58	ELDORADO - MEAD 230 KV LINES	-79.7	-7	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	6.9	3.15	218	0
60	INYO - CONTROL 115 KV TIE	8.6	15.29	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1505.6	62.73	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	234.5	9.03	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	5.6	0.43	1300	0
65	PACIFIC DC INTERTIE (PDCI)	1686.3	54.4	3100	-3100
66	COI	4757	99.1	4800	-3675
71	SOUTH OF ALLSTON	665.7	16.72	3980	-1115
73	NORTH OF JOHN DAY	4311.8	56	7700	-7700
75	MIDPOINT - SUMMER LAKE	603.8	40.25	1500	-550
76	ALTURAS PROJECT	176.3	58.78	300	-300
77	CRYSTAL - ALLEN	2.7	0.28	950	0
78	TOT 2B1	-155.1	-25.85	600	-600
79	TOT 2B2	-111.5	-42.06	265	-300
80	MONTANA SOUTHEAST	334.4	55.74	600	-600
81	SENTI-S.NEVADA TRAN INTERFACE	-616.5	-13.6	4533	-3790
82	TOTBEAST	763.4	21.72	3515	0
83	MATL	-261.7	-80.53	325	-300
450	Wyoming Wind	2782.5	86.95	3200	0



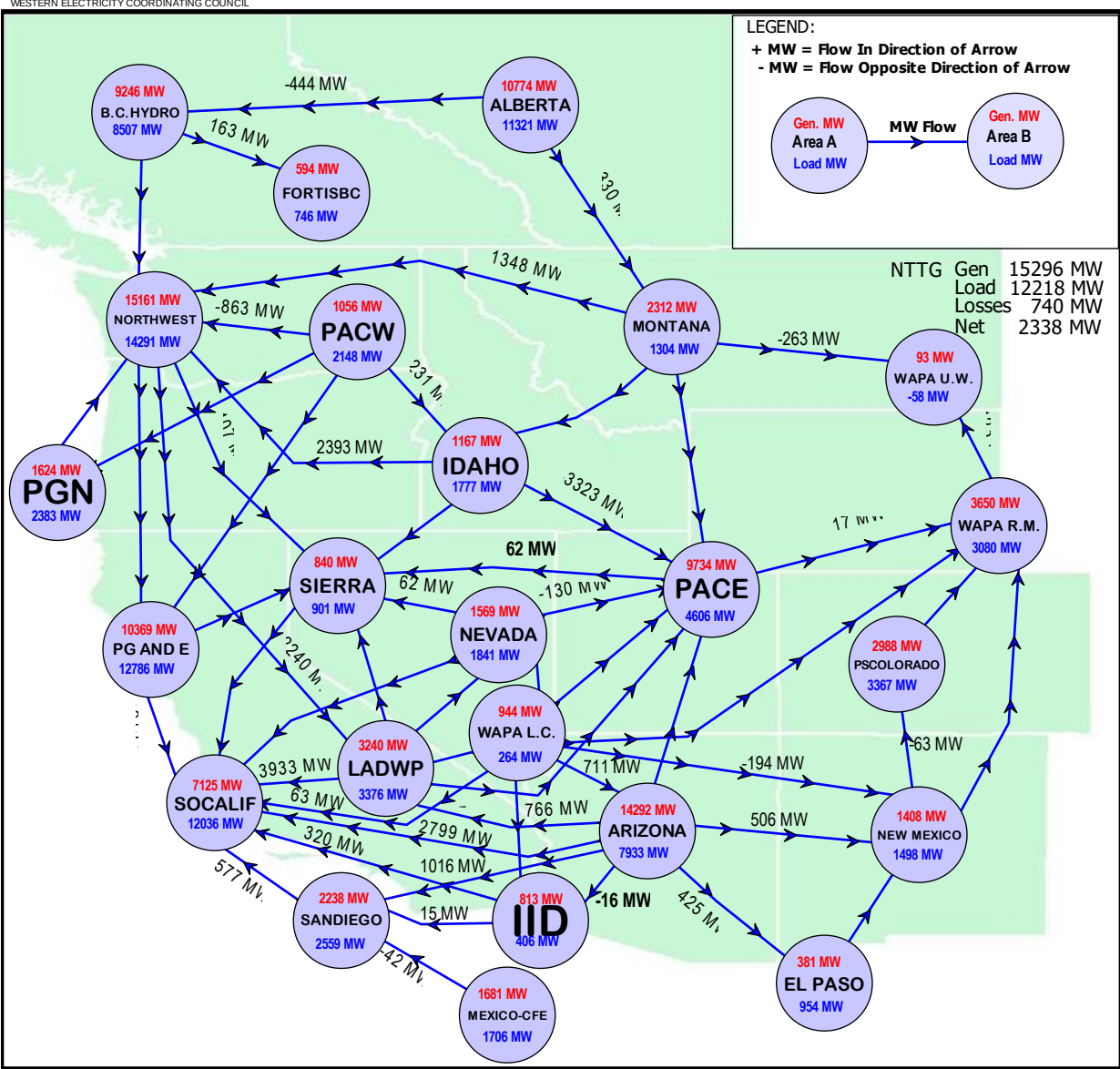
Case F – Heavy Wyoming Wind seed case

- Heavy Wind Production in Wyoming @ ~ 90% of Peak, selected February 24th at midnight
- Case also has High Borah West flows



Case F – Heavy W

WESTERN ELECTRICITY COORDINATING COUNCIL





GridView Case '2028 NTTG Basecase V1.1' in Project 'ADS PCM 2028'

