

Appendix A

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Historic Peak Substation Loads

Table A-1a: Historical Winter Peak Substation Loads

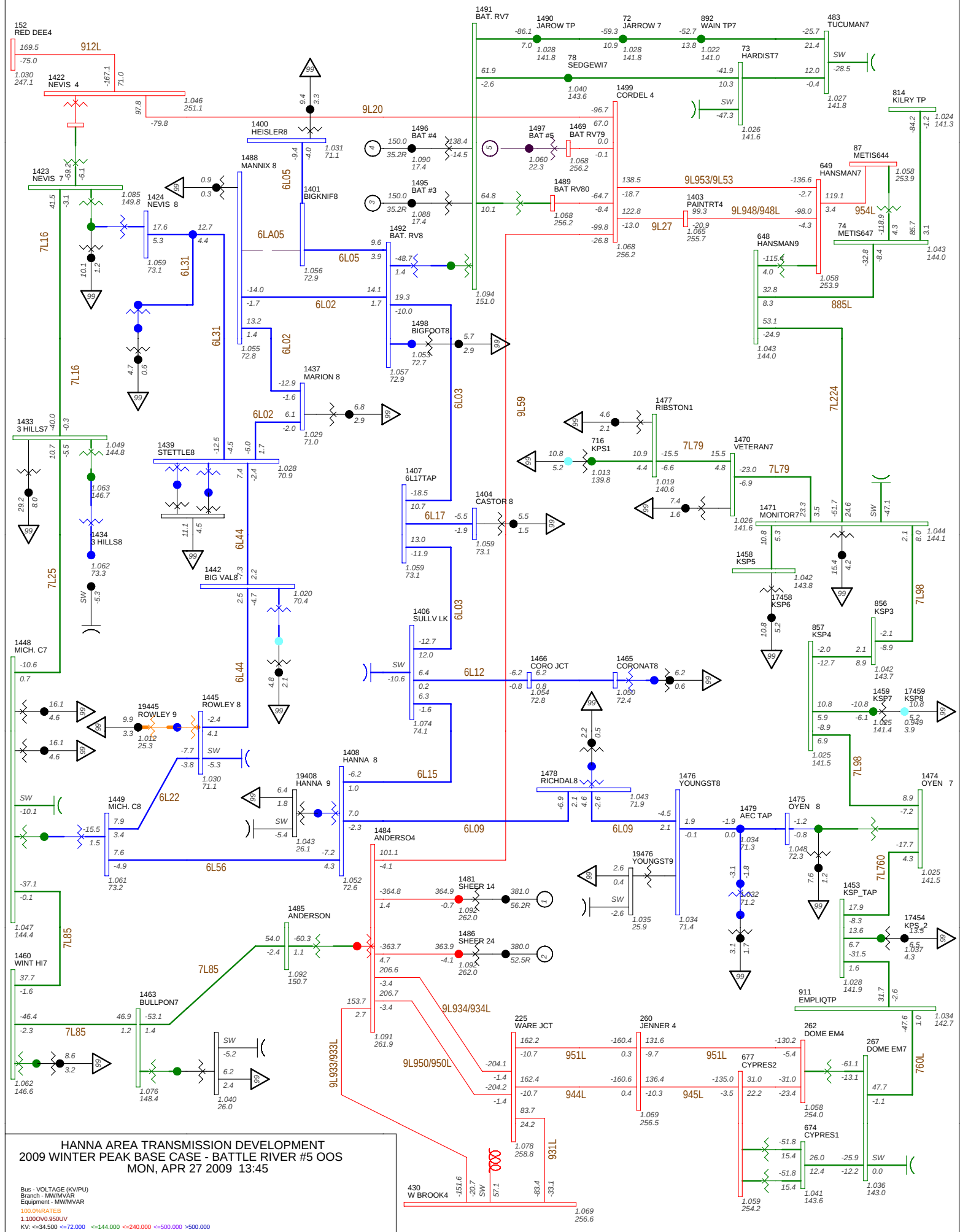
Historical Winter Peak Substation Loads						
Area	Substation	2004	2005	2006	2007	2008
Alliance/Battle River (36)	Bigfoot 756S	6.1	6.0	6.5	6.3	6.3
	Battle River757S	0.0	0.0	11.9	0.0	0.0
	Heisler 764S	10.0	10.1	9.9	9.0	8.6
	Mannix Mine 765S	1.2	1.1	1.1	1.1	1.0
	Bigknife Creek 843S	0.1	0.1	0.0	0.1	0.6
	Paintearth 863S	25.5	25.8	25.2	19.9	21.9
	Total Area 36	42.9	43.0	54.7	36.4	38.5
Hanna (42)	Castor 759S	4.0	5.5	4.9	5.0	4.9
	Delburne 760S	4.9	5.1	5.3	5.7	5.8
	Hanna 763S	6.4	6.3	6.9	6.6	6.7
	Nevis 766S	11.2	11.1	12.0	11.7	16.3
	Oyen 767S	7.5	7.6	7.8	8.6	8.6
	Rowley 768S	5.7	8.4	7.8	6.2	6.9
	Stettler 769S	10.3	10.7	11.4	11.7	12.4
	Three Hills 770S	23.1	26.1	27.4	27.4	26.8
	Veteran 771S	8.1	10.4	7.9	11.2	10.8
	Youngstown 772S	2.8	2.4	2.6	3.1	2.6
	Coronation 773S	5.5	6.1	6.5	7.7	8.6
	Monitor 774S	16.7	15.4	16.6	21.1	20.3
	Richdale 776S	2.0	4.8	5.3	5.2	5.0
	Big Valley 778S	5.4	6.7	4.4	5.7	6.8
	Michichi Creek 802S	26.6	29.4	29.4	30.6	30.8
	Marion Lake 873S	7.4	7.0	7.2	7.4	7.6
	Ribstone Creek 892S	0.0	5.0	5.4	5.2	4.9
	Youngstown Express	4.9	5.4	5.4	5.3	5.1
	Total Area 42	152.5	173.6	174.0	185.3	191.1
Sheerness (43)	Anderson 801S	6.2	6.3	7.0	7.0	6.7
	Bullpound 803S	13.5	13.1	12.1	9.1	14.2
	Wintering Hills 804S	7.8	6.5	7.5	7.1	6.7
	Sheerness 807S	25.9	19.7	23.2	0.0	0.0
	Total Area 43	53.4	45.6	49.8	23.2	27.6
Wainwright (32)	Sedgewick 137S	14.8	18.0	13.1	14.3	16.2
	Jarrow 252S	4.0	5.4	7.0	4.4	5.4
	Rosyth 296S	20.0	20.7	20.9	19.8	20.1
	HRT Express 329S	5.6	6.7	6.5	6.4	6.1
	Hardisty 377S	18.0	18.0	18.5	18.3	18.2
	Wainwright 51S	23.5	24.3	26.4	25.6	24.4
	Buffalo Creek 526S	14.5	14.2	14.8	14.4	16.4
	Cochin Pipeline 968S	1.7	1.0	0.7	0.4	0.5
	Total Area 32	101.9	108.3	107.8	103.6	107.3
Provost (37)	Hughenden 213S	15.6	15.4	15.5	15.2	14.4
	Sunken Lake 221S	12.6	18.3	17.1	18.6	17.9
	Killarney Lake 267S	24.9	25.4	25.3	25.1	26.5
	Hayter 277S	26.1	26.7	32.1	30.0	28.5
	Provost 545S	22.1	21.7	28.7	20.7	26.0
	Metiskow 648S	12.2	12.0	21.3	12.0	10.6
	Edgerton 899S	8.1	9.6	8.1	8.5	8.8
	Total Area 37	121.6	129.2	148.2	130.1	132.8
Total of All Areas		472.3	499.8	534.5	478.5	497.2

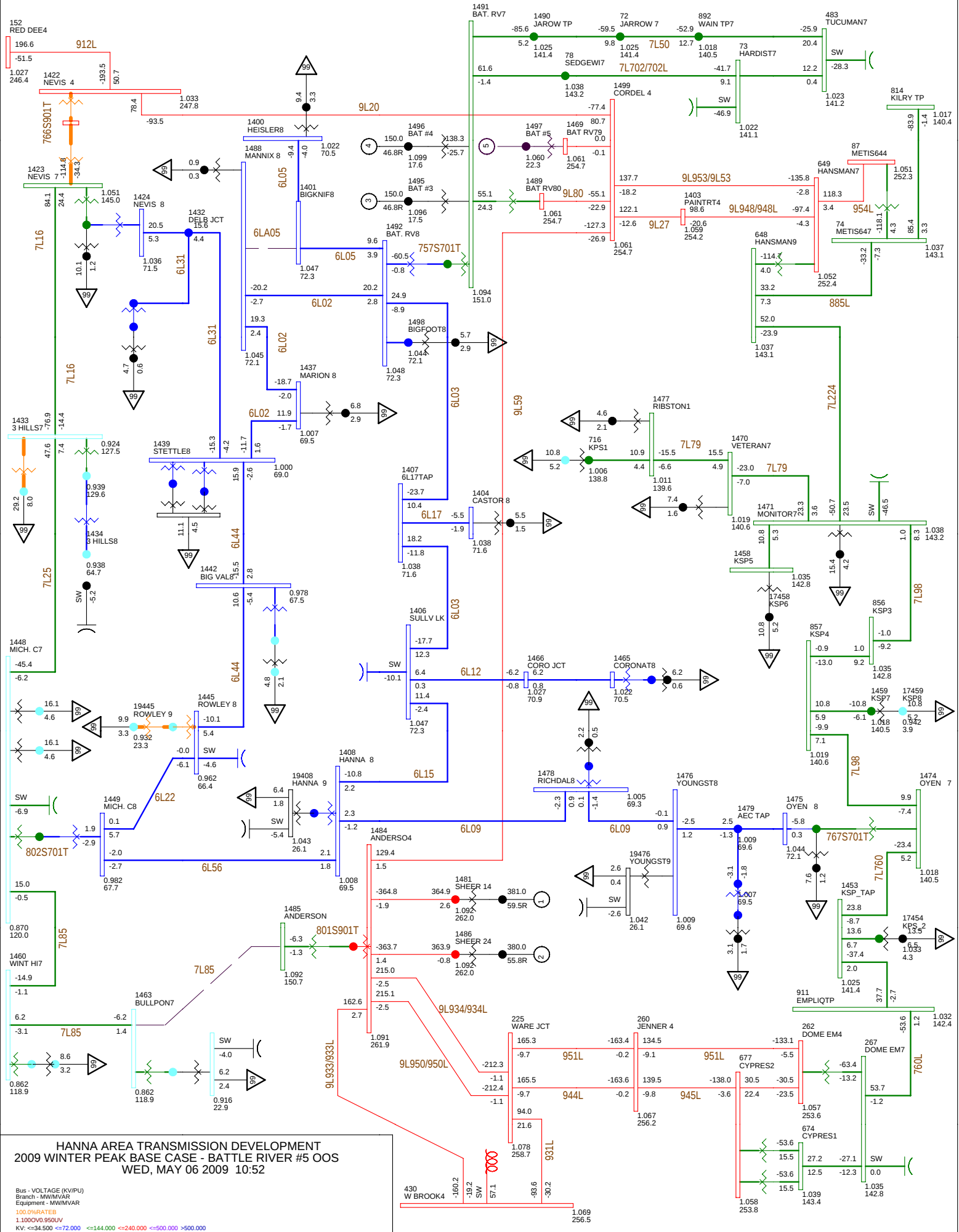
Table A-1b: Historical Summer Peak Substation Loads

Historical Summer Peak Substation Loads						
Area	Substation	2004	2005	2006	2007	2008
Alliance/Battle River (36)	Bigfoot 756S	5.8	5.9	5.7	6.1	5.7
	Battle River 757S	10.7	0.0	11.9	0.0	0.0
	Heisler 764S	9.7	9.1	8.6	8.0	7.2
	Mannix Mine 765S	0.9	0.8	0.9	0.9	0.8
	Bigknife Creek 843S	2.0	2.0	2.0	2.0	2.0
	Paintearth 863S	25.2	30.0	26.5	22.4	21.8
	Total Area 36	54.3	47.8	55.6	39.4	37.4
Hanna (42)	Castor 759S	3.8	3.4	4.6	4.8	3.8
	Delburne 760S	4.7	4.5	4.4	4.0	4.1
	Hanna 763S	5.1	5.0	5.5	5.5	5.4
	Nevis 766S	9.9	9.9	10.6	10.5	10.4
	Oyen 767S	7.1	7.0	7.0	7.2	6.4
	Rowley 768S	5.6	5.7	6.2	6.2	6.4
	Stettler 769S	9.4	10.3	10.5	11.3	11.1
	Three Hills 770S	19.9	20.8	24.0	25.2	23.1
	Veteran 771S	8.0	8.5	11.7	10.8	8.0
	Youngstown 772S	2.5	1.5	3.3	1.9	1.9
	Coronation 773S	5.0	5.6	6.0	5.5	6.2
	Monitor 774S	17.3	19.4	18.1	17.2	18.6
	Richdale 776S	4.5	3.7	5.0	4.0	2.7
	Big Valley 778S	4.7	4.1	3.8	4.8	4.6
	Michichi Creek 802S	23.9	25.5	30.2	32.5	30.5
	Marion Lake 873S	6.0	5.7	6.2	5.5	6.0
	Ribstone Creek 892S	0.0	5.4	5.3	5.4	5.0
	Youngstown Express	4.0	5.4	5.4	5.3	5.3
	Total Area 42	141.3	151.3	167.6	167.8	159.6
Sheerness (43)	Anderson 801S	5.3	5.1	6.2	6.0	5.9
	Bullpound 803S	15.6	16.0	17.3	22.7	17.3
	Wintering Hills 804S	6.0	6.2	6.2	7.2	6.8
	Sheerness 807S	0.0	16.3	21.7	0.0	0.0
	Total Area 43	27.0	43.6	51.4	36.0	29.9
Wainwright (32)	Sedgewick 137S	19.1	14.0	16.0	12.7	12.8
	Jarrow 252S	4.8	5.4	6.7	4.6	4.8
	Rosyth 296S	17.7	15.2	21.1	19.2	18.5
	HRT Express 329S	5.0	6.9	6.7	6.5	6.5
	Hardisty 377S	16.7	16.7	17.6	16.8	17.5
	Wainwright 51S	21.3	21.7	23.2	23.3	21.6
	Buffalo Creek 526S	12.7	12.8	13.5	12.7	12.7
	Cochin Pipeline 968S	1.9	1.3	0.7	0.6	0.5
	Total Area 32	99.3	94.1	105.6	96.4	94.9
Provost (37)	Hughenden 213S	15.6	14.3	14.6	14.1	13.6
	Sunken Lake 221S	12.8	11.4	15.6	15.0	16.3
	Killarney Lake 267S	22.8	23.2	23.2	23.1	24.3
	Hayter 277S	31.2	25.1	26.0	28.9	27.4
	Provost 545S	20.2	19.9	29.7	18.9	19.4
	Metiskow 648S	10.9	10.9	10.9	10.3	9.7
	Edgerton 899S	6.7	6.4	7.2	7.8	6.9
	Total Area 37	120.3	111.2	127.1	118.2	117.6
Total of All Areas		442.1	448.0	507.2	457.7	439.4

