APPENDIX A INTERCONNECTION QUEUE

Table A-1: Generation Interconnection Queue

Position	Project Number	Project Name	Planning Area	Generation (MW)	Type
1	**502**	**Kettles Hill Wind Farm- Expansion**	**53**	**77**	**Wind**
2	518	Confidential Wind Project	42	75	Wind
3	**519**	**Old Man River Wind Farm**	**53**	**47**	**Wind**
4	**393**	**VisionQuest Summerview Ph. 2 Wind Farm**	**53**	**63**	**Wind**
5	**376**	**VisionQuest Bluetrail Wind Farm**	**53**	**66**	**Wind**
6	**513**	**Confidential Wind Project**	**4**	**116**	**Wind**
7	**509**	**Yagos Wind Farm**	**53**	**100**	**Wind**
8	**524**	**River View Wind Power Plant**	**53**	**115**	**Wind**
9	**510**	**HWY 785 Wind Plant**	**53**	**235**	**Wind**
10	**462**	**Castle Rock Ridge Wind Power**	**53**	**112**	**Wind**
12	**392**	**VisionQuest - Waterton Wind Farm**	**55**	**300**	**Wind**
14	**389**	**VisionQuest Seven Persons Wind Farm**	**4**	**120**	**Wind**
16	444	MEG Energy 240 kV Interconnection	25	75	Cogen
17	475	Syncrude G11, G12, G21 Upgrade	25	no change	
19	**469**	**Confidential Wind Project**	**53**	**99**	**Wind**
20	**515**	**Confidential Wind Project**	**53**	**350**	**Wind**
21	**505**	**Confidential Wind Project**	**55**	**110**	**Wind**
22	**479**	**Wild Rose Wind Project Phase 1**	**48**	**200**	**Wind**
23	496	Suncor Firebag Stage 3	25	170	
25	500	TransAlta Keephills 3	40	450	Coal
29	465	Luscar Bow City Power Project	47	1050	Coal
31	**514**	**Confidential Wind Project**	**52**	**80**	**Wind**
36	**534**	**Confidential Wind Project**	**4**	**75**	**Wind**
40	557	Confidential Gas Project	19	370	Gas
42	**581**	**Confidential Wind Project**	**53**	**49.5**	**Wind**
44	**580**	**Confidential Wind Project**	**53**	**61.2**	**Wind**
47	**590**	**Windcor Buffalo Atlee Wind Farm**	**48**	**99**	**Wind**
48	593	Epcor Clover Bar Peaker	60	246	Gas
53	**614**	**Confidential Wind Project**	**53**	**100**	**Wind**
56	**617**	**Confidential Wind Project**	**47**	**100**	**Wind**
58	**622**	**Confidential Wind Project**	**55**	**120**	**Wind**
61	634	Confidential Wind Project	43	99	Wind
62	635	Confidential Wind Project	43	79.5	Wind
65	656	TransAlta Sundance 5 Upgrade	40	53	Coal
68	678	Confidential Wind Project	42	80	Wind
71	672	Grande Prairie Generation Northern Prairie Power Project	20	93	Gas
74	**679**	**Confidential Wind Project**	**55**	**99**	**Wind**
75	**680**	**Confidential Wind Project**	**45**	**70.5**	**Wind**
76	**681**	**Confidential Wind Project**	**53**	**99**	**Wind**
77	STS	Confidential STS Project	56	10	STS
79	STS	Confidential STS Project	25	80	STS

Position	Project Number	Project Name	Planning Area	Generation (MW)	Type
82	**689**	**Confidential Wind Project**	**52**	**15**	**Wind**
83	**690**	**Confidential Wind Project**	**55**	**60**	**Wind**
84	**691**	**Confidential Wind Project**	**53**	**30**	**Wind**
85	692	DAPP Power Westlock Expansion	27	12	Gas
86	STS	Confidential STS Project	43	29.9	STS
87	STS	Confidential STS Project	43	29.9	STS
88	**693**	**Confidential Wind Project**	**4**	**200**	**Wind**
90	**695**	**Greengate Stirling Wind Farm**	**54**	**100**	**Wind**
95	703	Maxim Power Skaro Peaking Station	33	180	Gas
96	707	Suncor Energy Firebag SAGD Project Stage 4	25	no change	
97	718	Greengate Wintering Hills Wind Project	42	150	Wind
105	**715**	**Confidential Wind Project**	**4**	**79.5**	**Wind**
106	716	Confidential Wind Project	20	79.5	Wind
108	STS	Confidential STS Project	40	25	STS
109	719	ENMAX 1200 MW Generation Project	6	1200	Gas
113	723	Greengate Halkirk Wind Project	42	150	Wind
114	**727**	**City of Medicine Hat Generator Upgrade**	**4**	**no change**	
115	**728**	**Greengate Blackspring Ridge Wind Project**	**49**	**300**	**Wind**
117	**729**	**Confidential Wind Project**	**4**	**700**	**Wind**
119	731	Confidential Wind Project	60	150	Wind
120	738	Confidential Gas Project	6	370	Gas
122	739	Confidential Gas Project	27	82	Gas
124	**740**	**Confidential Wind Project**	**52**	**150**	**Wind**
173	741	Confidential Gas Project	25	85	Gas
174	**742**	**Confidential Wind Project**	**53**	**120**	**Wind**
175	743	Greengate Pine Lake Wind Farm	35	100	Wind
176	744	TransCanada Saddlebrook Generating Station	46	350	Gas
177	745	Confidential Gas Project	46	200	Gas
179	747	Maxim Power Milner Unit II	22	475	Coal
180	749	Confidential Gas Project	46	90	Gas
181	**750**	**Confidential Wind Project**	**53**	**25**	**Wind**
182	**751**	**Confidential Wind Project**	**55**	**100**	**Wind**
183	752	Confidential Wind Project		100	Wind
184	753	Confidential Wind Project	43	130	Wind
185	**754**	**Confidential Wind Project**	**4**	**300**	**Wind**
188	**756**	**Confidential Wind Project**	**52**	**40**	**Wind**
189	757	Greengate Chigwell Wind Project	35	150	Wind
190	758	Confidential Wind Project	42	102	Wind
191	759	Confidential Wind Project	42	102	Wind
192	**760**	**Confidential Wind Project**	**45**	**102**	**Wind**
193	**761**	**Confidential Wind Project**	**49**	**102**	**Wind**
195	**762**	**Confidential Wind Project**	**48**	**200**	**Wind**

Position	Project Number	Project Name	Planning Area	Generation (MW)	Type
196	763	Confidential Wind Project	42	200	Wind
197	764	Confidential Wind Project	42	150	Wind
198	**765**	**Confidential Wind Project**	**4**	**150**	**Wind**
199	**766**	**Confidential Wind Project**	**54**	**100**	**Wind**
200	**767**	**Confidential Wind Project**	**55**	**300**	**Wind**
203	**770**	**Greengate Power Corp. Blackspring Ridge Phase II**	**49**	**300**	**Wind**
205	773	Confidential Wind Project	43	210	Wind
211	780	Confidential Gas Project	6	110	Cogen
212	781	Confidential Project	25	1000-1500	Hydro
213	782	Confidential Gas Project	39	123	Gas
215	STS	Confidential STS Project	40	54	STS
216	790	Confidential Wind Project	37	400	Wind
217	788	Confidential Generation Project	33	63	
218	789	Confidential Wind Project	26	130	Wind
222	796	Confidential Wind Project	43	2	Wind
224	798	Confidential Wind project	42	2	Wind
225	800	Confidential Wind project	26	200	Wind
227	**802**	**Confidential Wind Project**	**4**	**240**	**Wind**
228	**799**	**Confidential Wind project**	**49**	**299**	**Wind**
229	803	Confidential Biomass Project	18	30	Biomass
231	805	Greengate Power Halkirk II Wind Project	42	150	Wind
238	816	Confidential Biomass Project	20	150	Biomass
239	818	Confidential Wind Project	20	250	Wind
240	819	Confidential Wind Project	20	500	Wind
250	830	Glacier Power Dunvegan Hydro Electrick Project	33	100	Hydro
253	432	Nexen Long Lake Interconnection	25	120	Steam
258	841	Confidential Project	6	45	Gas
260	**845**	**Confidential Wind Project**	**45**	**102**	**Wind**
261	843	AlterNRG Bruderheim Generating Facility	60	120	Gas/Steam
262	844	TransAlta Sundance Unit 3 Upgrades	40	53	Coal
263	847	Confidential Wind Project	42	60	Wind
264	848	TransAlta Keephills 1 Uprate	40	35	Coal
265	849	TransAlta Keephills 2 Uprate	40	35	Coal
267	852	Confidential Generation Project	26	344	Combined Cycle
269	**854**	**TransAlta Ardenville Wind Farm**	**53**	**66**	**Wind**
271	856	Confidential Gas Project	54	175.32	Gas
275	**860**	**TransAlta Tempest Wind Farm**	**52**	**289.5**	**Wind**
283	868	Confidential Steam Project	25	85	
286	875	Confidential Wind Farm	42	100	Wind
287	876	Confidential Wind Farm	42	100	Wind
288	877	Confidential Wind Farm	29	100	Wind

* Wind generations in south region are highlighted.

APPENDIX B EXISTING SYSTEM POWER FLOW ANALYSIS

Table B-1: Summary of Existing 2008 South Planning Analysis

Figure No.	Contingency	Overloaded Element	Percentage	Other System Performance Concerns
Fig Existing-SL-1	Summer Light Generation Dispatch			
Fig Existing-SL-2/3	SL All Elements in Service	170L Coleman 799S to Natal	108%	None
Fig Existing-SL-4/5	Peigan 59S 240/138kV Transformer T1	170L Peigan 59S to Ft. Macleod 15S [1]	111%	None
		170L Coleman 799S to 170AL Tap	107%	
		170L Coleman 799S to Natal	125%	
Fig Existing-SL- 6/7	170L Peigan 59S to Ft. Macleod 15S	725L Bowron 674S to 725BL Tap [1]	107%	None
		170L Coleman 799S to Natal	116%	
Fig Existing-SL- 8/9	170L Peigan 59S to Kettle's Hill 383S	170L Pincher Creek 396S to 170AL Tap	108%	None
		170L Coleman 799S to 170AL Tap	141%	
		170L Coleman 799S to Natal	166%	
Fig Existing-SL-10/11	170L Coleman 799S to 170AL Tap	170L Peigan 59S to Ft. Macleod 15S [1]	106%	None
		170L Peigan 59S to Kettle's Hill 383S	125%	
Fig Existing-SL-12/13	863L Riverbend 618S to Magrath 225S	170L Coleman 799S to Natal	111%	None
		225L Stirling 67S to Raymond Reservoir Tap	168%	

Figure No.	Contingency	Overloaded Element	Percentage	Other System Performance Concerns
		225L Magrath 225S to Raymond Reservoir Tap	143%	
Fig Existing-SL-14/15	911L Janet 74S to Peigan 59S	170L Peigan 59S to Ft. Macleod 15S [1]	111%	None
		170L Coleman 799S to 170AL Tap	107%	
		170L Coleman 799S to Natal	125%	
Fig Existing-SP- 1	Summer Peak Generation Dispatch			
Fig Existing-SP- 2/3	SP All Elements in Serivce	None	N/A	None
Fig Existing-SP- 4/5	185L Pincher Creek 396S to Waterton 379S	Drywood 415S 138/69kV Transformer T1 [1]	133%	None
Fig Existing-SP- 6/7	931L Ware Junction 132S to W. Brooks 28S	Amoco Empress 163S 240/138Kv Transformer T5 [2]	104%	None
		760L Empress 394S to Amoco Empress 163S [2]	108%	
Fig Existing-SP- 8/9	100L Brooks 121S to Tilley 498S	760L Empress 394S to Amoco Empress 163S [2]	121%	None
		610L Fincastle 336S to Taber 83S [2]	110%	
Fig Existing-SP-10/11	814L Brooks 121S to W. Brooks 28S	827L Brooks 121S to W. Brooks 28S [2]	128%	None
Fig Existing-SP-12/13	827L Brooks 121S to W. Brooks 28S	814L Brooks 121S to W. Brooks 28S [2]	110%	None
Fig Existing-SP-14/15	W. Brooks 28S 240/138kV Transformer T1	W. Brooks 28S 240/138kV Transformer T2 [2]	159%	None
Fig Existing-SP-16/17	610L Fincastle 336S to Taber 83S	100L Brooks 121S to Tilly 498 [2]	112%	Low voltage in Medicine Hat area

Figure No.	Contingency	Overloaded Element	Percentage	Other System Performance Concerns
		760L Empress 394S to Amoco Empress 163S [2]	109%	
		892L Suffield 895S to Medicine Hat 41S [2]	108%	
Fig Existing-SP-18/19	207L Coal Banks 111S to N. Lethbridge 370S	734L Lethbridge Upland 241S to N. Lethbridge 370S [2]	111%	None
Fig Existing-SP-20/21	734L Lethbridge Upland 241S to N. Lethbridge 370S	207L Coal Banks 111S to N. Lethbridge 370S [2]	131%	None
Fig Existing-SP-22/23	944L Ware Junction to Jenner	None Converge [2]		
Fig Existing-SP-24/25	727L Janet 74S to Okotoks 678S	158L High River 65S to Black Diamond 392S	100%	Voltage Collpas in High River Area
Fig Existing-SP-26/27	Drywood 415S 138/69kV Transformer T1	None	N/A	Voltage drops more than 5% on the Drywood 415S , Waterton 379S, Yarrow 995S, Glenwood 229S and Shell Waterton 502S 69kV buses

[1] Addressed by Southwest Alberta Transmission System Need Application

2 Addressed by Southeast Alberta Transmission System Need Application

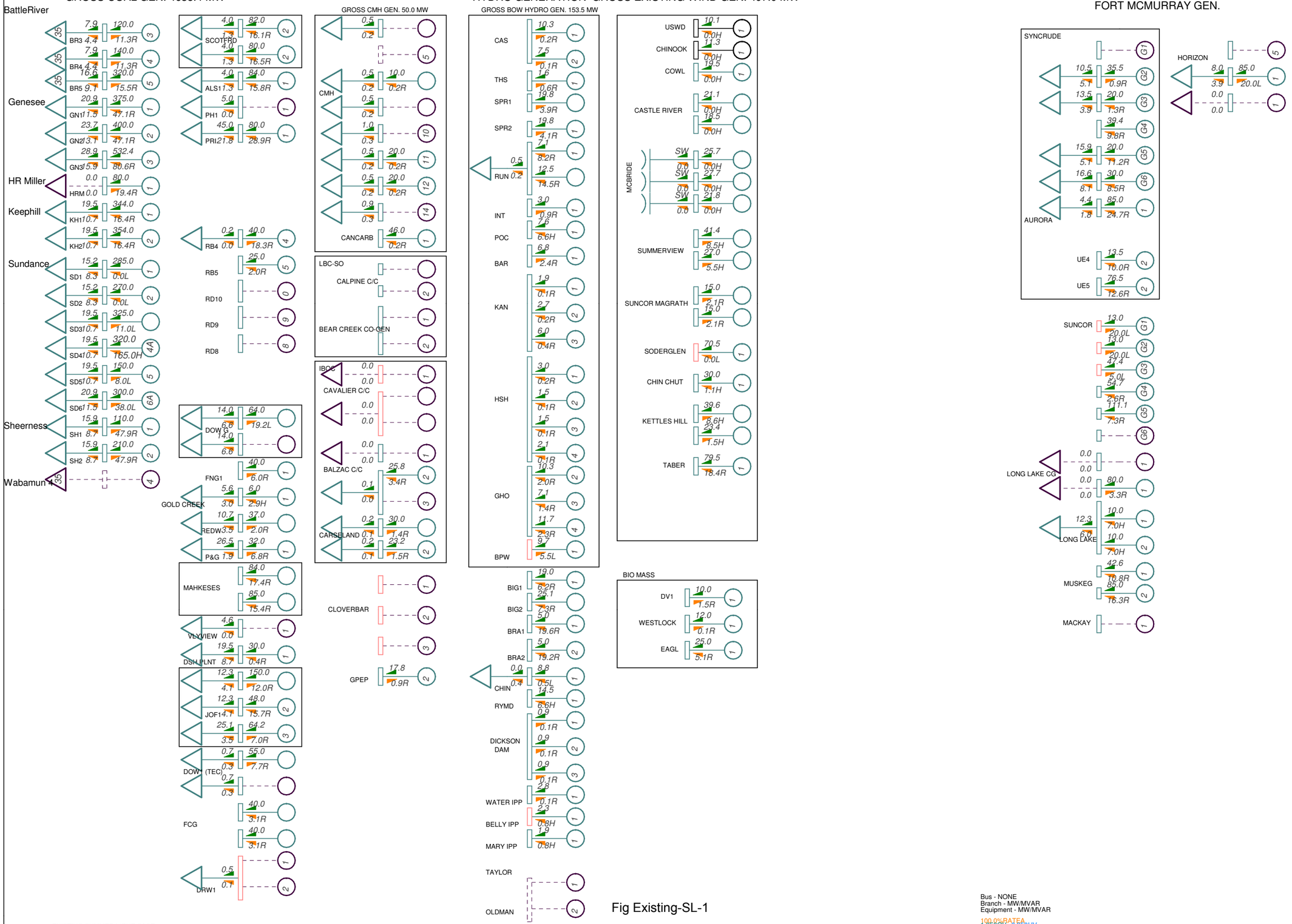
GENERATION DISPATCH REPORT

GROSS COAL GEN. 4635.4 MW

GAS GENERATION

HYDRO GENERATION GROSS EXISTING WIND GEN. 497.0 MW

FORT MCMURRAY GEN.



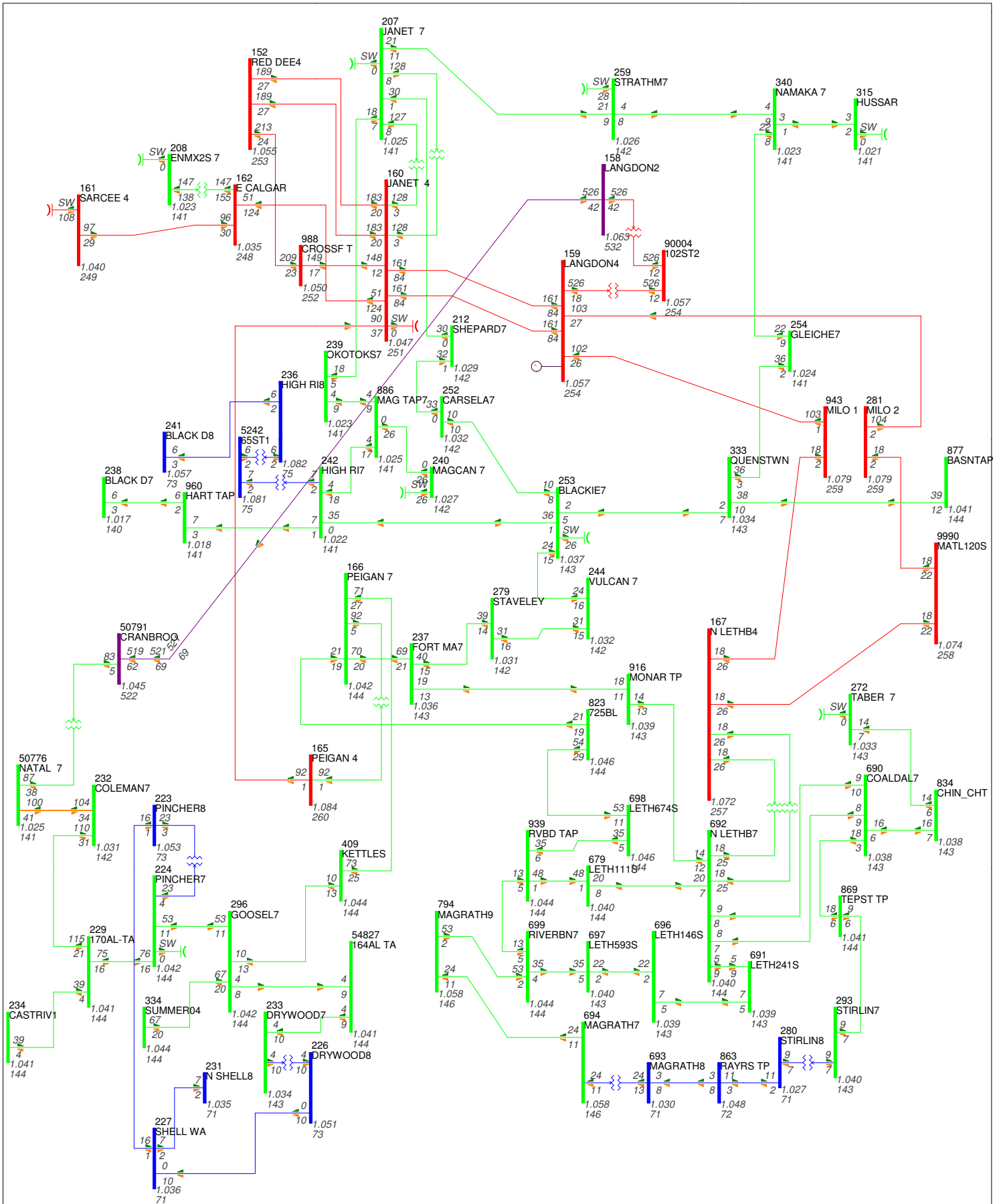
EXISTING SUMMER LIGHT CASE

SUN, NOV 23 2008 10:53

Fig Existing-SL-1

Bus - NONE
Branch - MW/MVAR
Equipment - MW/MVAR

100.00 DATE1
1.050OV 0.950UV
KV: <=25.000 <=34.500 <=69.000 <=138.000 <=240.000 >240.000



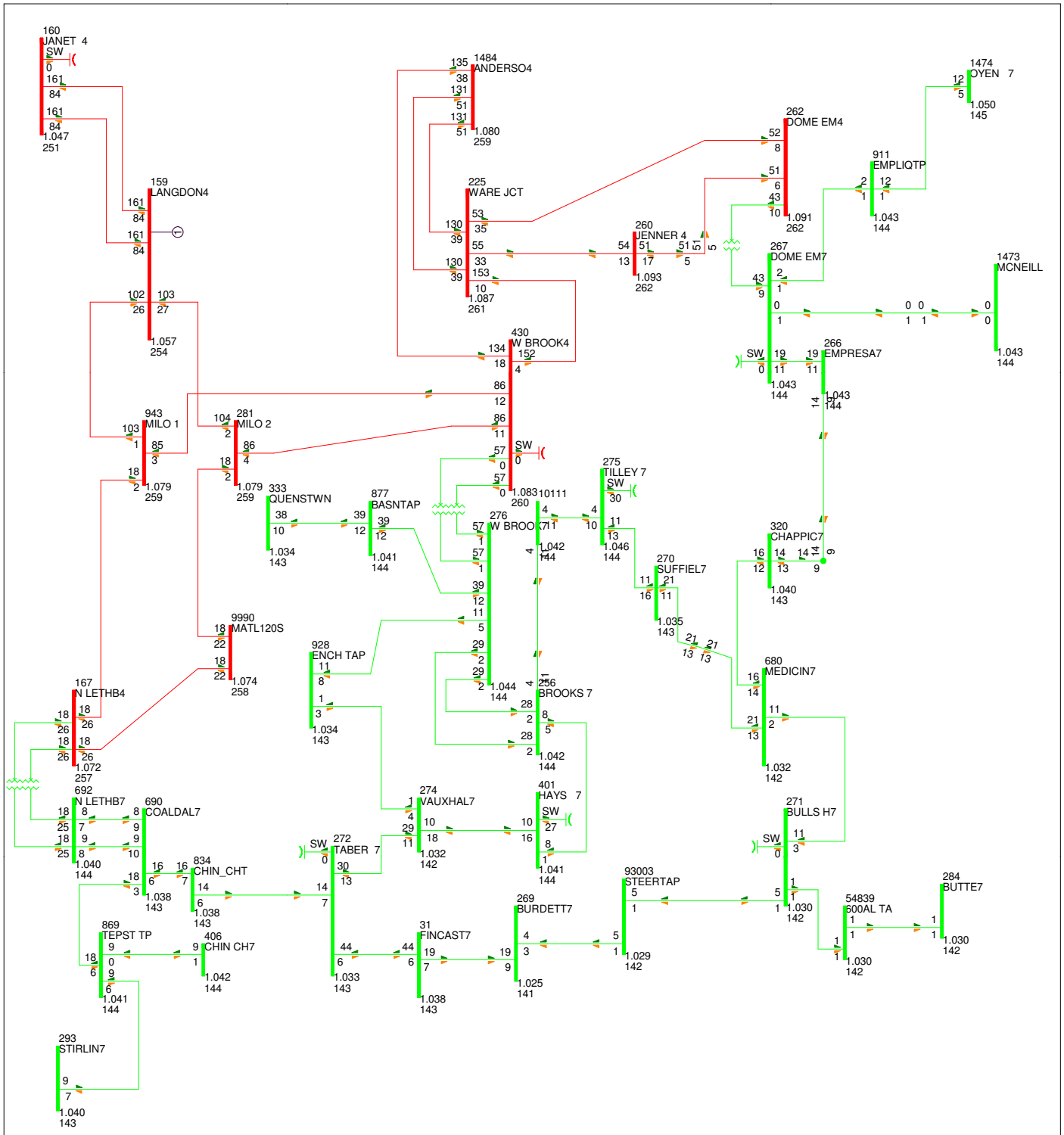
EXISTING SUMMER LIGHT CASE

Existing South West System THU, NOV 20 2008 15:23

EXISTING SYSTEM

Fig Existing-SL-2

BC Export: 642 MW



EXISTING SUMMER LIGHT CASE

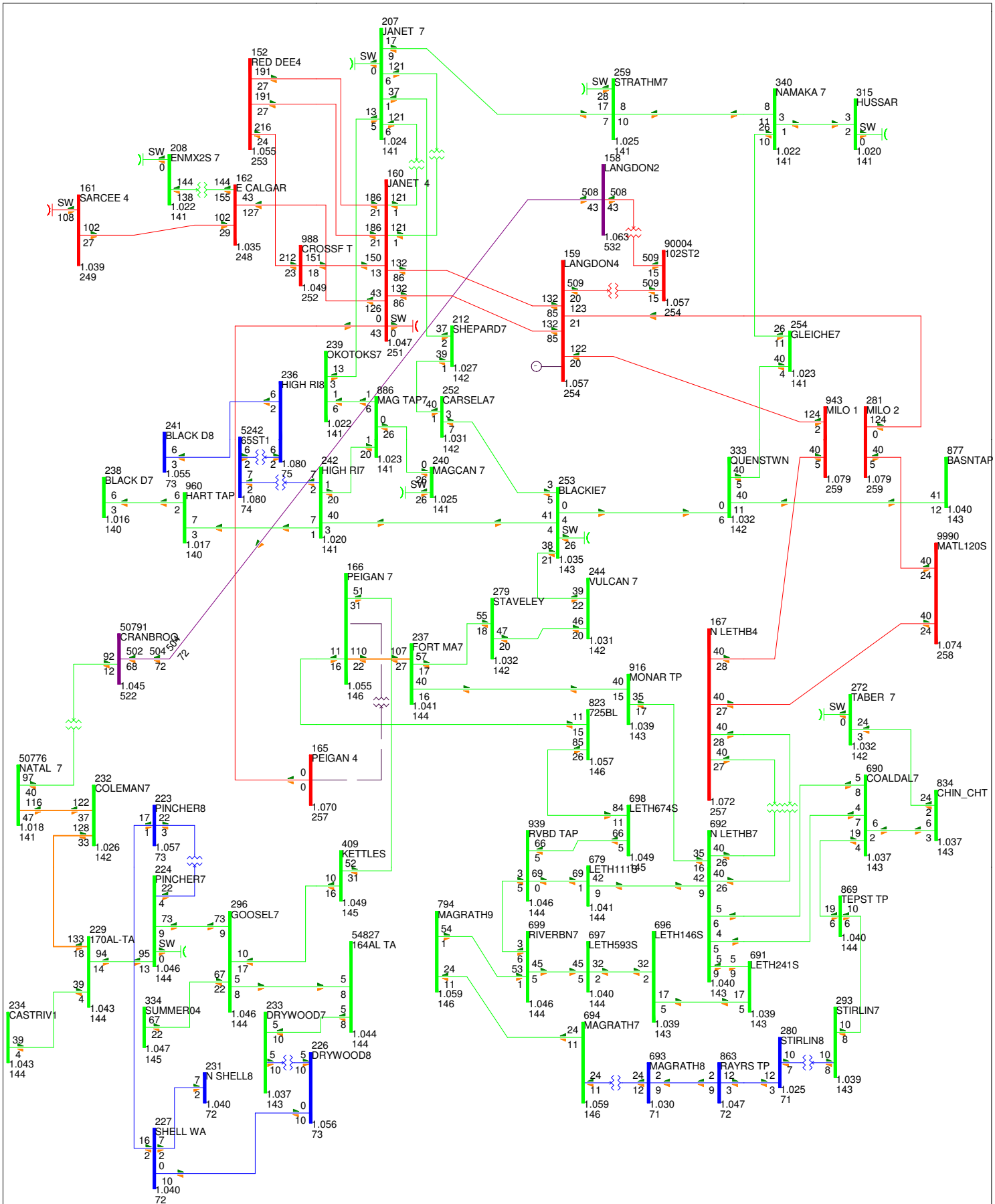
Existing South East System THU, NOV 20 2008 16:49