Developed from:
WESTERN ELECTRICITY COORDINATING COUNCIL
2028 HS1 ADS PLANNING CASE
DECEMBER 20, 2017



Case F – Heavy Wyoming Wind seed case

Interface Number	Name	Interface MW Fl	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-440.5	-44.05	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.07	150	-150
3	NORTHWEST - CANADA	368.9	12.3	3000	-3150
4	WEST OF CASCADES - NORTH	4596.4	45.06	10200	-10200
5	WEST OF CASCADES - SOUTH	3307.1	45.93	7200	-7200
6	WEST OF HATWAI	765.1	17.89	4277	0
8	MONTANA - NORTHWEST	1348.3	61.29	2200	-1350
9	WEST OF BROADVIEW	1770.7	68.82	2573	0
10	WEST OF COLSTRIP	1552.3	59.75	2598	0
11	WEST OF CROSSOVER	1913.6	73.66	2598	0
14	IDAHO - NORTHWEST	2643.5	77.75	3400	-2250
15	MIDWAY - LOS BANOS	3269	68.1	4800	-2000
16	IDAHO - SIERRA	-48.9	-9.77	500	-360
17	BORAH WEST	3184.9	71.57	4450	-1600
18	MONTANA - IDAHO	-208.2	-54.37	383	-256
19	BRIDGER WEST	1788.1	74.5	2400	-600
20	PATH C	-372.7	-23.3	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1299.3	55.88	2325	0
23	FOUR CORNERS 345/500	76.5	7.65	1000	-1000
24	PG&E - SPP	-36	-22.5	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	61.8	61.83	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	-2972.6	-74.32	4000	-3000
27	IPP DC LINE	2158.6	89.94	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	-584.7	-41.76	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	35.2	17.59	200	0
30	TOT 1A	145.5	22.38	650	0
31	TOT 2A	21.8	3.15	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	96.9	22.01	440	-235
33	BONANZA WEST	-348.3	-44.37	785	0
34	TOT 2B	24.7	3.16	780	-850
35	TOT 2C	130	21.66	600	-580
36	TOT 3	872.2	51.92	1680	0
37	TOT 4A	-3.1	-0.38	810	0
38	TOT 4B	172.2	25.33	680	0

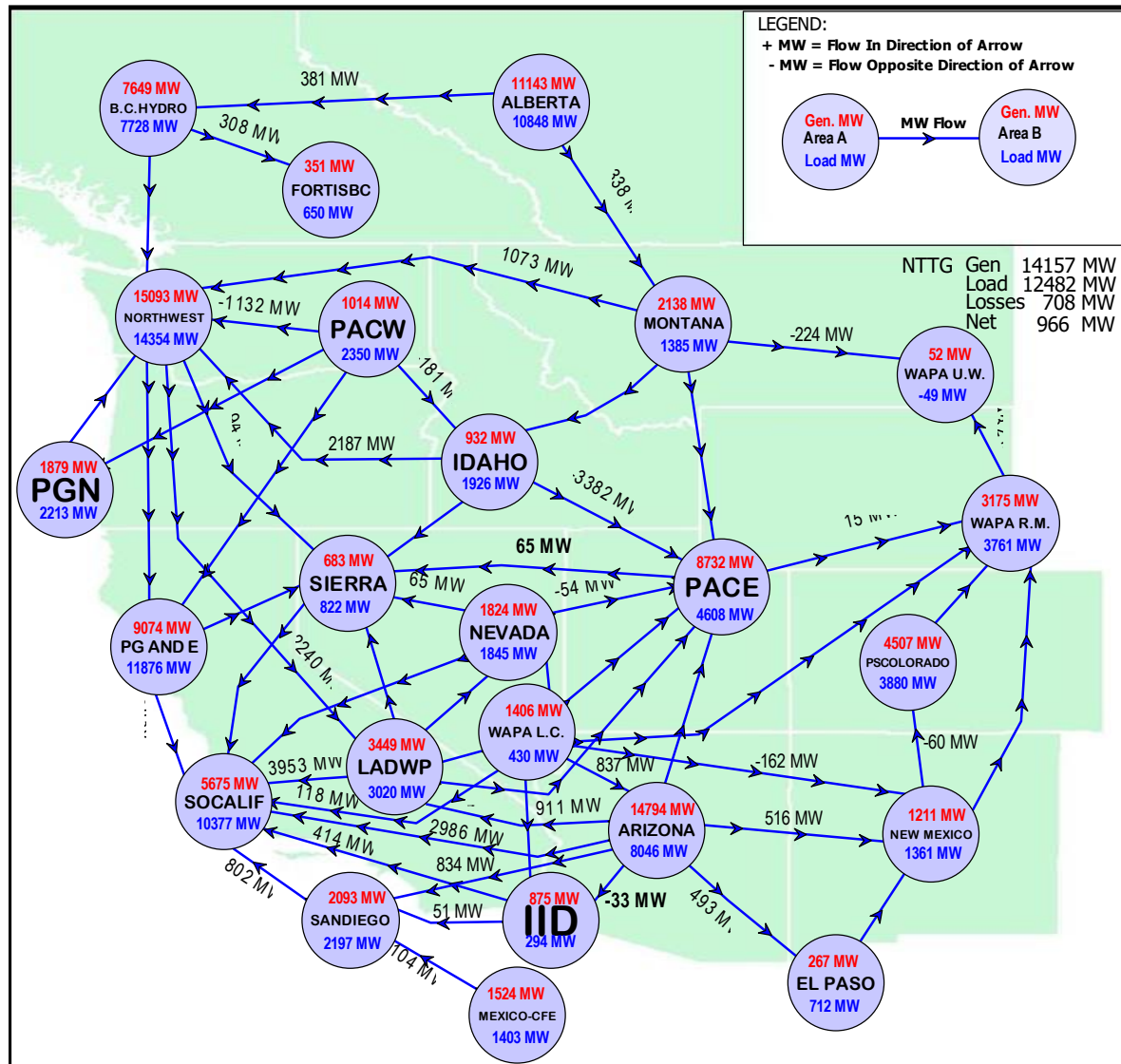
39	TOT 5	360.2	21.44	1680	0
40	TOT 7	237.1	26.64	890	0
41	SYLMAR - SCE	556.4	34.77	1600	-1600
42	IID - SCE	320.3	53.38	600	0
43	NORTH OF SAN ONOFRE (Retired)	576.7		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-685.3	-31.15	2200	0
45	SDG&E - CFE	-40.5	-9.94	408	-800
46	WEST OF COLORADO RIVER (WOR)	6574.2	58.7	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	441.3	42.11	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	815.8	41.41	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	4880.4	48.32	10100	0
50	CHOLLA - PINNACLE PEAK	498.4	41.54	1200	0
51	SOUTHERN NAVAJO	-138.9	-4.96	2800	0
52	SILVER PEAK - CONTROL 55 KV	1.4	8.26	17	-17
54	CORONADO - SILVER KING - KYRENE	778.5	52.11	1494	0
55	BROWNLEE EAST	150.1	7.84	1915	0
58	ELDORADO - MEAD 230 KV LINES	-9.9	-0.87	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	11.1	5.1	218	0
60	INYO - CONTROL 115 KV TIE	-0.6	-1.12	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1925.8	80.24	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-424.2	-16.33	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	826	63.54	1300	0
65	PACIFIC DC INTERTIE (PDCI)	2240.5	72.27	3100	-3100
66	COI	-312.2	-6.5	4800	-3675
71	SOUTH OF ALLSTON	148.5	3.73	3980	-1115
73	NORTH OF JOHN DAY	378.3	4.91	7700	-7700
75	MIDPOINT - SUMMER LAKE	1243	82.87	1500	-550
76	ALTURAS PROJECT	107.5	35.82	300	-300
77	CRYSTAL - ALLEN	78.2	8.23	950	0
78	TOT 2B1	-56.2	-9.37	600	-600
79	TOT 2B2	-31.5	-11.9	265	-300
80	MONTANA SOUTHEAST	-573.4	-95.56	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-576.3	-12.71	4533	-3790
82	TOTBEAST	-1092.9	-31.09	3515	0
83	MATL	-317.4	-97.66	325	-300
450	Wyoming Wind	2706.8	84.59	3200	0