2009 Load Flow Diagrams

Load Adequacy: Winter Peak 2009 Bat River #5 off





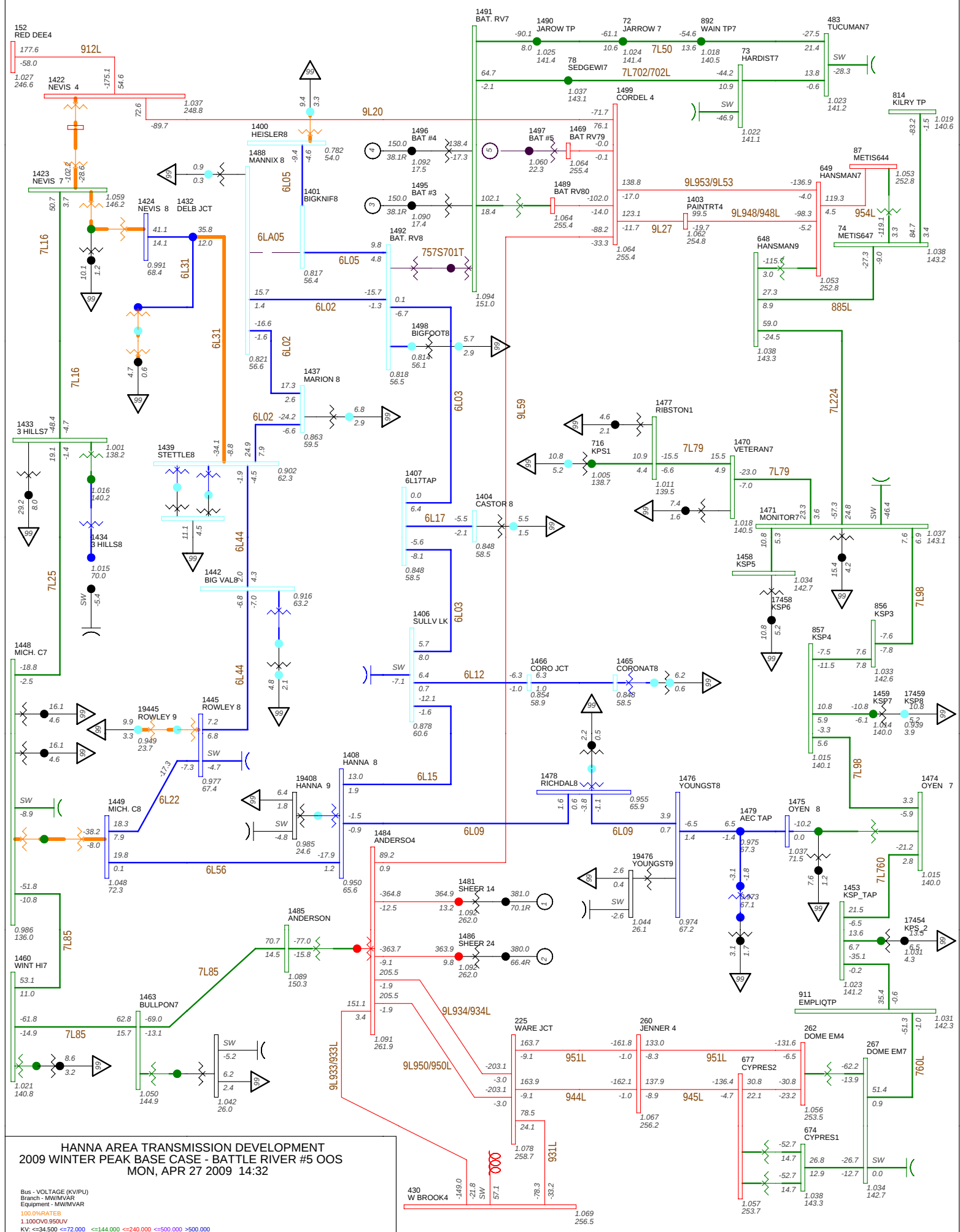


Figure 2009WP-03: 757S701T at Battle River 757S

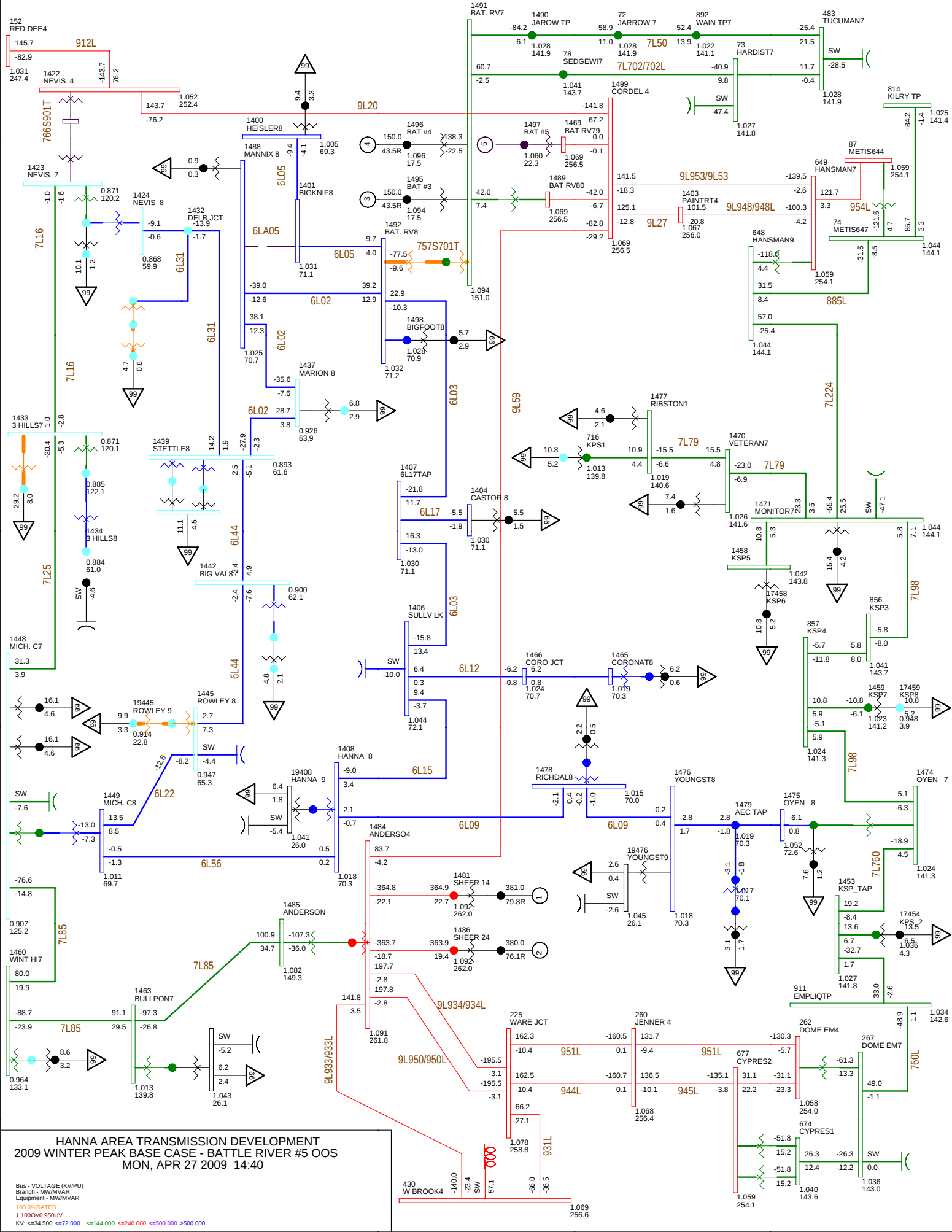


Figure 2009WP-04: 766S901T at Nevis 766S

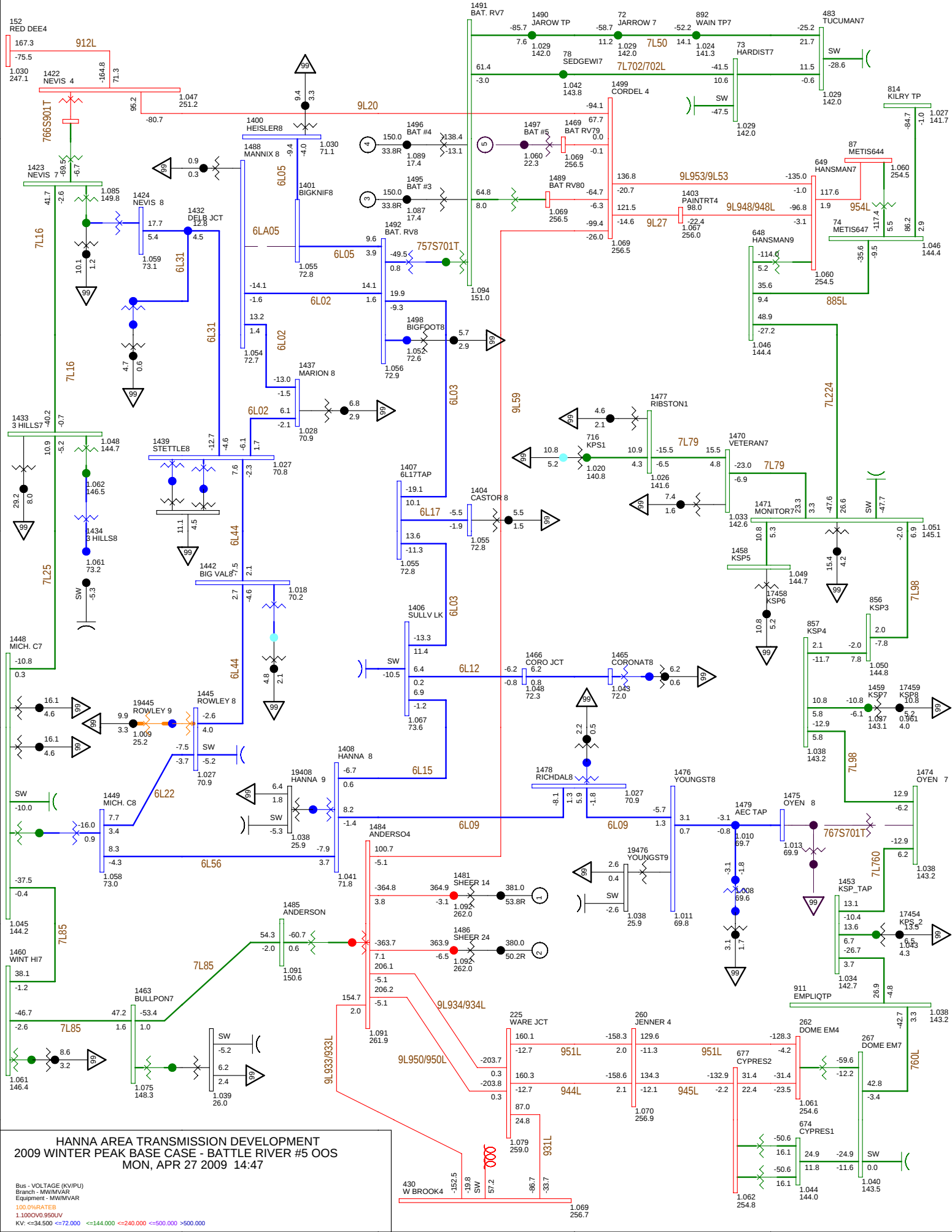


Figure 2009WP-05: 767S701T at Oyen 767S

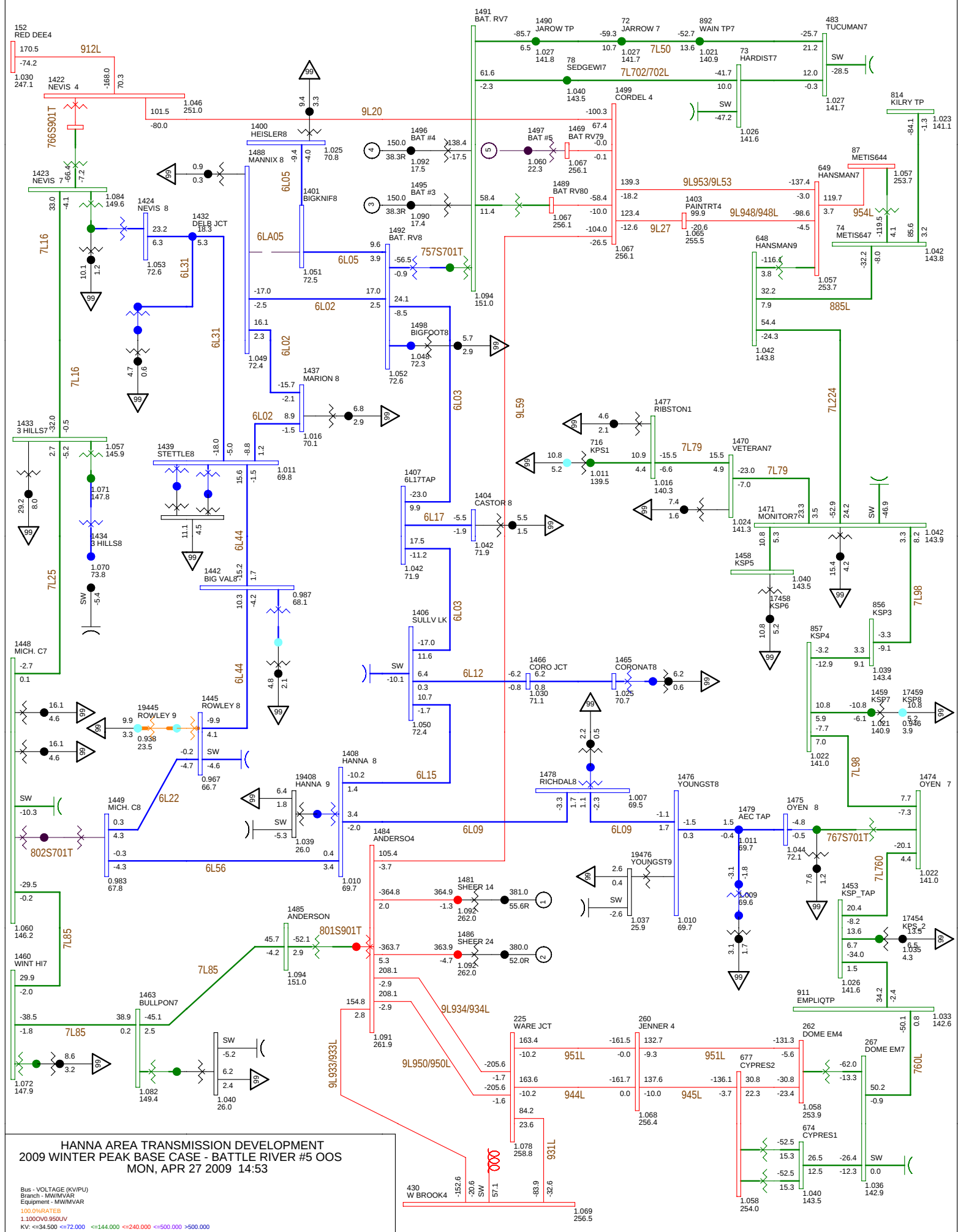


Figure 2009WP-07: 802S701T at Michichi Creek 802S

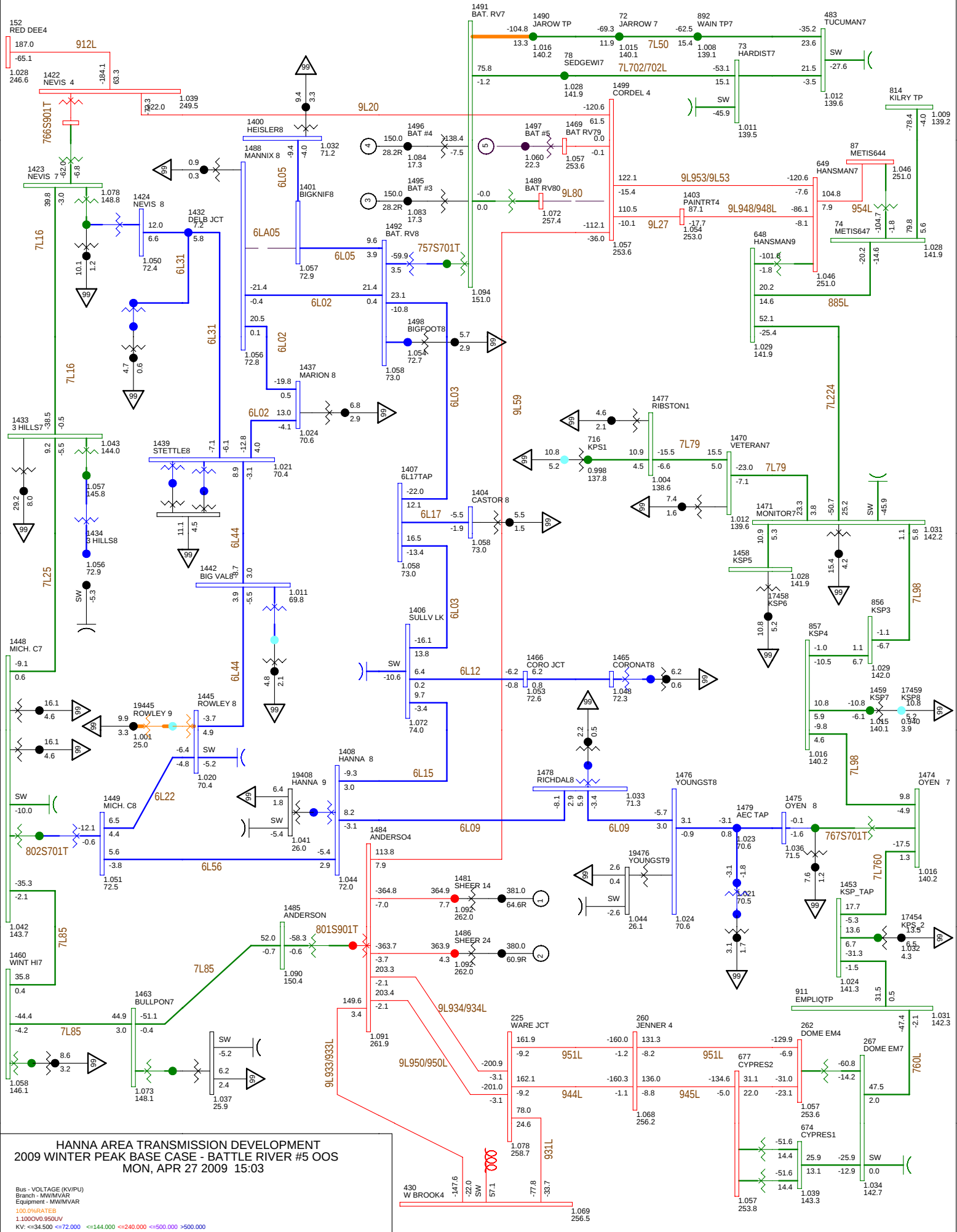


Figure 2009WP-08: 9L80 Battle River 757S to Cordel 755S

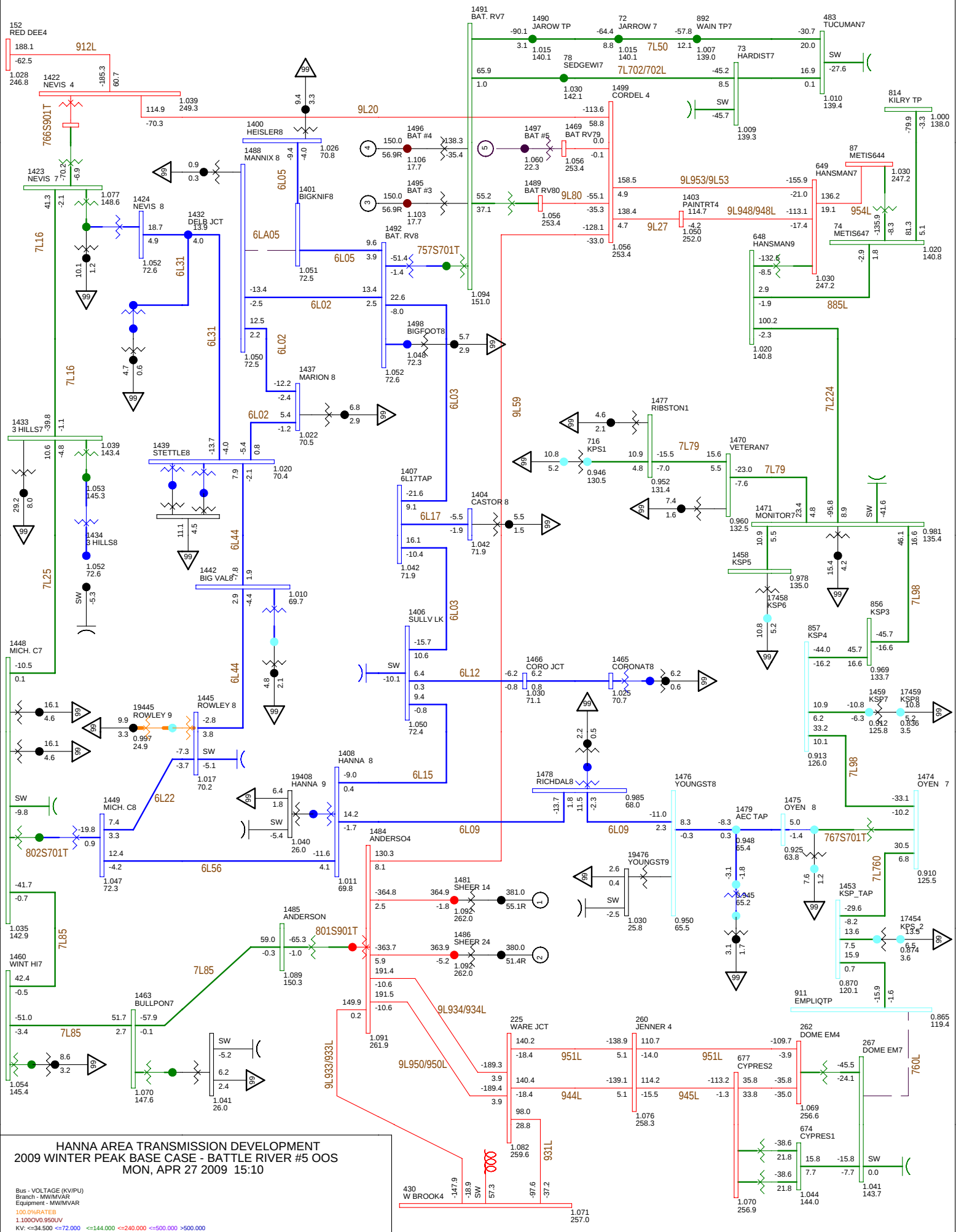


Figure 2009WP-11: 760L Empress Liquids 164S Tap to Bindloss 914S Tap (Keystone 4)