EXISTING SYSTEM

Fig Existing-SL-3

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: 642 MW



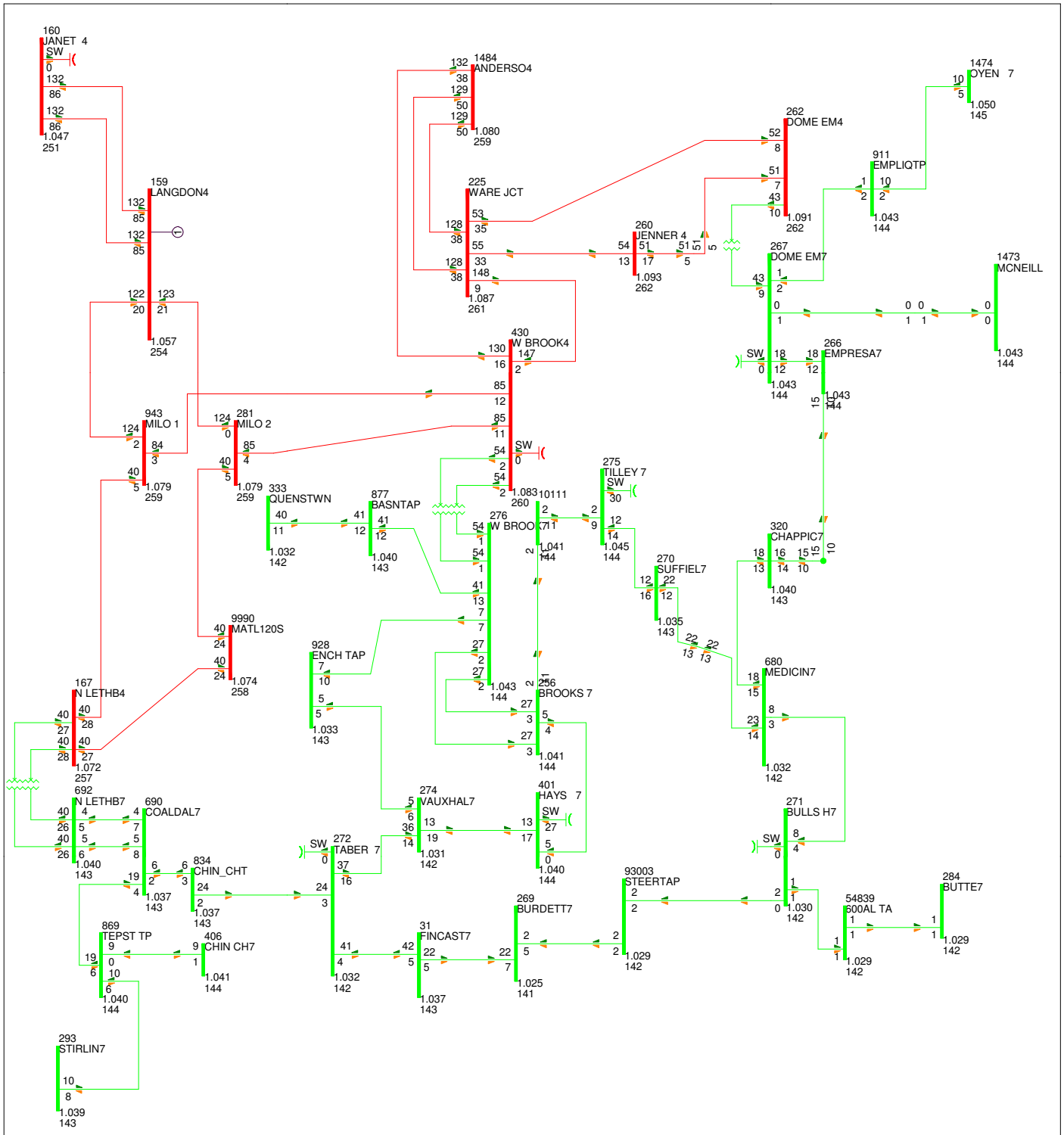
EXISTING SUMMER LIGHT CASE

Existing South West System THU, NOV 20 2008 15:27

EXISTING SYSTEM

Fig Existing-SL-4

BC Export: 636 MW



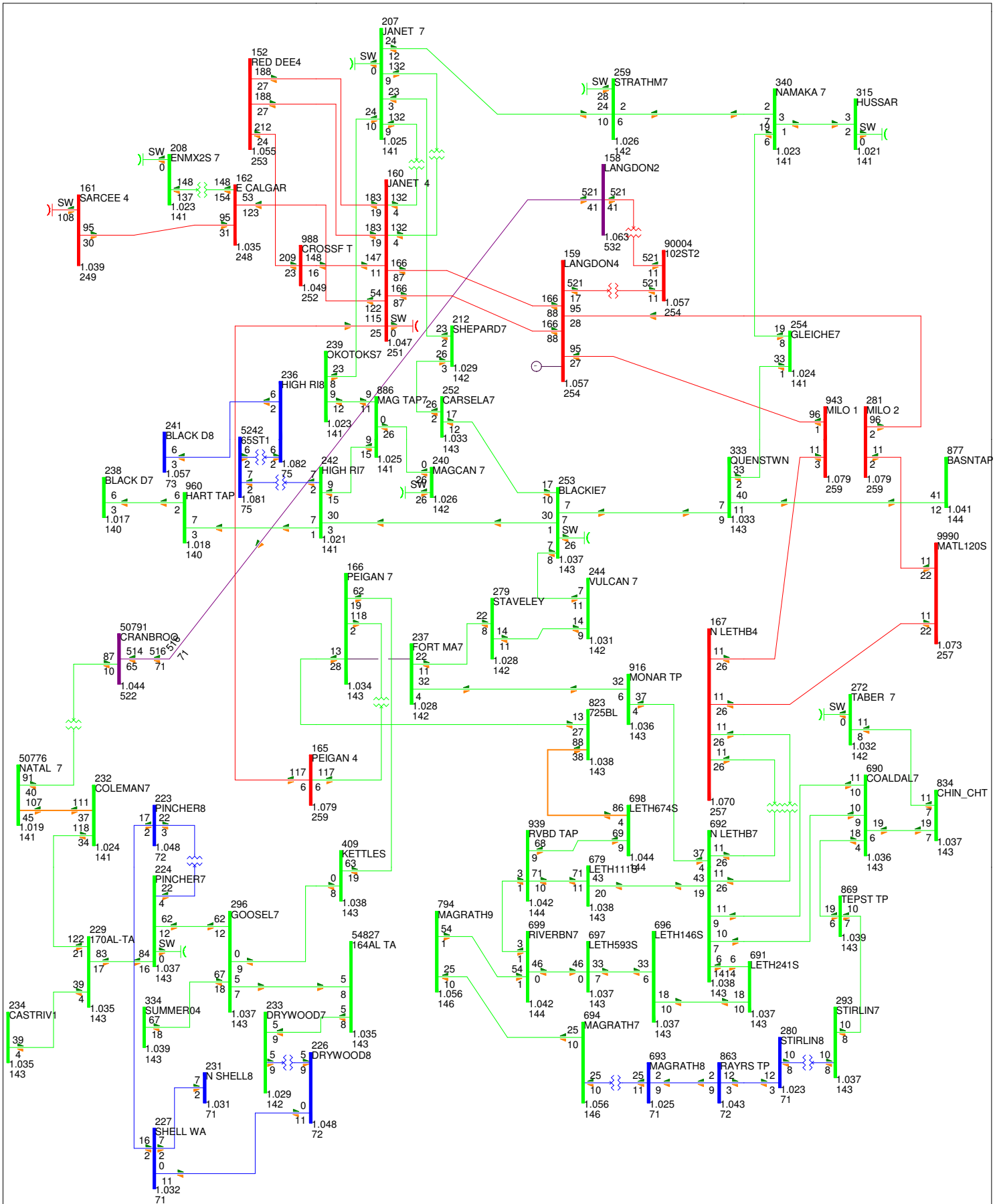
EXISTING SUMMER LIGHT CASE

Existing South East System THU, NOV 20 2008 16:50

EXISTING SYSTEM

Fig Existing-SL-5

BC Export: 636 MW



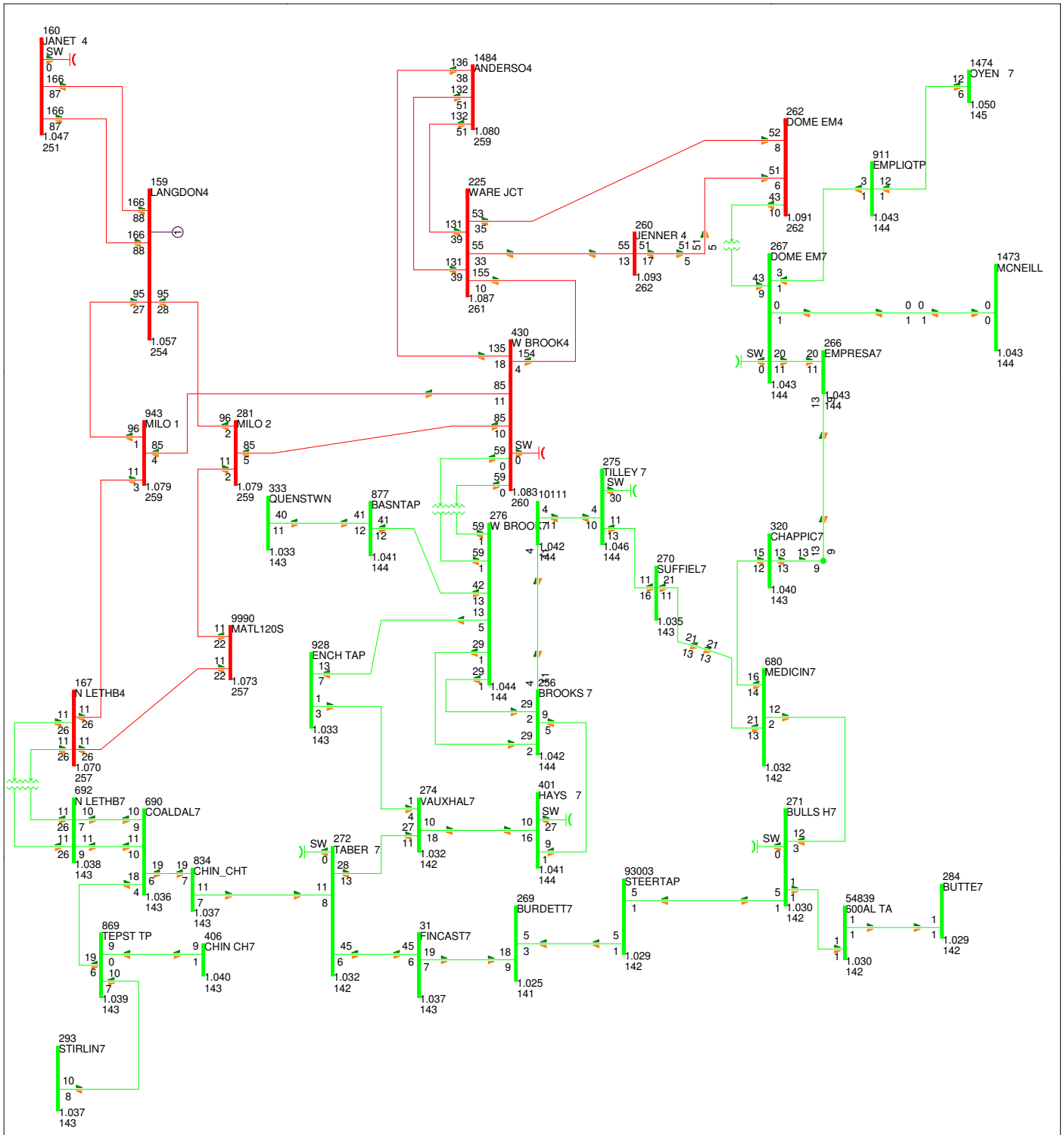
EXISTING SUMMER LIGHT CASE

Existing South West System THU, NOV 20 2008 15:28

EXISTING SYSTEM

Fig Existing-SL-6

BC Export: 642 MW



EXISTING SUMMER LIGHT CASE

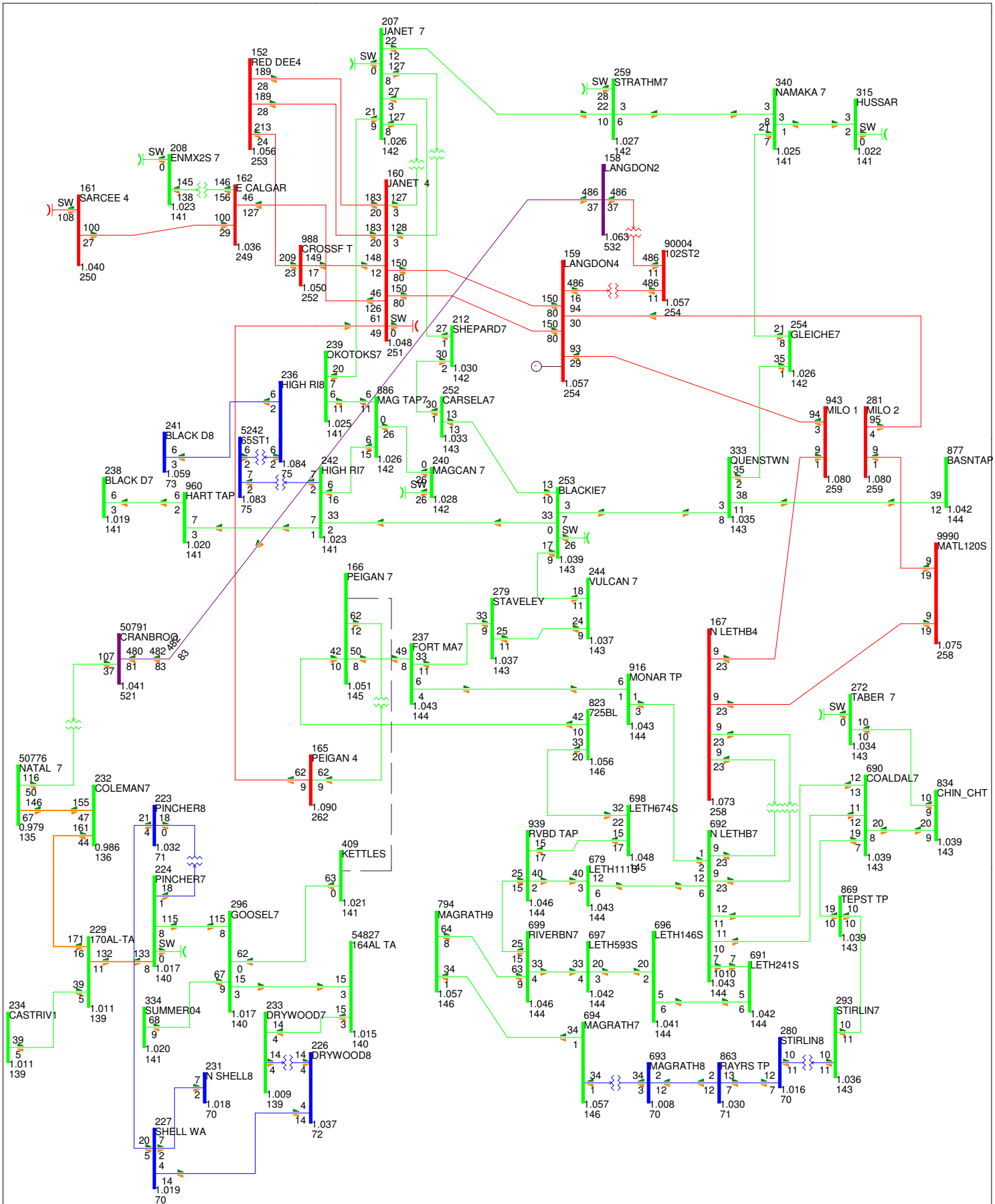
Existing South East System THU, NOV 20 2008 16:51

EXISTING SYSTEM

Fig Existing-SL-7

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: 642 MW



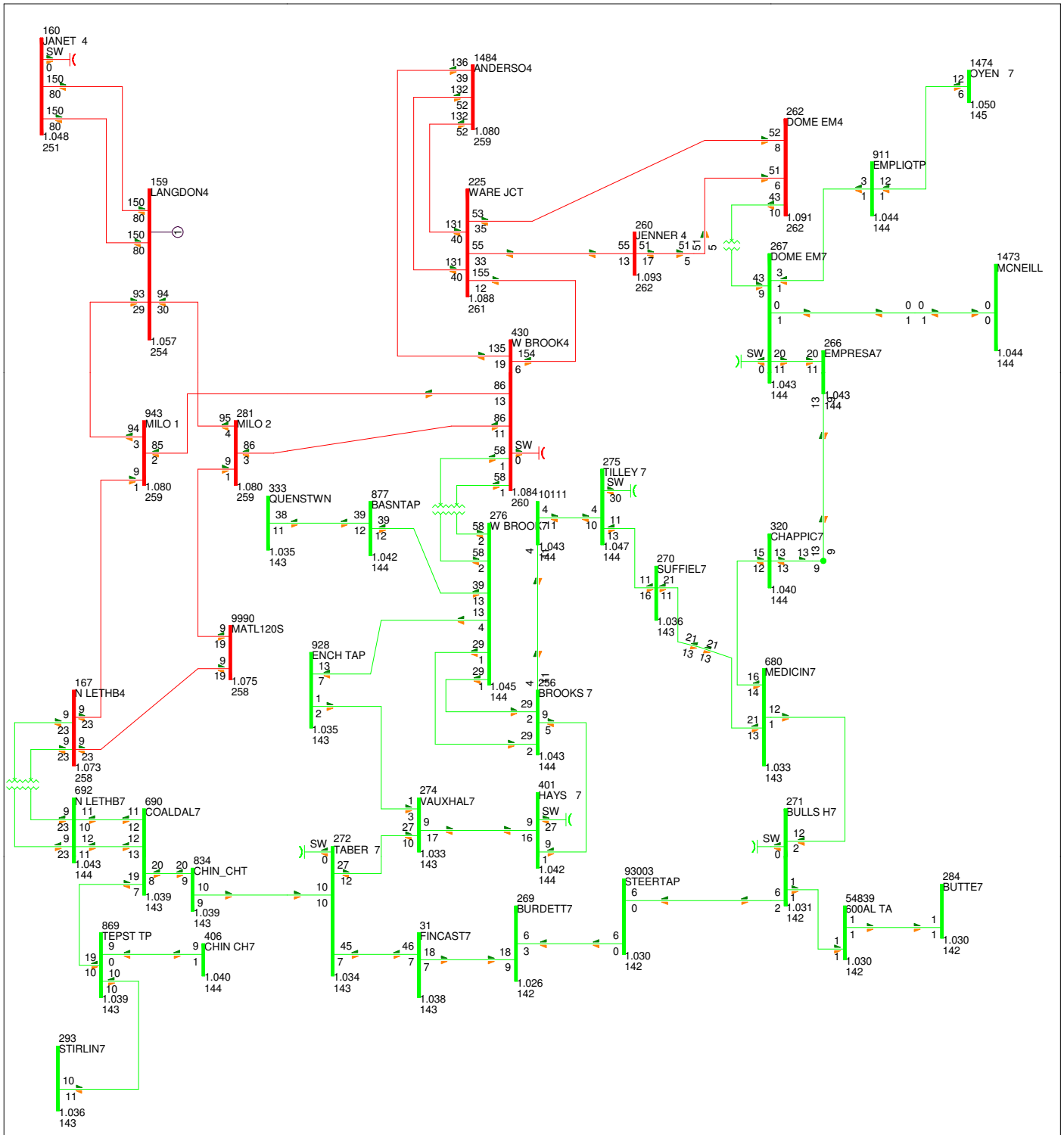
EXISTING SUMMER LIGHT CASE

Existing South West System THU, NOV 20 2008 15:28

EXISTING SYSTEM

Fig Existing-SL-8

BC Export: 637 MW



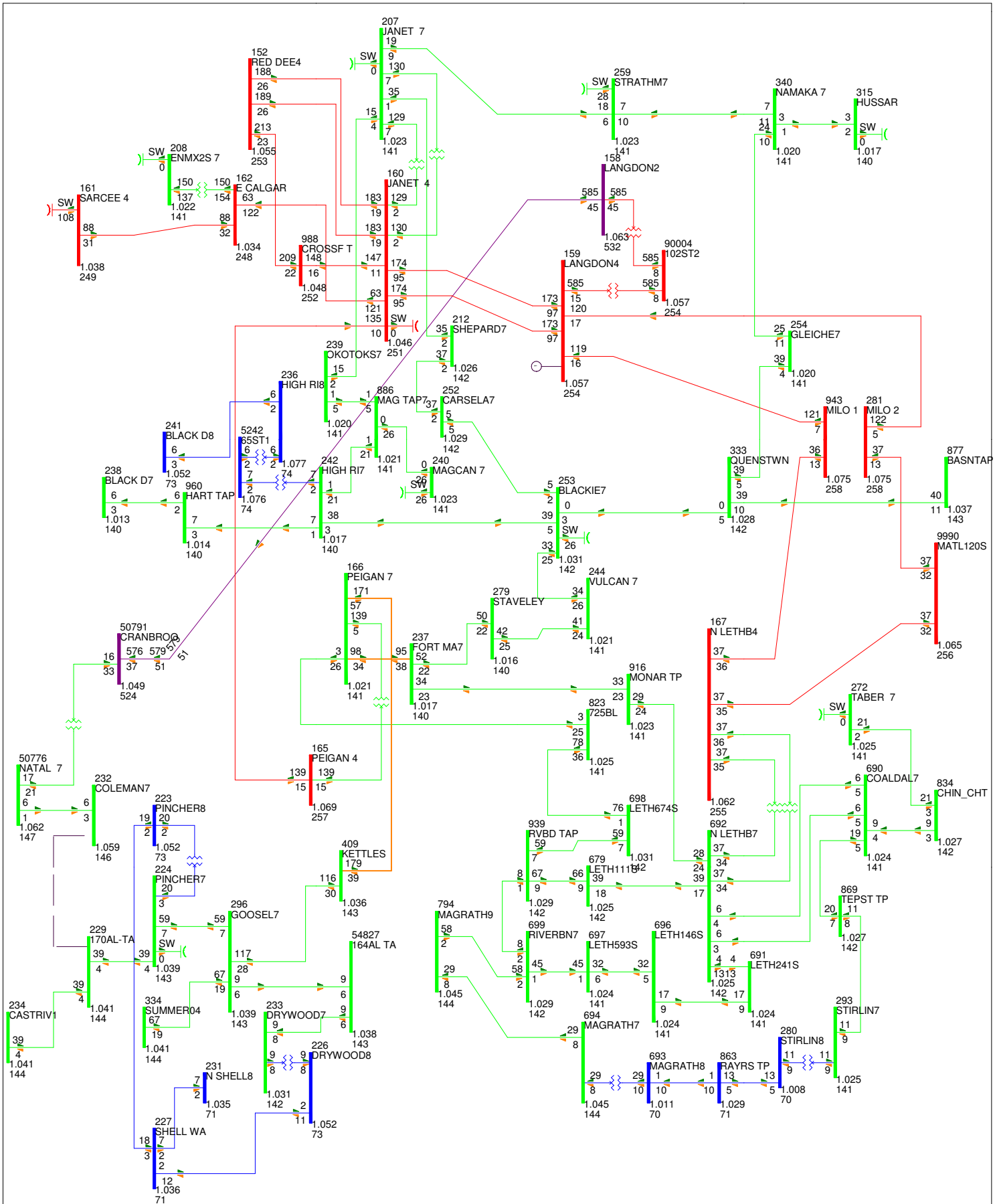
EXISTING SUMMER LIGHT CASE

Existing South East System THU, NOV 20 2008 16:51

EXISTING SYSTEM

Fig Existing-SL-9

BC Export: 637 MW



EXISTING SUMMER LIGHT CASE

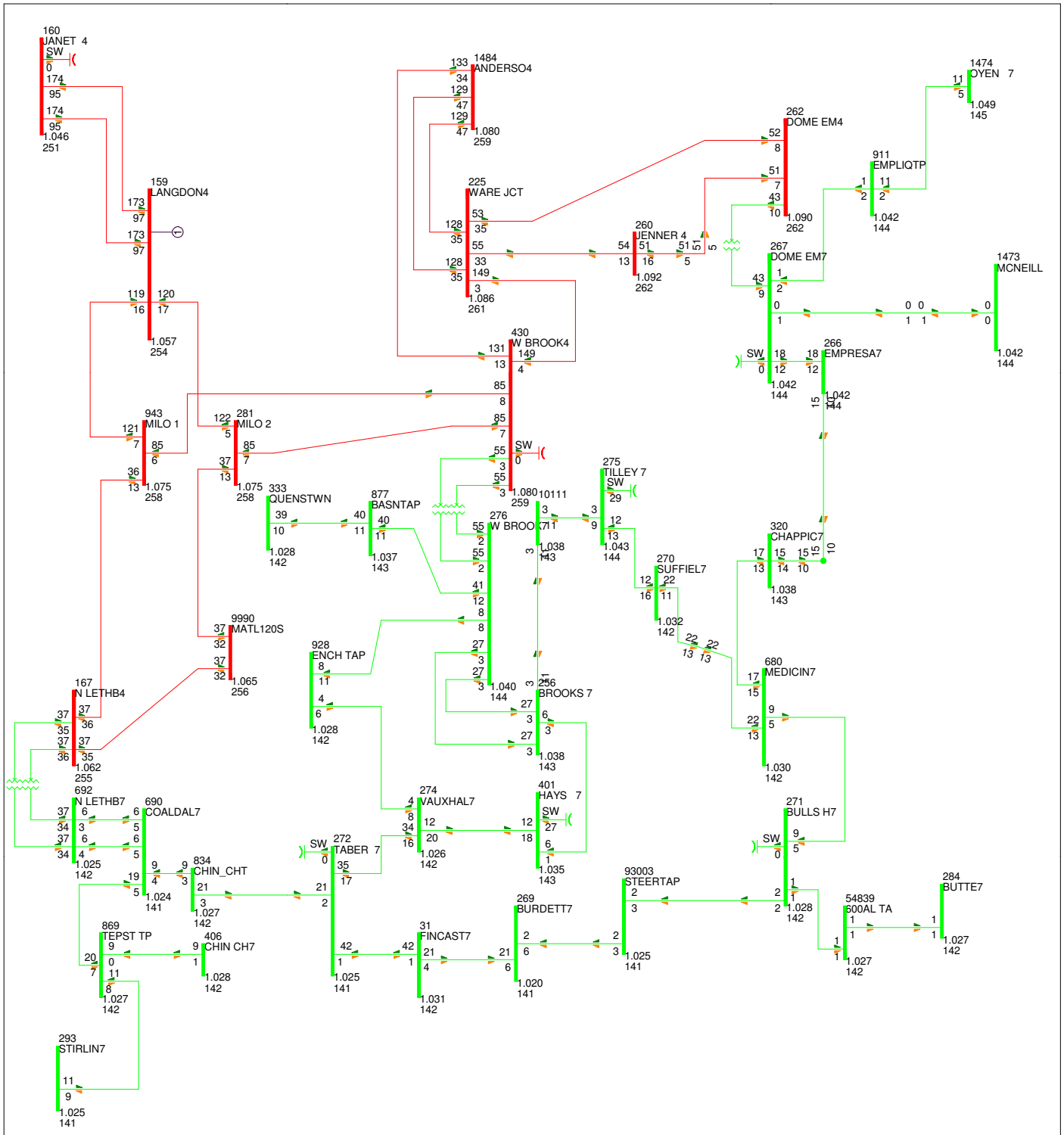
Existing South West System WED, NOV 26 2008 10:18