Case G – High Borah West seed case

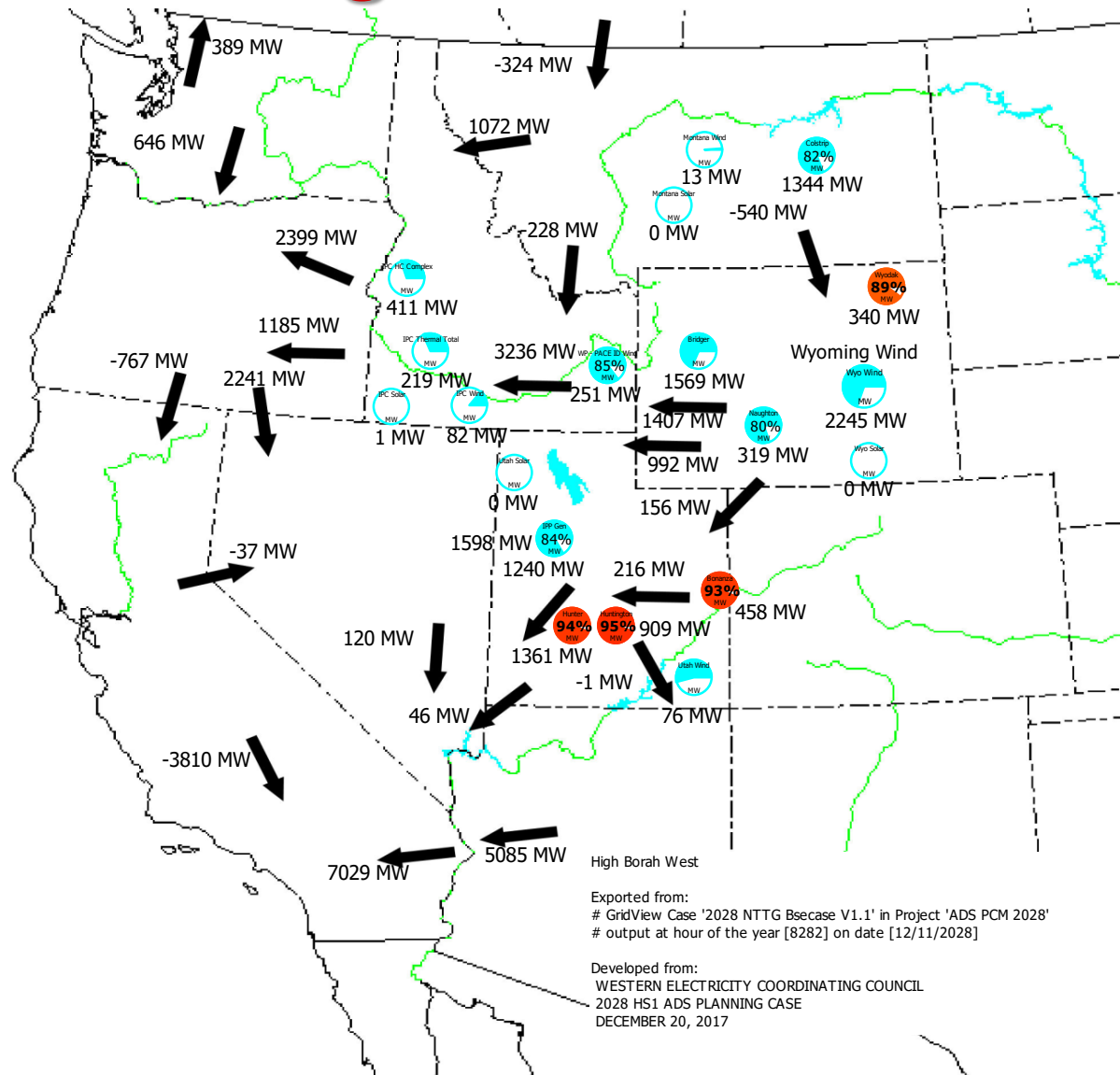
- High flows above existing Borah West Path rating (2557 MW), selected December 11th at 2 AM

