ATTACHMENT 3 SYSTEM PLANNING STUDY REPORT

ALBERTA ELECTRIC SYSTEM OPERATOR

Goose Lake to Chapel Rock Alternatives System Planning Study Report

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1 INTRODUCTION

1.1 BACKGROUND

On December 30, 2008, the Alberta Electric System Operator (AESO) applied to the Alberta Utilities Commission (AUC) for approval of a needs identification document for southern Alberta transmission reinforcement (SATR NID). The AUC approved the SATR NID in *Decision 2009-126* in September 2009. As part of the approved SATR NID, a double circuit 240 kV transmission line from Goose Lake 103S to the proposed Crowsnest substation was proposed to provide a path for generation in southern Alberta to reach the major load centers.

The North of Pincher Creek area lies within the AESO's Fort Macleod planning area (Area 53) as shown in Figure 1-1 . The existing transmission system includes a double circuit 240 kV line connecting Goose Lake 103S substation to Peigan 59S substation and onward to North Lethbridge 370S substation. Additional major transmission developments are planned to be constructed in southern Alberta as part of SATR.[1] Stage 1 of the SATR includes a double circuit 240 kV line from the Goose Lake 103S substation to a new substation, designated Chapel Rock 491S, connected to 1201L between Langdon 102S and BC Hydro's Cranbrook substation.[2] Also, the existing 911L will be replaced by a new double circuit 240 kV line with 2-bundle 1033 kcmil conductors per phase with series compensation. A double circuit 240 kV line, one side strung, will be constructed from Goose Lake 103S to Journault 260S in the Sterling area. SATR also includes the addition of a 138 kV phase shifting transformer at Russell 632S.

The AESO has recently filed the Fidler 312S Collector Substation Needs Identification Document (Fidler NID) which describes the need for transmission system expansions and enhancements in the Northeast of Pincher Creek area to facilitate the connection of wind farms and to alleviate existing constraints. The proposed Fidler Plan includes a new 240/138 kV substation designated Fidler 312S connecting to the existing 240 kV line 1071L in an in/out configuration. It also includes the re-configuration of 138 kV line 893L. Figure 1-2 shows the proposed Fidler Plan.

The planned Fidler substation provides the AESO an opportunity to evaluate terminating the planned 240 kV double circuit connecting Goose Lake 103S to Chapel Rock 491S via Fidler substation or via Castle Rock Ridge substation . Each of these Chapel Rock

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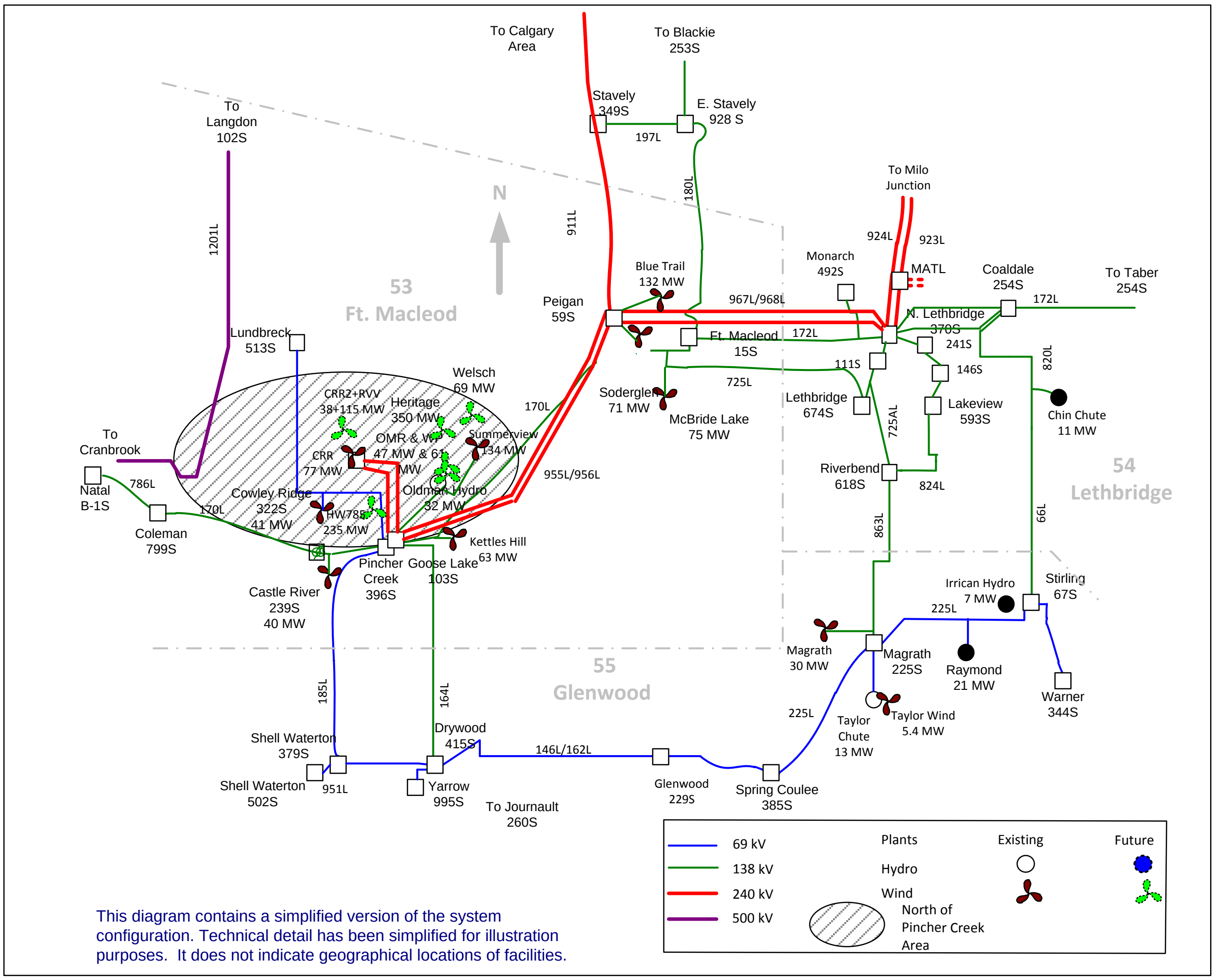
[1] Approval No U2011-115

[2] The new substation connecting Goose Lake 103S to 1201L was identified as Crowsnest substation in Approval No.2011-115. For ease of reference in this system planning engineering report, the planned substation is referred to as Chapel Rock 491S consistent with the AESO's forthcoming SATR amendment application, to be filed shortly.

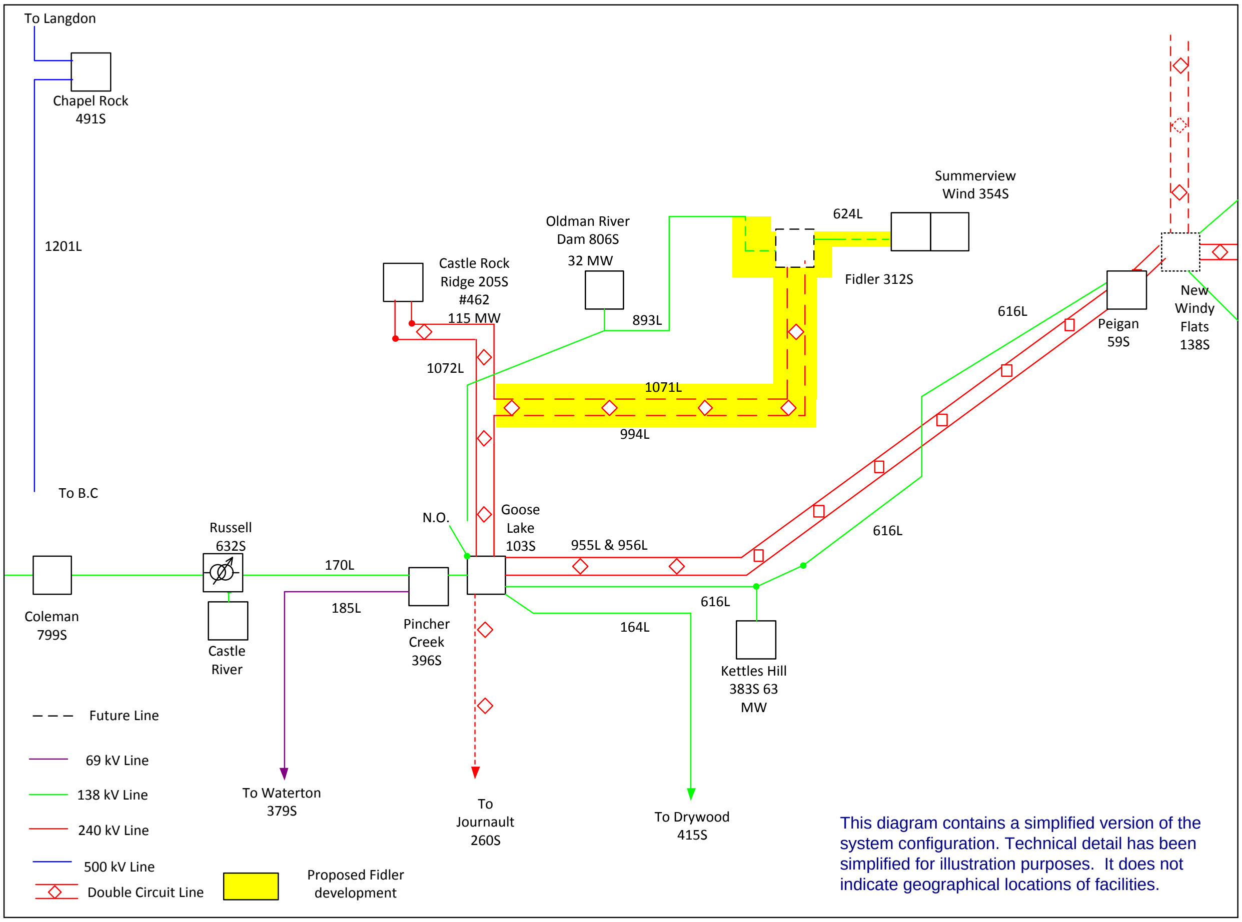
Connection alternatives would connect to Goose Lake 103S substation via the existing 1071L/1072L which was constructed to facilitate connection of the Castle Rock Ridge wind farm.[3] These two 240 kV double circuit alternatives are evaluated in this report.

Figure 1-1 : Existing Southwest Alberta Transmission System and the Study Area



3 Approved by the Alberta Utilities Commission in Decision 2011-439.

Figure 1-2: The Proposed Fidler Plan



1.2 STUDY SCOPE

The objectives of this study are to:

- Evaluate two alternatives for the planned 240 kV double circuit transmission line connecting the Goose Lake 103S substation to the proposed Chapel Rock 491S substation.

- Identify a preferred alternative

The study area identified for the evaluation was limited to the area north of the town of Pincher Creek and west of the Piikani Nation Reserve located within the AIES planning area 53, as shown in Figure 1-1. For the Goose Lake to Chapel Rock alternative evaluation, all anticipated generation facilities in the North of Pincher Creek area Creek were taken into consideration.

Detailed technical assessments were performed for Category A, Category B, and selected Category C conditions to ensure compliance with the Alberta Reliability Standards for each alternative. Capital costs estimates were provided by AltaLink Management Ltd. (AltaLink) as the legal owner of transmission facilities (TFO) in the area. Stakeholder input on the alternatives was considered and a high-level land impact assessment was conducted by AltaLink, which considered factors such as population density, agriculture, alignment with existing rights-of-way and environmentally sensitive areas. Alternatives were compared across these technical, economic and societal factors and the alternative that provided the best combination of attributes was recommended for development.

The following studies were performed on the selected alternative under Category A, Category B, and selected Category C contingencies:

a) Power flow analysis for the thermal loading and voltage deviation assessment

b) Transient stability analysis to assess the transient response of the system during a fault and after a fault has been cleared

c) Short-circuit analysis to calculate the maximum short-circuit levels at the critical buses before and after the recommended system developments

The following section describes the study criteria, modeling, methodology and transmission system assumptions applied for the studies.

2 CRITERIA, SYSTEM DATA, AND STUDY ASSUMPTIONS

This section describes the applicable criteria, system data, methodology and specific study assumptions applied in this study.

The study assumptions and system data reflect the most current information available at the time the studies were conducted. The AESO has taken reasonable steps to validate the assumptions and system data, where possible.

2.1 ALBERTA RELIABILITY STANDARDS

The Alberta Reliability Standards were applied to assess the transmission system performance.[4] Category A (all transmission elements in-service), Category B (a single transmission element out-of-service), and selected Category C (two or more transmission elements out-of-service) conditions were examined.

The following is a general explanation of the Alberta Reliability Standards applied throughout this study:

- The Alberta Reliability Standards[5] require that system performance be evaluated under Category A (N-0), Category B (N-1) and Category C (N-2) conditions.
- Category A represents a normal system with no contingencies and all facilities in service. Under Category A conditions, the system must be able to supply all firm load and firm transfers to other areas. All equipment must operate within its applicable rating, voltages must be within their applicable ratings, and the system must be stable with no cascading outages.
- Category B events result in the loss of any single specified system element under specified fault conditions with normal clearing. The specified elements are a generator, a transmission circuit, a transformer or a single pole of a direct current bipolar line. The acceptable impact on the system is the same as Category A.
- Category C events result in the loss of two elements under specified fault conditions with normal clearing. The specified elements are a generator, a transmission circuit, a transformer or a single pole of a direct current bipolar line. The acceptable impact on the system is the same as of Category A; however, the use of Remedial Action

[4] The Alberta Reliability Standards are available at: http://www.aeso.ca/rulesprocedures/8677.html

[5] The Alberta Reliability Standards also required that Category D conditions to be studied as well. The Category D studies have been carried out as part of the TPL assessments.

Schemes (RAS) is allowed to maintain the system stability. Intertie tripping is an acceptable mitigation measure to maintain the system stability under Cat C events

- AESO Thermal Loading Criteria requires that the continuous thermal rating of any transmission element shall not be exceeded under normal operating conditions. In this study, thermal limits were assumed to be one hundred percent of the normal summer and winter ratings.

- System-Normal minimum and maximum voltage limits specified by the Reliability Criteria were used to identify Category A system voltage violations, while the extreme minimum and maximum limits were used to identify the Category B system violations. Table 2-1 shows the acceptable steady state voltages for different transmission voltage classes.

- Voltage Deviation guidelines were applied for Category A and Category B contingency analysis.

Table 2-1: Acceptable Range of Steady State Voltage (kV)

Nominal	Extreme Minimum	Normal Minimum	Normal Maximum	Extreme Maximum
500	500	510	540	550
240	220	240	264	264
144	130	137	151	155
138	124	135	145	150
72	65	71	75	78
69	62	65	72	74

2.2 LOAD AND GENERATION ASSUMPTIONS

2.2.1 Load Assumptions

The study was conducted using the most recent AESO corporate load forecast - the AESO 2012 *Long-term Outlook (2012 LTO)*. Two bounding conditions (summer peak and light load conditions) for the year 2022 were examined. Summer peak load condition was selected as the ruling condition over winter peak condition because southern Alberta is a summer peaking area and summer line ratings are typically lower than winter ratings, so this represents the most stressed system condition. The 2022 load forecast for Fort MacLeod planning area (Area 53) at South region peak is presented in Table 2.2 below. Further details can be found in Attachment 4 of the AESO's Goose Lake to Chapel Rock Amendment to the SATR NID Approval.

Table 2-2: Fort MacLeod Area (Area 53) Load Assumptions (MW)

Fort MacLeod (Area 53)	2022
Summer Peak	40
Summer Light	14

2.2.2 Generation Assumptions

In evaluating the Goose Lake to Chapel Rock alternatives, all generation facilities in the North of Pincher Creek area are critical to system impact evaluation and need to be taken into consideration. Table 2-3 below lists existing and future generation in the North of Pincher Creek area.

For the evaluation, the AESO considered both the provincial wind capacity forecast as well as project specific information to dispatch generation in the North of Pincher Creek area. All existing wind generation was dispatched assuming high wind conditions. Forecast wind capacity additions were allocated first to projects under construction, and then the remaining capacity to projects in the North of Pincher creek area. Any remaining forecast capacity additions were allocated to projects throughout the province. This results in 644 MW of incremental wind capacity dispatch in the North of Pincher Creek area in 2022.

Table 2-3: Generation Assumptions for the North of Pincher Creek area (MW)

	Project Capacity (MW)	2022 Dispatch
Existing Generation in North of Pincher Creek	310	310
Future Generation in North of Pincher Creek	992	644

Details regarding the forecast assumptions can be found in Attachment 4 of the AESO's Goose Lake to Chapel Rock Amendment to SATR NID Approval.

The following intertie flows were assumed in the studies. Maximum Alberta to BC export typically occurs under the summer light and high wind conditions whereas zero or medium import usually coincides with peak load and high wind conditions.

- Alberta-Saskatchewan:0 MW for all conditions

- Alberta- Montana 0 MW for all conditions
- Alberta-BC: 0 MW and 400 MW import for peak load and high wind conditions

  750 MW export for light load and high wind conditions

2.3 Transmission Assumptions

As part of SATR, a double circuit 240 kV line is planned to be built from the Goose Lake 103S substation to the proposed Chapel Rock 491S 500/240 kV substation which will be connected to the 1201L line between Langdon 102S and BC Hydro's (BCH) Cranbrook substation. The SATR developments also include the addition of a 138 kV phase shifting transformer at Russell 632S and a new double circuit 240 kV line from Goose Lake 103S to the proposed Journault 260S substation in the Sterling area

SATR also includes replacement of the existing 911L with a new double circuit 240 kV line, 1037L/1038L. The AESO has filed an amendment application with the Alberta Utilities Commission (Commission) to terminate1037L/1038L at a new Windy Flats 138S substation instead of Peigan 59S substation as originally planned in SATR.

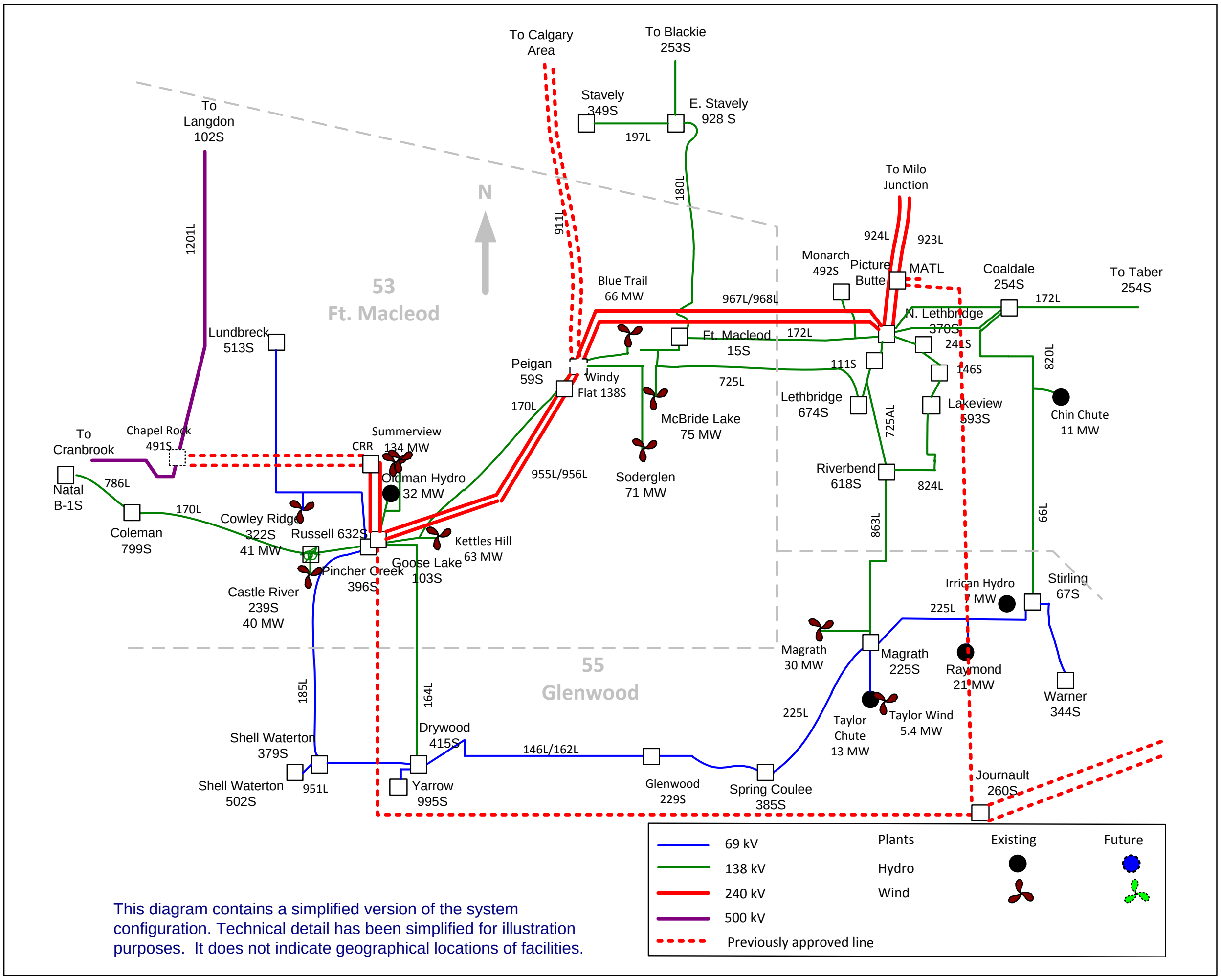
Table 2-4 shows the scheduled in-service date for each component of SATR in southwest Alberta. SATR is being constructed in stages and it is expected that all of the SATR developments will be in service in the 2017 timeframe. The bulk transmission system configuration is consistent with the AESO's 2012 Long-term Transmission Plan. In this study, these facilities were assumed according to their in-service dates. Figure 2-1 shows the 2022 SW Alberta transmission system.

Table 2-4: List of SATR Component in SW Alberta

Component	Projected In-Service Date (ISD)
Milo Junction Switching Station	In-service
Russell PST	In-service
911 Rebuild	2015
Journault to Picture Butte (MATL) 240 line	2015

Windy Flats 138S substation	2015
Goose Lake to Chapel Rock 240 kV D/C line	2016
Goose Lake to Journault 240 line	2017

Figure 2-1 : Future Southwest Alberta Transmission System (year 2022)



2.4 FACILITY RATINGS AND SHUNT ELEMENTS

Table 2-5 provides the ratings of the key existing and future transmission lines in Planning Areas 53, 54 and 55 for this study.

Table 2-5: Existing Facility Ratings – Key 240 kV and 138kV Transmission Lines

Line	From	To	Voltage (KV)	Summer Rating (MVA)	Winter Rating (MVA)
164 L	Goose Lake 103S	Drywood 415S	138	85	90
413L	Russell 632S	Castle River 239S	138	120	148
616L	Goose Lake 103S	Peigan 59S	138	119	146
412L	Pincher Creek 396S	Russell 632S	138	121	148
170L	Russell 632S	Coleman 799S	138	121	148
786L	Natal	Coleman 799S	138	99	132
613L	Goose Lake 103S	Pincher Creek 396S	138	119	147
893L	Goose Lake 103S	Summerview 354S	138	119	147
955L/956L	Goose Lake 103S	Peigan 59S	240	611	751
1071L/1072L	Goose Lake 103S	Castle Rock Ridge 205S	240	967	1203

Table 2-6: Future Facility Ratings – Key 240 kV and 138kV Transmission Lines

Line	From	To	Voltage (KV)	Summer Rating (MVA)	Winter Rating (MVA)
1048L/1049L	Peigan 59S	Windy Flats 138S	240	611	751
1037L/1038L	Windy Flats 138S	Foothills 237S	240	958	1213
967L	Windy Flats 138S	N Lethbridge 370S	240	499	499
1084L	Windy Flats 138S	KaiyaTree 278S	240	600	744

Capacitor banks and reactors in the Planning Area 53, 54 and 55 are shown inTable 2-7.

Table 2-7: Key Shunt Elements in Planning Areas 53, 54 and 55

Substation Name and Number	Nominal Bus Voltage (kV)	Capacitors		Reactors	
		Number of Switched Shunt Blocks	Total at nominal voltage (MVAr)	Number of Switched Shunt Blocks	Total at nominal voltage (MVAr)
Pincher Creek 396S	138	1	24.46	-	-

2.5 Dynamic Data and Assumptions

Dynamic data that has been validated by the equipment owners was used for existing equipment in the AIES such as generators, Wind Power Facilities (WPFs), motor loads, and Static VAR Compensators (SVCs) when such data was available. Generic dynamic models were adopted for existing equipment if validated data was not available and for facilities planned to be in service within the timeline of this engineering study. All data used was deemed by the AESO to be acceptable for the purposes of this study.

2.6 Protection Fault Clearing Time

Dynamic contingency analysis will consider the generic clearing times as provided by the AESO Transmission Reliability Criteria, Part II System Planning: Standard New System Clearing Times, i.e., for the existing and proposed transmission lines, the fault clearing times in Table 2-8 were used in the study.

Table 2-8: Assumptions for Clearing Times of Facilities

Nominal Voltage (kV)	Fast End (Cycles)	Slow End (Cycles)
500	4	6
240	5	7

2.7 Applicable Operating Policies and Procedures (OPP)

OPP 515 will be applied to provide criteria and policies for the operation of the south area of Alberta transmission system and to define policies and procedures for the System Controller (SC) in implementing transfer limits and ensuring system reliability in the Southern Alberta.

OPP 702 will be applied to establish pre-contingency voltage profiles in Planning Areas 53, 54 and 55. The area voltage will be monitored following a Category B and selected Category C contingencies to document any differences from the required minimum voltage at the key nodes.

2.8 STUDY SCENARIOS

North of Pincher Creek area becomes a high power outflow area under high wind conditions. Two bounding conditions (summer peak and light load conditions) for the year 2022 were examined in the study. The summer peak load condition is selected because southern Alberta is a summer peaking area and summer line ratings are typically lower than winter ratings.

The system conditions for 2022 were assessed to ensure that the proposed transmission development will be sufficient for reliable system performance in the long term.

In summary, the system performance was evaluated for the generation and load conditions:

- 2022 summer peak with zero import from BC and with 100% output from forecasted wind capacity
- 2022 summer light with 750 MW export to BC and with 100% output from forecasted wind capacity
- 2022 summer light with zero export to BC and with no forecasted wind capacity dispatched
- 2022 summer peak with 400 MW import from BC and with 100% output from forecasted wind capacity

2.8.1 Power Flow Analysis

For the power flow analysis, Category A and Category B contingencies in Planning Area 53 were simulated. The system in Planning Areas 53, 54 and 55 was monitored to identify any violation of the Reliability Criteria, including thermal overload and voltage issues.

The contingencies considered for the power flow studies include the outage of transmission elements rated at 138 kV and above in the study area and its vicinity.

The area that was monitored for any violation of the Reliability Criteria includes all the transmission components in the study area and its vicinity.

2.8.2 Short-Circuit Analysis

For the short-circuit analysis, all existing and potential future generators in Planning Areas 53, 54 and 55 were switched on to evaluate the maximum fault current under three-phase-to-ground faults and single-line-to-ground faults. Three-phase faults typically create the maximum fault current. Single-line-to-ground faults were calculated because under certain circumstances they may exceed the three-phase fault currents. The calculated fault currents under three-phase-to-ground faults and single-line-to-ground faults should be considered by the transmission facility owners when specifying substation equipment.

2.8.3 Transient Stability Analysis

In the transient stability analysis, a three-phase–to-ground fault was applied to critical 240 kV and higher voltage class transmission lines in Planning Area 53 to assess system stability with either alternative in service. The following selected Category C (C3, C5 and C7) events were also analyzed to test the system transient stability. The fault was cleared by opening the near-end and far-end breakers of the line according to the protection operating time provided in Table 2-8.

Category C3 faults are defined as a three phase fault with normal clearing time and manual system adjustment, followed by another three phase fault with normal clearing time.

Category C5 faults are defined as double line-to-ground faults of a double circuited transmission line with normal clearing time.

Category C7 faults are defined as single line-to-ground faults of transmission lines with delayed clearing time (stuck breaker condition).

A system dynamic response is considered acceptable if the following conditions are met after a disturbance:

- All the generators remain stable and connected to the AIES
- All oscillations in the system are damped successfully.

3 DEVELOPMENT OF ALTERNATIVES

As part of the SATR project, a double circuit 240 kV transmission line from the Goose Lake 103S substation to the new Chapel Rock 491S substation on 1201L is planned to be in-service in 2016. The southern portion of a double circuit 240 kV transmission line from Goose Lake 103S to Castle Rock Ridge 205S has recently been built (designated as 1071L and 1072L) to facilitate connection of the Castle Rock Ridge wind farm.

The addition of the planned Fidler substation creates an option to consider building the 240 kV Goose Lake 103S to Chapel Rock 491S double circuit line via either the Fidler 312S or the Castle Rock Ridge 205S substations. While the proposed Fidler Plan is independent of the chosen alternative for the Goose Lake to Chapel Rock 240 kV transmission line, planning evaluations have been performed for each of the Chapel Rock Connection alternatives to identify any impact to the functionality of the proposed Fidler Plan and determine whether both alternatives would meet the Reliability Criteria and technical requirements in the long-term following Fidler 312S development.

The two alternatives described below were formulated for the 240 kV double circuit connecting Goose Lake 103S to Chapel Rock 491S.

3.1 SATR GOOSE LAKE TO CHAPEL ROCK CONNECTION ALTERNATIVE 1- VIA FIDLER (CHAPEL ROCK CONNECTION ALTERNATIVE 1)

The proposed development area for Chapel Rock Connection Alternative 1 lies north of the Oldman Reservoir and includes the following components; a simplified diagram of the configuration is provided in Figure 3-1

- A new 500/240 kV substation, designated as Chapel Rock 491S, connecting to the existing 500 kV 1201L line in an in/out configuration.
- A new 240 kV D/C line from Fidler 312S substation to Chapel Rock 491S substation using 2x1033 kcmil conductor with summer and winter ratings of approximately 977 MVA and 1213 MVA.

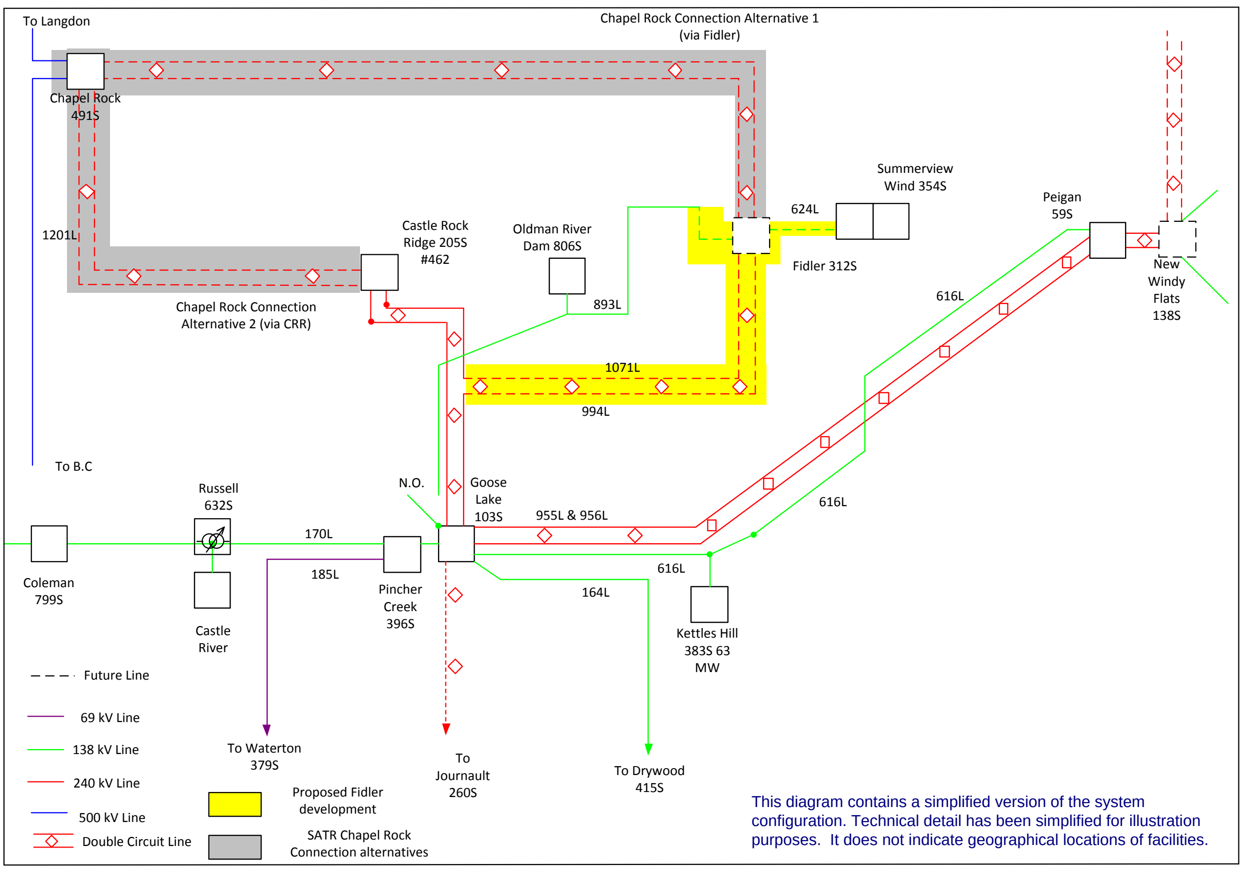
3.2 SATR Goose Lake to Chapel Rock Connection Alternative 2- via CRR (Chapel Rock Connection Alternative 2)

The proposed development area for Chapel Rock Connection Alternative 2 lies south of the Oldman Reservoir and includes the following components; a simplified diagram of the configurations is provided in Figure 3-1.

- A new 500/240 kV substation, designated as Chapel Rock 491S, connecting to the existing 500 kV 1201L line in an in/out configuration.

- A new 240 kV D/C line from Castle Rock Ridge 205S substation to Chapel Rock 491S substation, using 2x1033 kcmil conductor with summer and winter ratings of approximately 977 MVA and 1213 MVA.

Figure 3-1 : Chapel Rock Connection Alternatives



3.3 Capital Costs

Capital cost estimates with an accuracy of +/- 30% were prepared by AltaLink at the AESO's direction. Capital cost estimates for the two Chapel Rock Connection alternatives are provided in Table 3-1. Due to the uncertainty associated with final siting of future substations and final routes of future transmission lines, ranges of capital cost estimates were used for comparative purposes.

Table 3-1: Capital Cost Estimates for Chapel Rock Connection Alternatives

(Millions of 2016$, +/-30%)

	Chapel Rock Connection Alternative 1	Chapel Rock Connection Alternative 2
Capital Cost	$331 M to $363 M	$311 M to $323 M

4 ALTERNATIVE EVALUATION

Since the new Goose Lake to Chapel Rock 240 kV transmission line is planned to be in service by 2016, the planning evaluations for both Chapel Rock Connection alternatives was performed for year 2022, assuming that the Fidler 312S substation and associated transmission reinforcements are in service in 2014.

This section summarizes the study results. Attachments A, B and C provide detailed results for the reported critical contingencies.

4.1 Power Flow Analysis

Chapel Rock Connection Alternative 1 (via Fidler)

The steady state performance of the system under normal conditions (Category A), single contingency (Category B) and double circuit contingency (Category C) conditions was assessed using the following system conditions with Chapel Rock Connection Alternative 1.

- 2022 summer peak with zero import from BC and with forecasted wind
- 2022 summer light with 750 MW export to BC and with forecasted wind
- 2022 summer peak with 400 MW import from BC and with forecasted wind

The results show that the Chapel Rock Connection Alternative 1 provides sufficient capacity to accommodate forecasted generation growth in the North of Pincher Creek Area in the long term.

The results of the steady state analysis are summarized below and illustrated by the plots in Attachment A.

The 2022 light load with no wind condition was also examined to ensure that the system can be operated within the allowable voltage range under such conditions. The results show that the Chapel Rock Connection Alternative 1 will not cause high voltage under light load and no wind conditions in the study area with reactive power support as determined by the SATR development.

4.1.1 System Normal (N-0) Results

No overloads or voltage violations were observed for the 2022 SP and SL conditions under forecasted load and generation growth. No constraints and voltage issues associated with forecast load and generation growth were observed.

4.1.2 Single Element Contingency (N-1) Results

No overloads or voltage violations were observed for the 2022 SP and SL conditions under forecasted load and generation growth. No constraints and voltage issues associated with forecast load and generation growth were observed.

4.1.3 Selected Double Element Contingency (N-2) Results

Thermal overloading on 138 kV 616L from Goose Lake 103S to Peigan 59S has been observed for 2022 SP and 2022 SL conditions under 955L/956L 240 kV double circuit contingencies. These thermal overloads can be addressed by Remedial Action Schemes as required or Operational measures, the details of which are to be determined from operational studies. The AESO will evaluate the area operations and propose the required Remedial Action Schemes for all credible contingencies as required if this alternative is chosen for development. These studies are beyond the scope of this report.

Chapel Rock Connection Alternative 2 (via Castle Rock Ridge)

The steady state performance of the system under system normal conditions (Category A) and for single contingency (Category B) and double circuit contingency (Category C) conditions was assessed for Chapel Rock Connection Alternative 2 using the same 2022 summer peak and light conditions that were used to evaluate Chapel Rock Connection Alternative 1.

The results show that the Chapel Rock Connection Alternative 2 provides sufficient capacity to accommodate forecasted generation growth in the study area in the long term.

The results of the steady state analysis are summarized below and illustrated by the plots in Attachment A.

The 2022 light load with no wind condition was also examined to ensure that the system can be operated within the allowable voltage range under such conditions. The results show that the Chapel Rock alternative 2 will not cause high voltage under light load and no wind conditions in the study area with reactive power support as determined by the SATR development.

4.1.4 System Normal (N-0) Results

No overloads or voltage violations were observed for the 2022 SP and SL conditions under forecasted load and generation growth. No constraints and voltage issues associated with forecast load and generation growth were observed.

4.1.5 Single Element Contingency (N-1) Results

No overloads or voltage violations were observed for the 2022 SP and SL conditions under forecasted load and generation growth. No constraints and voltage issues associated with forecast load and generation growth were observed.

4.1.6 Selected Double Element Contingency (N-2) Results

Up to 693 MW of generation at Fidler substation will be lost under double circuit contingency of 1071L/994L from Fidler 312S to Goose Lake 103S and Castle Rock Ridge 205S. However, based on the Alberta Reliability Standards these events are acceptable as long as mitigation strategies are in place. The AESO will develop a C5 mitigation strategy if required during the operations planning stage of the project. Thermal overloading on 138 kV 616L from Goose Lake 103S to Peigan 59S has been observed for 2022 SP and 2022 SL conditions under 955L/956L 240 kV double circuit contingencies. These thermal overloads can be addressed by Remedial Action Schemes as required or Operational measures, the details of which are to be determined from operational studies. The AESO will evaluate the area operations and propose the required Remedial Action Schemes for all credible contingencies as required if this alternative is chosen for development. These studies are beyond the scope of this report.

4.2 Transient Stability Analysis

A comprehensive transient stability study was performed for each of Chapel Rock Connection Alternative 1 and Chapel Rock Connection Alternative 2 on the 2022 system. Bus voltages, bus frequencies, generator real power, and generator angles were monitored. Category B and selected Category C faults were simulated. Transient stability analysis was performed using 2022 summer peak with 400 MW import condition.

The results confirm that the system remains stable for both Chapel Rock Connection Alternatives 1 and 2 following Category B and selected Category C contingencies.

For Category C events, there is no impact of a C5 event on Chapel Rock Connection Alternative 1 whereas up to 693 MW of generation at Fidler substation may be lost with Chapel Rock Connection Alternative 2 which could require a mitigation strategy. With Chapel Rock Connection Alternative 2, a common tower failure between Fidler substation and the tap point on 1071L will result in losing all generation at the Fidler substation. The system remains stable under such a condition. A Remedial Action Scheme (RAS) or operational procedure may be required to address the impact of this contingency. However, based on the Alberta Reliability Standards these events are acceptable as long as mitigation strategies are in place. The AESO will develop a C5 mitigation strategy if required during the operations planning stage of the project. These studies are beyond the scope of this report.

Study results of the stability analysis for critical contingencies are provided in Attachment B and C.

4.3 Short Circuit Analysis

Short circuit analysis was performed using the 2022 summer peak scenarios for both Chapel Rock Connection Alternative 1 and Chapel Rock Connection Alternative 2 to determine the maximum fault levels. Both three phase and single-line-to-ground fault currents were calculated. The results of the short circuit analysis are presented in Attachment D.

4.4 System Losses

The AESO calculated total southwest Alberta transmission system losses under summer peak and summer light conditions for each of the Chapel Rock Connection alternatives. Table 4-1 summarizes system summer peak and light losses for 2022. The results indicate that there is no material difference in system losses between the two alternatives.

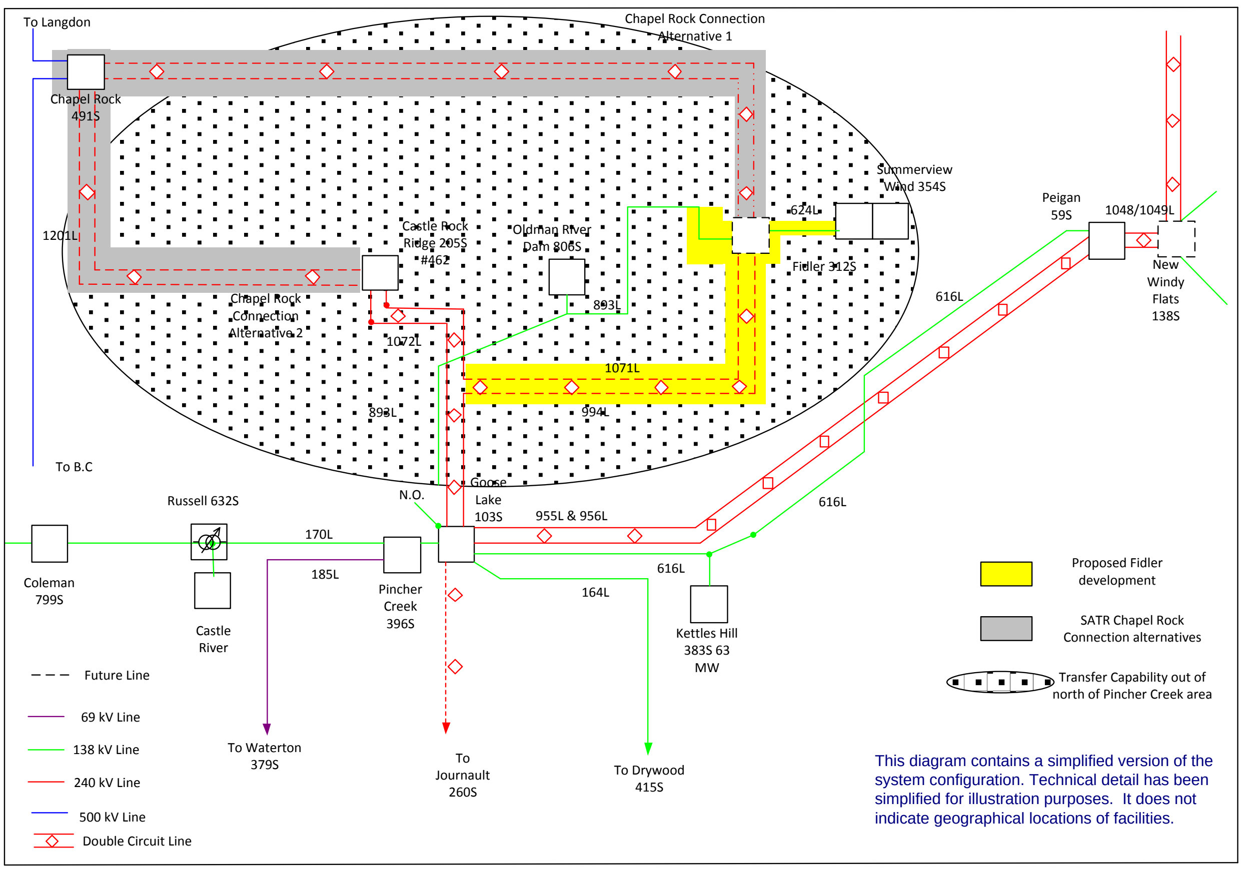
Table 4-1: 2022 Southwest Alberta Transmission System Losses

Year	Alternative 1 (MW)	Alternative 2 (MW)
2022 SP	57	57
2022 SL	51	50

4.5 Transfer Capability

Completion of the Chapel Rock Connection will create two major transmission paths out of the North of Pincher Creek area: a 240 kV double circuit line to Chapel Rock substation and a 240 kV double circuit line from Goose Lake substation to Peigan substation. Transfer capability out of the North of Pincher Creek area was studied as part of the transfer capability analysis. In order to test the transfer limits, the output of an assumed generic supply source was modeled at either Goose Lake substation or Fidler substation to test the transfer limits of each alternative. The supply source output was progressively increased until overloads were observed under N-1 contingencies. Total generation dispatched to the transmission system between Goose Lake substation and the future Chapel Rock substation is shown as the shaded area in Figure 4-1.

Figure 4-1: North of Pincher Creek Area Transfer Capability



4.5.1 Assumed generation increase at Goose Lake substation

In order to simulate an assumed supply source, a generic generator was modeled at Goose Lake 103S substation to determine the difference in transfer capability out of the North of Pincher Creek area between the two alternatives. This generic generator does not represent any specific generation project in the AESO connection queue. It is simply used to model potential aggregate supply from the area for the purpose of testing the transfer capability limits of the proposed developments.

The results are summarized in Table 4-2 and demonstrate that under the summer peak condition, the limiting element of the transmission system out of the North of Pincher Creek area is 1048L/1049L between Peigan 59S and the future Windy Flats 138S substations. Under summer light heavy export condition, power flow is evenly distributed between the two major 240 kV paths. This allows an increase of approximately 560 MW to be transferred out of that area than summer peak conditions. For both system conditions[6], the two alternatives have similar transfer capability out of the area. The limiting element under N-1 conditions is either of the 240 kV lines 1048L/1049L between Peigan 59S and the new Windy Flats 138S substations.

4.5.2 Assumed generation increase at Fidler substation

The same exercise was also performed with a generic generator at Fidler substation. Even though Fidler substation will connect to the system via two more lines in Alternative 1 than Alternative 2, the study determined that the two alternatives have almost the same transfer capabilities out of the area under the summer peak condition. The similarity occurs because the limiting element remains 1048L/1049L under the summer peak condition. Overloading on 1048L/1049L occurs before more generation can be connected at the Fidler substation. It is only under the summer light heavy export condition that evenly distributed power flow would allow approximately 220 MW additional wind power to be connected in the North of Pincher Creek area with Alternative 1 compared to Alternative 2. The limiting element is still 1048L/1049L with Alternative 1 whereas transfer capability of Alternative 2 is limited by the double circuit line connecting Fidler 312S to the system. The results are summarized in Table 4-2.

4.5.3 Transfer Capability Results

The transfer capability comparative analysis results are summarized in Table 4-2. The transfer capabilities for both alternatives are approximately equivalent (within 2% of each other) for all extreme cases except the 2022 summer light case with maximum export flows for which the transfer capability of Alternative 1 is approximately 14% greater than Alternative 2. This scenario assumes maximum wind output and maximum export conditions assuming all future wind generation beyond applied-for generation in the North of Pincher Creek area will flow through the Fidler substation. Alternative 1 provides a small transfer capability advantage under these conditions. However, both alternatives have sufficient capacities to accommodate existing and forecasted generation in the area for long term.

[6] Summer peak condition during heavy import will push power to east and further overload 1048/1049L. The results will be similar to summer peak with no import from BC and therefore it is excluded from this analysis.

Table 4-2: Summary of Transfer Capability from the North of Pincher Creek Area

	System Condition	Alternative 1 (via Fidler) (MW)	Alternative 2 (via CRR) (MW)
Transfer Capability with assumed generation at Goose Lake Substation	2022 SP with zero import	1260	1260
	2022 SL with 750 MW export	1820	1810
Transfer Capability with assumed generation at Fidler Substation	2022 SP with zero import	1290	1270
	2022 SL with 750 MW export	1860	1640

4.6 Summary

Detailed studies were performed on Chapel Rock Connection Alternatives 1 and 2 for study year 2022. Power flow and transient stability analysis were performed for Category A, Category B, and selected Category C conditions to ensure compliance with the Alberta Reliability Standards. Transmission system losses and transfer capabilities were compared between the two alternatives.

The results confirm that the both Chapel Rock Connection alternatives satisfy the Alberta Reliability Standards in the long-term. Transfer capabilities for the two alternatives are approximately equivalent except under summer light loading with high wind and maximum export conditions, during which Alternative 1 provides slightly higher transfer capability. The losses for both alternatives are approximately equivalent. Overall, the two Chapel Rock Connection alternatives are technically very similar and both are feasible from a technical perspective. Table 4-3 provides a summary of the comparative analysis.

Table 4-3: Comparison of Chapel Rock Connection Alternatives

Measure	Chapel Rock Connection Alternative 1 (North via Fidler)	Chapel Rock Connection Alternative 2 (South via CRR)
Alberta Reliability Standards	Satisfied	Satisfied (Category C mitigation may be required)
System Losses	Equivalent	Equivalent

Transfer Capability	Similar (slightly greater under high export conditions assuming future generation at Fidler substation)	Similar

5 CHAPEL ROCK CONNECTION ALTERNATIVE COMPARISON

Detailed technical evaluations were performed on each of the Chapel Rock Connection alternatives. The following section compares the two alternatives based on technical, economic and environmental/societal factors. Table 5-1 provides a summary of the comparison.

5.1 TECHNICAL COMPARISON

From a technical perspective, the results indicate that either of the Chapel Rock Connection alternatives satisfies the Alberta Reliability Standards in the long-term. Alternative 1 has a slight advantage over Alternative 2 with respect to Category C exposure and with respect to transfer capability under the 2022 summer light load conditions with maximum wind generation and maximum export conditions. With Alternative 2 up to 693 MW at Fidler substation may be lost under a double circuit contingency of 1071L/994L. Alberta Reliability Standards allow for the controlled loss of load or generation in response to Category C events provided there are no cascading outages of other system elements. The study has confirmed that the system remains stable under that double circuit contingency. Alternative 1 shows a slightly higher transfer capability in the North of Pincher Creek area under one of the four system scenarios assumed. This scenario assumes that all future wind generation beyond applied-for generation in the North of Pincher Creek area will flow through the Fidler substation. At present, three existing generation facilities and four future wind farms are planned to be connected through the Fidler substation. Discussions with wind developers have indicated that the Fidler area is approaching saturation with respect to wind power facility developments, so this scenario is considered to represent an extreme condition for planning purposes. Overall, the two Chapel Rock Connection alternatives are technically very similar and both are feasible from a technical perspective.

Discussions with wind developers regarding the potential for future wind development in the Pincher Creek area have indicated that future wind projects in the Pincher Creek area may be more likely to develop in the vicinity of Alternative 2 than in the vicinity of Alternative 1. From a long-term system development perspective, this indicates a slight advantage for Alternative 2 as it may provide better flexibility to accommodate future wind development in the area. However, given the uncertainty associated with future wind development, Alternative 1 would also provide adequate flexibility and is also a feasible alternative.

5.2 Economic Comparison

A present value analysis was not prepared because the two Chapel Rock Connection alternatives have equivalent economic lives and similar anticipated operating and maintenance costs so initial capital cost comparisons are adequate for comparative purposes.

The estimated losses associated with both alternatives are approximately equivalent, within the uncertainty of the analysis. Therefore, neither of the Chapel Rock Connection alternatives offers a loss savings benefit over the other.