EXISTING SYSTEM

Fig Existing-SL-10

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=600.000 >600.000

BC Export: 627 MW



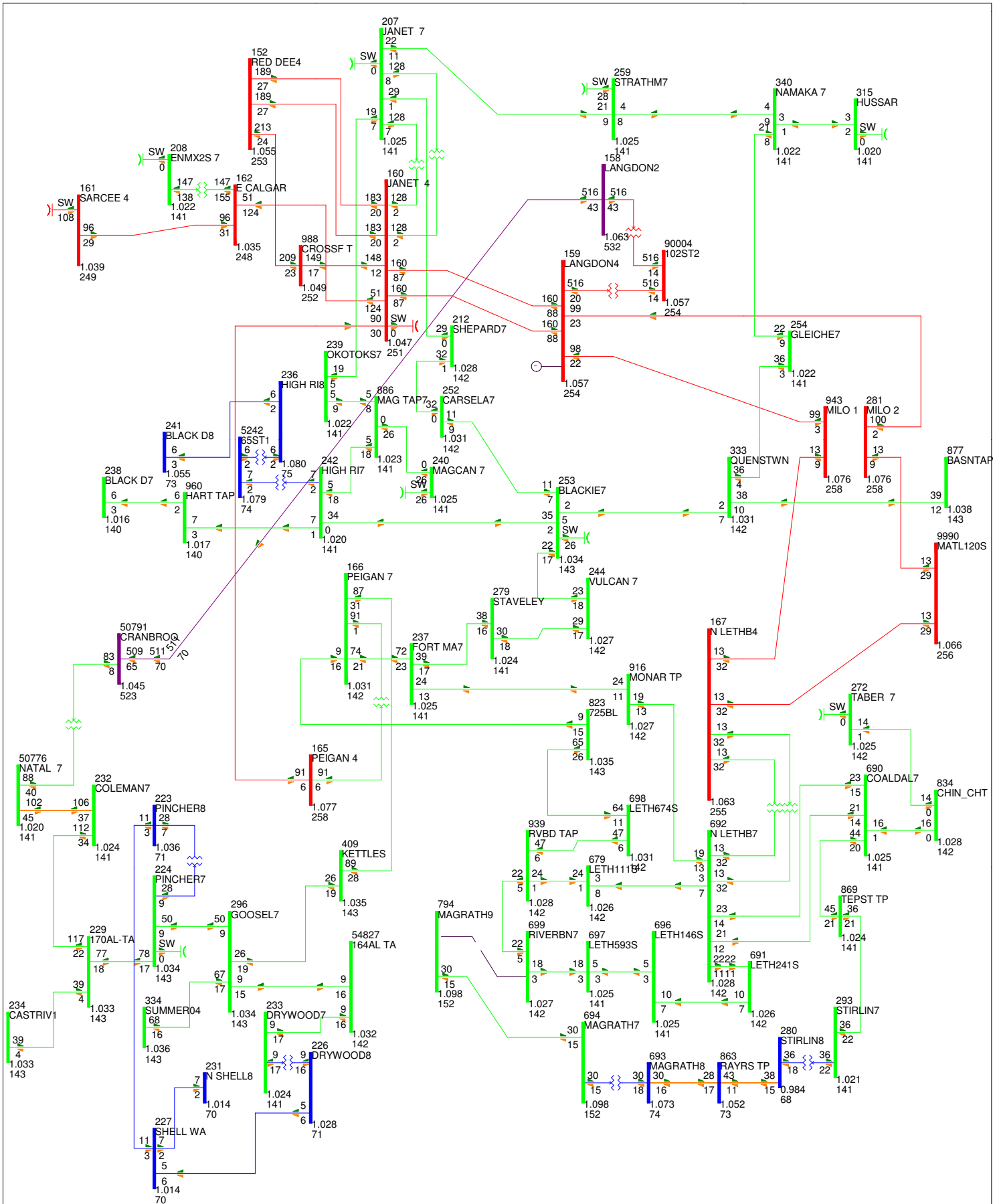
EXISTING SUMMER LIGHT CASE

Existing South East System THU, NOV 20 2008 16:52

EXISTING SYSTEM

Fig Existing-SL-11

BC Export: 627 MW



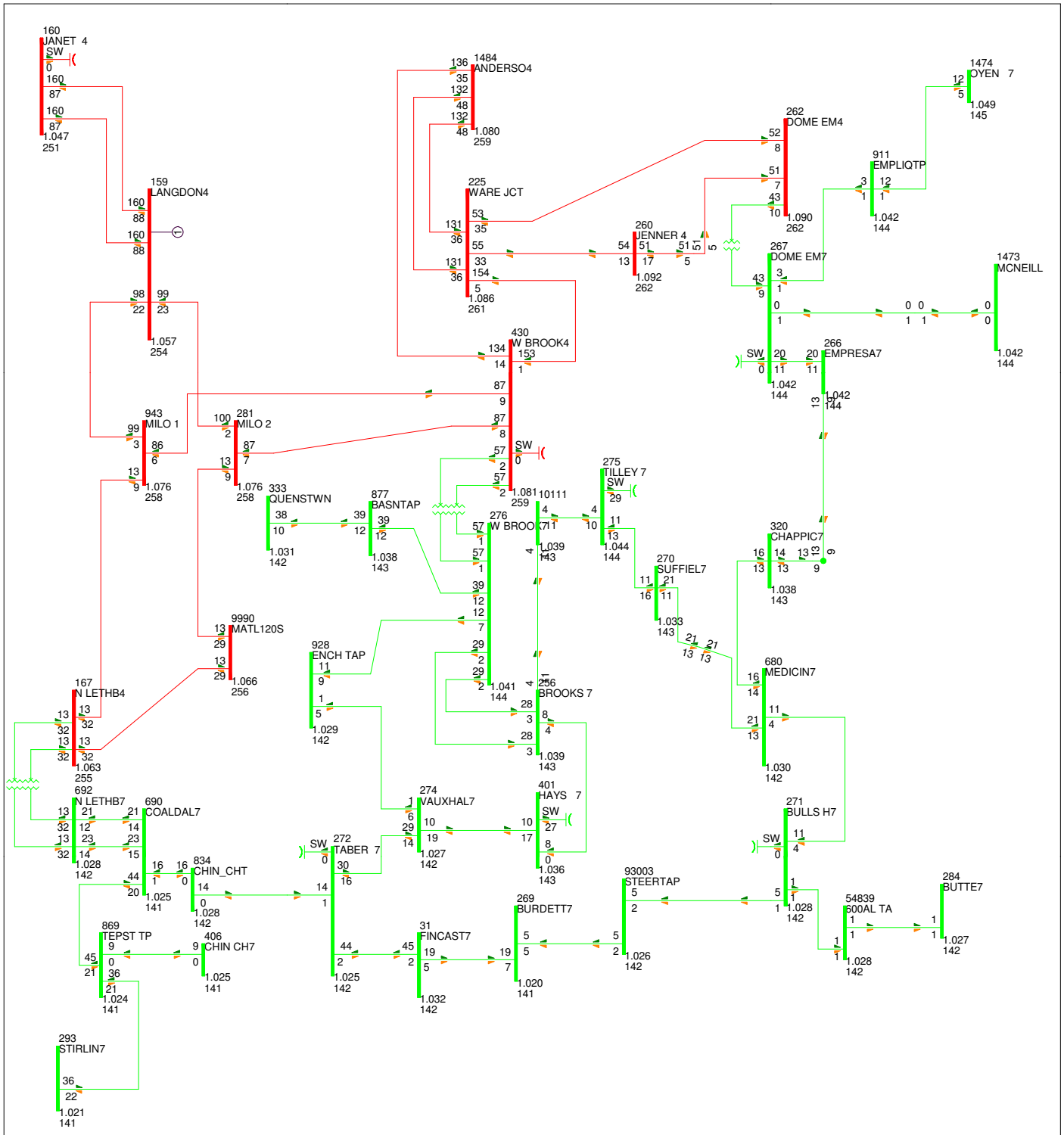
EXISTING SUMMER LIGHT CASE

Existing South West System THU, NOV 20 2008 15:30

EXISTING SYSTEM

Fig Existing-SL-12

BC Export: 633 MW



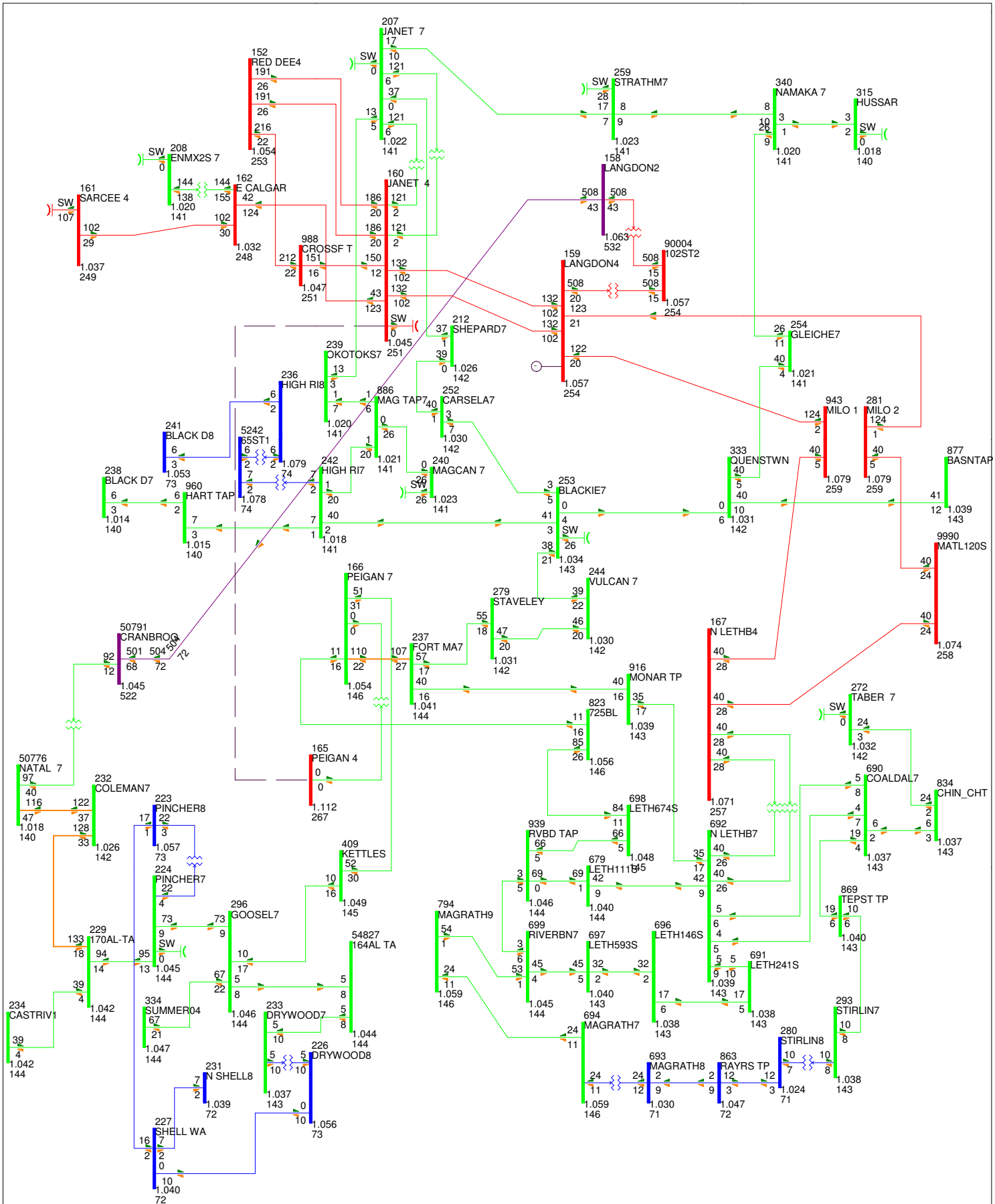
EXISTING SUMMER LIGHT CASE

Existing South East System THU, NOV 20 2008 16:52

EXISTING SYSTEM

Fig Existing-SL-13

BC Export: 633 MW



EXISTING SUMMER LIGHT CASE

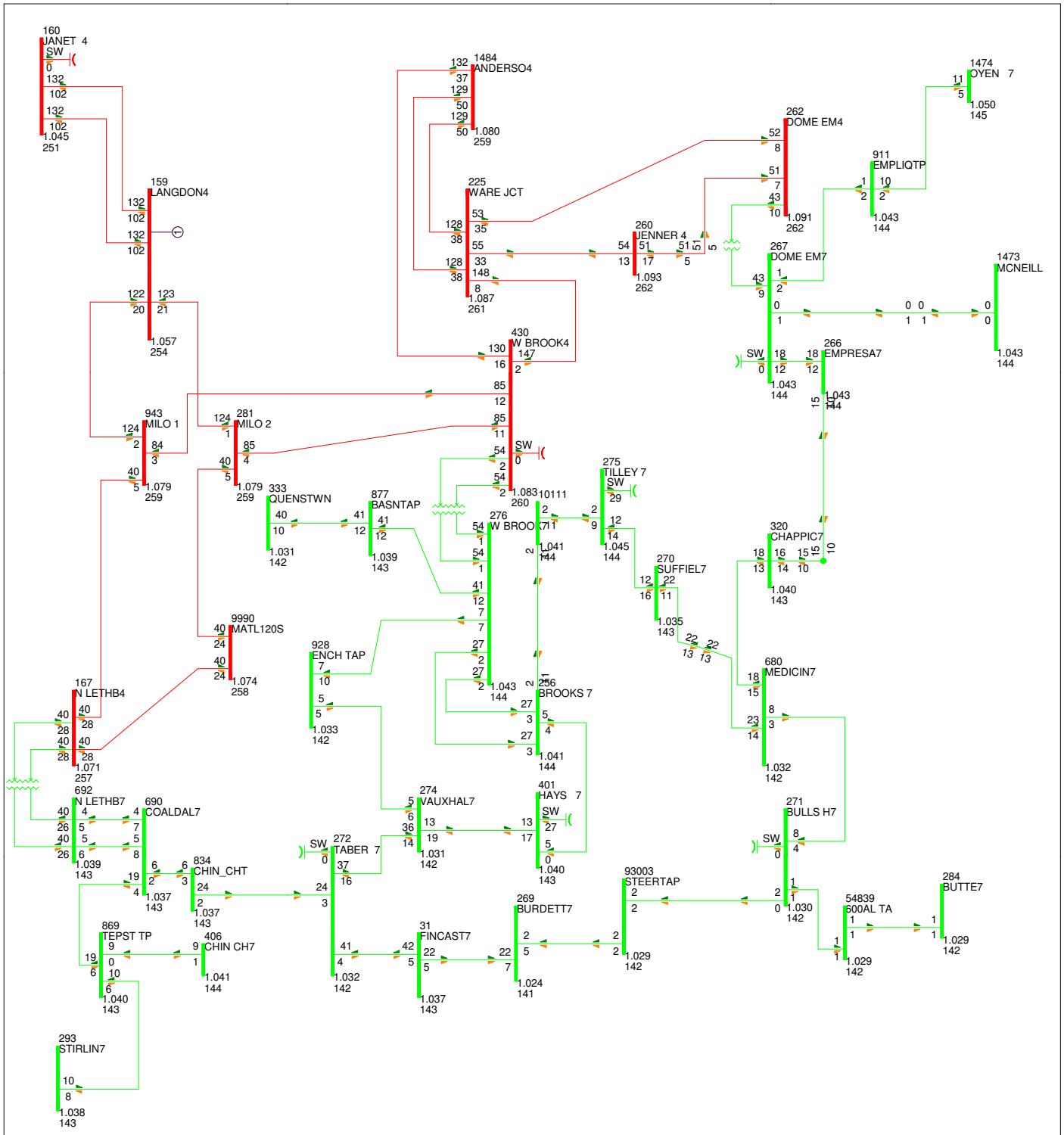
Existing South West System THU, NOV 20 2008 15:31

EXISTING SYSTEM

Fig Existing-SL-14

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=600.000 >600.000

BC Export: 635 MW



EXISTING SUMMER LIGHT CASE

Existing South East System THU, NOV 20 2008 16:53

EXISTING SYSTEM

Fig Existing-SL-15

BC Export: 635 MW

GENERATION DISPATCH REPORT

GROSS COAL GEN. 6120.6 MW

GAS GENERATION

HYDRO GENERATION

GROSS EXISTING WIND GEN. 0.0 MW

FORT MCMURRAY GEN.

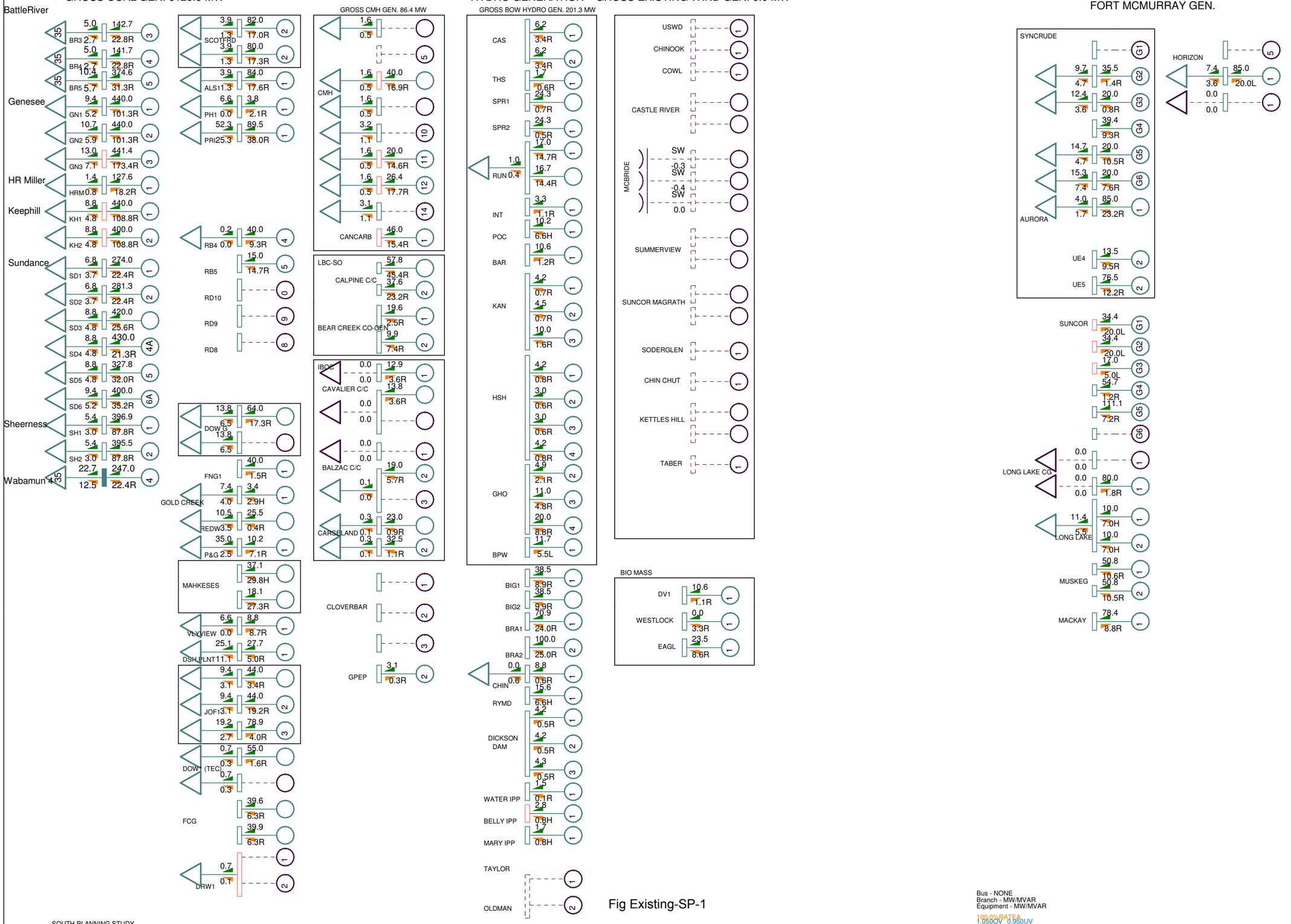
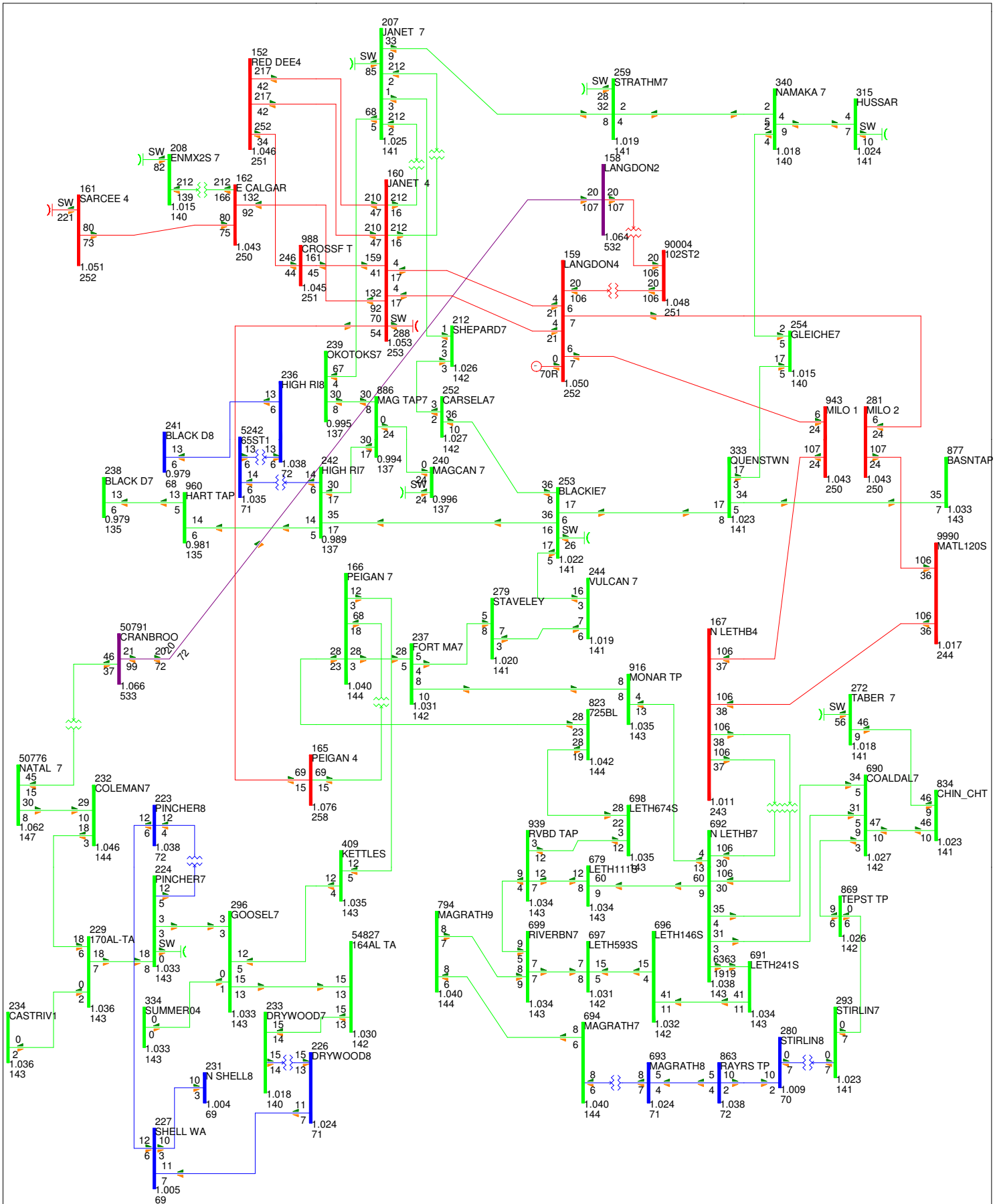


Fig Existing-SP-1

SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
SUN, NOV 23 2008 10:55

Bus - NONE
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
1.050OV 0.950UV
KV: <=25.000 <=34.500 <=69.000 <=138.000 <=240.000 >240.000



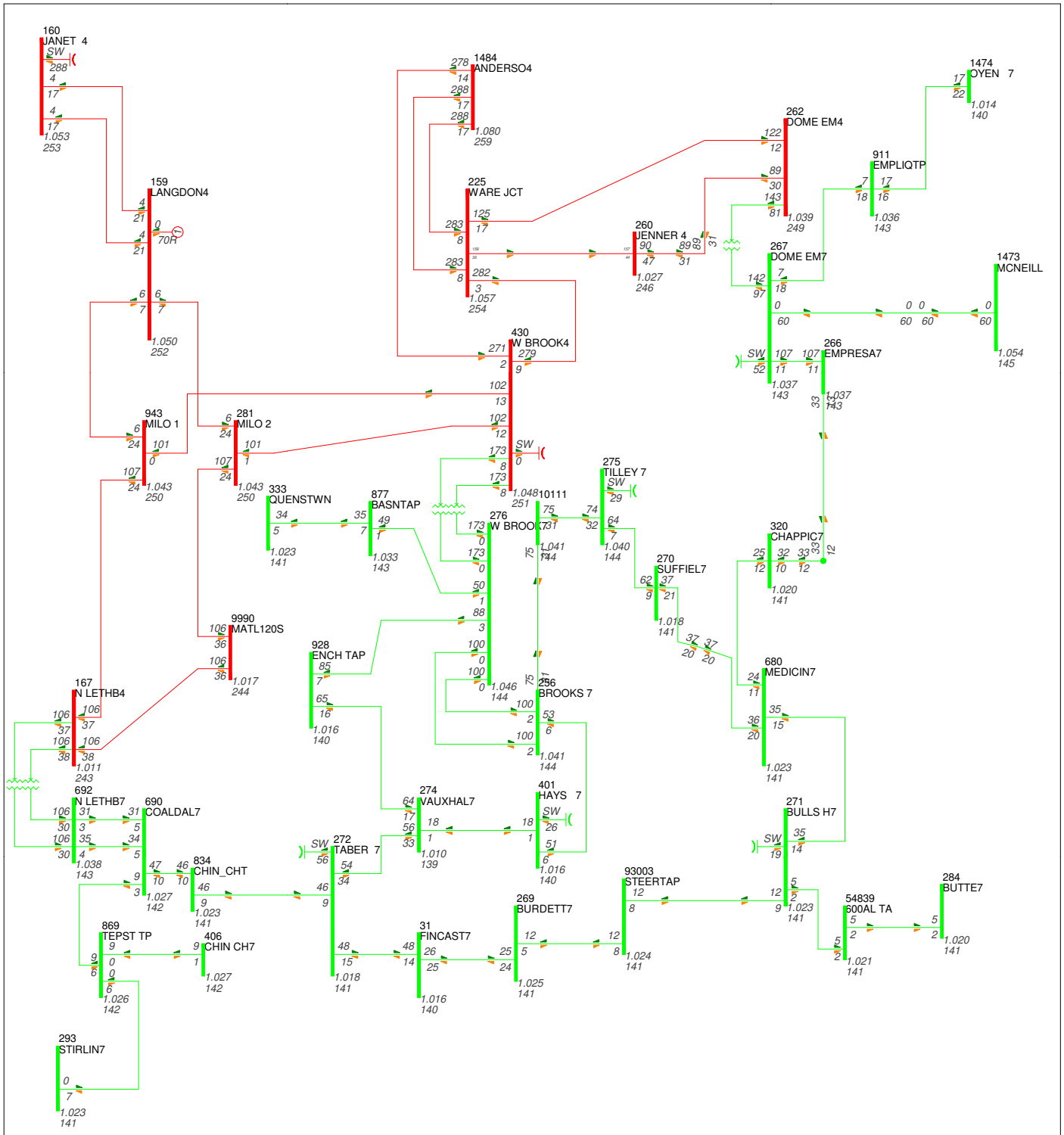
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 16:56