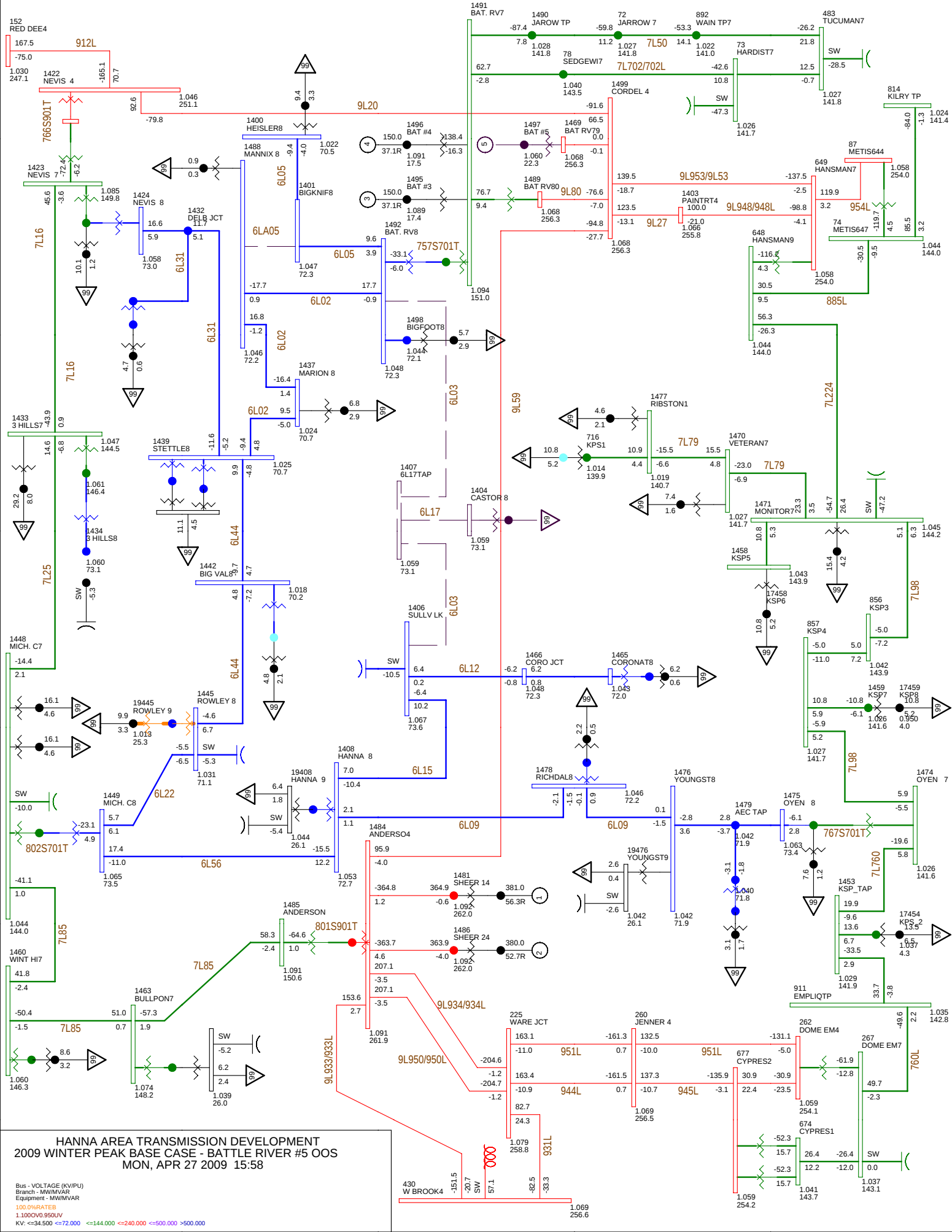


Figure 2009WP-13: 6L03 Battle River 757S to Sullivan Lake 775S

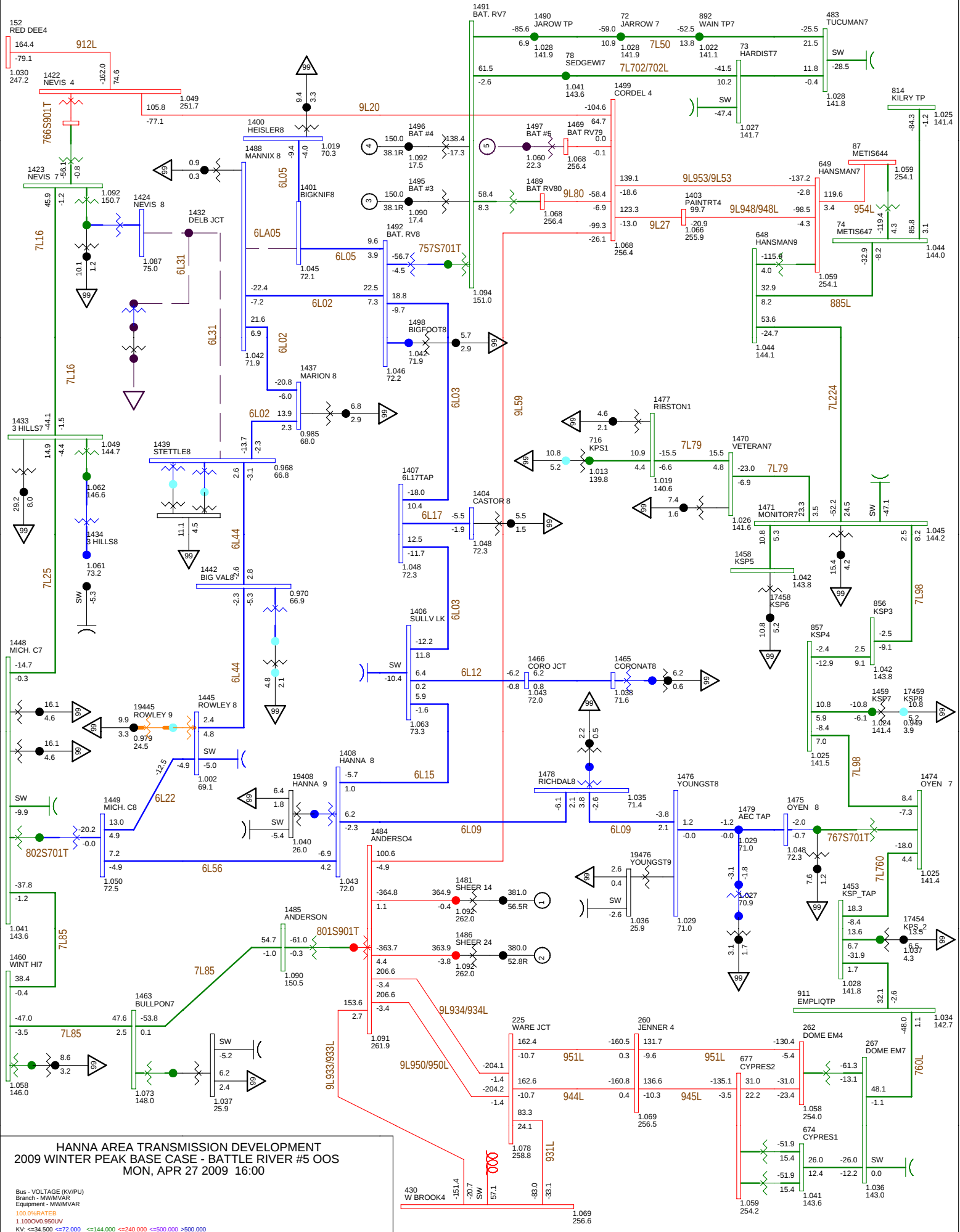
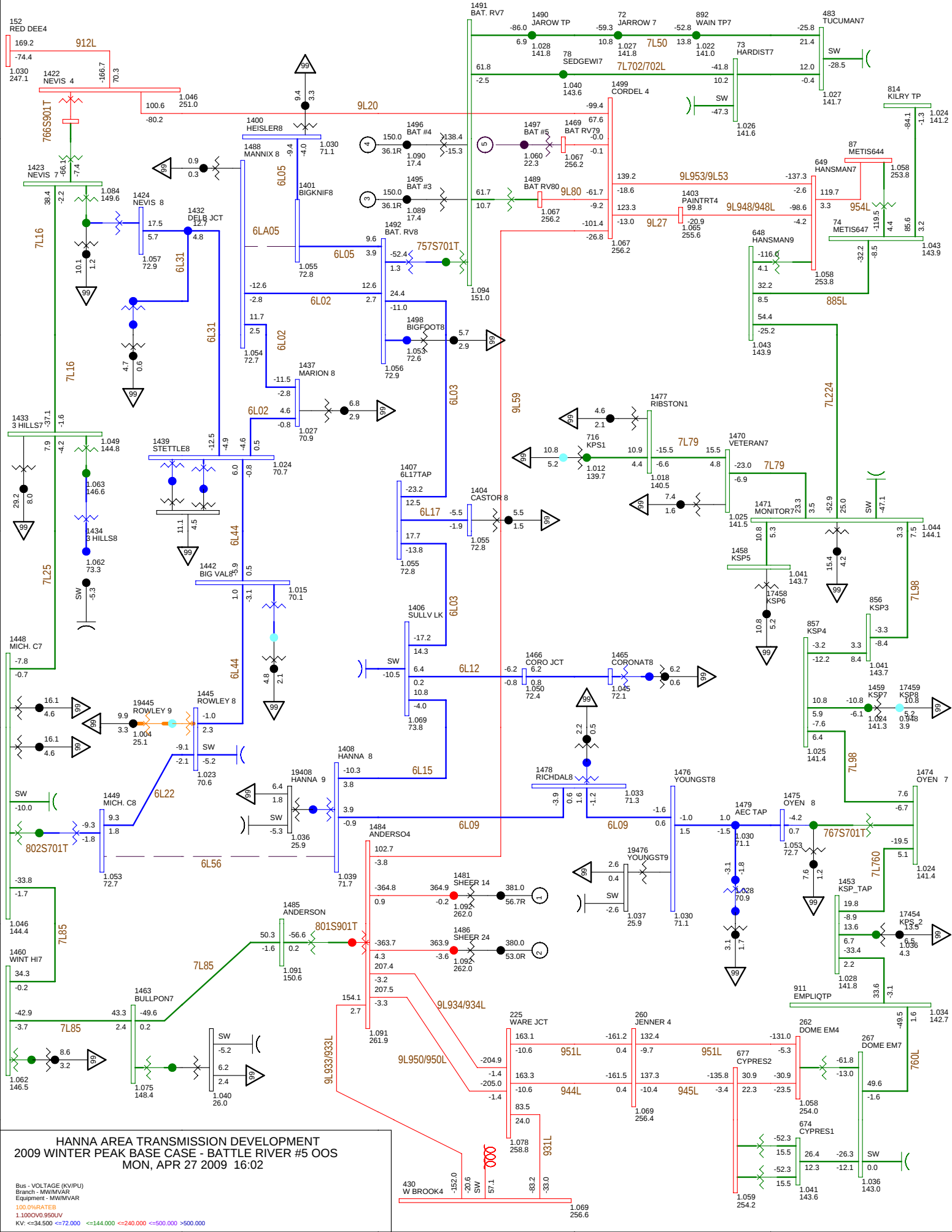


Figure 2009WP-14: 6L31 Nevis 766S to Stettler 769S and Delburne 760S



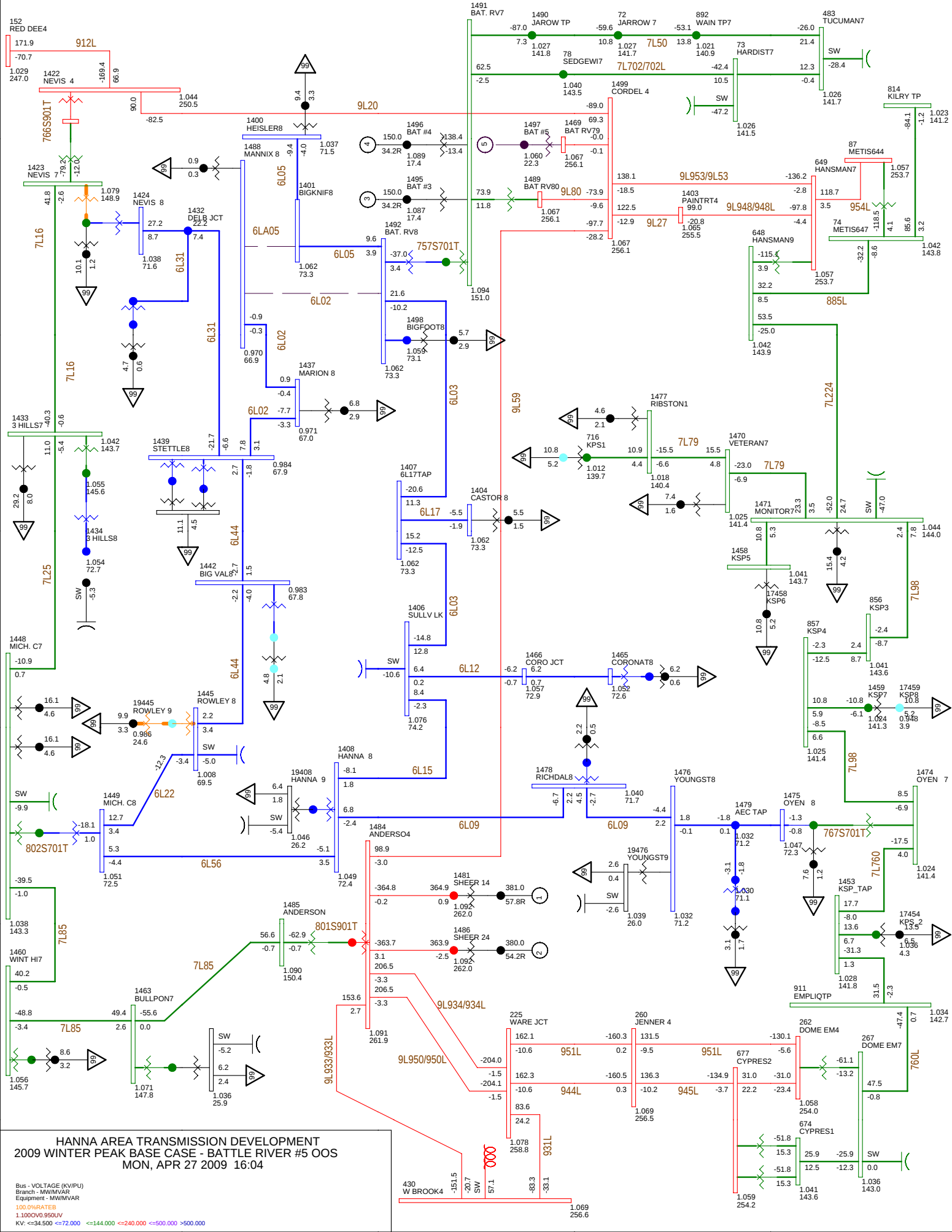
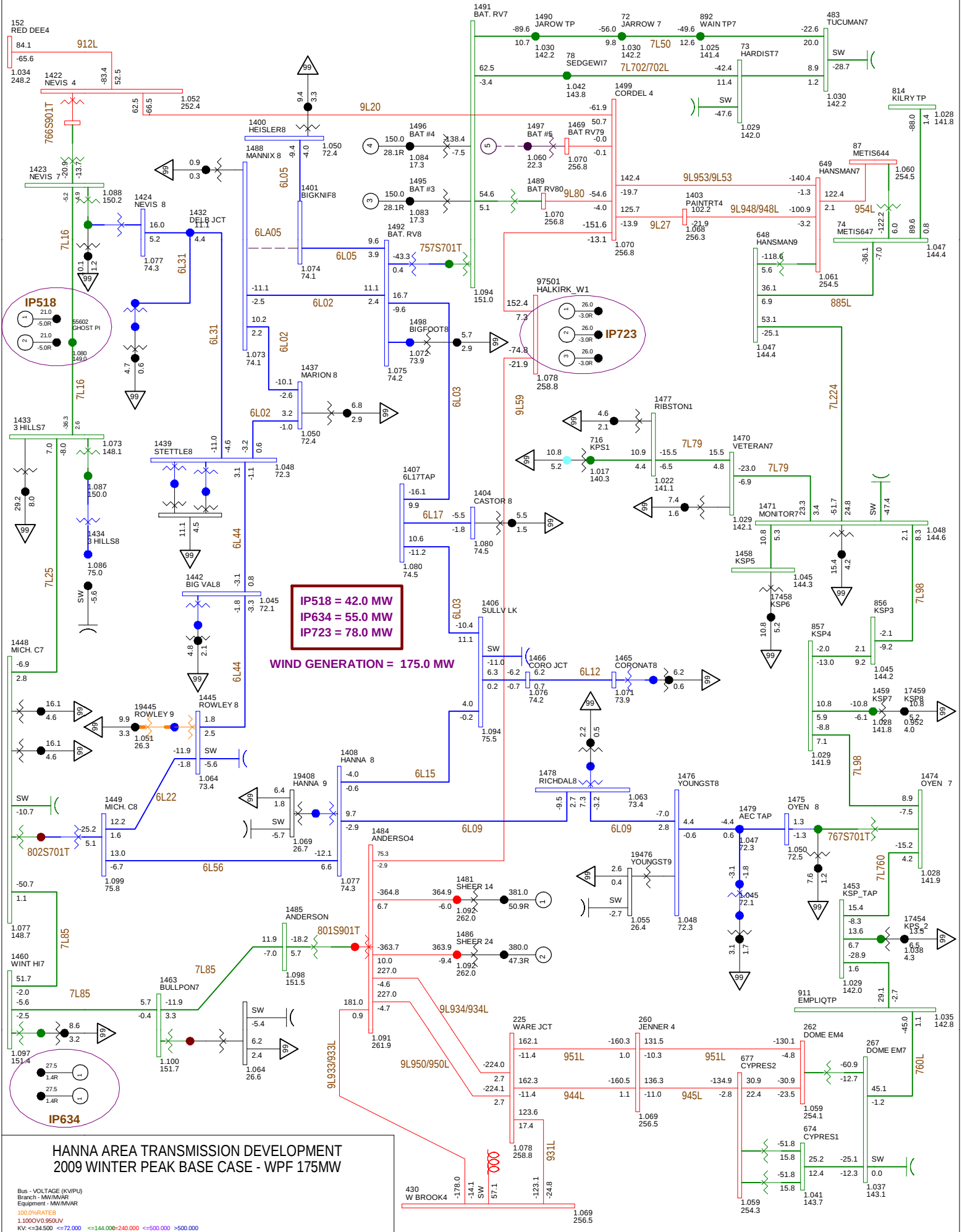
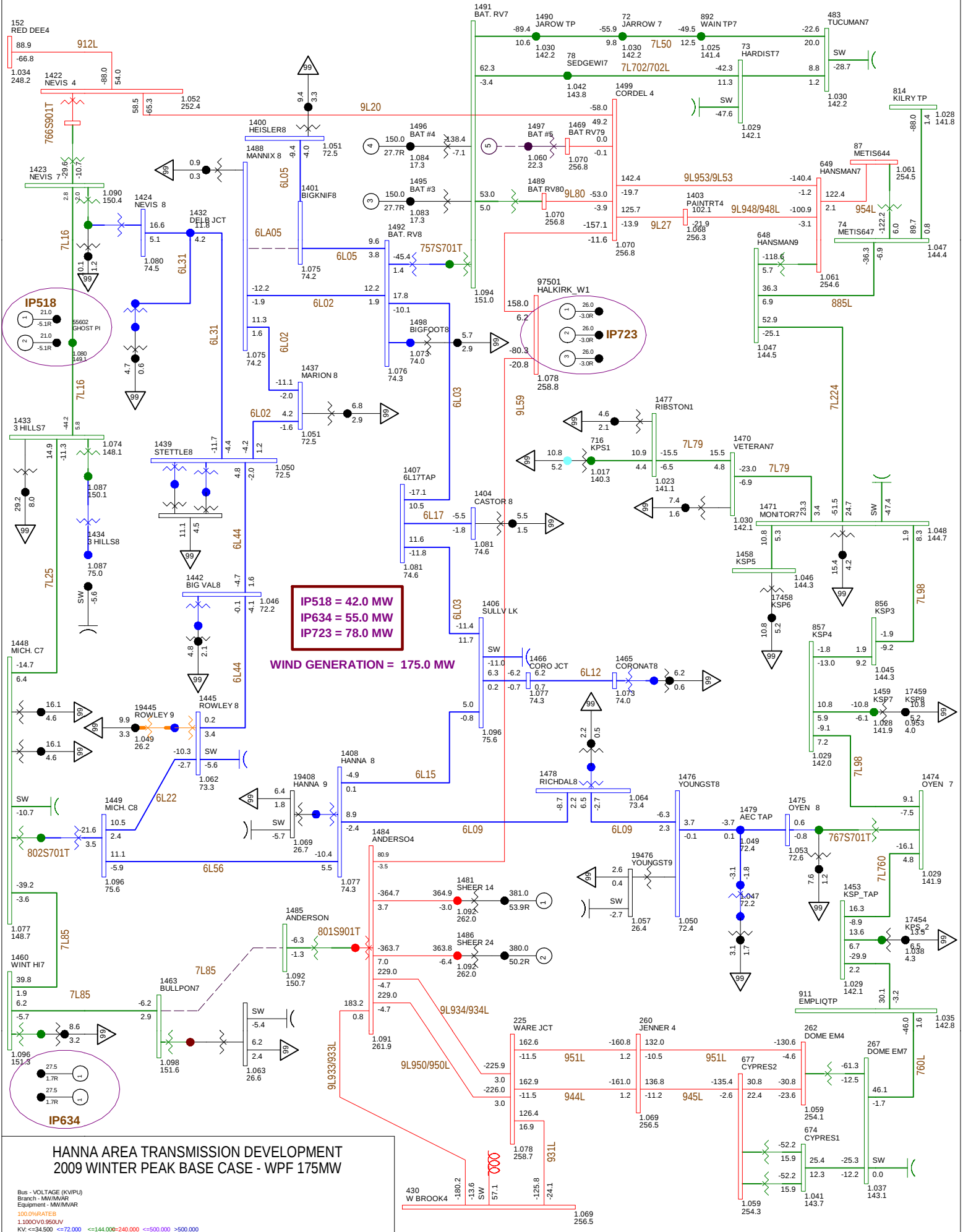