The estimated capital cost of Alternative 2 is $8 million to $51 million lower than Alternative 1, making it the lower cost alternative.

5.3 Environmental/Societal Comparison

A Land Impact Assessment (LIA) was used to compare the two Chapel Rock Connection alternatives. The LIA was prepared by AltaLink at the direction of the AESO. These assessments are relatively coarse high-level indicators of potential land impacts based on currently available information and are not site-specific assessments. The specific determination of land impacts associated with transmission facility siting is completed during the facility application stage using more detailed environmental assessments.

The LIA indicates that both alternatives are feasible from land impact perspective and no factors have been identified in the LIA that preclude the development of either of the alternatives. However, compared to Alternative 2, Alternative 1 impacts more native vegetation due to its location and longer length, has greater river crossing impacts, and offers less potential to parallel existing linear disturbances in the vicinity. Based on these factors, Alternative 2 was determined to have lower overall potential environmental impacts than Alternative 1 and is better aligned with Section 15.1 of the Transmission Regulation which requires the AESO to consider maximizing the efficient use of rights of way when planning enhancements and upgrades to the transmission system. The LIA used for this comparison is presented as Attachment 6 to the AESO's Goose Lake to Chapel Rock Amendment to the SATR NID Approval, provided under separate cover.

The AESO also conducted a Participant Involvement Program (PIP) for this development pursuant to Commission Rule 007. Based on the feedback received in the open houses, the PIP indicates stakeholders were less opposed to Alternative 2 compared to Alternative 1. Also, discussions with municipal development planners and community organizations indicated more support for Alternative 2 over Alternative 1. For these reasons, Alternative 2 has a slight advantage over Alternative 1 from a stakeholder feedback perspective. A summary of the Participant Involvement Program is presented in Attachment 7 of the AESO's Goose Lake to Chapel Rock Amendment to the SATR NID Approval.

5.4 Alternative Comparison Summary

While both of Chapel Rock Connection alternatives are technically feasible and satisfy Alberta Reliability Standards, Alternative 2 is the preferred alternative due to lower capital costs, lower land impacts, better geographic alignment with potential future wind development and less stakeholder opposition. Table 5-1 summarizes the results of the Chapel Rock Connection alternative comparison.

Table 5-1: Comparison of Chapel Rock Connection alternatives

Measure	Chapel Rock Connection Alternative 1 (North via Fidler)	Chapel Rock Connection Alternative 2 (South via CRR)
Technical Factors		
Alberta Reliability Standards	Satisfied	Satisfied (Category C mitigation may be required)
Transfer Capability 2022 SP/zero import/all generation at Goose Lake	1260 MW	1260 MW
Transfer Capability 2022 SL/maximum export/ all generation at Goose Lake	1820 MW	1810 MW
Transfer Capability 2022 SP/zero import/all generation at Fidler	1290 MW	1270 MW
Transfer Capability 2022 SL/maximum export/ all generation at Fidler	1860 MW	1640 MW
Flexibility to Accommodate Future Development	Adequate	Good
Economic Factors		

System Losses 2022 SP	57 MW	57 MW
System Losses 2022 SL	51 MW	50 MW
NID Level Cost Estimates (+30/-30%, 2016$)	$331 M to $363 M	$311 M to $323 M (Lower by $8M to $51M)
Environmental/Societal Factors		
Land Impact Assessment	Feasible	Feasible (Lower native vegetation impacts, more opportunity to parallel existing linear disturbances)
Stakeholder Feedback	More opposed	Less opposed

6 RECOMMENDED ALTERNATIVE

Two alternatives were evaluated for the planned 240 kV double circuit line between Goose Lake 103S substation to the new Chapel Rock substation planned as part of SATR. In Alternative 1, the 240 kV double circuit line connects the proposed Fidler 312S before terminating at the new Chapel Rock substation while the Chapel Rock substation connects to the existing Castle Rock Ridge 205S substation with Alternative 2.

Detailed engineering evaluations determined that the two alternatives are technically very similar and both are feasible. Further, these evaluations indicate that the functionality of the Fidler 312S substation will not be materially affected by the selection of either Chapel Rock Connection alternative.

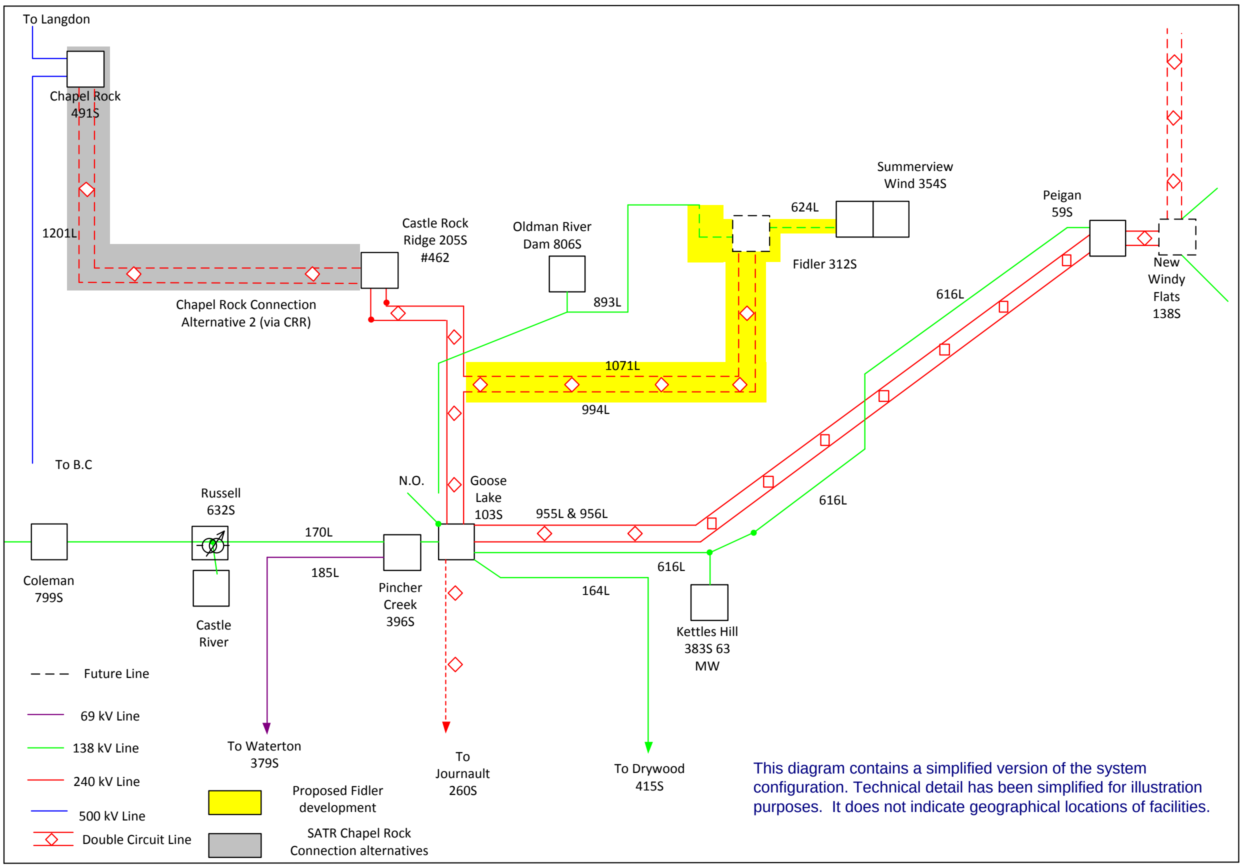
The estimated capital cost of Alternative 2 is $8M to $51M lower than Alternative 1, making it the lower cost alternative. The losses for both alternatives are approximately equivalent.

The NID level LIA indicates that both alternatives are feasible. However, Alternative 2 was judged to have lower land use impacts than Alternative 1 as it may impact less native vegetation due to its location and shorter length and it offers greater potential to parallel existing linear disturbances in the vicinity.

The Participant Involvement Program indicated that stakeholders were less opposed to Alternative 2 than Alternative 1.

Based on the comparative evaluation of technical, economic, and environmental factors and stakeholder input, the AESO has recommended Alternative 2 – Goose Lake 103S to Chapel Rock 491S via Castle Rock Ridge 205S substation as the preferred alternative. Figure 6-1 shows the preferred Chapel Rock Connection alternative.

Figure 6-1: The Preferred Chapel Rock Connection Alternative – Via Castle Rock Ridge



ATTACHMENT A
Power Flow Analysis(Year 2022)

Table A-1 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-1-1	2022 SP	A	Alternative 1	Base Case (N - 0)	None	None
Figure C-1-2	2022 SP	B	Alternative 1	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-1-3	2022 SP	B	Alternative 1	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-1-4	2022 SP	B	Alternative 1	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-1-5	2022 SP	B	Alternative 1	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-1-6	2022 SP	B	Alternative 1	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-1-7	2022 SP	B	Alternative 1	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-1-8	2022 SP	B	Alternative 1	1004L 240kV line (Chapel Rock 491S to Fidler 312S)	None	None
Figure C-1-9	2022 SP	B	Alternative 1	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-1-10	2022 SP	B	Alternative 1	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-1-11	2022 SP	B	Alternative 1	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-1-12	2022 SP	B	Alternative 1	Peigan 59S 240/138 kV transformer	None	None
Figure C-1-13	2022 SP	B	Alternative 1	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-1-14	2022 SP	B	Alternative 1	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-1-15	2022 SP	B	Alternative 1	170L 138kV line (Russell 632S to Coleman 799S)	None	None

Figure C-1-16	2022 SP	C	Alternative 1	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	138 kV 616L from Goose Lake to Peigan (can be addressed by transfer tripping 138 kV 616L from Goose Lake to Kettles Hill)	None
Figure C-1-17	2022 SP	C	Alternative 1	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None*	None
Figure C-1-18	2022 SP	C	Alternative 1	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-1-19	2022 SP	C	Alternative 1	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None	None
Figure C-1-20	2022 SP	C	Alternative 1	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-1-21	2022 SP	C	Alternative 1	992L/1004L 240kV D/C (Fidler 312S to Chapel Rock 491S)	None	None

* Glenwood area 69 kV system overloading under C5 can be addressed by mitagation measures.

Table A-2 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-2-1	2022 SP- 400 import	A	Alternative 1	Base Case (N - 0)	None	None
Figure C-2-2	2022 SP- 400 import	B	Alternative 1	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-2-3	2022 SP- 400 import	B	Alternative 1	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-2-4	2022 SP- 400 import	B	Alternative 1	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-2-5	2022 SP- 400 import	B	Alternative 1	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-2-6	2022 SP- 400 import	B	Alternative 1	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-2-7	2022 SP- 400 import	B	Alternative 1	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-2-8	2022 SP- 400 import	B	Alternative 1	1004L 240kV line (Chapel Rock 491S to Fidler 312S)	None	None
Figure C-2-9	2022 SP- 400 import	B	Alternative 1	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-2-10	2022 SP- 400 import	B	Alternative 1	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-2-11	2022 SP- 400 import	B	Alternative 1	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-2-12	2022 SP- 400 import	B	Alternative 1	Peigan 59S 240/138 kV transformer	None	None
Figure C-2-13	2022 SP- 400 import	B	Alternative 1	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-2-14	2022 SP- 400 import	B	Alternative 1	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-2-15	2022 SP- 400 import	B	Alternative 1	170L 138kV line (Russell 632S to Coleman 799S)	None	None

Figure C-2-16	2022 SP- 400 import	C	Alternative 1	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	616L and Peigan 240/138 transformer (can be addressed by transfer tripping 138 kV 616L from Goose Lake to Kettles Hill)	None
Figure C-2-17	2022 SP- 400 import	C	Alternative 1	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None*	None
Figure C-2-18	2022 SP- 400 import	C	Alternative 1	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-2-19	2022 SP- 400 import	C	Alternative 1	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None	None
Figure C-2-20	2022 SP- 400 import	C	Alternative 1	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-2-21	2022 SP- 400 import	C	Alternative 1	992L/1004L 240kV D/C (Fidler 312S to Chapel Rock 491S)	None	None

* Glenwood area 69 kV system overloading under C5 can be addressed by mitagation measures.

Table A-3 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-3-1	2022 SL	A	Alternative 1	Base Case (N - 0)	None	None
Figure C-3-2	2022 SL	B	Alternative 1	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-3-3	2022 SL	B	Alternative 1	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-3-4	2022 SL	B	Alternative 1	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-3-5	2022 SL	B	Alternative 1	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-3-6	2022 SL	B	Alternative 1	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-3-7	2022 SL	B	Alternative 1	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-3-8	2022 SL	B	Alternative 1	1004L 240kV line (Chapel Rock 491S to Fidler 312S)	None	None
Figure C-3-9	2022 SL	B	Alternative 1	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-3-10	2022 SL	B	Alternative 1	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-3-11	2022 SL	B	Alternative 1	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-3-12	2022 SL	B	Alternative 1	Peigan 59S 240/138 kV transformer	None	None
Figure C-3-13	2022 SL	B	Alternative 1	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-3-14	2022 SL	B	Alternative 1	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-3-15	2022 SL	B	Alternative 1	170L 138kV line (Russell 632S to Coleman 799S)	None	None
Figure C-3-16	2022 SL	C	Alternative 1	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	None	None

Figure C-3-17	2022 SL	C	Alternative 1	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None	None
Figure C-3-18	2022 SL	C	Alternative 1	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-3-19	2022 SL	C	Alternative 1	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None	None
Figure C-3-20	2022 SL	C	Alternative 1	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-3-21	2022 SL	C	Alternative 1	992L/1004L 240kV D/C (Fidler 312S to Chapel Rock 491S)	None	None

Table A-4 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-4-1	2022 SP	A	Alternative 2	Base Case (N - 0)	None	None
Figure C-4-2	2022 SP	B	Alternative 2	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-4-3	2022 SP	B	Alternative 2	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-4-4	2022 SP	B	Alternative 2	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-4-5	2022 SP	B	Alternative 2	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-4-6	2022 SP	B	Alternative 2	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-4-7	2022 SP	B	Alternative 2	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-4-8	2022 SP	B	Alternative 2	1004L 240kV line (Chapel Rock 491S to CRR 205S)	None	None
Figure C-4-9	2022 SP	B	Alternative 2	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-4-10	2022 SP	B	Alternative 2	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-4-11	2022 SP	B	Alternative 2	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-4-12	2022 SP	B	Alternative 2	Peigan 59S 240/138 kV transformer	None	None
Figure C-4-13	2022 SP	B	Alternative 2	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-4-14	2022 SP	B	Alternative 2	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-4-15	2022 SP	B	Alternative 2	170L 138kV line (Russell 632S to Coleman 799S)	None	None

Figure C-4-16	2022 SP	C	Alternative 2	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	138 kV 616L from Goose Lake to Peigan (can be addressed by transfer tripping 138 kV 616L from Goose Lake to Kettles Hill)	None
Figure C-4-17	2022 SP	C	Alternative 2	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None*	None
Figure C-4-18	2022 SP	C	Alternative 2	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-4-19	2022 SP	C	Alternative 2	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None (Losing all generation at Fidler 312S)	None
Figure C-4-20	2022 SP	C	Alternative 2	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-4-21	2022 SP	C	Alternative 2	992L/1004L 240kV D/C (CCR 205S to Chapel Rock 491S)	None	None

* Glenwood area 69 kV system overloading under C5 can be addressed by mitagation measures.

Table A-5 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-5-1	2022 SP- 400 import	A	Alternative 2	Base Case (N - 0)	None	None
Figure C-5-2	2022 SP- 400 import	B	Alternative 2	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-5-3	2022 SP- 400 import	B	Alternative 2	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-5-4	2022 SP- 400 import	B	Alternative 2	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-5-5	2022 SP- 400 import	B	Alternative 2	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-5-6	2022 SP- 400 import	B	Alternative 2	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-5-7	2022 SP- 400 import	B	Alternative 2	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-5-8	2022 SP- 400 import	B	Alternative 2	1004L 240kV line (Chapel Rock 491S to CRR 205S)	None	None
Figure C-5-9	2022 SP- 400 import	B	Alternative 2	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-5-10	2022 SP- 400 import	B	Alternative 2	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-5-11	2022 SP- 400 import	B	Alternative 2	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-5-12	2022 SP- 400 import	B	Alternative 2	Peigan 59S 240/138 kV transformer	None	None
Figure C-5-13	2022 SP- 400 import	B	Alternative 2	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-5-14	2022 SP- 400 import	B	Alternative 2	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-5-15	2022 SP- 400 import	B	Alternative 2	170L 138kV line (Russell 632S to Coleman 799S)	None	None

Figure C-5-16	2022 SP- 400 import	C	Alternative 2	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	616L and Peigan 240/138 transformer (can be addressed by transfer tripping 138 kV 616L from Goose Lake to Kettles Hill)	None
Figure C-5-17	2022 SP- 400 import	C	Alternative 2	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None*	None
Figure C-5-18	2022 SP- 400 import	C	Alternative 2	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-5-19	2022 SP- 400 import	C	Alternative 2	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None (Losing all generation at Fidler 312S)	None
Figure C-5-20	2022 SP- 400 import	C	Alternative 2	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-5-21	2022 SP- 400 import	C	Alternative 2	992L/1004L 240kV D/C (CCR 205S to Chapel Rock 491S)	None	None

* Glenwood area 69 kV system overloading under C5 can be addressed by mitagation measures.

Table A-6 Power Flow Analysis Summary- 2022

Figure Number	System Condition	Category	Alternative	Contingency	Thermal Violation	Voltage Violation
Figure C-6-1	2022 SL	A	Alternative 2	Base Case (N - 0)	None	None
Figure C-6-2	2022 SL	B	Alternative 2	955L 240kV line (Goose Lake 103S to Peigan 59S)	None	None
Figure C-6-3	2022 SL	B	Alternative 2	1048L 240kV line (Peigan 59S to Windy Flats 138S)	None	None
Figure C-6-4	2022 SL	B	Alternative 2	1072L 240kV line (Goose Lake 103S to HYW785)	None	None
Figure C-6-5	2022 SL	B	Alternative 2	1072L 240kV line (CRR 205S to HYW785)	None	None
Figure C-6-6	2022 SL	B	Alternative 2	994L 240kV line (Goose Lake 103S to Fidler 312S)	None	None
Figure C-6-7	2022 SL	B	Alternative 2	1071L 240kV line (CRR 205S to Fidler 312S)	None	None
Figure C-6-8	2022 SL	B	Alternative 2	1004L 240kV line (Chapel Rock 491S to CRR 205S)	None	None
Figure C-6-9	2022 SL	B	Alternative 2	1037L 240kV line (Foothills 237S to Windy Flats 138S)	None	None
Figure C-6-10	2022 SL	B	Alternative 2	Chapel Rock 491S 500/240 kV transformer	None	None
Figure C-6-11	2022 SL	B	Alternative 2	1201 5000kV line (Chapel Rock 491S to Langdon)	None	None
Figure C-6-12	2022 SL	B	Alternative 2	Peigan 59S 240/138 kV transformer	None	None
Figure C-6-13	2022 SL	B	Alternative 2	Goose Lake 103S 240/138 kV transformer	None	None
Figure C-6-14	2022 SL	B	Alternative 2	170L 138kV line (Russell 632S to Pincher Creek 396S)	None	None
Figure C-6-15	2022 SL	B	Alternative 2	170L 138kV line (Russell 632S to Coleman 799S)	None	None
Figure C-6-16	2022 SL	C	Alternative 2	955L/956L 240kV D/C (Goose Lake 103S to Peigan 59S)	None	None

Figure C-6-17	2022 SL	C	Alternative 2	1048L/1049L 240kV D/C (Peigan 59S to Windy Flats 138S)	None	None
Figure C-6-18	2022 SL	C	Alternative 2	994L/1072L 240kV D/C (Goose Lake 103S to Fidler 312S and CCR 205S)	None	None
Figure C-6-19	2022 SL	C	Alternative 2	994L/1071L 240kV D/C (Fidler 312S to Goose Lake 103S and CCR 205S)	None (Losing all generation at Fidler 312S)	None
Figure C-6-20	2022 SL	C	Alternative 2	1037L/1038L 240kV D/C (Foothills 237S to Windy Flats 138S)	None	None
Figure C-6-21	2022 SL	C	Alternative 2	992L/1004L 240kV D/C (CCR 205S to Chapel Rock 491S)	None	None

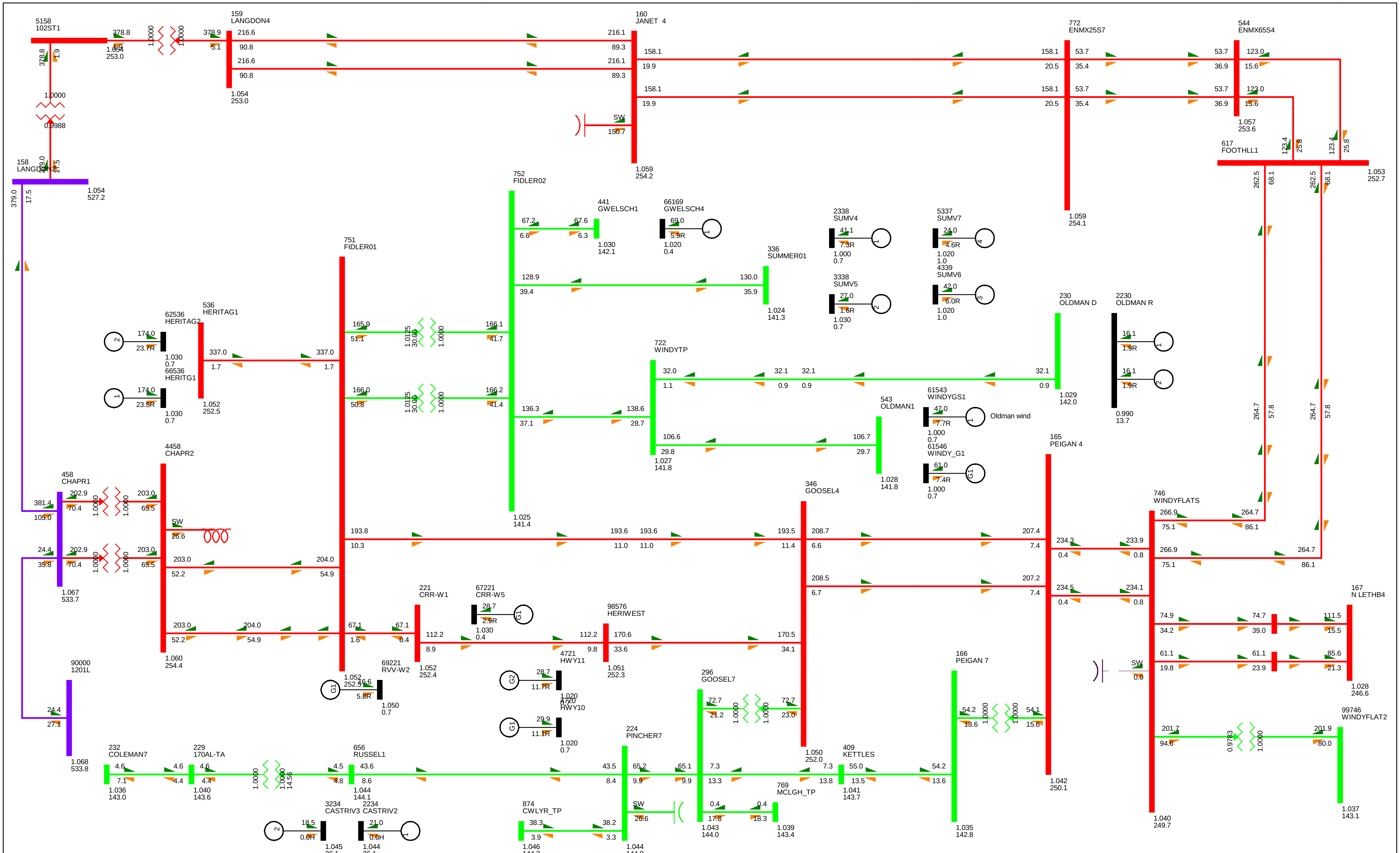


FIGURE C-1-1 - SYSTEM NORMAL
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

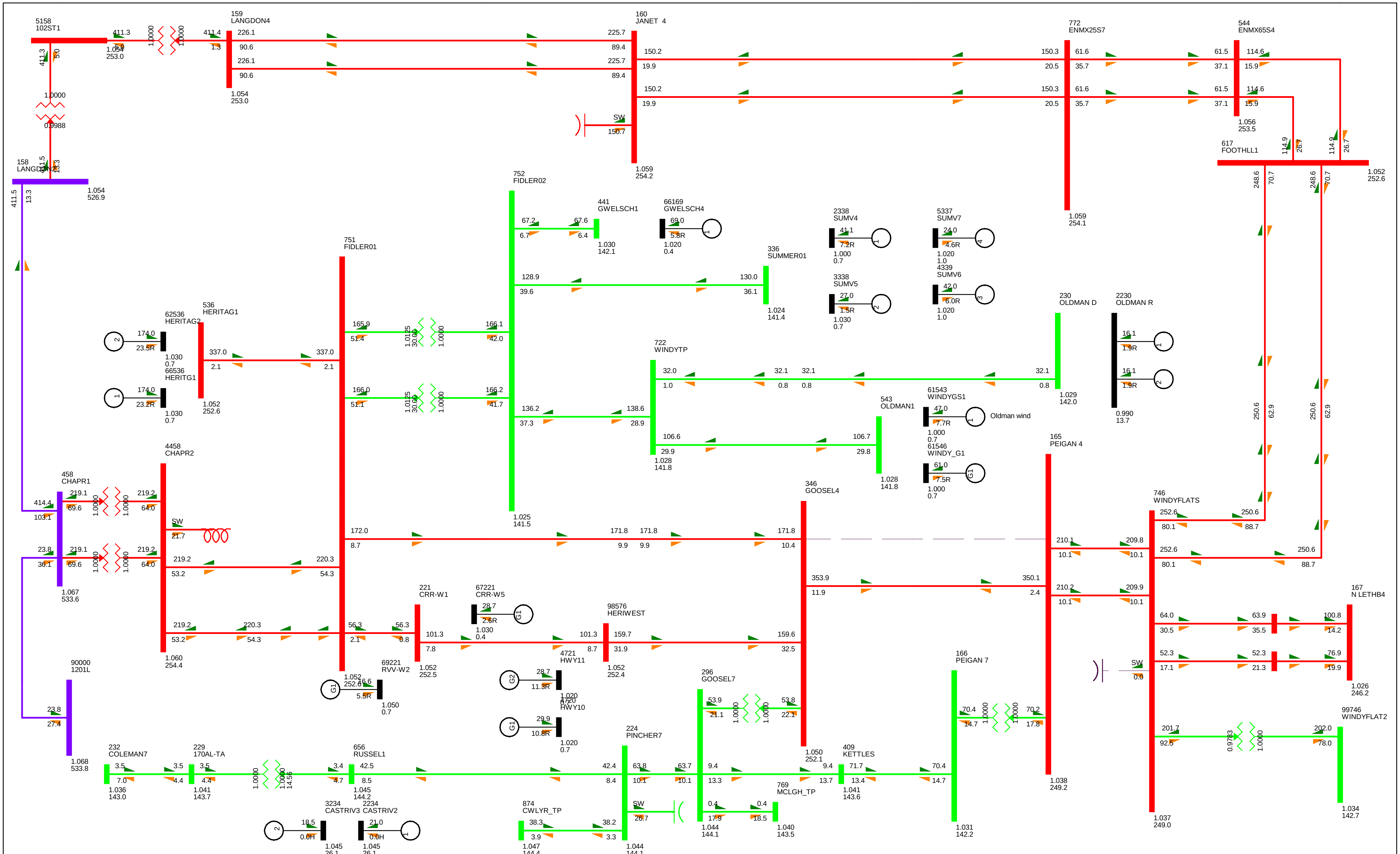


FIGURE C-1-2 - CONTINGENCY 955L
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 2.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

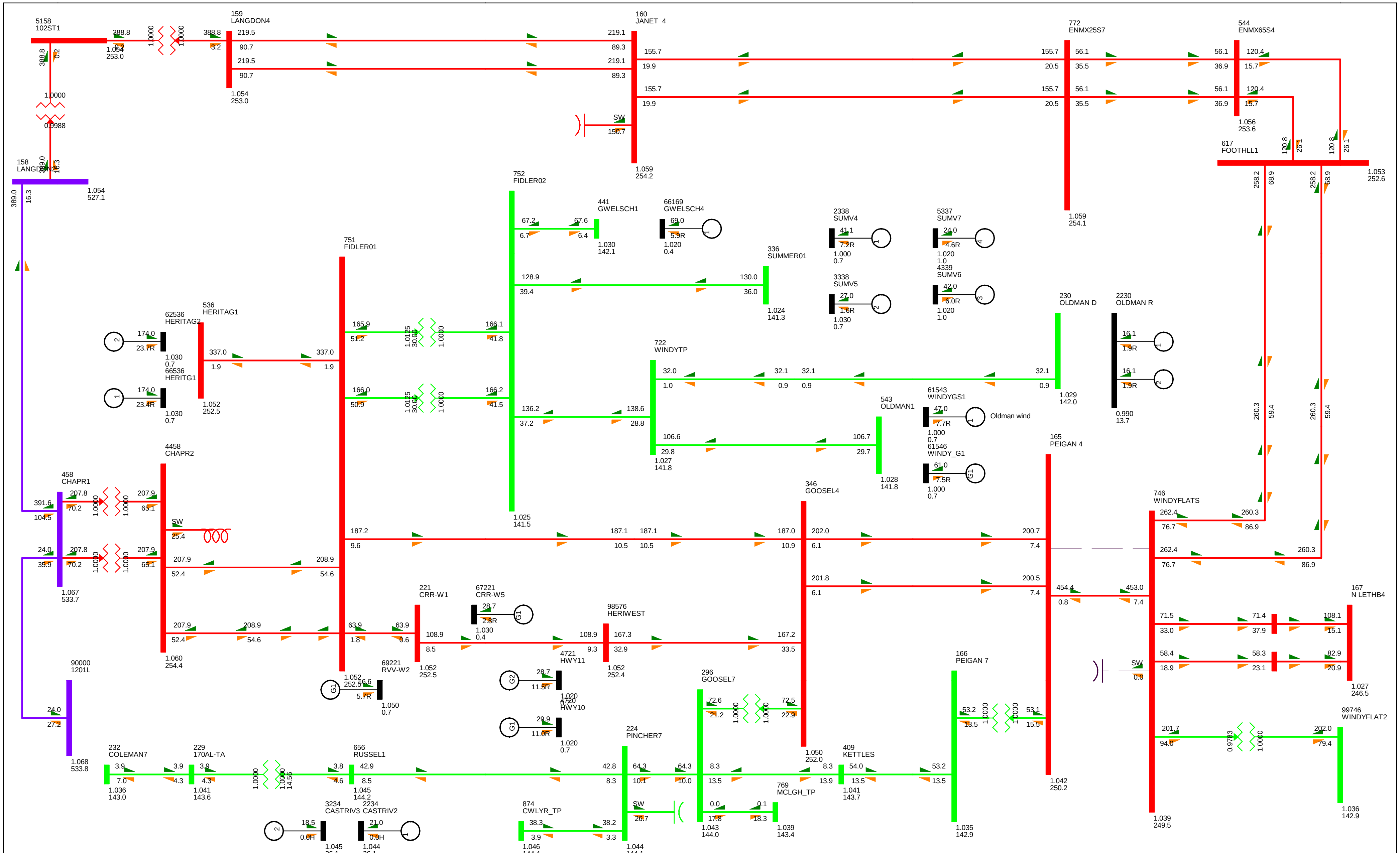


FIGURE C-1-3 - CONTINGENCY 1048L
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

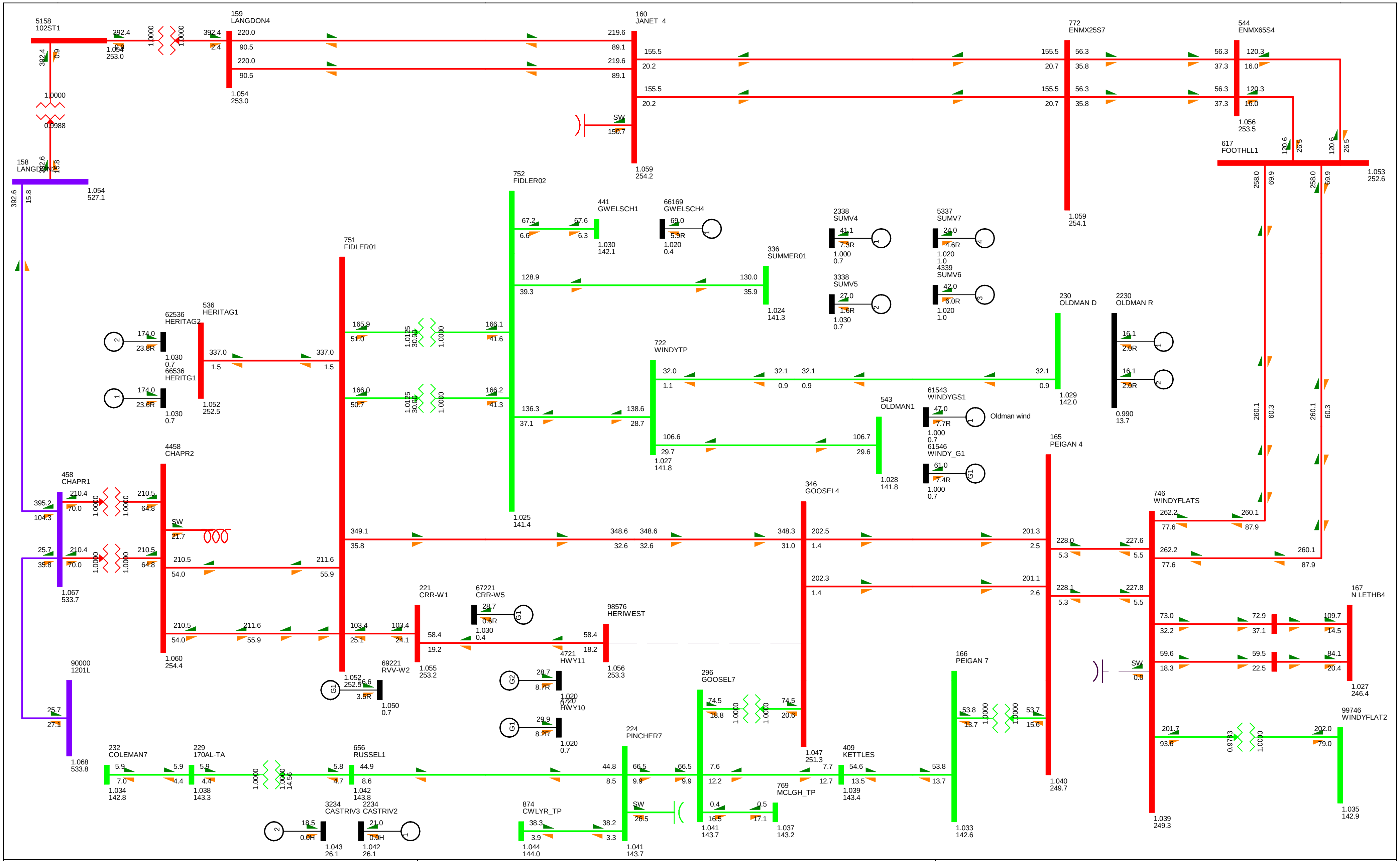


FIGURE C-1-4 - CONTINGENCY 1072L
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

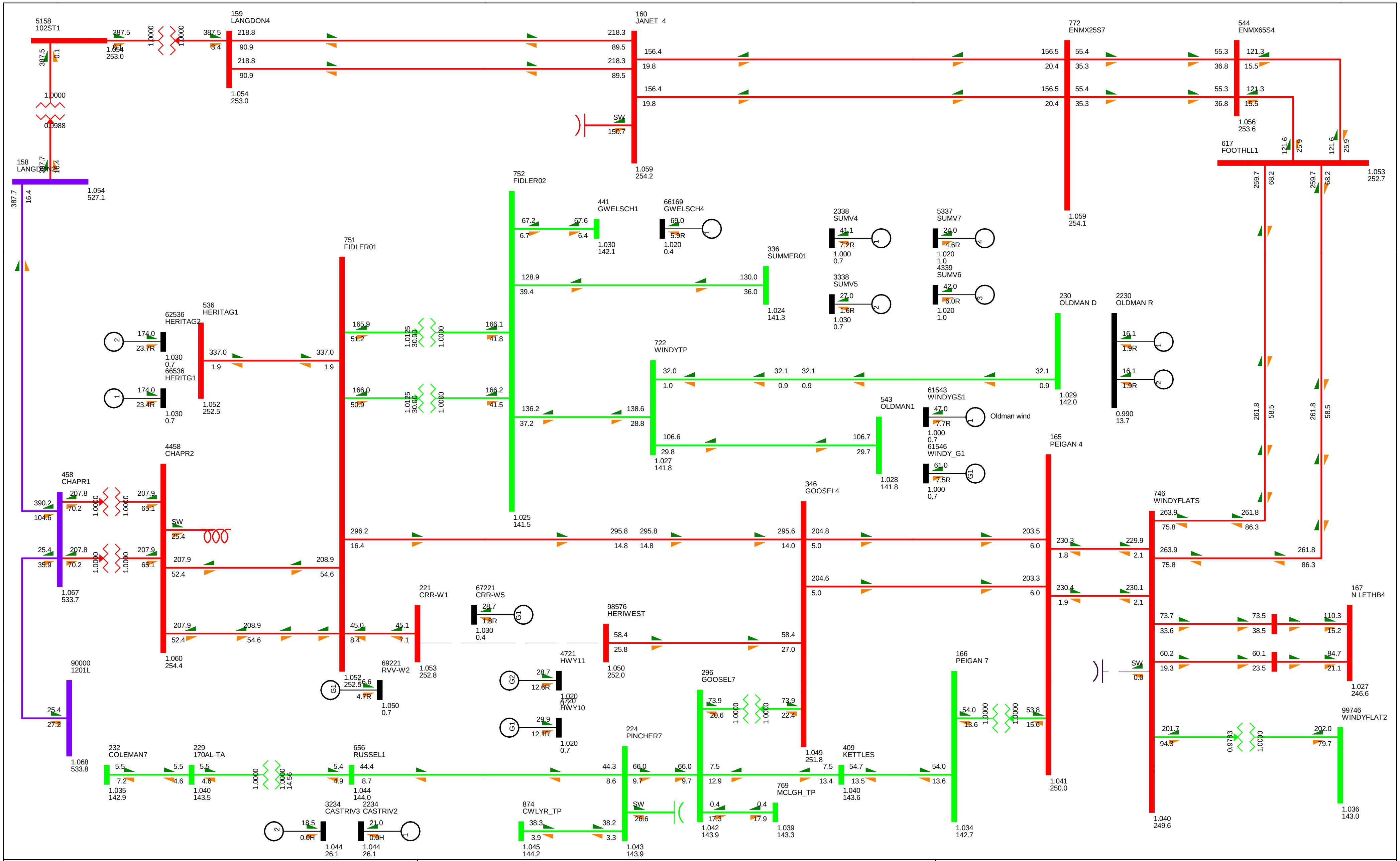


FIGURE C-1-5 - CONTINGENCY 1072LCTOH
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

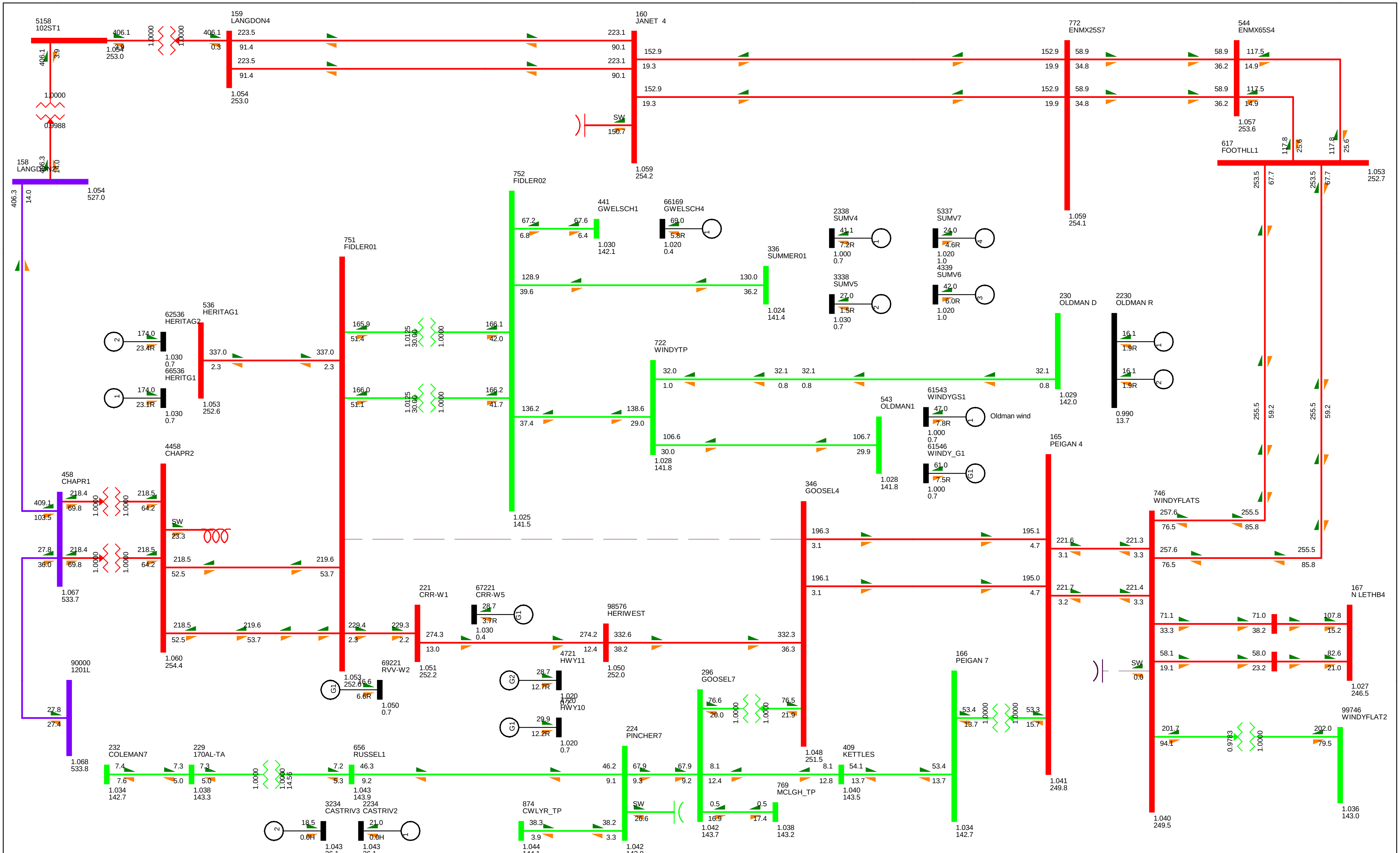


FIGURE C-1-6 - CONTINGENCY 994L
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

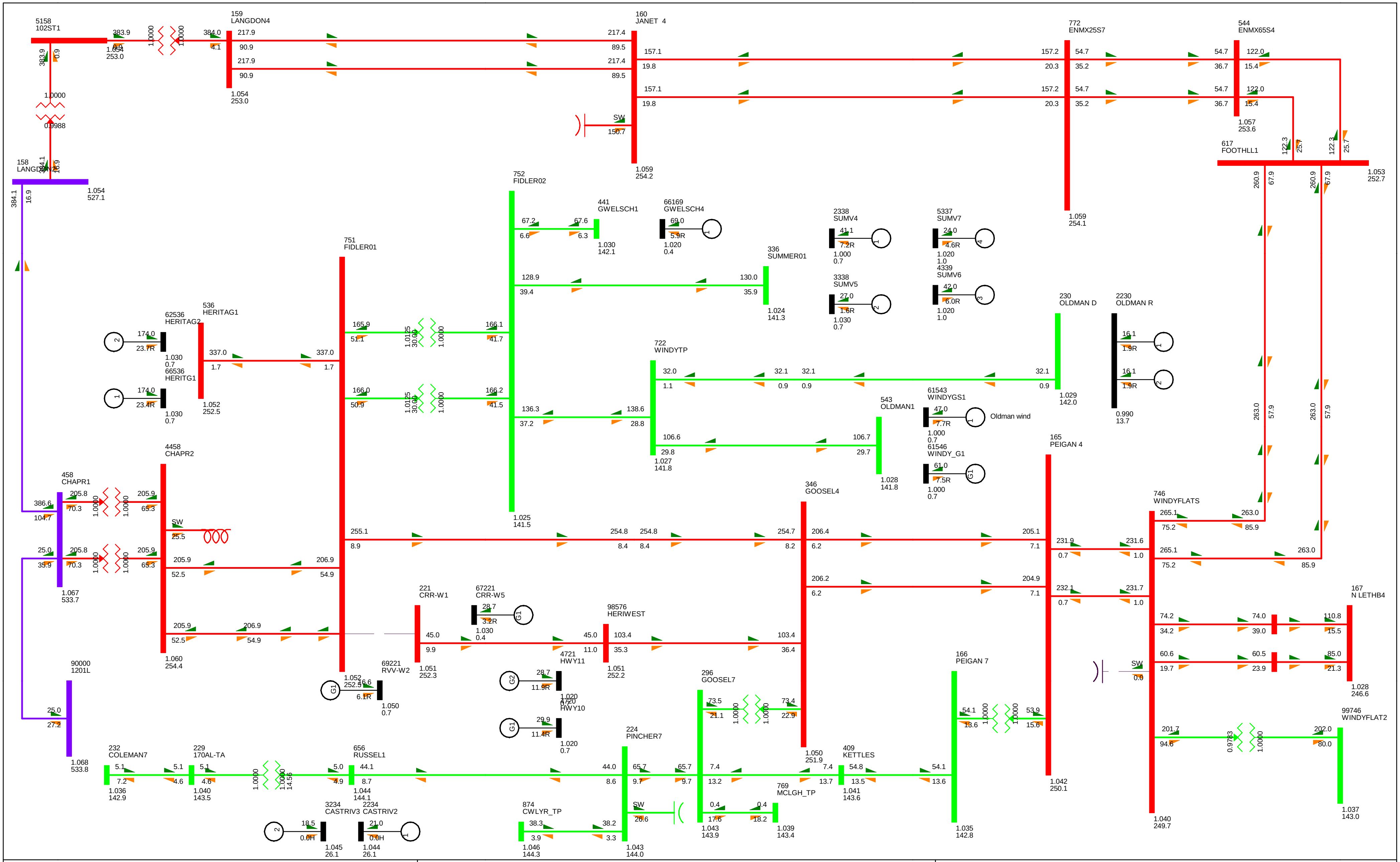


FIGURE C-1-7 - CONTINGENCY 1071L
2022 SP ALT1
WED, JUN 27 2012 1:30

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

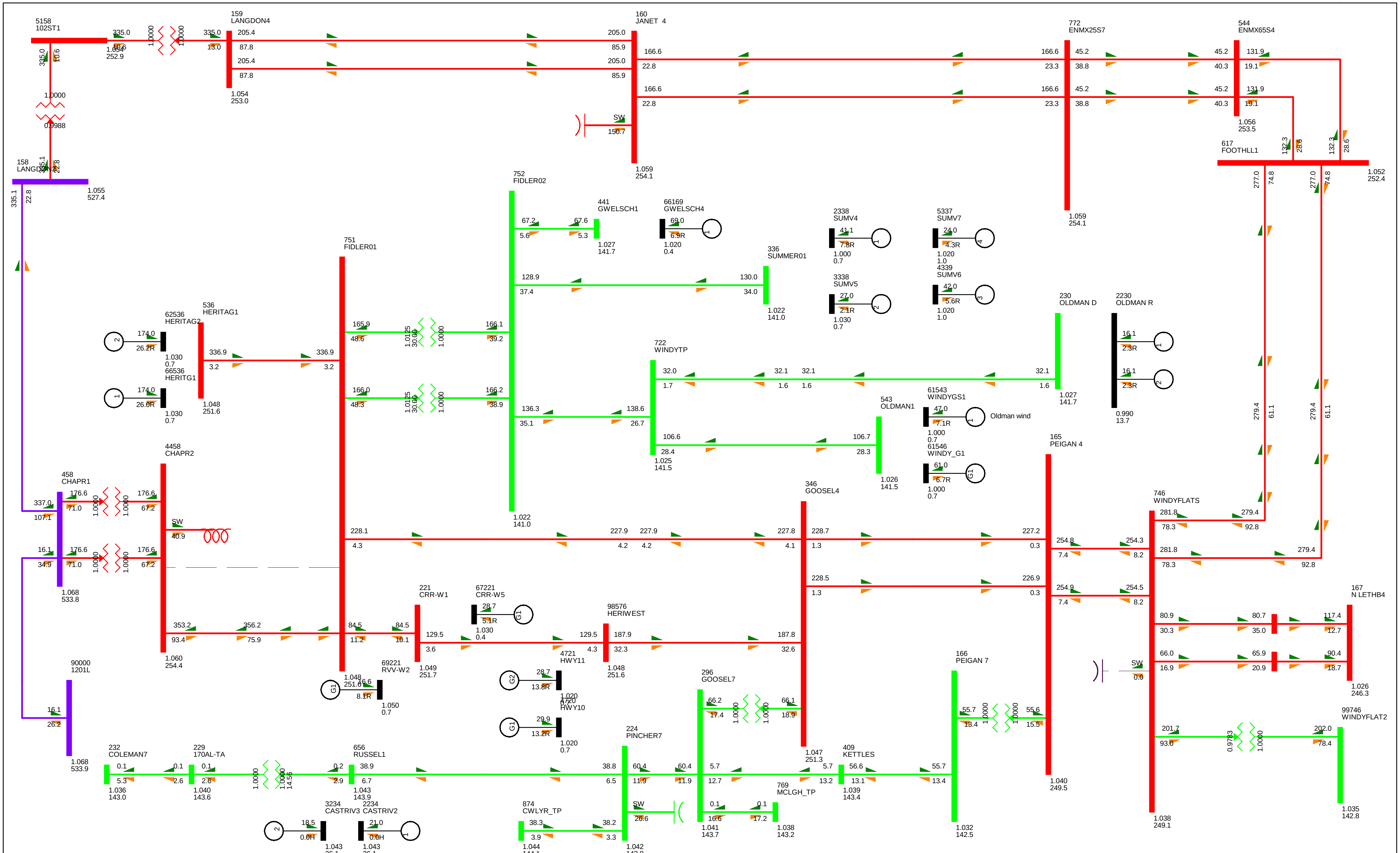


FIGURE C-1-8 - CONTINGENCY 1004L
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 0.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