EXISTING SYSTEM

Fig Existing-SP-2

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=600.000 >600.000

BC Export: -35 MW

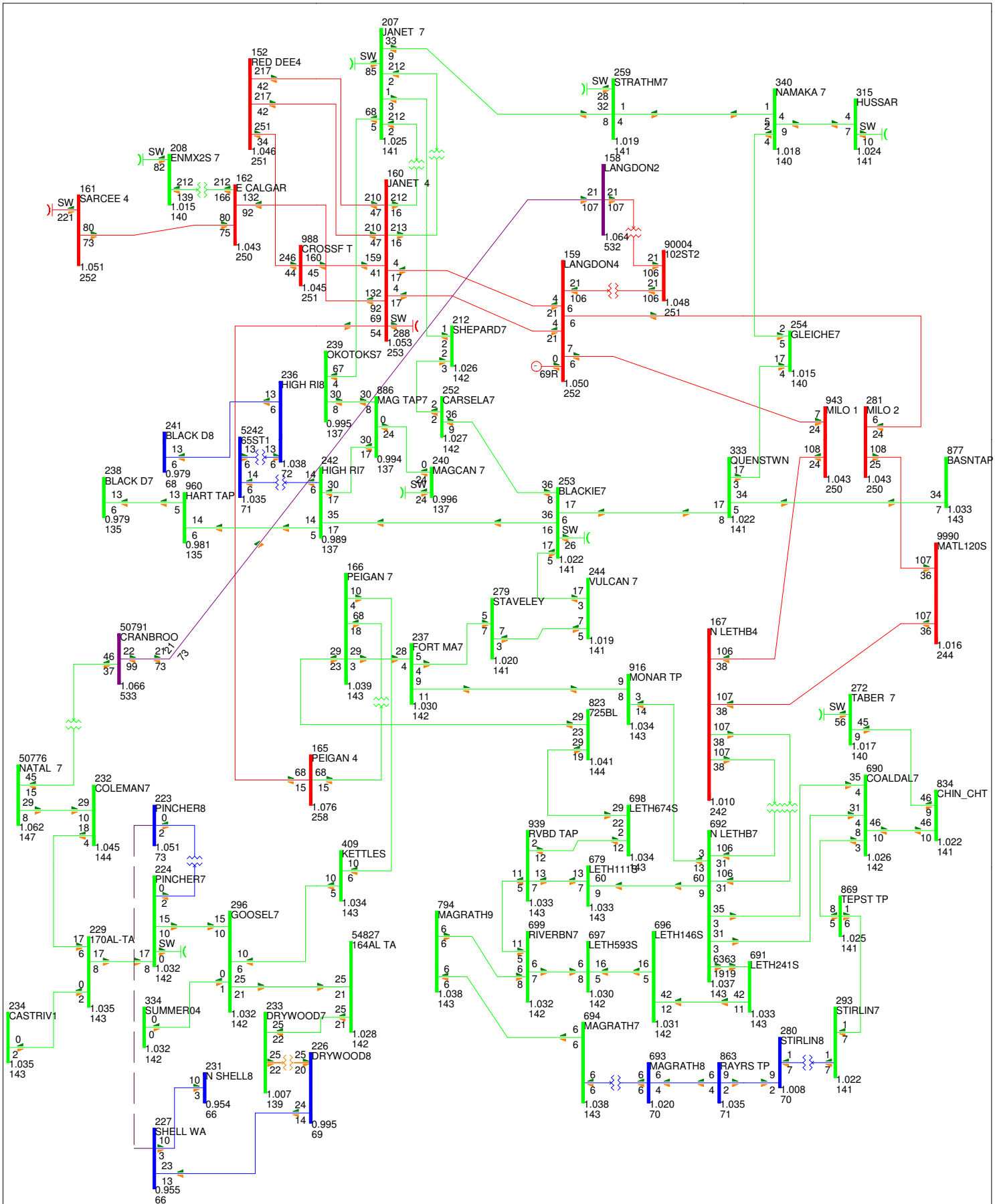


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:04

EXISTING SYSTEM

Fig Existing-SP-3

BC Export: -35 MW

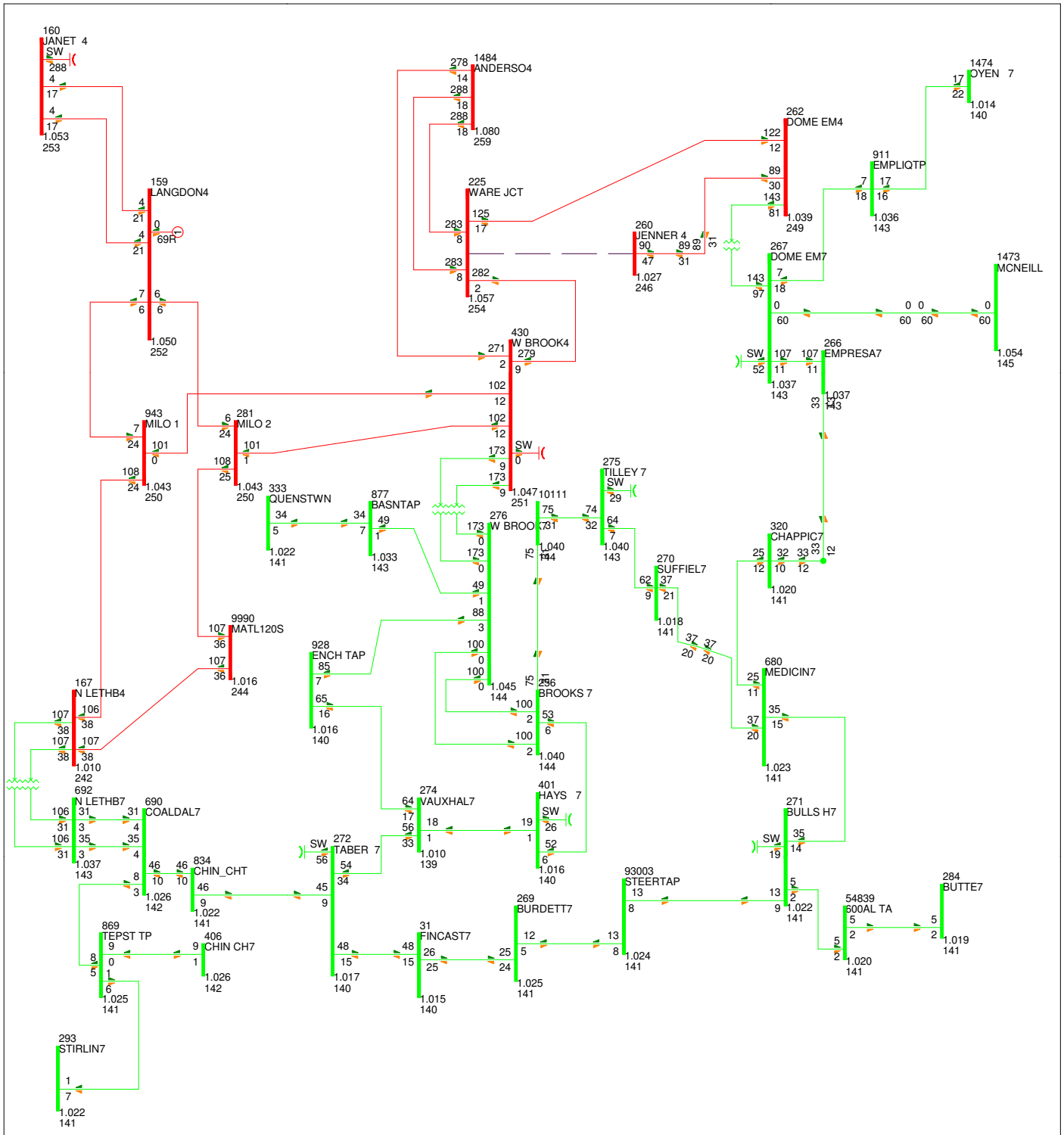


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:05

EXISTING SYSTEM

Fig Existing-SP-4

BC Export: -36 MW

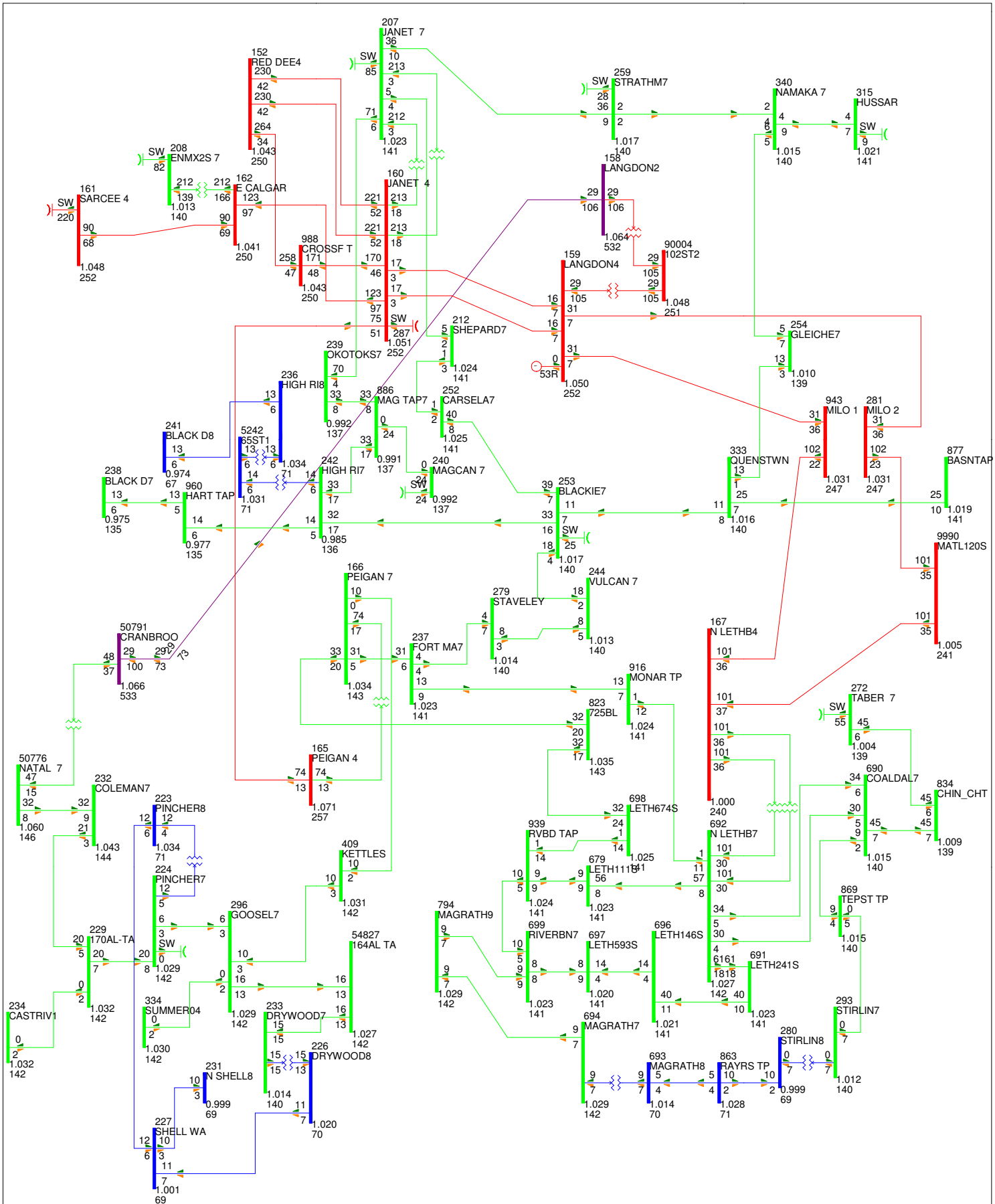


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 16:57

EXISTING SYSTEM

Fig Existing-SP-5

BC Export: -36 MW

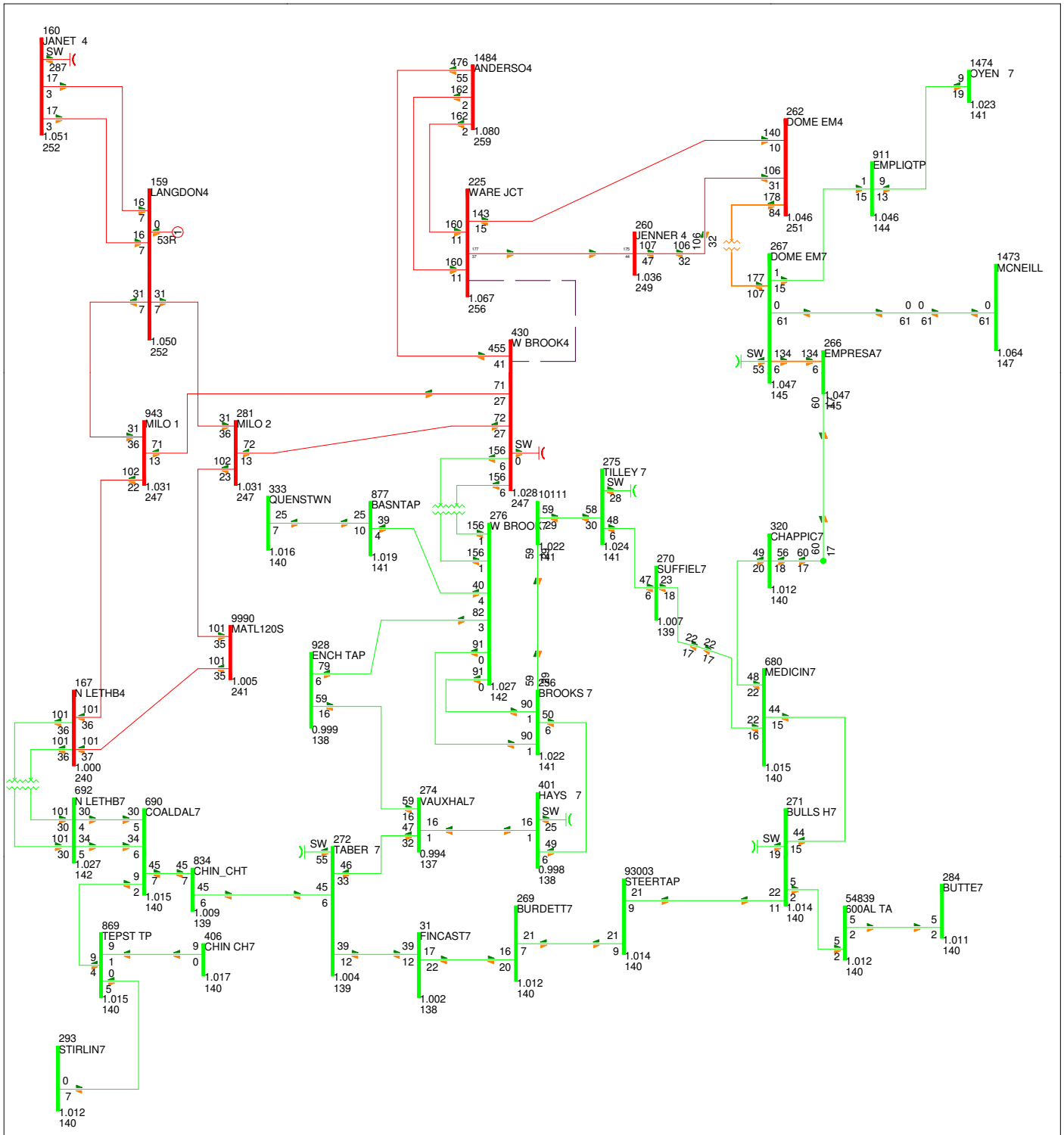


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:06

EXISTING SYSTEM

Fig Existing-SP-6

BC Export: -46 MW



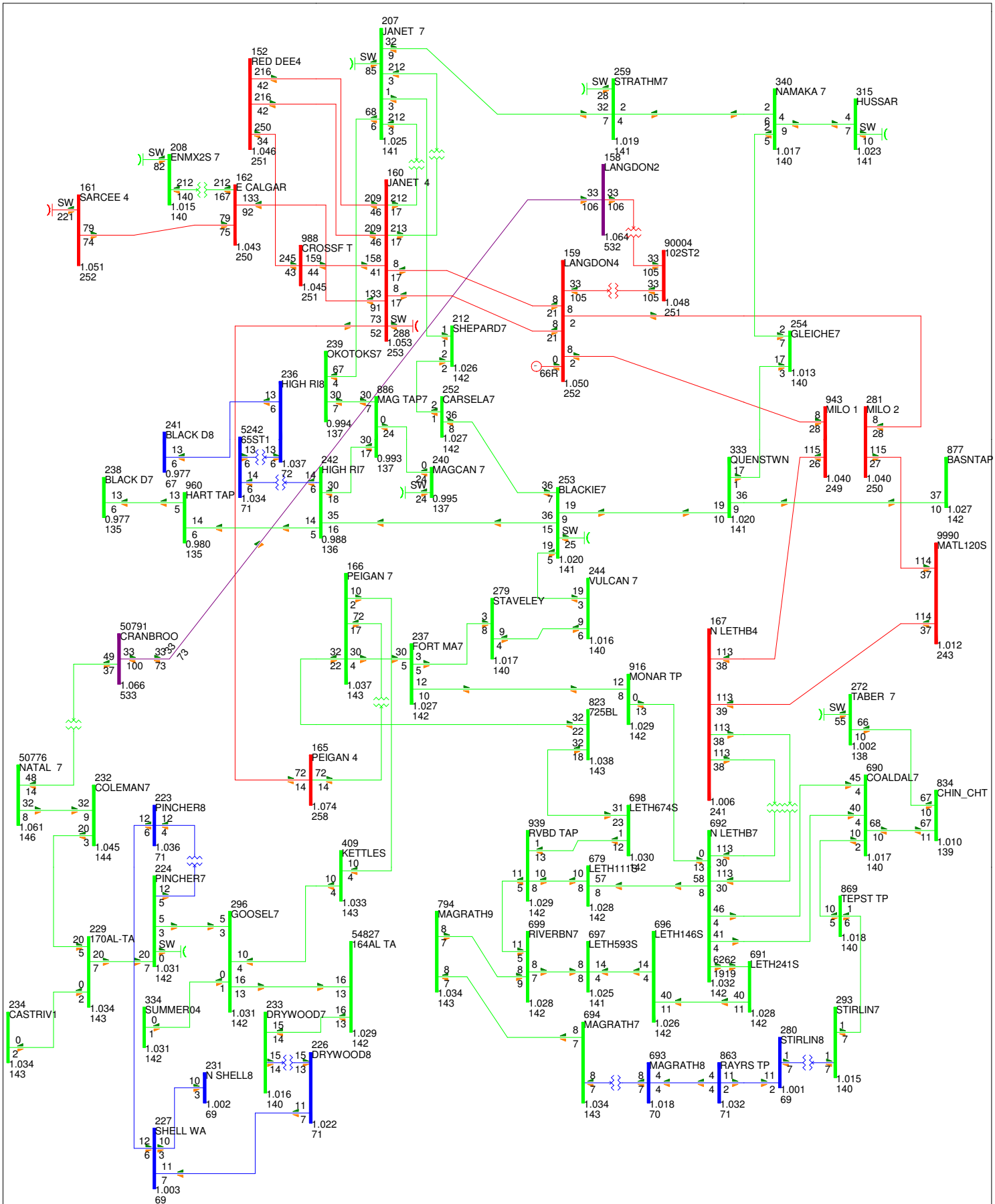
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:06

EXISTING SYSTEM

Fig Existing-SP-7

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -46 MW

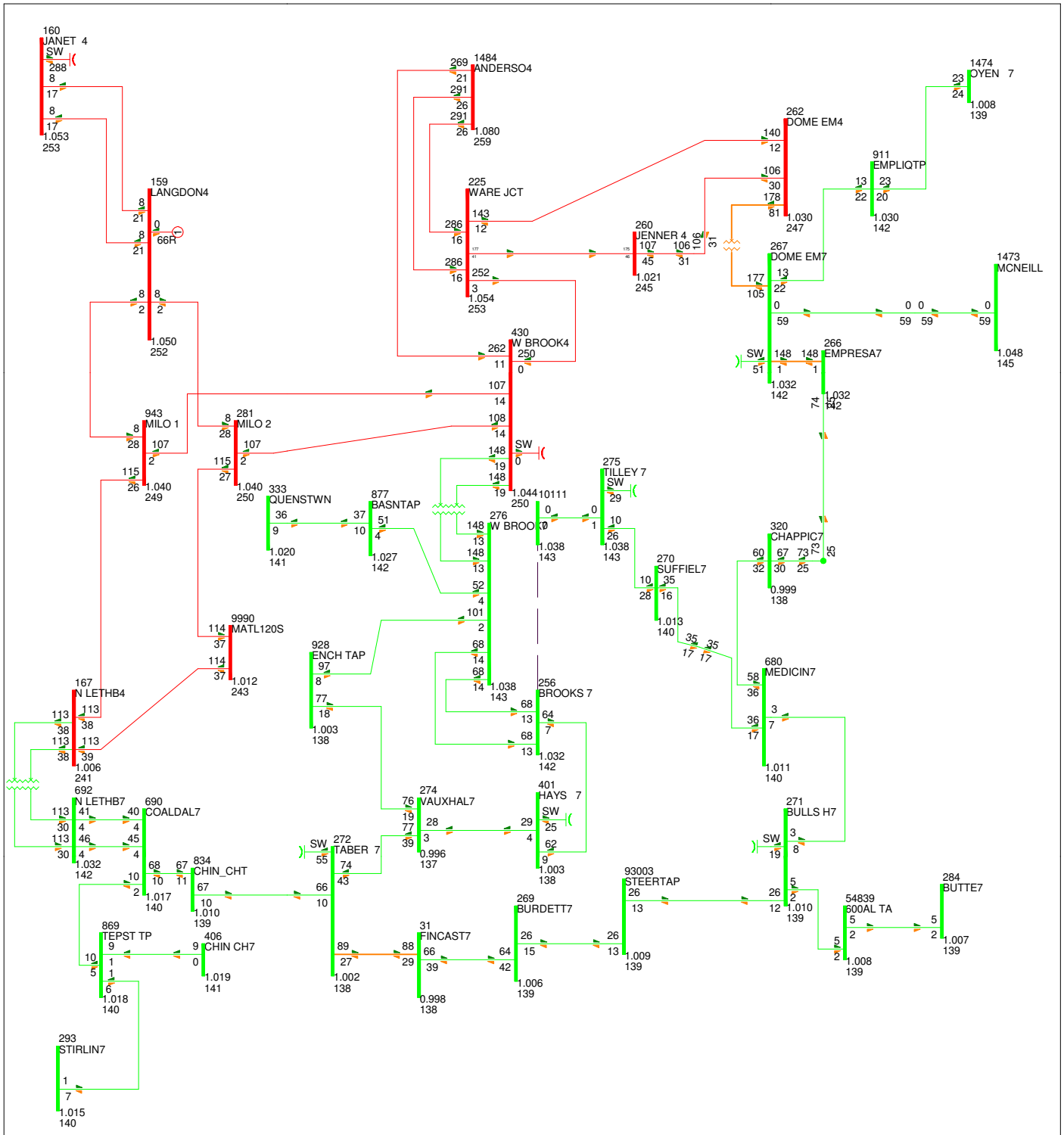


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:09

EXISTING SYSTEM

Fig Existing-SP-8

BC Export: -50 MW

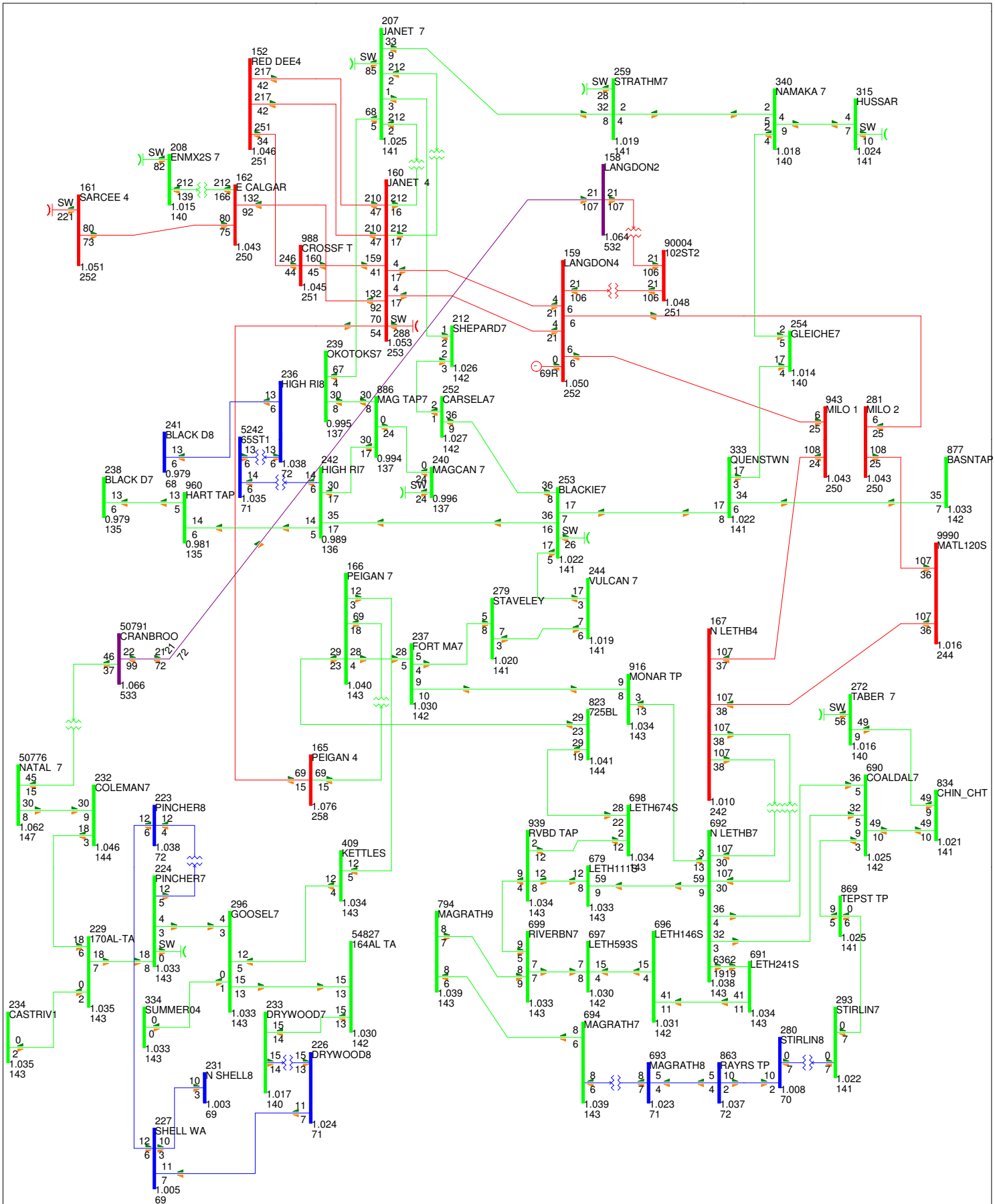


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:09

EXISTING SYSTEM

Fig Existing-SP-9

BC Export: -50 MW



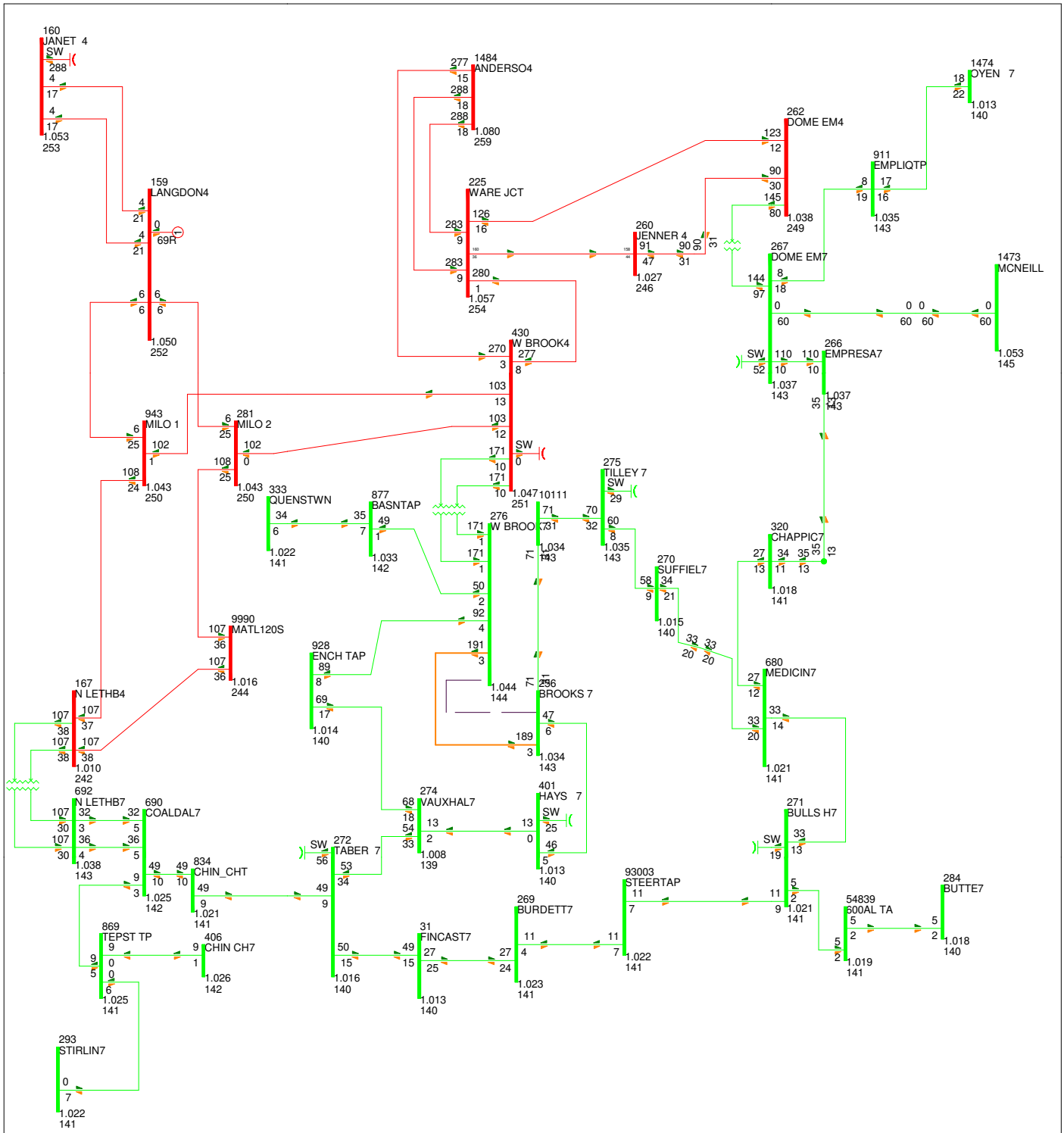
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:10