Case G – High Borah West seed case





Case G – High Borah West seed case





Case G – High Borah West seed case

Interface					
Number	Name	Interface MW Flow	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	385	38.5	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.06	150	-150
3	NORTHWEST - CANADA	388.4	12.95	3000	-3150
4	WEST OF CASCADES - NORTH	4065.3	39.86	10200	-10200
5	WEST OF CASCADES - SOUTH	3130.3	43.48	7200	-7200
6	WEST OF HATWAI	263.1	6.15	4277	0
8	MONTANA - NORTHWEST	1073	48.77	2200	-1350
9	WEST OF BROADVIEW	1508.7	58.63	2573	0
10	WEST OF COLSTRIP	1366.3	52.59	2598	0
11	WEST OF CROSSOVER	1703.9	65.58	2598	0
14	IDAHO - NORTHWEST	2368	69.65	3400	-2250
15	MIDWAY - LOS BANOS	4064.7	84.68	4800	-2000
16	IDAHO - SIERRA	-122.2	-24.43	500	-360
17	BORAH WEST	3209.8	72.13	4450	-1600
18	MONTANA - IDAHO	-226.7	-59.2	383	-256
19	BRIDGER WEST	1405.7	58.57	2400	-600
20	PATH C	-827.1	-51.69	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1120.2	48.18	2325	0
23	FOUR CORNERS 345/500	18.8	1.88	1000	-1000
24	PG&E - SPP	-39.3	-24.57	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	61.5	61.45	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	-3836.2	-95.91	4000	-3000
27	IPP DC LINE	1240.1	51.67	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	280.2	20.01	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	74	36.99	200	0
30	TOT 1A	-18	-2.76	650	0
31	TOT 2A	124.4	18.03	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	137.5	31.24	440	-235
33	BONANZA WEST	-231.2	-29.46	785	0
34	TOT 2B	1.3	0.17	780	-850
35	TOT 2C	53.5	8.92	600	-580
36	TOT 3	552.4	32.88	1680	0
37	TOT 4A	-58.1	-7.18	810	0
38	TOT 4B	196.1	28.84	680	0

39	TOT 5	362.2	21.56	1680	0
40	TOT 7	169.1	19	890	0
41	SYLMAR - SCE	926.3	57.9	1600	-1600
42	IID - SCE	414	69	600	0
43	NORTH OF SAN ONOFRE (Retired)	801.6		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-863.8	-39.26	2200	0
45	SDG&E - CFE	105.5	25.87	408	-800
46	WEST OF COLORADO RIVER (WOR)	7052	62.96	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	545.7	52.07	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	506.3	25.7	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	5095.7	50.45	10100	0
50	CHOLLA - PINNACLE PEAK	435	36.25	1200	0
51	SOUTHERN NAVAJO	-123.2	-4.4	2800	0
52	SILVER PEAK - CONTROL 55 KV	-0.6	-3.43	17	-17
54	CORONADO - SILVER KING - KYRENE	704.4	47.15	1494	0
55	BROWNLEE EAST	-75.8	-3.96	1915	0
58	ELDORADO - MEAD 230 KV LINES	-10.9	-0.95	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	24.2	11.11	218	0
60	INYO - CONTROL 115 KV TIE	-7.8	-13.91	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1615.9	67.33	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-391.2	-15.06	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	923.5	71.04	1300	0
65	PACIFIC DC INTERTIE (PDCI)	2240.5	72.27	3100	-3100
66	COI	-795.4	-16.57	4800	-3675
71	SOUTH OF ALLSTON	189	4.75	3980	-1115
73	NORTH OF JOHN DAY	646	8.39	7700	-7700
75	MIDPOINT - SUMMER LAKE	1163.7	77.58	1500	-550
76	ALTURAS PROJECT	94.3	31.43	300	-300
77	CRYSTAL - ALLEN	90	9.48	950	0
78	TOT 2B1	7.4	1.24	600	-600
79	TOT 2B2	8.7	3.29	265	-300
80	MONTANA SOUTHEAST	-543.4	-90.56	600	-600
81	SENTI-S.NEVADA TRAN INTERFACE	-601.2	-13.26	4533	-3790
82	TOTBEAST	-1239.4	-35.26	3515	0
83	MATL	-324.8	-99.95	325	-300
450	Wyoming Wind	2245	70.16	3200	0