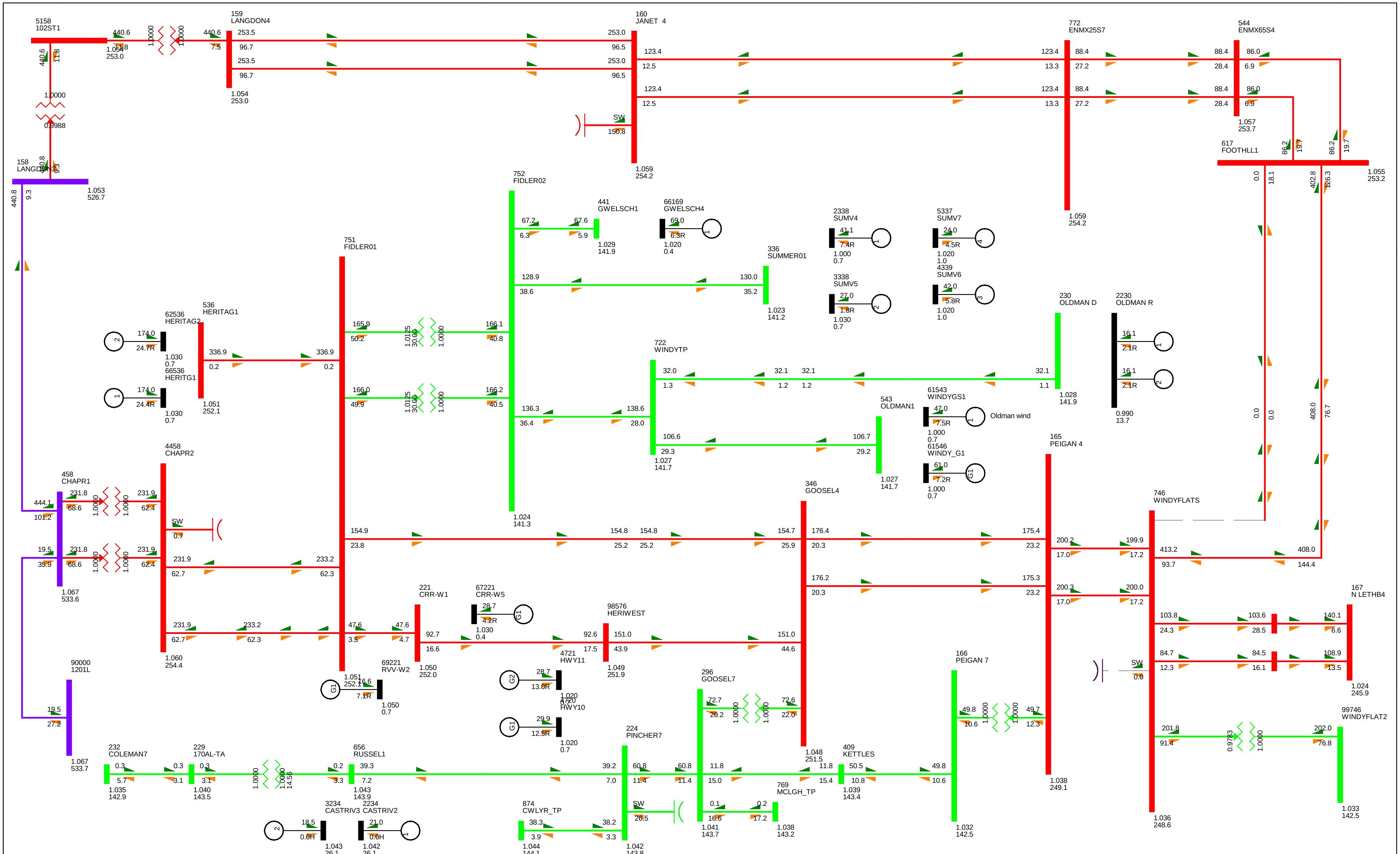


FIGURE C-1-9 - CONTINGENCY 1037L
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -1.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

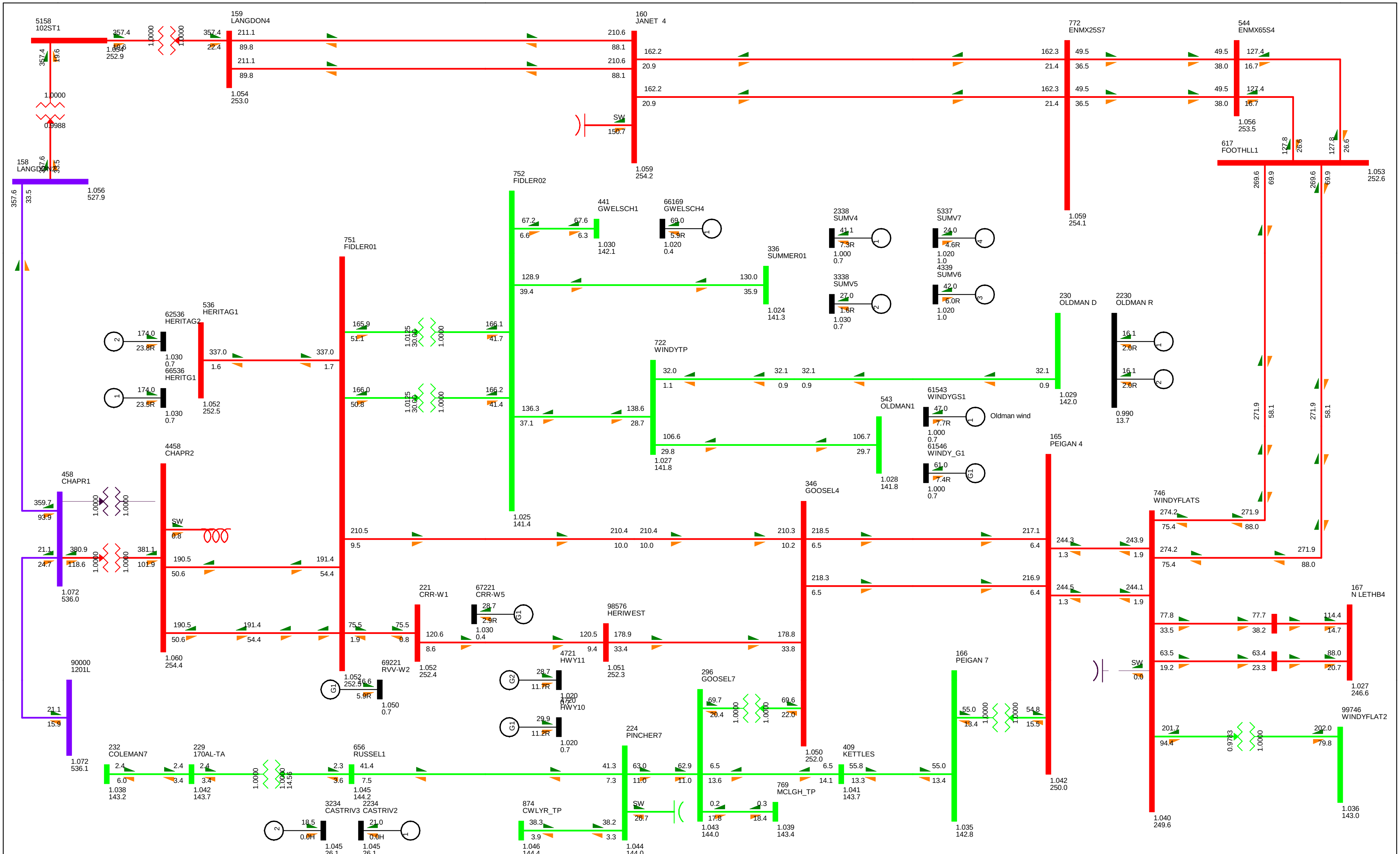


FIGURE C-1-10 - CONTINGENCY CHAPELXMER
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

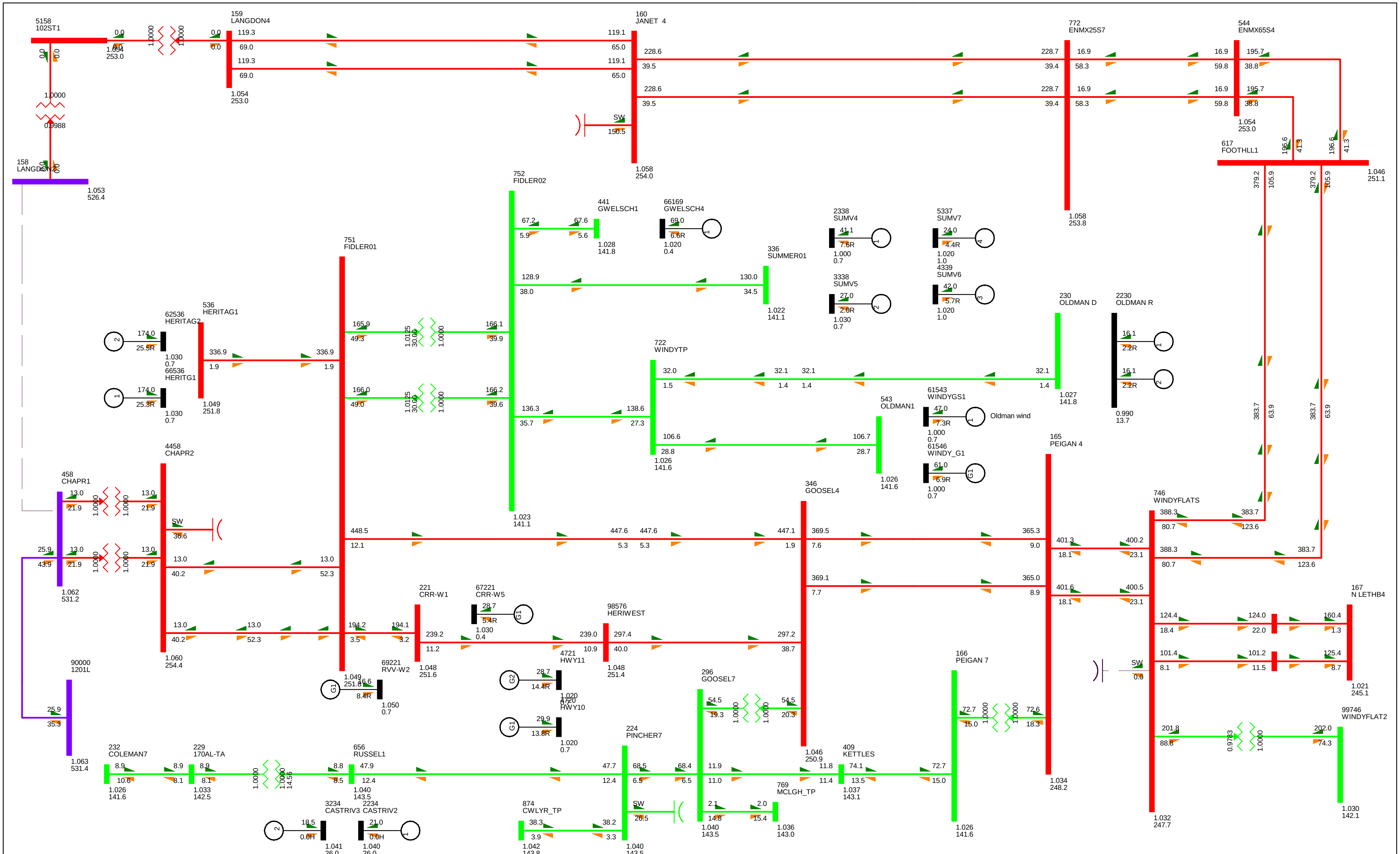


FIGURE C-1-11 - CONTINGENCY 1201L
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -20.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

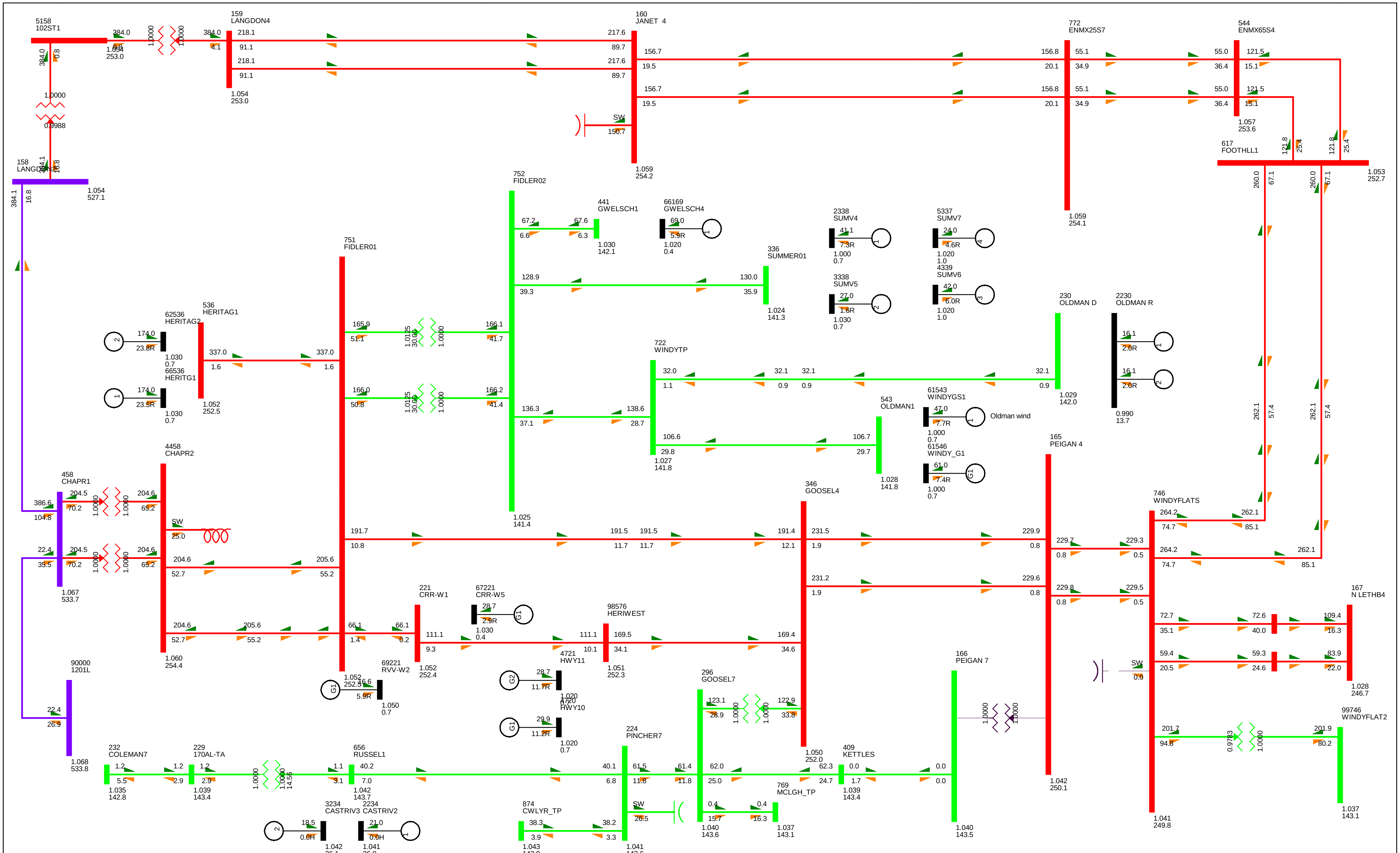


FIGURE C-1-12 - CONTINGENCY PEIXMER
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

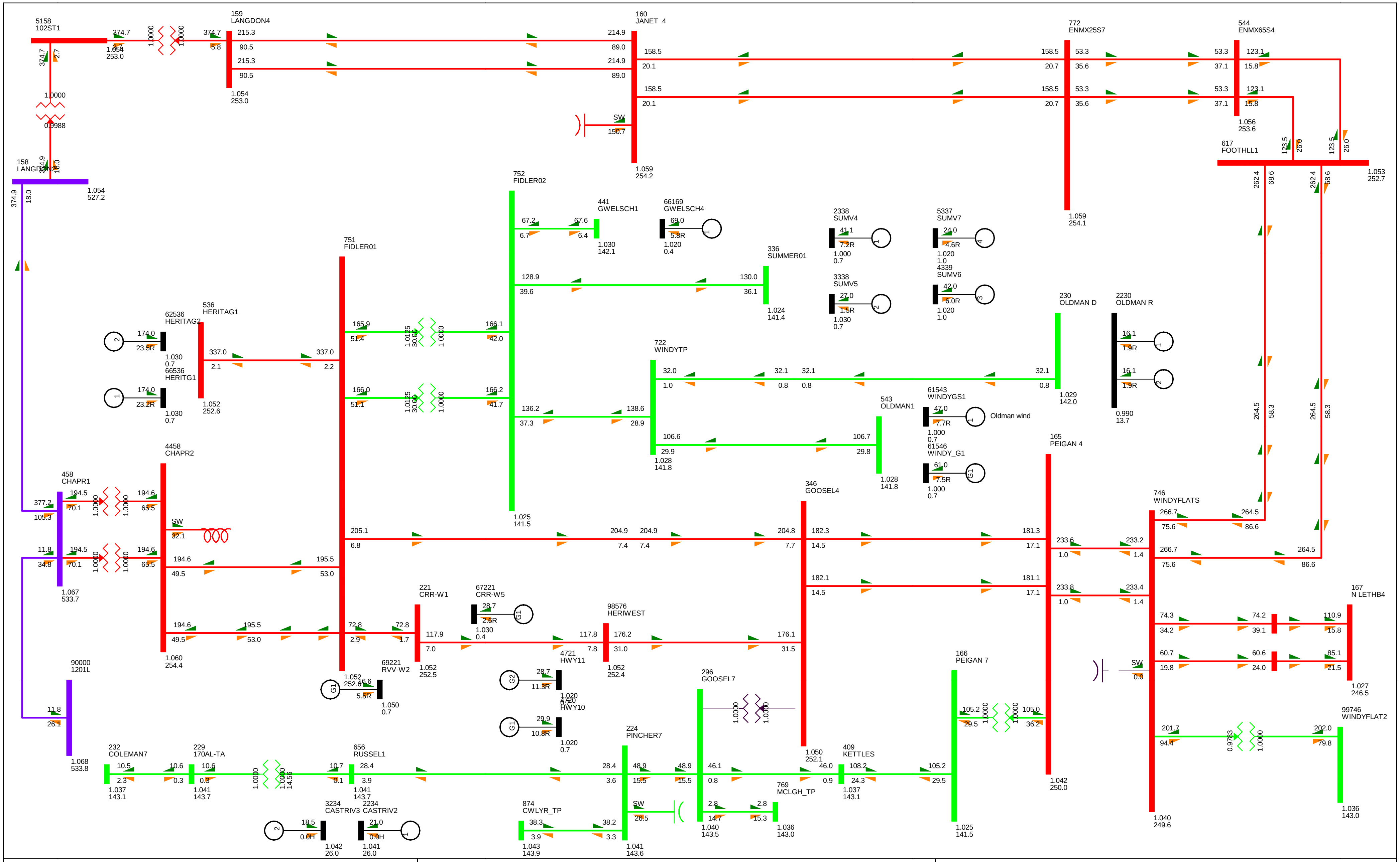


FIGURE C-1-13 - CONTINGENCY GLXMER
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

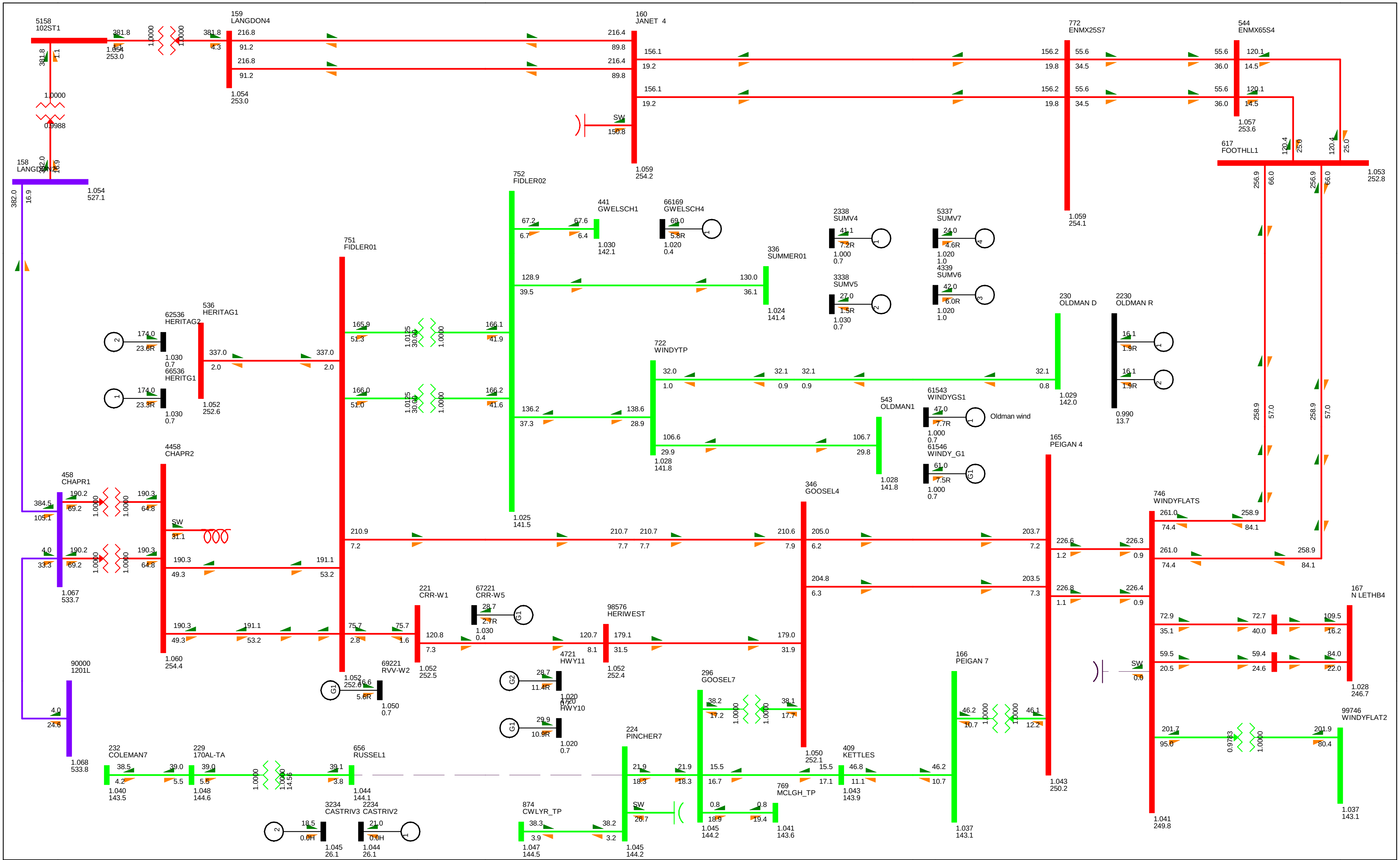


FIGURE C-1-14 - CONTINGENCY 170LRTOPC
2022 SP ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 4.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

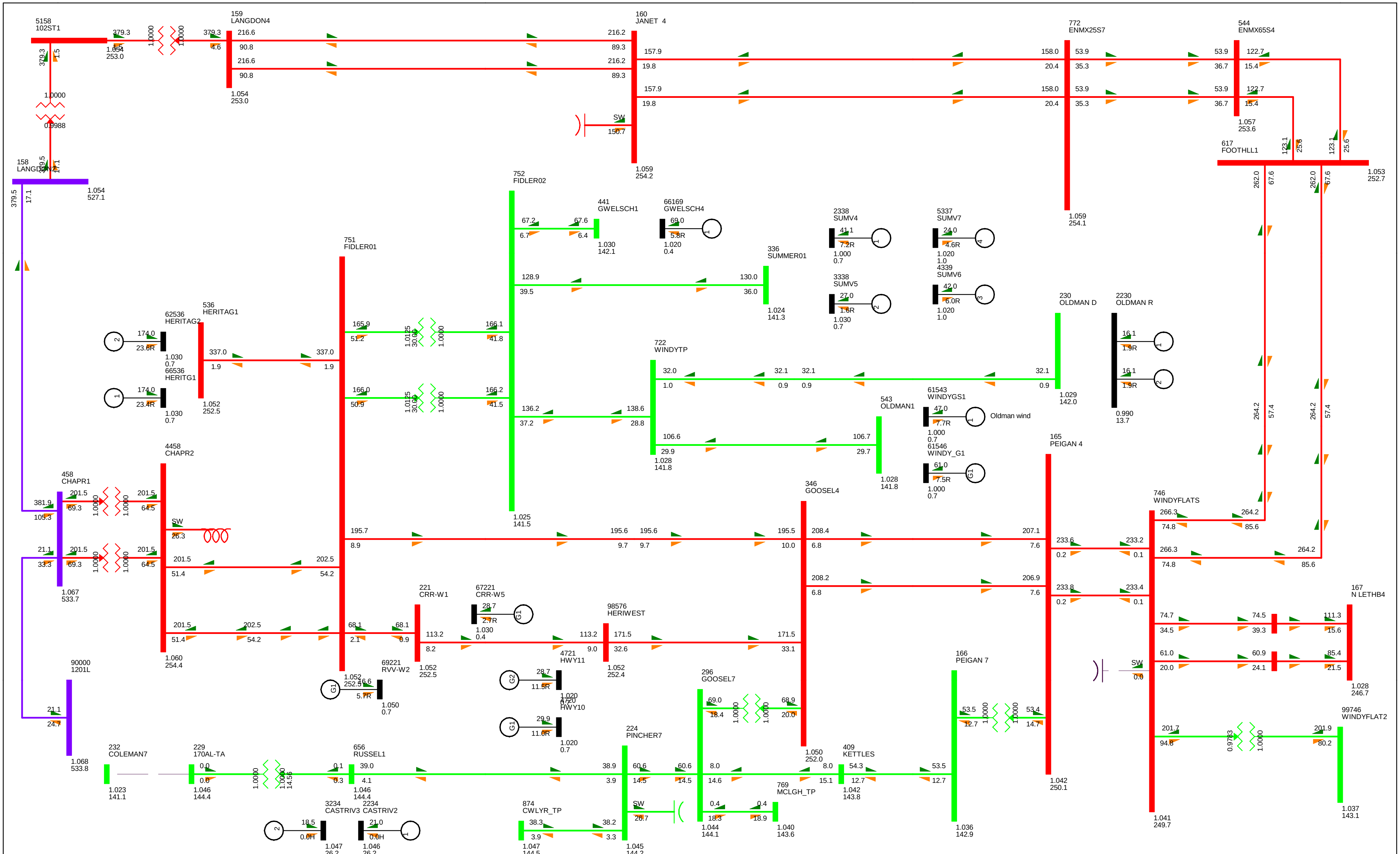


FIGURE C-1-15 - CONTINGENCY 170LRTOC 2022 SP ALT1 WED, JUN 27 2012 1:31	**Fidler Connection**	Bus - VOLTAGE (kV/PU) Branch - MW/Mvar Equipment - MW/Mvar 100.0%RATEA 1.120OV 0.950UV kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000	BC Export : 4.2 MW SA Export : -0.1 MW MH Export : 0.0 MW

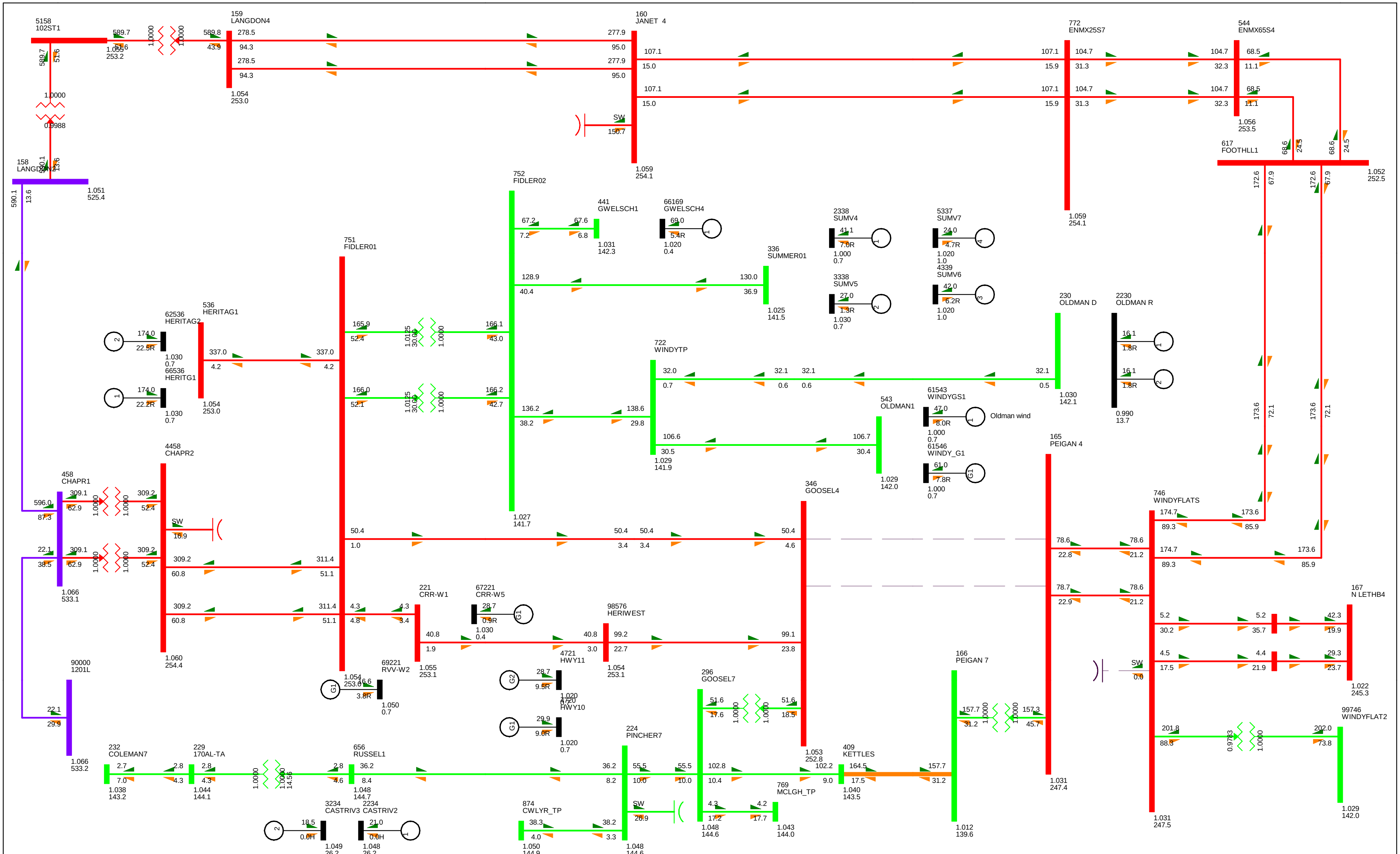


FIGURE C-1-16 - CONTINGENCY 95556L
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -2.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

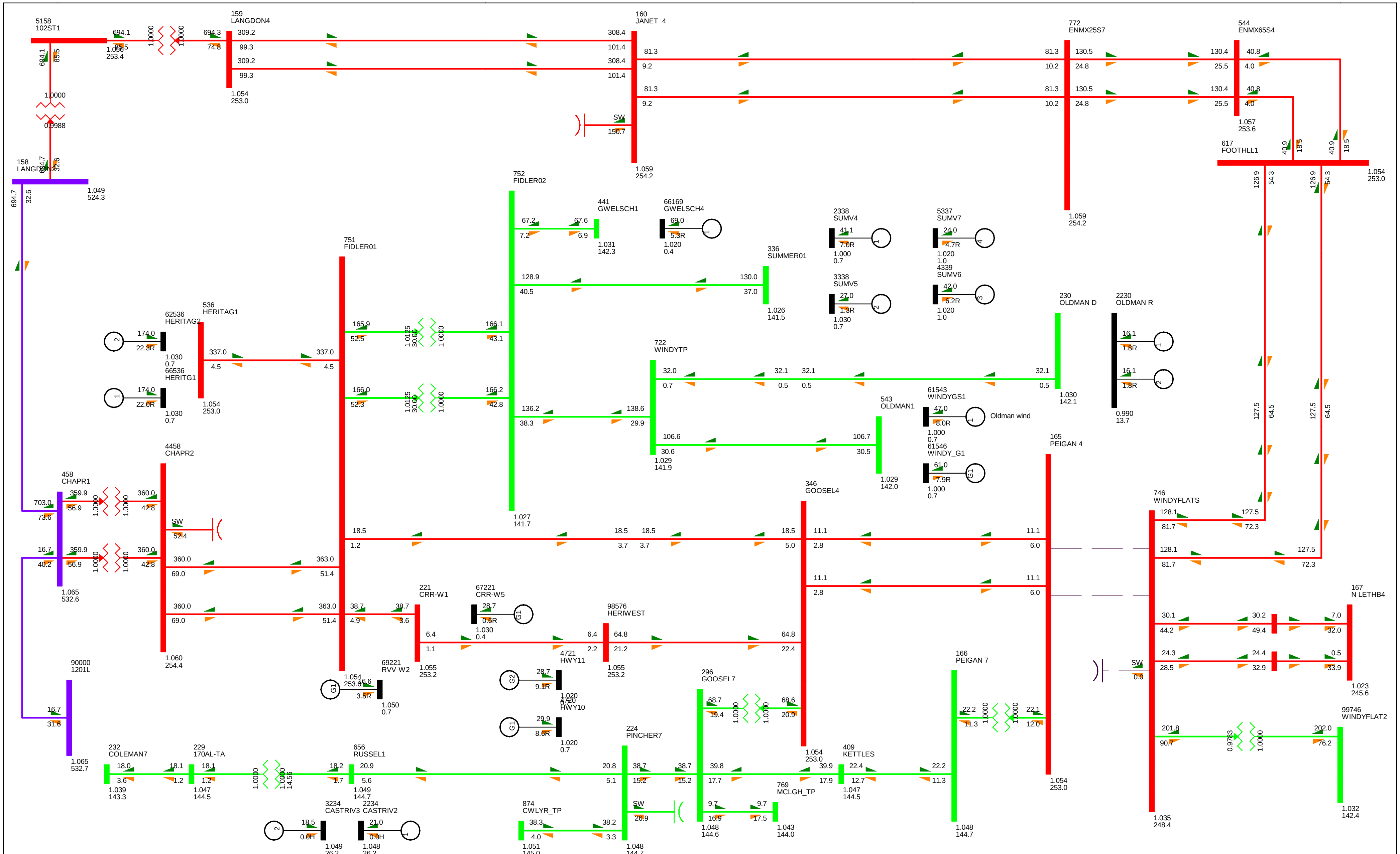


FIGURE C-1-17 - CONTINGENCY PEIWF
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -2.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

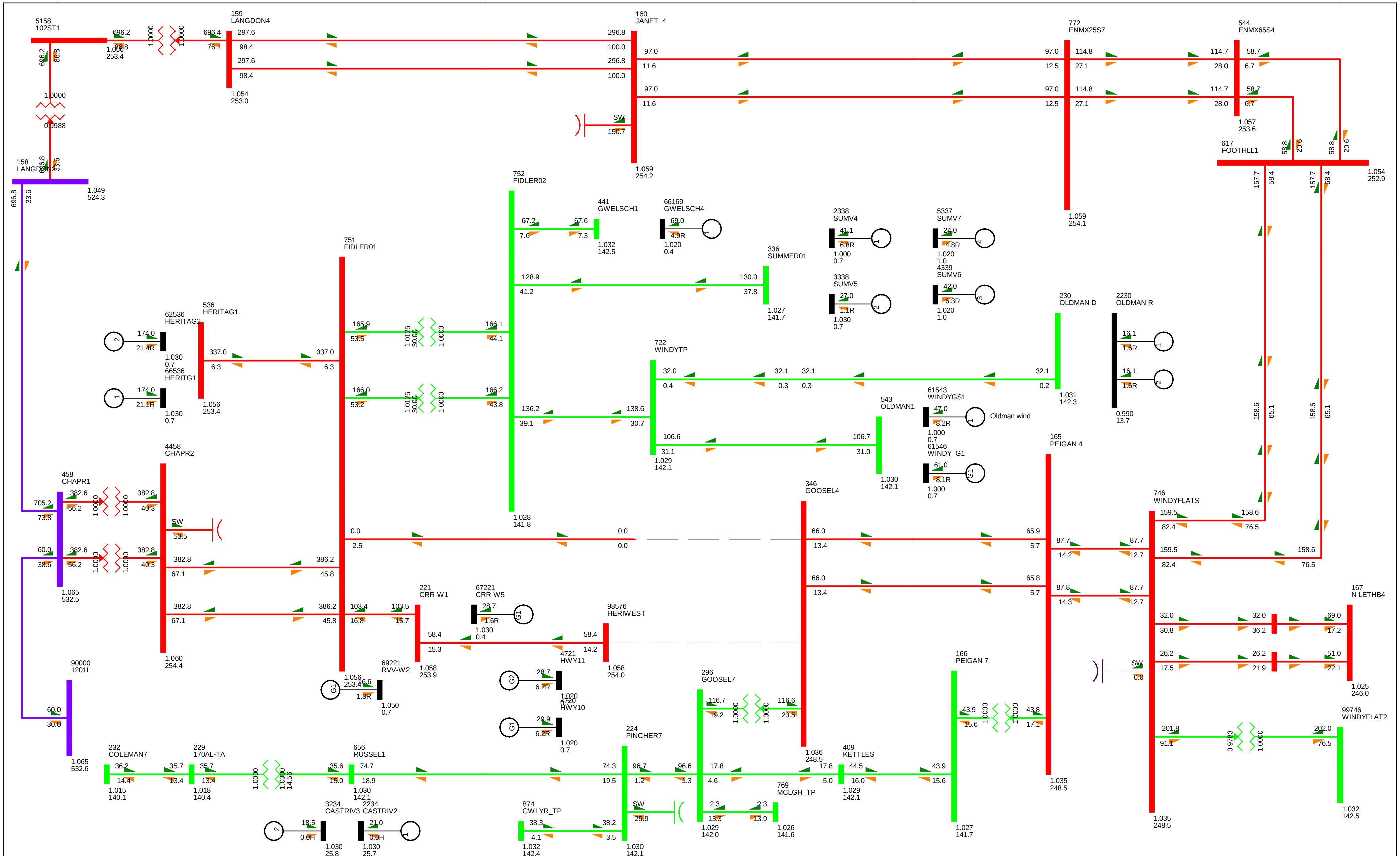


FIGURE C-1-18 - CONTINGENCY GLTOH
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 5.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

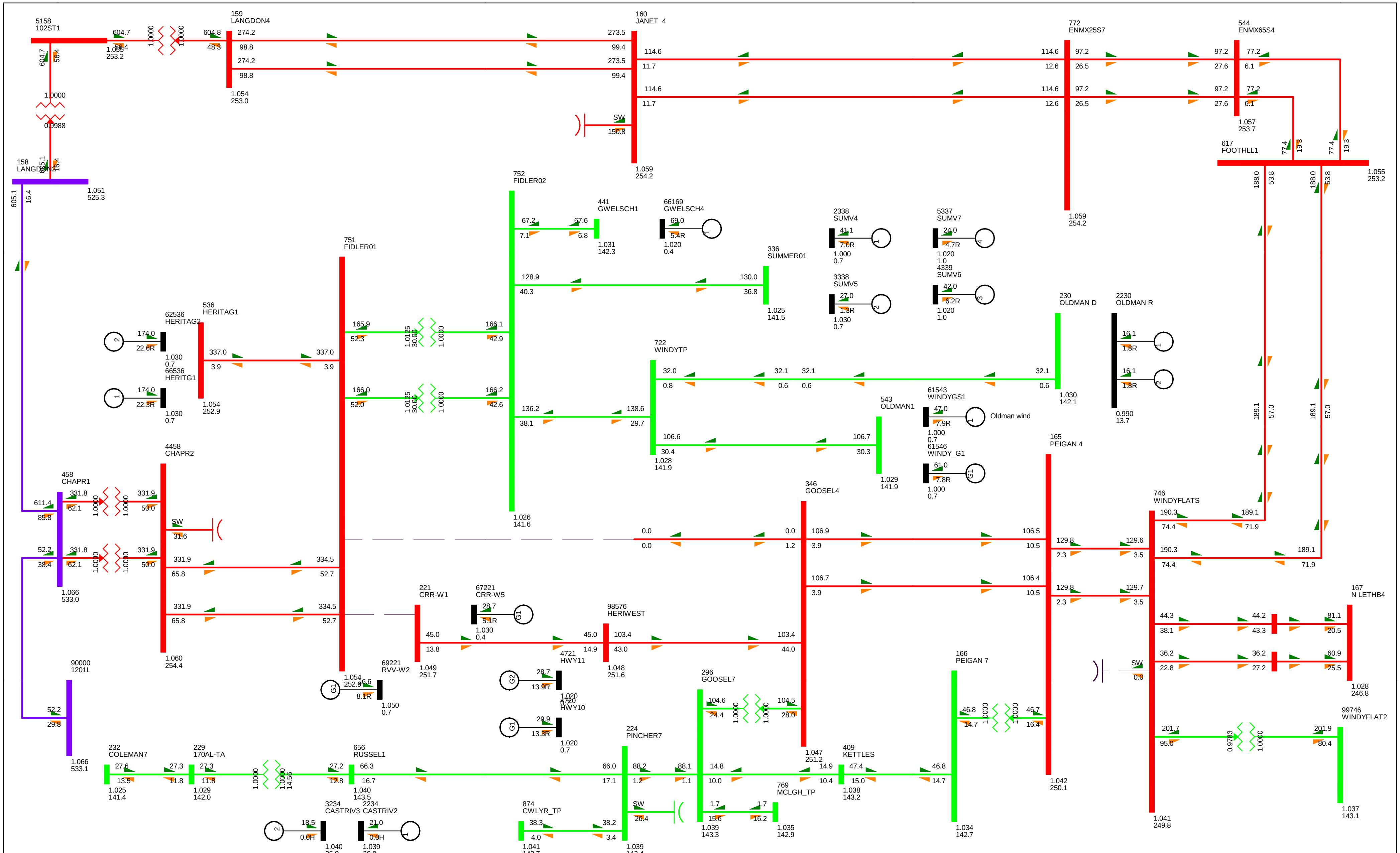


FIGURE C-1-19 - CONTINGENCY FIDLERTOCRRA
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 6.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

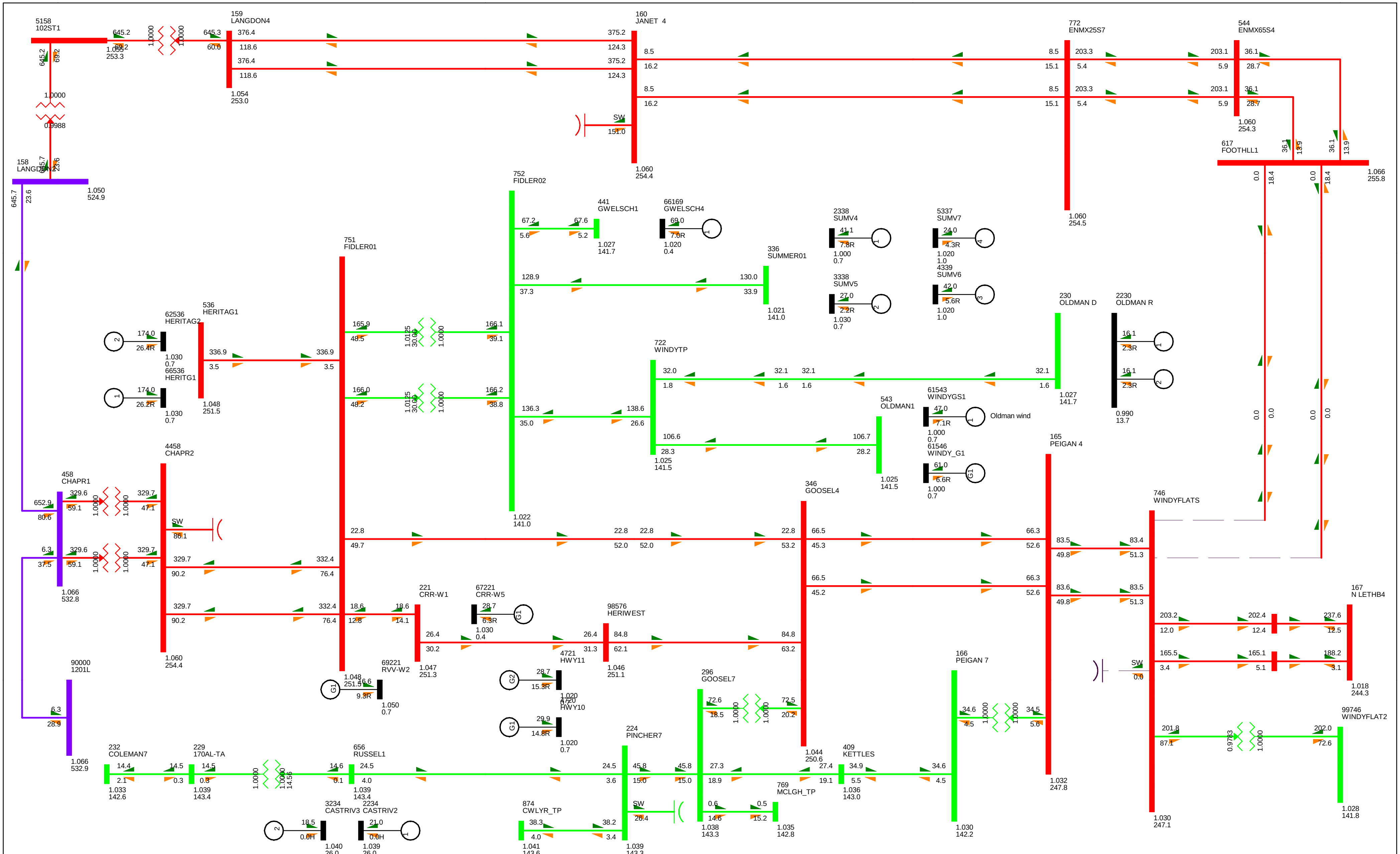


FIGURE C-1-20 - CONTINGENCY 1037L1038L
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -14.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

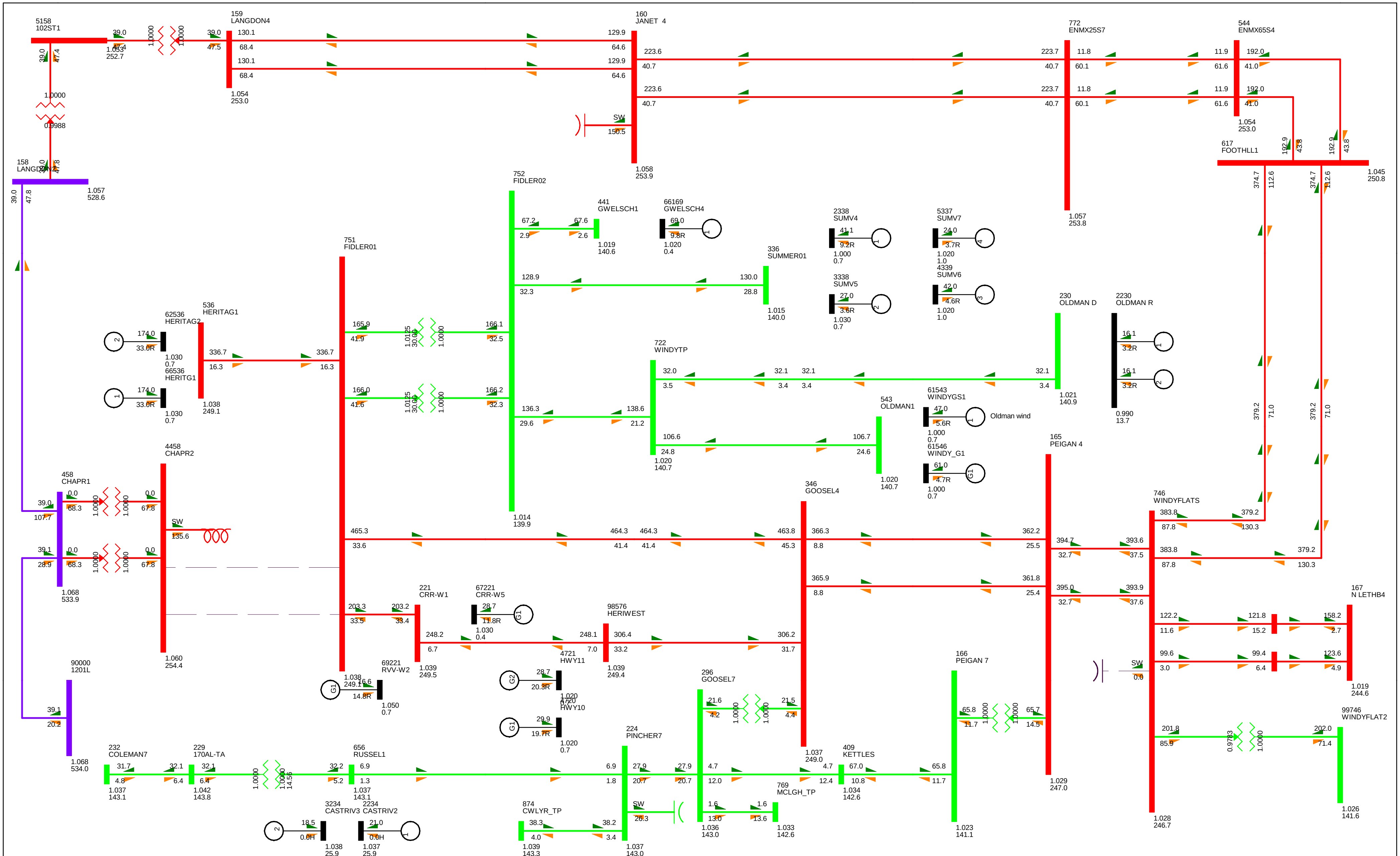


FIGURE C-1-21 - CONTINGENCY FIDLERTOCHAP
2022 SP ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -20.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

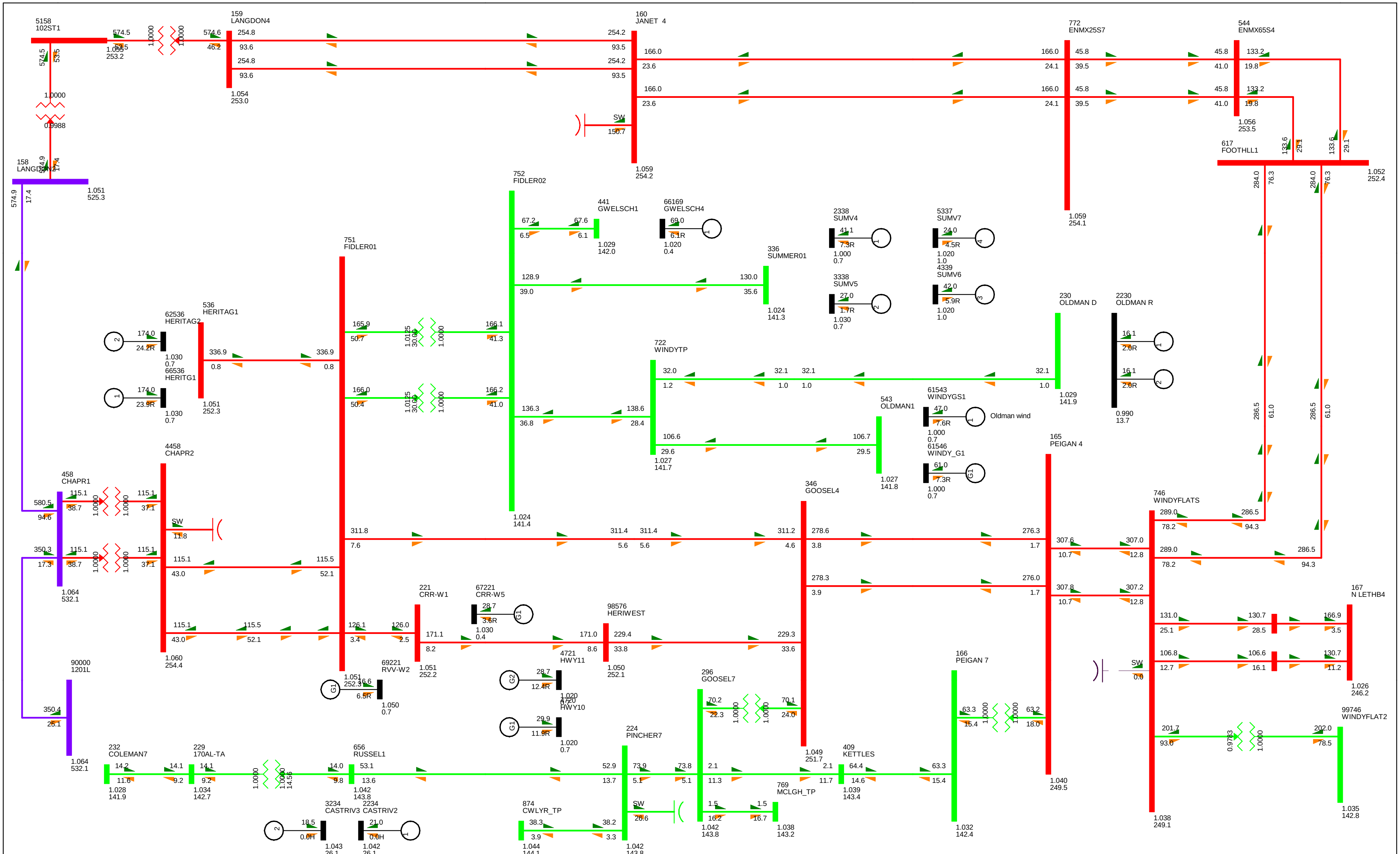


FIGURE C-2-1 - SYSTEM NORMAL
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.5 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