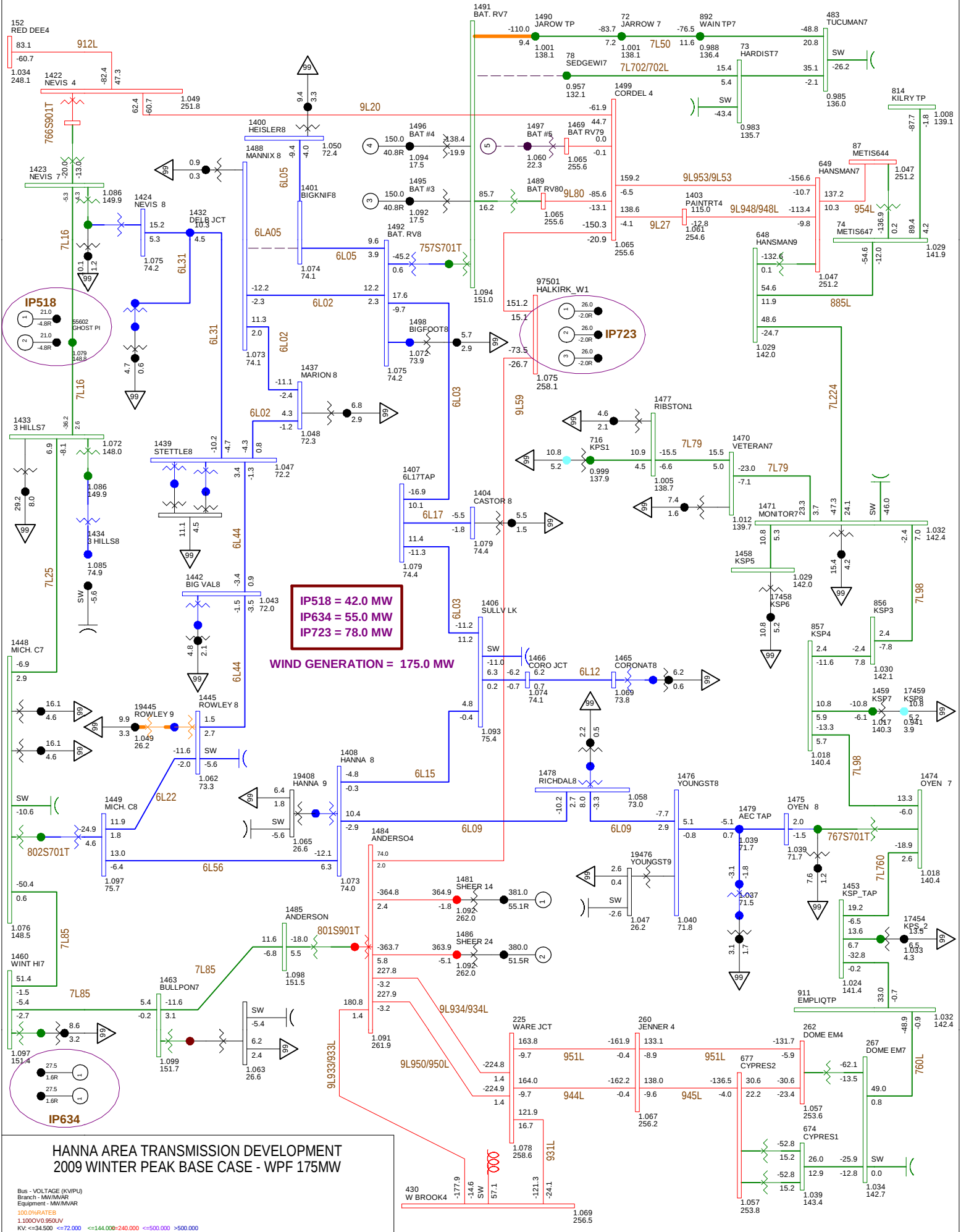
Figure 2009WP-16: 6L02 Battle River 757S to Mannix Mine 765S

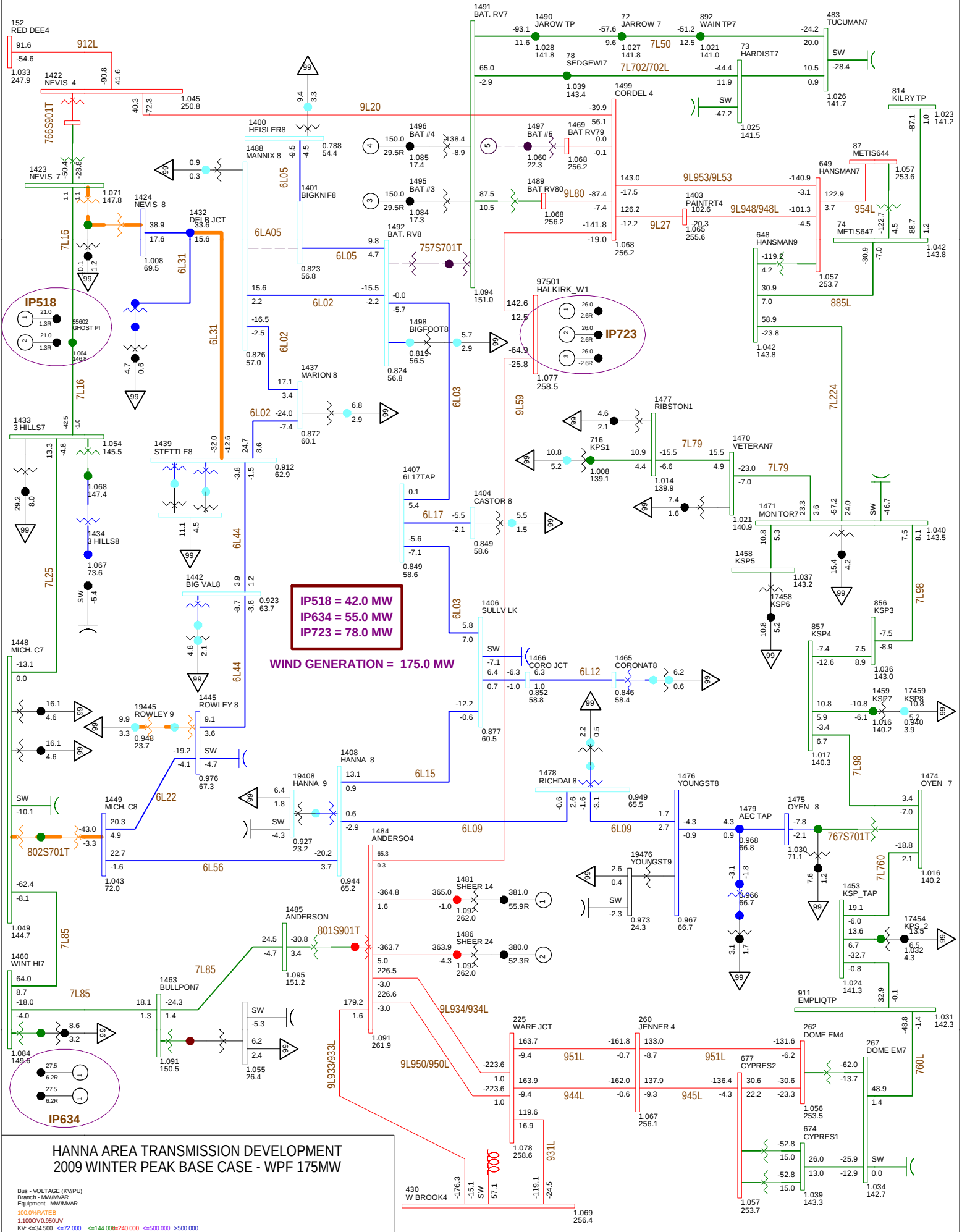
2009 Load Flow Diagrams

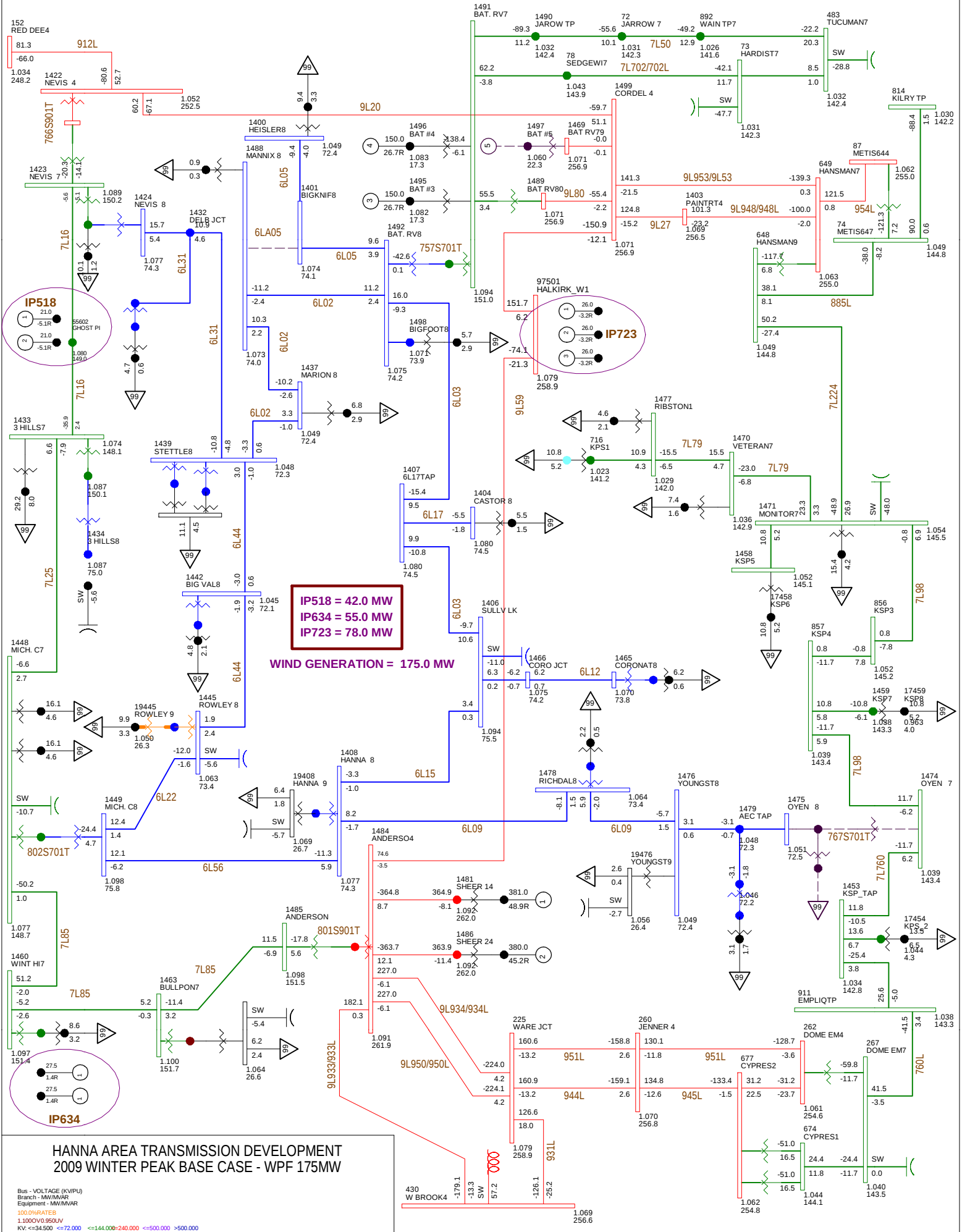
**Wind Integration: Winter Peak 2009 Bat River #5 off, 175
MW Wind**