EXISTING SYSTEM

Fig Existing-SP-10

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=600.000 >600.000

BC Export: -37 MW

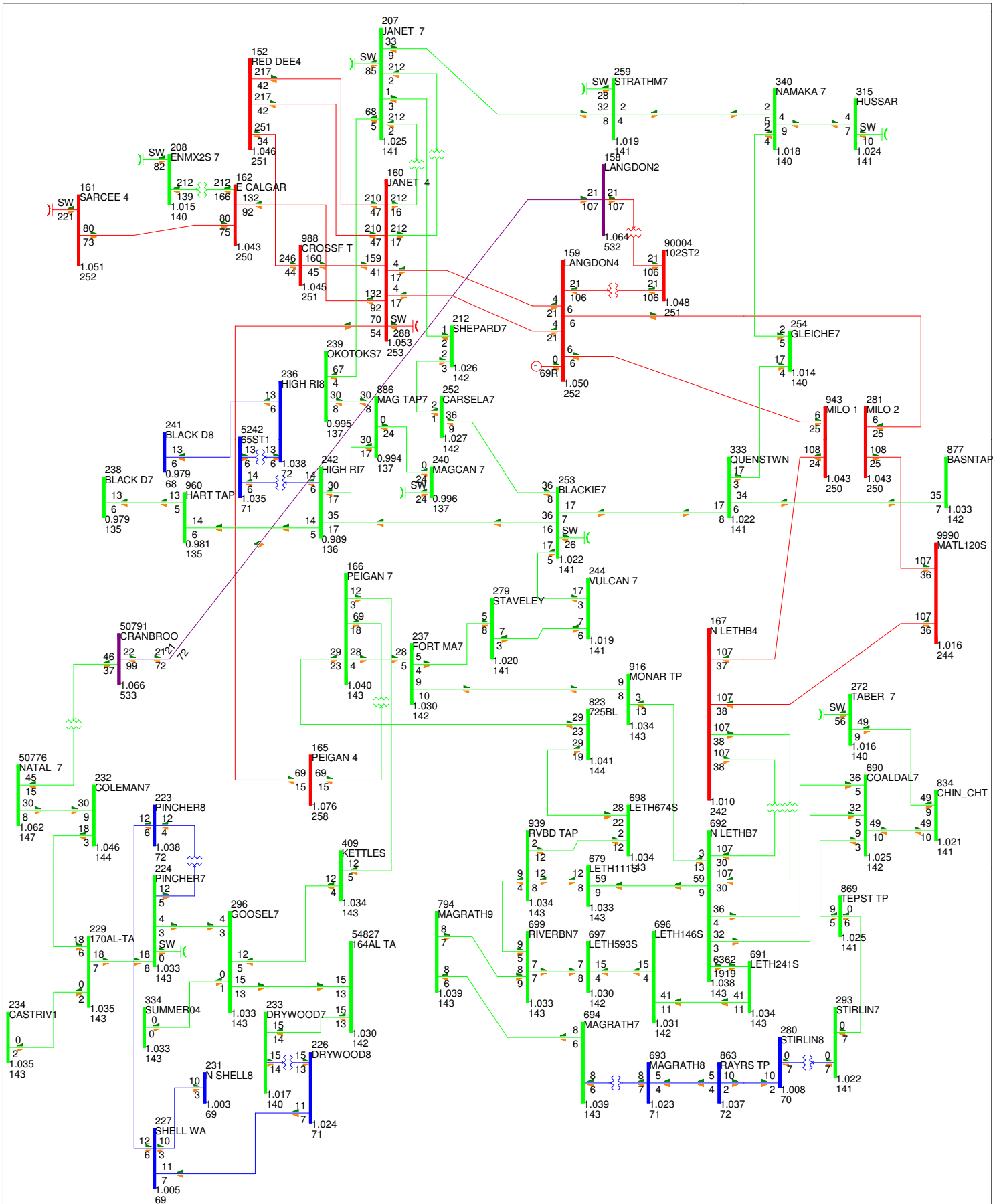


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:10

EXISTING SYSTEM

Fig Existing-SP-11

BC Export: -37 MW

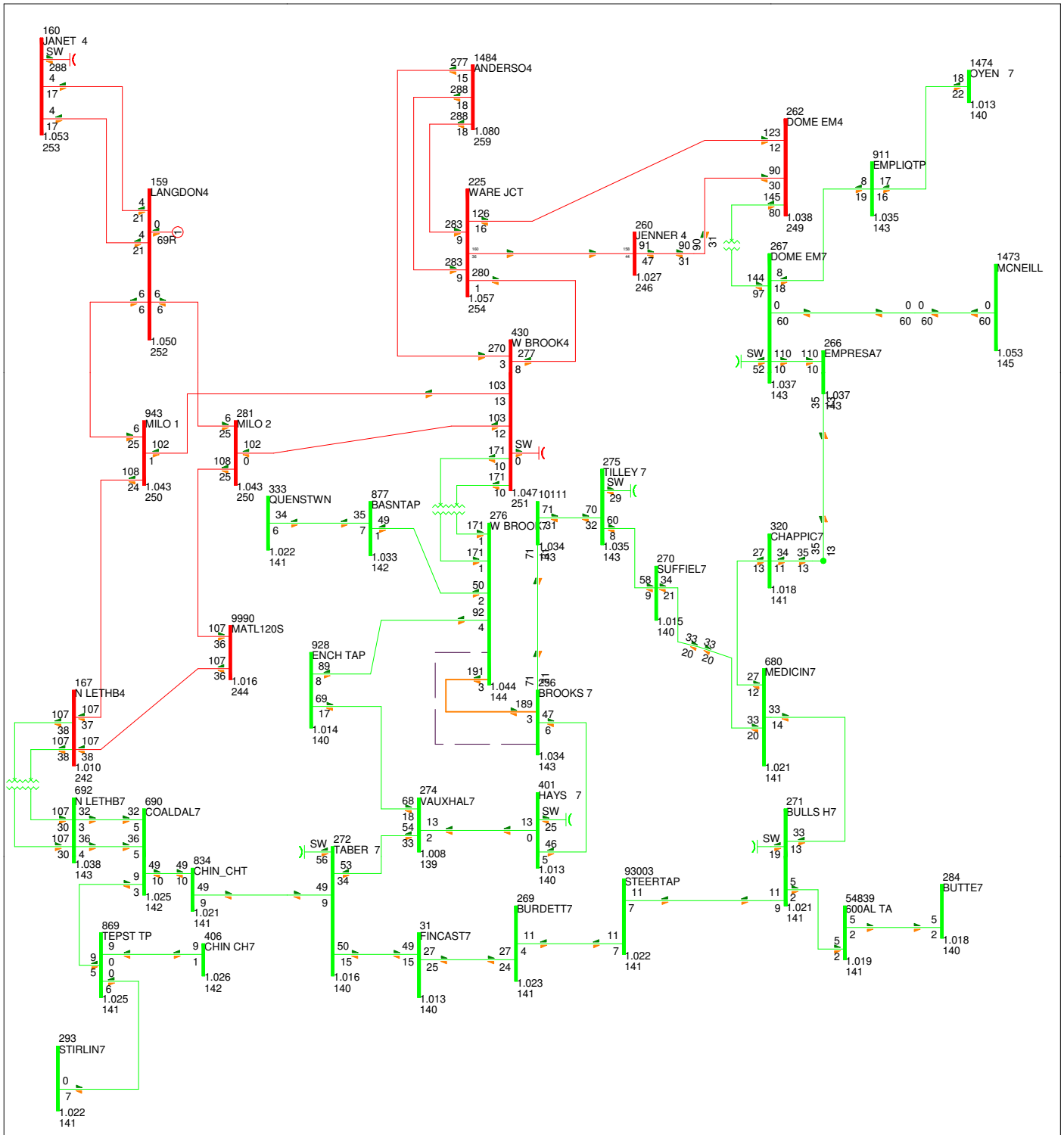


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:11

EXISTING SYSTEM

Fig Existing-SP-12

BC Export: -37 MW



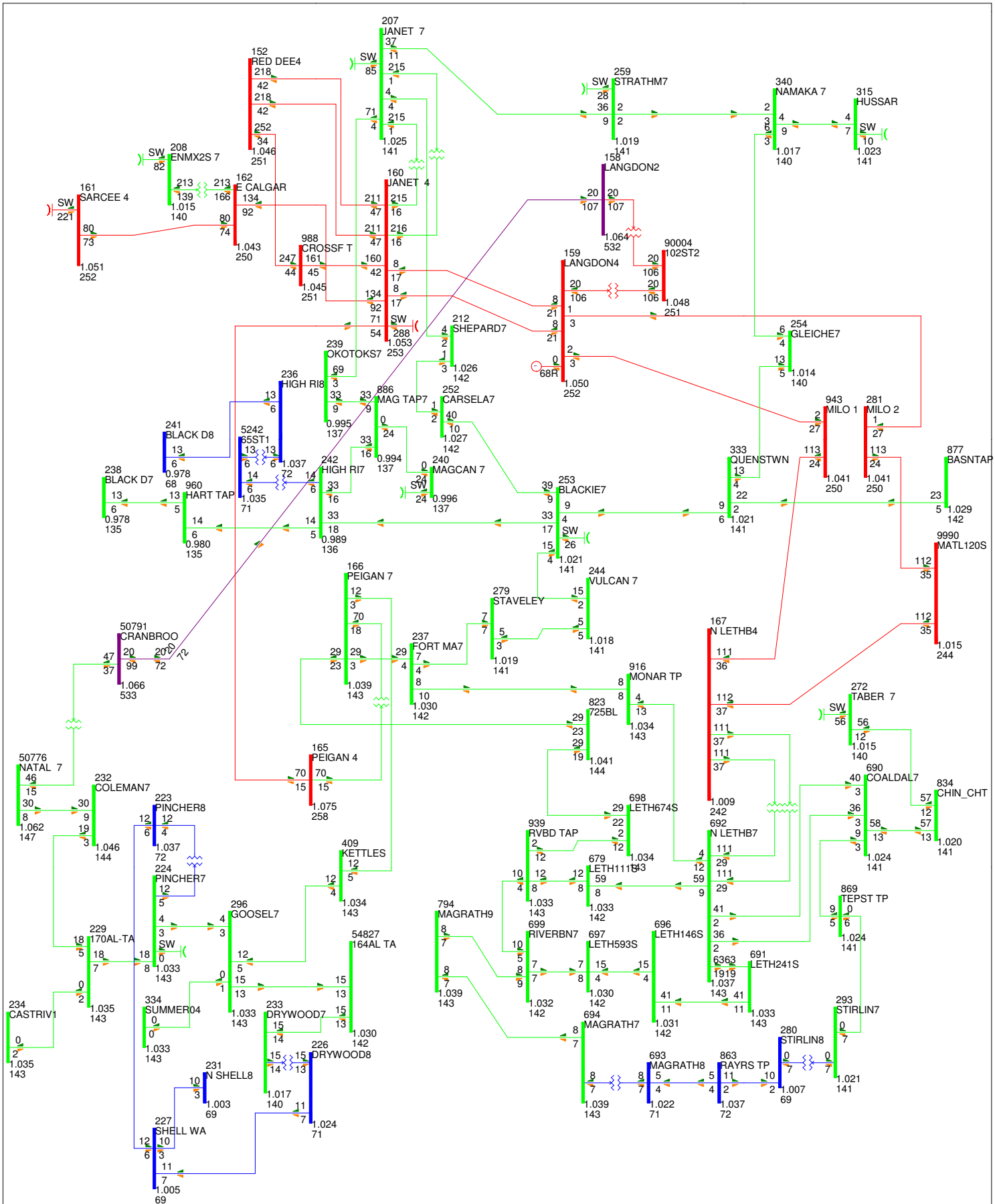
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:11

EXISTING SYSTEM

Fig Existing-SP-13

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -37 MW

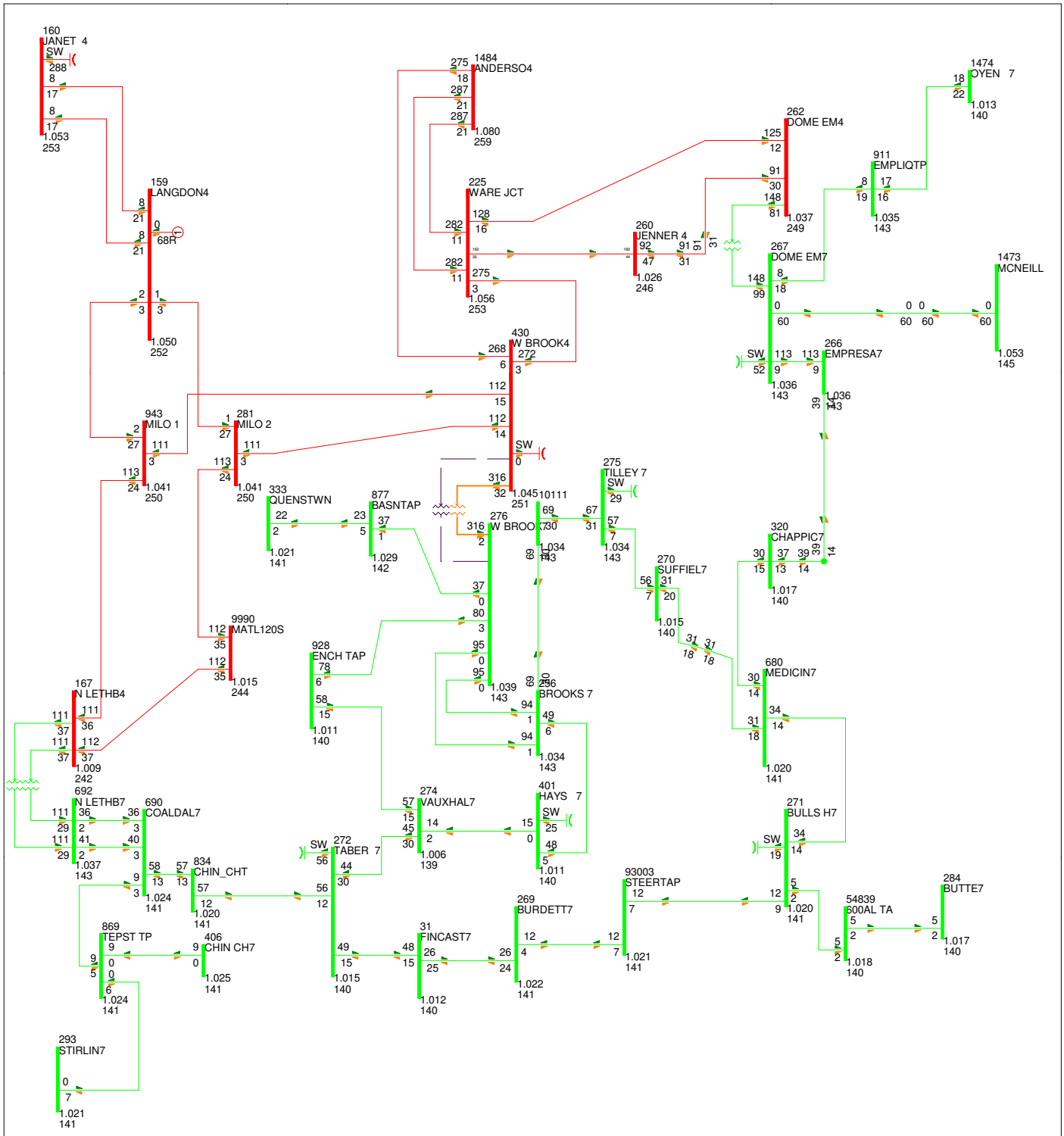


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:12

EXISTING SYSTEM

Fig Existing-SP-14

BC Export: -35 MW



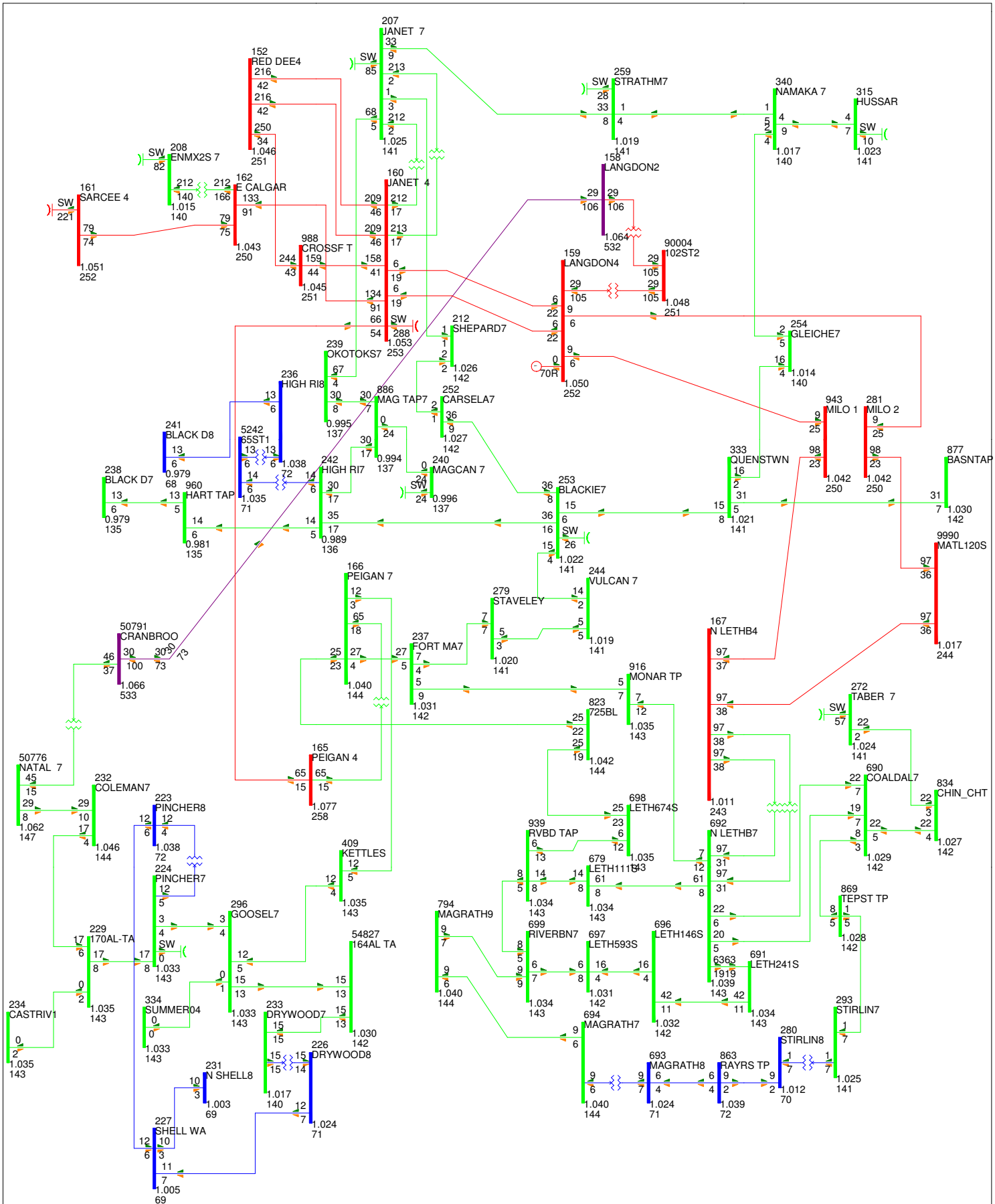
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:12

EXISTING SYSTEM

Fig Existing-SP-15

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -35 MW

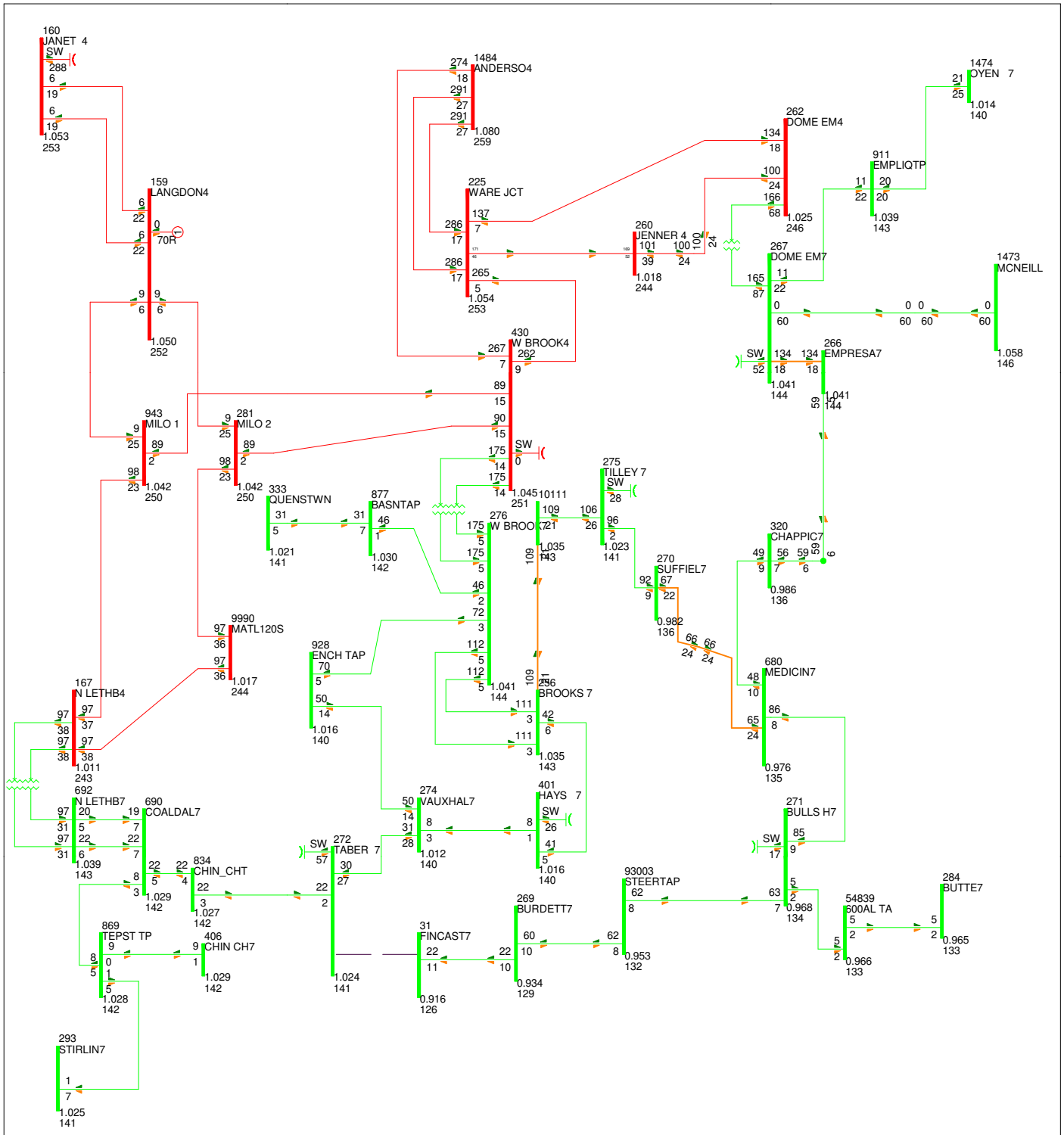


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:13

EXISTING SYSTEM

Fig Existing-SP-16

BC Export: -45 MW



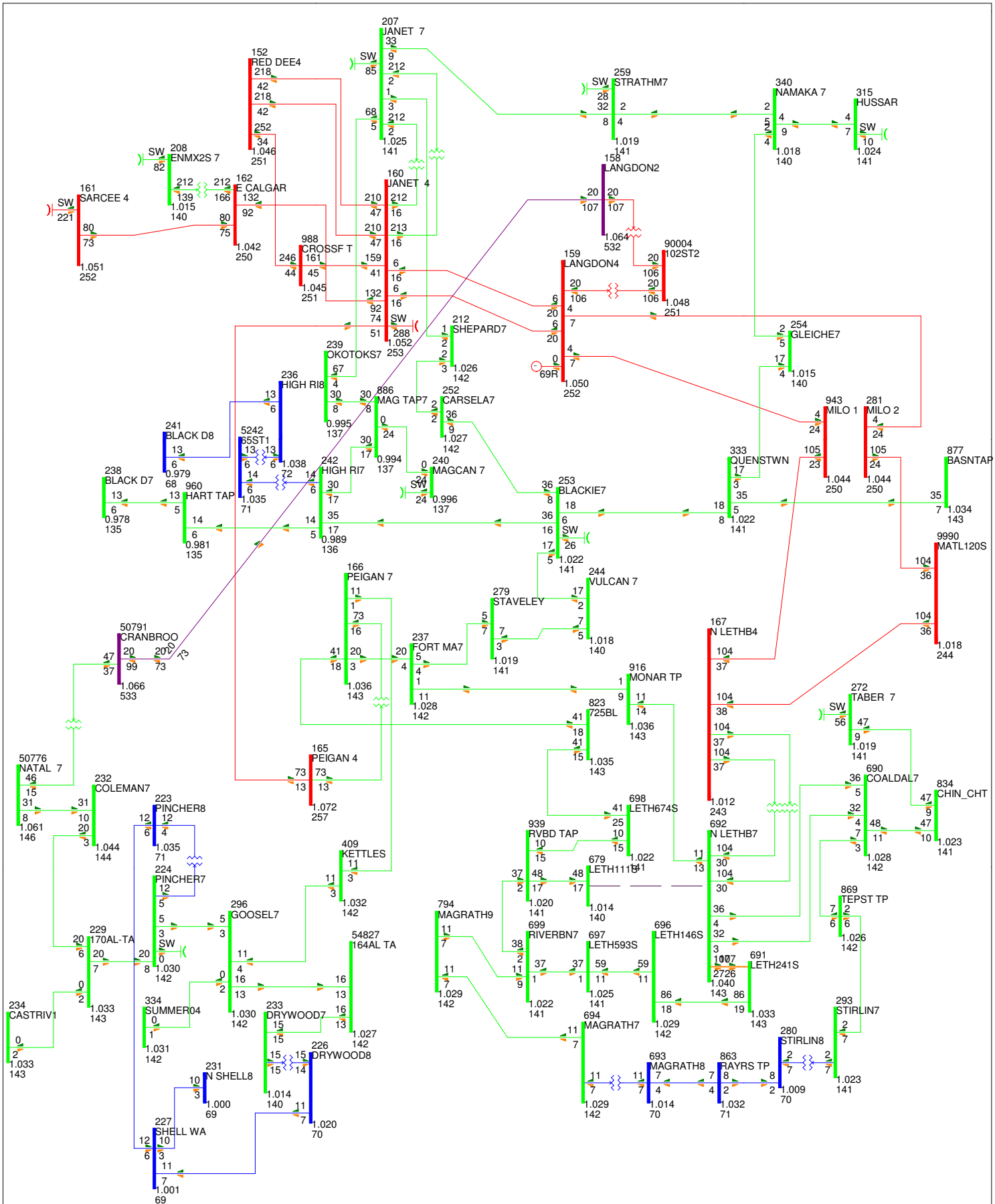
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:13

EXISTING SYSTEM

Fig Existing-SP-17

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -45 MW

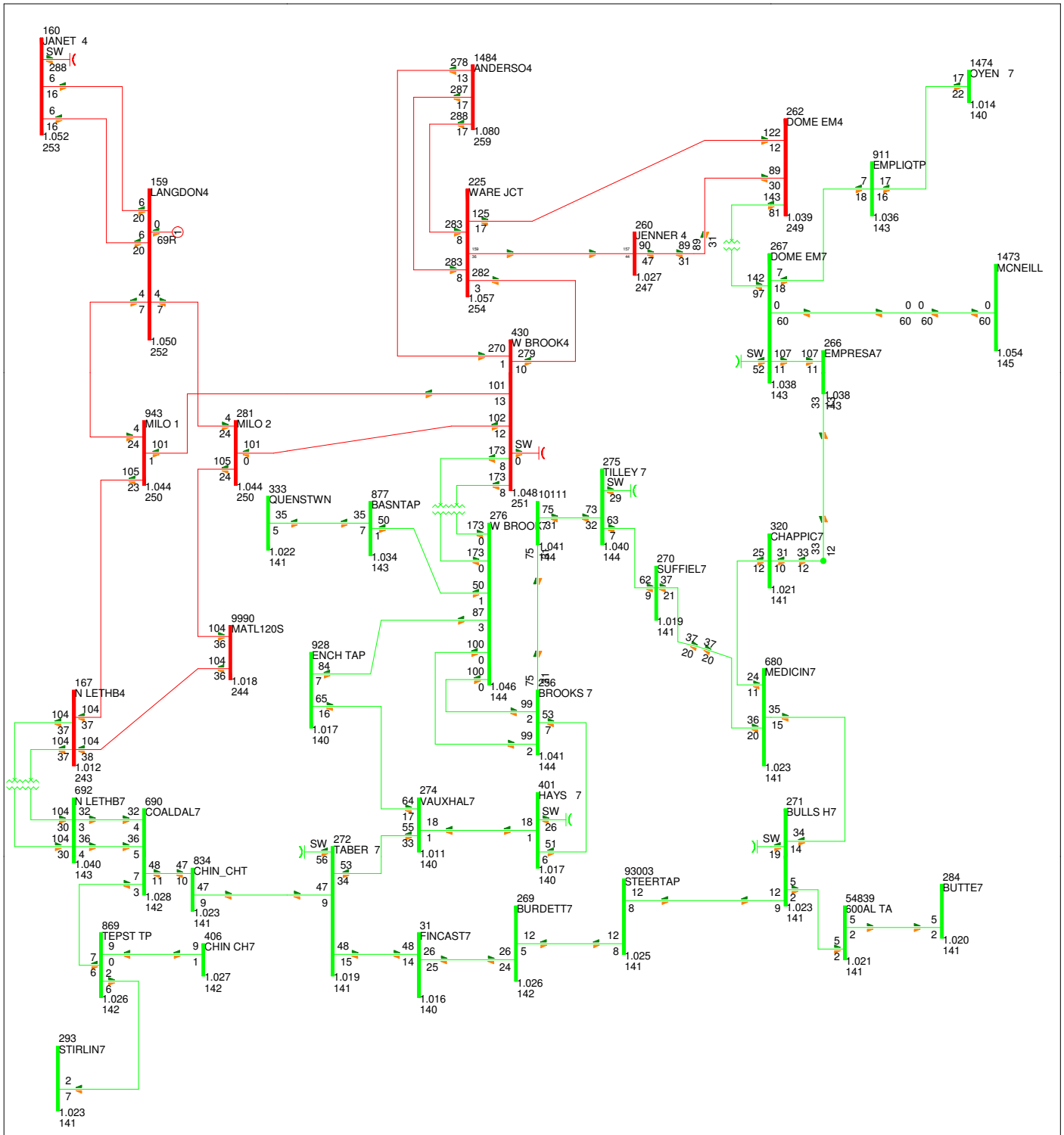


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:14

EXISTING SYSTEM

Fig Existing-SP-18

BC Export: -36 MW



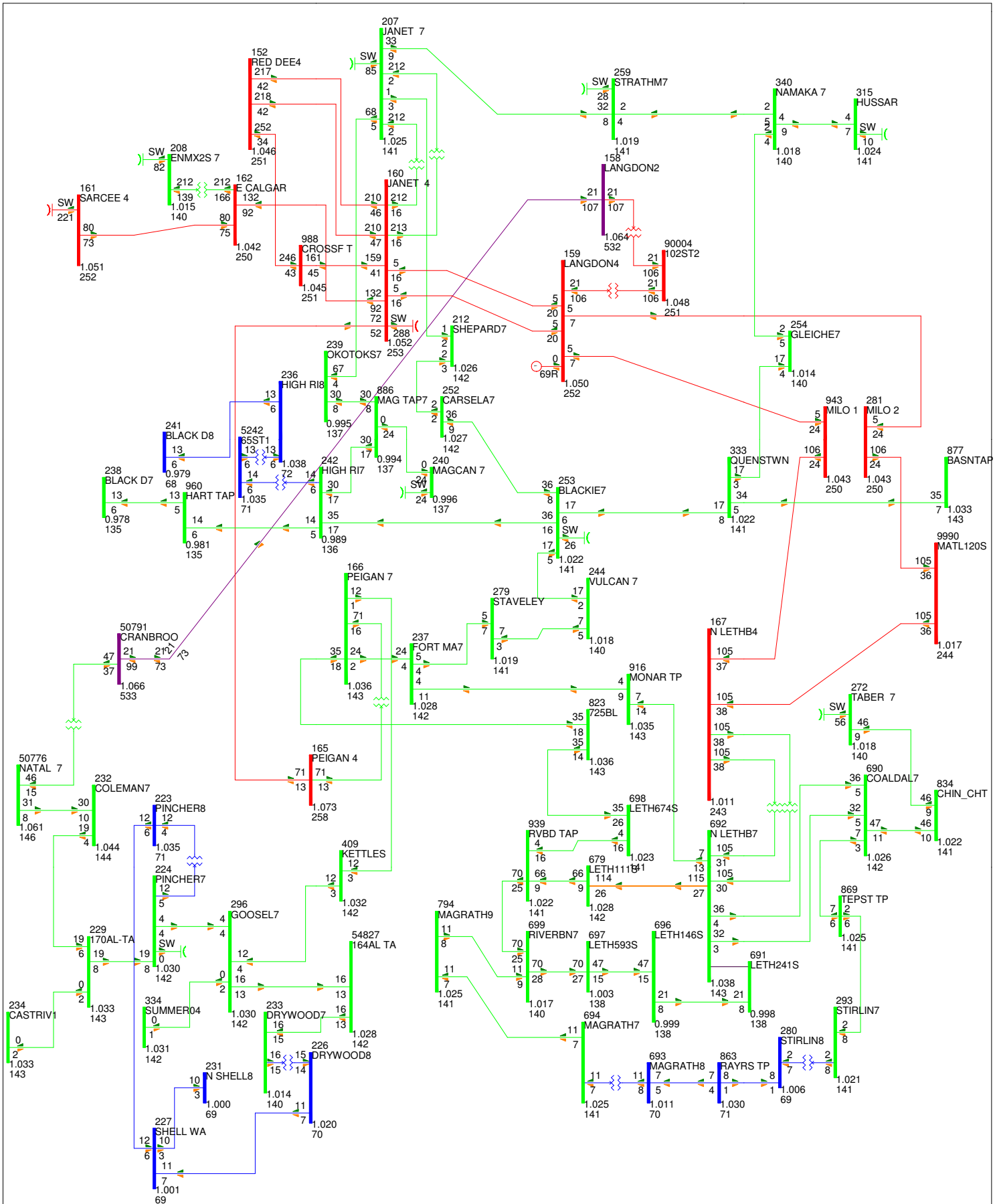
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:14