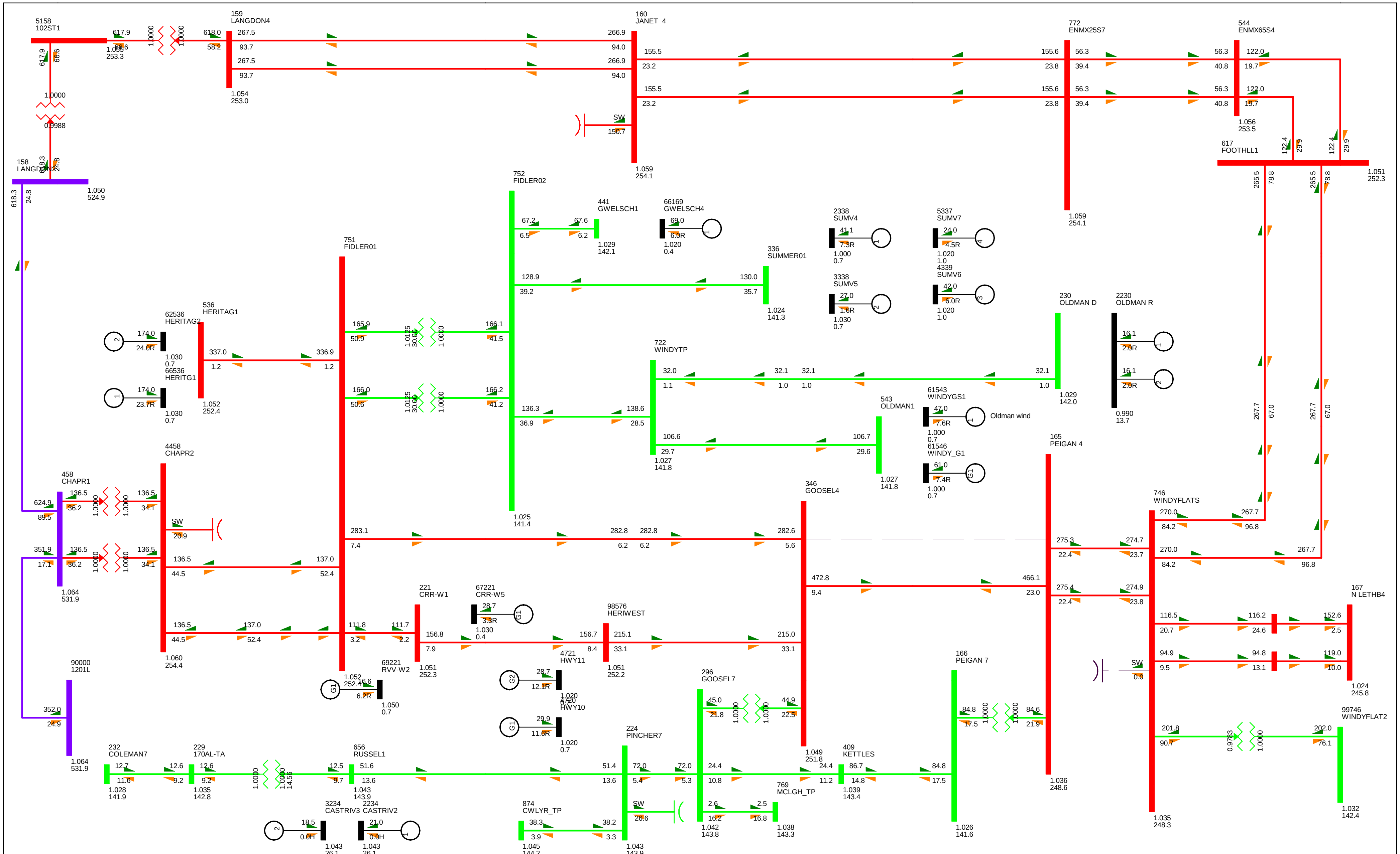


FIGURE C-2-2 - CONTINGENCY 955L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -394.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

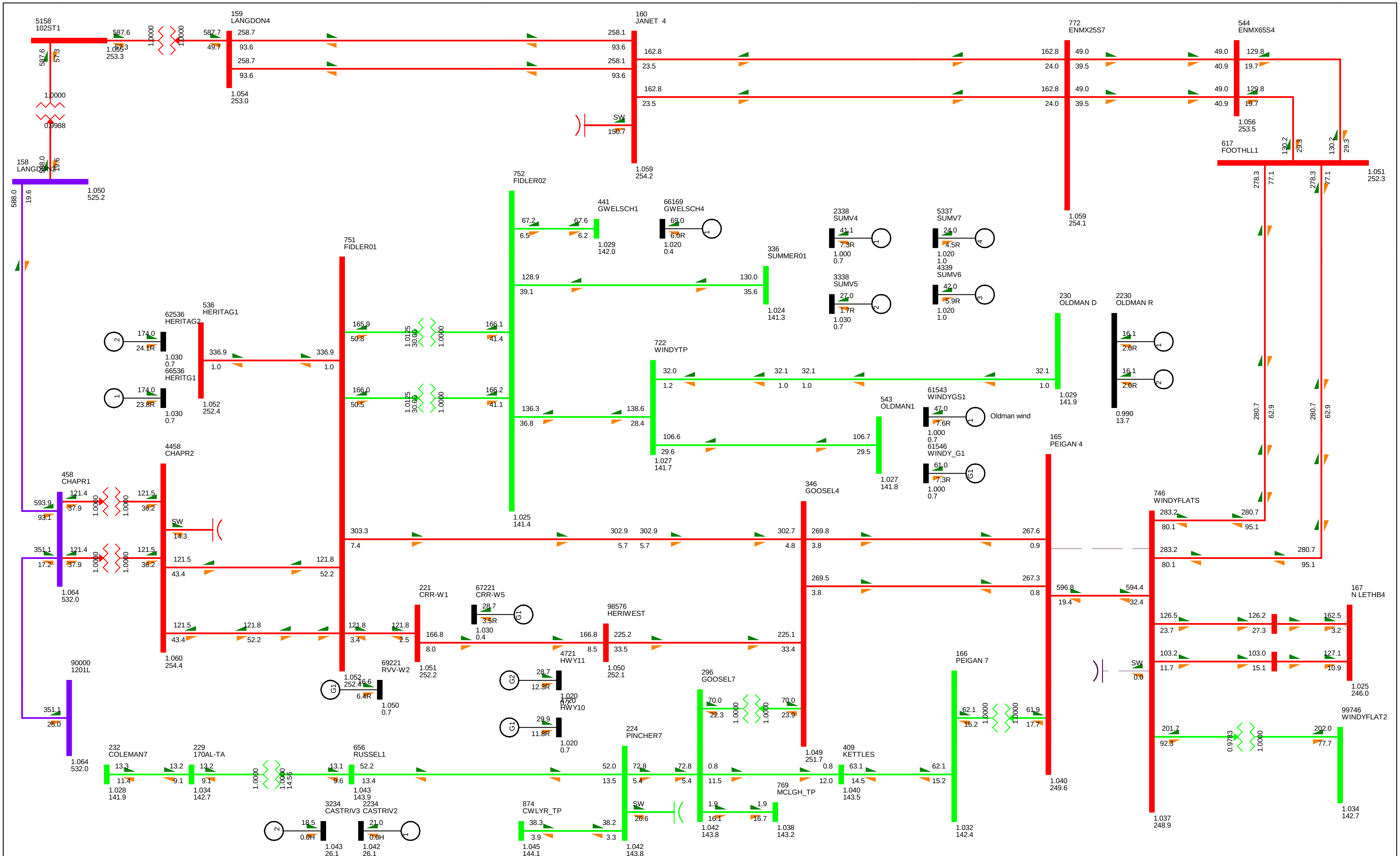


FIGURE C-2-3 - CONTINGENCY 1048L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

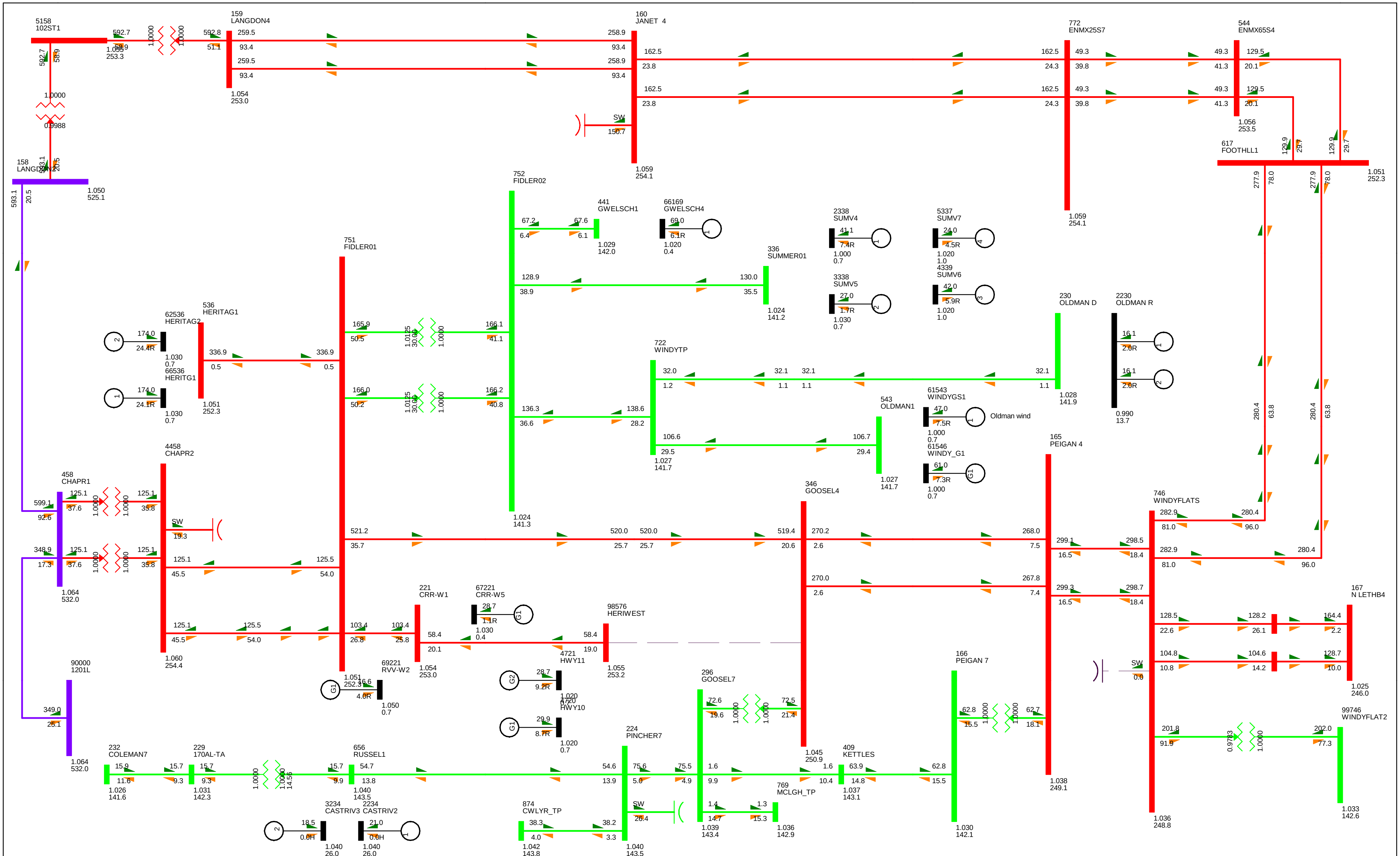


FIGURE C-2-4 - CONTINGENCY 1072L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

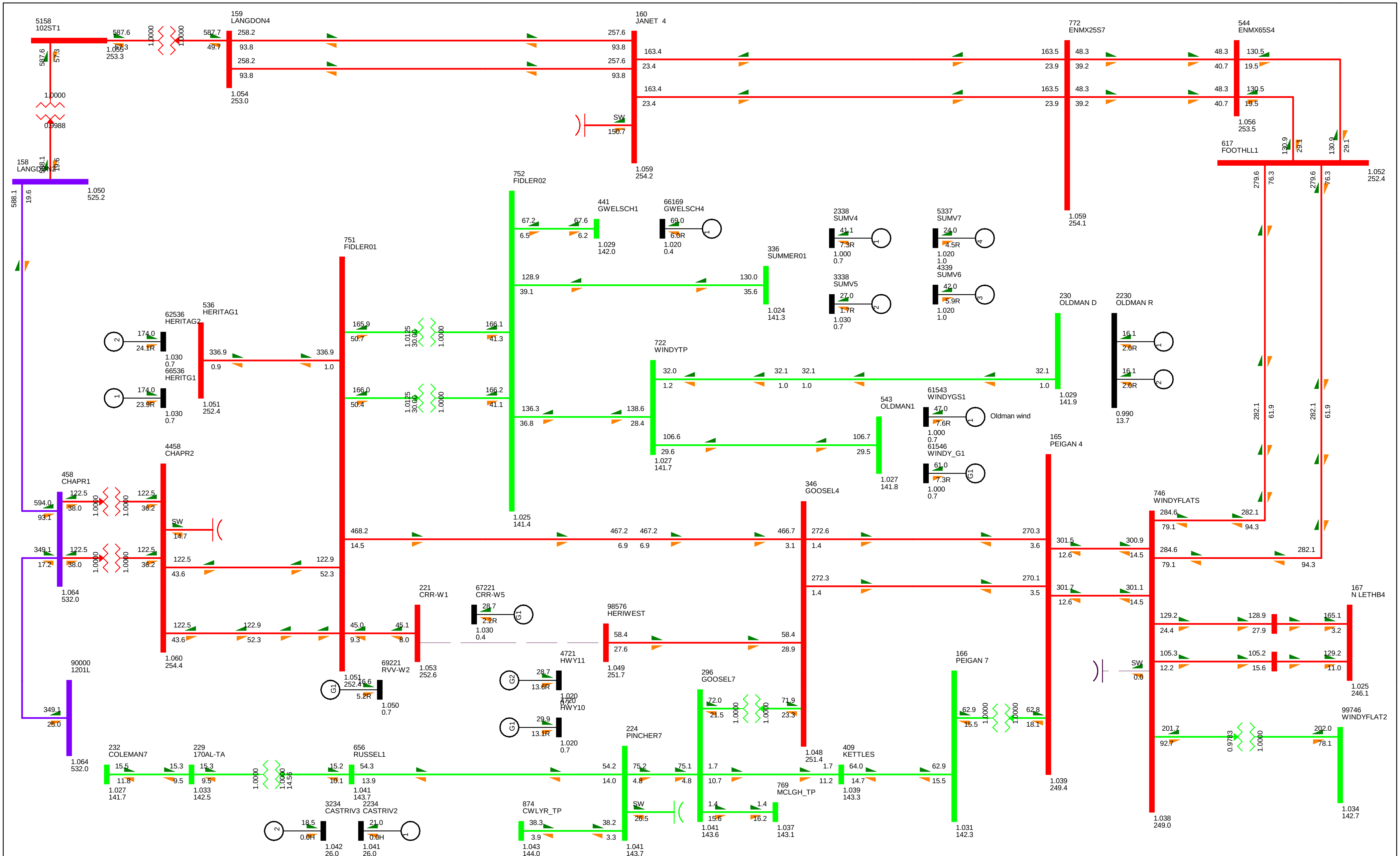


FIGURE C-2-5 - CONTINGENCY 1072LCTOH
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

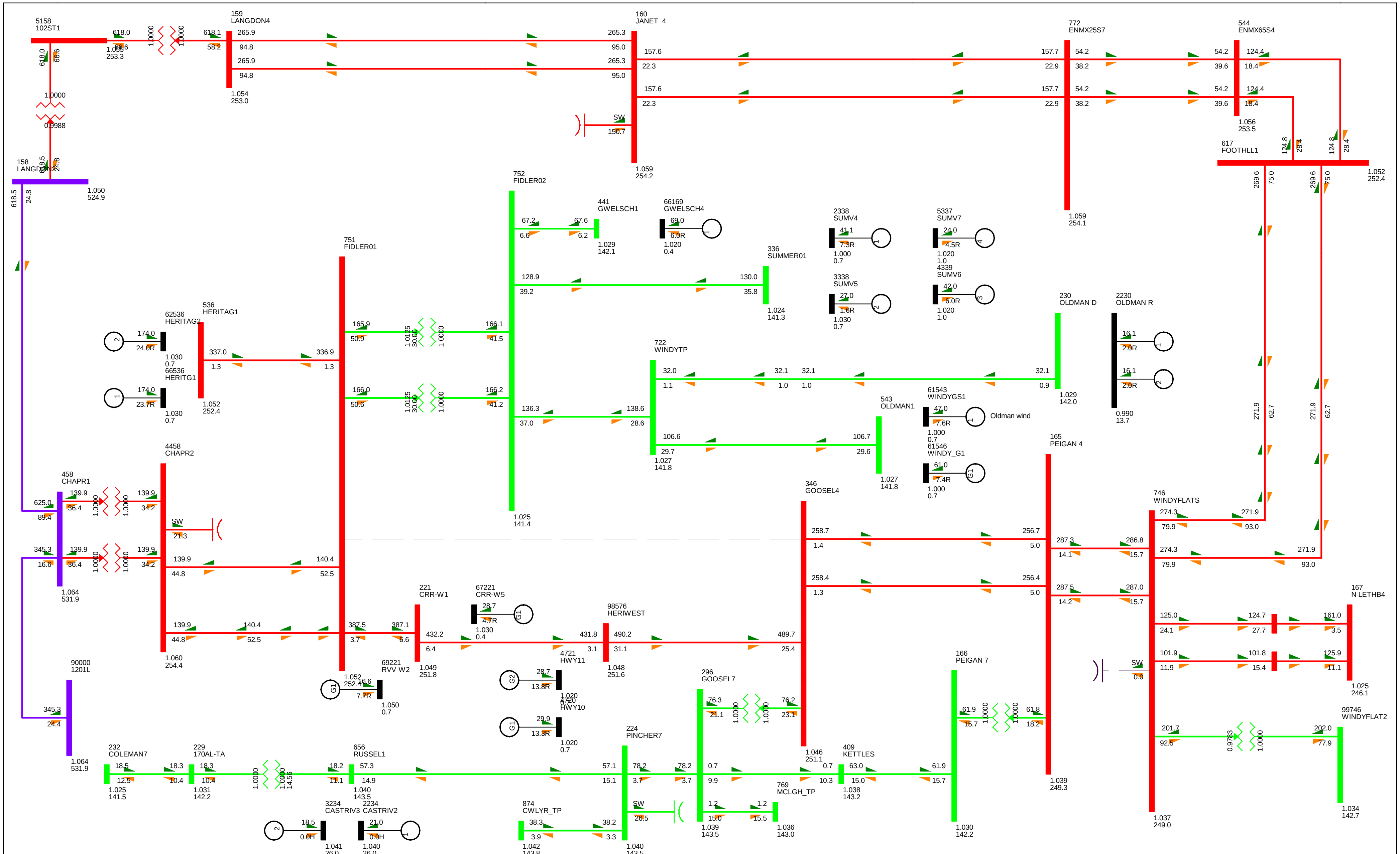


FIGURE C-2-6 - CONTINGENCY 994L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

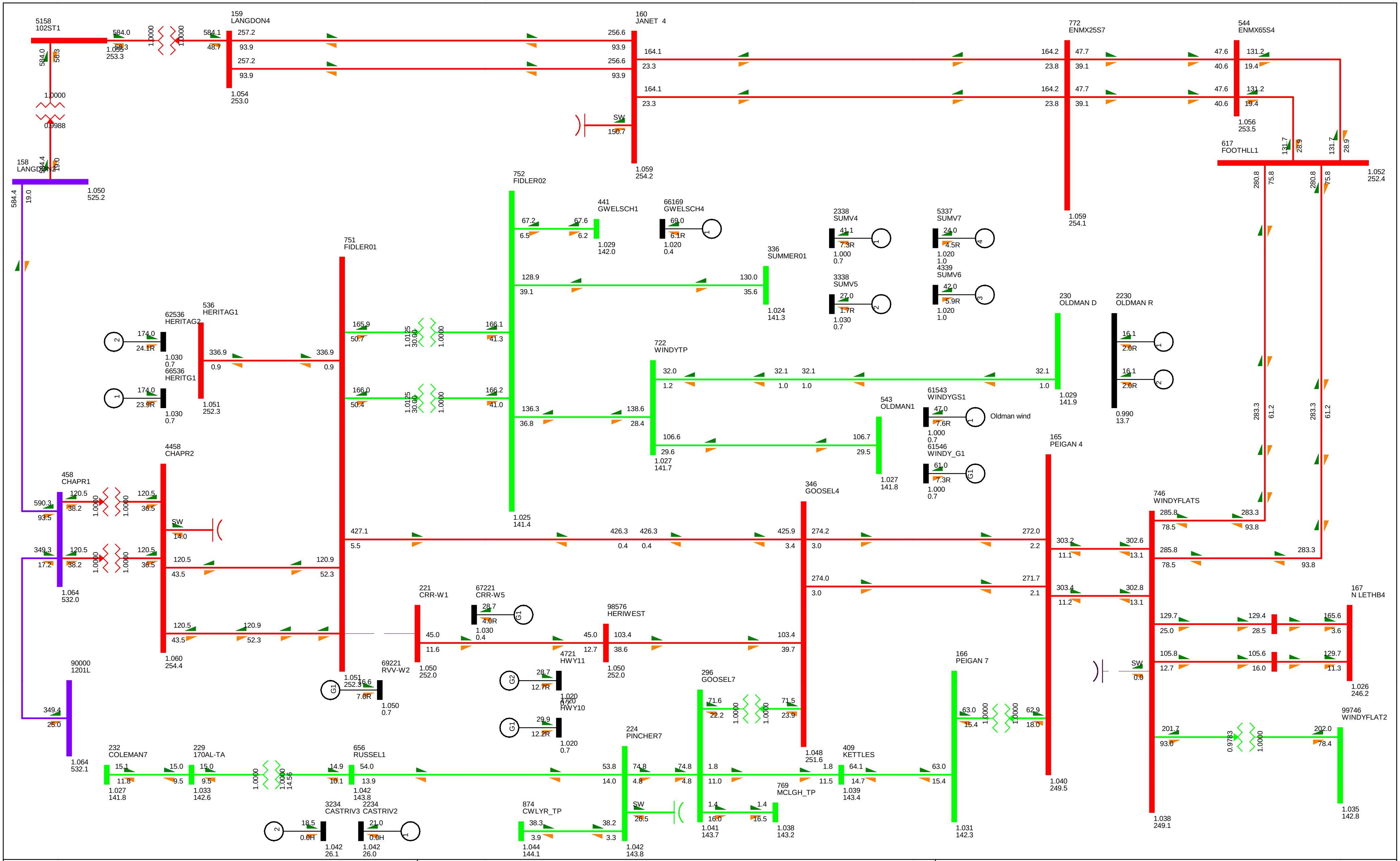


FIGURE C-2-7 - CONTINGENCY 1071L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

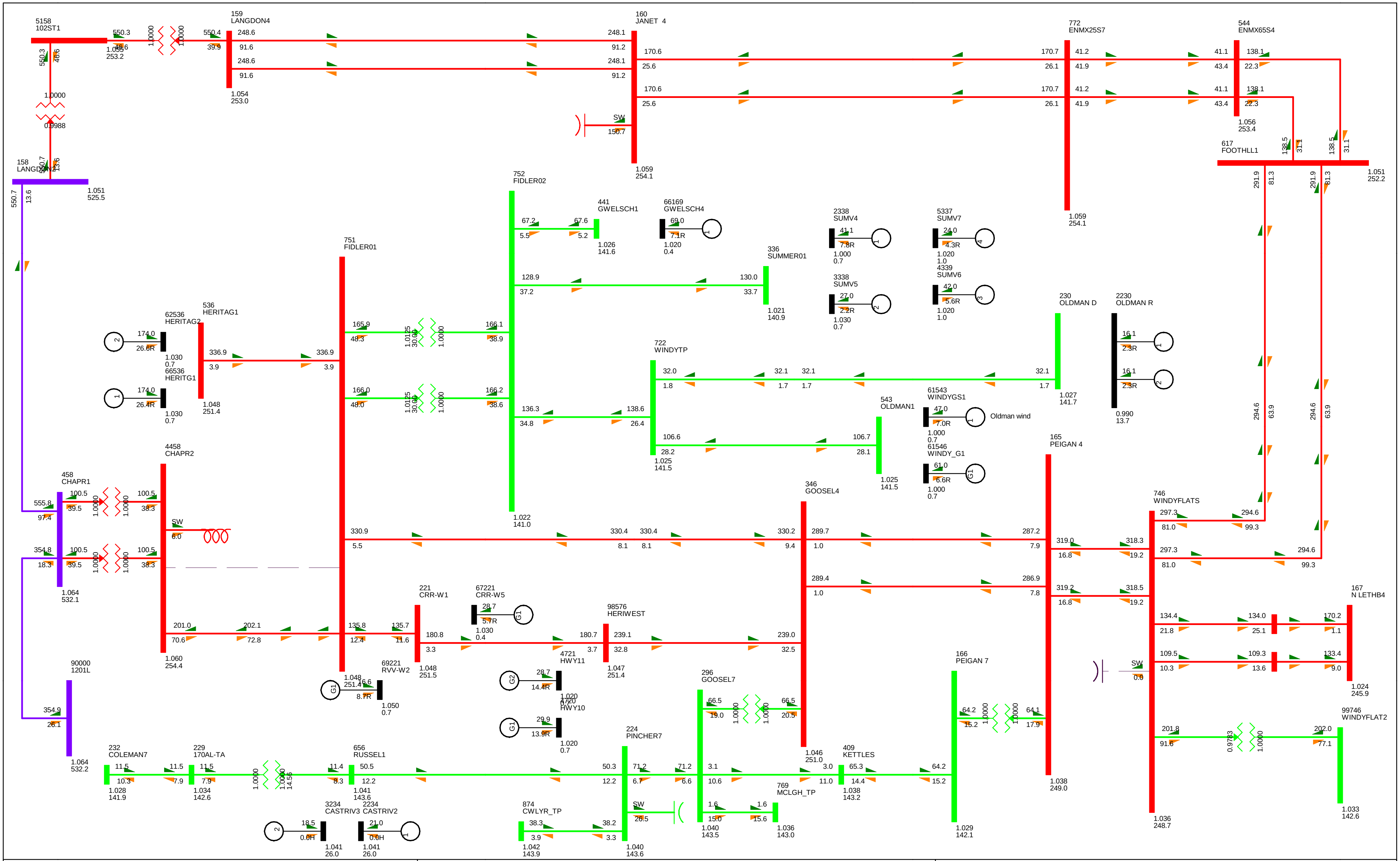


FIGURE C-2-8 - CONTINGENCY 1004L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -393.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

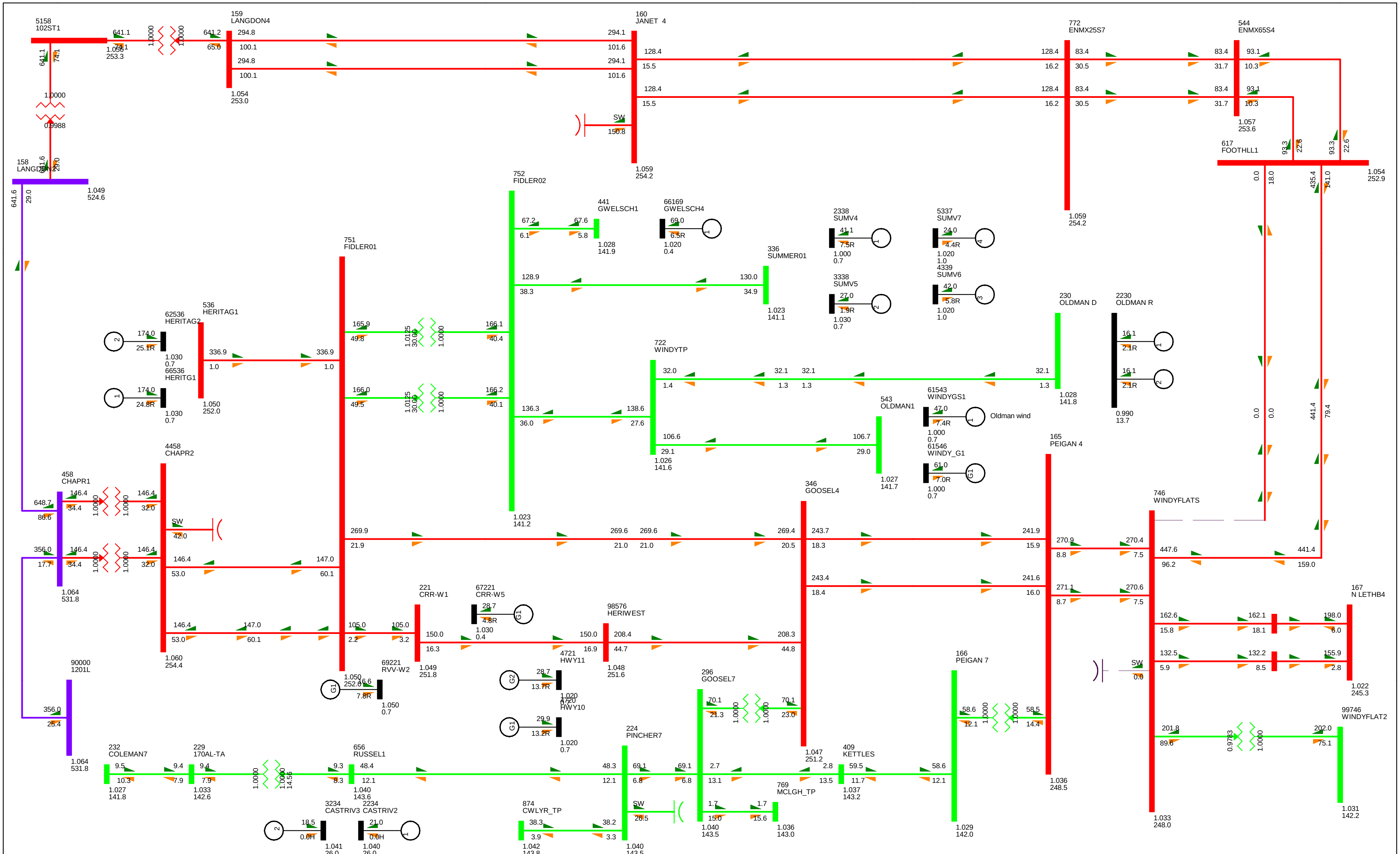


FIGURE C-2-9 - CONTINGENCY 1037L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -397.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

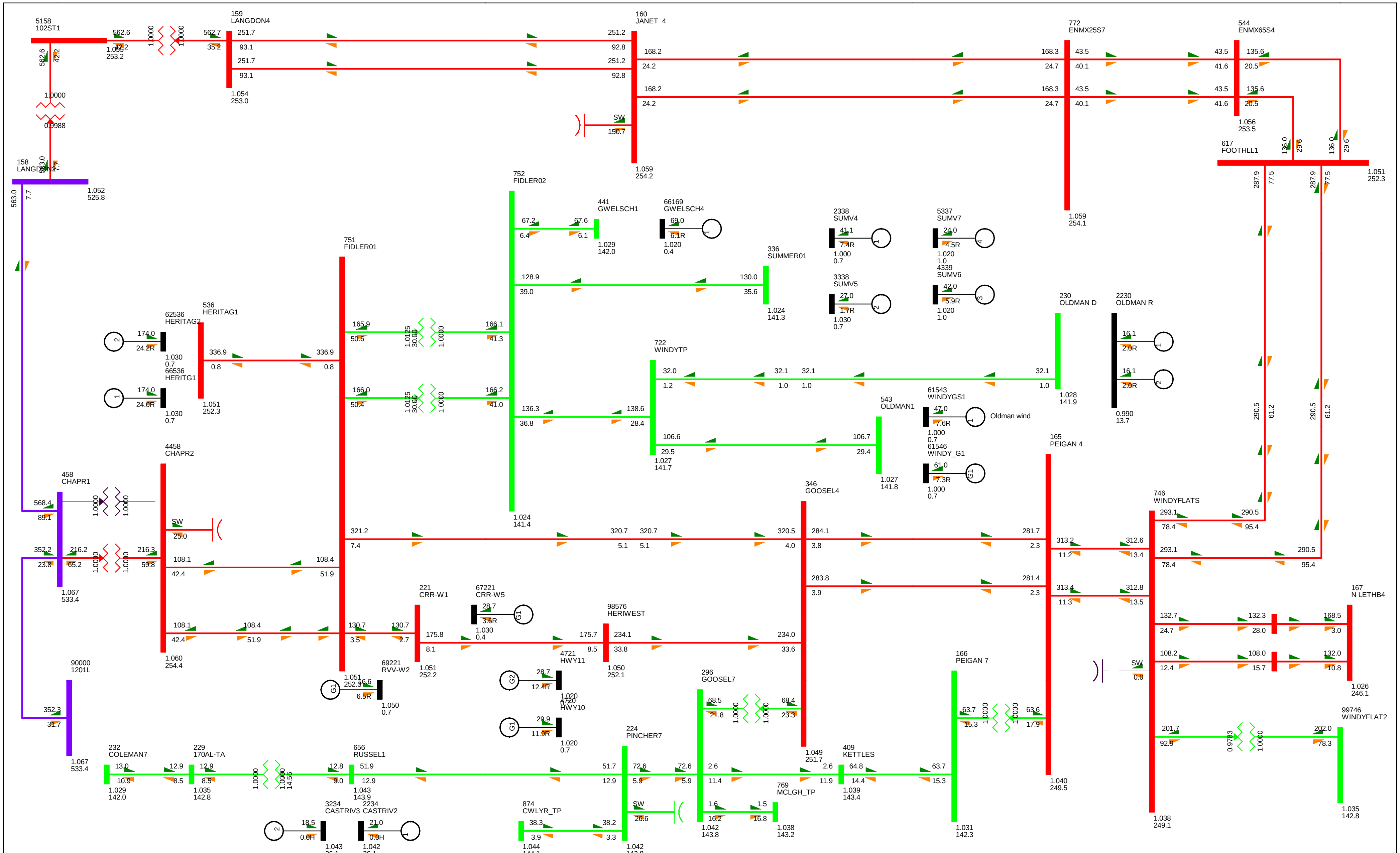


FIGURE C-2-10 - CONTINGENCY CHAPELXMER
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

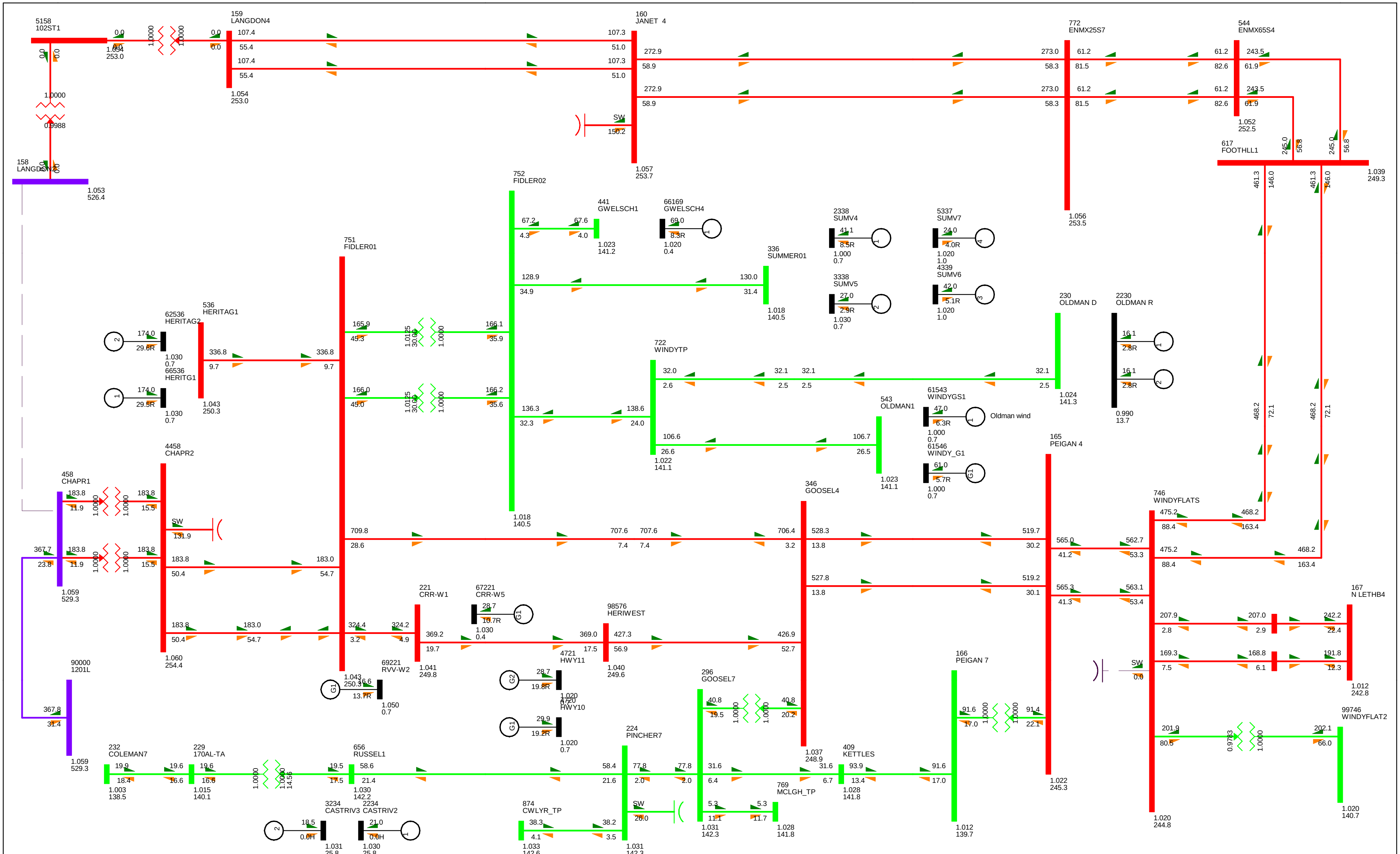


FIGURE C-2-11 - CONTINGENCY 1201L
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -446.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

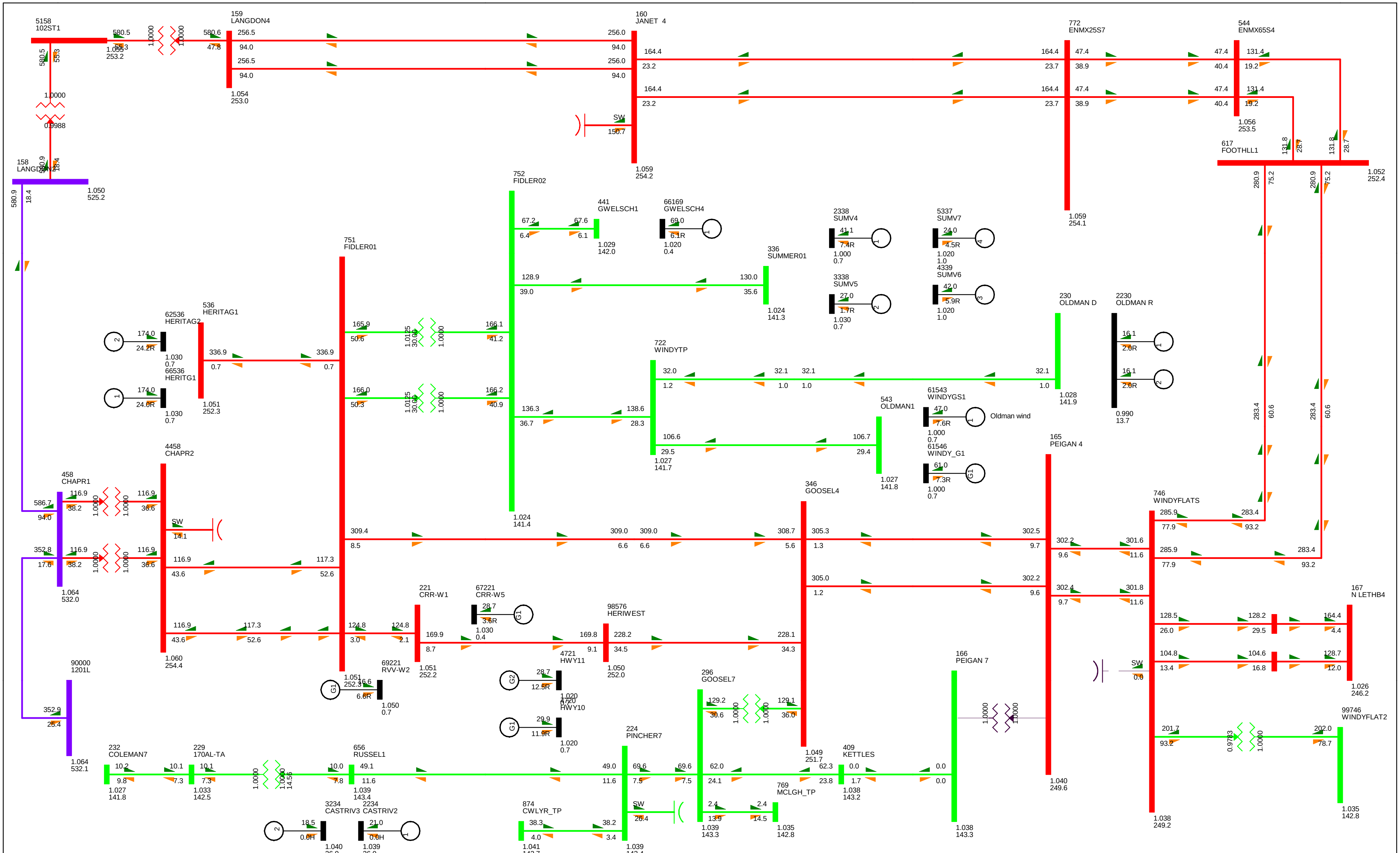


FIGURE C-2-12 - CONTINGENCY PEIXMER
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

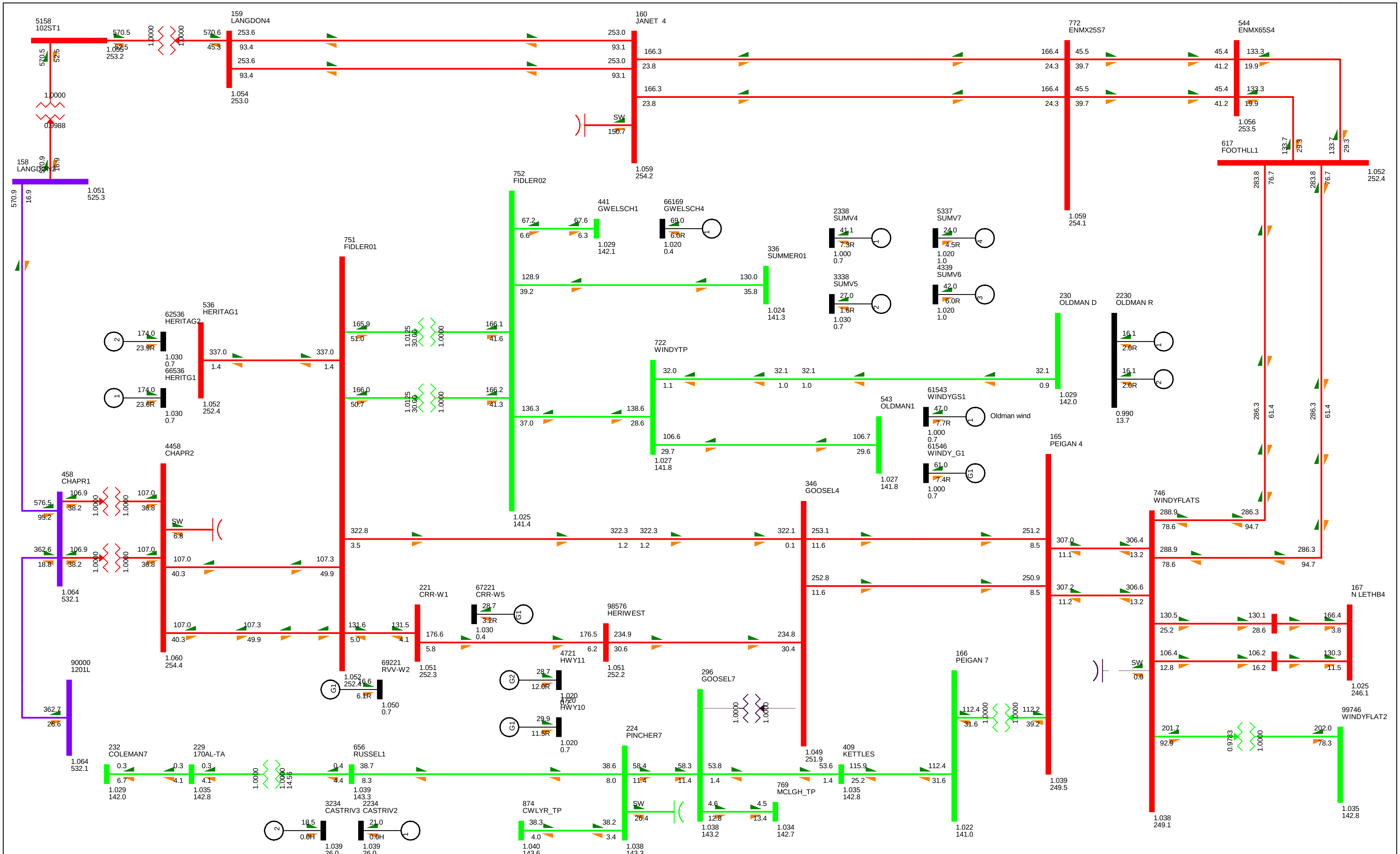


FIGURE C-2-13 - CONTINGENCY GLXMER
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -393.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

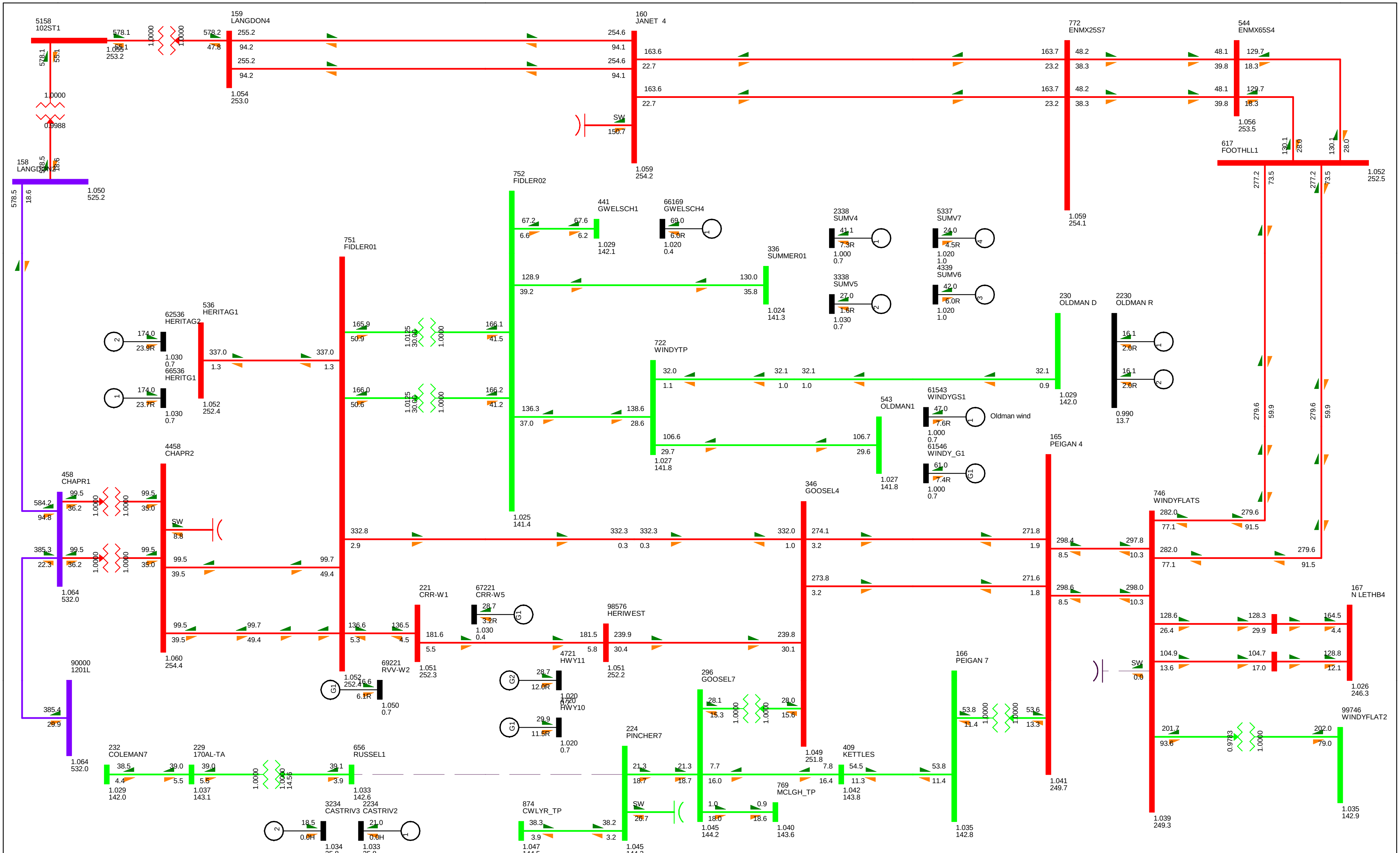


FIGURE C-2-14 - CONTINGENCY 170LRTOPC
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -390.5 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