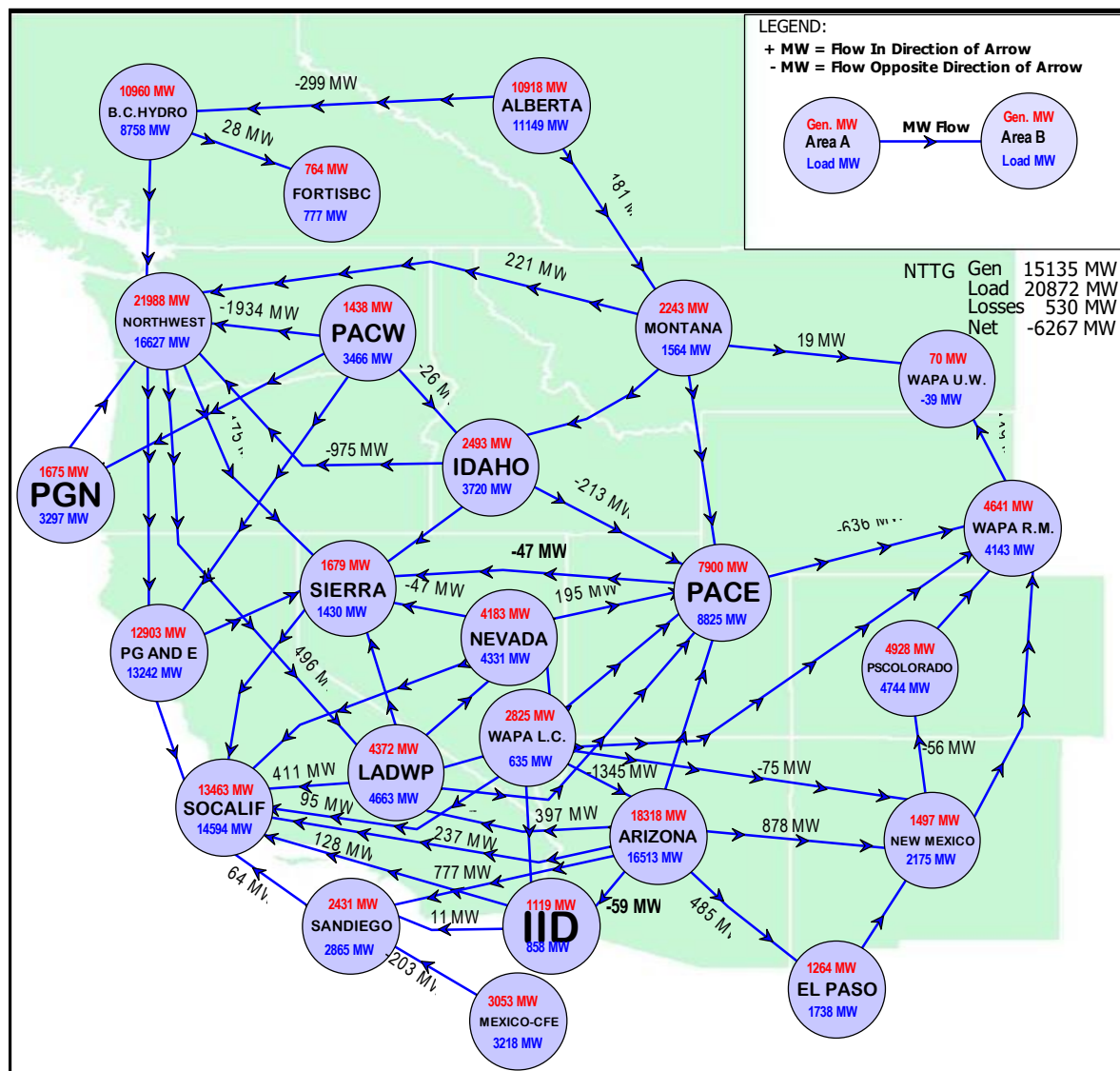


Case H – Max NTTG Import Case

- Maximum observed Import, selected July 27th at 2 PM
- Note Wyoming Wind Production near zero