EXISTING SYSTEM

Fig Existing-SP-19

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -36 MW

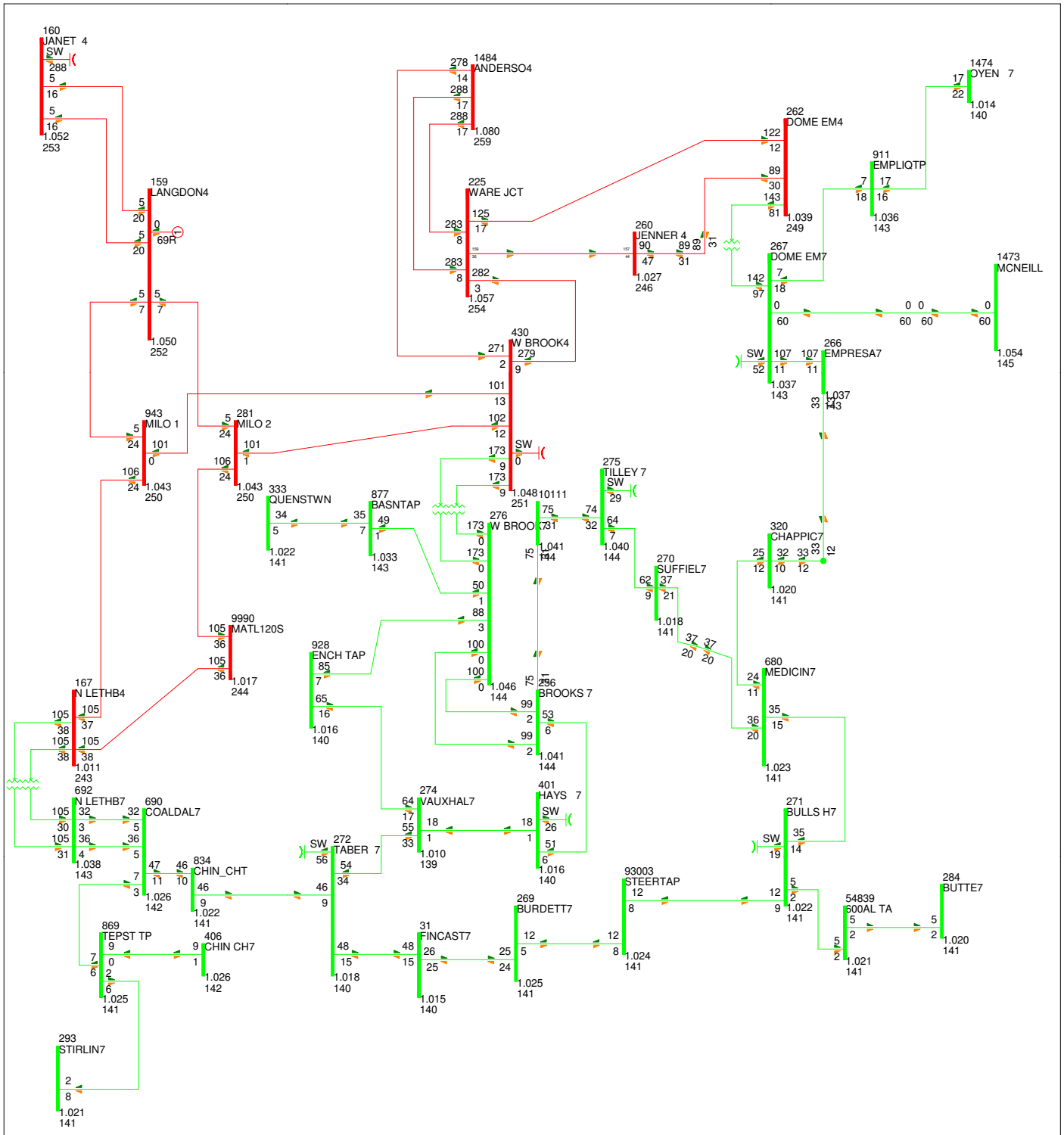


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:15

EXISTING SYSTEM

Fig Existing-SP-20

BC Export: -37 MW



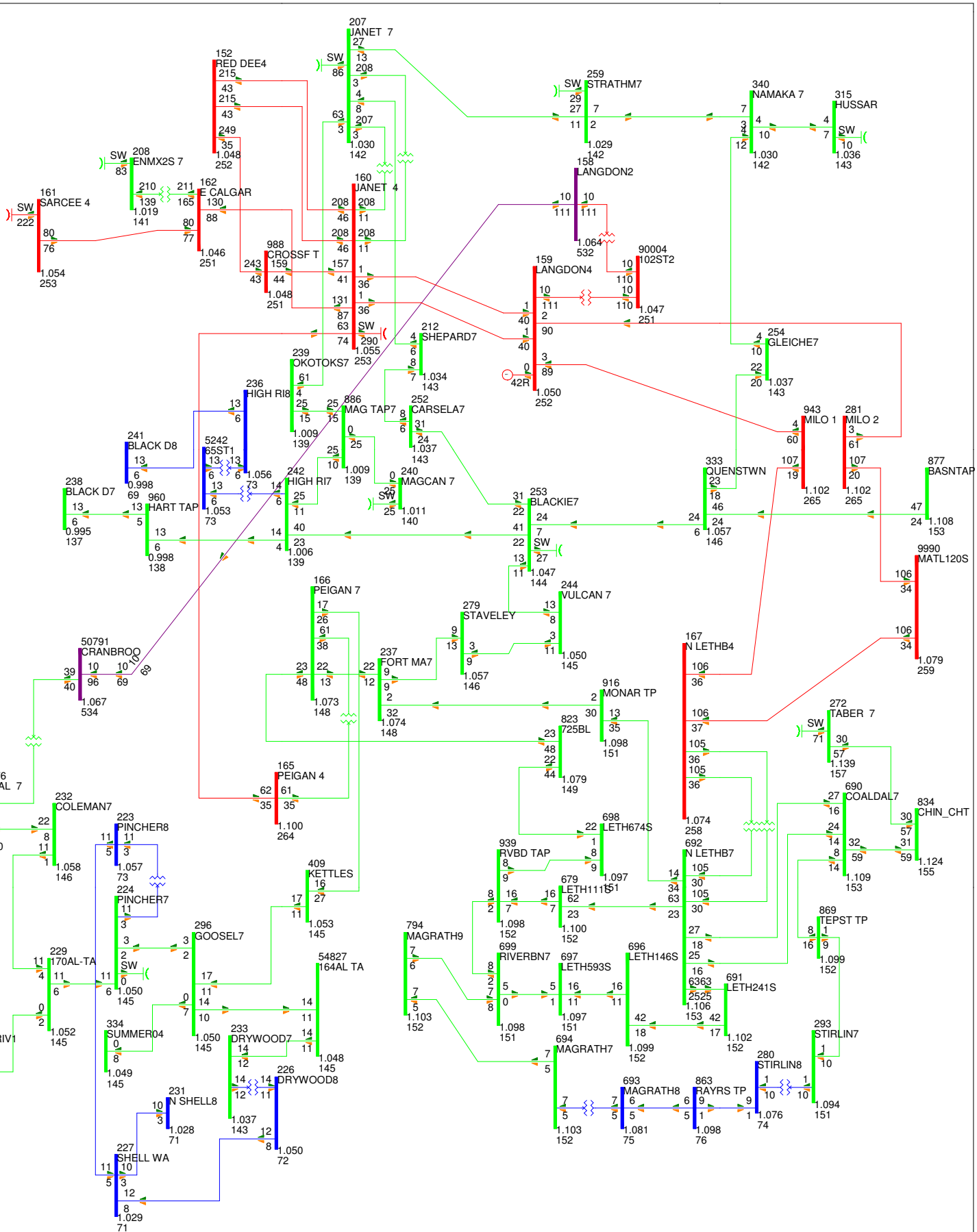
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:15

EXISTING SYSTEM

Fig Existing-SP-21

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -37 MW



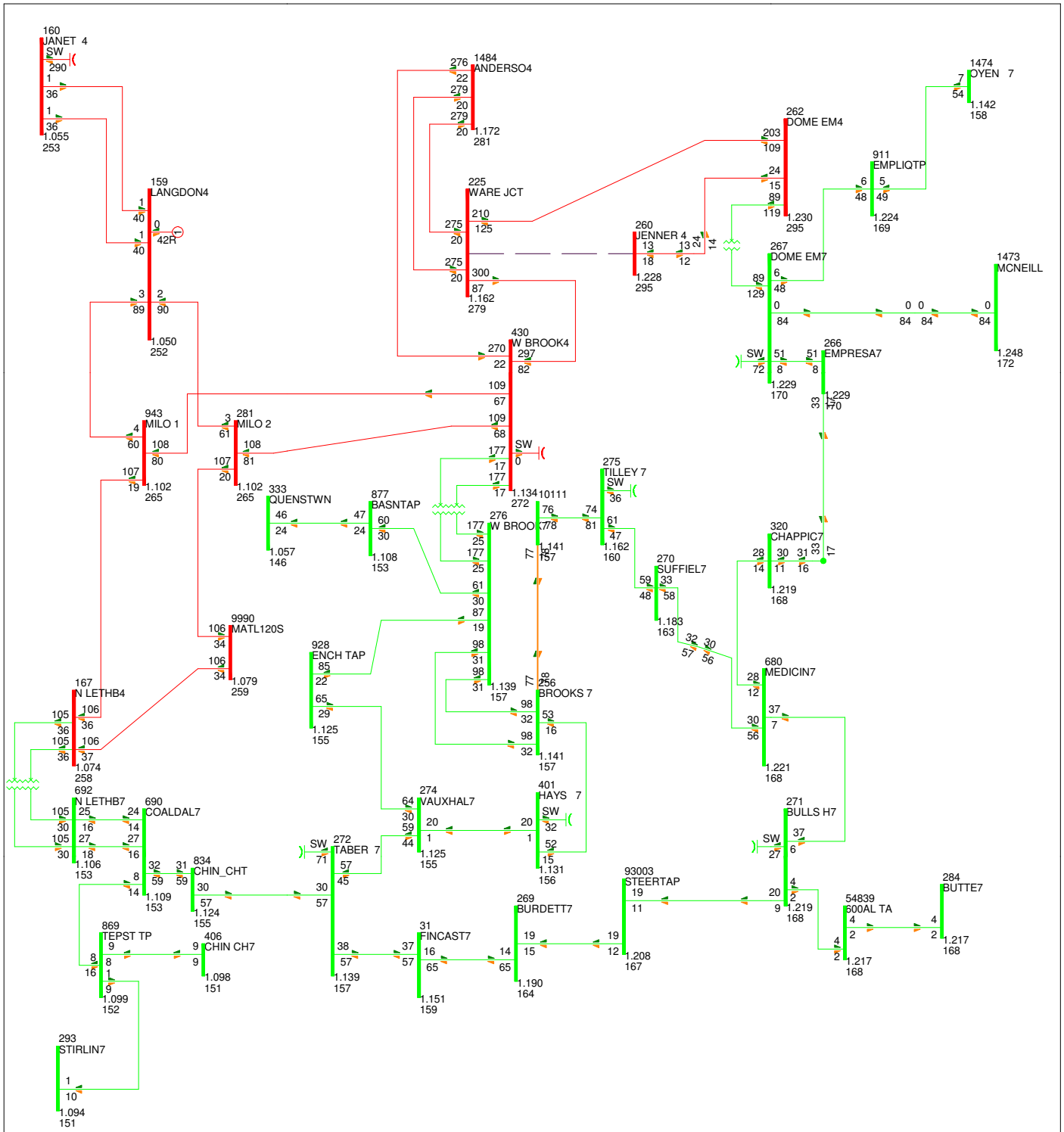
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System THU, NOV 20 2008 17:16

EXISTING SYSTEM

Fig Existing-SP-22

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
100.0%RATEA
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=600.000 >600.000

BC Export: 1 MW



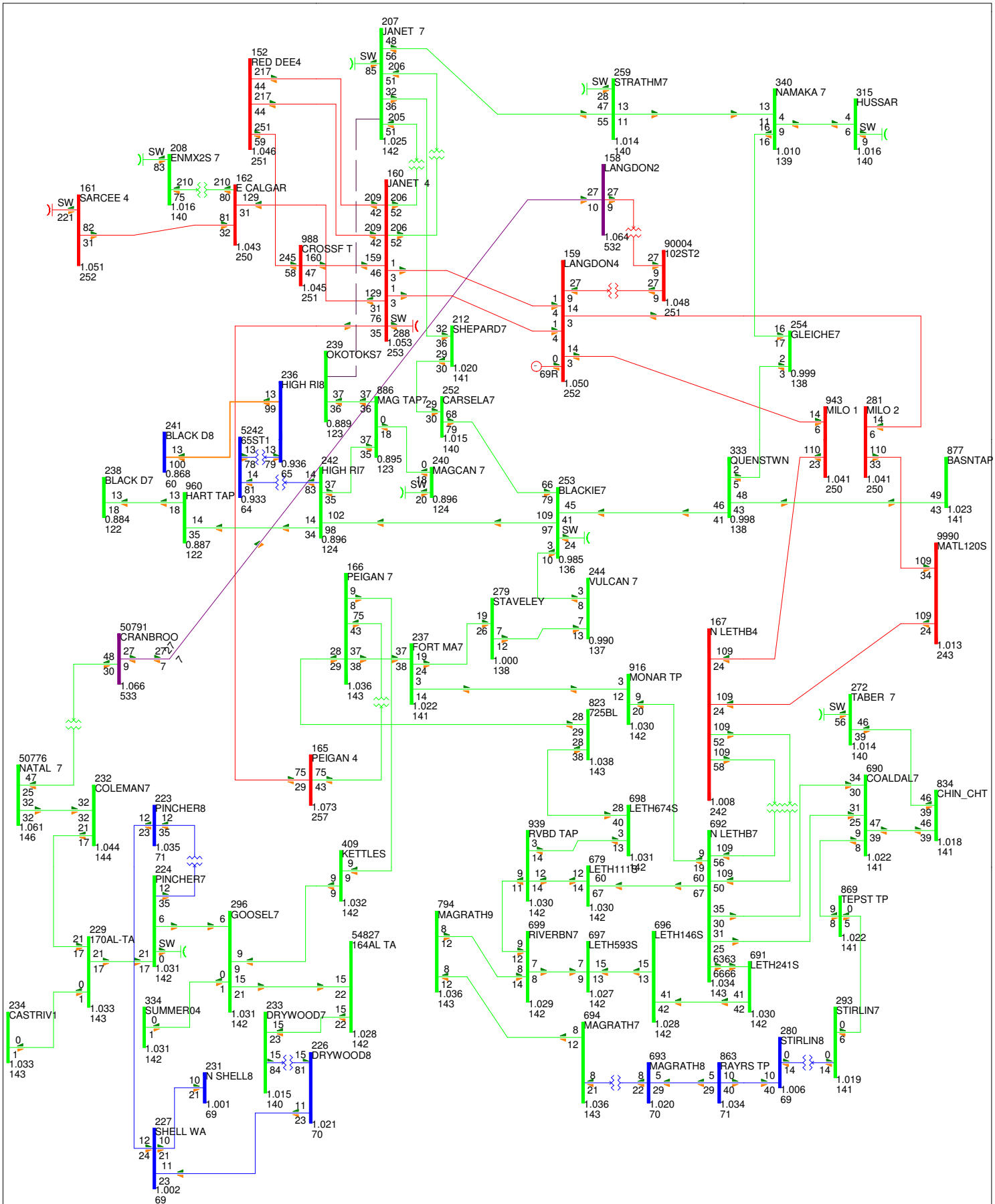
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System THU, NOV 20 2008 17:16

EXISTING SYSTEM

Fig Existing-SP-23

Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: 1 MW

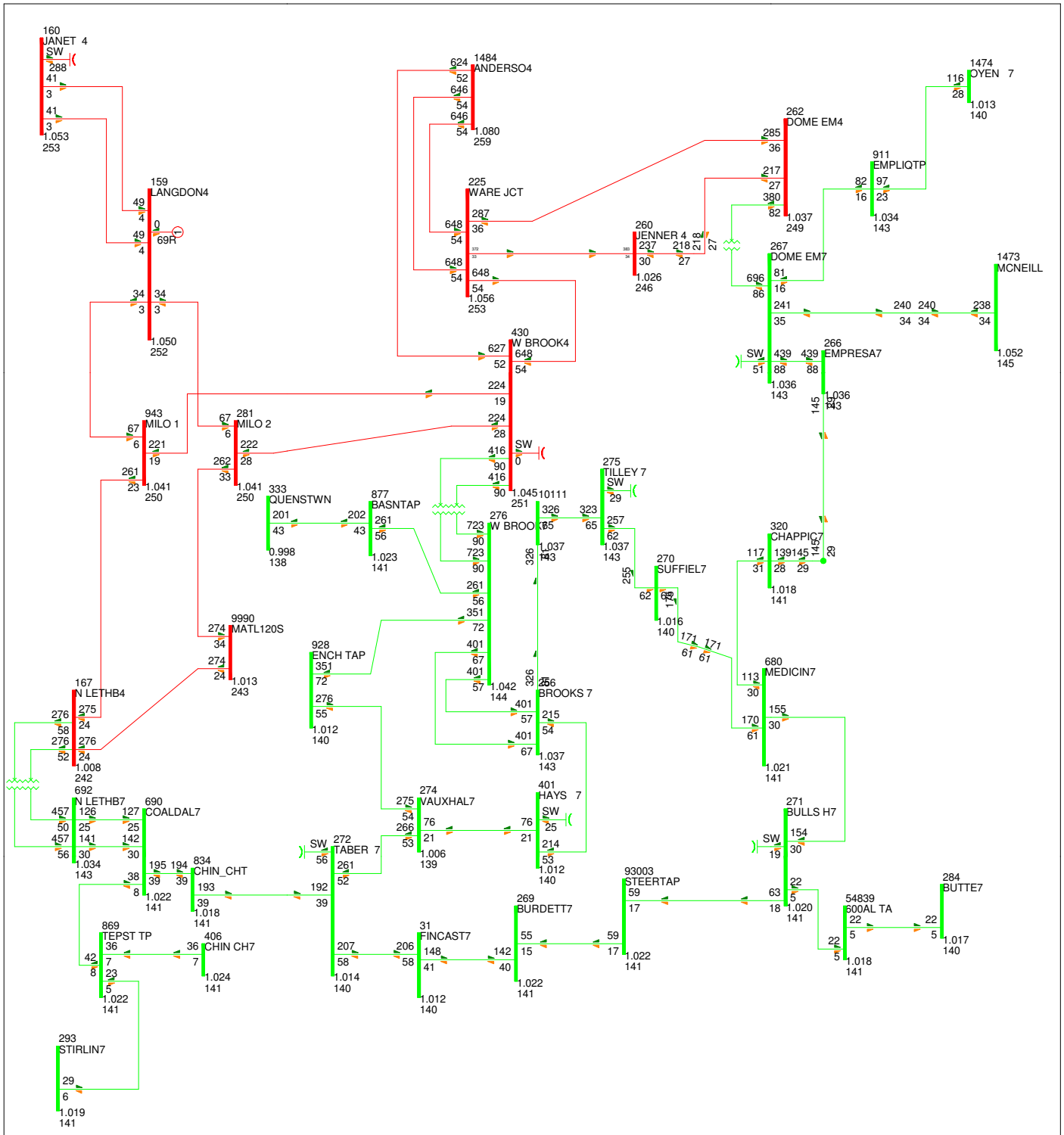


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System FRI, NOV 21 2008 8:30

EXISTING SYSTEM

Fig Existing-SP-24

BC Export: -44 MW



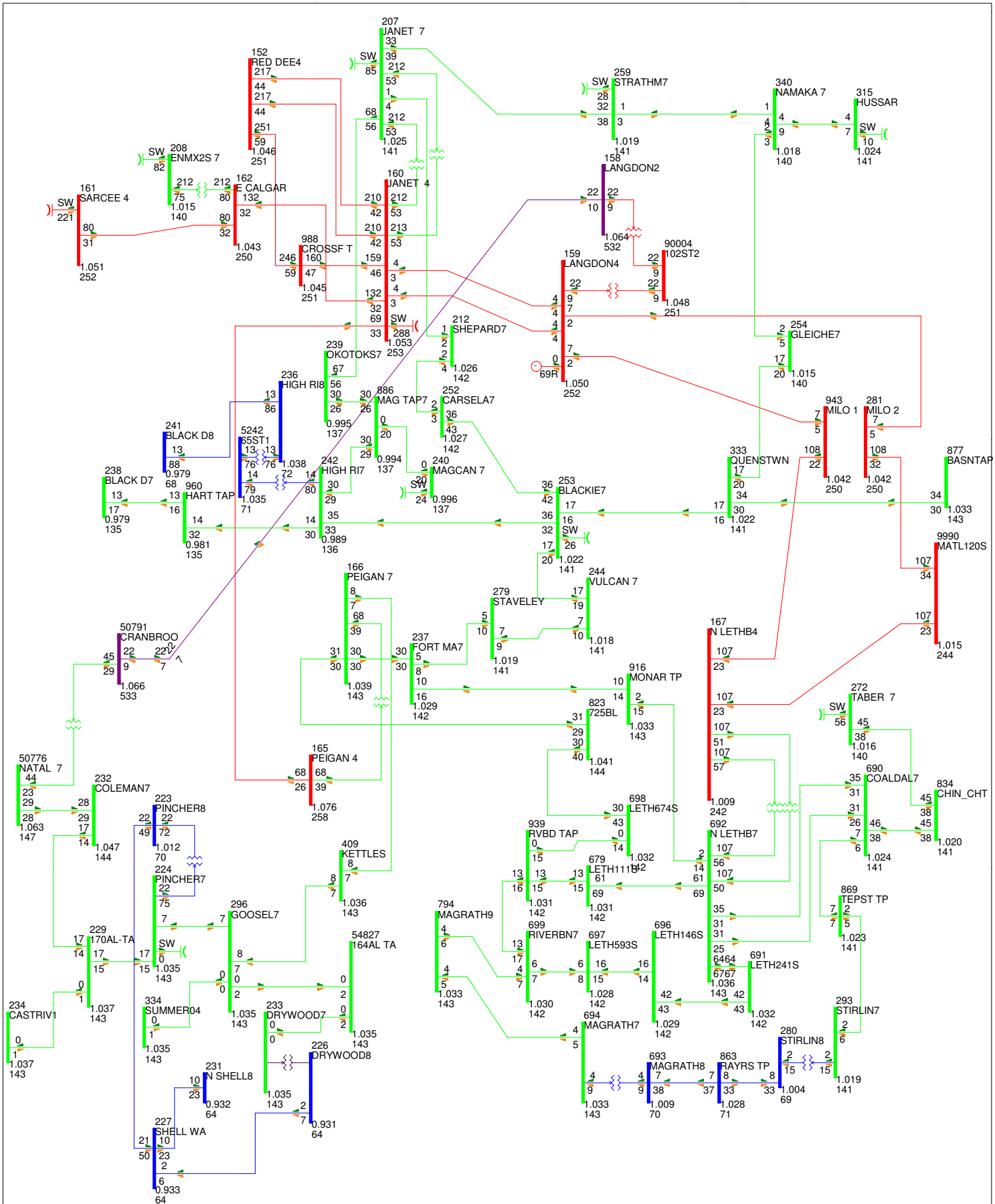
SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System FRI, NOV 21 2008 8:31

EXISTING SYSTEM

Fig Existing-SP-25

Bus - VOLTAGE (KV/PU)
Branch - AMPS% RATE A
Equipment - MW/MVAR
KV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 <=800.000 >800.000

BC Export: -44 MW

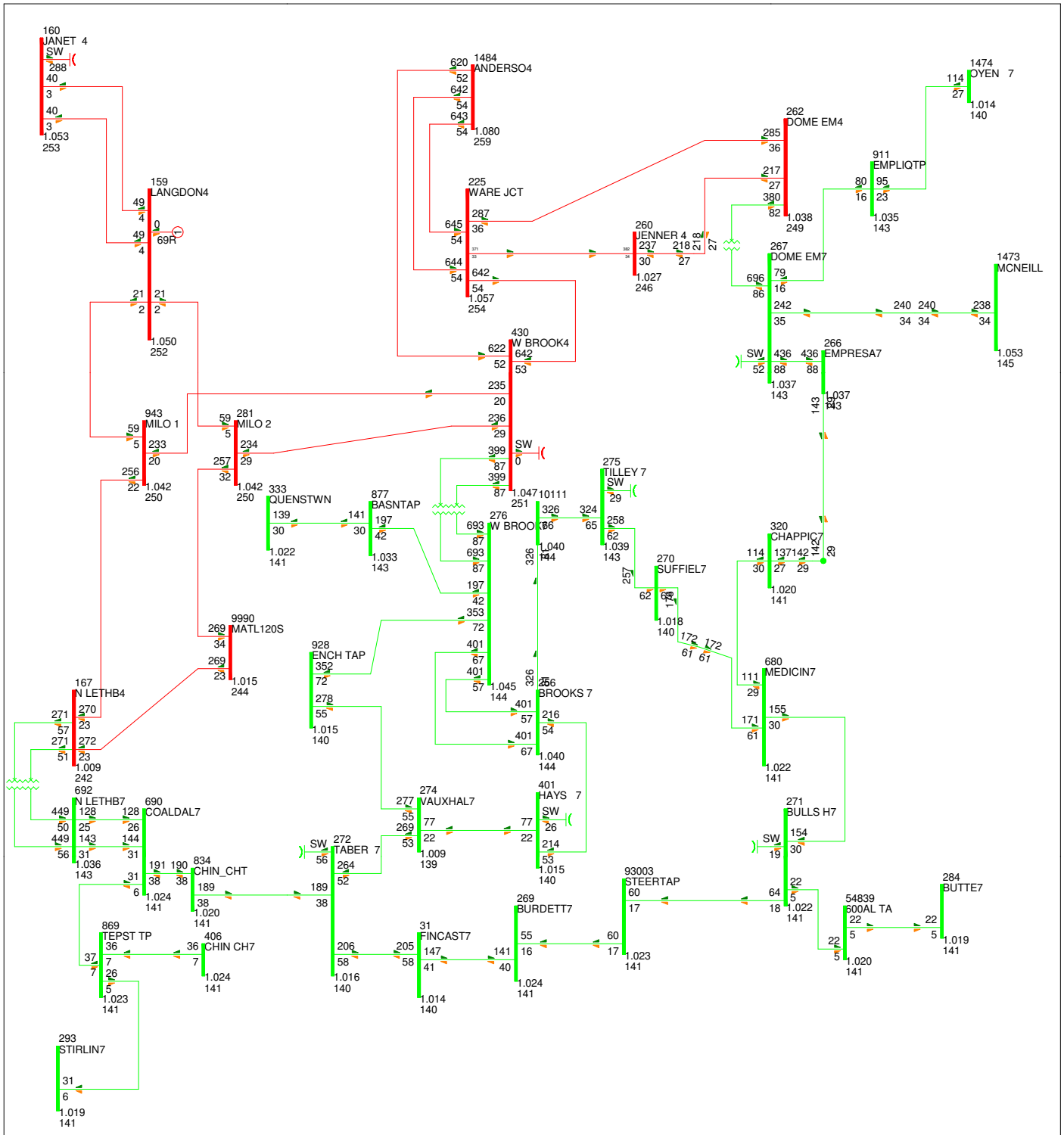


SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South West System FRI, NOV 21 2008 8:32

EXISTING SYSTEM

Fig Existing-SP-26

BC Export: -37 MW



SOUTH PLANNING STUDY
2007 SUMMER PEAK CASE
Existing South East System FRI, NOV 21 2008 8:32

EXISTING SYSTEM

Fig Existing-SP-27

BC Export: -37 MW

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limiting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
1382[BUFALOTP] - 1383[VERMILO7] 138 kV line 50														923		
1382[BUFALOTP] - 1490[JAROW TP] 138 kV line 50														831		
1474[OYEN 7] - 89993[KYSTP3T3] 138 kV line 98														1043		
1474[OYEN 7] - 89994[KYSTP4T4] 138 kV line 60													612	930		
159[LANGDON4] - 160[JANET 4] 240 kV line 36	268	424	439	394	408	413	320	328	376	334	345	333	350	405		351
159[LANGDON4] - 281[MILO 2] 240 kV line 27																
160[JANET 4] - 165[PEIGAN 4] 240 kV line 11	366	426	417	551	552	468	715	1000	491	583				720		555
165[PEIGAN 4] - 166[PEIGAN 7] 240/138 kV transformer T1	11	9	8			17	113									
165[PEIGAN 4] - 346[GOOSEL4] 240 kV line 75		841														
165[PEIGAN 4] - 346[GOOSEL4] 240 kV line 76		841														
166[PEIGAN 7] - 77703[TAP BUS] 138 kV line 70	34	29	25			48	339									
167[N LETHB4] - 692[N LETHB7] 240/138 kV transformer T3				474	441		767	777								505
167[N LETHB4] - 692[N LETHB7] 240/138 kV transformer T5				425	407		766	448								455
167[N LETHB4] - 943[MILO 1] 240 kV line 24			929						775							
167[N LETHB4] - 9990[MATL120S] 240 kV line 1		807	700						270							
171[SEEBE 7] - 329[POCATER7] 138 kV line 77	225	523	580						829							756