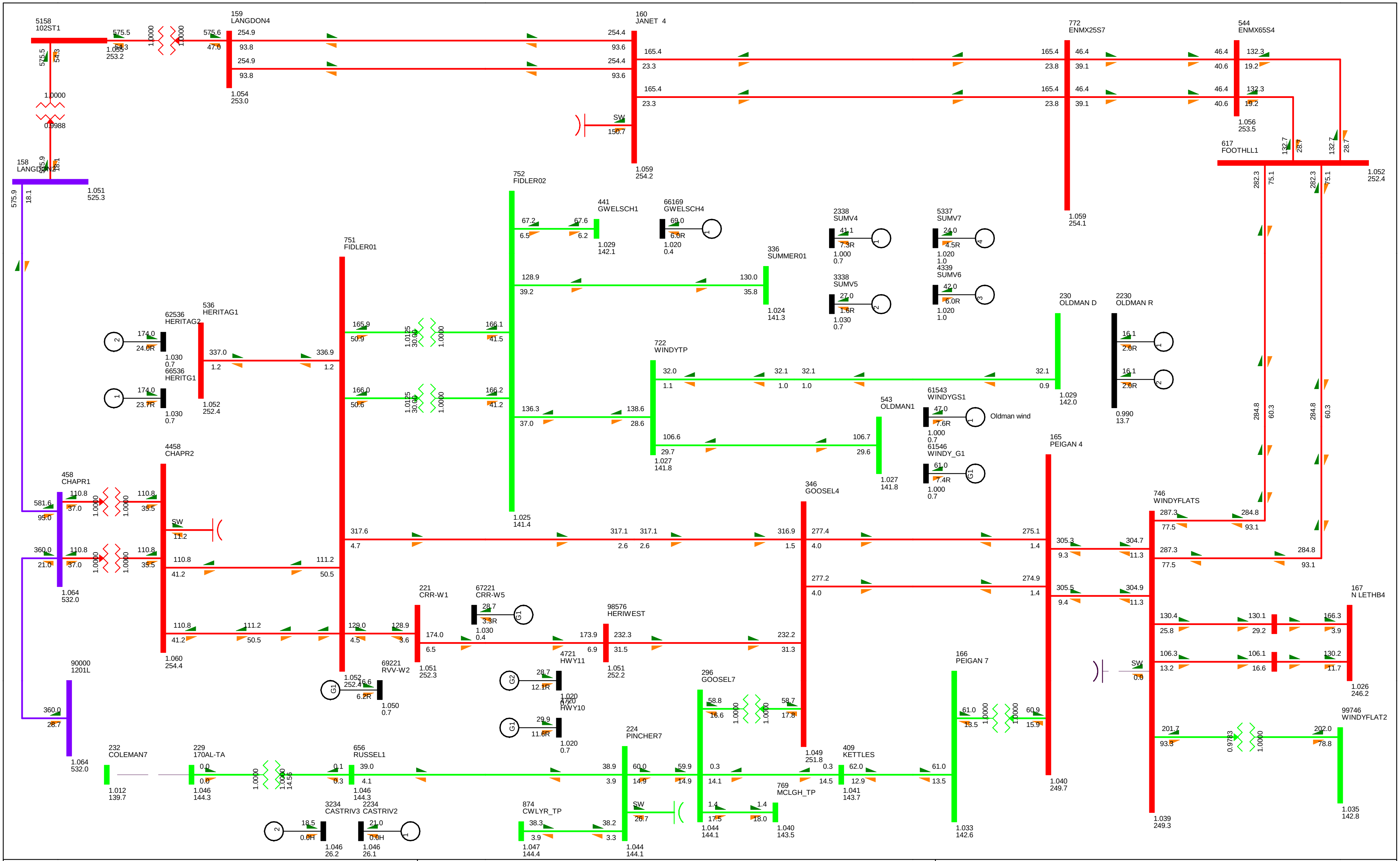


FIGURE C-2-15 - CONTINGENCY 170LRTOC
2022 SP ALT1-400 IM
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

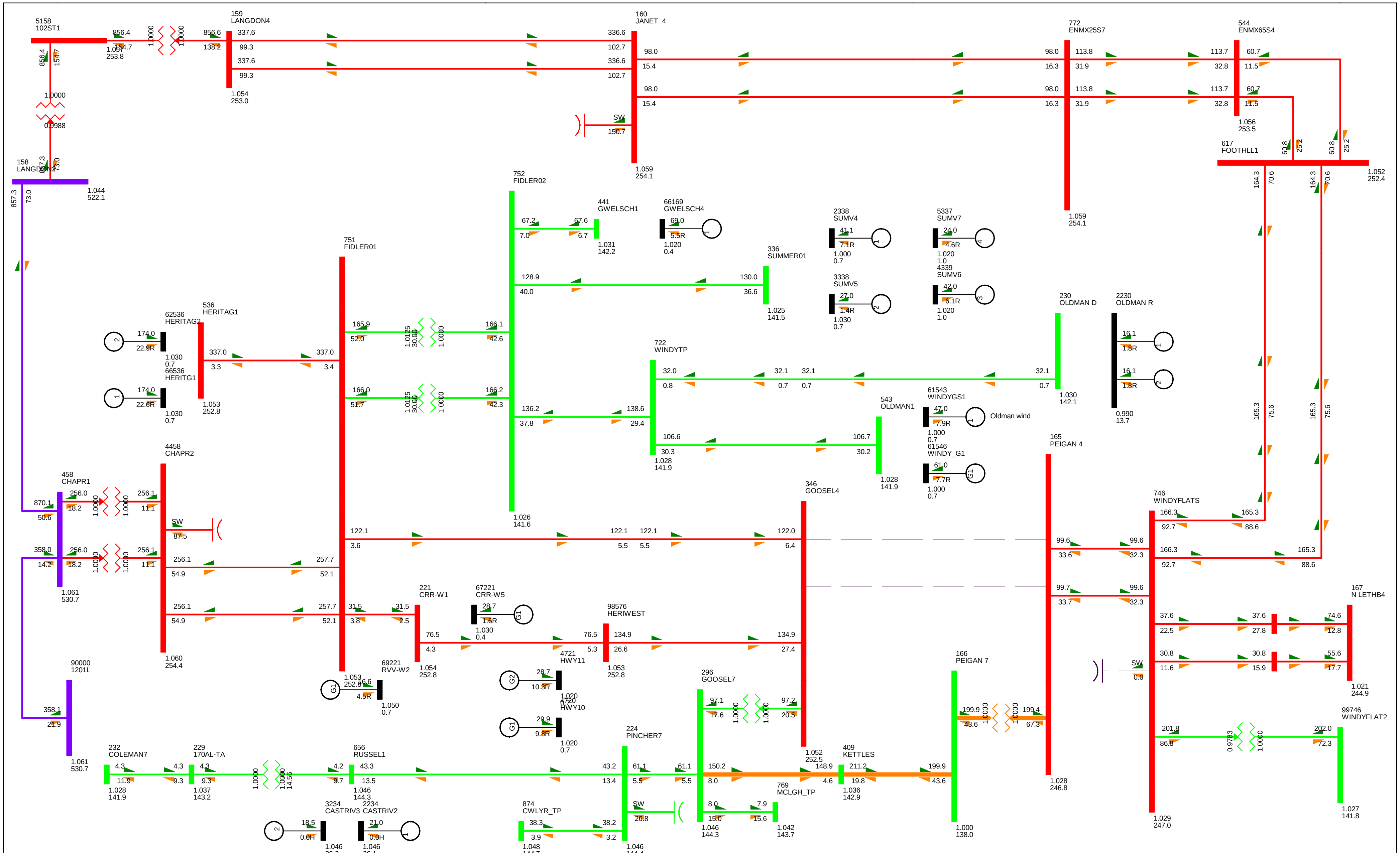


FIGURE C-2-16 - CONTINGENCY 95556L
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -405.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

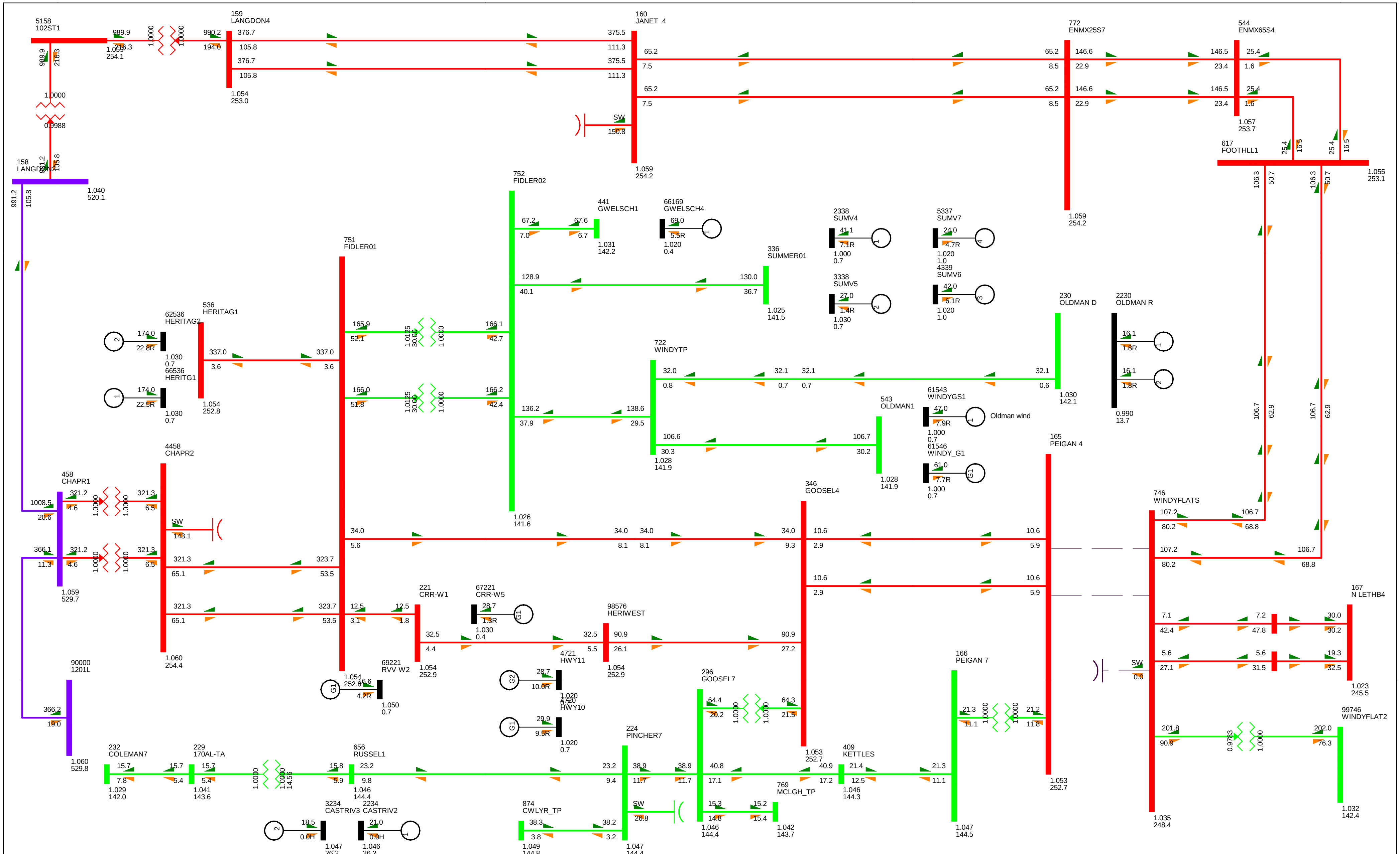


FIGURE C-2-17 - CONTINGENCY PEIWF
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -405.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

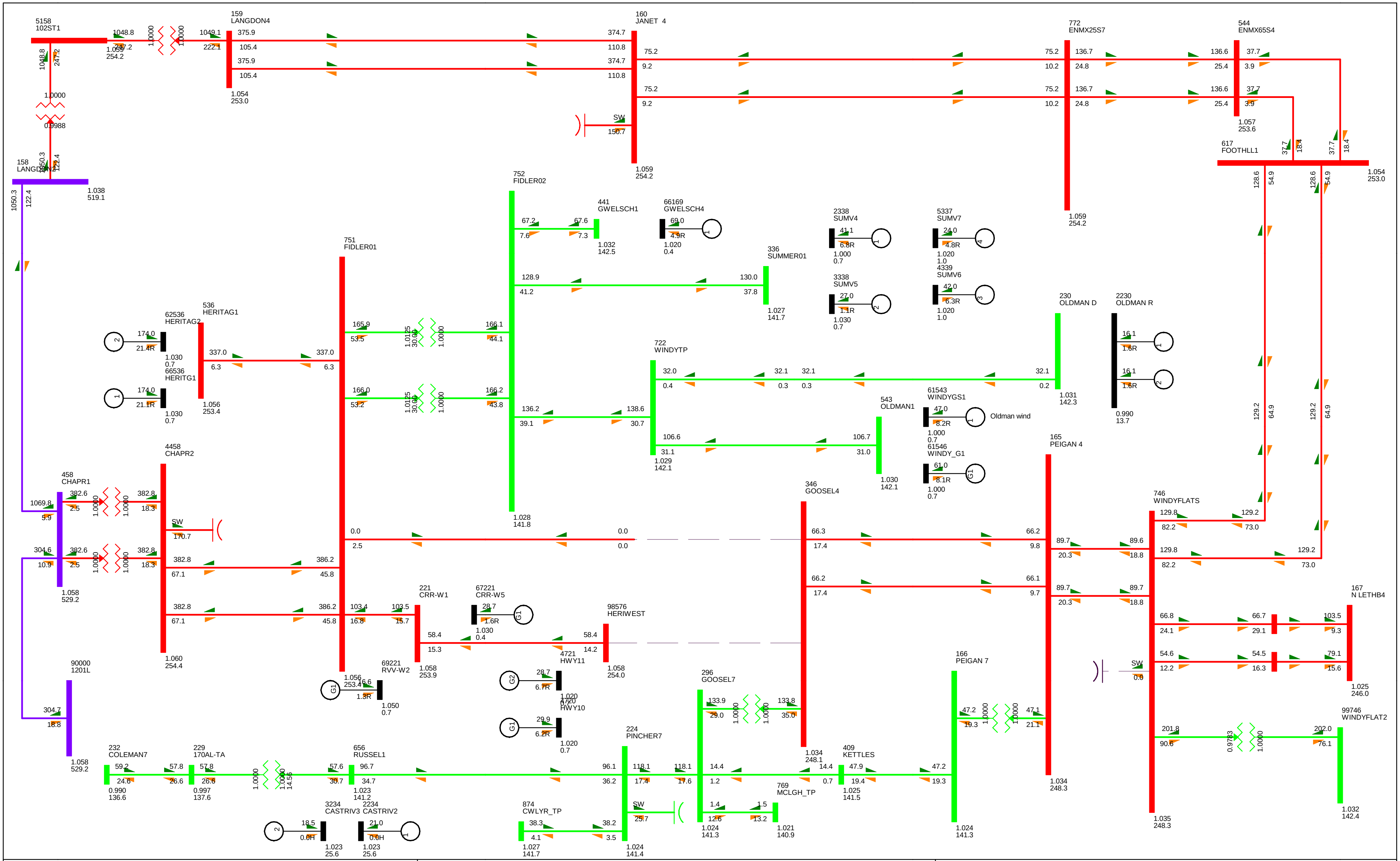


FIGURE C-2-18 - CONTINGENCY GLTOH
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -393.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

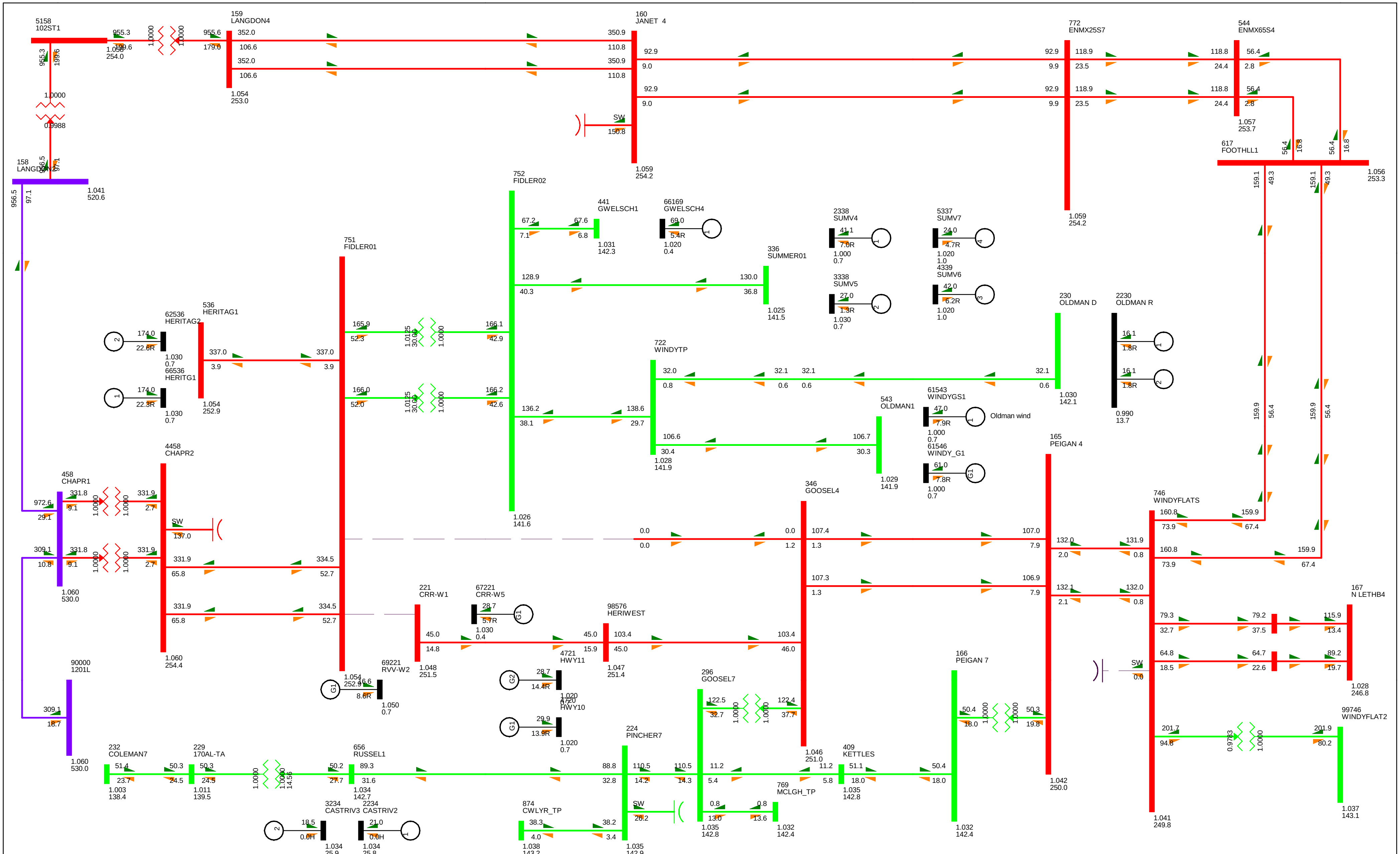


FIGURE C-2-19 - CONTINGENCY FIDLERTOCRRA
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -390.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

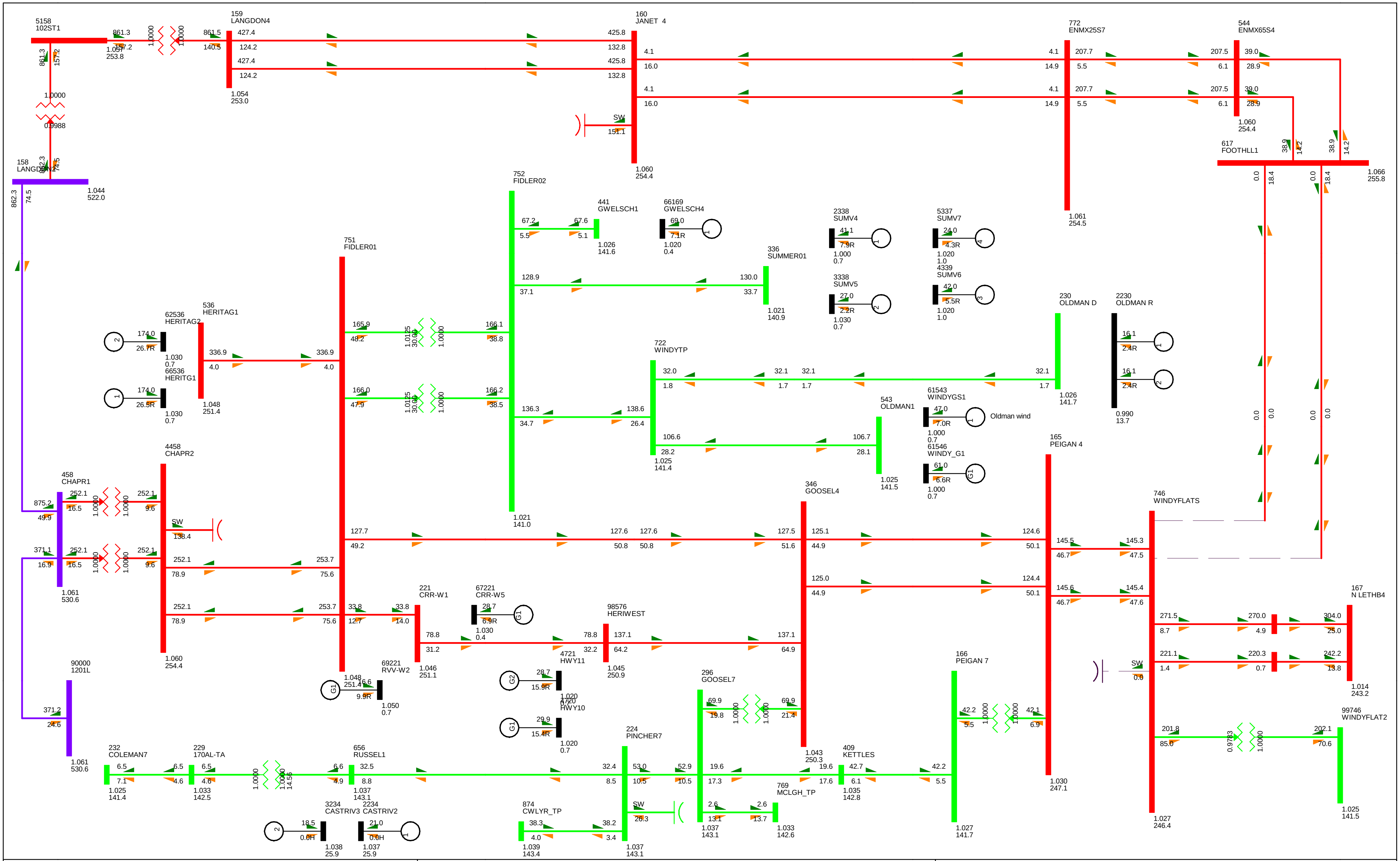


FIGURE C-2-20 - CONTINGENCY 1037L1038L
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -411.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

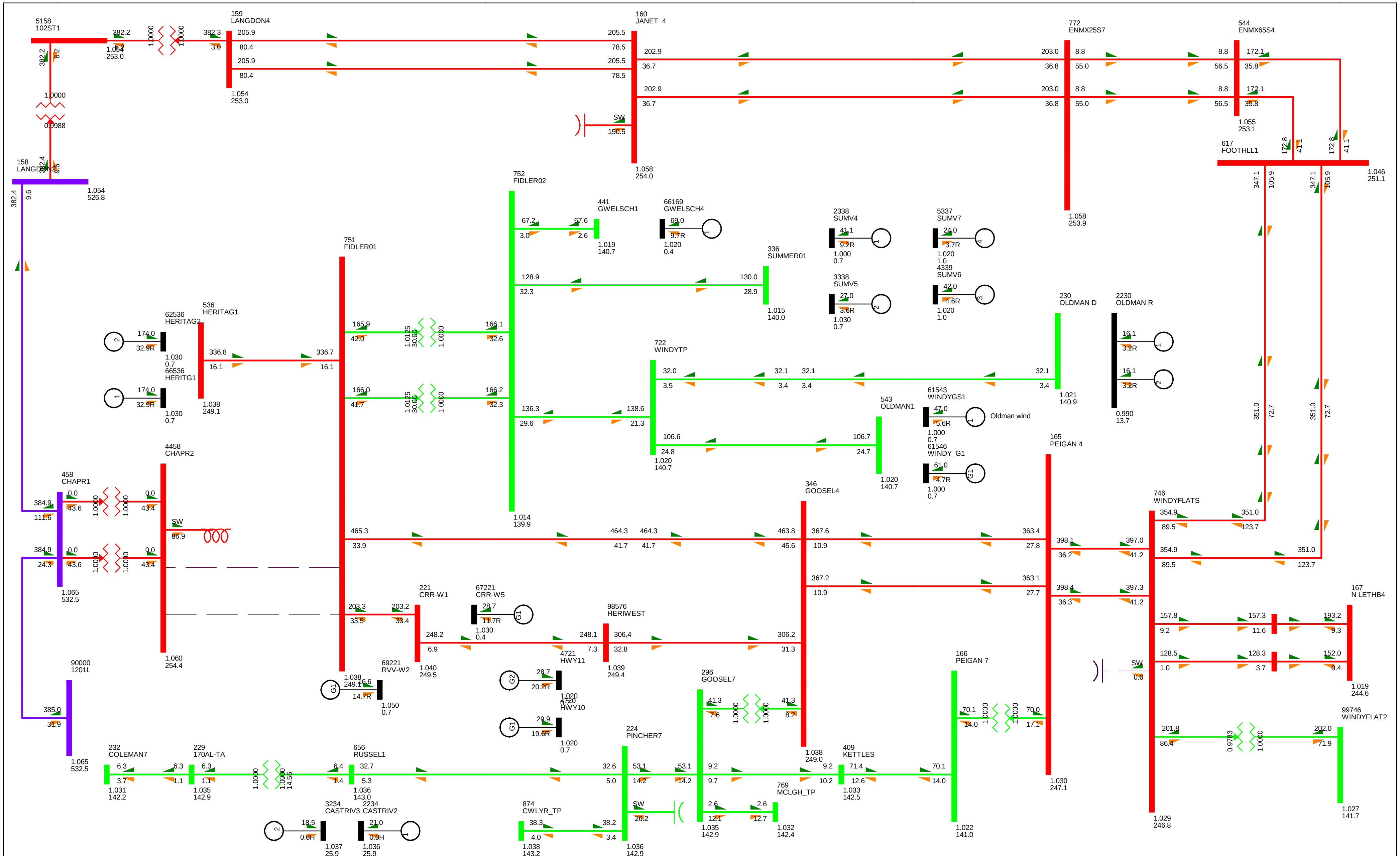


FIGURE C-2-21 - CONTINGENCY FIDLERTOCHAP
2022 SP ALT1-400 IM
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -404.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

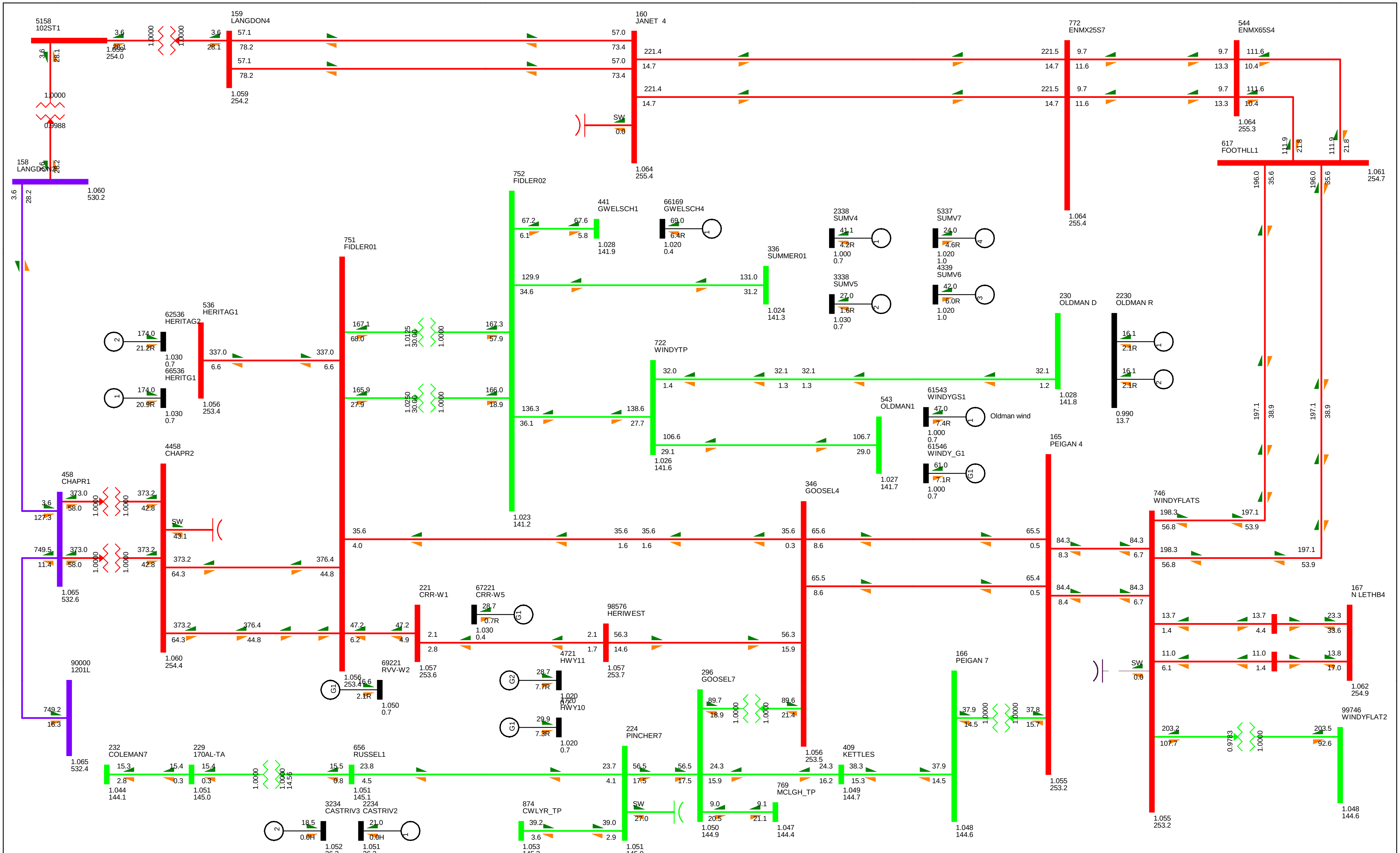


FIGURE C-3-1 - SYSTEM NORMAL
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

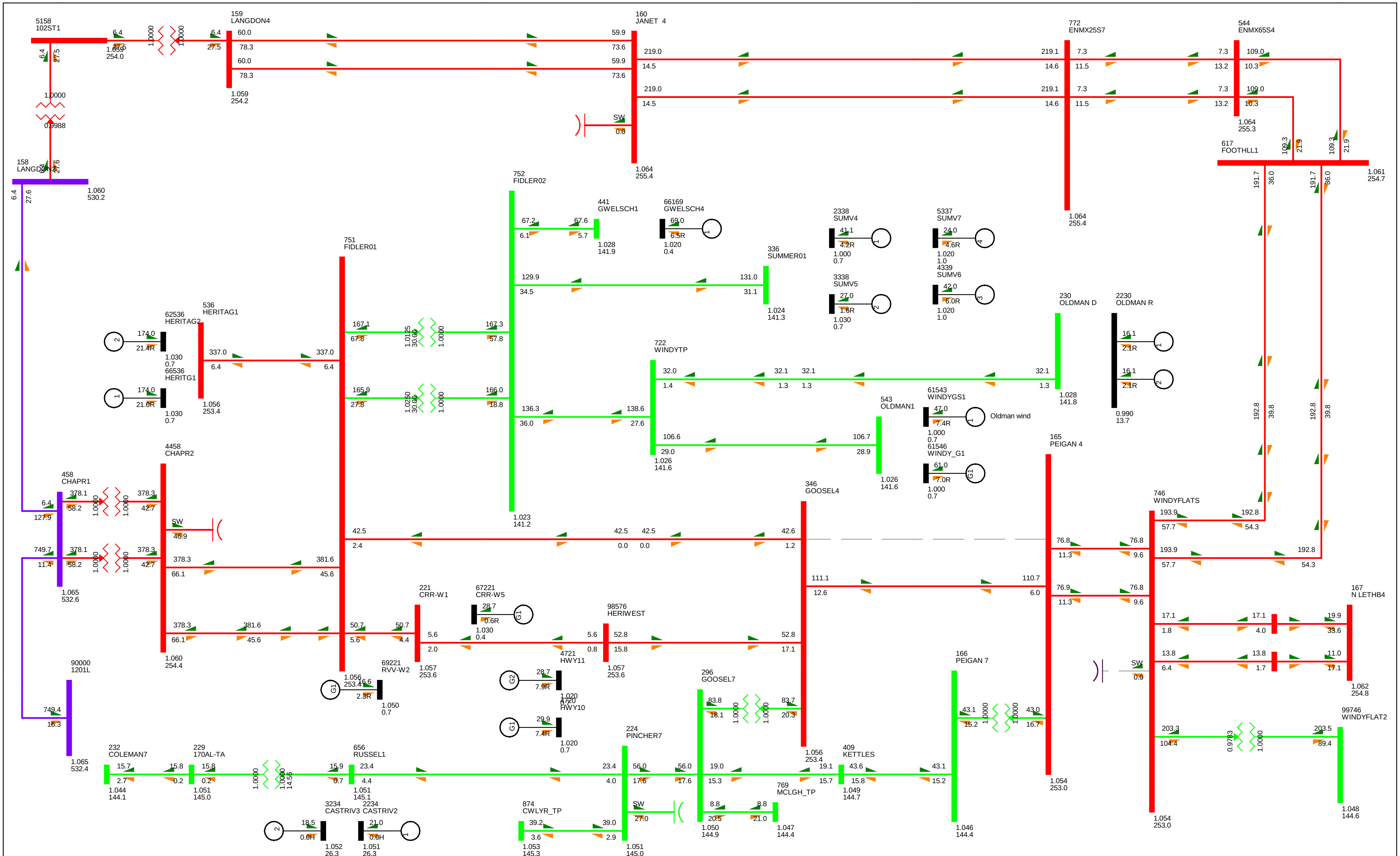


FIGURE C-3-2 - CONTINGENCY 955L
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

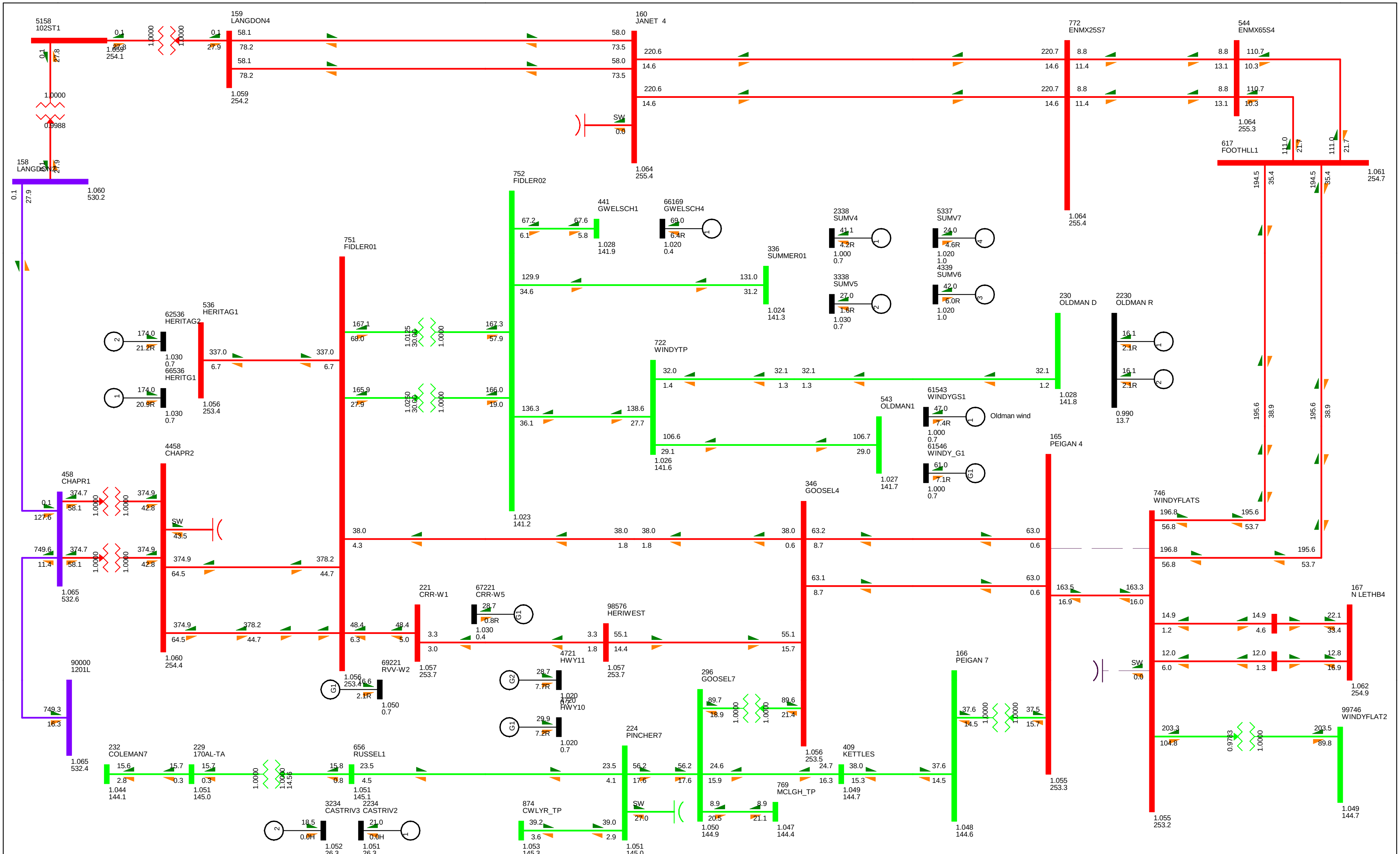


FIGURE C-3-3 - CONTINGENCY 1048L
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

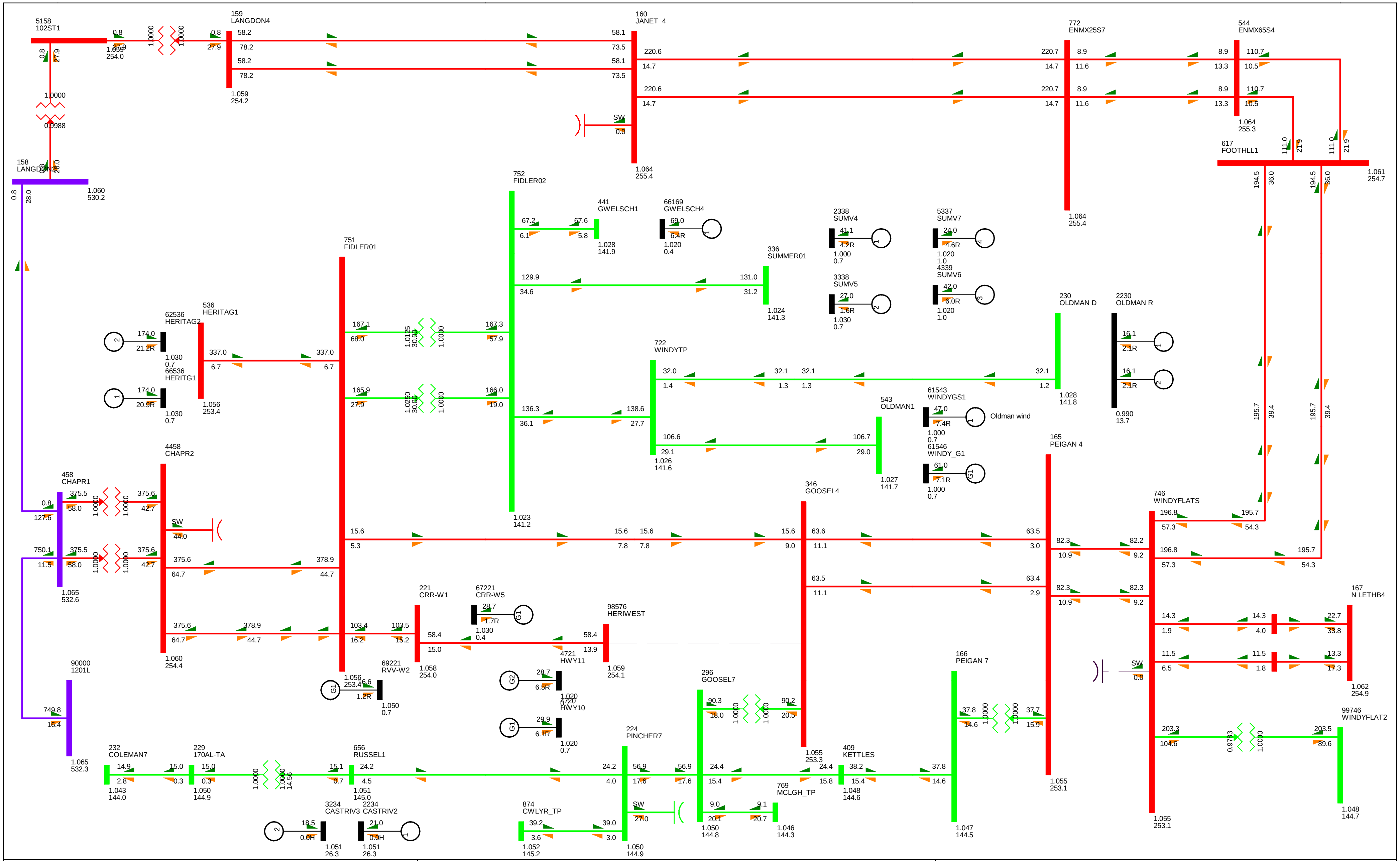


FIGURE C-3-4 - CONTINGENCY 1072L 2022 SL ALT1 WED, JUN 27 2012 1:31	**Fidler Connection**	Bus - VOLTAGE (kV/PU) Branch - MW/Mvar Equipment - MW/Mvar 100.0%RATEA 1.120OV 0.950UV kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000 BC Export : 775.3 MW SA Export : -0.1 MW MH Export : 0.0 MW

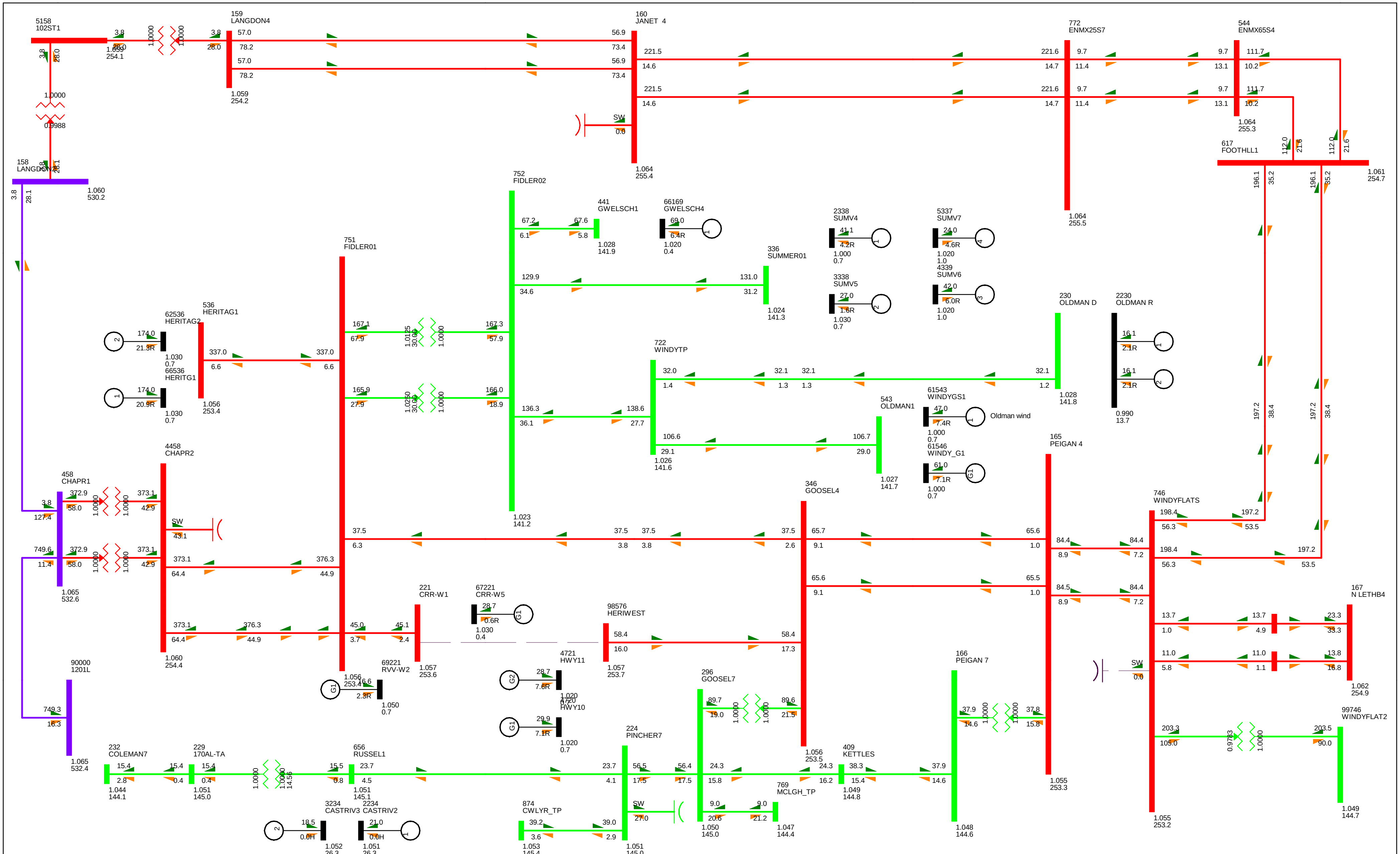


FIGURE C-3-5 - CONTINGENCY 1072LCTOH
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

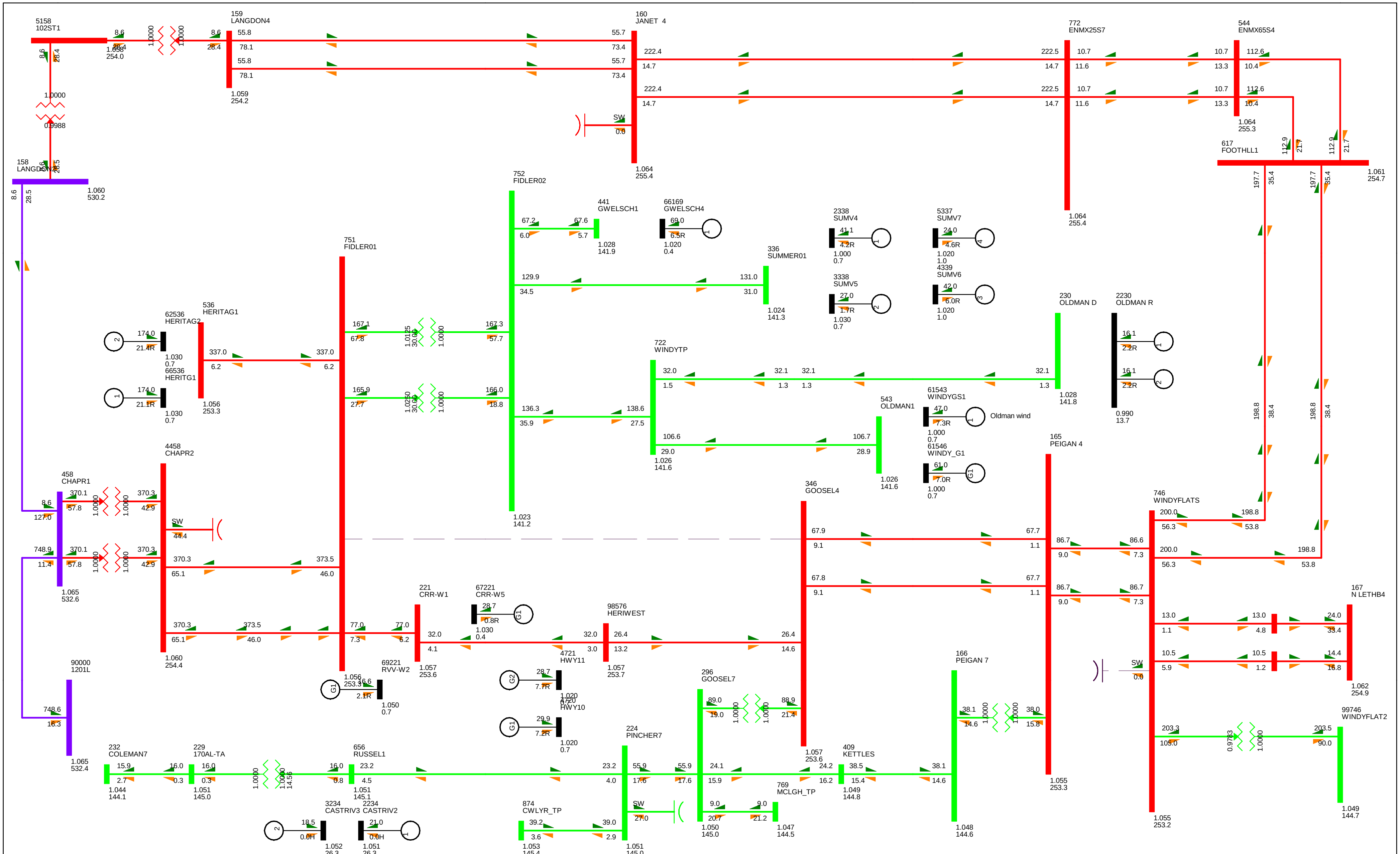


FIGURE C-3-6 - CONTINGENCY 994L 2022 SL ALT1 WED, JUN 27 2012 1:31	**Fidler Connection**	Bus - VOLTAGE (kV/PU) Branch - MW/Mvar Equipment - MW/Mvar 100.0%RATEA 1.120OV 0.950UV kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000 BC Export : 775.1 MW SA Export : -0.1 MW MH Export : 0.0 MW

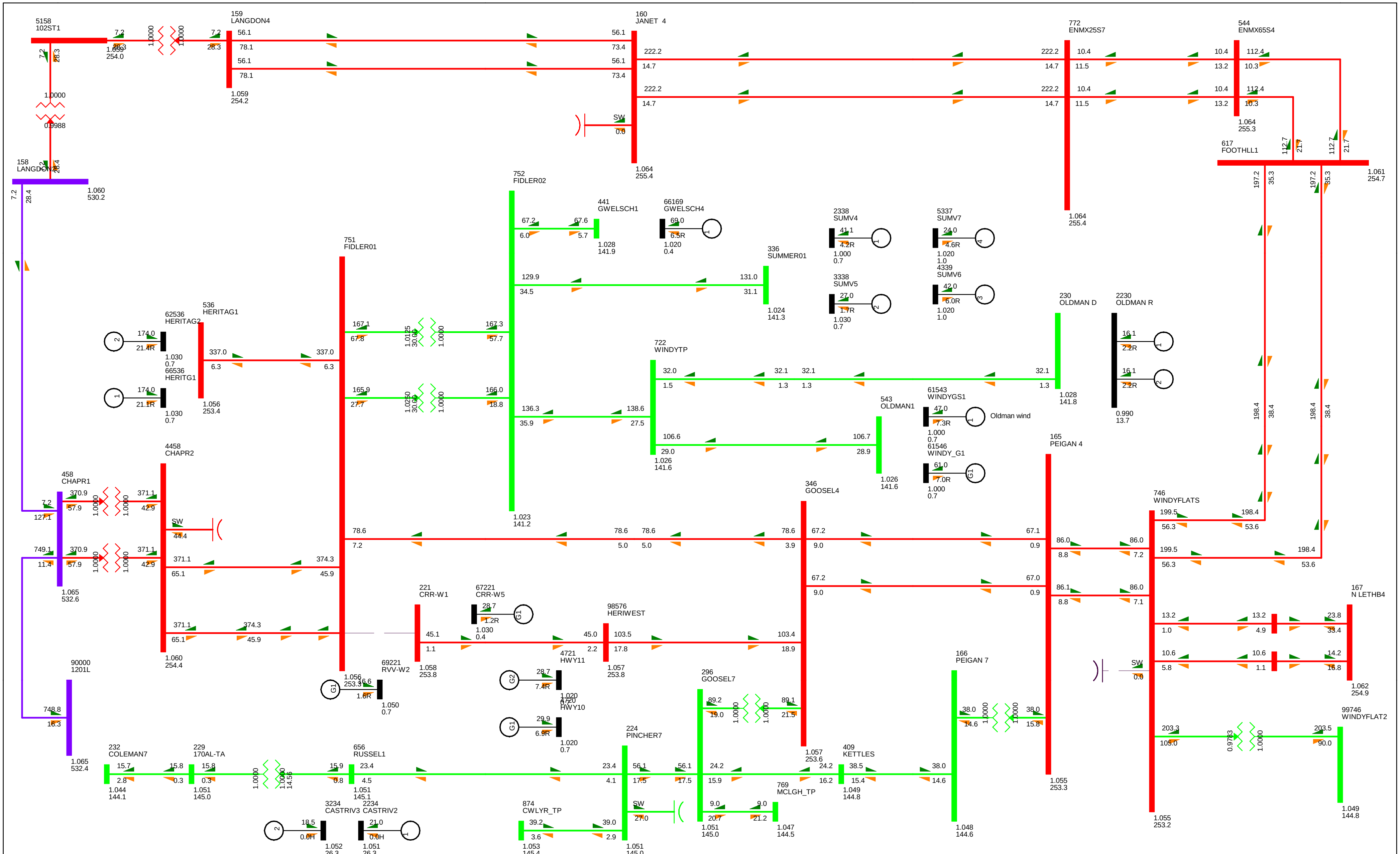


FIGURE C-3-7 - CONTINGENCY 1071L
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