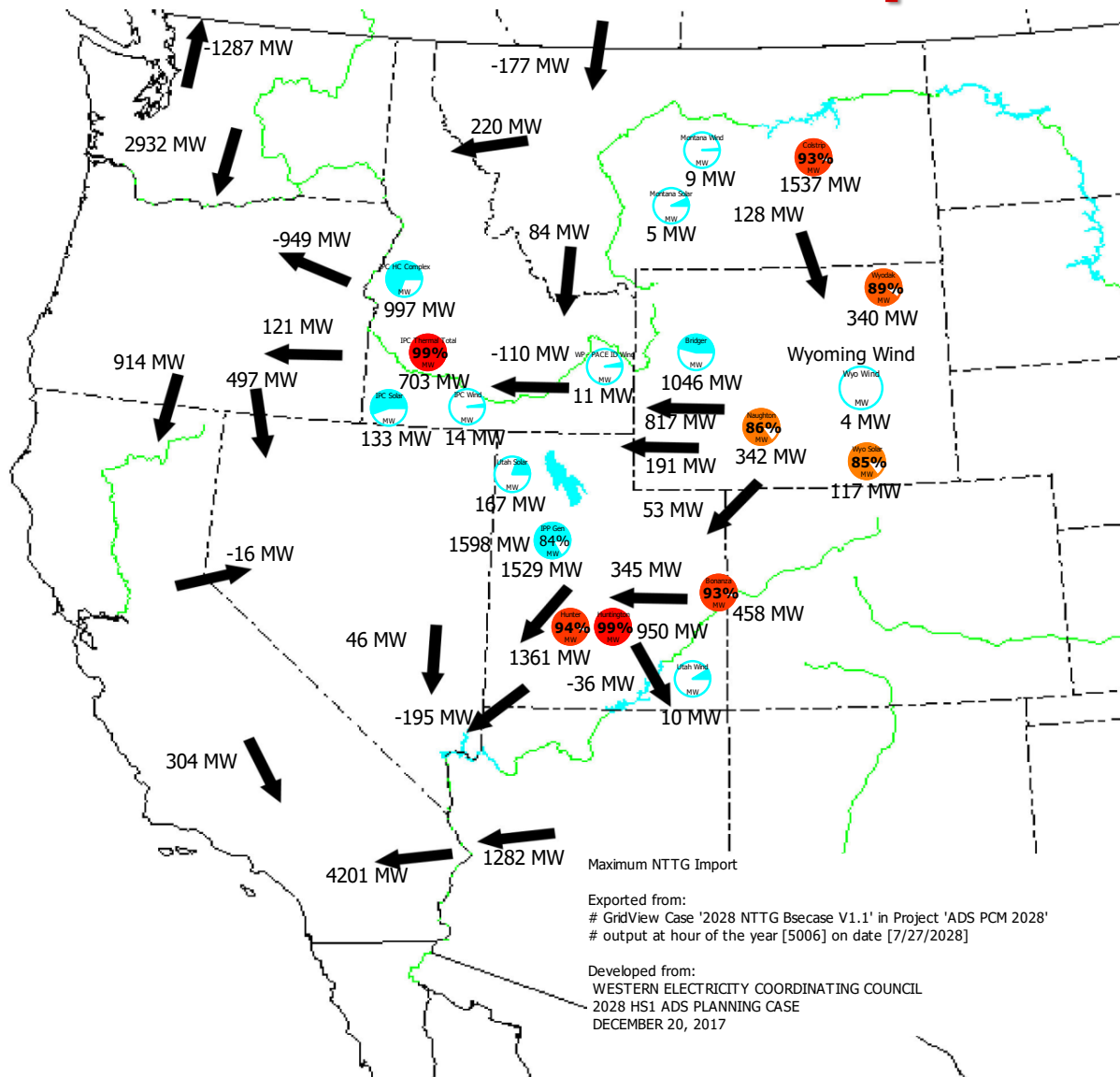


Case H – Max NTTG Import Case





Case H – Max NTTG Import Case





Case H – Max NTTG Import Case

Interface					
Numbe	Name	Interface MW Flo	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-296.7	-29.67	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.07	150	-150
3	NORTHWEST - CANADA	-1287.3	-42.91	3000	-3150
4	WEST OF CASCADES - NORTH	4048.8	39.69	10200	-10200
5	WEST OF CASCADES - SOUTH	4060.2	56.39	7200	-7200
6	WEST OF HATWAI	28.6	0.67	4277	0
8	MONTANA - NORTHWEST	219.7	9.99	2200	-1350
9	WEST OF BROADVIEW	1016.1	39.49	2573	0
10	WEST OF COLSTRIP	1556.1	59.9	2598	0
11	WEST OF CROSSOVER	1619.6	62.34	2598	0
14	IDAHO - NORTHWEST	-949.4	-27.92	3400	-2250
15	MIDWAY - LOS BANOS	1279.9	26.66	4800	-2000
16	IDAHO - SIERRA	-170.9	-34.18	500	-360
17	BORAH WEST	-109.6	-2.46	4450	-1600
18	MONTANA - IDAHO	84	21.94	383	-256
19	BRIDGER WEST	816.7	34.03	2400	-600
20	PATH C	731.3	45.71	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	669.4	28.79	2325	0
23	FOUR CORNERS 345/500	-248.5	-24.85	1000	-1000
24	PG&E - SPP	-15.5	-9.69	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	60.2	60.21	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	303.6	7.59	4000	-3000
27	IPP DC LINE	1529.5	63.73	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	259.8	18.56	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	-60.1	-30.04	200	0
30	TOT 1A	281.9	43.37	650	0
31	TOT 2A	24.6	3.56	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	-108.2	-24.58	440	-235
33	BONANZA WEST	-384	-48.92	785	0
34	TOT 2B	-35.5	-4.56	780	-850
35	TOT 2C	-194.8	-32.47	600	-580
36	TOT 3	339.1	20.18	1680	0
37	TOT 4A	25.3	3.12	810	0
38	TOT 4B	133	19.56	680	0

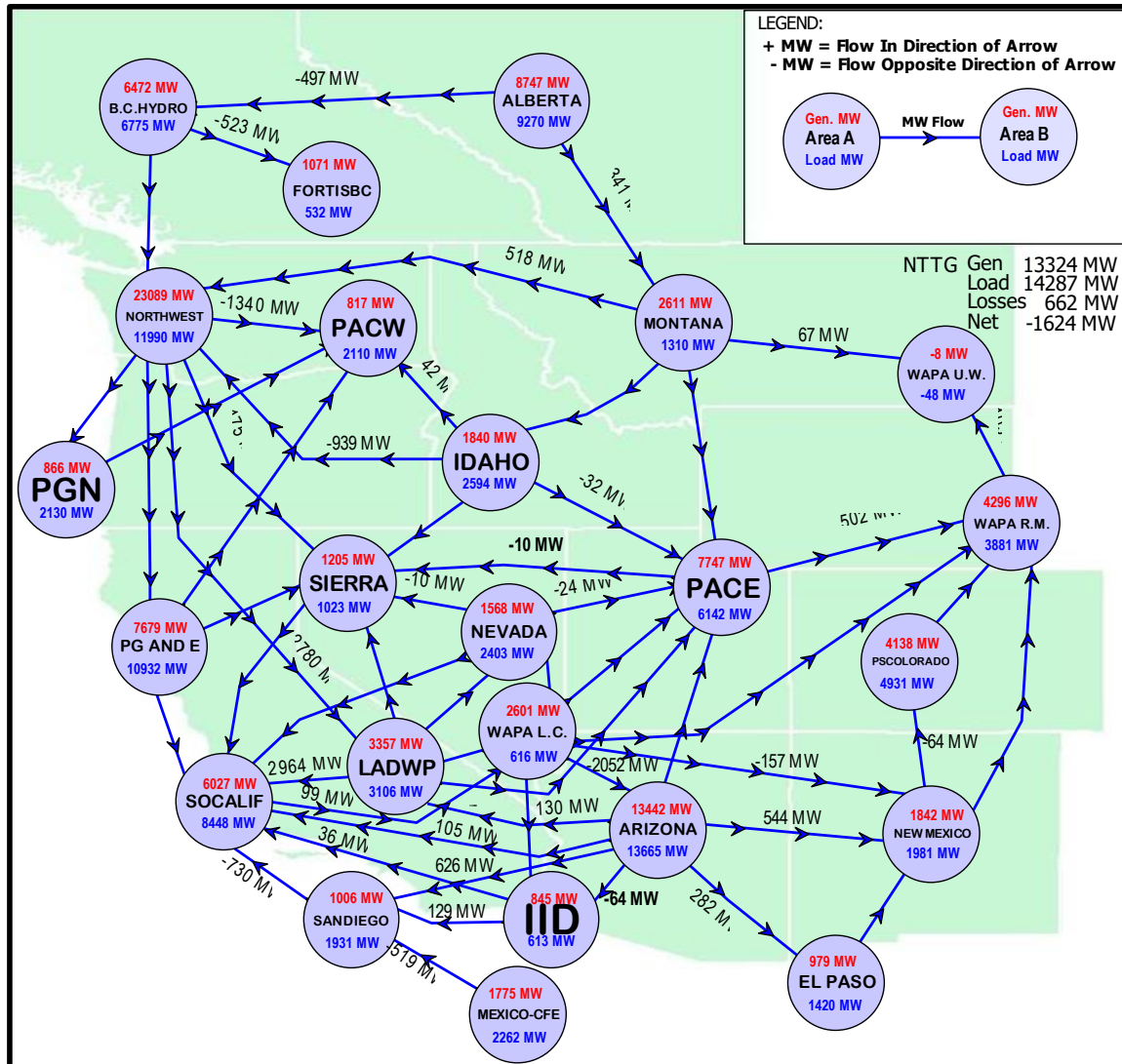
39	TOT 5	291.2	17.33	1680	0
40	TOT 7	42.5	4.78	890	0
41	SYLMAR - SCE	-18.9	-1.18	1600	-1600
42	IID - SCE	128.2	21.37	600	0
43	NORTH OF SAN ONOFRE (Retired)	64.5		0	0
44	SOUTH OF SAN ONOFRE (Retired)	-246.5	-11.2	2200	0
45	SDG&E - CFE	-202.3	-49.58	408	-800
46	WEST OF COLORADO RIVER (WOR)	4201.2	37.51	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	427.8	40.82	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	1630.5	82.77	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	1282.1	12.69	10100	0
50	CHOLLA - PINNACLE PEAK	408.7	34.06	1200	0
51	SOUTHERN NAVAJO	886.2	31.65	2800	0
52	SILVER PEAK - CONTROL 55 KV	0.5	3.15	17	-17
54	CORONADO - SILVER KING - KYRENE	724.4	48.49	1494	0
55	BROWNLEE EAST	1079.3	56.36	1915	0
58	ELDORADO - MEAD 230 KV LINES	46.9	4.11	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	10	4.61	218	0
60	INYO - CONTROL 115 KV TIE	-11.9	-21.28	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	416	17.34	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	218.3	8.4	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	-65.5	-5.04	1300	0
65	PACIFIC DC INTERTIE (PDCI)	496.9	16.03	3100	-3100
66	COI	914.4	19.05	4800	-3675
71	SOUTH OF ALLSTON	1327.6	33.36	3980	-1115
73	NORTH OF JOHN DAY	2932.3	38.08	7700	-7700
75	MIDPOINT - SUMMER LAKE	-121.4	-8.09	1500	-550
76	ALTURAS PROJECT	174.7	58.24	300	-300
77	CRYSTAL - ALLEN	145.2	15.28	950	0
78	TOT 2B1	46.7	7.79	600	-600
79	TOT 2B2	11.2	4.22	265	-300
80	MONTANA SOUTHEAST	128.2	21.36	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-895.1	-19.75	4533	-3790
82	TOTBEAST	1200.7	34.16	3515	0
83	MATL	-176.9	-54.44	325	-300
450	Wyoming Wind	3.9	0.12	3200	0