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
207[JANET 7] - 212[SHEPARD7] 138 kV line 50		666	668	550	512				860	783				888	129	759
207[JANET 7] - 239[OKOTOKS7] 138 kV line 27															364	
207[JANET 7] - 259[STRATHM7] 138 kV line 65															264	
207[JANET 7] - 577[ENMX23S7] 138 kV line 80															681	
207[JANET 7] - 590[ENMX24S7] 138 kV line 83															786	
212[SHEPARD7] - 252[CARSELA7] 138 kV line 50		743	806	615	571				662					972	141	822
223[PINCHER8] - 227[SHELL WA] 69 kV line 85	18					151										
223[PINCHER8] - 876[514BL TP] 69 kV line 14	0															
224[PINCHER7] - 223[PINCHER8] 138/69 kV transformer T1	7	683	703			48	346	141								
224[PINCHER7] - 229[170AL-TA] 138 kV line 70	201	321	367			435										
224[PINCHER7] - 296[GOOSEL7] 138 kV line 1	59	372	424													
225[WARE JCT] - 260[JENNER 4] 240 kV line 44														872		
225[WARE JCT] - 260[JENNER 4] 240 kV line 51														687		
225[WARE JCT] - 430[W BROOK4] 240 kV line 31														728		
226[DRYWOOD8] - 227[SHELL WA] 69 kV line 85	29					132	409									
226[DRYWOOD8] - 245[GLENWOO8] 69 kV line 46	87	297	365		656	17	49	193								632

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
229[170AL-TA] - 232[COLEMAN7] 138 kV line 70	113	166	194		1000	457	636		655							1000
232[COLEMAN7] - 1501[NATAL 7] 138 kV line 86	81	103	122	752	654	349	614	773	454							1000
233[DRYWOOD7] - 226[DRYWOOD8] 138/69 kV transformer T1	34	893	957			41	240	210								
233[DRYWOOD7] - 54827[164AL TA] 138 kV line 64	73					88	352									
237[FORT MA7] - 279[STAVELEY] 138 kV line 80	358	519	516	152	120	412	312	327	429	424				694	603	352
237[FORT MA7] - 77705[TAP BUS] 138 kV line 72				86	87				982						514	919
237[FORT MA7] - 823[725BL] 138 kV line 25		995	945	12	219	467	248	209	776							651
239[OKOTOKS7] - 886[MAG TAP7] 138 kV line 27															331	
242[HIGH RI7] - 253[BLACKIE7] 138 kV line 53					1000										239	
242[HIGH RI7] - 886[MAG TAP7] 138 kV line 27															330	
244[VULCAN 7] - 253[BLACKIE7] 138 kV line 61		677	621	202	155	454	705	470	586	580					536	492
244[VULCAN 7] - 279[STAVELEY] 138 kV line 80	357	621	617	180	140	481	689	397	521	520				816	567	431
245[GLENWOO8] - 246[SPRING 8] 69 kV line 25	133	263	328		938	19	1	3								1000
246[SPRING 8] - 693[MAGRATH8] 69 kV line 25	135	261	324		953	19	1	5								
252[CARSELA7] - 253[BLACKIE7] 138 kV line 51					933										223	
253[BLACKIE7] - 77715[TAP BUS] 138 kV line 52					459										116	

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
254[GLEICHE7] - 333[QUENSTWN] 138 kV line 76		786	806	693	683				823	721				767	118	724
254[GLEICHE7] - 340[NAMAKA 7] 138 kV line 33															227	
256[BROOKS 7] - 10111[] 138 kV line 1										648	264	272	289			
256[BROOKS 7] - 401[HAYS 7] 138 kV line 95										511						476
259[STRATHM7] - 340[NAMAKA 7] 138 kV line 33															275	
260[JENNER 4] - 677[CYPRESS1] 240 kV line 45														650		
260[JENNER 4] - 77714[TAP BUS] 240 kV line 51														345		
262[DOME EM4] - 267[DOME EM7] 240/138 kV transformer T5													241	377		
262[DOME EM4] - 677[CYPRESS1] 240 kV line 45														650		
262[DOME EM4] - 77714[TAP BUS] 240 kV line 51														343		
266[EMPRESA7] - 267[DOME EM7] 138 kV line 60										827	625	681	144	559		
266[EMPRESA7] - 77713[TAP BUS] 138 kV line 60					992					302	184	117	62	653		558
267[DOME EM7] - 911[EMPLIQTP] 138 kV line 60													563	824		
269[BURDETT7] - 77711[TAP BUS] 138 kV line 72				817	291			395		31	88	112	327			109
270[SUFFIEL7] - 275[TILLEY 7] 138 kV line 00										233	180	160	170			986
270[SUFFIEL7] - 675[REDCLIFF] 138 kV line 00										167	136	122	132			991

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
271[BULLS H7] - 54839[600AL TA] 138 kV line 00												119				
271[BULLS H7] - 680[MEDICIN7] 138 kV line 80										130	108	100	269			583
271[BULLS H7] - 93003[STEERTAP] 138 kV line 72					972			872		51	44	97	255			252
272[TABER 7] - 274[VAUXHAL7] 138 kV line 63				789	758		722	477		160	207	290				147
272[TABER 7] - 834[CHIN_CHT] 138 kV line 72	309		936	404	386	452	509	217	796	194	243	344	746			92
274[VAUXHAL7] - 401[HAYS 7] 138 kV line 21										322	440					295
274[VAUXHAL7] - 928[ENCH TAP] 138 kV line 63										344	450					318
275[TILLEY 7] - 10111[] 138 kV line 00										637	263	270	287			
276[W BROOK7] - 877[BASNTAP] 138 kV line 53		586	592						542	417	397	1000	388	398	273	472
276[W BROOK7] - 928[ENCH TAP] 138 kV line 63										353	465					326
280[STIRLIN8] - 863[RAYRS TP] 69 kV line 25	-195					-47	-27	11								
281[MILO 2] - 9990[MATL120S] 240 kV line 23			995						347							
284[BUTTE7] - 54839[600AL TA] 138 kV line 00												119				
293[STIRLIN7] - 280[STIRLIN8] 138/69 kV transformer T3	236					19	10	33								
293[STIRLIN7] - 869[TEPST TP] 138 kV line 20						430	302	94								
296[GOOSEL7] - 409[KETTLES] 138 kV line 70	1	116	-10			199										

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
296[GOOSEL7] - 54543[OLDMAN1] 138 kV line 24		164														
296[GOOSEL7] - 54827[164AL TA] 138 kV line 64	75					90	355									
31[FINCAST7] - 269[BURDETT7] 138 kV line 12		995	967	-17	-17	431	-15	-11	868	-4	105	133	400			-7
31[FINCAST7] - 272[TABER 7] 138 kV line 10				703	685		689	358		21	43	60	175			209
31[FINCAST7] - 828[PURPLETP] 138 kV line 88										11						
320[CHAPPIC7] - 680[MEDICIN7] 138 kV line 60					211					74	39	27	97	911		116
320[CHAPPIC7] - 77713[TAP BUS] 138 kV line 60					371					133	68	47	93	872		206
329[POCATER7] - 819[BRITT TP] 138 kV line 87	211	412	459		613				636					763		595
333[QUENSTWN] - 77715[TAP BUS] 138 kV line 52					1000										115	
333[QUENSTWN] - 877[BASNTAP] 138 kV line 53		590	605						547	421	401	1000	392	401	270	476
346[GOOSEL4] - 296[GOOSEL7] 240/138 kV transformer T1	377	238	246			510										
389[CHIN-CH8] - 834[CHIN_CHT] 138 kV line 72																87
409[KETTLES] - 77703[TAP BUS] 138 kV line 70	25	24	55			38	264									
430[W BROOK4] - 276[W BROOK7] 240/138 kV transformer T1																845
430[W BROOK4] - 276[W BROOK7] 240/138 kV transformer T2																845
65[BARDO 7] - 68[N HOLDE7] 138 kV line 74														825		

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
670[TAYLOR 8] - 693[MAGRATH8] 69 kV line 25							13									
675[REDCLIFF] - 680[MEDICIN7] 138 kV line 00										168	135	122	132			987
679[LETH111S] - 692[N LETHB7] 138 kV line 07				92	241	260	145	215								
679[LETH111S] - 939[RVBD TAP] 138 kV line 25				65	194	222	106	213								
68[N HOLDE7] - 76[IPPL ST7] 138 kV line 01														693		
690[COALDAL7] - 692[N LETHB7] 138 kV line 70								252		366	475					241
690[COALDAL7] - 692[N LETHB7] 138 kV line 72								227		329	423	1000				194
690[COALDAL7] - 834[CHIN_CHT] 138 kV line 72				569	546	484	658	268	961	168	214	306	715			93
690[COALDAL7] - 869[TEPST TP] 138 kV line 20						400	274	87								
691[LETH241S] - 692[N LETHB7] 138 kV line 34				258	699		157	224								
691[LETH241S] - 696[LETH146S] 138 kV line 13				235	640	538	146	201								
692[N LETHB7] - 916[MONAR TP] 138 kV line 72		616	590	112	92			348	526						677	322
693[MAGRATH8] - 863[RAYRS TP] 69 kV line 25	-178					-36	-20	2		444						687
694[MAGRATH7] - 693[MAGRATH8] 138/69 kV transformer T1	127					38	16	21								
694[MAGRATH7] - 794[MAGRATH9] 138 kV line 63	126					203	71	185								
696[LETH146S] - 697[LETH593S] 138 kV line 23				240	652	460	151	203								

Table B-2

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Light Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
697[LETH593S] - 699[RIVERBN7] 138 kV line 24				206	558	399	131	193								
698[LETH674S] - 823[725BL] 138 kV line 25				13	102										631	
698[LETH674S] - 939[RVBD TAP] 138 kV line 25				35	141										904	
699[RIVERBN7] - 794[MAGRATH9] 138 kV line 63	129					88	33	52								
699[RIVERBN7] - 939[RVBD TAP] 138 kV line 25				214	550	218	75	195								
76[IPPL ST7] - 1491[BAT. RV7] 138 kV line 01														672		
77711[TAP BUS] - 93003[STEERTAP] 138 kV line 72					953		677	852		50	44	98	257			250
816[LINE TP] - 1501[NATAL 7] 138 kV line 87	230	628	693													
816[LINE TP] - 817[ELKFRD T] 138 kV line 87	218	659														
823[725BL] - 901[MCBRIDE1] 138 kV line B1				105												
911[EMPLIQTP] - 89994[KYSTP4T4] 138 kV line 60												1000	518	723		
916[MONAR TP] - 77705[TAP BUS] 138 kV line 72		668	643	105	86				584						626	423

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
1382[BUFALOTP] - 1383[VERMILO7] 138 kV line 50														NC		
1382[BUFALOTP] - 1490[JAROW TP] 138 kV line 50		NC	NC		NC				NC					NC		NC
1471[MONITOR7] - 89993[KYSTP3T3] 138 kV line 98													1451	1018		
1474[OYEN 7] - 89993[KYSTP3T3] 138 kV line 98													699	900		
1474[OYEN 7] - 89994[KYSTP4T4] 138 kV line 60													636	788		
159[LANGDON4] - 160[JANET 4] 240 kV line 36		803	824		785				787					809		697
159[LANGDON4] - 160[JANET 4] 240 kV line 37		803	824		785				787					809		697
159[LANGDON4] - 281[MILO 2] 240 kV line 27									923							
160[JANET 4] - 162[E CALGAR] 240 kV line 17	377	762	762	856	839	531	754	790	784	830	857			929		800
160[JANET 4] - 165[PEIGAN 4] 240 kV line 11	301	664	635			492	701		808							
165[PEIGAN 4] - 166[PEIGAN 7] 240/138 kV transformer T1	37	31	26			54	429									
165[PEIGAN 4] - 346[GOOSEL4] 240 kV line 75		847														
165[PEIGAN 4] - 346[GOOSEL4] 240 kV line 76		847														
166[PEIGAN 7] - 77703[TAP BUS] 138 kV line 70	62	49	43			88	705									
167[N LETHB4] - 692[N LETHB7] 240/138 kV transformer T3				520	470		727	747								467
167[N LETHB4] - 692[N LETHB7] 240/138 kV transformer T5				489	444		739	677								443

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
167[N LETHB4] - 943[MILO 1] 240 kV line 24									903							
167[N LETHB4] - 9990[MATL120S] 240 kV line 1		794	698						299							
171[SEEBE 7] - 329[POCATER7] 138 kV line 77	213	439	504													
207[JANET 7] - 212[SHEPARD7] 138 kV line 50				359	331			980	790	786				825	89	680
207[JANET 7] - 239[OKOTOKS7] 138 kV line 27															378	
207[JANET 7] - 259[STRATHM7] 138 kV line 65														771	85	
207[JANET 7] - 577[ENMX23S7] 138 kV line 80	-194	-527	-524	-331	-325	-128	-364	-351	-420	-398	-388	-374	-428	-493	-138	-407
207[JANET 7] - 590[ENMX24S7] 138 kV line 83	-193	-637	-633	-950	-1058	-123	-375	-400	-544	-475	-483	-406	-490	-619	-490	-474
208[ENMX2S 7] - 577[ENMX23S7] 138 kV line 80		925	905	675	655				840	867				923	263	837
212[SHEPARD7] - 252[CARSELA7] 138 kV line 50				405	379			1000	882	966				932	99	771
223[PINCHER8] - 227[SHELL WA] 69 kV line 85	18					158										
223[PINCHER8] - 876[514BL TP] 69 kV line 14	2															
224[PINCHER7] - 223[PINCHER8] 138/69 kV transformer T1	10	808	828			66	311	194								
224[PINCHER7] - 229[170AL-TA] 138 kV line 70	206	313	358			398										
224[PINCHER7] - 296[GOOSEL7] 138 kV line 1	58	346	395			301										
225[WARE JCT] - 260[JENNER 4] 240 kV line 44														978		

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
225[WARE JCT] - 260[JENNER 4] 240 kV line 51														792		
225[WARE JCT] - 430[W BROOK4] 240 kV line 31														288		
226[DRYWOOD8] - 227[SHELL WA] 69 kV line 85	32					131	303									
226[DRYWOOD8] - 245[GLENWOO8] 69 kV line 46	82	301	370			19	61	90								615
229[170AL-TA] - 232[COLEMAN7] 138 kV line 70	117	160	187		1000	267	605	759	611							991
232[COLEMAN7] - 1501[NATAL 7] 138 kV line 86	87	107	126	682	620	250	609	763	444	1000						1000
233[DRYWOOD7] - 226[DRYWOOD8] 138/69 kV transformer T1	38	790	846			41	269	235								
233[DRYWOOD7] - 54827[164AL TA] 138 kV line 64	1					97	347									
237[FORT MA7] - 279[STAVELEY] 138 kV line 80	345	666	629	166	132	209	620	566	590	817					623	515
237[FORT MA7] - 77705[TAP BUS] 138 kV line 72				85	87			1000	994						499	962
237[FORT MA7] - 823[725BL] 138 kV line 25		989	936	13	218	226	284	224	759							631
239[OKOTOKS7] - 886[MAG TAP7] 138 kV line 27															330	
242[HIGH RI7] - 253[BLACKIE7] 138 kV line 53				780	713										168	
242[HIGH RI7] - 886[MAG TAP7] 138 kV line 27															291	
244[VULCAN 7] - 253[BLACKIE7] 138 kV line 61		948	894	226	174	480	695	811	803						534	809
244[VULCAN 7] - 279[STAVELEY] 138 kV line 80		828	782	200	156	516	708	842	711						576	669

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
245[GLENWOO8] - 246[SPRING 8] 69 kV line 25	116	273	339		947	21	1	4								922
246[SPRING 8] - 693[MAGRATH8] 69 kV line 25	122	274	340		963	20	1	5								
252[CARSELA7] - 253[BLACKIE7] 138 kV line 51				788	720										170	
253[BLACKIE7] - 77715[TAP BUS] 138 kV line 52														762	55	1000
254[GLEICHE7] - 333[QUENSTWN] 138 kV line 76															151	
254[GLEICHE7] - 340[NAMAKA 7] 138 kV line 33															267	
256[BROOKS 7] - 10111[] 138 kV line 1										632	345	290	315			
256[BROOKS 7] - 401[HAYS 7] 138 kV line 95										569						528
259[STRATHM7] - 340[NAMAKA 7] 138 kV line 33					968									734	82	
260[JENNER 4] - 677[CYPRESS1] 240 kV line 45														723		
260[JENNER 4] - 77714[TAP BUS] 240 kV line 51														346		
262[DOME EM4] - 267[DOME EM7] 240/138 kV transformer T5													287	NC		
262[DOME EM4] - 677[CYPRESS1] 240 kV line 45														723		
266[EMPRESA7] - 267[DOME EM7] 138 kV line 60										877	690	705	153	351		
266[EMPRESA7] - 77713[TAP BUS] 138 kV line 60							-38	-31		-16	-10	-7	-4	526		-24
267[DOME EM7] - 911[EMPLIQTP] 138 kV line 60												1000	NC	744		

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
269[BURDETT7] - 77711[TAP BUS] 138 kV line 72					575			1000		54	86	116	265			202
270[SUFFIEL7] - 275[TILLEY 7] 138 kV line 00										231	182	166	179			1022
270[SUFFIEL7] - 675[REDCLIFF] 138 kV line 00										146	121	112	125			
271[BULLS H7] - 54839[600AL TA] 138 kV line 00												117				
271[BULLS H7] - 680[MEDICIN7] 138 kV line 80										162	134	125	211			771
271[BULLS H7] - 93003[STEERTAP] 138 kV line 72								1000		68	60	103	217			311
272[TABER 7] - 274[VAUXHAL7] 138 kV line 63							664	900		191	251	531				176
272[TABER 7] - 834[CHIN_CHT] 138 kV line 72				433	418	233	655	235	869	210	254	382	739			92
274[VAUXHAL7] - 401[HAYS 7] 138 kV line 21										359						331
274[VAUXHAL7] - 928[ENCH TAP] 138 kV line 63										387						360
275[TILLEY 7] - 10111[] 138 kV line 00										612	342	288	313			
276[W BROOK7] - 877[BASNTAP] 138 kV line 53												1000	847	559	248	
276[W BROOK7] - 928[ENCH TAP] 138 kV line 63										404						375
280[STIRLIN8] - 863[RAYRS TP] 69 kV line 25	-190					-48	-28	13								
281[MILO 2] - 9990[MATL120S] 240 kV line 23									348							
284[BUTTE7] - 54839[600AL TA] 138 kV line 00												117				

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
293[STIRLIN7] - 280[STIRLIN8] 138/69 kV transformer T3	119					13	7	35								
293[STIRLIN7] - 869[TEPST TP] 138 kV line 20						416	318	100								
296[GOOSEL7] - 409[KETTLES] 138 kV line 70	1	127	-11			212										
296[GOOSEL7] - 54543[OLDMAN1] 138 kV line 24		163														
296[GOOSEL7] - 54827[164AL TA] 138 kV line 64	1					100	351									
31[FINCAST7] - 269[BURDETT7] 138 kV line 12				-243	-242	-118	-194	-139		-49	118	156	389			-91
31[FINCAST7] - 272[TABER 7] 138 kV line 10				717	698		729	363		27	59	85	177			212
31[FINCAST7] - 828[PURPLETP] 138 kV line 88										10						
320[CHAPPIC7] - 680[MEDICIN7] 138 kV line 60							-374	-398		-375	-259	-209	99	808		-544
320[CHAPPIC7] - 77713[TAP BUS] 138 kV line 60							-362	-397		-275	-181	-169	93	754		-418
329[POCATER7] - 819[BRITT TP] 138 kV line 87	151	302	341		481	162			764							397
333[QUENSTWN] - 77715[TAP BUS] 138 kV line 52										530			408	354	116	736
333[QUENSTWN] - 877[BASNTAP] 138 kV line 53												1000	861	566	246	
346[GOOSEL4] - 296[GOOSEL7] 240/138 kV transformer T1	374	263	272			238										
389[CHIN-CH8] - 834[CHIN_CHT] 138 kV line 72																85
409[KETTLES] - 77703[TAP BUS] 138 kV line 70	40	36	53			61	504									

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
430[W BROOK4] - 1484[ANDERSO4] 240 kV line 33														427		
430[W BROOK4] - 276[W BROOK7] 240/138 kV transformer T1														-334		861
430[W BROOK4] - 276[W BROOK7] 240/138 kV transformer T2														-334		861
550[ENMX22S7] - 572[ENMX39S7] 138 kV line 81		576	569	536	532				551	568				632	304	559
567[ENMX1S 7] - 568[ENMX5S 7] 138 kV line 82				-1054	-974			-400	-1238	-388					-884	-383
567[ENMX1S 7] - 568[ENMX5S 7] 138 kV line 84				-1054	-974			-400	-1238	-388					-884	-383
579[ENMX31S7] - 585[ENMX9S 7] 138 kV line 80															920	
579[ENMX31S7] - 590[ENMX24S7] 138 kV line 81															630	
583[ENMX32S7] - 589[ENMX26S7] 138 kV line 81															903	
589[ENMX26S7] - 590[ENMX24S7] 138 kV line 82															356	
65[BARDO 7] - 68[N HOLDE7] 138 kV line 74														726		
670[TAYLOR 8] - 693[MAGRATH8] 69 kV line 25							14									
675[REDCLIFF] - 680[MEDICIN7] 138 kV line 00										145	121	112	125			
679[LETH111S] - 692[N LETHB7] 138 kV line 07				122	295	264	192	232								
679[LETH111S] - 939[RVBD TAP] 138 kV line 25				81	222	199	129	200								
68[N HOLDE7] - 76[IPPL ST7] 138 kV line 01													822	593		

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
690[COALDAL7] - 692[N LETHB7] 138 kV line 70								259		377	494					252
690[COALDAL7] - 692[N LETHB7] 138 kV line 72					970			235		344	448	1074				204
690[COALDAL7] - 834[CHIN_CHT] 138 kV line 72				582	573	457	690	280		182	229	325	674			93
690[COALDAL7] - 869[TEPST TP] 138 kV line 20						431	291	92								
691[LETH241S] - 692[N LETHB7] 138 kV line 34				320	782	514	185	232								
691[LETH241S] - 696[LETH146S] 138 kV line 13				289	727	266	169	234								
692[N LETHB7] - 916[MONAR TP] 138 kV line 72		667	656	117	96			311	576	451					717	315
693[MAGRATH8] - 863[RAYRS TP] 69 kV line 25	-191					-43	-24	6		337						253
694[MAGRATH7] - 693[MAGRATH8] 138/69 kV transformer T1	132					47	19	25								
694[MAGRATH7] - 794[MAGRATH9] 138 kV line 63	128					207	76	183								
696[LETH146S] - 697[LETH593S] 138 kV line 23				276	722	266	165	222								
697[LETH593S] - 699[RIVERBN7] 138 kV line 24				228	615	220	137	198								
698[LETH674S] - 823[725BL] 138 kV line 25				12	103										640	
698[LETH674S] - 939[RVBD TAP] 138 kV line 25				45	155											
699[RIVERBN7] - 794[MAGRATH9] 138 kV line 63	133					106	38	65								
699[RIVERBN7] - 939[RVBD TAP] 138 kV line 25				227	572	231	80	208								

Table B-3

TRANSFER OUT ANALYSIS RESULTS
2010 Summer Peak Model

Limting Element	CP #1	CP #2	CP #3	CP #4	CP #5	CP #6	CP #7	CP #8	CP #9	CP #10	CP #11	CP #12	CP #13	CP #14	CP #15	CP #16
74[METIS647] - 814[KILRY TP] 138 kV line 49														881		
76[IPPL ST7] - 1491[BAT. RV7] 138 kV line 01									960	966			779	569		989
77711[TAP BUS] - 93003[STEERTAP] 138 kV line 72								1000		67	60	104	220			308
816[LINE TP] - 1501[NATAL 7] 138 kV line 87	212	573	628													
816[LINE TP] - 817[ELKFRD T] 138 kV line 87	217	604	666													
817[ELKFRD T] - 818[GR HL TP] 138 kV line 87		636	702													
818[GR HL TP] - 819[BRITT TP] 138 kV line 87		666														
823[725BL] - 901[MCBRIDE1] 138 kV line B1				105												
911[EMPLIQTP] - 89994[KYSTP4T4] 138 kV line 60												1000	NC	676		
916[MONAR TP] - 77705[TAP BUS] 138 kV line 72		749	723	107	89			342	672						643	392

In the result tables, there are positive and negative values as well as the notation "NC". The positive values indicate that the limiting element shown became an overloaded system constraint at that level of MW transfer from the respective collection point (CP) substation. For example, in Table B-2, the positive value of 37 shown in the CP #1 column indicates that the Peigan 240/138 kV transformer T1 becomes overloaded when 37 MW of generation is injected at the collection substation CP #1.

A negative value in the transfer out analysis results indicates that the limiting element shown is already overloaded under single contingency conditions and has zero incremental transfer capability. This means that zero wind generation can be injected at that collection substation without overloading the limiting element during a single contingency condition.

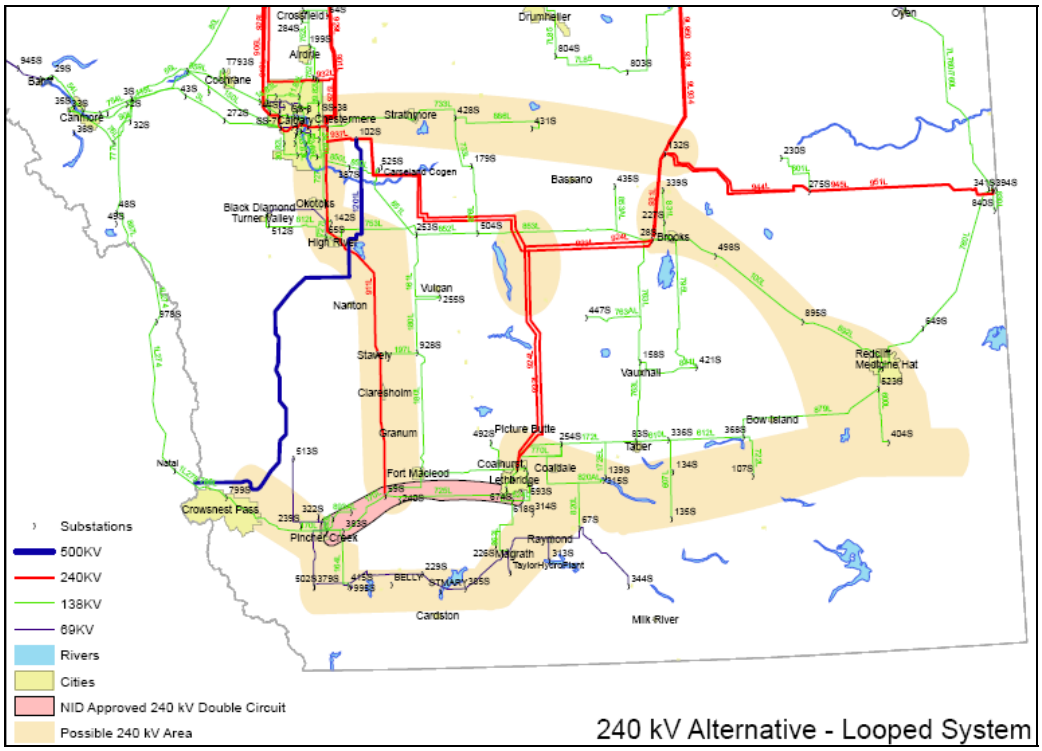
The notation "NC" in the results indicates that the worst case single contingency did not converge for the identified limiting element. There is a high likelihood that a transfer limitation exists for the identified limiting element, but the transfer MW value is not known from this result. However, if the same limiting element consistently has reported values for other collection point substation columns, then the transfer MW value can be inferred from the results from similar collection point substations. A blank cell in the table indicates that the facility does not overload for a transfer up to 1000 MW from the specific collection substation.

Some important factors about the transfer out can be observed. As shown by the rows in the result tables with some blank cells and some non-blank cells, a transmission line or transformer which is a limiting element for one collection substation is not necessarily a limiting element for all collection substations. For example, the Peigan 240/138 kV transformer T1, shown in Table B-2, is a transfer limiting element for collection substations 1, 2, 3, 6, and 7, while not a limiting element for the remaining collection substations. This clearly illustrates that the southern transmission system responds differently depending upon the generation interconnection location.

Also shown by the results are that some limiting elements are persistent across all or most collection substations. For example, the Peigan to Janet 240 kV line is a limiting element in the summer light transfer out results for all but four of the collection substation locations. Therefore, some lines and transformers are consistently overloading regardless of the generation interconnection location.