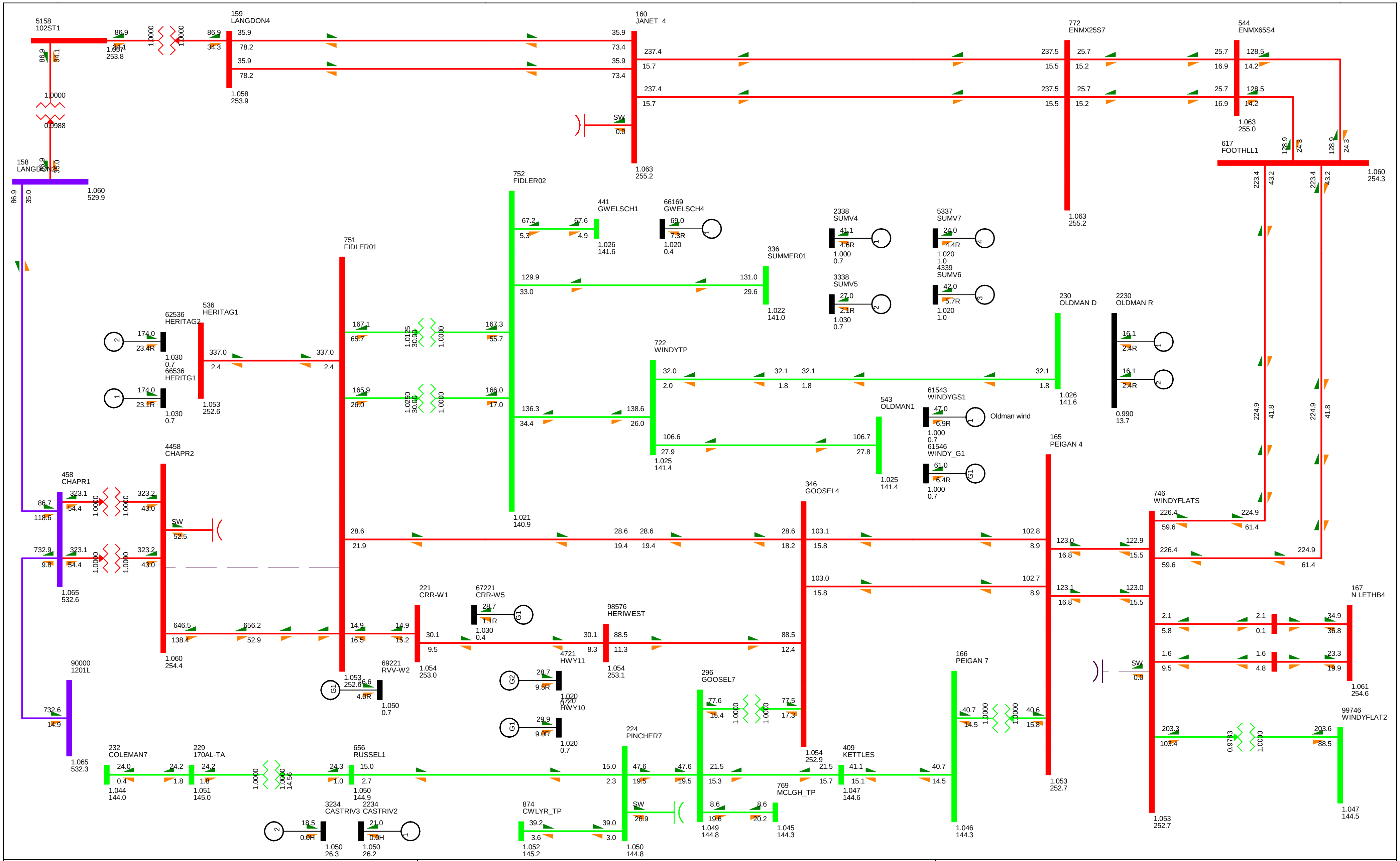


FIGURE C-3-8 - CONTINGENCY 1004L
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 768.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

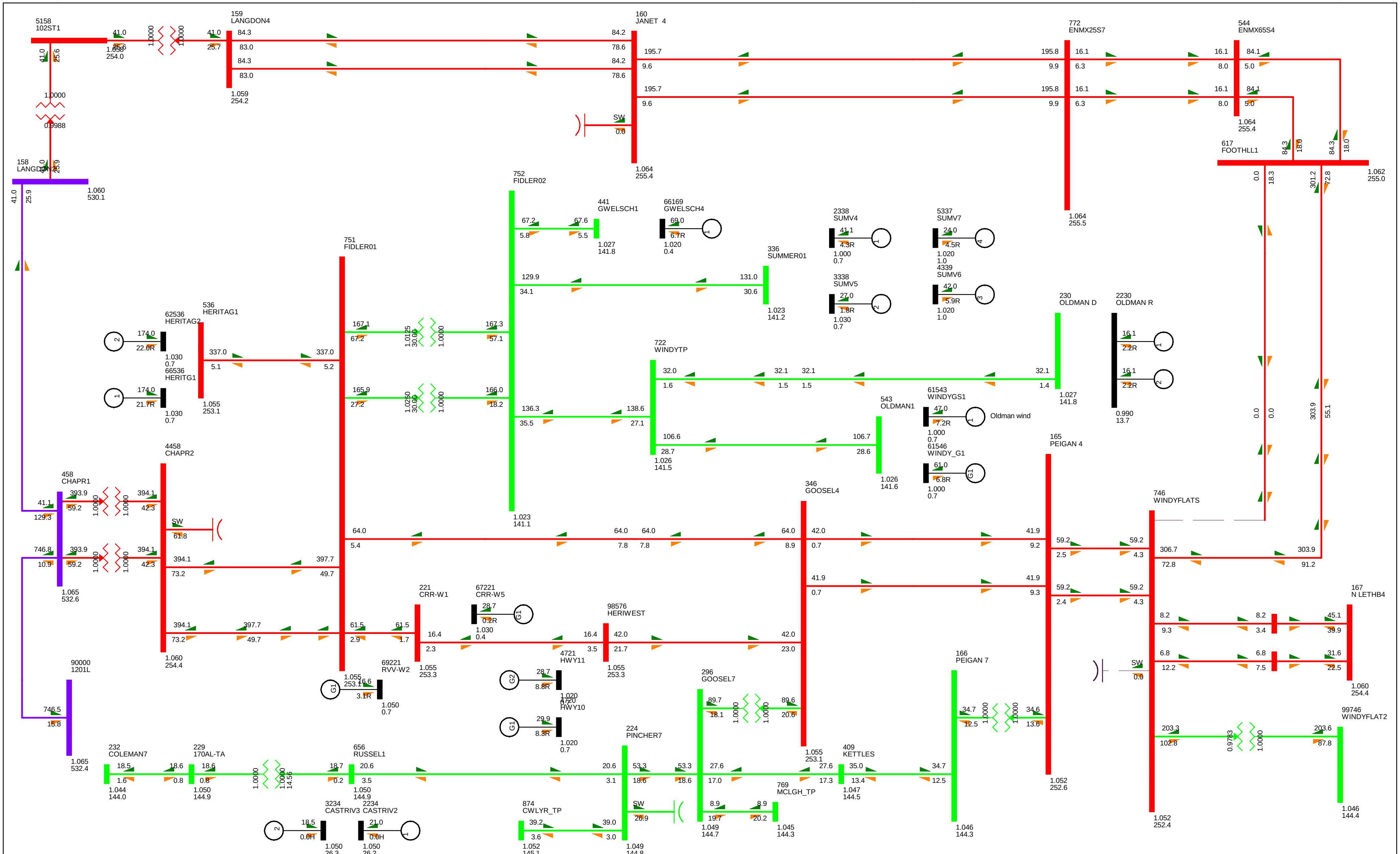


FIGURE C-3-9 - CONTINGENCY 1037L
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 772.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

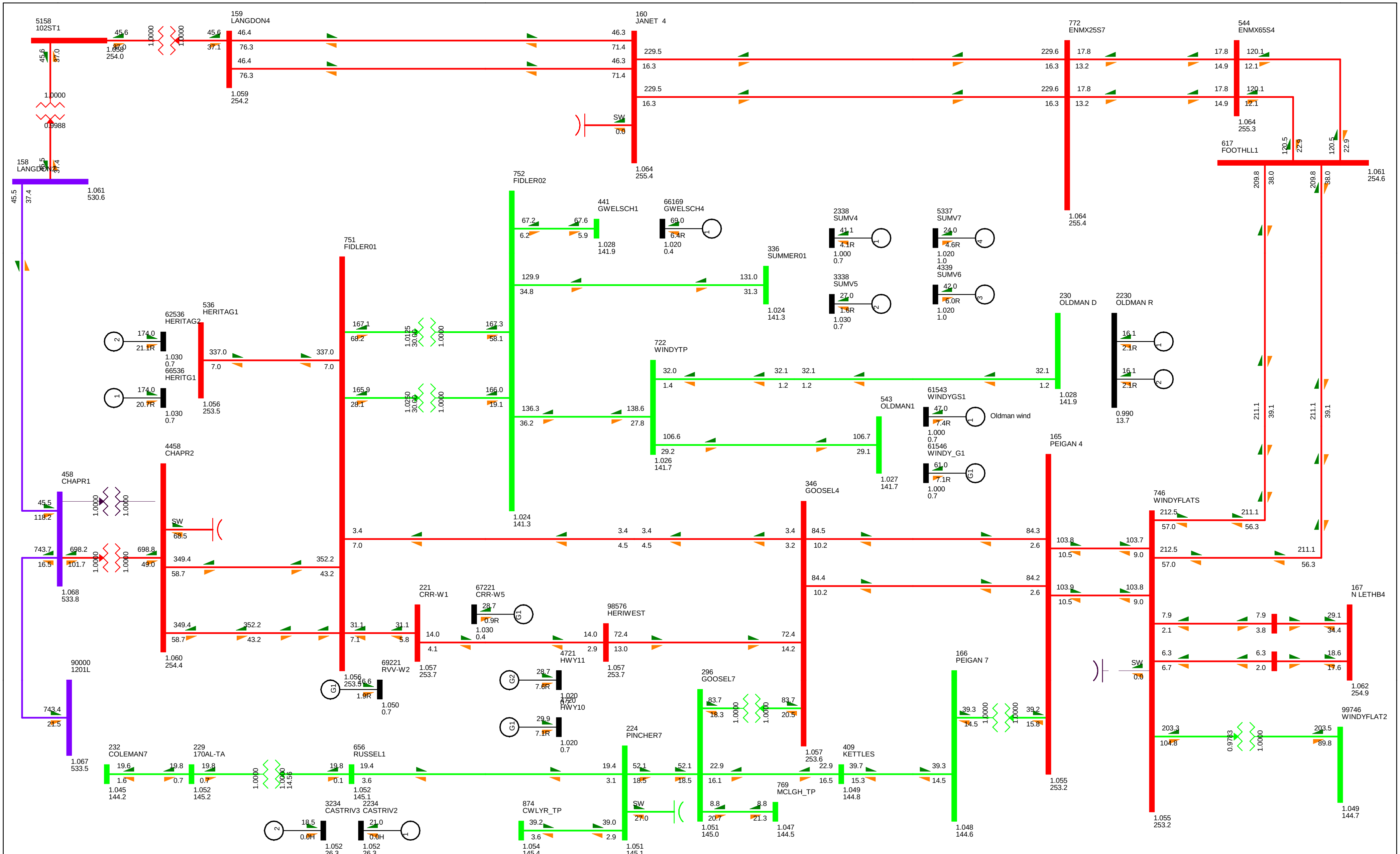


FIGURE C-3-10 - CONTINGENCY CHAPELXMER
2022 SL ALT1
WED, JUN 27 2012 1:31

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

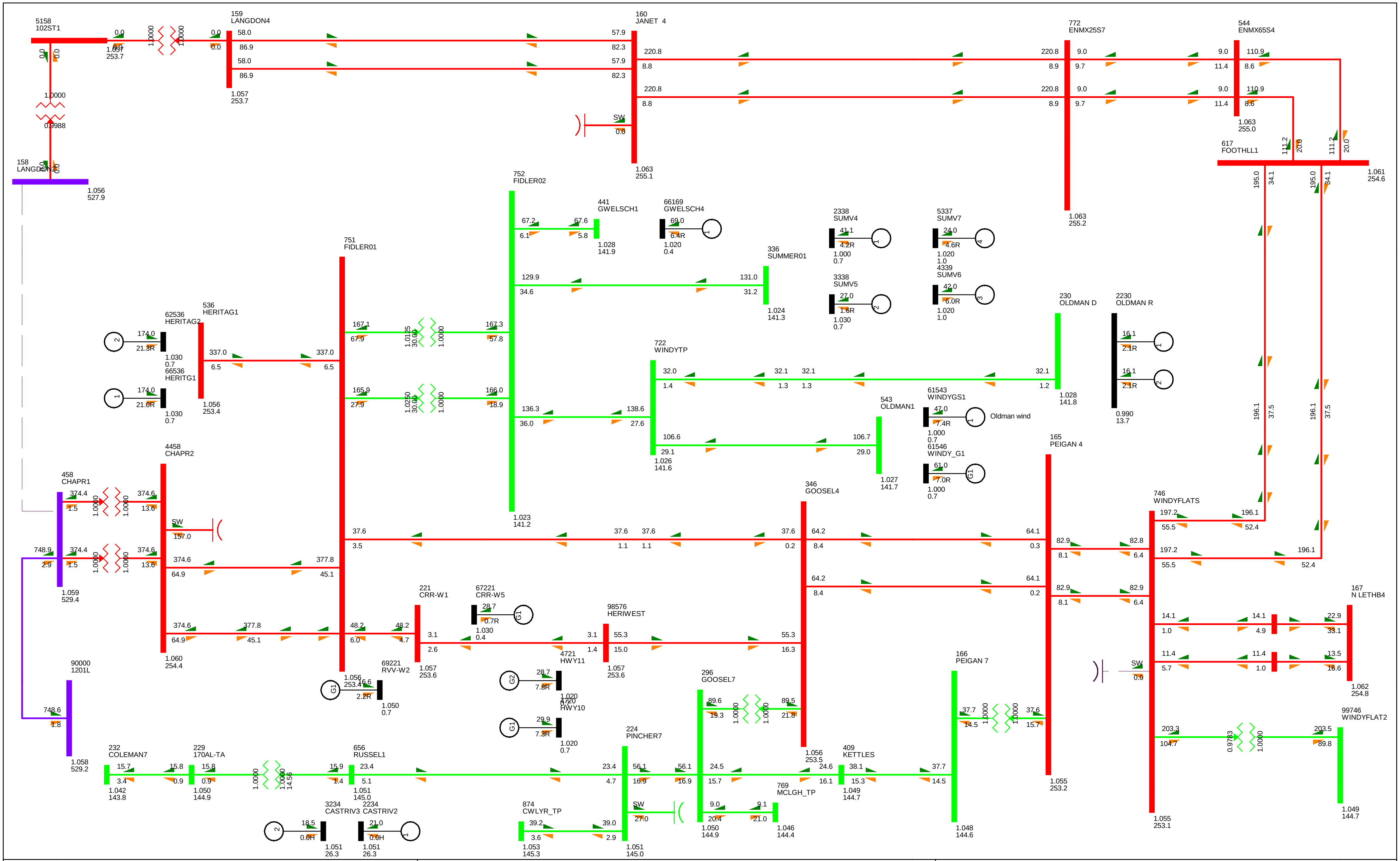


FIGURE C-3-11 - CONTINGENCY 1201L
2022 SL ALT1
WED, JUN 27 2012 1:32

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

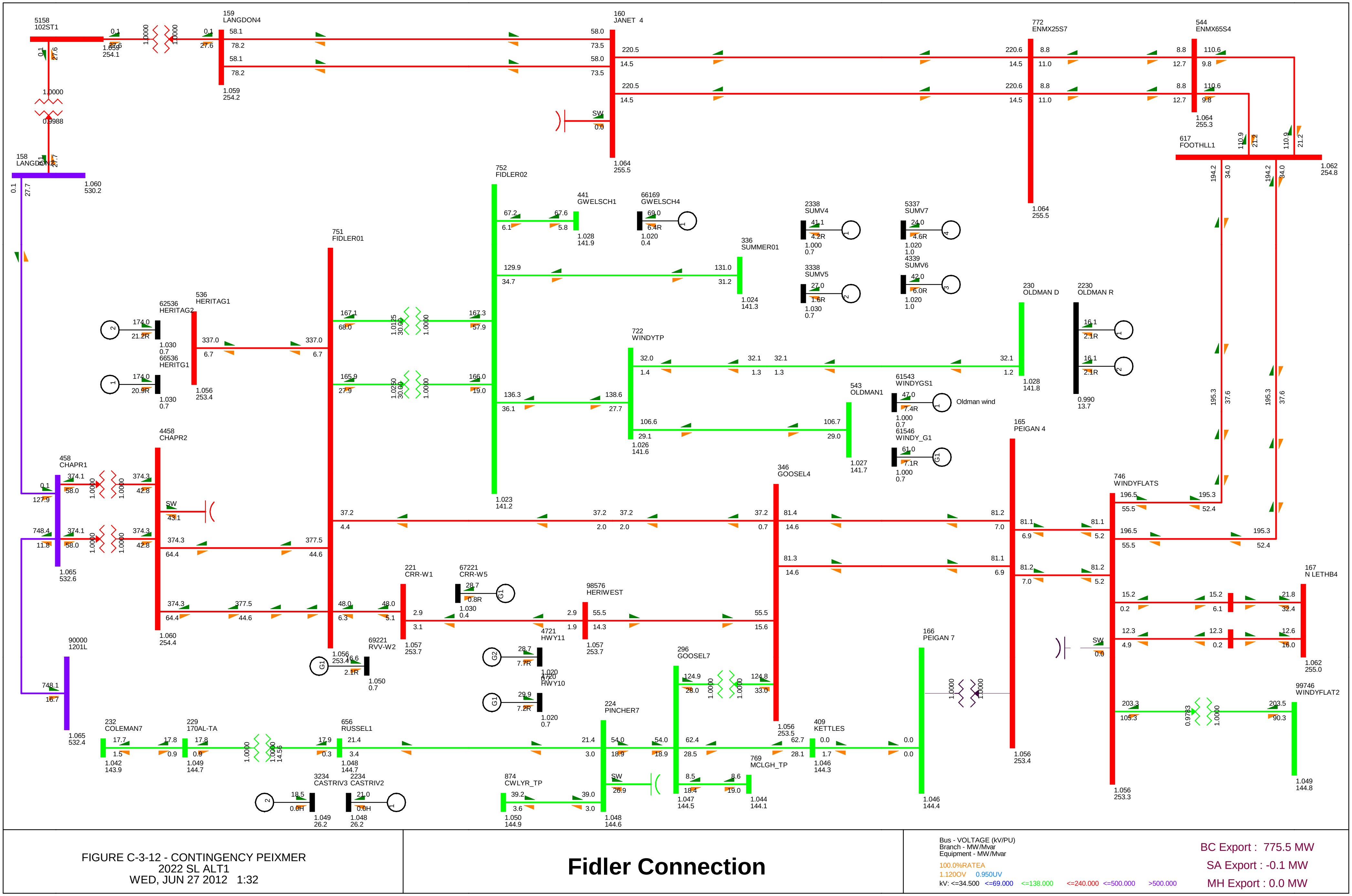


FIGURE C-3-12 - CONTINGENCY PEIXMER
2022 SL ALT1
WED, JUN 27 2012 1:32

Fidler Connection

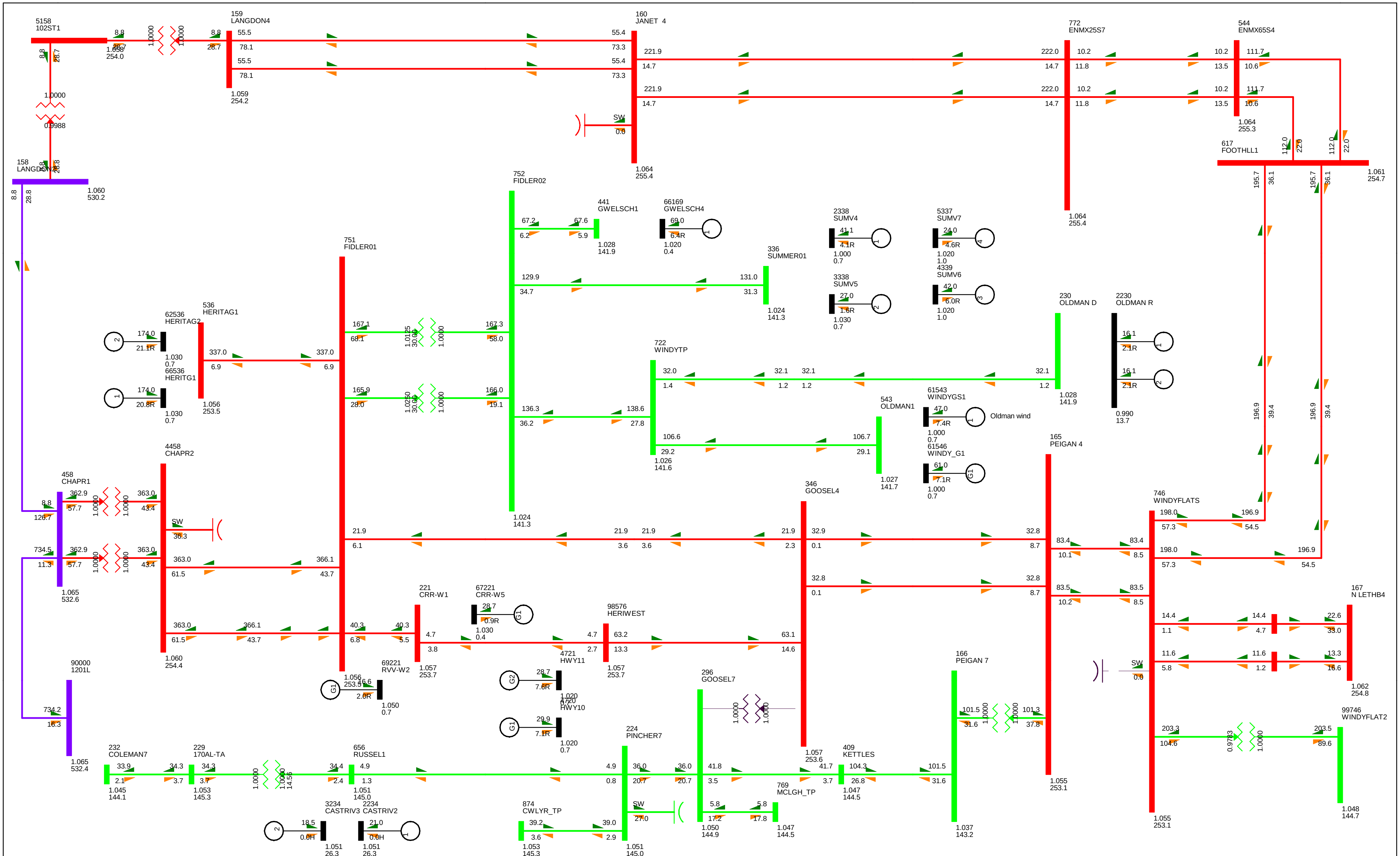


FIGURE C-3-13 - CONTINGENCY GLXMER
2022 SL ALT1
WED, JUN 27 2012 1:32

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 773.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

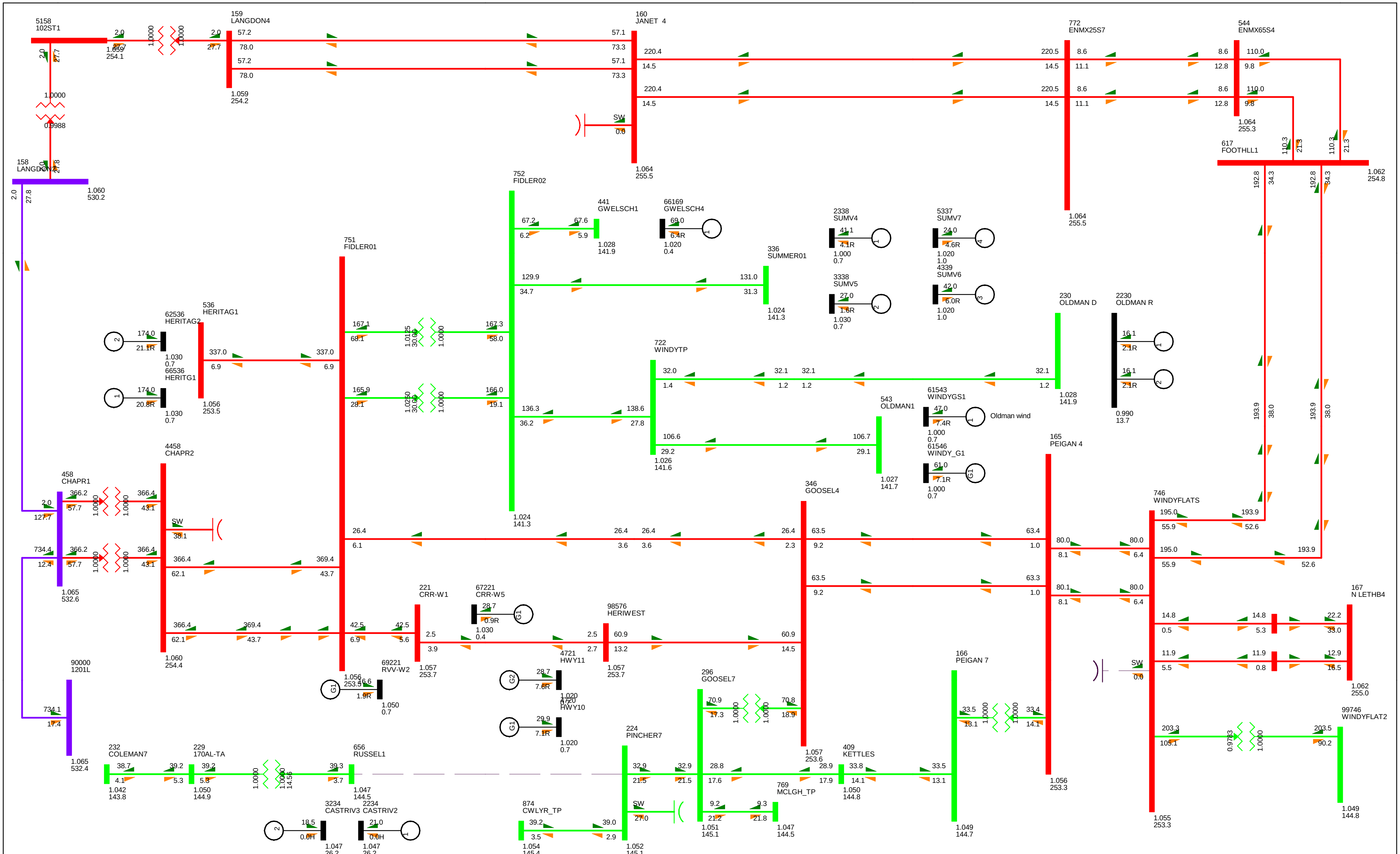


FIGURE C-3-14 - CONTINGENCY 170LRTOPC
2022 SL ALT1
WED, JUN 27 2012 1:32

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

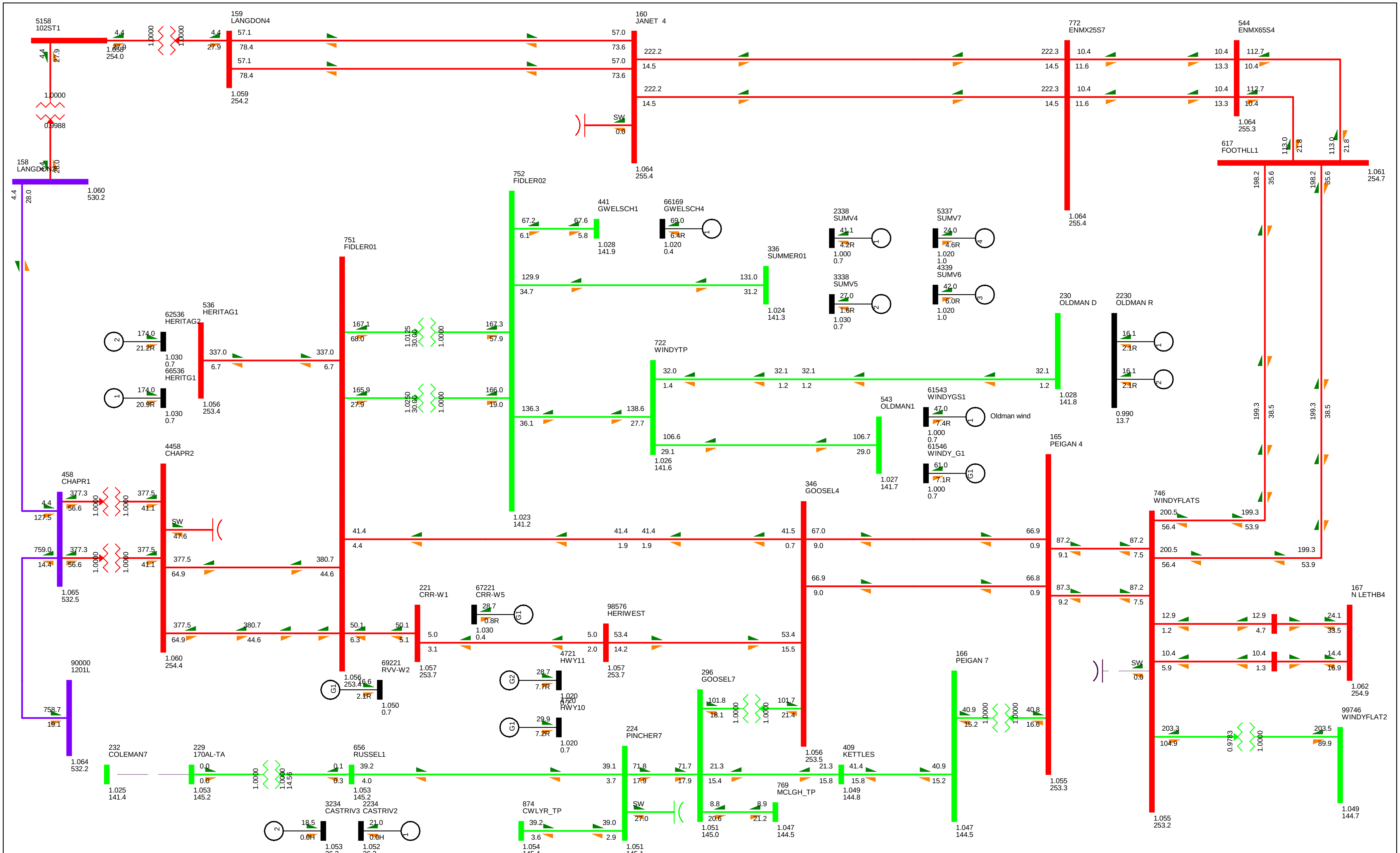


FIGURE C-3-15 - CONTINGENCY 170LRTOC
2022 SL ALT1
WED, JUN 27 2012 1:32

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

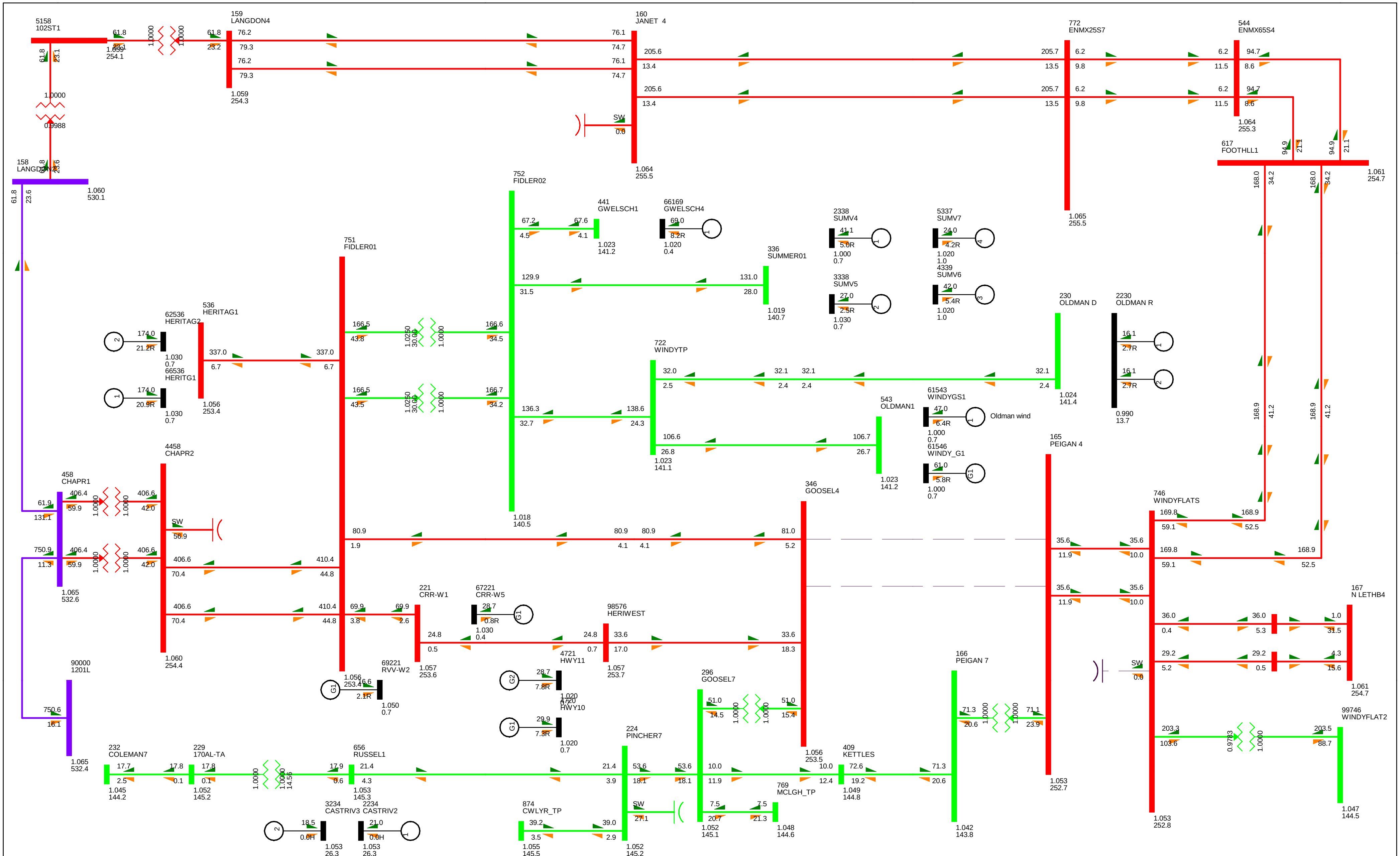


FIGURE C-3-16 - CONTINGENCY 95556L
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

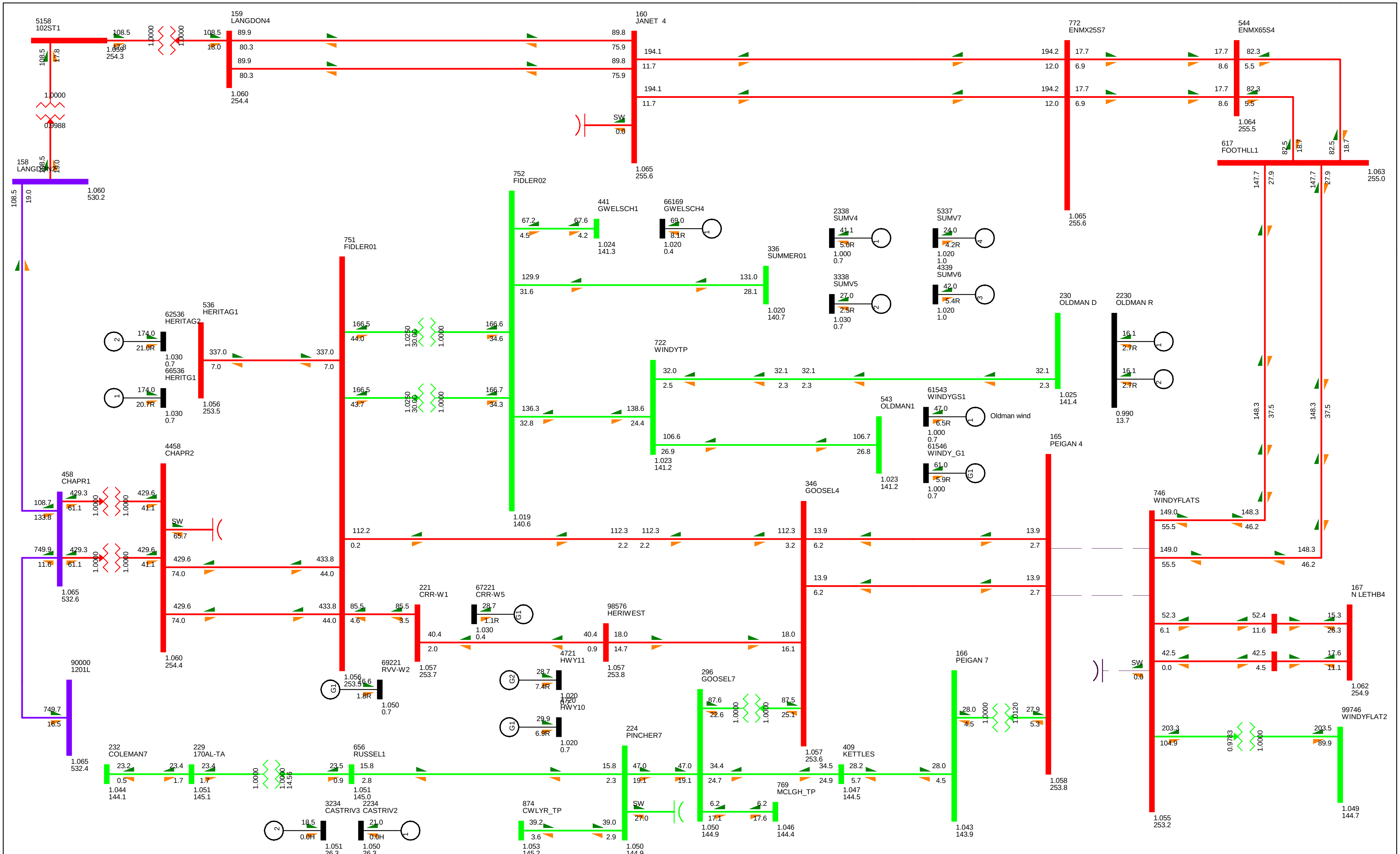


FIGURE C-3-17 - CONTINGENCY PEIWF
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

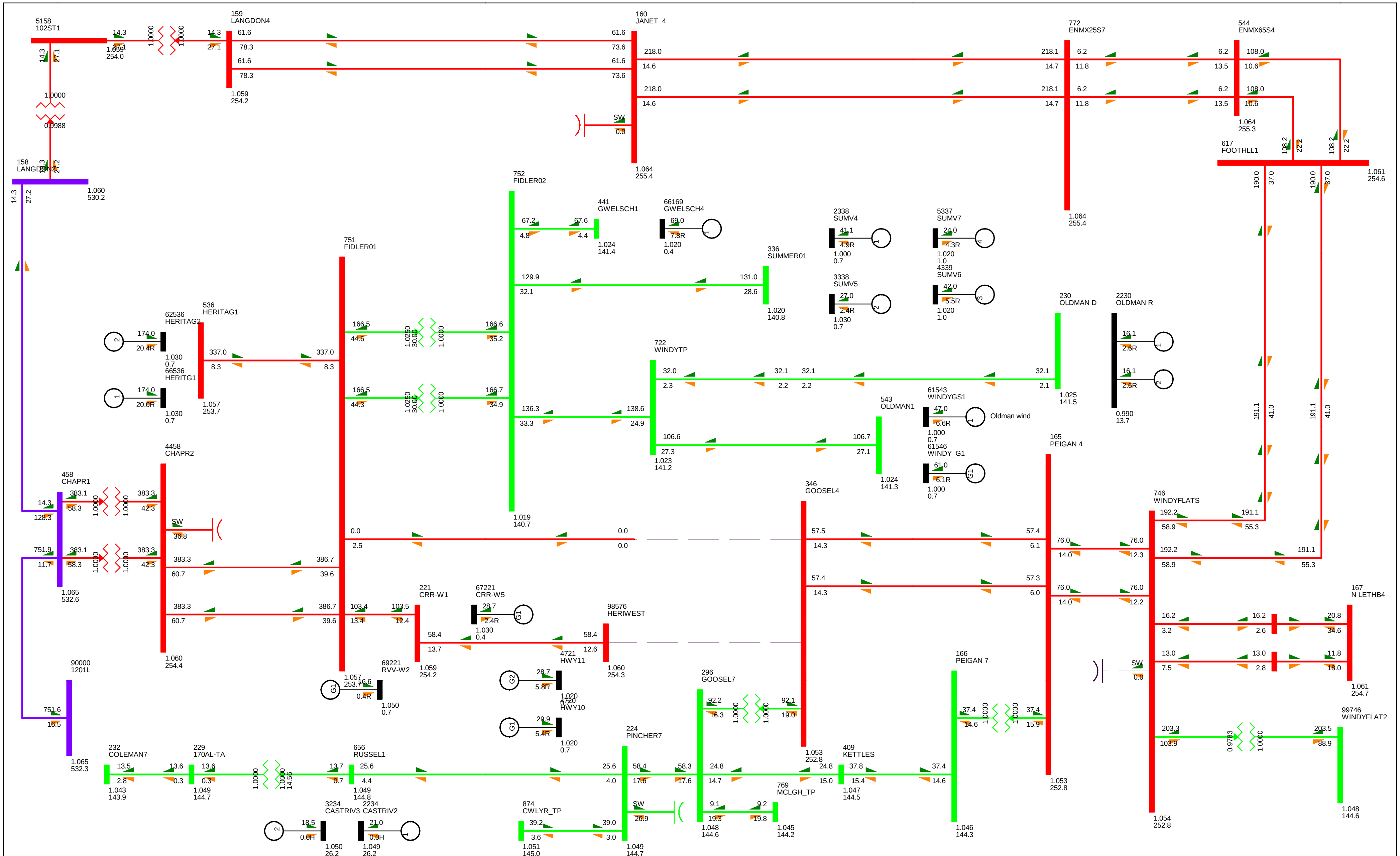


FIGURE C-3-18 - CONTINGENCY GLTOH
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

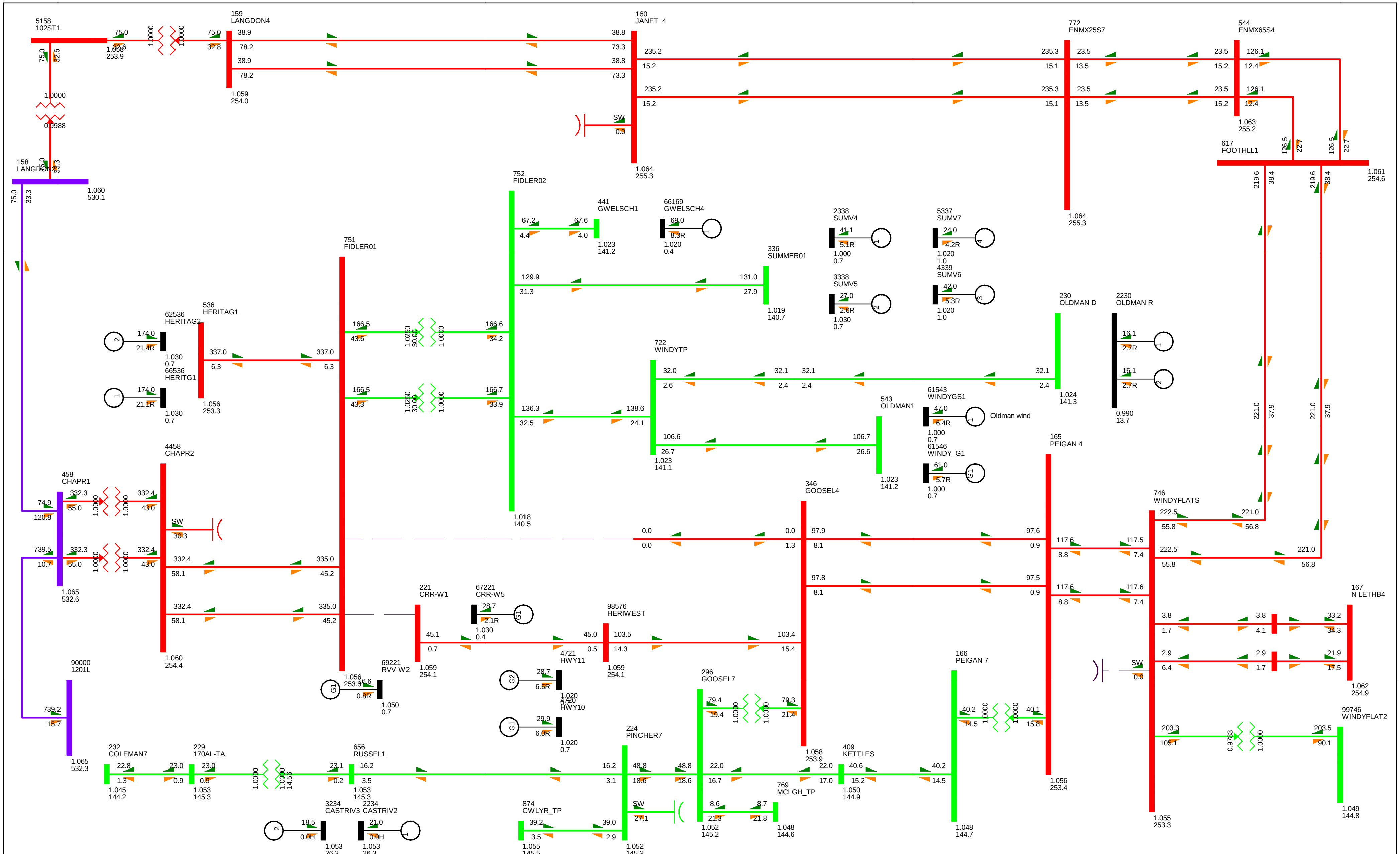


FIGURE C-3-19 - CONTINGENCY FIDLERTOCRRA
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 773.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

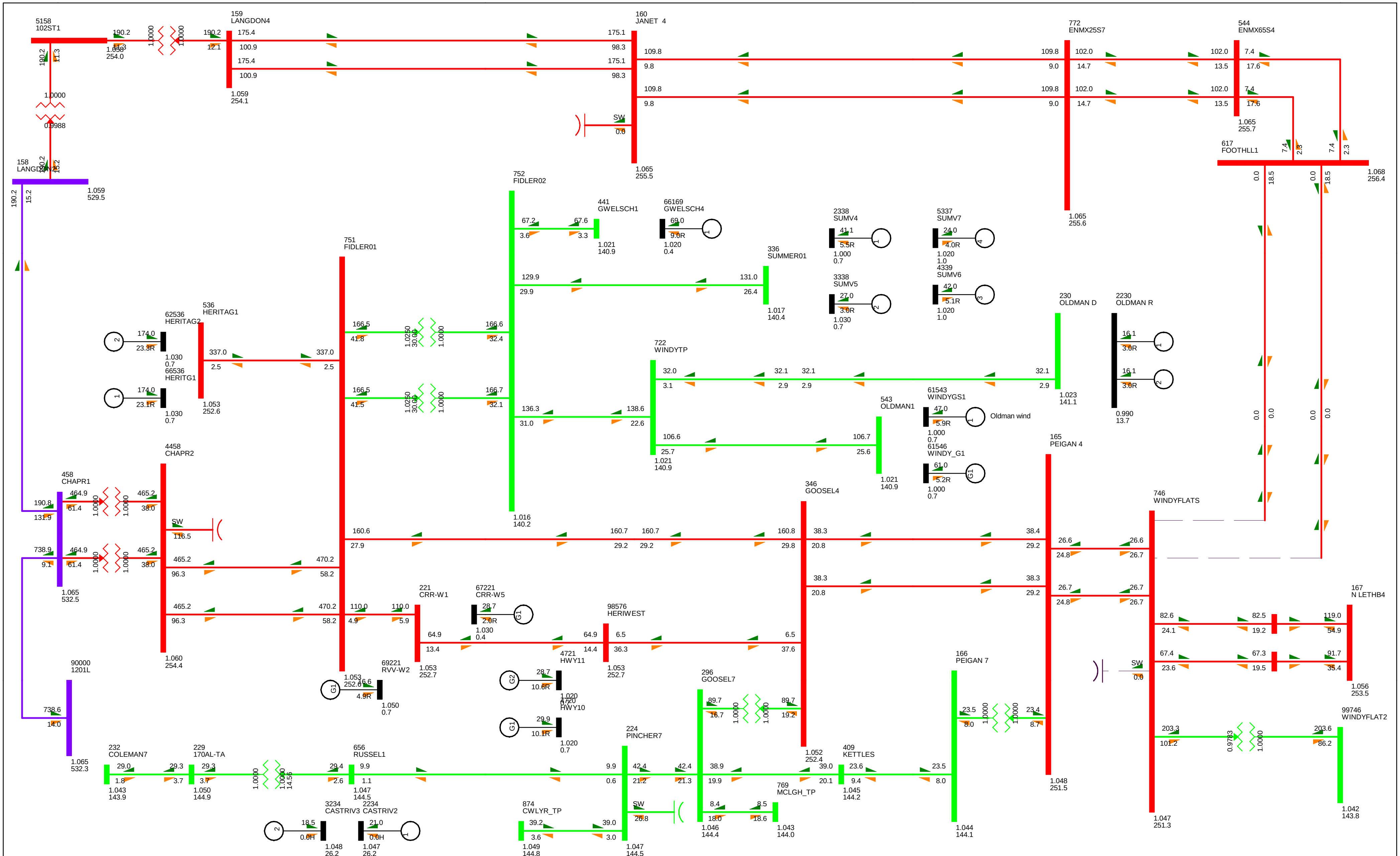


FIGURE C-3-20 - CONTINGENCY 1037L1038L
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 764.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