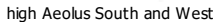


Case I – High Aeolus South & West Case

- High flows South and West of Aeolus,
selected June 3rd at 6 PM

Case I – High Aeolus South & West Case





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exported from:
# GridView Case '2028 NTTG Bsease V1.1' in Project 'ADS PCM 2028'
# output at hour of the year [3714] on date [6/3/2028]
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developed from:
WESTERN ELECTRICITY COORDINATING COUNCIL
2028 HS1 ADS PLANNING CASE
DECEMBER 20, 2017



Case I – High Aeolus South & West Case

Interface					
Number	Name	Interface MW Flow	Percent	Lim MW	Lim MW B
1	ALBERTA - BRITISH COLUMBIA	-491.7	-49.17	1000	-1200
2	ALBERTA - SASKATCHEWAN	0.1	0.05	150	-150
3	NORTHWEST - CANADA	496.1	16.54	3000	-3150
4	WEST OF CASCADES - NORTH	5800.6	56.87	10200	-10200
5	WEST OF CASCADES - SOUTH	3081.9	42.8	7200	-7200
6	WEST OF HATWAI	1321.5	30.9	4277	0
8	MONTANA - NORTHWEST	516.7	23.49	2200	-1350
9	WEST OF BROADVIEW	868.4	33.75	2573	0
10	WEST OF COLSTRIP	1473.8	56.73	2598	0
11	WEST OF CROSSOVER	1398.4	53.83	2598	0
14	IDAHO - NORTHWEST	-980.4	-28.84	3400	-2250
15	MIDWAY - LOS BANOS	-691.2	-14.4	4800	-2000
16	IDAHO - SIERRA	116.1	23.21	500	-360
17	BORAH WEST	-188.4	-4.23	4450	-1600
18	MONTANA - IDAHO	149.6	39.07	383	-256
19	BRIDGER WEST	739.1	30.8	2400	-600
20	PATH C	1785	111.57	1600	-1250
22	SOUTHWEST OF FOUR CORNERS	1103.5	47.46	2325	0
23	FOUR CORNERS 345/500	-167.5	-16.75	1000	-1000
24	PG&E - SPP	-32.9	-20.57	160	-150
25	PACIFICORP/PG&E 115 KV INTERCON.	61.8	61.85	100	-45
26	NORTHERN - SOUTHERN CALIFORNIA	161.8	4.05	4000	-3000
27	IPP DC LINE	2405.9	100.25	2400	-1400
28	INTERMOUNTAIN - MONA 345 KV	-761	-54.36	1400	-1200
29	INTERMOUNTAIN - GONDER 230 KV	-49.7	-24.84	200	0
30	TOT 1A	-77.9	-11.99	650	0
31	TOT 2A	11.6	1.69	690	0
32	PAVANT, INTRMTN - GONDER 230 KV	-60.7	-13.79	440	-235
33	BONANZA WEST	-303.4	-38.65	785	0
34	TOT 2B	19.3	2.48	780	-850
35	TOT 2C	23.8	3.97	600	-580
36	TOT 3	1536.4	91.45	1680	0
37	TOT 4A	187.4	23.14	810	0
38	TOT 4B	-108.5	-15.96	680	0