APPENDIX C TRANSMISSION ALTERNATIVES

ALTERNATIVE 1A:



Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation
- Sub D (south of Bow Island) substation
- Sub D – Medicine Hat 2 – West Brooks 240 kV double circuit transmission line
- Milo Junction Switching Station
- Phase Shifting Transformer on 170L Coleman to Natal
- Peigan SVC = 0 - -200MVAR and Sub D SVC = 0 - -100 MVAR

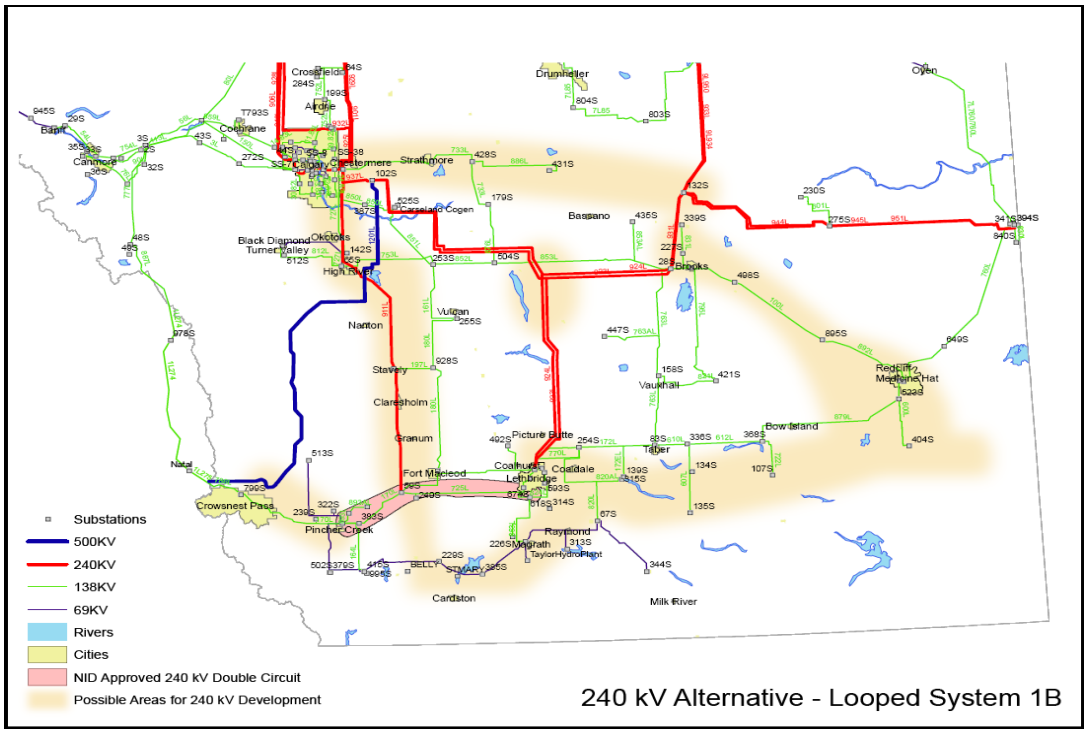
Stage II:

- Medicine Hat 2 substation; Medicine Hat 138 kV changes/upgrades (reflected in analysis as potentially being advanced in parallel with Stage I development)
- New Crowsnest 500/240 kV substation 2 x 1200 MVA
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Goose Lake – Sub C 240 kV double circuit line with one side strung
- Sub C (south of Taber) substation
- Sub C – Montana Alberta Tie Ltd. (MATL) 240 kV double circuit line with one side strung
- Sub C – Sub D 240 kV double circuit transmission line
- Salvage line 911L
- Peigan 179 MVA transformer replaced by 2 x 200 MVA transformers
- Blackie Area 138 kV upgrades/modifications
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- Crowsnest SVC = +400 MVAR, Sub C SVC = 0 - -100 MVAR, Cypress SVC = 25 - -50 MVAR

Stage III:

- Ware Junction – Langdon 240 kV double circuit transmission line with 50% series compensation

ALTERNATIVE 1B:



Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation
- Sub D (south of Bow Island) substation
- Sub D – Medicine Hat 2 – West Brooks 240 kV double circuit transmission line
- Milo Junction Switching Station
- Phase Shifting Transformer on 170L Coleman to Natal
- Peigan SVC = 0 - -200MVAR and Sub D SVC = 0 - -100 MVAR

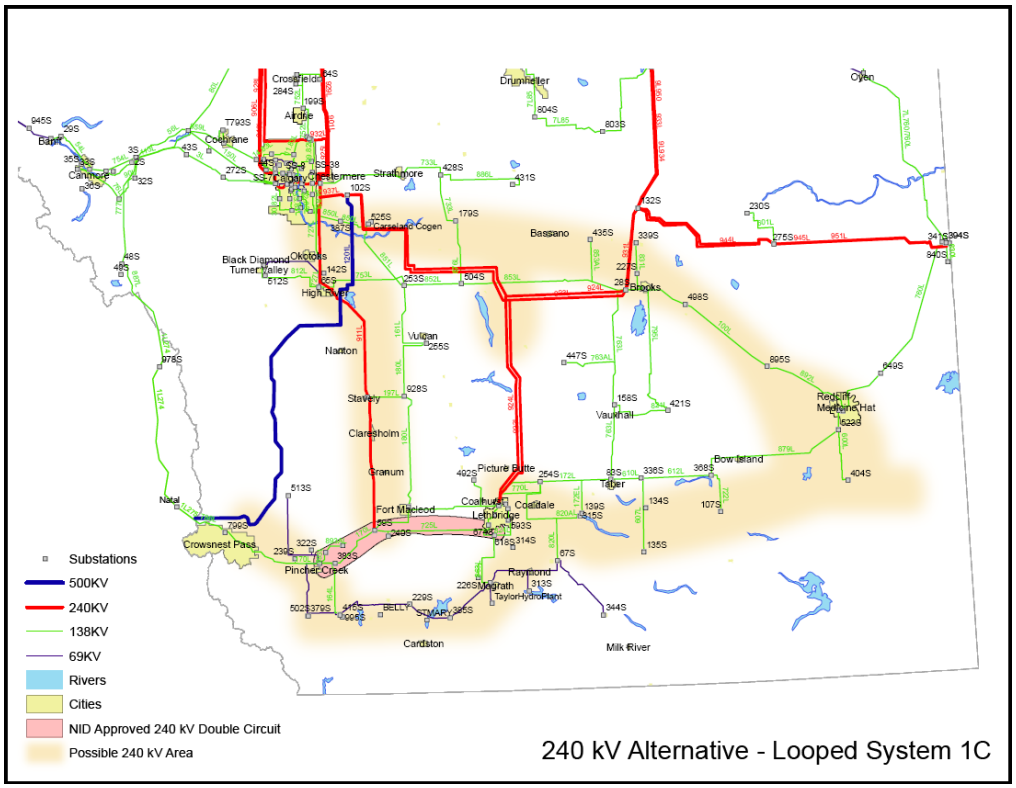
Stage II:

- Medicine Hat 2 substation; Medicine Hat 138 kV changes/upgrades (reflected in analysis as potentially being advanced in parallel with Stage I development)
- New Crowsnest 500/240 kV substation 2 x 1200 MVA
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Peigan – Sub C 240 kV double circuit line with one side strung
  (This is the only difference from Alternative 1A.)
- Sub C (south of Taber) substation
- Sub C – Montana Alberta Tie Ltd. (MATL) 240 kV double circuit line with one side strung
- Sub C – Sub D 240 kV double circuit transmission line
- Salvage line 911L
- Peigan 179 MVA transformer replaced by 2 x 200 MVA transformers
- Blackie Area 138 kV upgrades/modifications
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- Crowsnest SVC = +400 MVAR Sub C SVC = 0 - -100 MVAR, Cypress SVC = 25 - -50 MVAR

Stage III:

- Ware Junction – Langdon 240 kV double circuit transmission line with 50% series compensation

ALTERNATIVE 1C:



Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation
- Sub D (south of Bow Island) substation
- Sub D – Medicine Hat 2 – West Brooks 240 kV double circuit transmission line
- Milo Junction Switching Station
- Phase Shifting Transformer on 170L Coleman to Natal
- Peigan SVC = 0 - -200MVAR and Sub D SVC = 0 - -100 MVAR

Stage II:

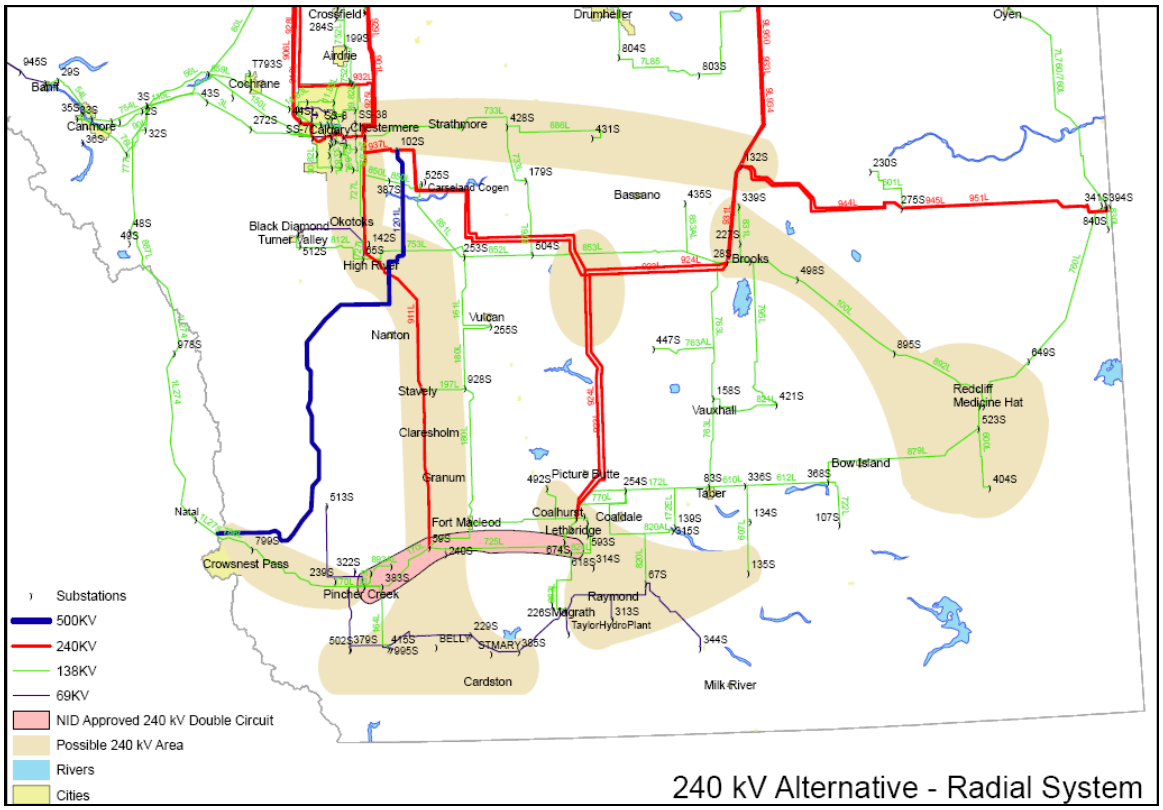
- Medicine Hat 2 substation; Medicine Hat 138 kV changes/upgrades (reflected in analysis as potentially being advanced in parallel with Stage I development)
- New Crowsnest 500/240 kV substation 2 x 1200 MVA
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Goose Lake – Sub C 240 kV double circuit line with one side strung
- Sub C (south of Taber) substation
- Sub C – Montana Alberta Tie Ltd. (MATL) 240 kV double circuit line with one side strung
- Sub C – Sub D 240 kV double circuit transmission line
- Salvage line 911L
- Peigan 179 MVA transformer replaced by 2 x 200 MVA transformers
- Blackie Area 138 kV upgrades/modifications
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- Crowsnest SVC = +400 MVAR Sub C SVC = 0 - -100 MVAR, Cypress SVC = 25 - -50 MVAR

Stage III:

- West Brooks – South Calgary 240 kV double circuit transmission line

(This is the only difference from Alternative 1A.)

ALTERNATIVE 2:



Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation
- Sub D (south of Bow Island) substation
- Sub D – Medicine Hat 2 – West Brooks 240 kV double circuit transmission line
- Milo Junction Switching Station
- Phase Shifting Transformer on 170L Coleman to Natal
- Peigan SVC = 0 - -200MVAR and West Brooks SVC = 0 - -300 MVAR

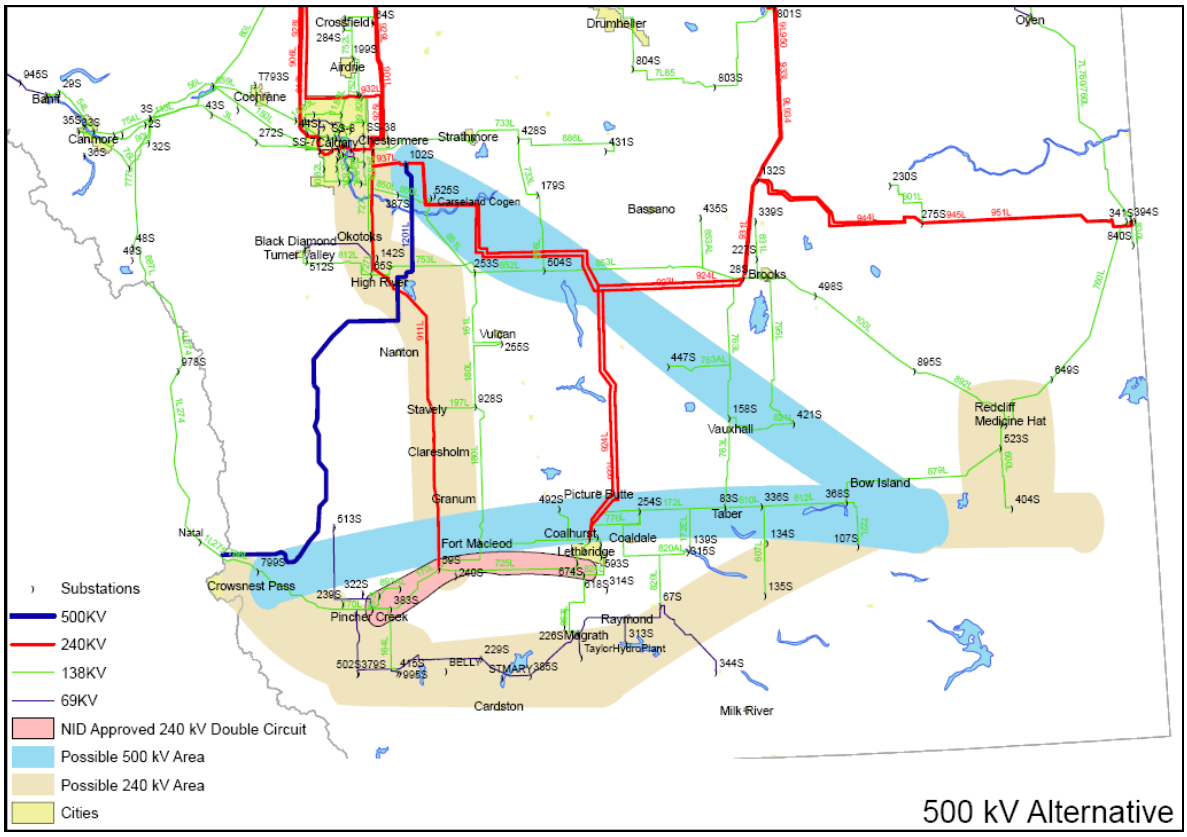
Stage II:

- Med Hat2 2 X 200 MVA substations
- Med Hat 138 kV changes/upgrades
- New Crowsnest 500/240 kV substation 2 x 1200 MVA, Sub C 240 kV substation, Sub A 240 kV substation
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Peigan– Sub A 240 kV double circuit line
- Sub C – MATL 240 kV double circuit line
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- West Brooks – Sub D 240 kV single circuit line
- Peigan 179 MVA transformers replaced by 2 x 200 MVA transformer
- Blackie Area 138 kV upgrades/modifications
- Crowsnest SVC = 0 - +400 MVAR, MATL SVC = 0 - -100 MVAR, Cypress SVC = 25 - -50 MVAR

Stage III:

- Ware Junction – Langdon 240 kV double circuit transmission line

ALTERNATIVE 3:



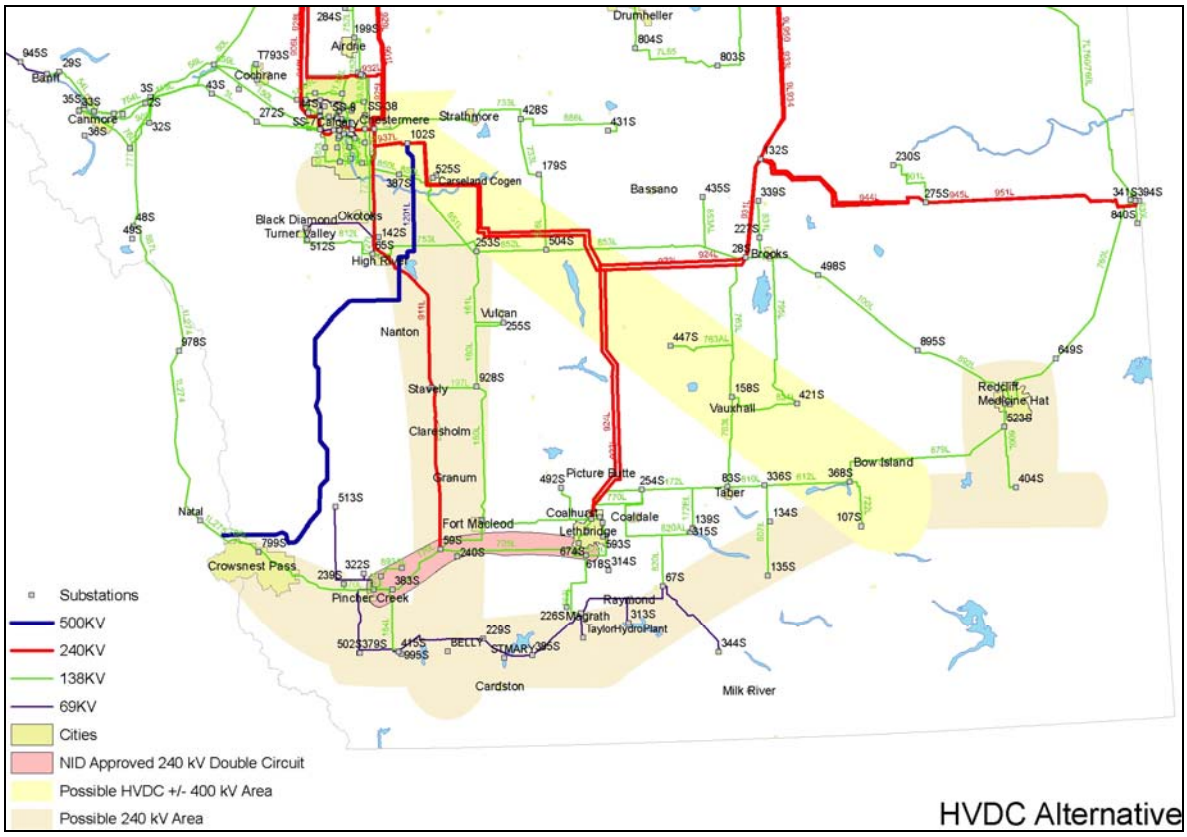
Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation
- Sub D substation 240kV (Sub H)
- Milo Junction Switching Station 240kV
- Langdon to Milo Junction 500kV single circuit line operated at 240kV
- Milo Junction to Sub D 500kV single circuit line operated at 240kV
- Phase Shifting Transformer on 170L

Stage II:

- New Crowsnest 500/240 kV 2 X 1200 MVA, Sub D 500kV 2 X 1200 MVA, Milo Junction 500kV 2 X 1200 MVA, Sub C 240kV
- Langdon to Milo Junction to Sub D upgrade to 500kV
- Crowsnest – Sub D 500kV single circuit line
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Goose Lake – Sub C 240kV single circuit line
- Sub C – Sub D 240kV single circuit line
- Sub D – Med Hat 2 240 kV double circuit transmission line
- Med Hat2 240kV substation 2 X 200 MVA
- Med Hat 138 kV changes/upgrades
- Peigan 179 MVA transformers replaced by 2 x 200 MVA transformer
- Blackie Area 138 kV upgrades/modifications
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- Crowsnest SVC = 0 - -300 MVAR, Sub D SVC = 0 - -300 MVAR, Milo Junction SVC = 0 - -400 MVAR

ALTERNATIVE 4



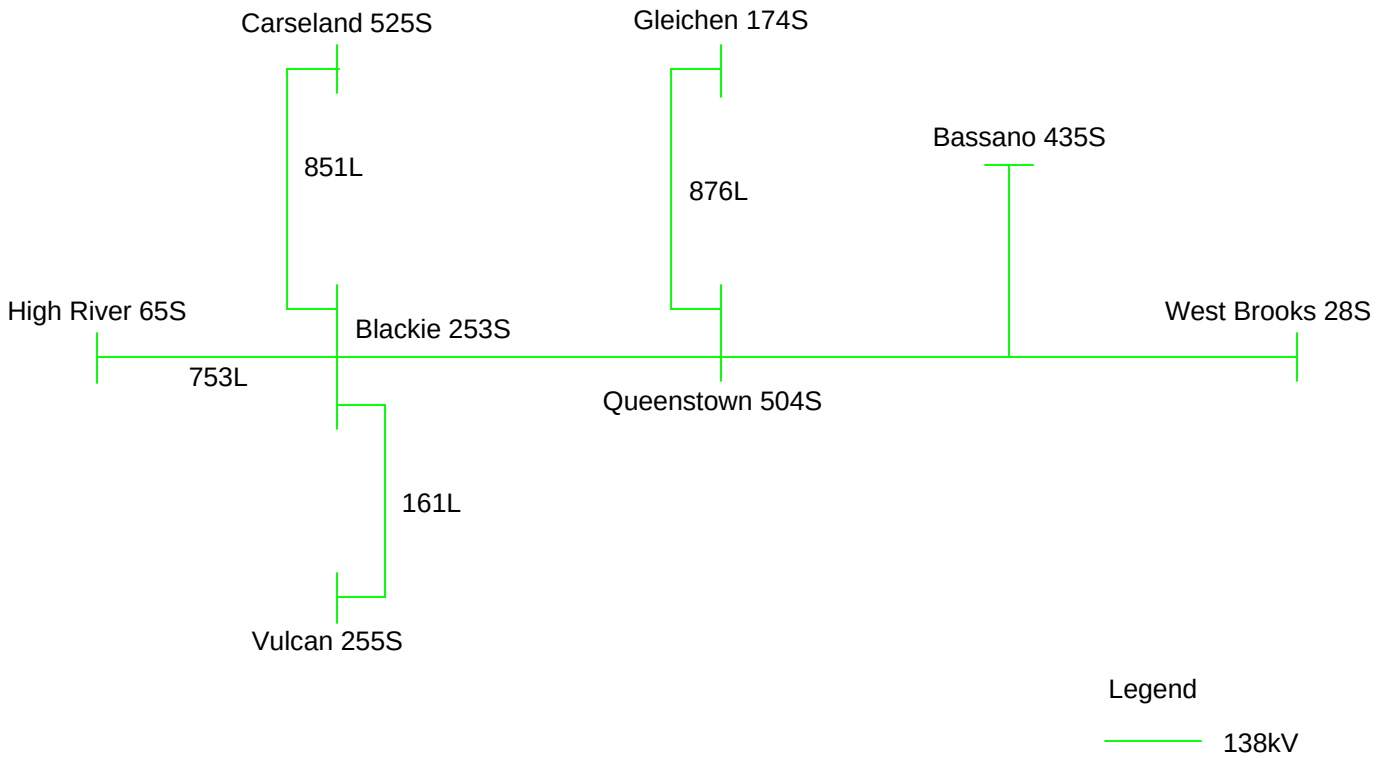
Stage I:

- 911L replaced by Calgary South – Peigan 240 kV double circuit transmission line with 50% seires compensation with a SVC at Peigan
- Milo Junction Switching Station
- Langdon 500kV converter station
- Sub D 500kV converter station
- Sub D 500/240kV substation 2 X 1200 MVA
- Langdon – Sub D HVDC line
- Phase Shifting Transformer on 170L

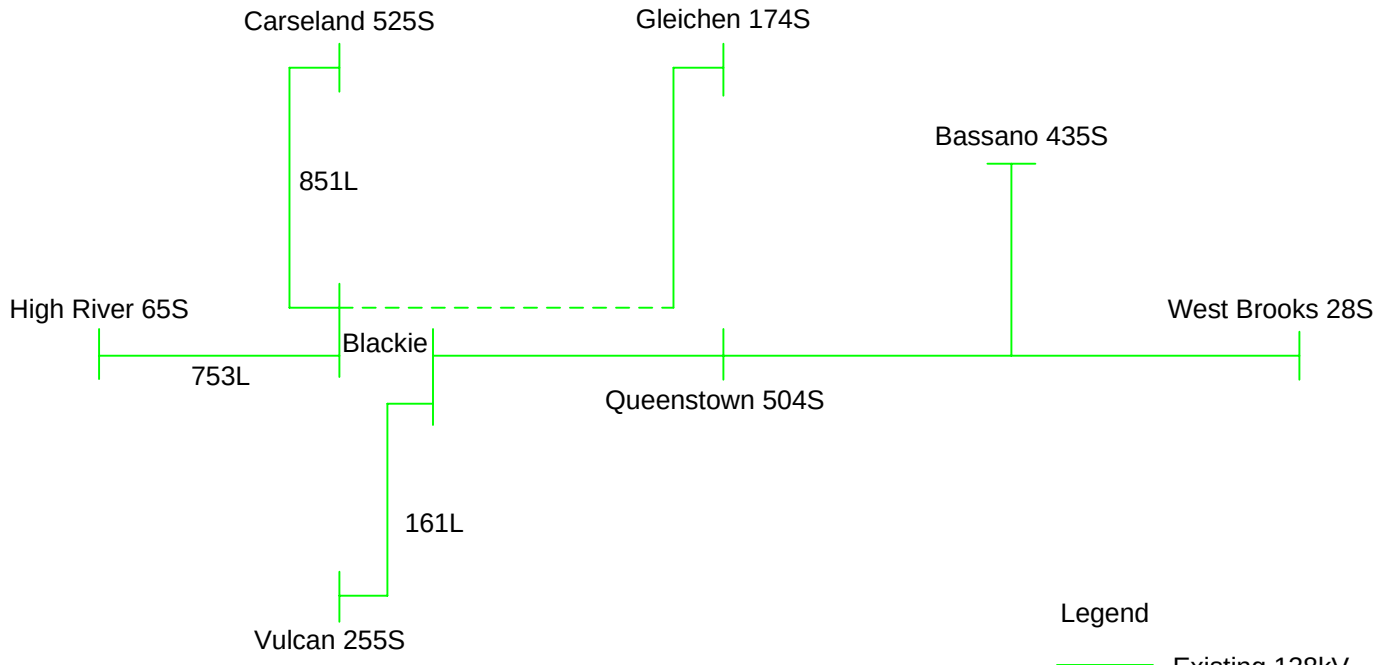
Stage II:

- New Crowsnest 500/240 kV 2 X 1200 MVA, Sub C 240kV, Medicine Hat 2 240kV 2 X 200 MVA substations
- Crowsnest – Goose Lake 240 kV double circuit transmission line
- Goose Lake – Sub C 240kV single circuit line
- Sub C – Sub D 240kV single circuit line
- Sub D – Med Hat 2 240 kV double circuit transmission line
- Med Hat 138 kV changes/upgrades
- Peigan 179 MVA transformers replaced by 2 x 200 MVA transformer
- Blackie Area 138 kV upgrades/modifications
- Anderson – W. Brooks 240 kV in-and-out at Ware Junction
- Crowsnest SVC = 0 - +400 MVAR, Sub C SVC = 0 - -100 MVAR, Sub D SVC =300 - -50 MVAR, Cypress SVC = 25 - -50 MVAR

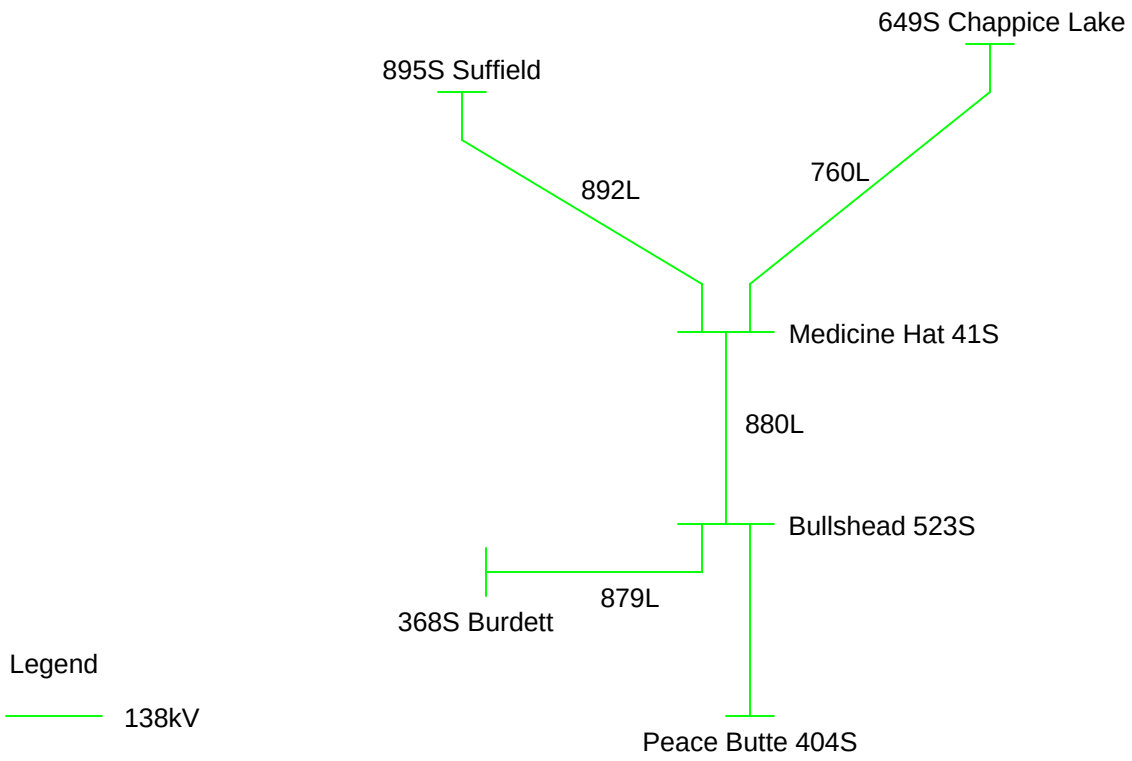
Blackie 138kV Existing System



Blackie 138kV Proposed Modifications



Medicine Hat 138kV Existing System



Medicine Hat Proposed 138kV Upgrade
(Conceptual)