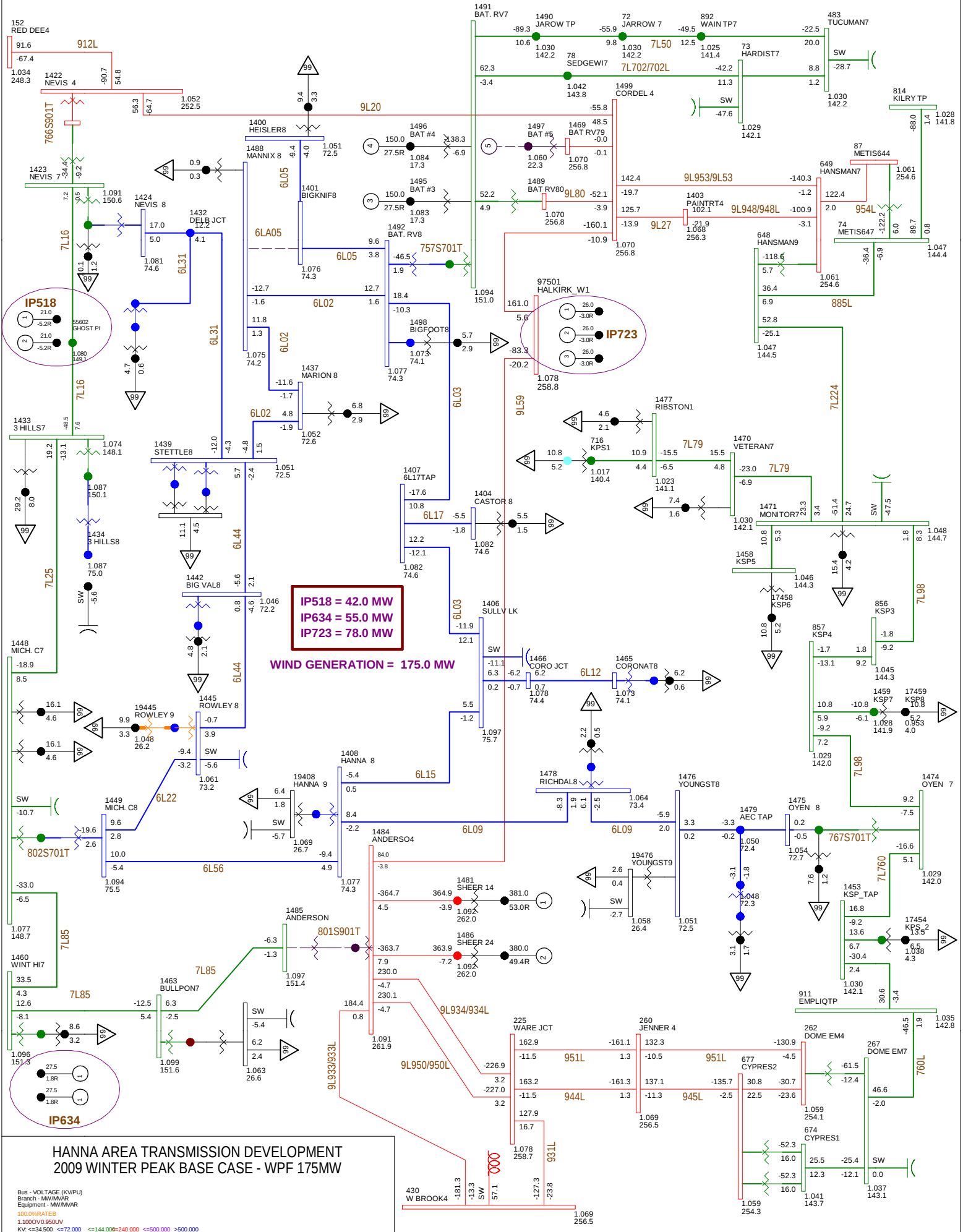


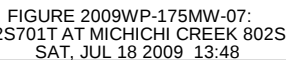


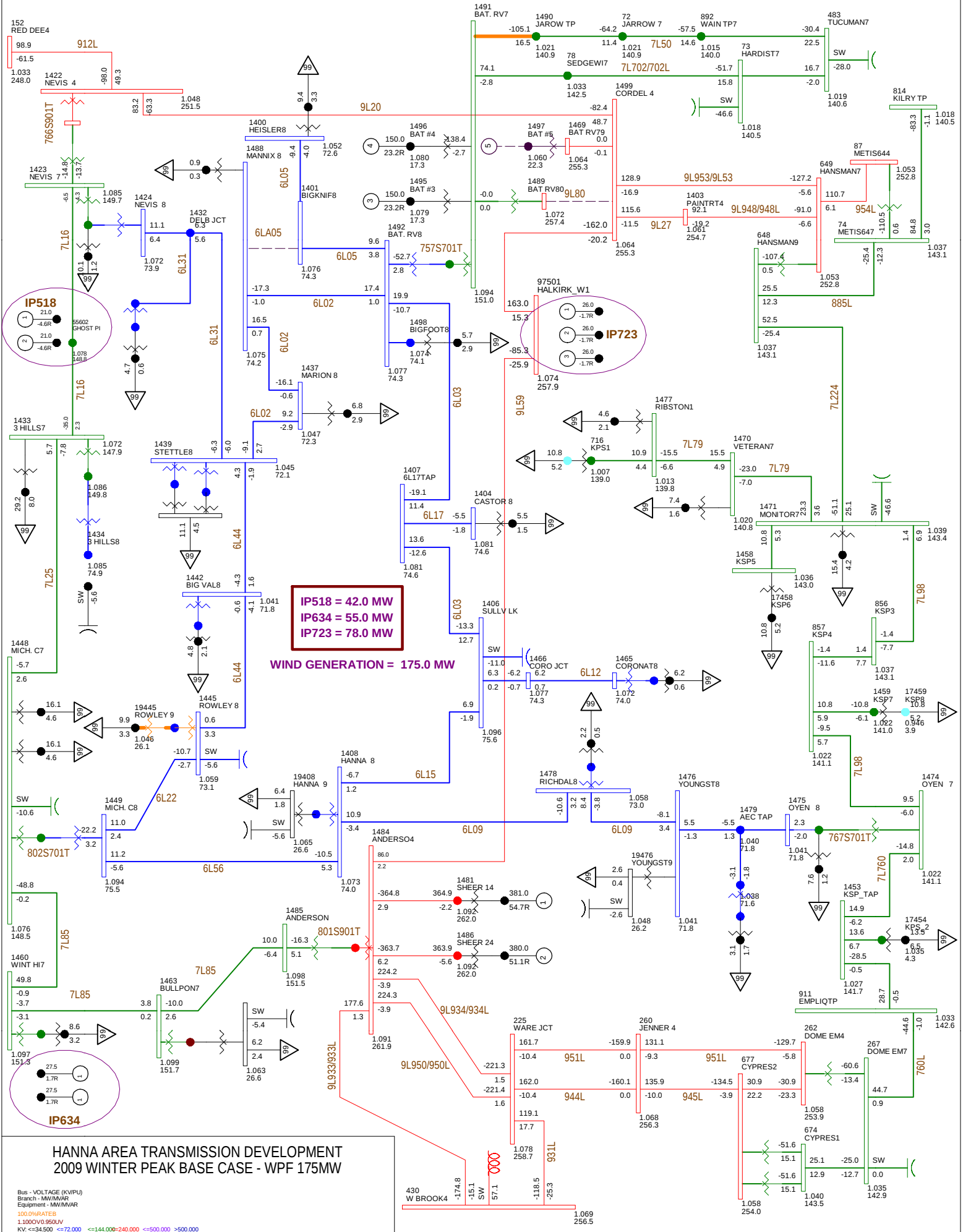


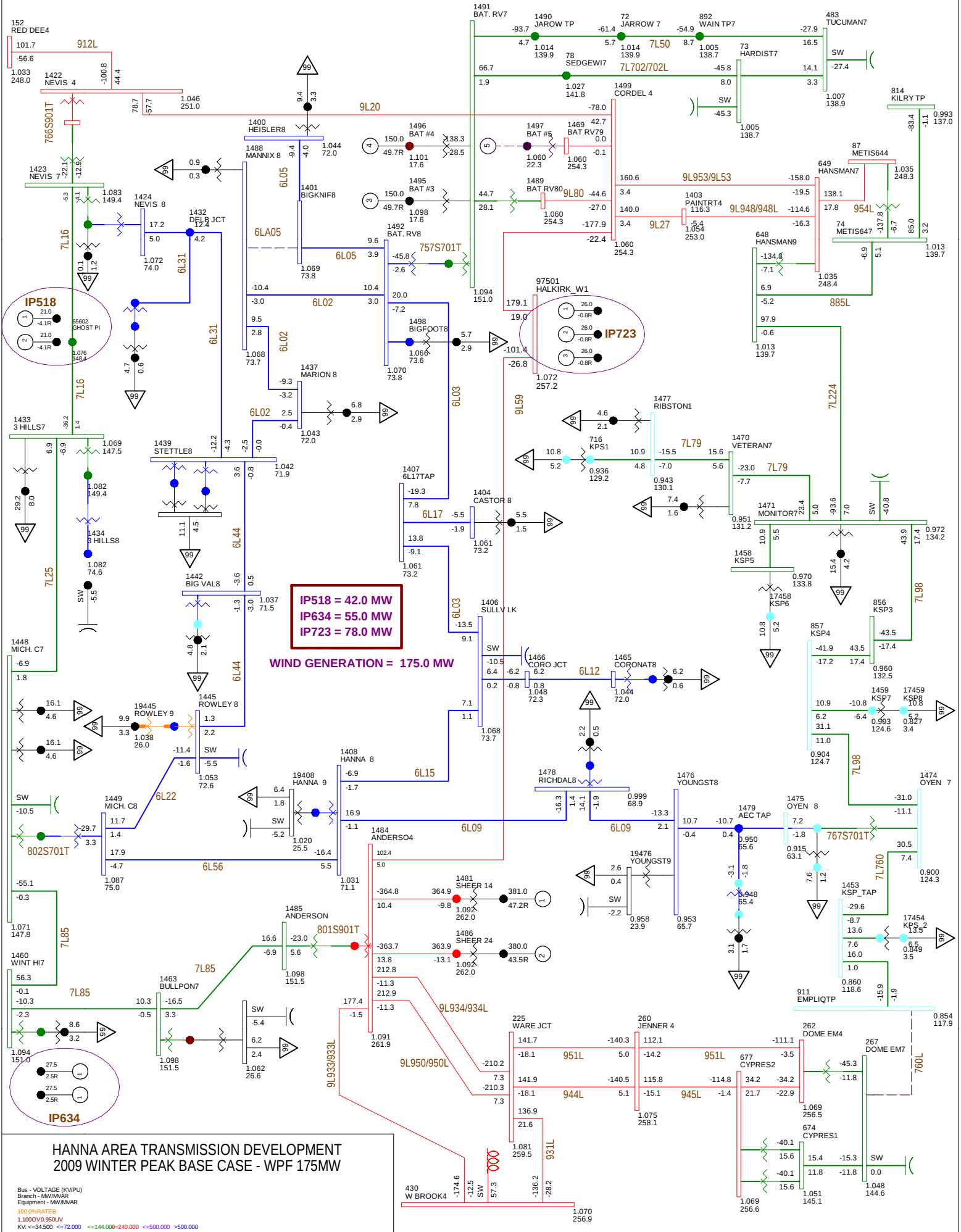












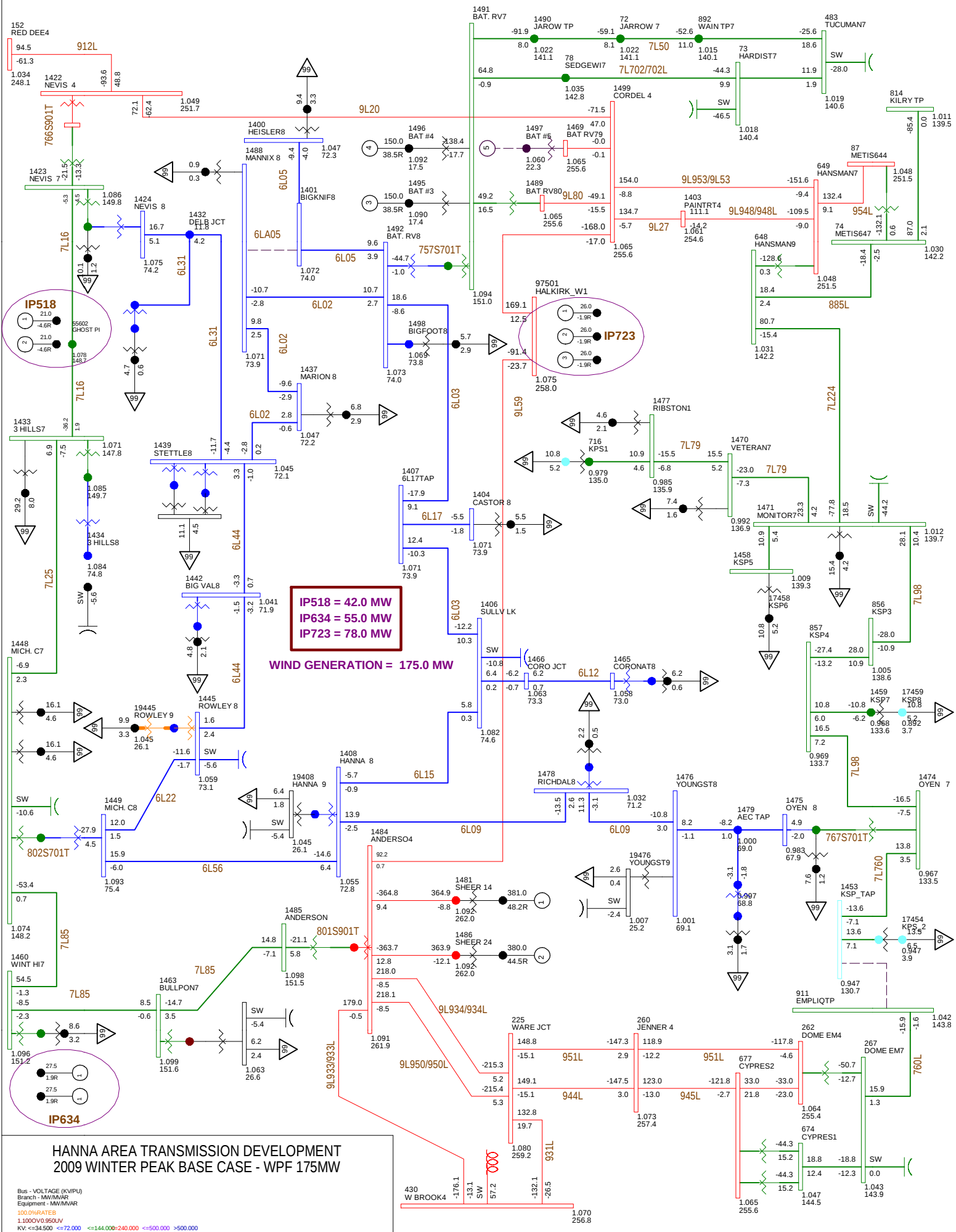
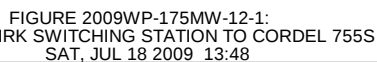
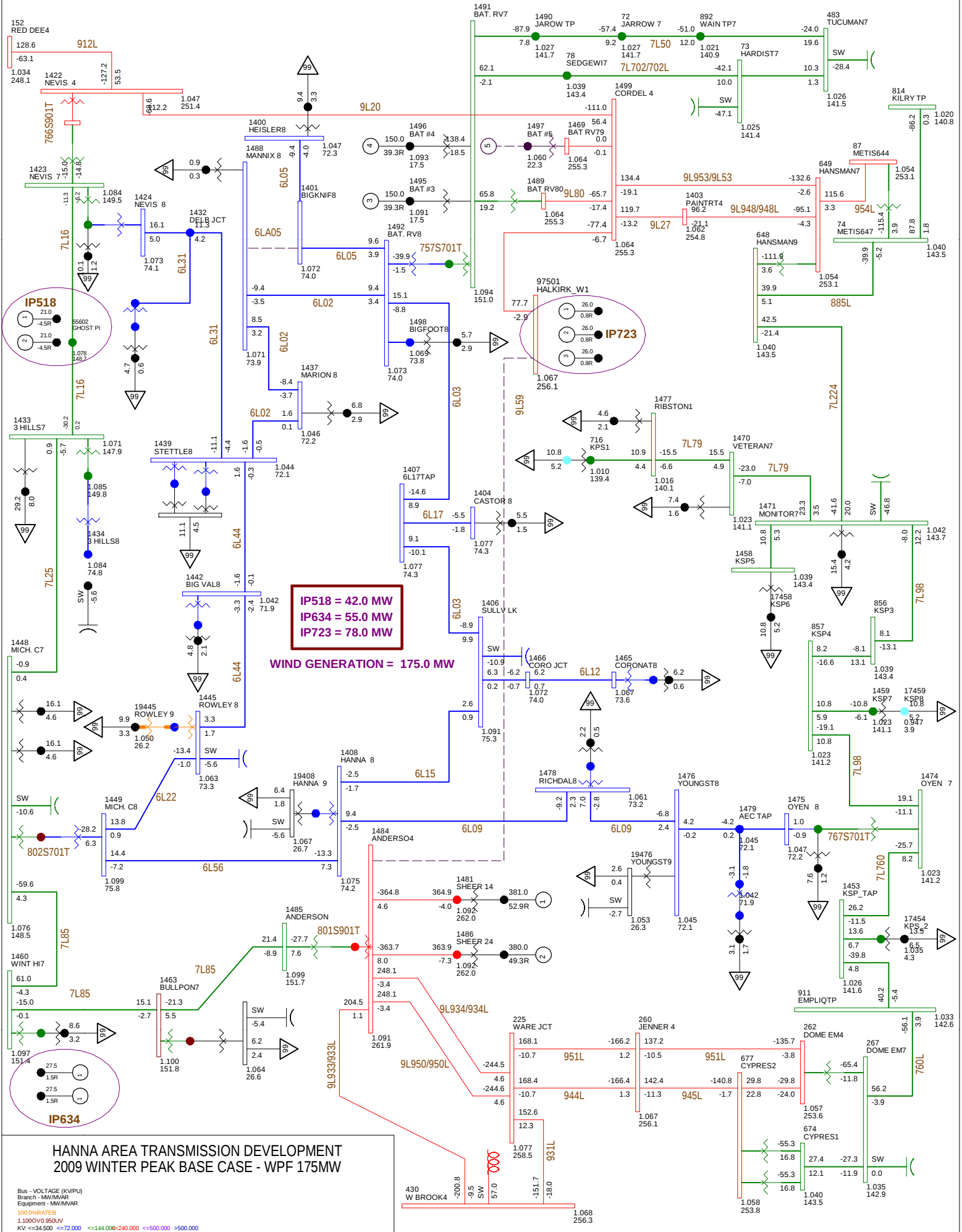
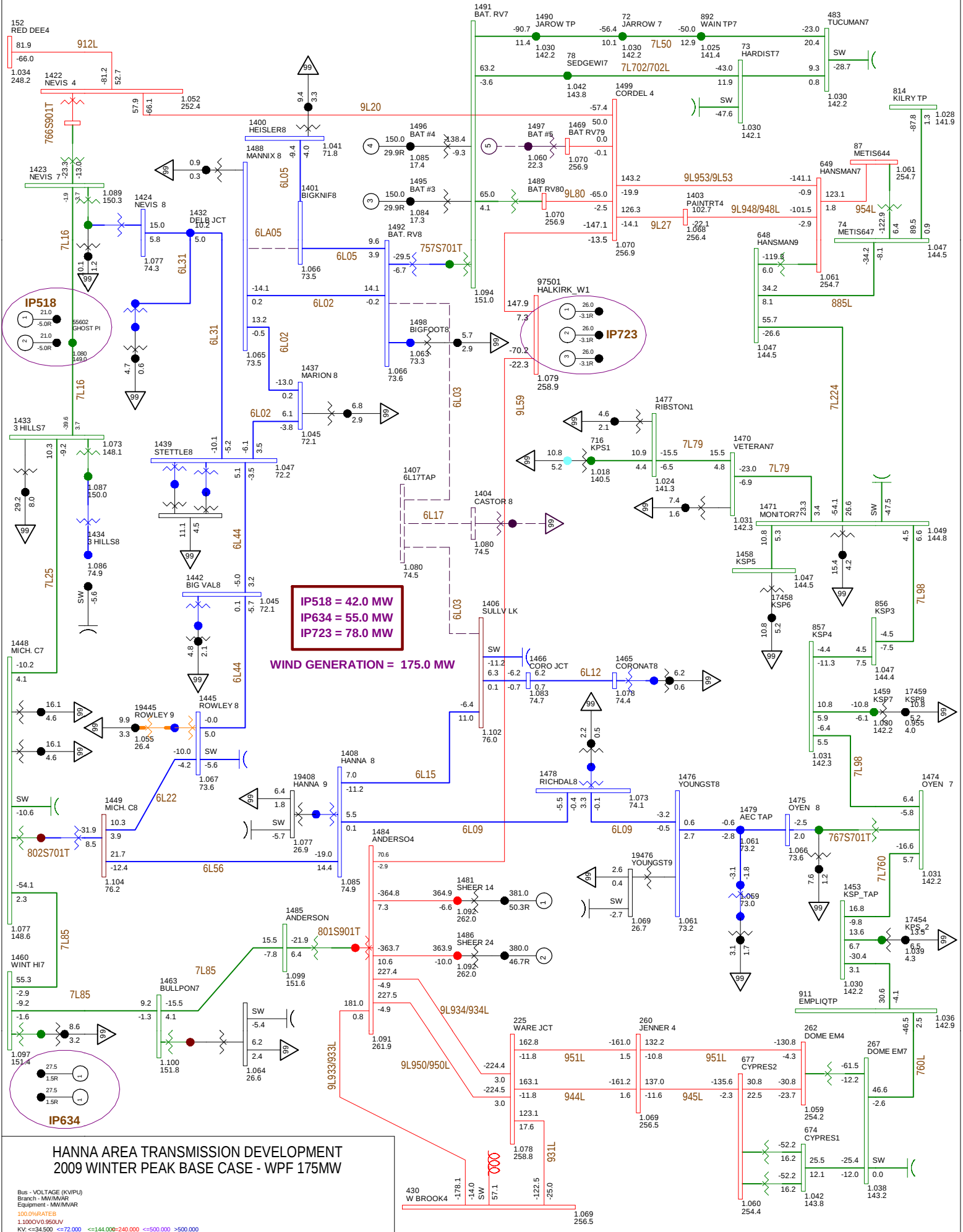