39	TOT 5	534	31.79	1680	0
40	TOT 7	378.7	42.55	890	0
41	SYLMAR - SCE	52.1	3.26	1600	-1600
42	IID - SCE	35.6	5.94	600	0
43	NORTH OF SAN ONOFRE (Retired)	-729.8		0	0
44	SOUTH OF SAN ONOFRE (Retired)	534.7	24.3	2200	0
45	SDG&E - CFE	-518.1	-126.99	408	-800
46	WEST OF COLORADO RIVER (WOR)	1444.1	12.89	11200	-11200
47	SOUTHERN NEW MEXICO (NM1)	279.9	26.71	1048	-1048
48	NORTHERN NEW MEXICO (NM2)	1059.2	53.77	1970	-1970
49	EAST OF COLORADO RIVER (EOR)	16.7	0.16	10100	0
50	CHOLLA - PINNACLE PEAK	530.3	44.19	1200	0
51	SOUTHERN NAVAJO	1615.4	57.69	2800	0
52	SILVER PEAK - CONTROL 55 KV	2.4	13.96	17	-17
54	CORONADO - SILVER KING - KYRENE	964.2	64.54	1494	0
55	BROWNLEE EAST	1460	76.24	1915	0
58	ELDORADO - MEAD 230 KV LINES	14.3	1.26	1140	-1140
59	WALC BLYTHE - SCE BLYTHE 161 KV	-31.8	-14.59	218	0
60	INYO - CONTROL 115 KV TIE	4.8	8.59	56	-56
61	LUGO - VICTORVILLE 500 KV LINE	1511.6	62.98	2400	-900
62	ELDORADO - MCCULLOUGH 500 KV	-151.5	-5.83	2598	-2598
63	PERKINS - MEAD - MARKETPLACE 500	-668.1	-51.39	1300	0
65	PACIFIC DC INTERTIE (PDCI)	2780.8	89.7	3100	-3100
66	COI	3728	77.67	4800	-3675
71	SOUTH OF ALLSTON	708.3	17.8	3980	-1115
73	NORTH OF JOHN DAY	4376.3	56.84	7700	-7700
75	MIDPOINT - SUMMER LAKE	211.1	14.07	1500	-550
76	ALTURAS PROJECT	175.2	58.41	300	-300
77	CRYSTAL - ALLEN	103.8	10.93	950	0
78	TOT 2B1	-124.7	-20.78	600	-600
79	TOT 2B2	-105.3	-39.75	265	-300
80	MONTANA SOUTHEAST	204.2	34.03	600	-600
81	SNTI-S.NEVADA TRAN INTERFACE	-588.9	-12.99	4533	-3790
82	TOTBEAST	1248.9	35.53	3515	0
83	MATL	-327.5	-100.78	325	-300
450	Wyoming Wind	3058.4	95.57	3200	0



TWG Case Terminology

- Base Case – Topology represented in PCM model (all pRTP facilities included)
- Null – all iRTP facilities excluded
- pRTP – Prior Regional Transmission Plan, includes:
 - B2H, Gateway West (less Populus-Borah, Cedar Hill-Midpoint and Midpoint-Hemingway) and Gateway South
 - Un-committed BES facilities outside the NTTG footprint
- iRTP – Initial Regional Transmission Plan, includes:
 - B2H, McNary-Wallula, Gateway West, Gateway South, Antelope Projects, local Load serving projects
 - Un-committed BES facilities outside the NTTG footprint

Change Case Selection

Case	B2H	Gateway S	Gateway W	Antelope Projects	SWIP N	Cross-Tie	TWE DC	TWE DC/AC	Stressed Conditions:
null									AB C D F G H I
pRTP	X	X	a	X					AB C D E F G H I
iRTP	X	X	X	X					AB C D E F G H I
CC1	X								AB C D F G
CC2		X		X					AC D E F I
CC3		X	X						AC D E F I
CC4	X		X	X					AC D E I
CC5	X	X		X					AC D E F I
CC6	X	X	X						AB C D E F G H I
CC7								X	AB C D E F I
CC8							X		AB C D F I
CC9						X			AB C D F I
CC10					X				AB C D F
CC11								X	(E I)+RPS
CC12		X						X	(E I)+RPS
CC13			X					X	(E I)+RPS
CC14		X	X					X	(E I)+RPS
CC15							X		(E I)+RPS
CC16		X					X		(E I)+RPS
CC17		X	X				X		(E I)+RPS
CC18						X			(E I)+RPS
CC19		X				X			(E I)+RPS
CC20		X	X			X			(E I)+RPS
CC21					X				(E I)+RPS
CC22			X		X				(E I)+RPS
CC23		X	X		X				(E I)+RPS
CC24		X	X		X	X			(E I)+RPS
CC25			X		X			X	(E I)+RPS
CC26		X				X		X	(E I)+RPS
CC27		X	X		X	X		X	(E I)+RPS
CC28			X		X		X		(E I)+RPS
CC29		X				X	X		(E I)+RPS
CC30		X	X		X	X	X		(E I)+RPS

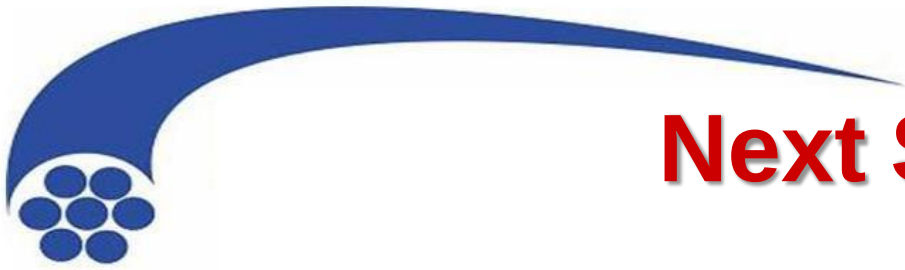
- The change case does not include the non-Committed Project
- X The change case includes the non-Committed Project
- a Gateway West without Midpoint-Hemingway #2, Cedar Hill-Midpoint and Populus-Borah
- The change case was run with and without B2H



Reliability Analysis

Method

- Tune case to meet flow objectives
- Adjust reactive to meet voltage targets
- Testing each case with 482 contingencies



Next Steps

- Continue with selection of Scenario Cases
- Consider and respond to stakeholder input
- Review reliability study preliminary results at the September Planning Committee meeting