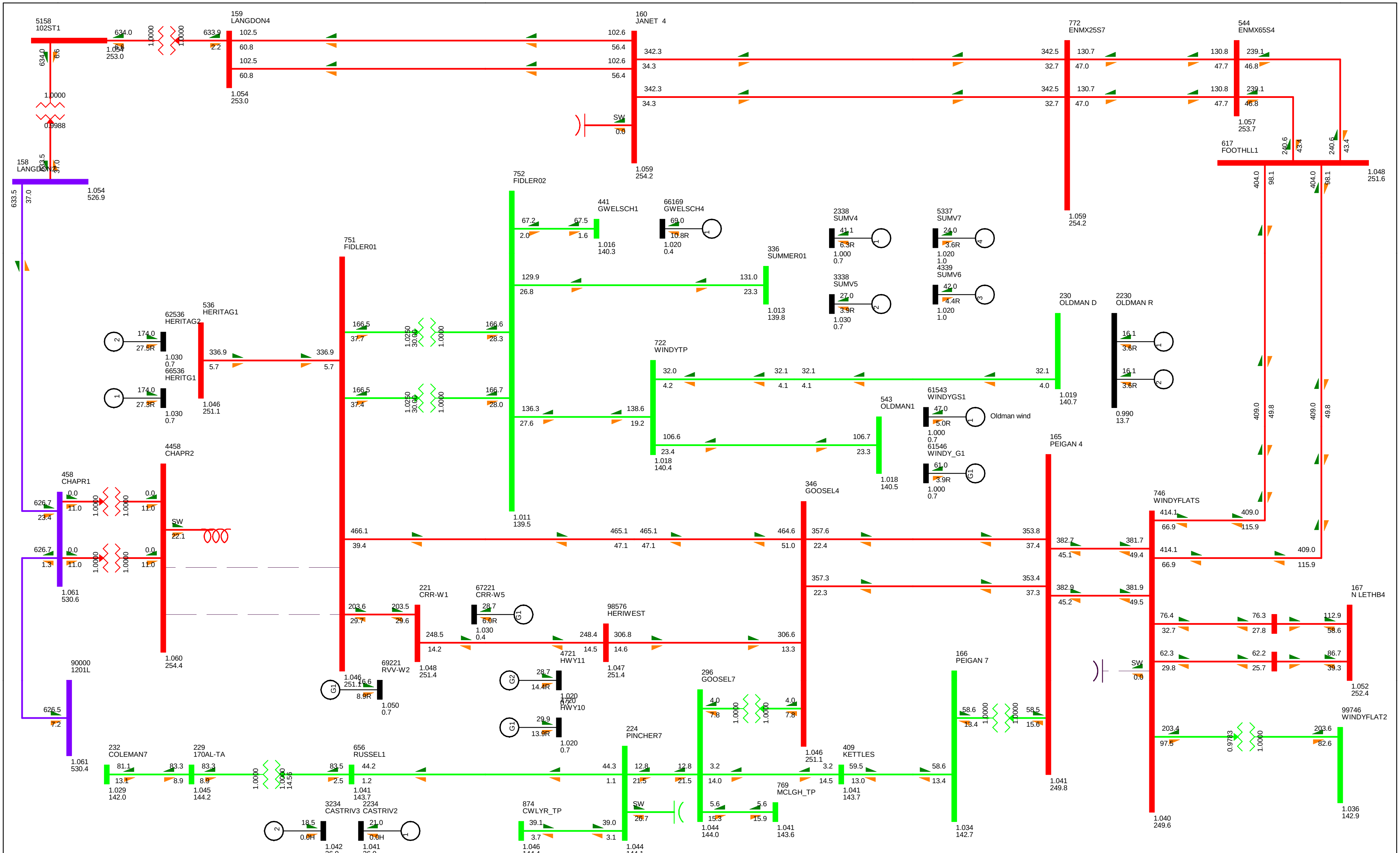


FIGURE C-3-21 - CONTINGENCY FIDLERTOCHAP
2022 SL ALT1
SUN, OCT 14 2012 13:02

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 724.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

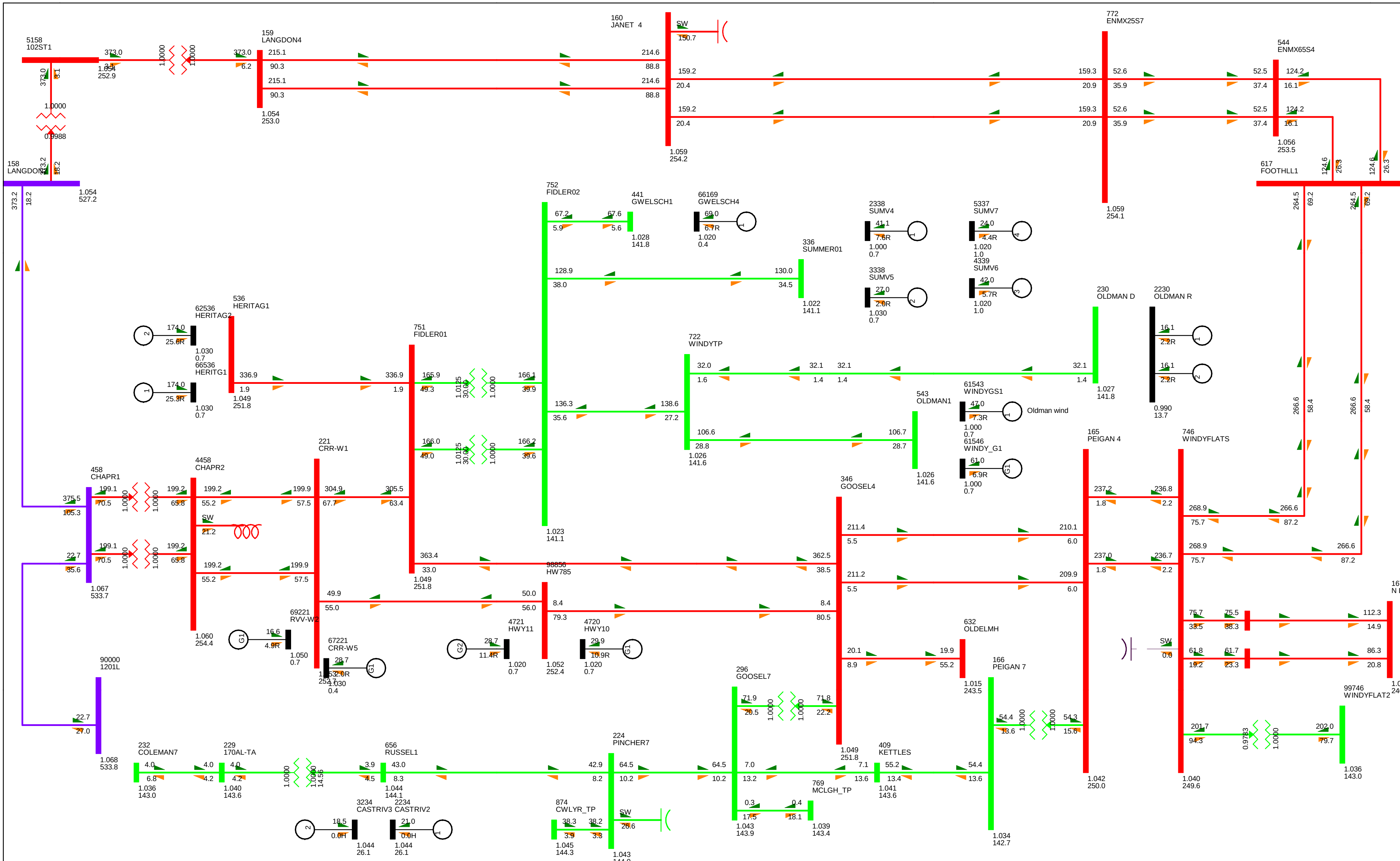


FIGURE C-4-1 - SYSTEM NORMAL
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 2.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

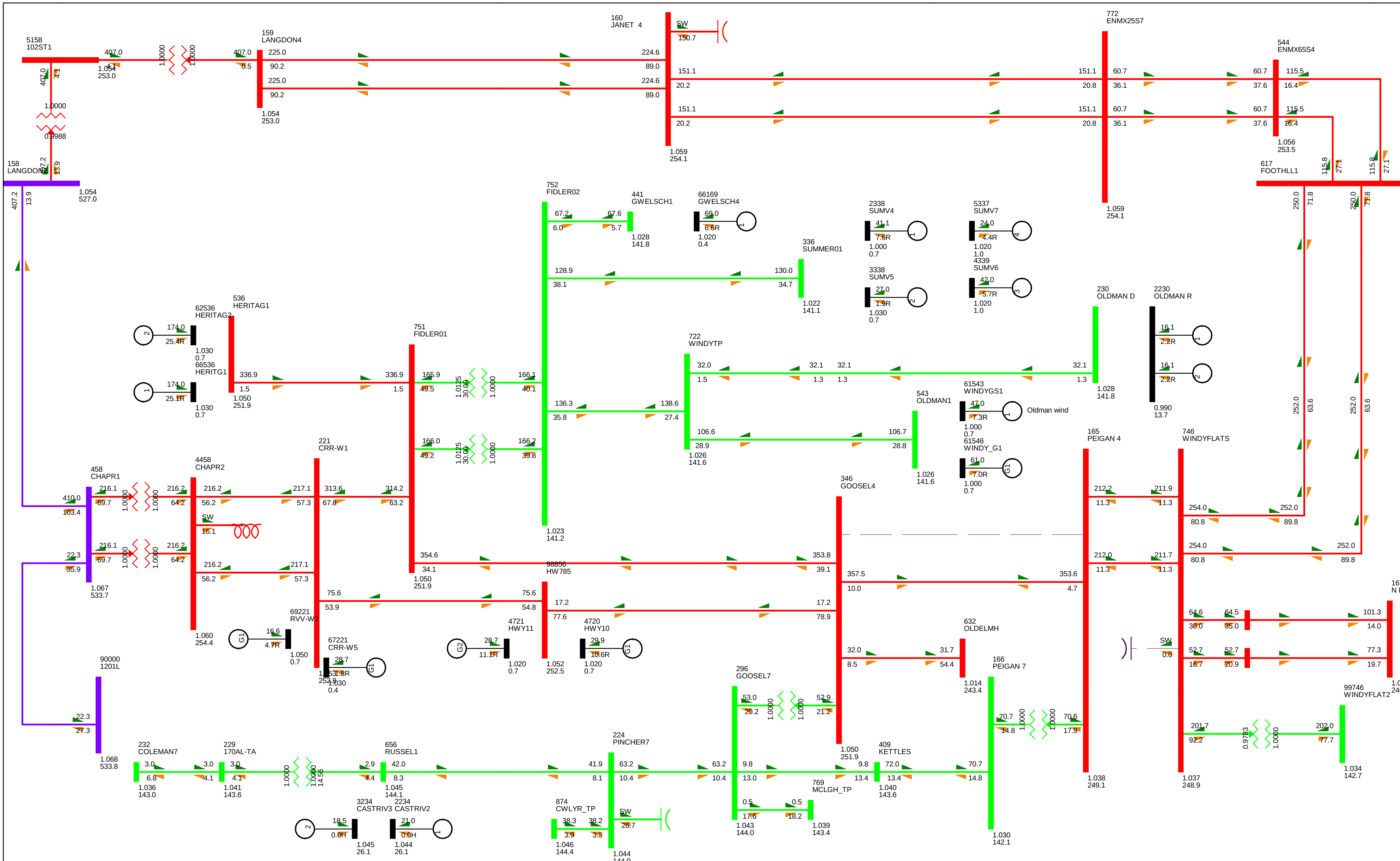


FIGURE C-4-2 - CONTINGENCY 955L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 1.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

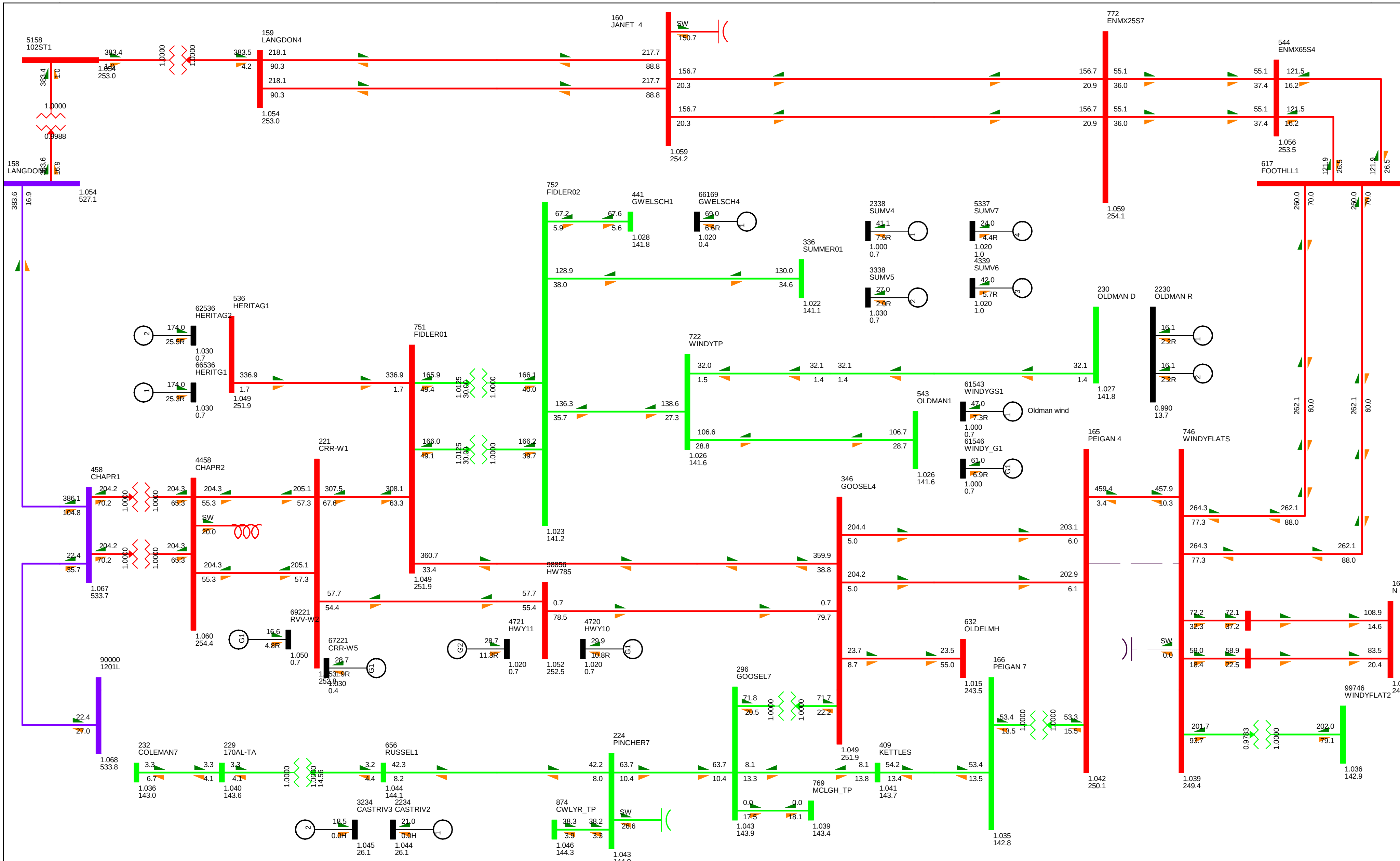


FIGURE C-4-3 - CONTINGENCY 1048L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 2.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

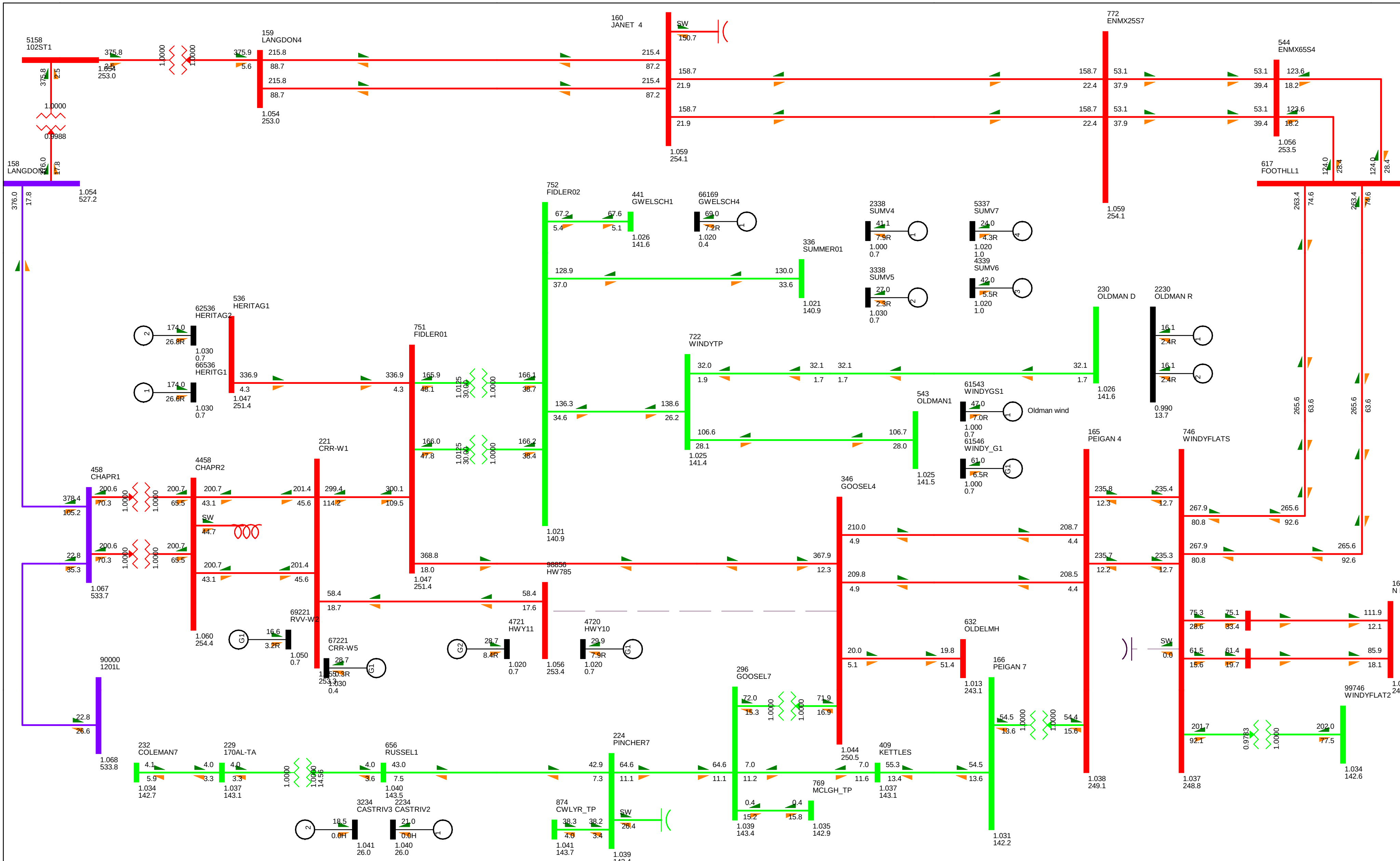


FIGURE C-4-4 - CONTINGENCY 1072L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 2.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

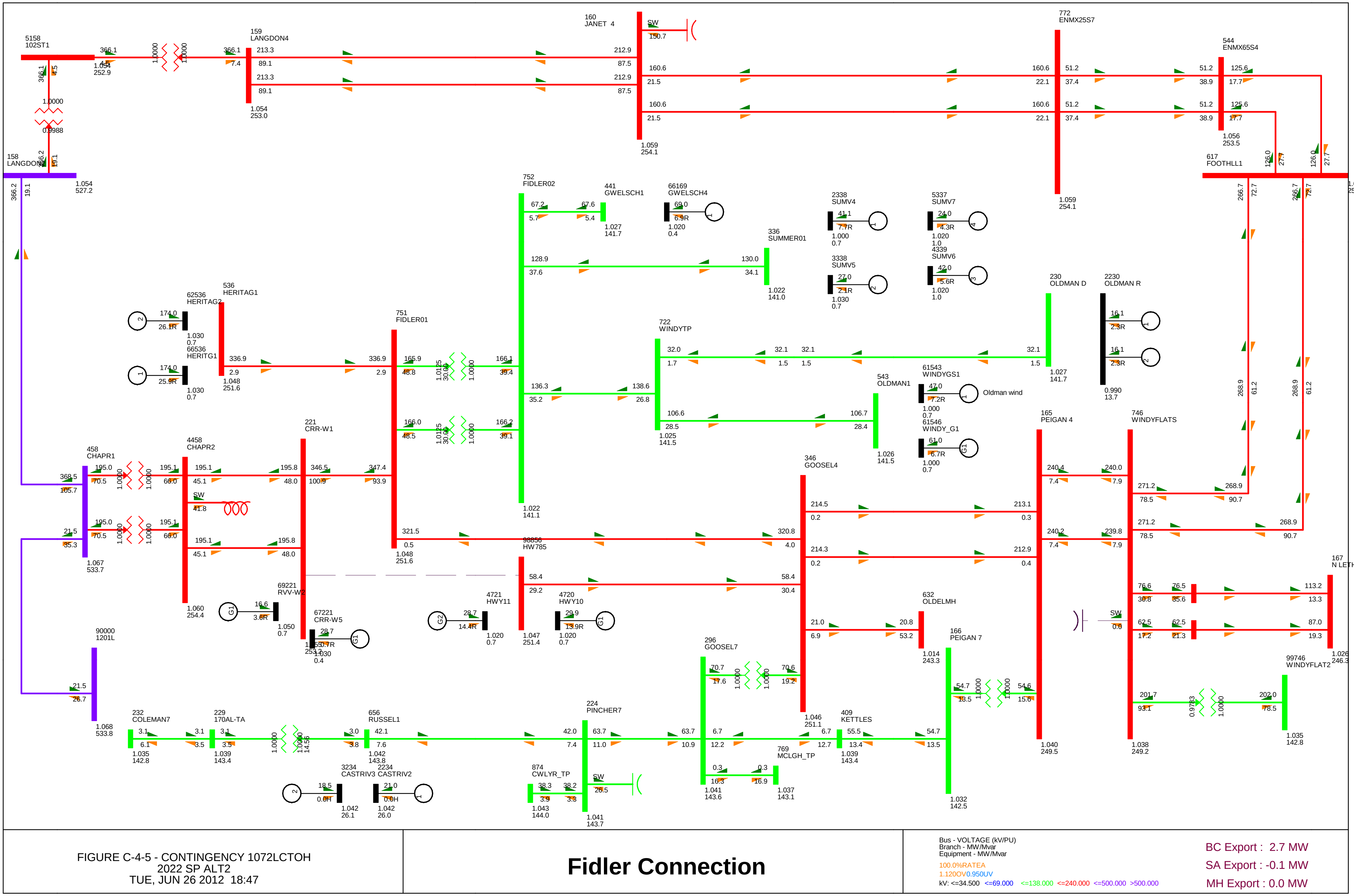


FIGURE C-4-5 - CONTINGENCY 1072LCTOH
2022 SP ALT2
TUE, JUN 26 2012 18:47
Fidler Connection
Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000
BC Export : 2.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

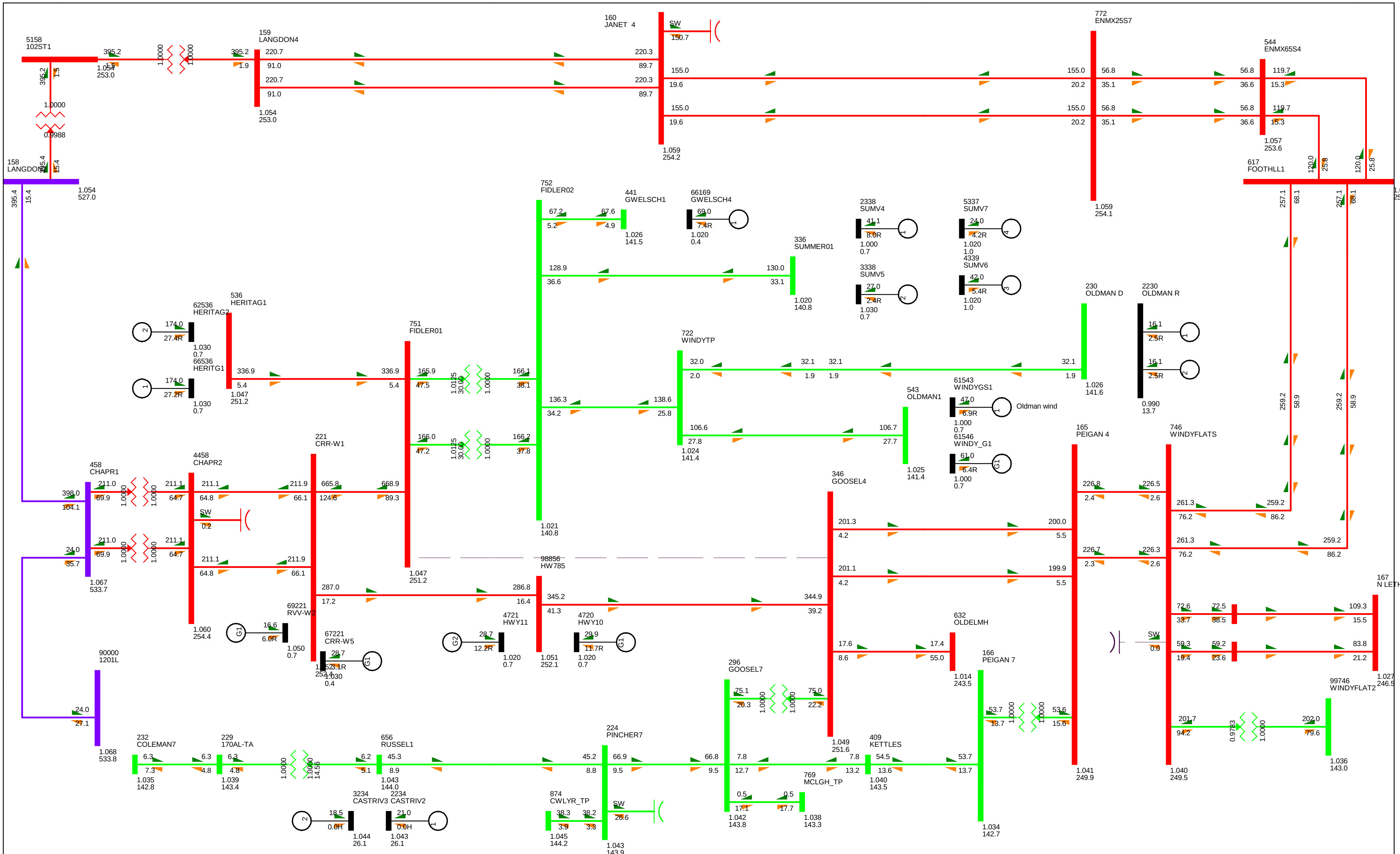


FIGURE C-4-6 - CONTINGENCY 994L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 1.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

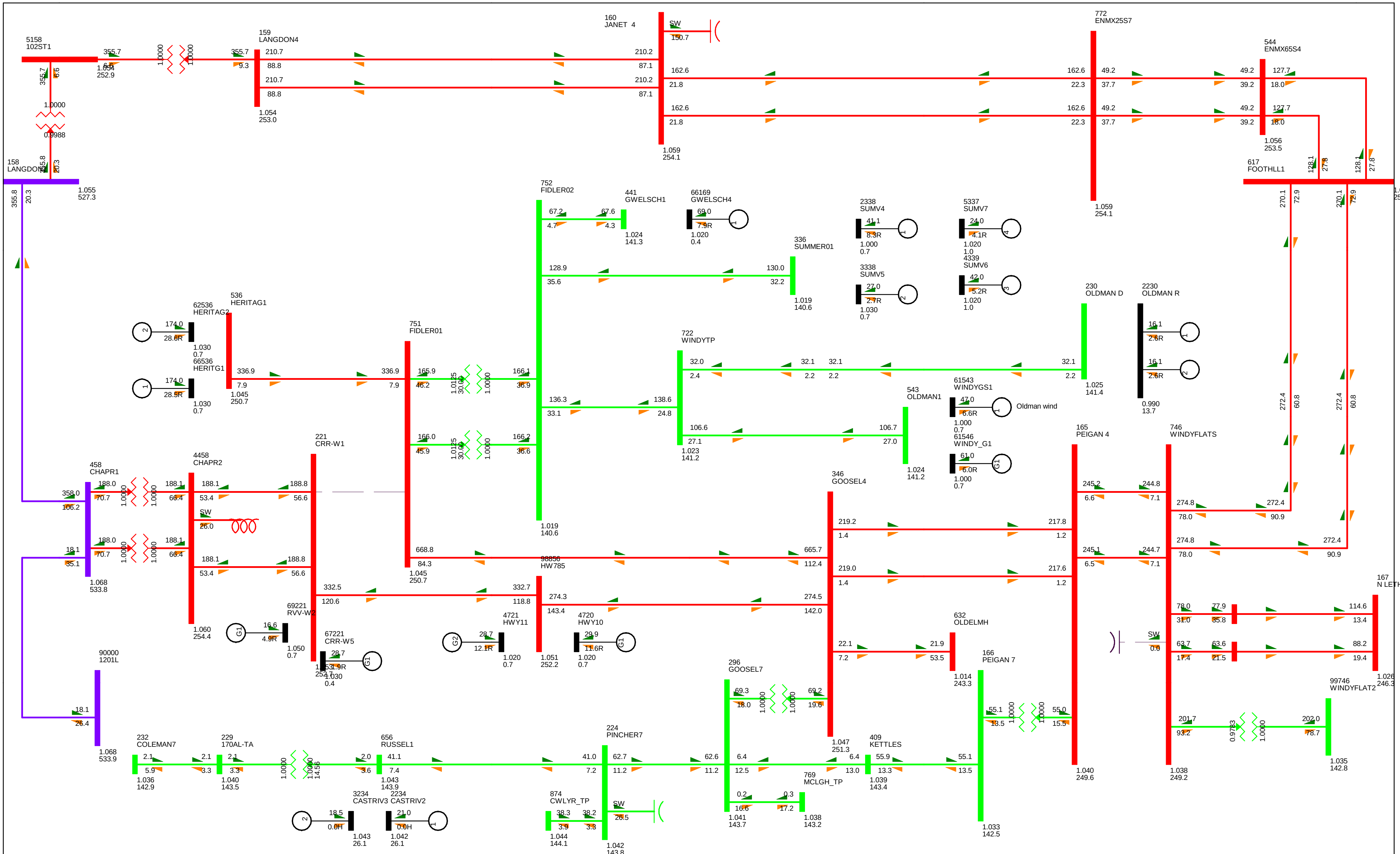


FIGURE C-4-7 - CONTINGENCY 1071L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 0.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

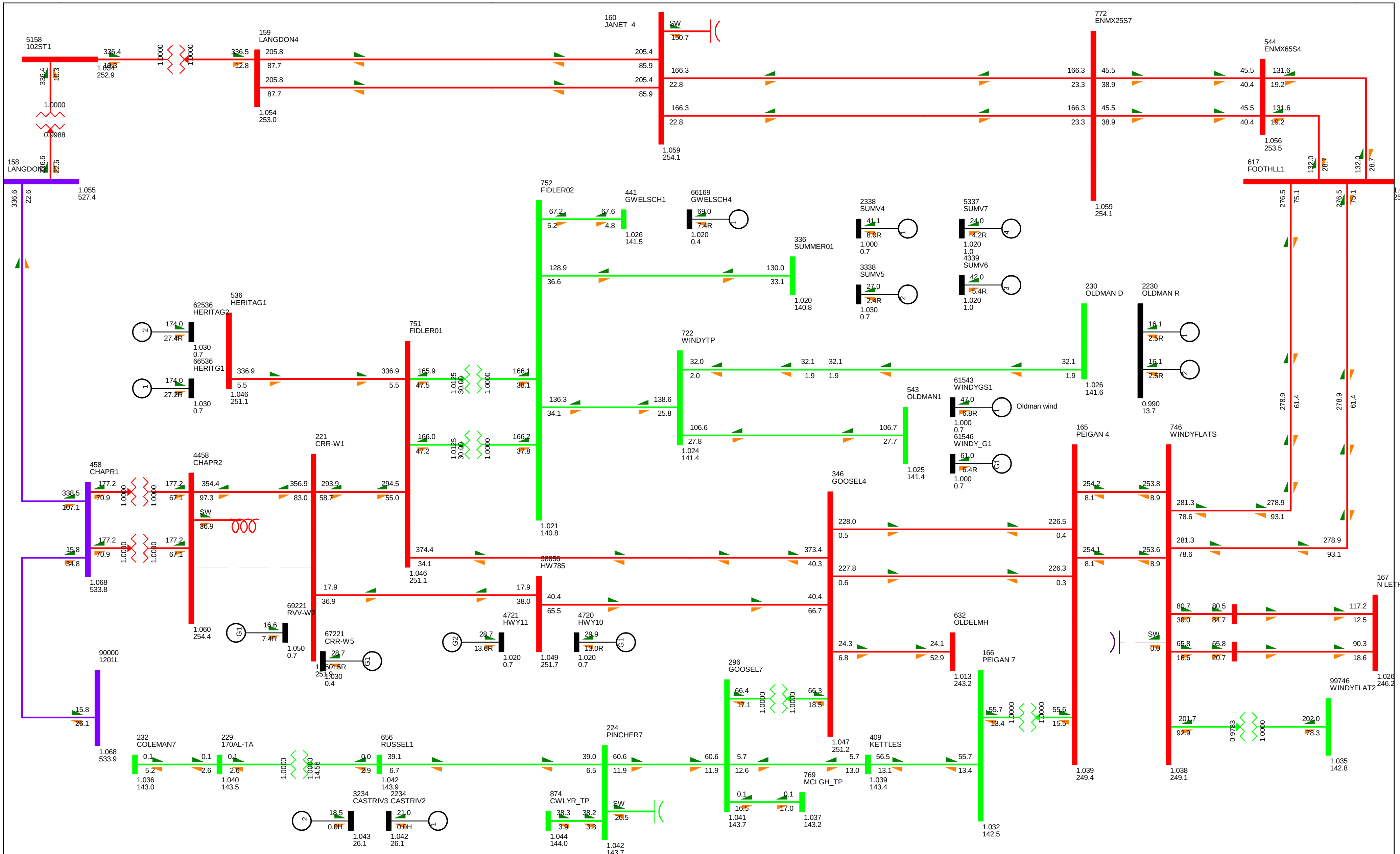


FIGURE C-4-8 - CONTINGENCY 1004L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 0.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

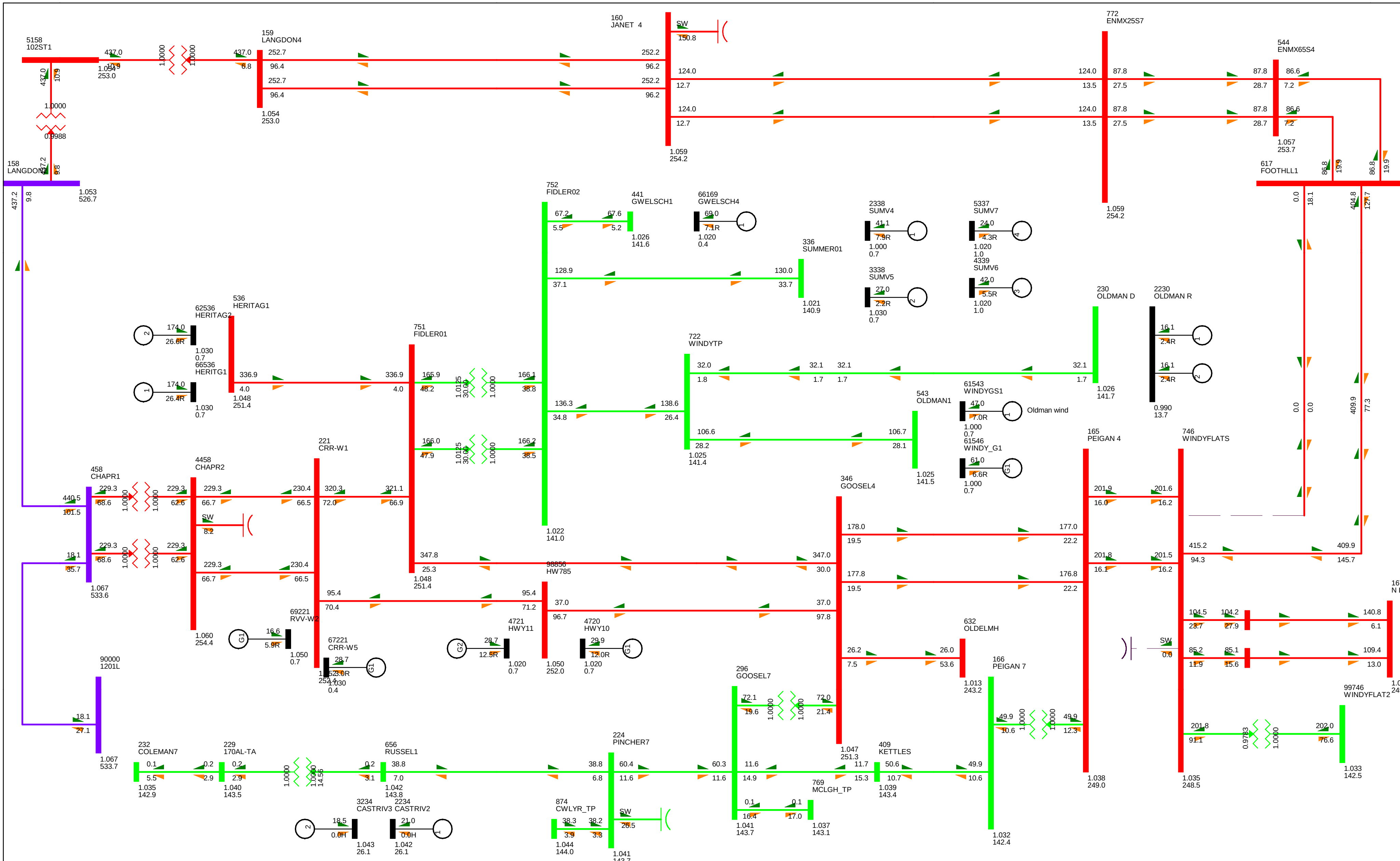


FIGURE C-4-9 - CONTINGENCY 1037L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

BC Export : -2.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

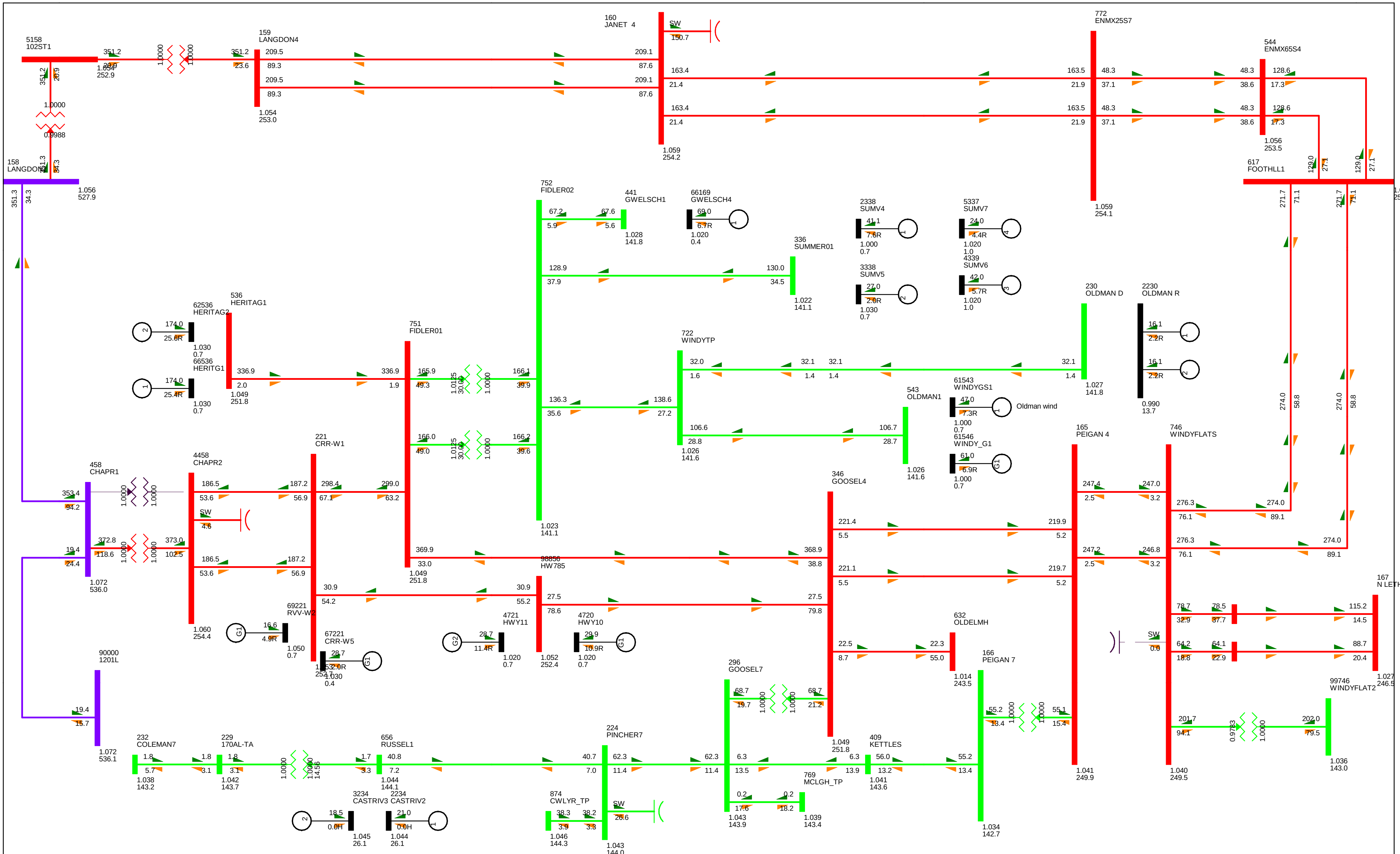


FIGURE C-4-10 - CONTINGENCY CHAPELXMER
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 1.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

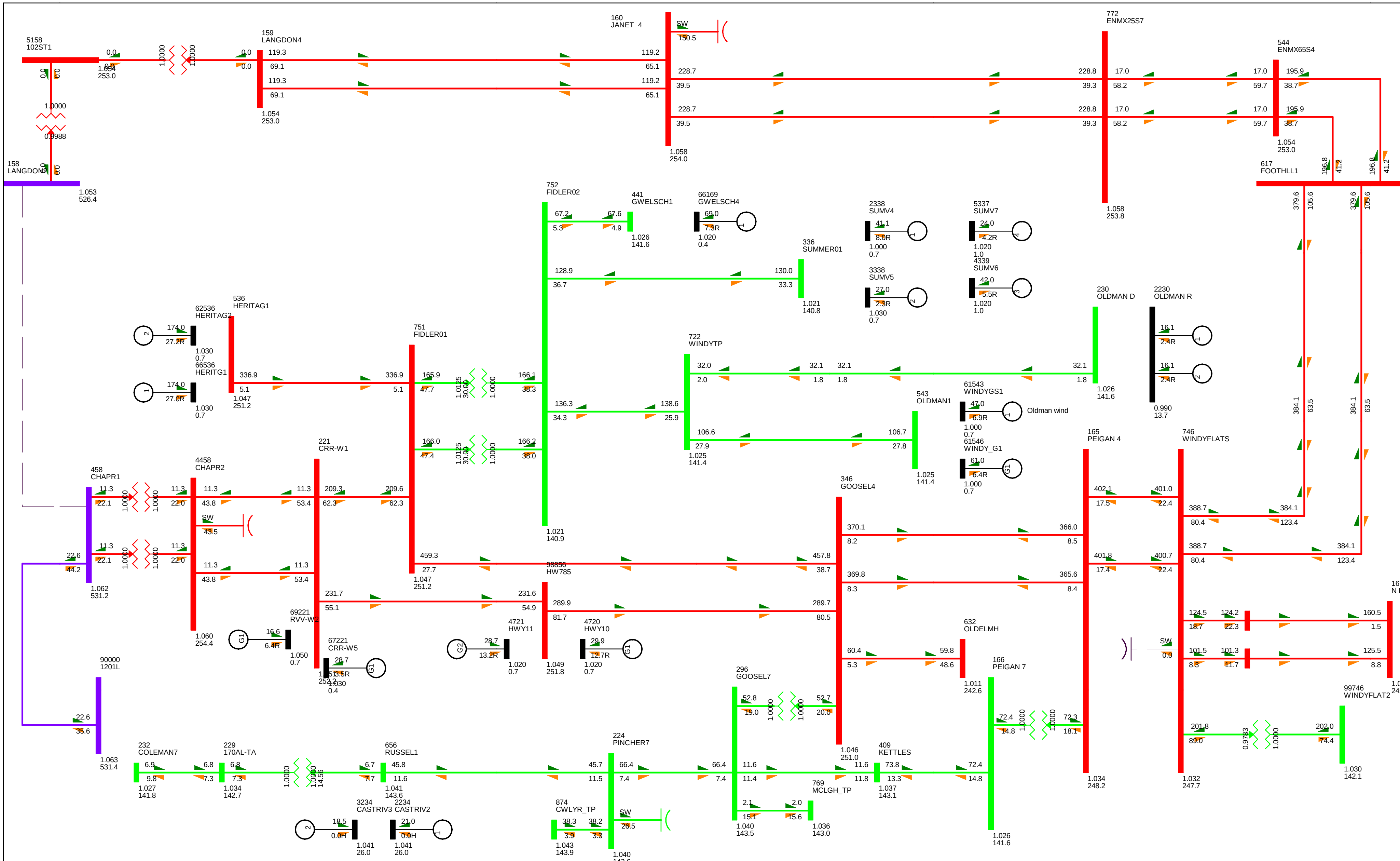


FIGURE C-4-11 - CONTINGENCY 1201L
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

BC Export : -20.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

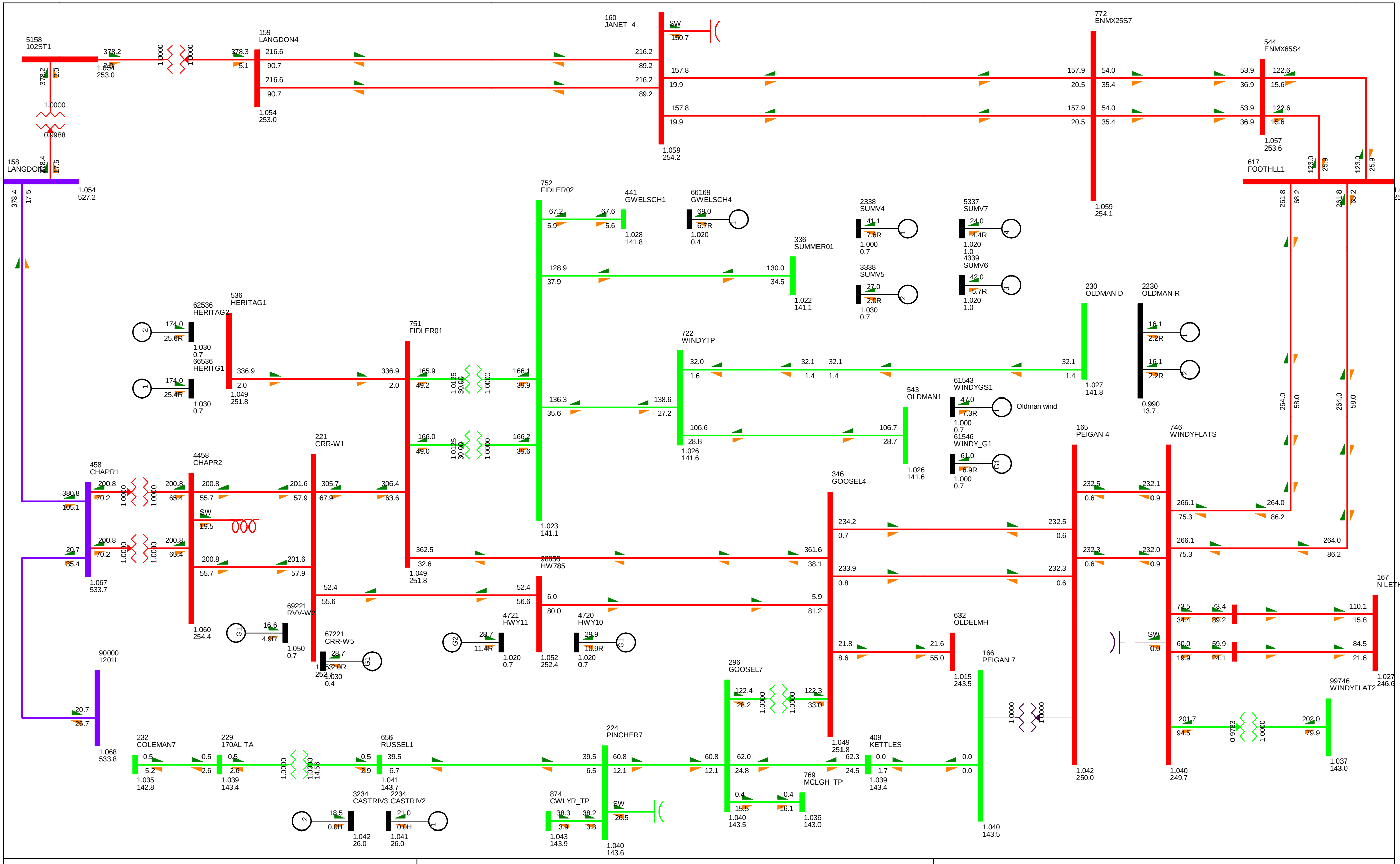


FIGURE C-4-12 - CONTINGENCY PEIXMER
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

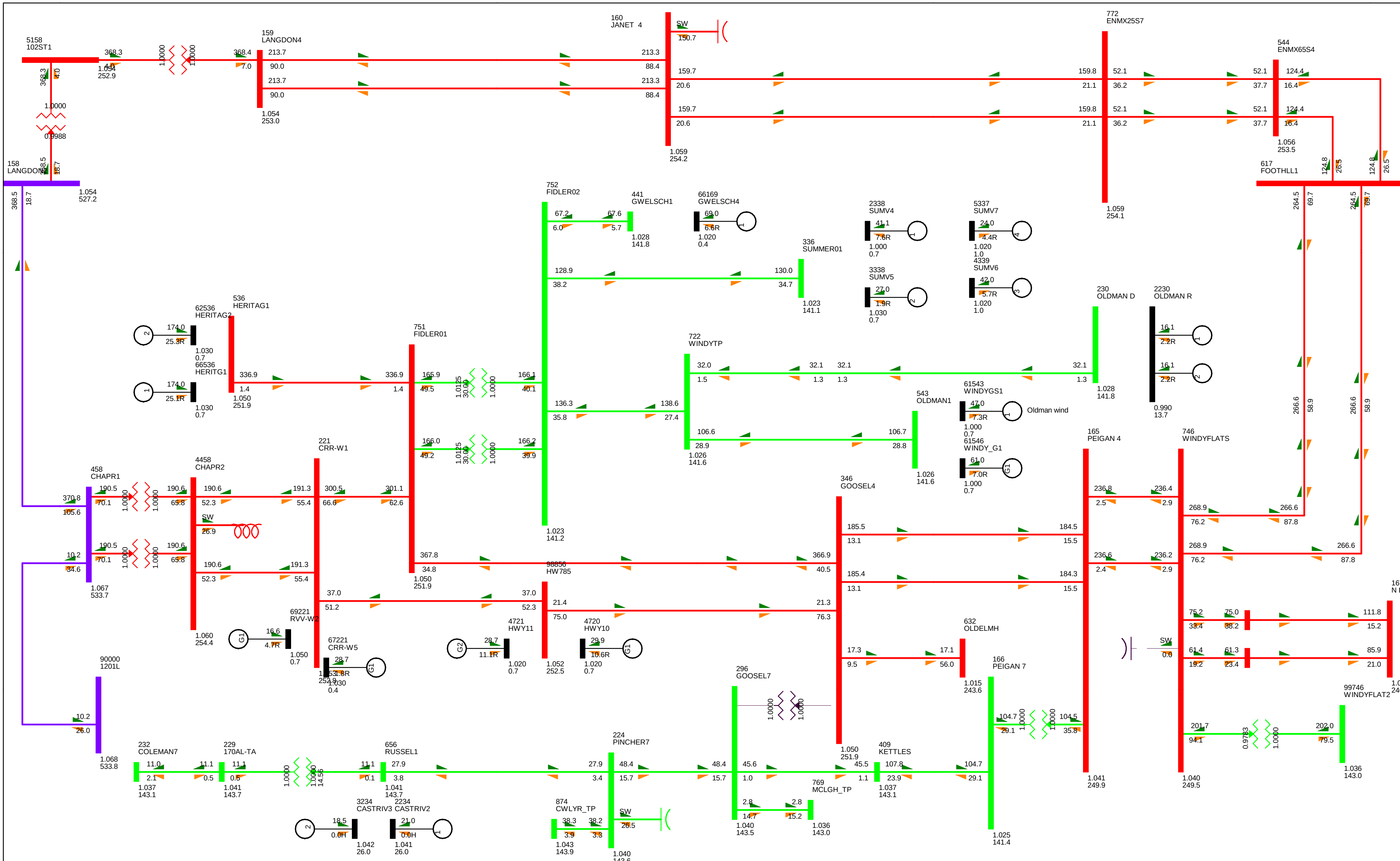


FIGURE C-4-13 - CONTINGENCY GLXMER
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 0.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