FIGURE 2009WP-175MW-11:
760L EMPRESS LIQUIDS 164S TAP TO BINDLOSS 914S TAP (KEYSTONE
SAT, JUL 18 2009 13:48







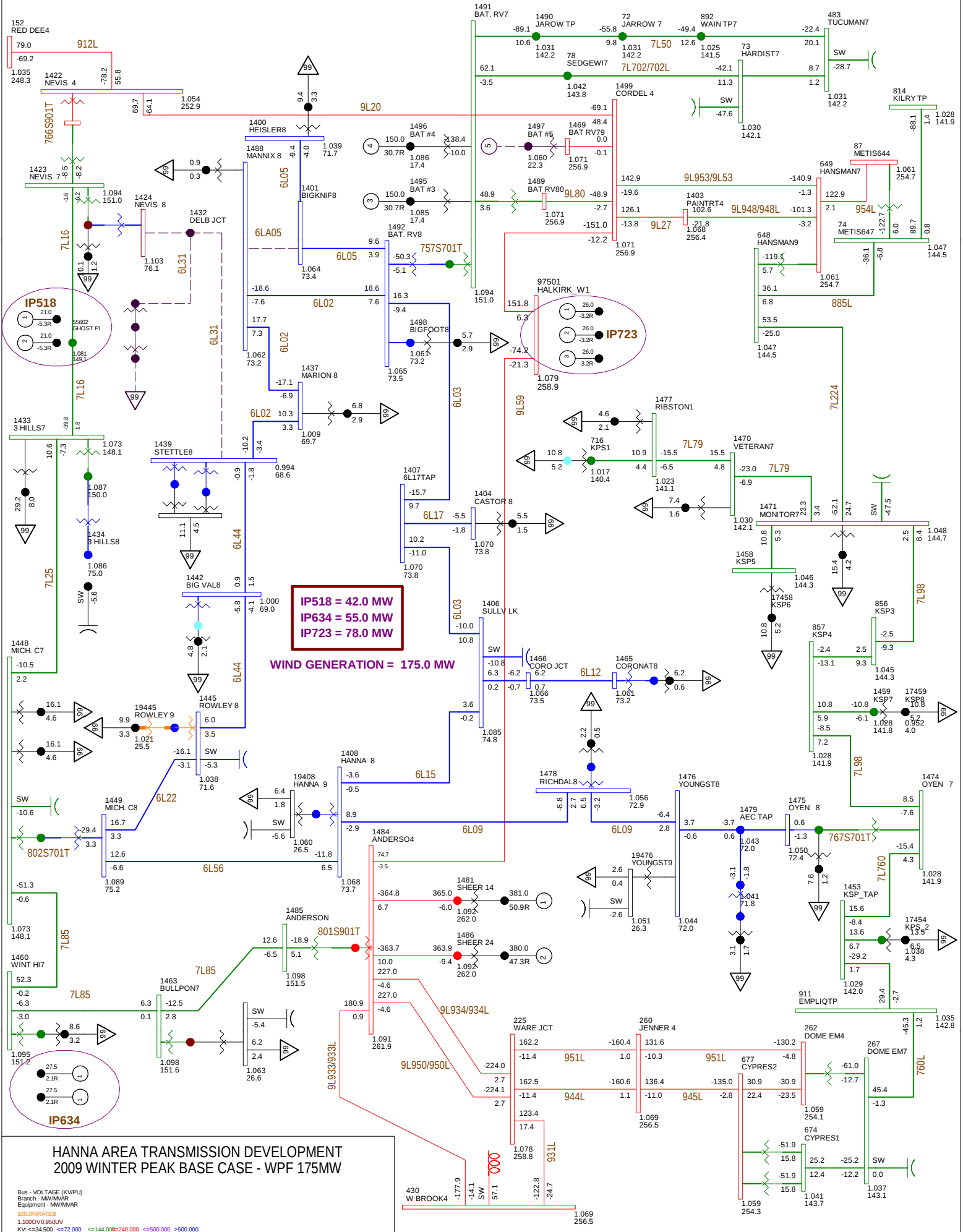


FIGURE 2009WP-175MW-14:
 6L31 NEVIS 766S TO STETTLER 769S AND DELBURNE 760S
 SAT, JUL 18 2009 13:48

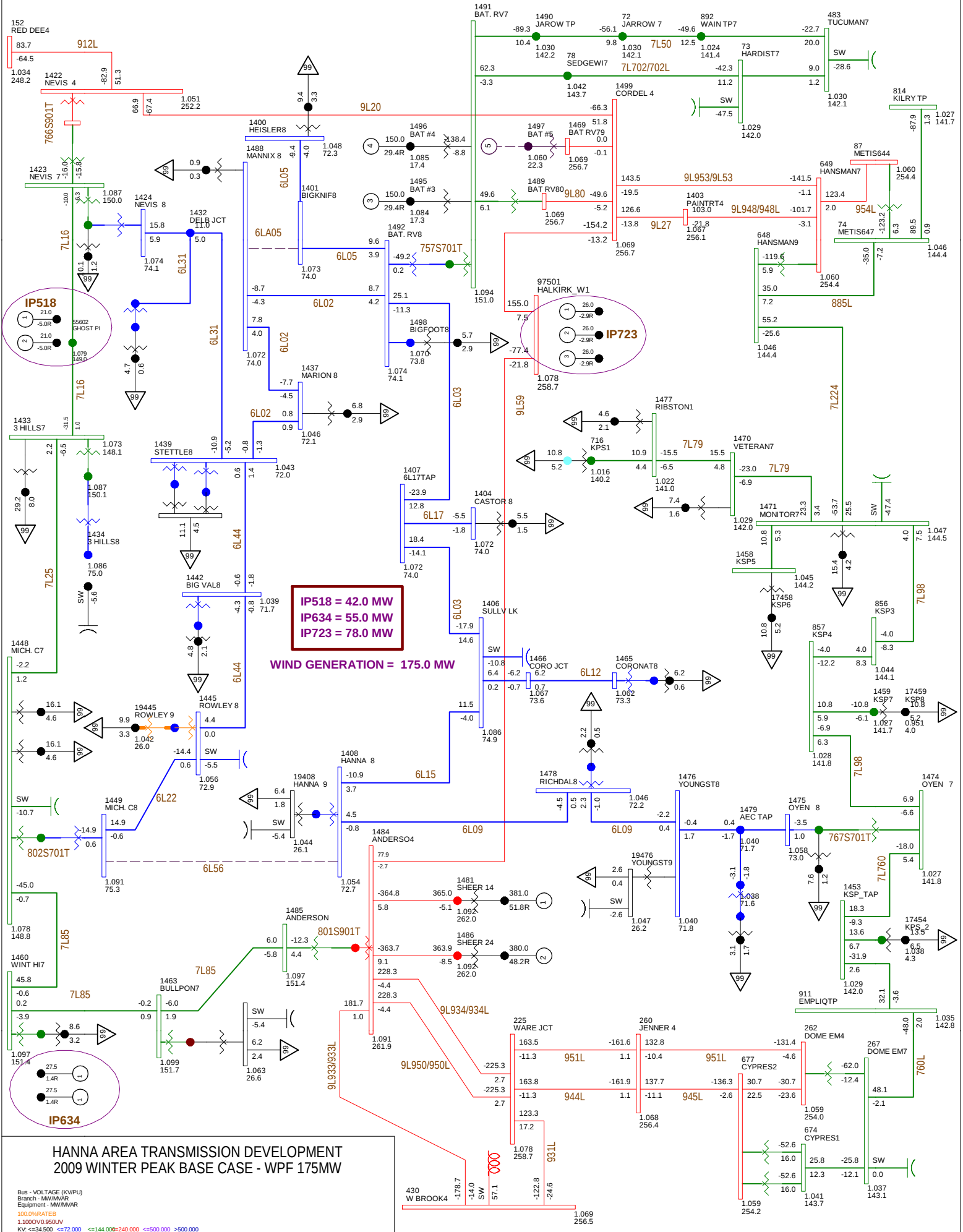
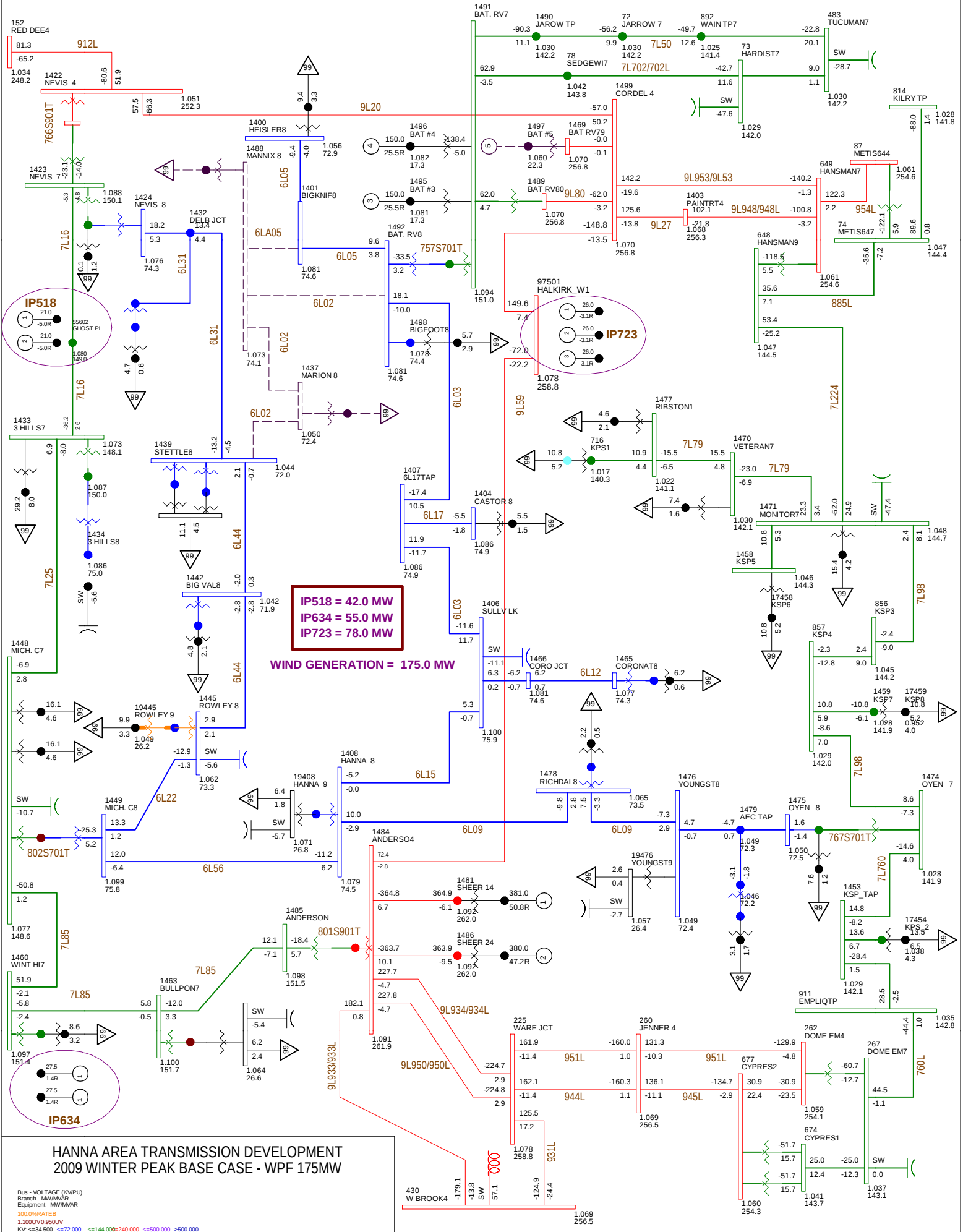


FIGURE 2009WP-175MW-15:
 6L56 HANNA 763S TO MICHICHI CREEK 802S
 SAT. JUL 18 2009 13:48



2012 Load Flow Diagrams

Load Adequacy: Winter Peak 2012 Bat River #5 off

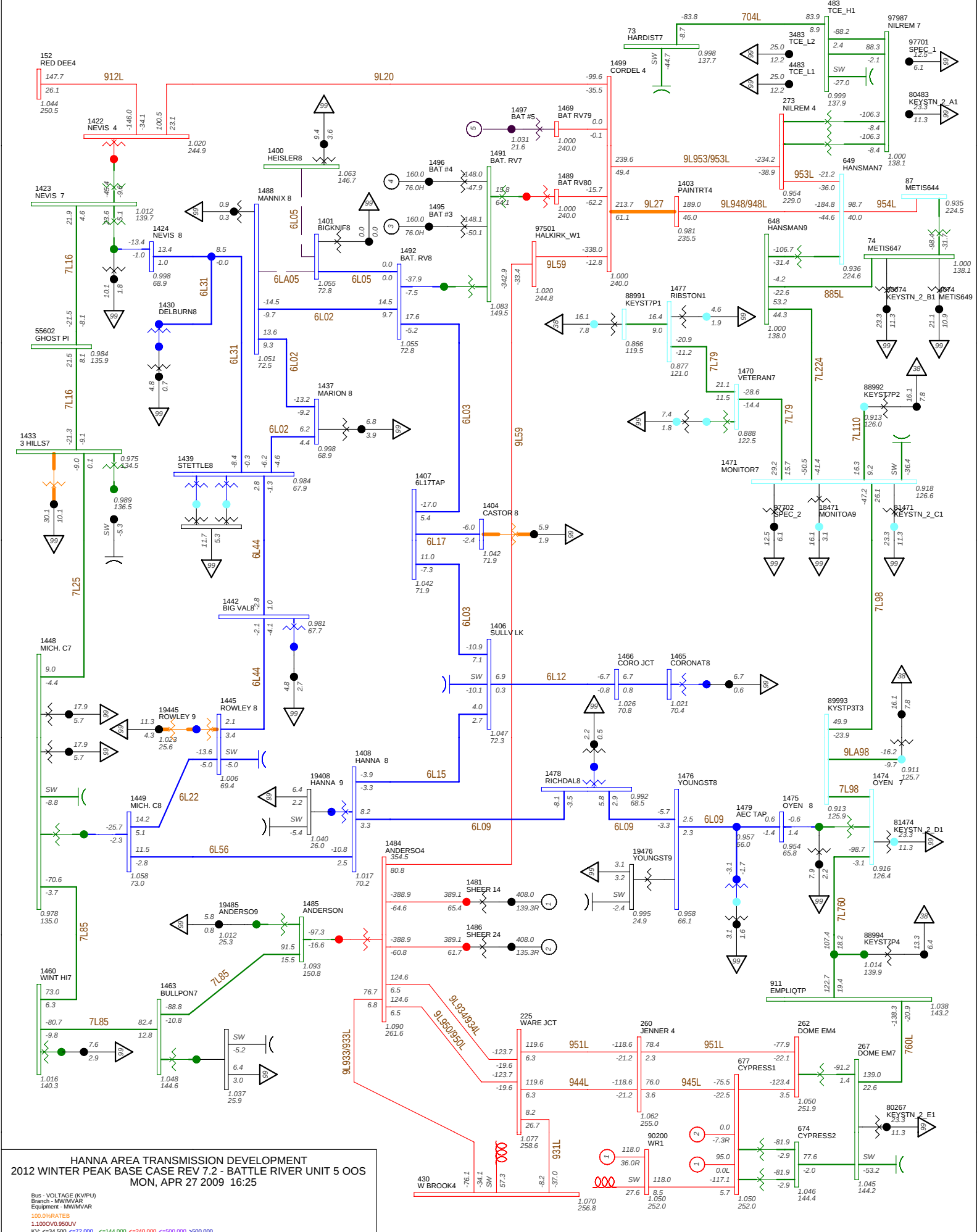


Figure 2012WP-LD-00: Base Case (Battle River Unit 5 Offline)



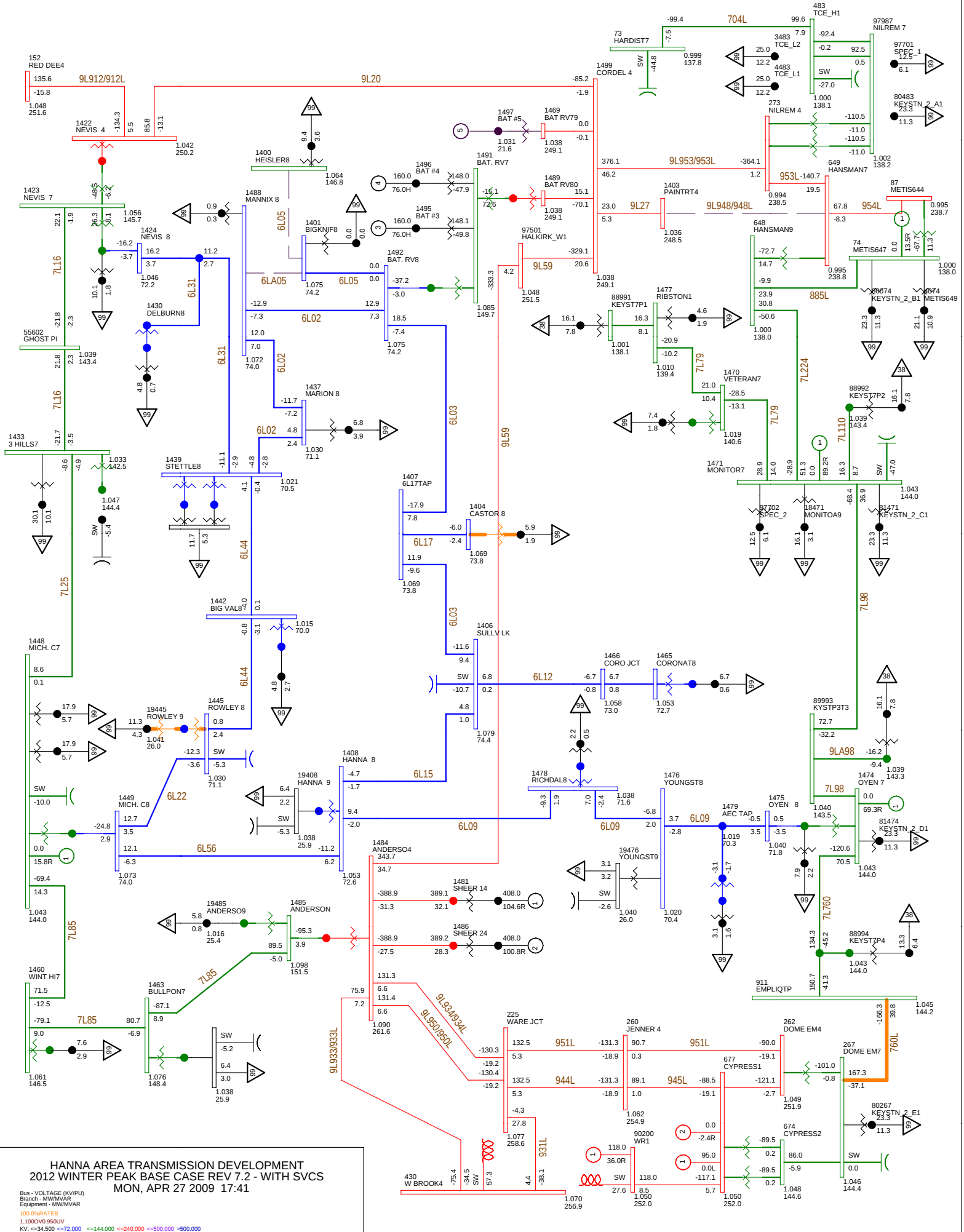


Figure 2012WP-LD-02: 9L948/948L Hansman Lake 650S to Paintearth Creek 863S



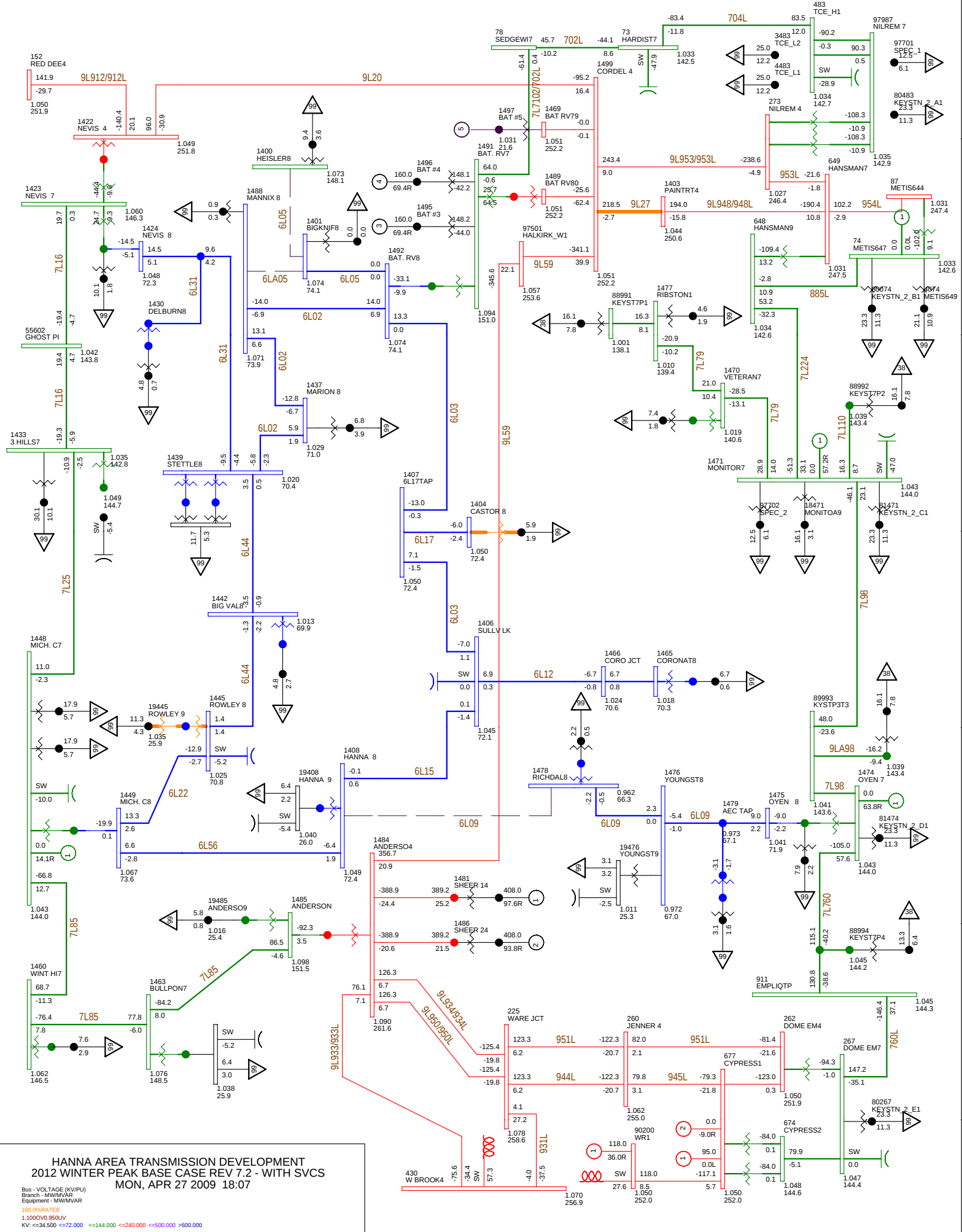


Figure 2012WP-LD-07: 6L09 Hanna 763S to Richdale 776S

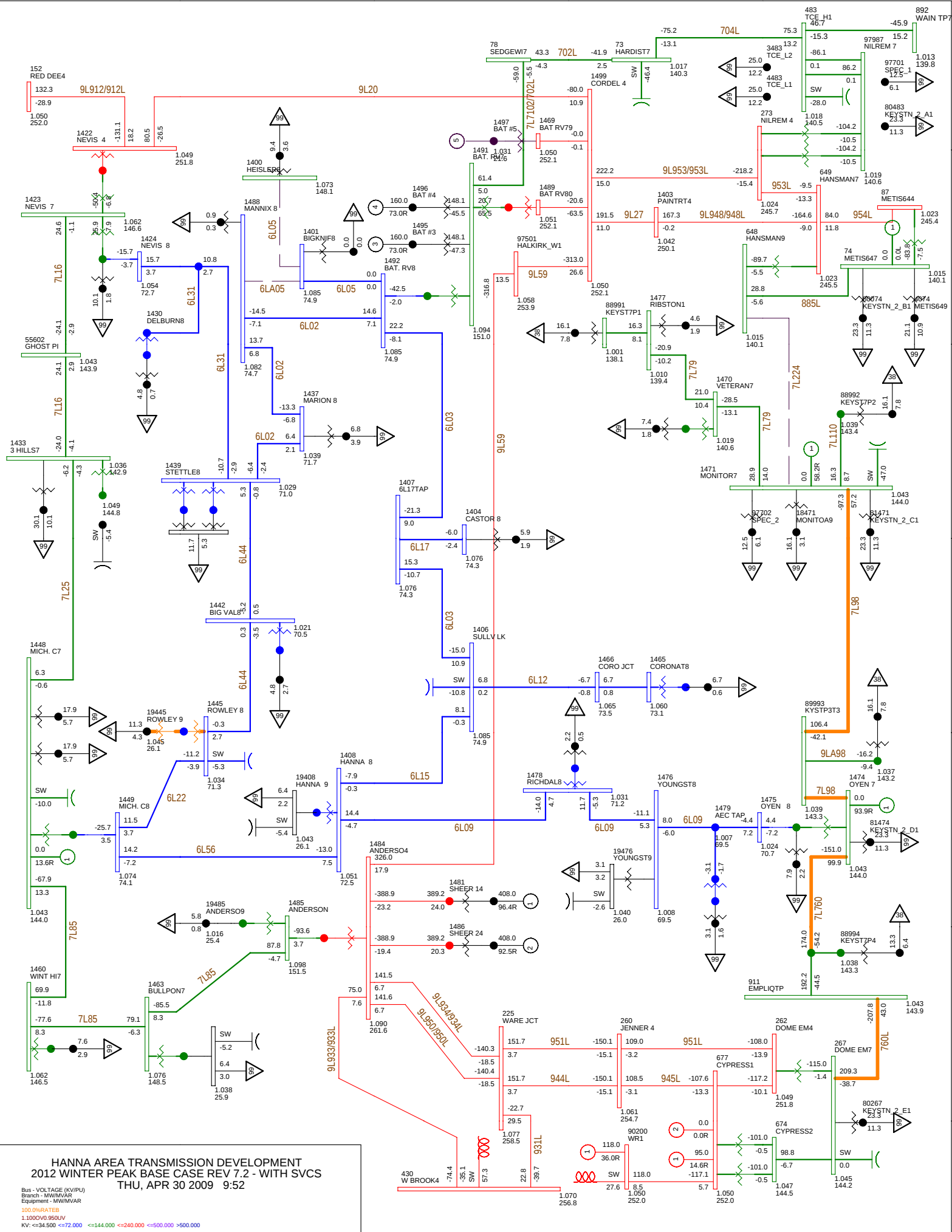


Figure 2012WP-LD-08: 7L224 Hansman Lake 650S to Monitor 774S

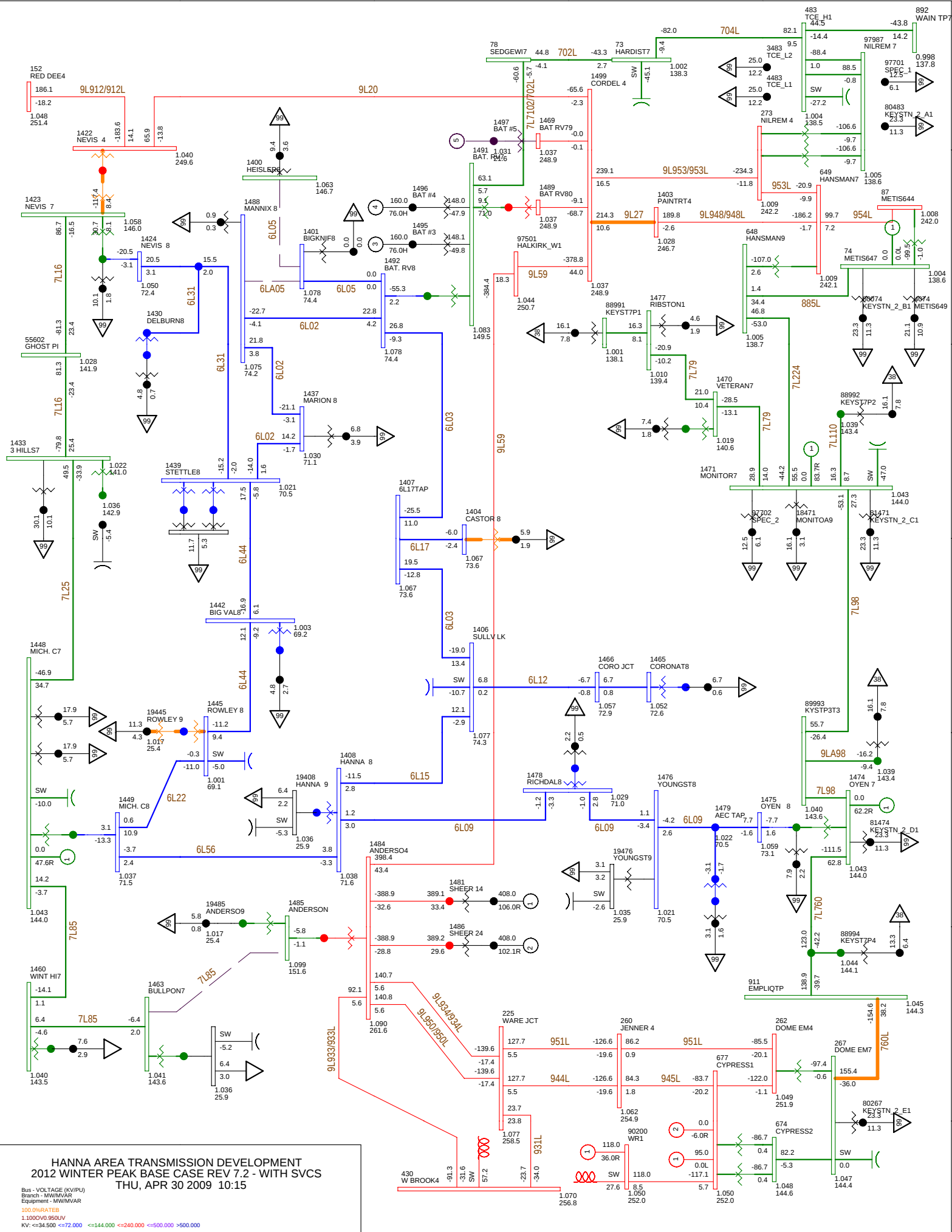
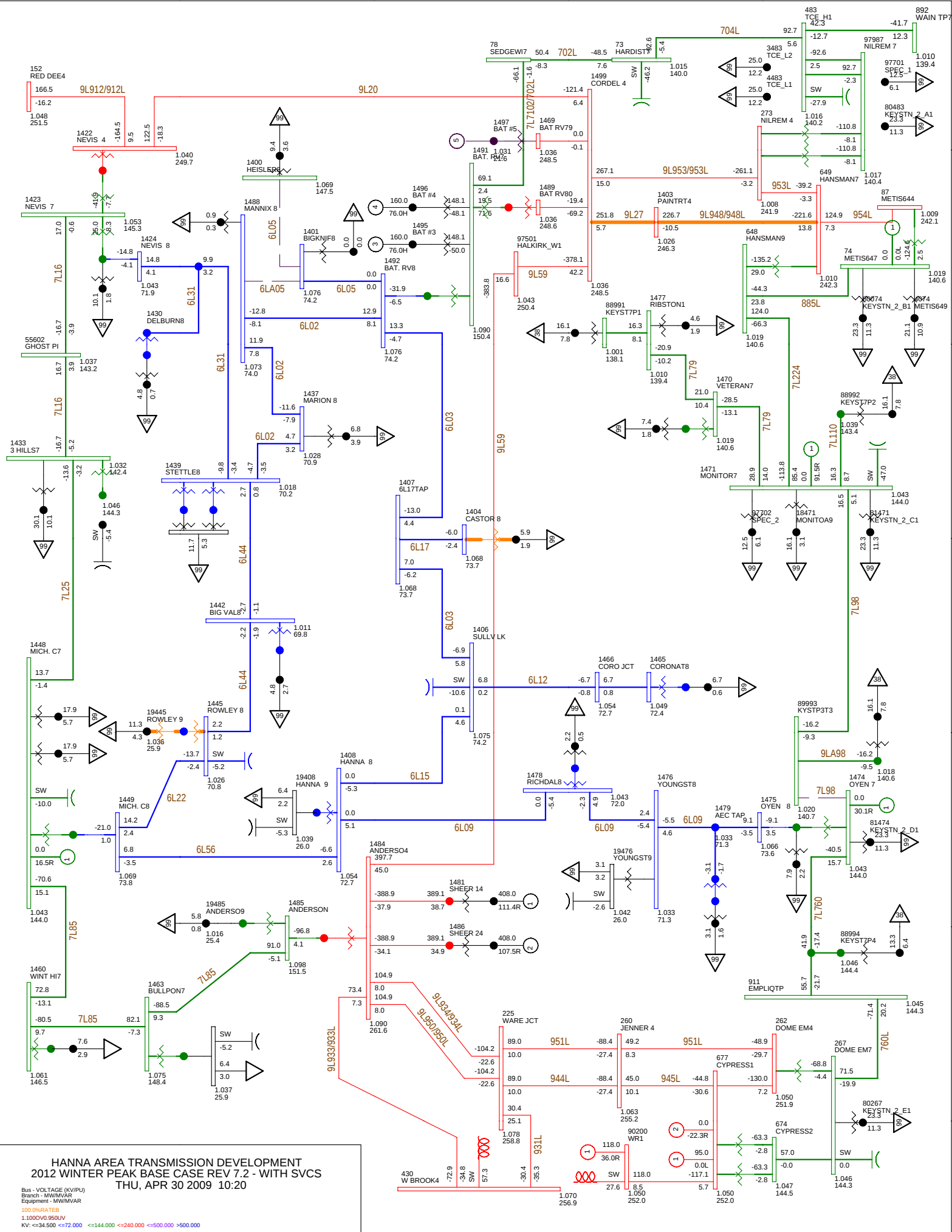


Figure 2012WP-LD-09: 7L85 Bullpound 803S to Anderson 801S



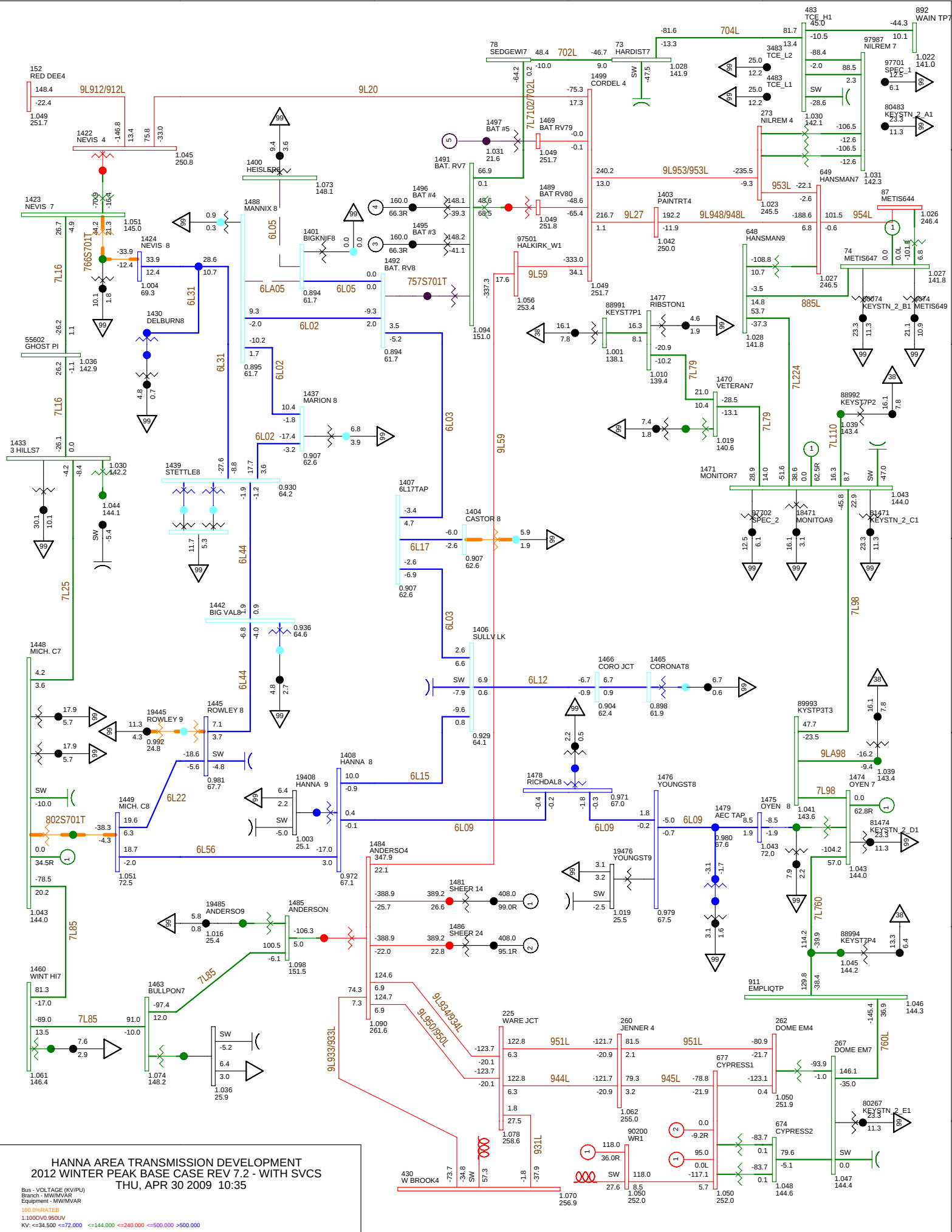


Figure 2012WP-LD-12: 757S701T at Battle River 757S

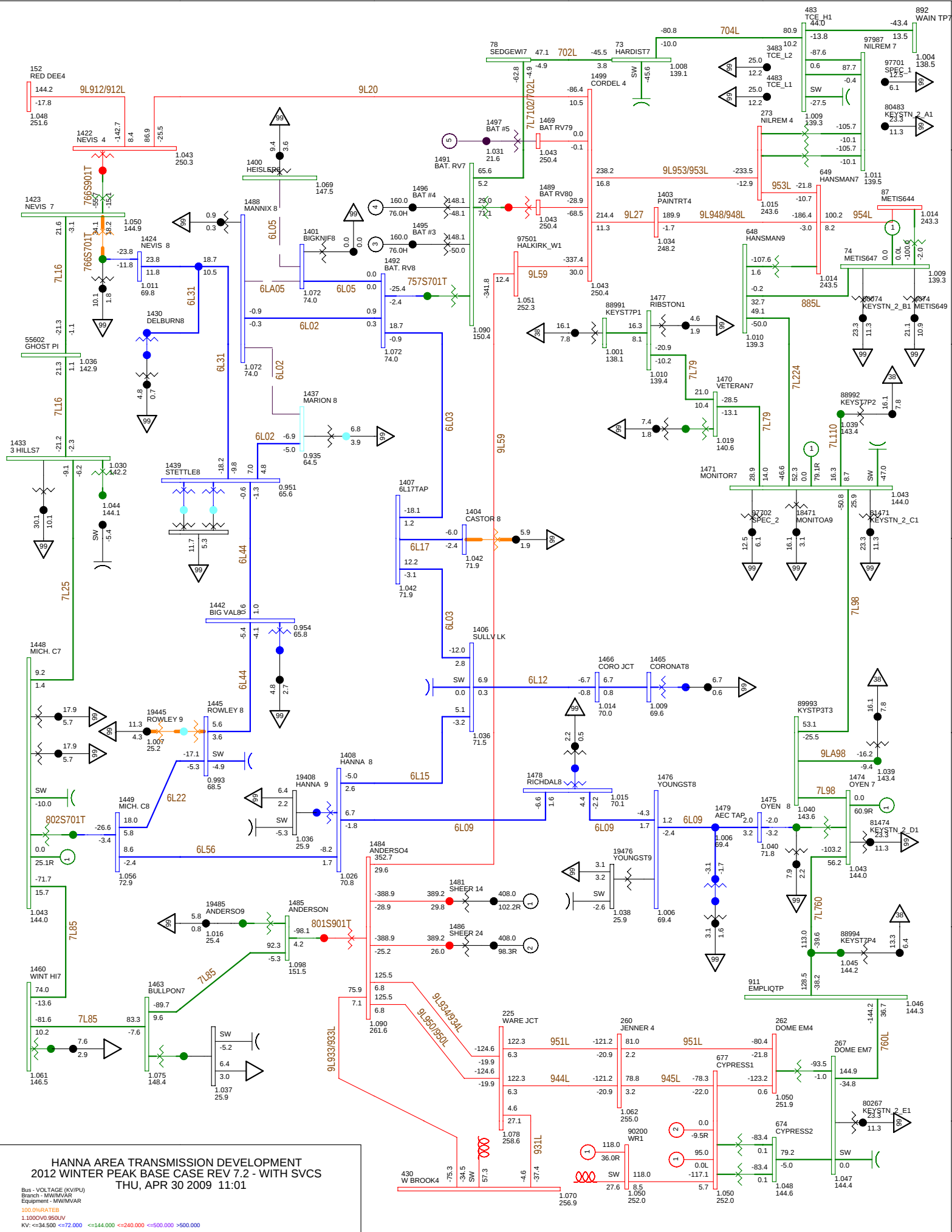


Figure 2012WP-LD-14: 6L02 Marion 873S to Mannix Mine 765S

2012 Load Flow Diagrams

**Wind Integration: Winter Peak 2012 Bat River #5 off , 175
MW Wind**

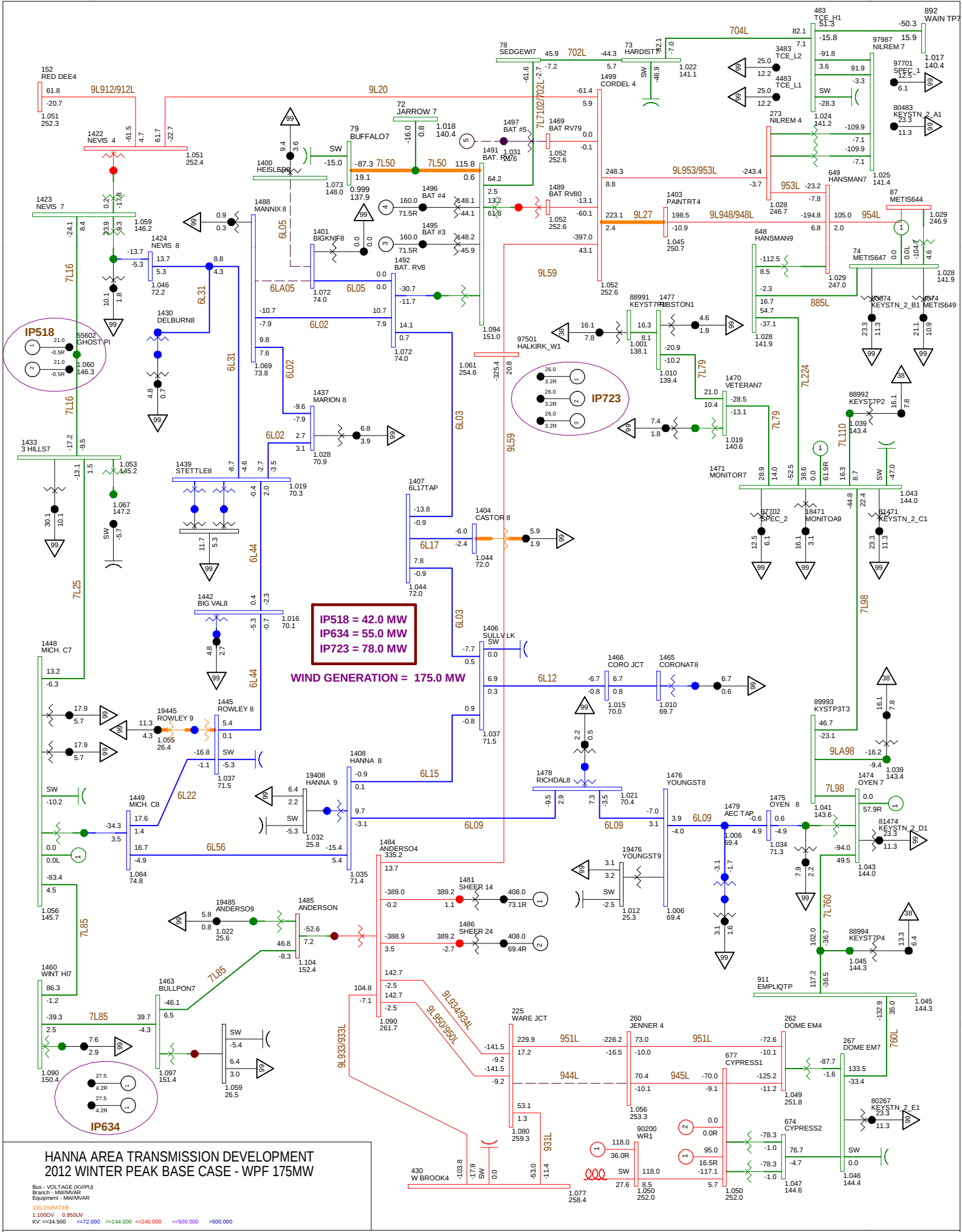


FIGURE 2012WP-175MW-03:
944L JENNER 275S TO WARE JUNCTION 132S
FRI, JUL 17 2009 21:02

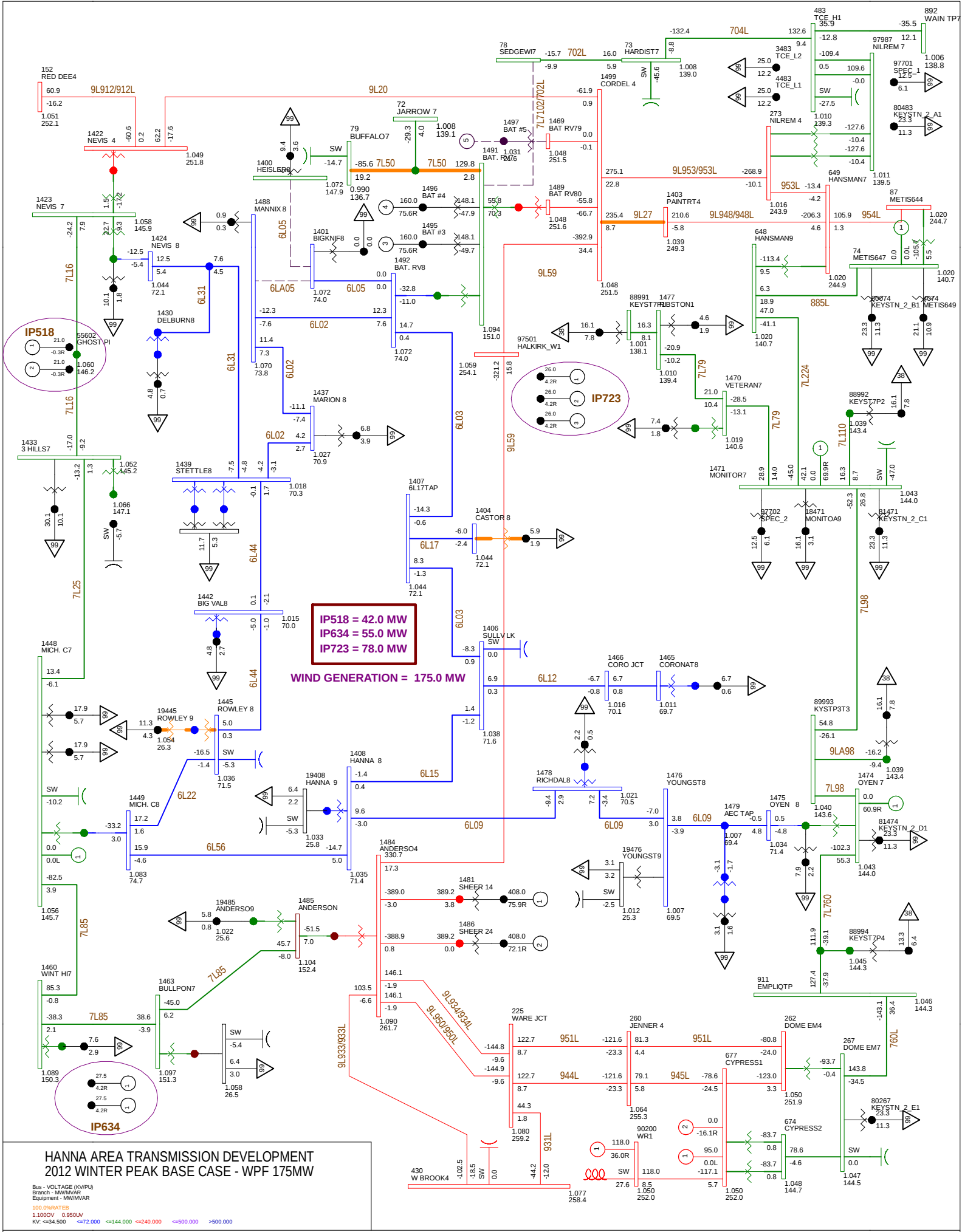
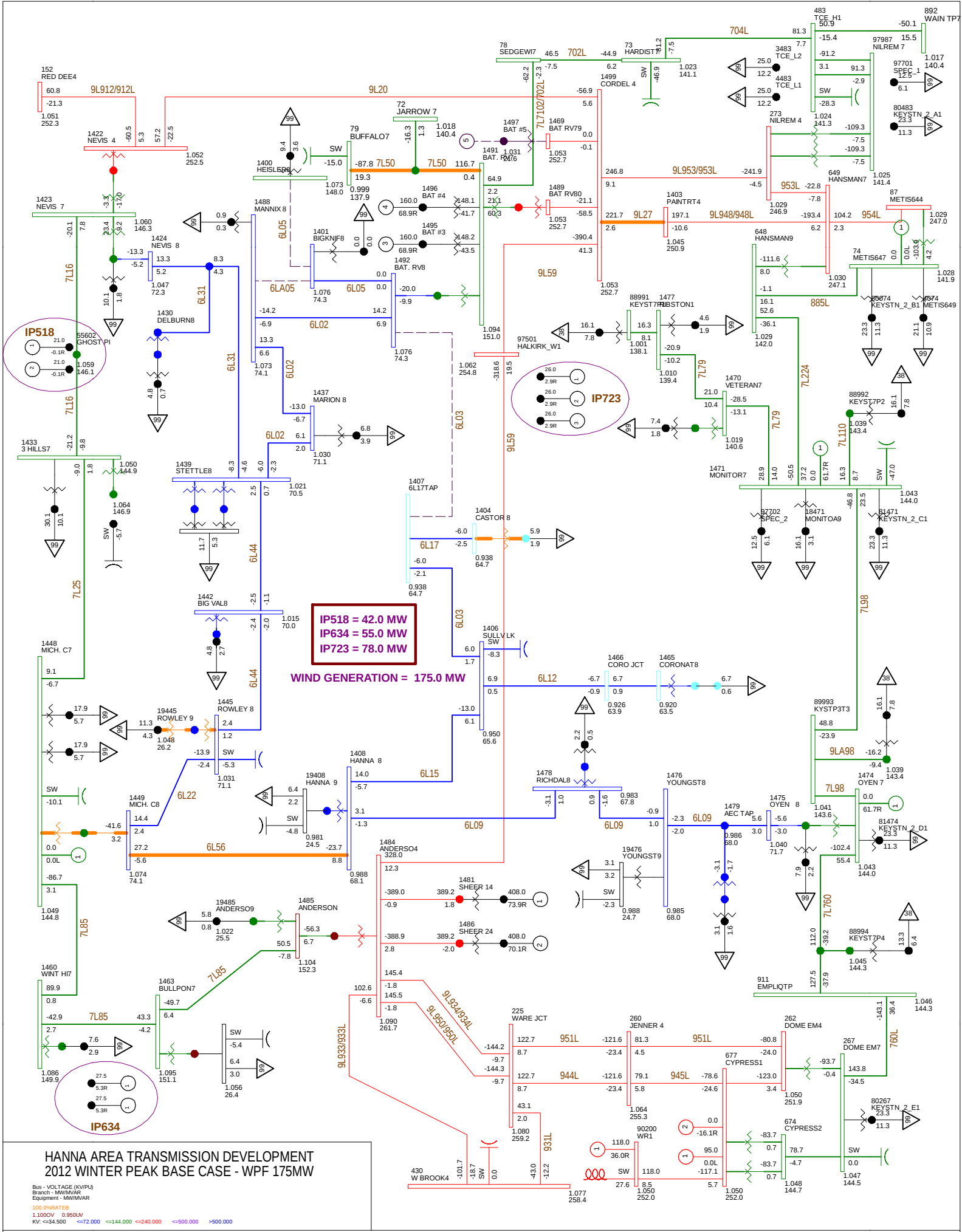


FIGURE 2012WP-175MW-04:
7L702/702L BATTLE RIVER 75TS TO HARDISTY 377S
FRI, JUL 17 2009 21:02



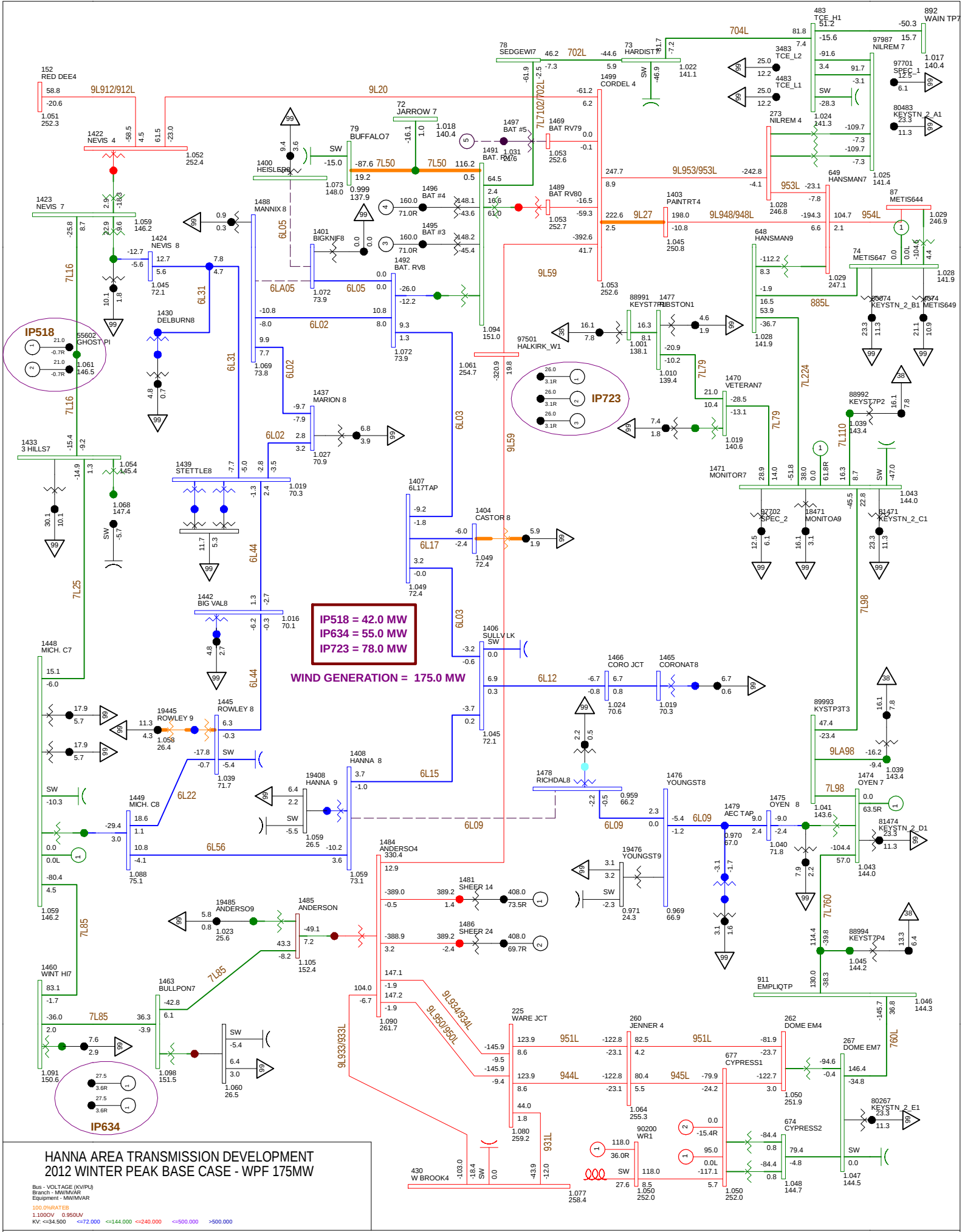
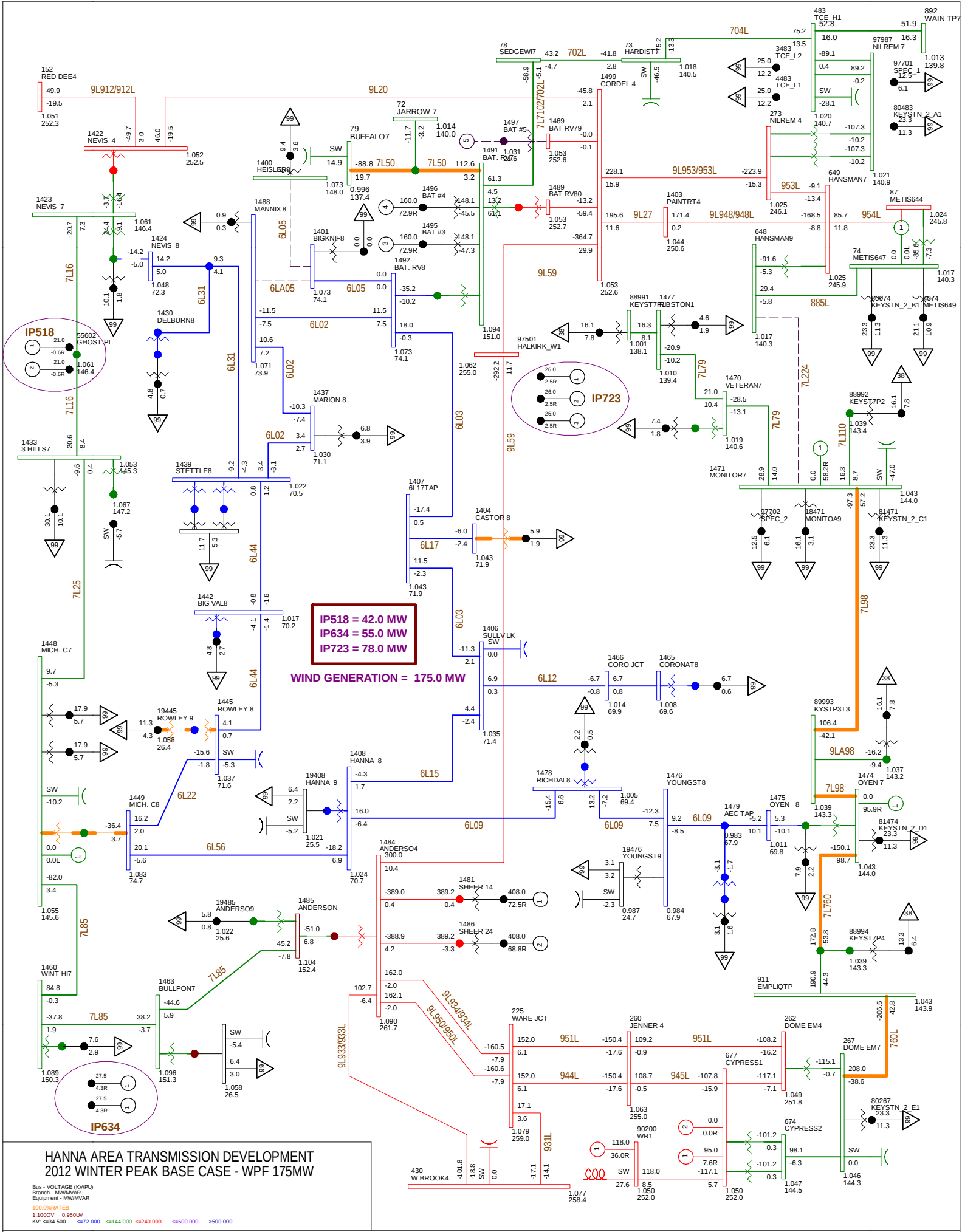
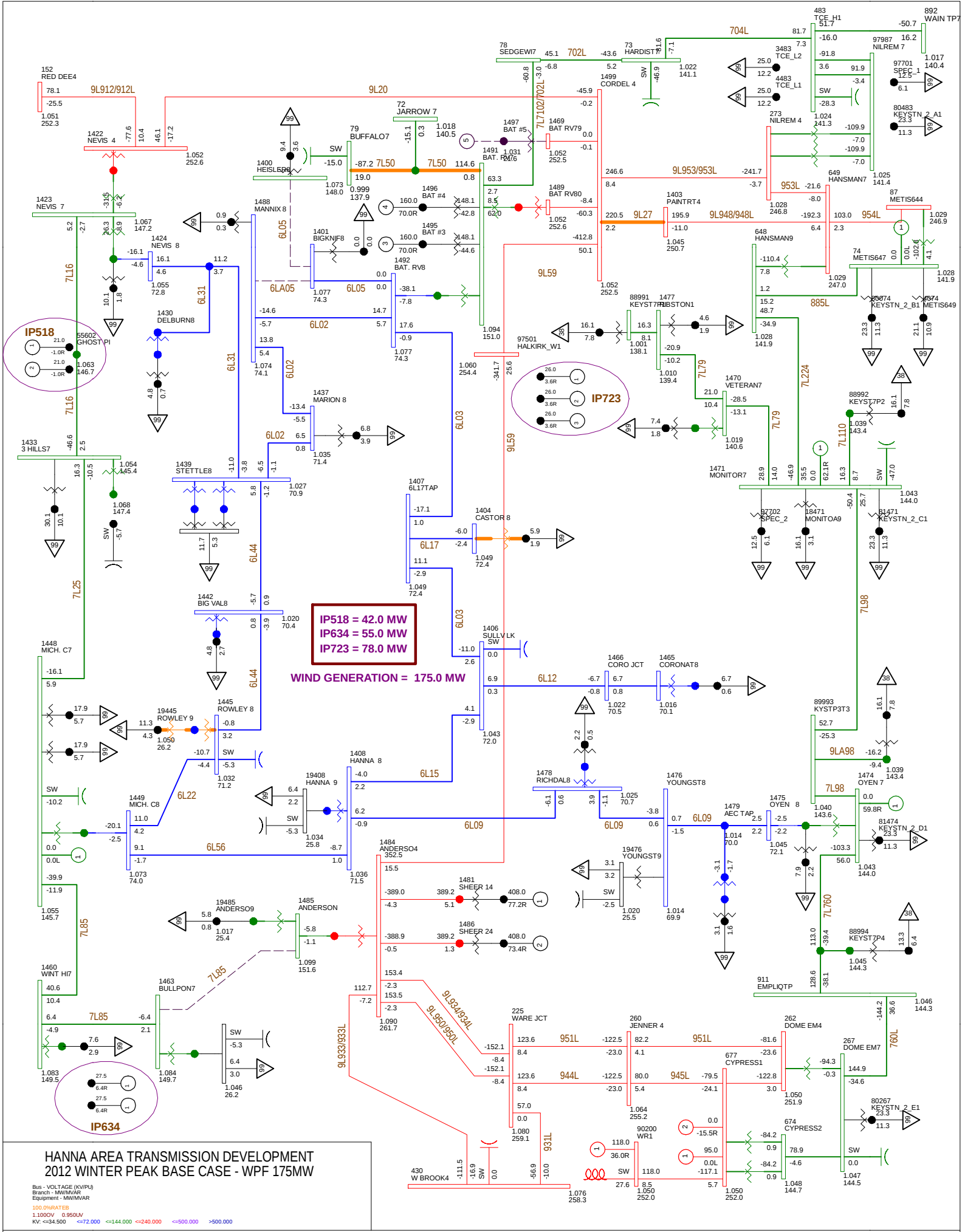


FIGURE 2012WP-175MW-07:
6L09 HANNA 763S TO RICHDAL 776S
FRI, JUL 17 2009 21:02





HANNA AREA TRANSMISSION DEVELOPMENT
2012 WINTER PEAK BASE CASE - WPF 175MW

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0MVA
1.1000V 0.9500V
KV - <34.500 <72.000 <144.000 <240.000 <500.000 >500.000

FIGURE 2012WP-175MW-09:
7L85 ANDERSON 801S TO BULLPOUND 803S
FRI, JUL 17 2009 21:02