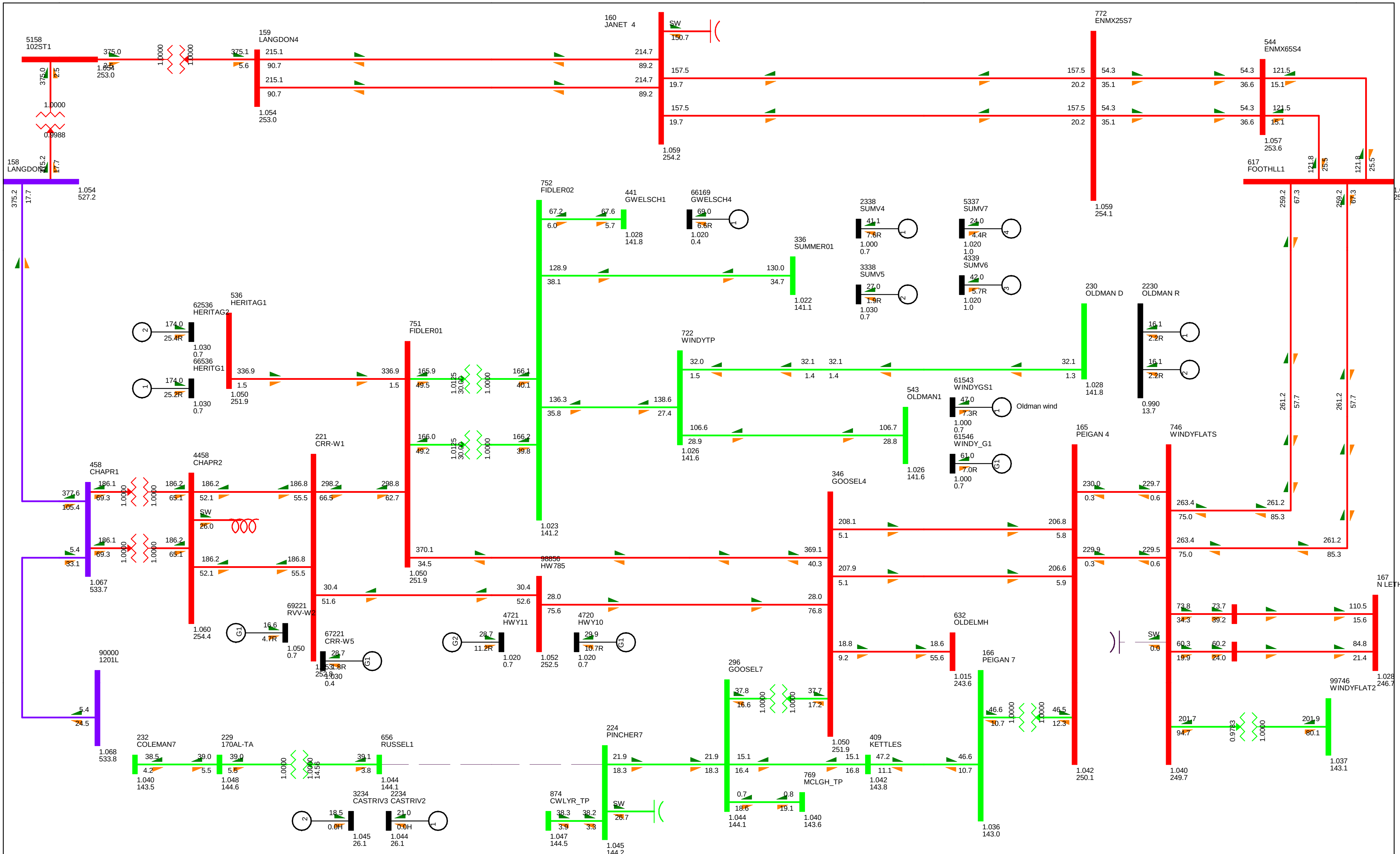


FIGURE C-4-14 - CONTINGENCY 170LRTOPC
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

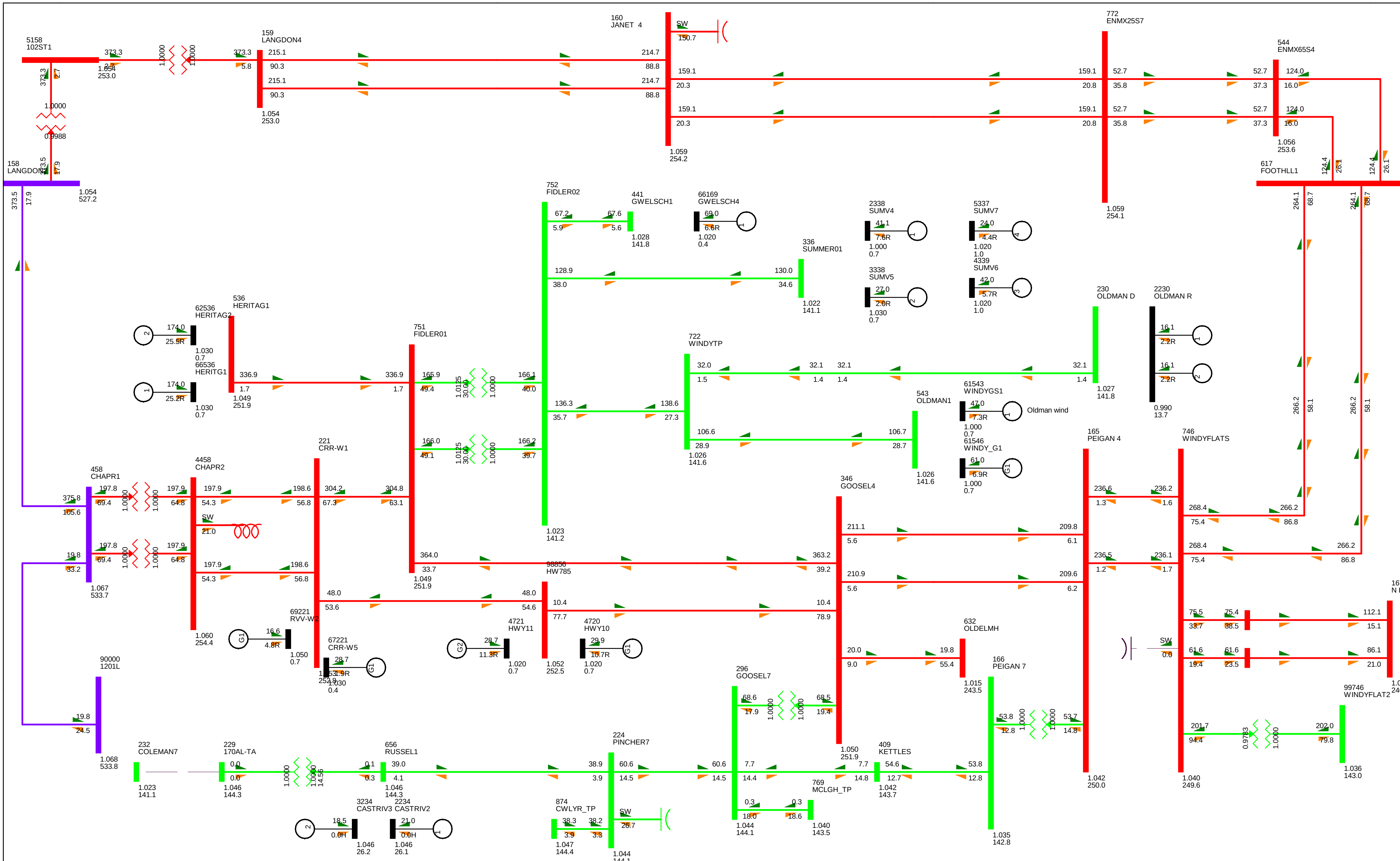


FIGURE C-4-15 - CONTINGENCY 170LRTOC
2022 SP ALT2
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 3.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

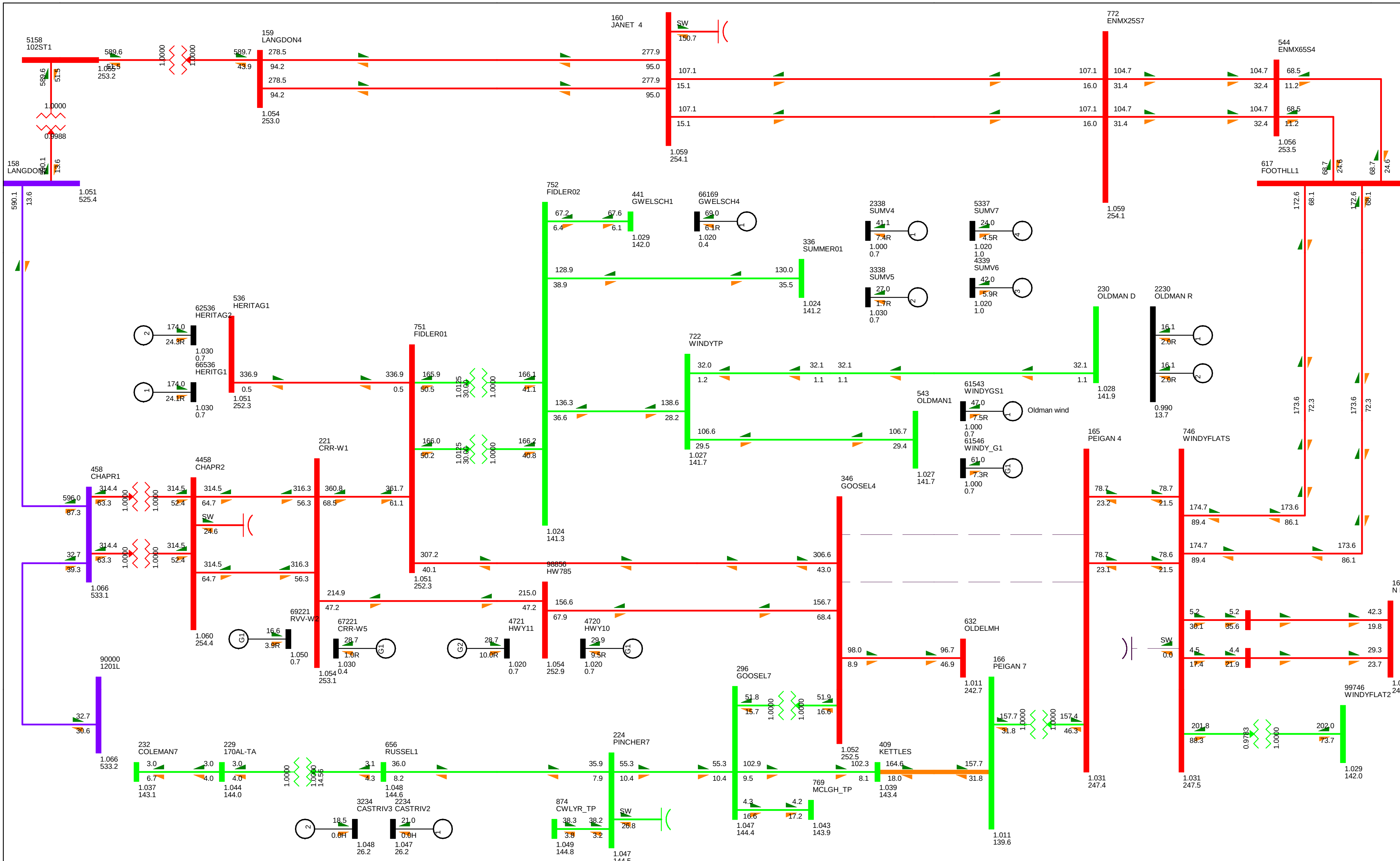


FIGURE C-4-16 - CONTINGENCY 95556L
2022 SP ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 8.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

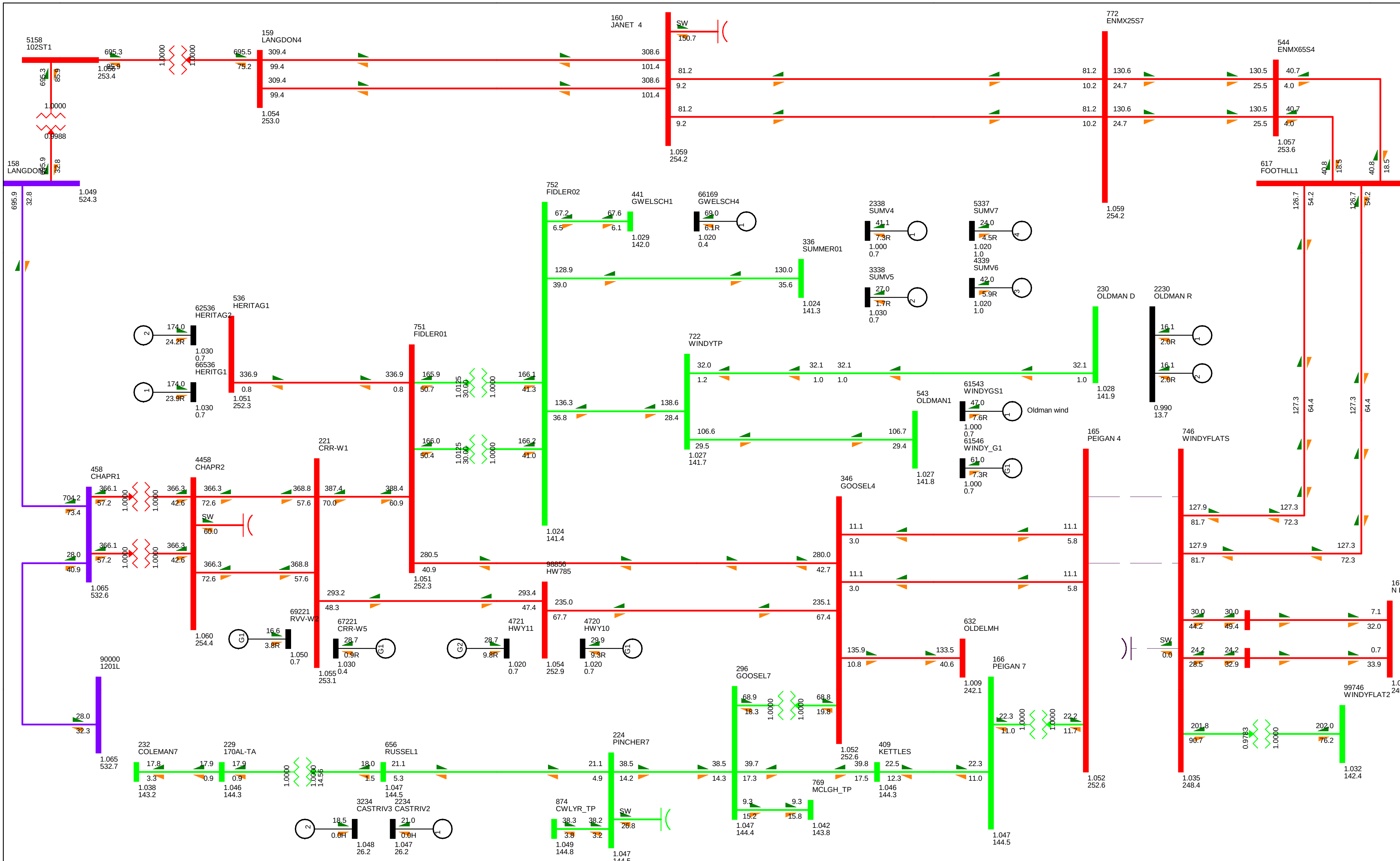


FIGURE C-4-17 - CONTINGENCY PEIWF
2022 SP ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 8.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

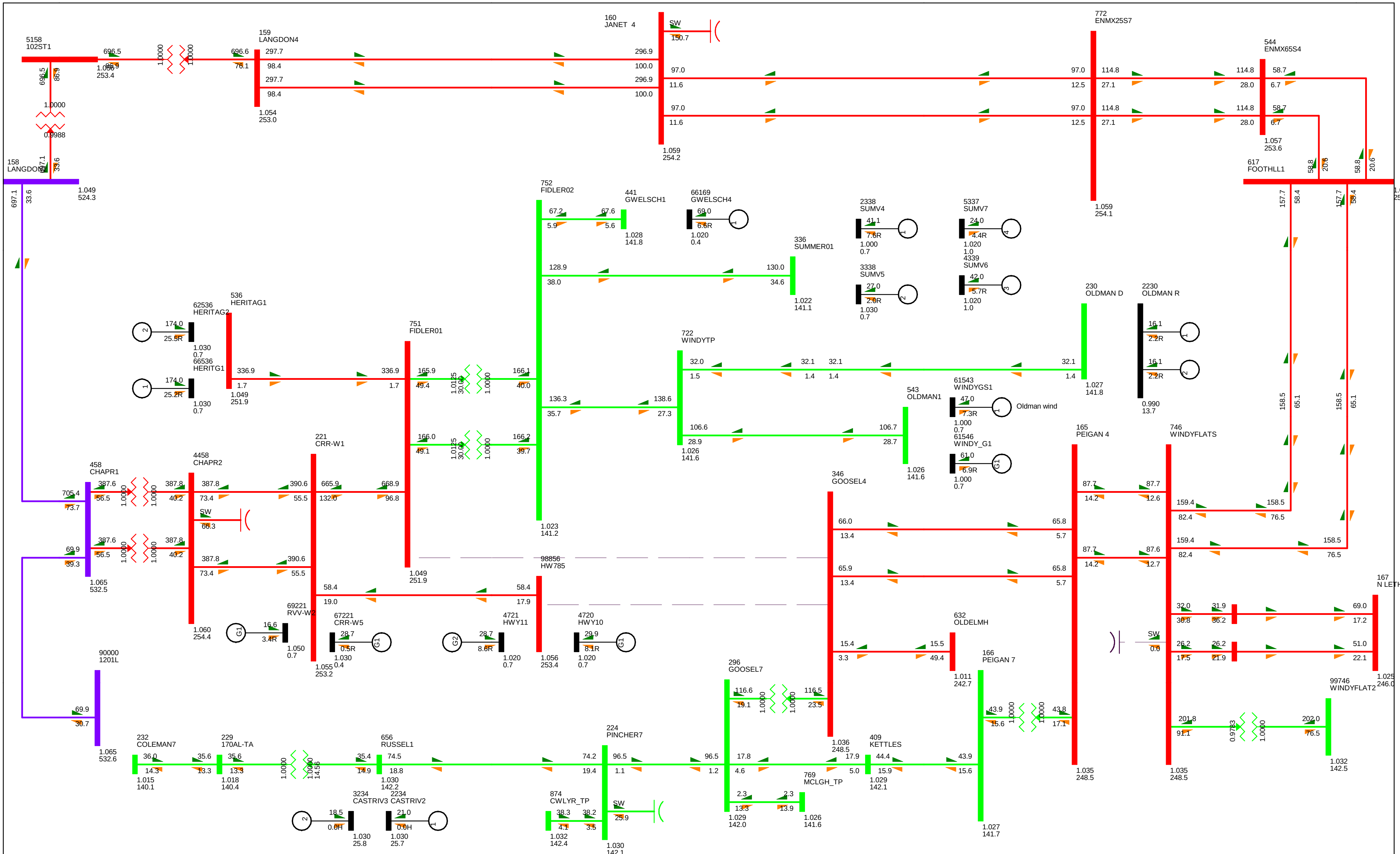


FIGURE C-4-18 - CONTINGENCY GLTOH
2022 SP ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 15.5 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

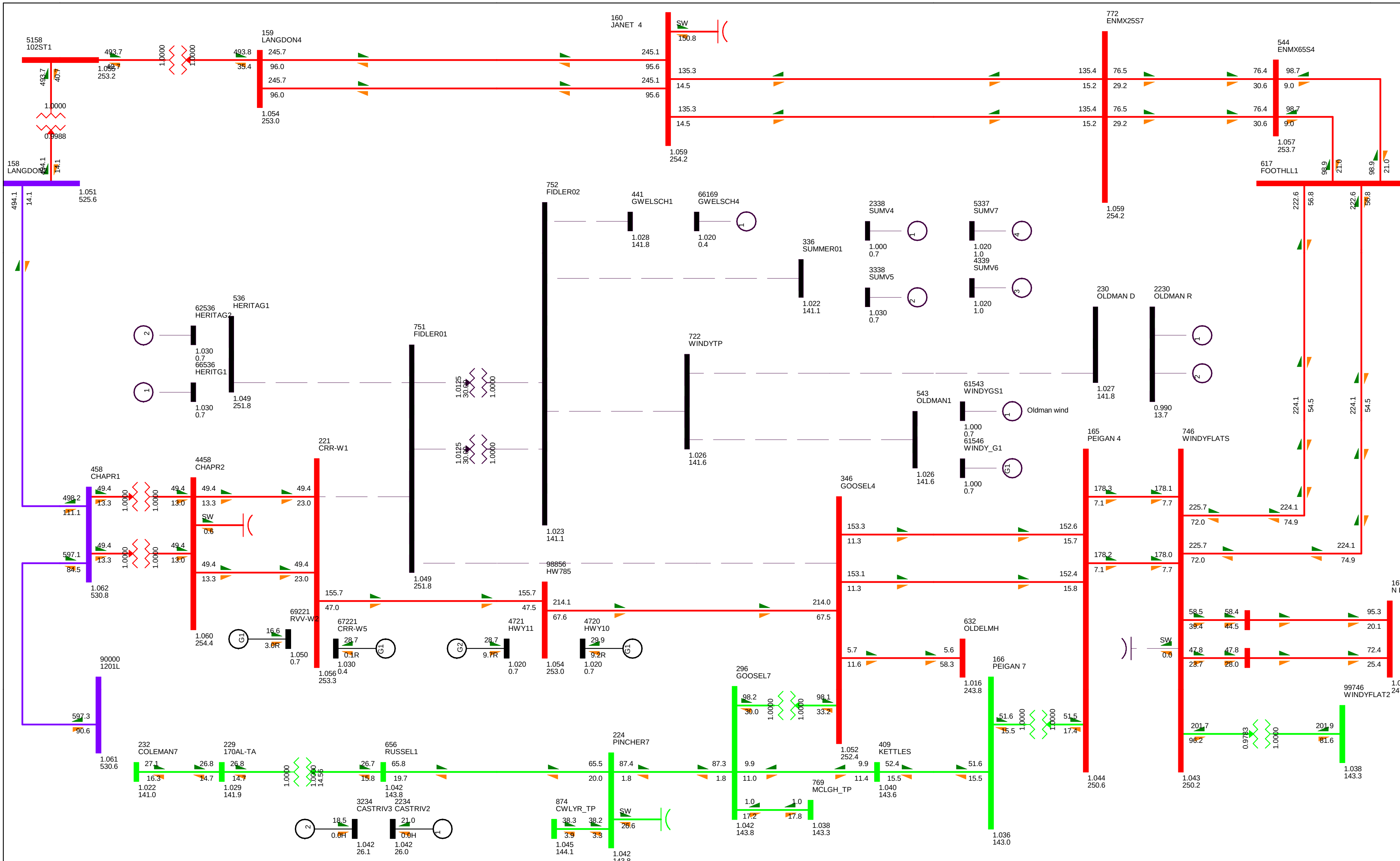


FIGURE C-4-19 - CONTINGENCY CRRTOCHAPEL
2022 SP ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -646.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

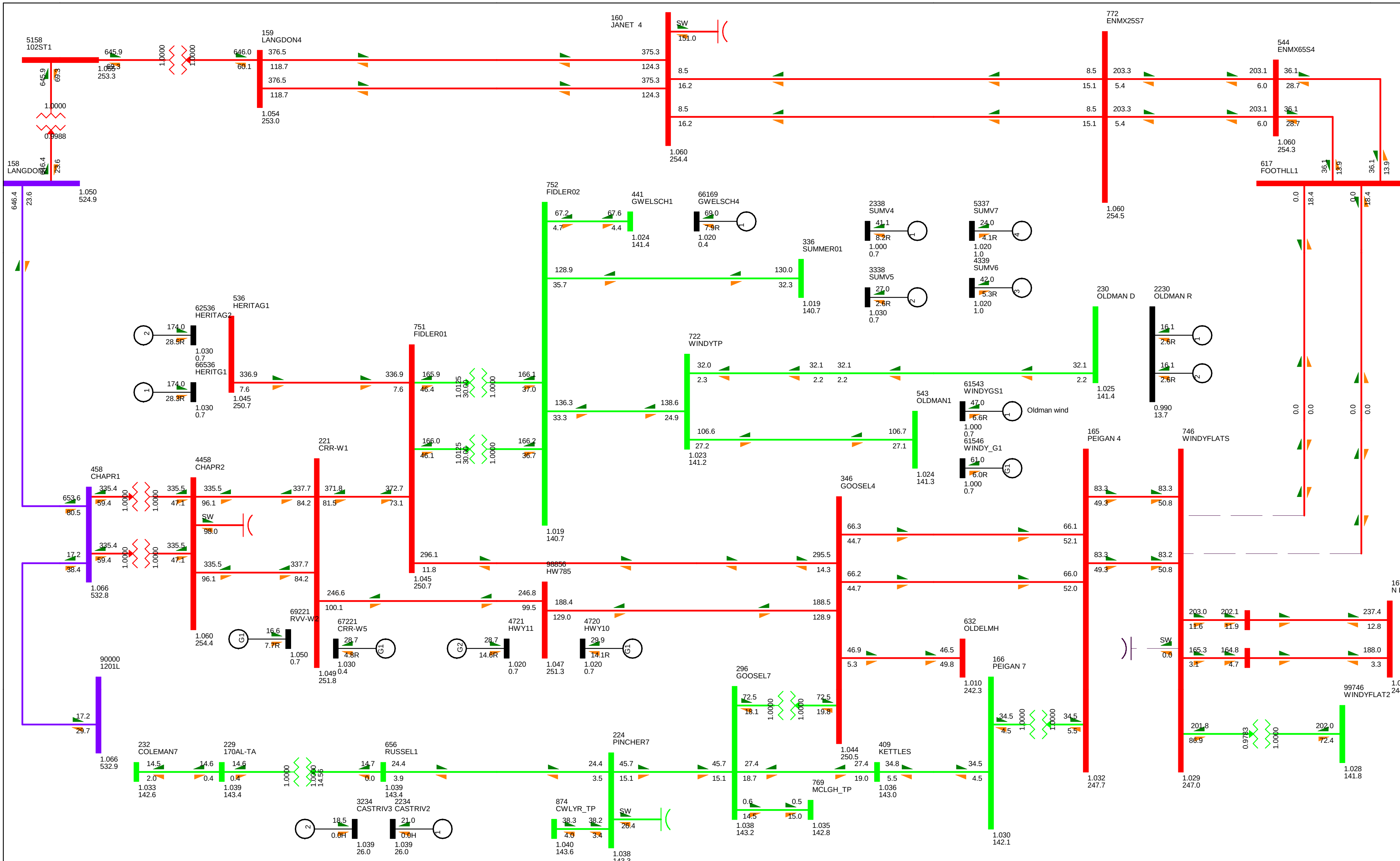


FIGURE C-4-20 - CONTINGENCY 1037L1038L
2022 SP ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -3.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

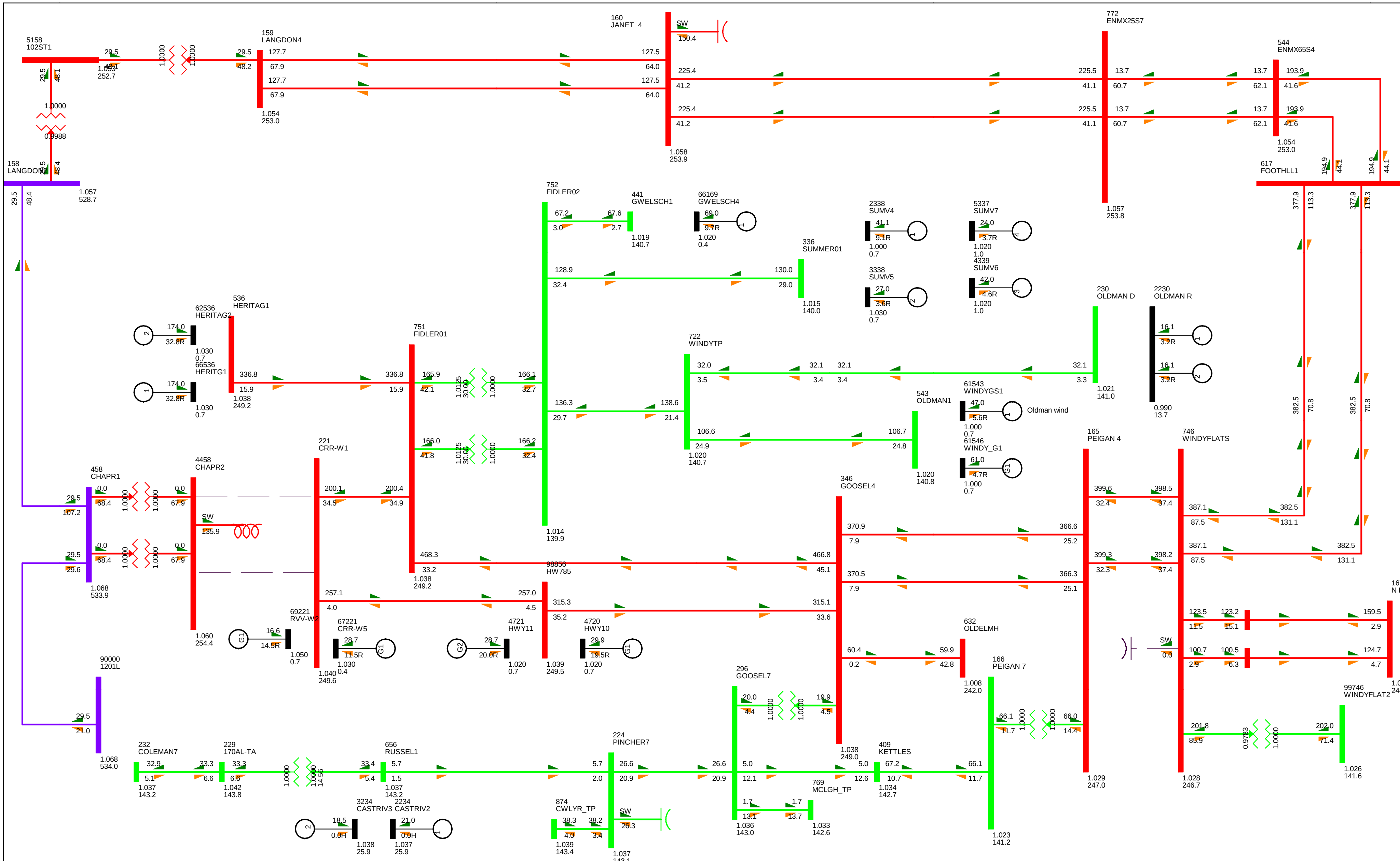


FIGURE C-4-21 - CONTINGENCY CRRTOCHAPEL
2022 SP ALT2
WED, OCT 10 2012 16:26

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -9.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

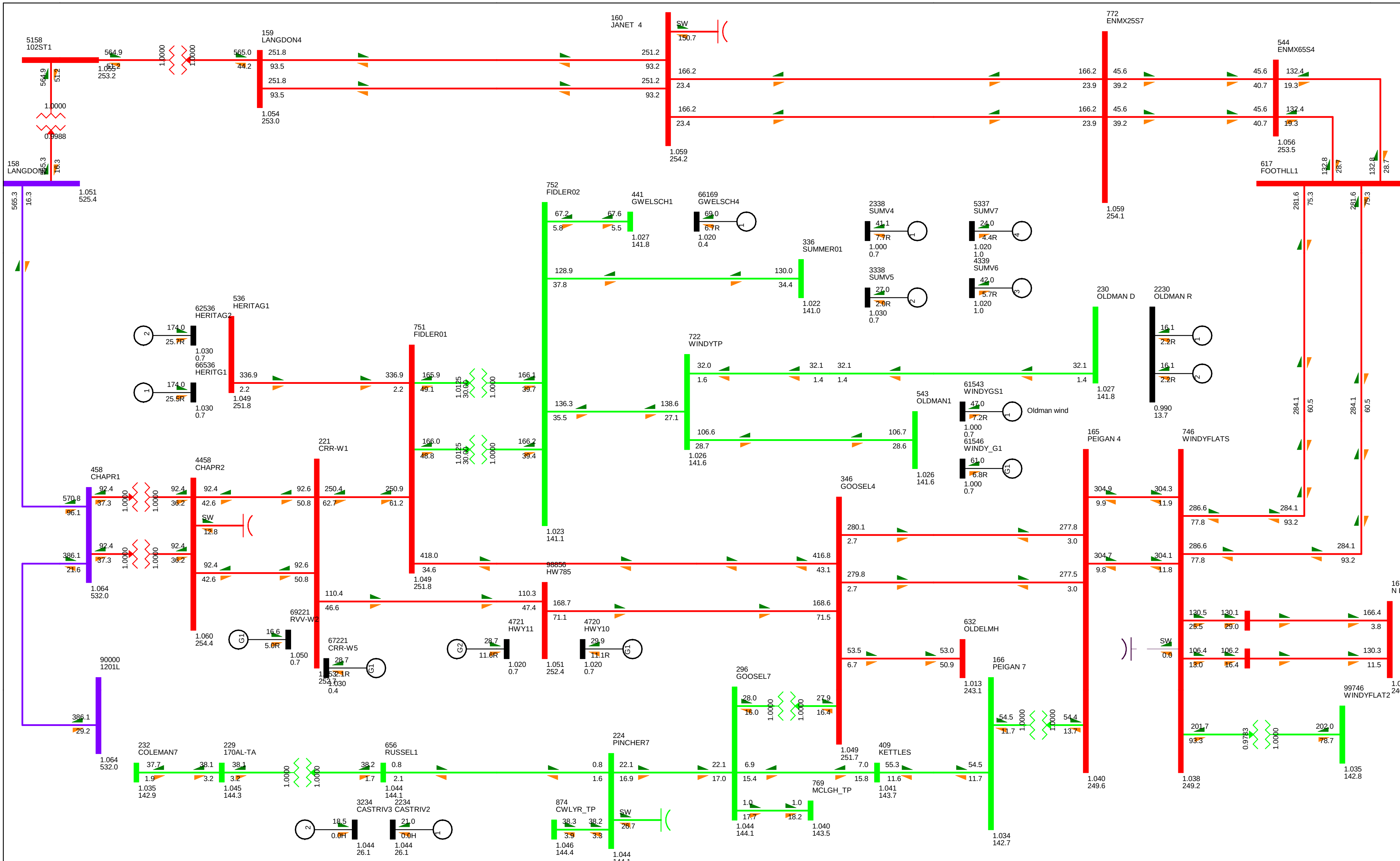


FIGURE C-5-1 - SYSTEM NORMAL
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

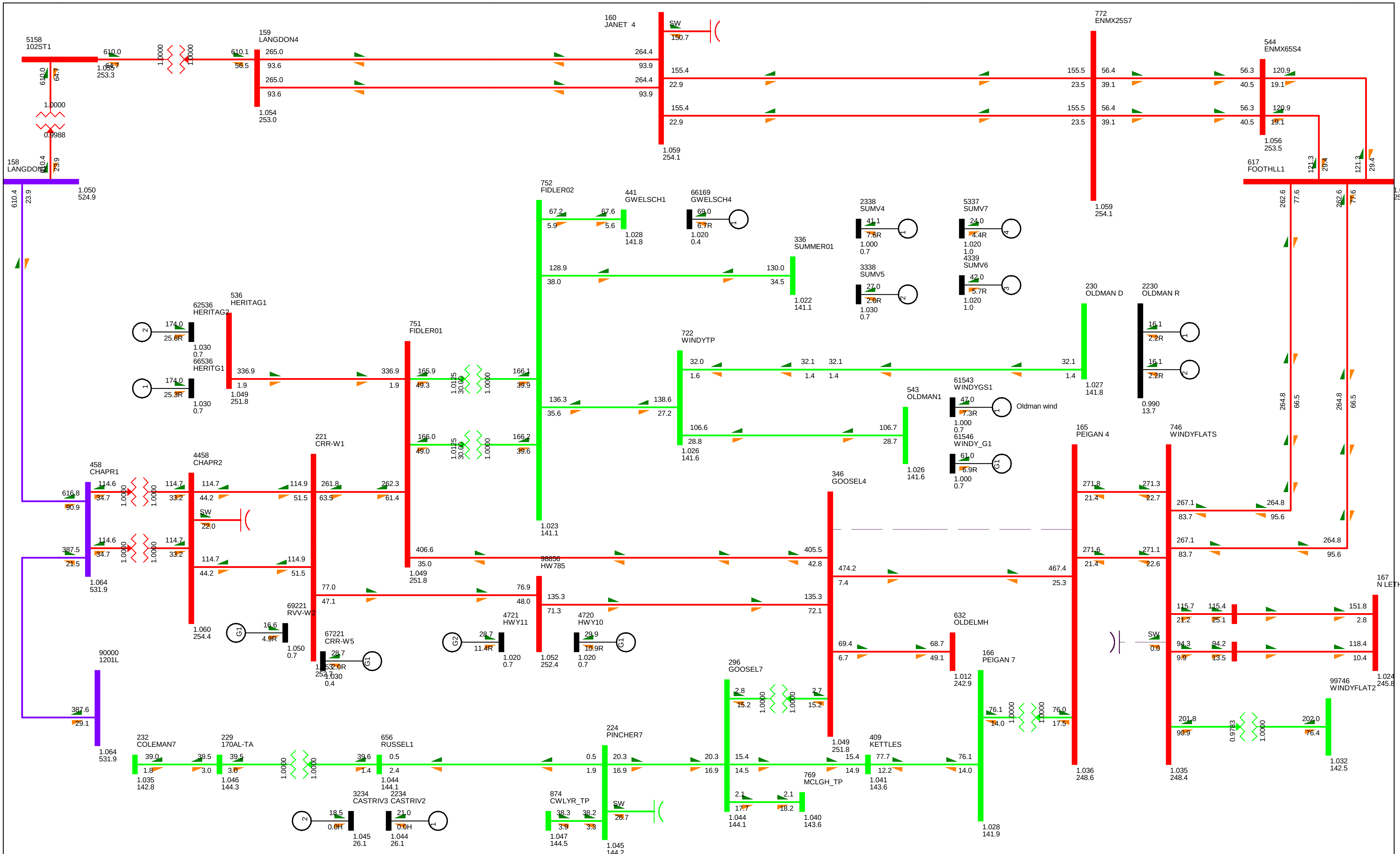


FIGURE C-5-2 - CONTINGENCY 955L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -394.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

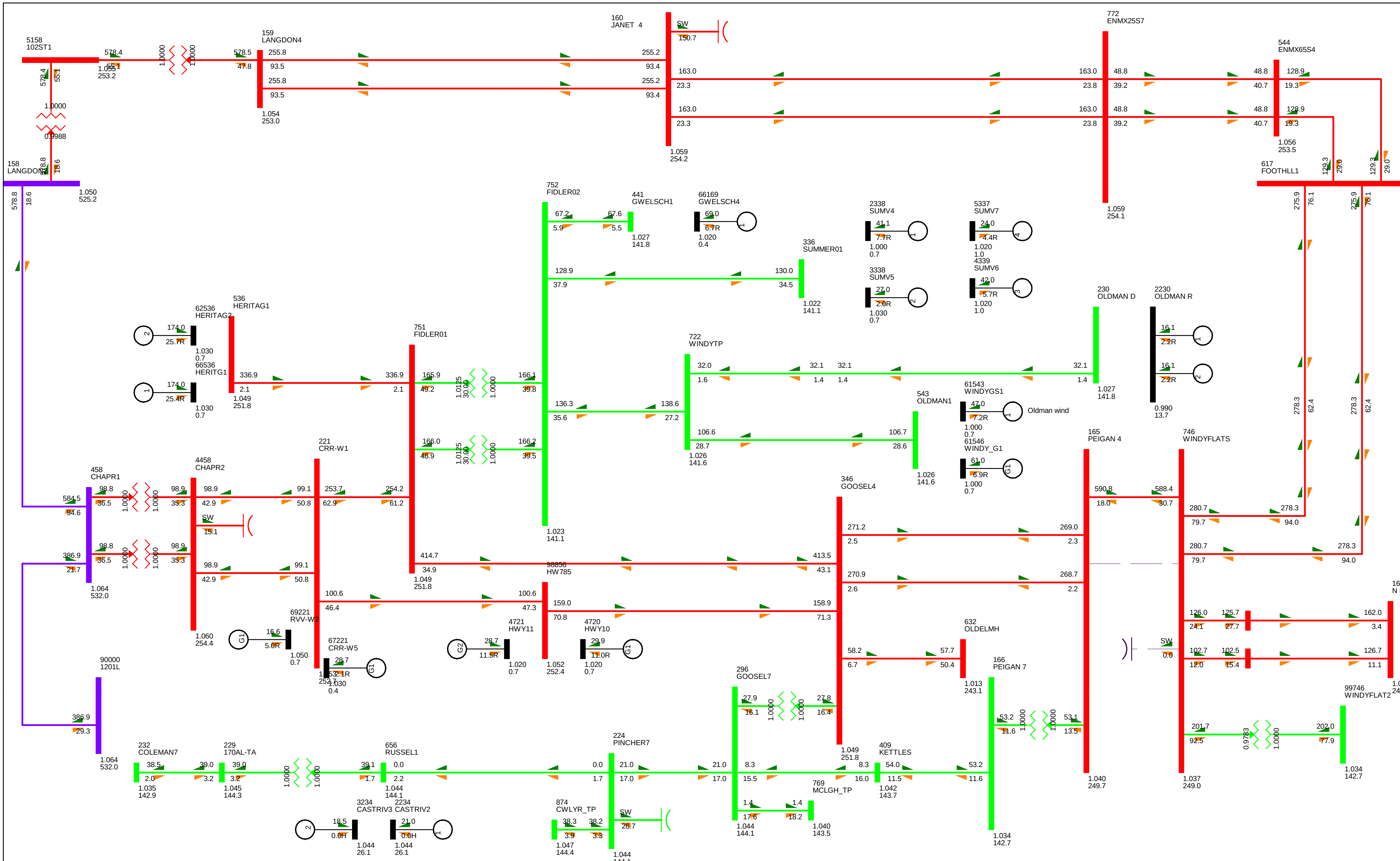


FIGURE C-5-3 - CONTINGENCY 1048L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

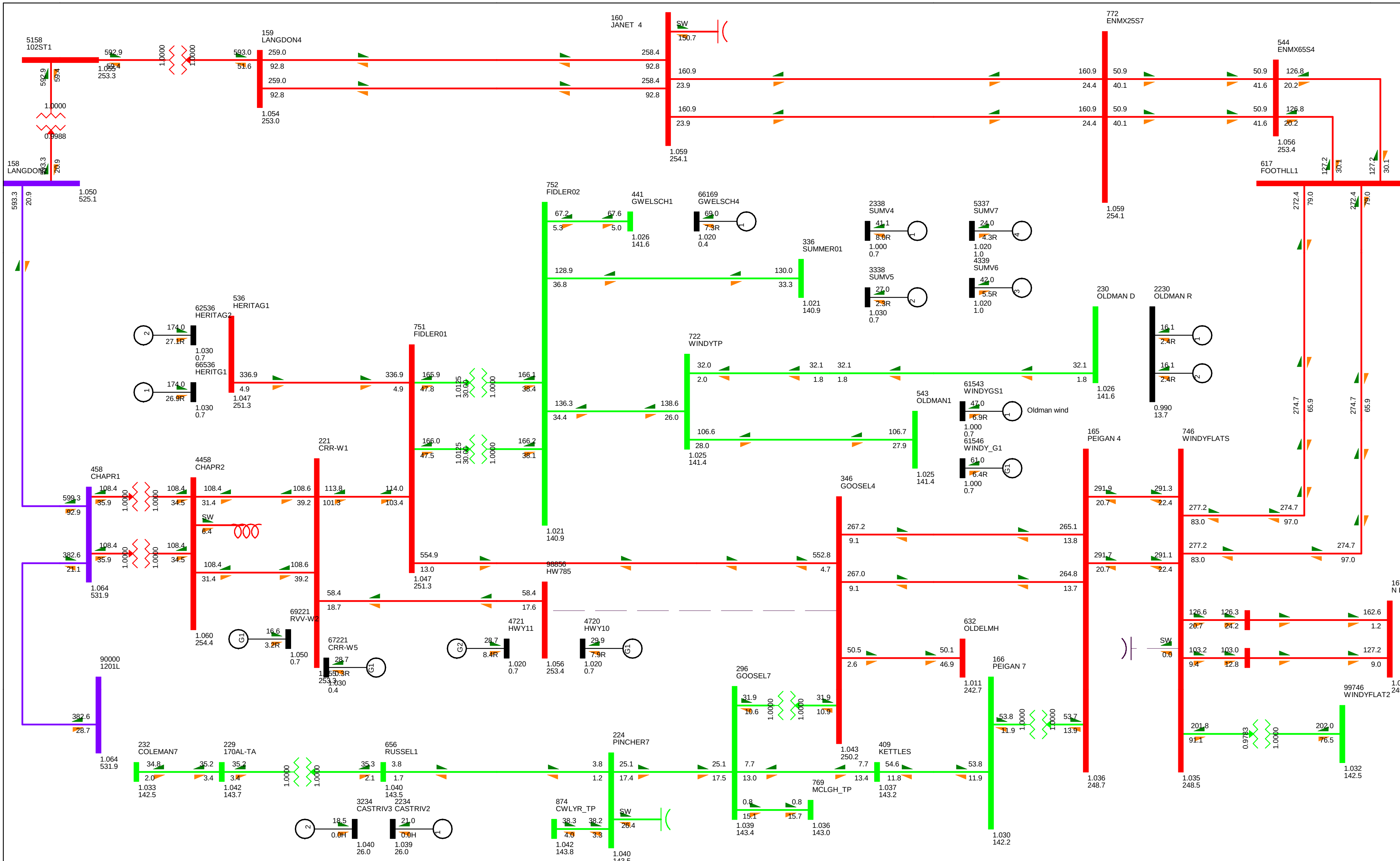


FIGURE C-5-4 - CONTINGENCY 1072L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

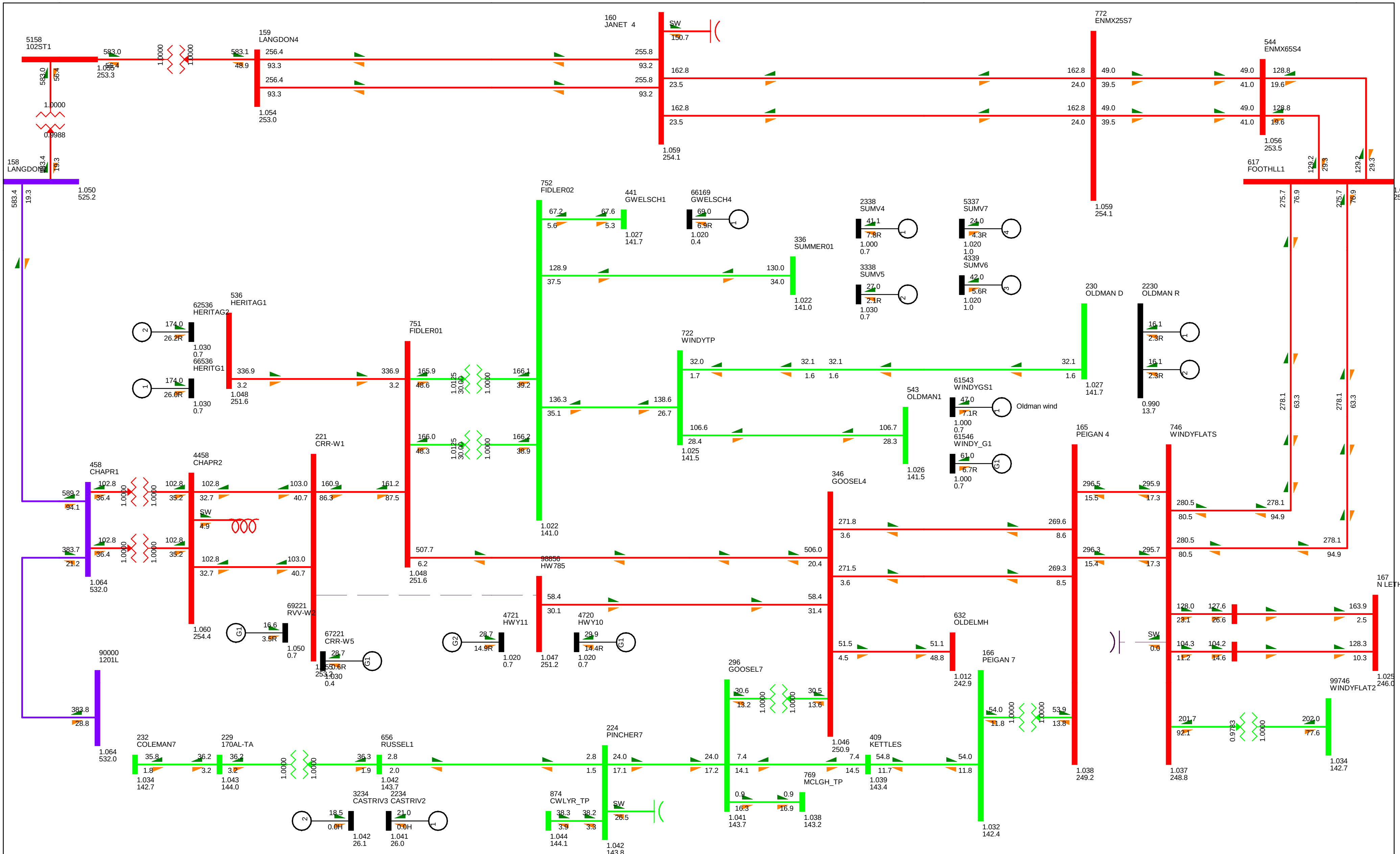


FIGURE C-5-5 - CONTINGENCY 1072LCTOH
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

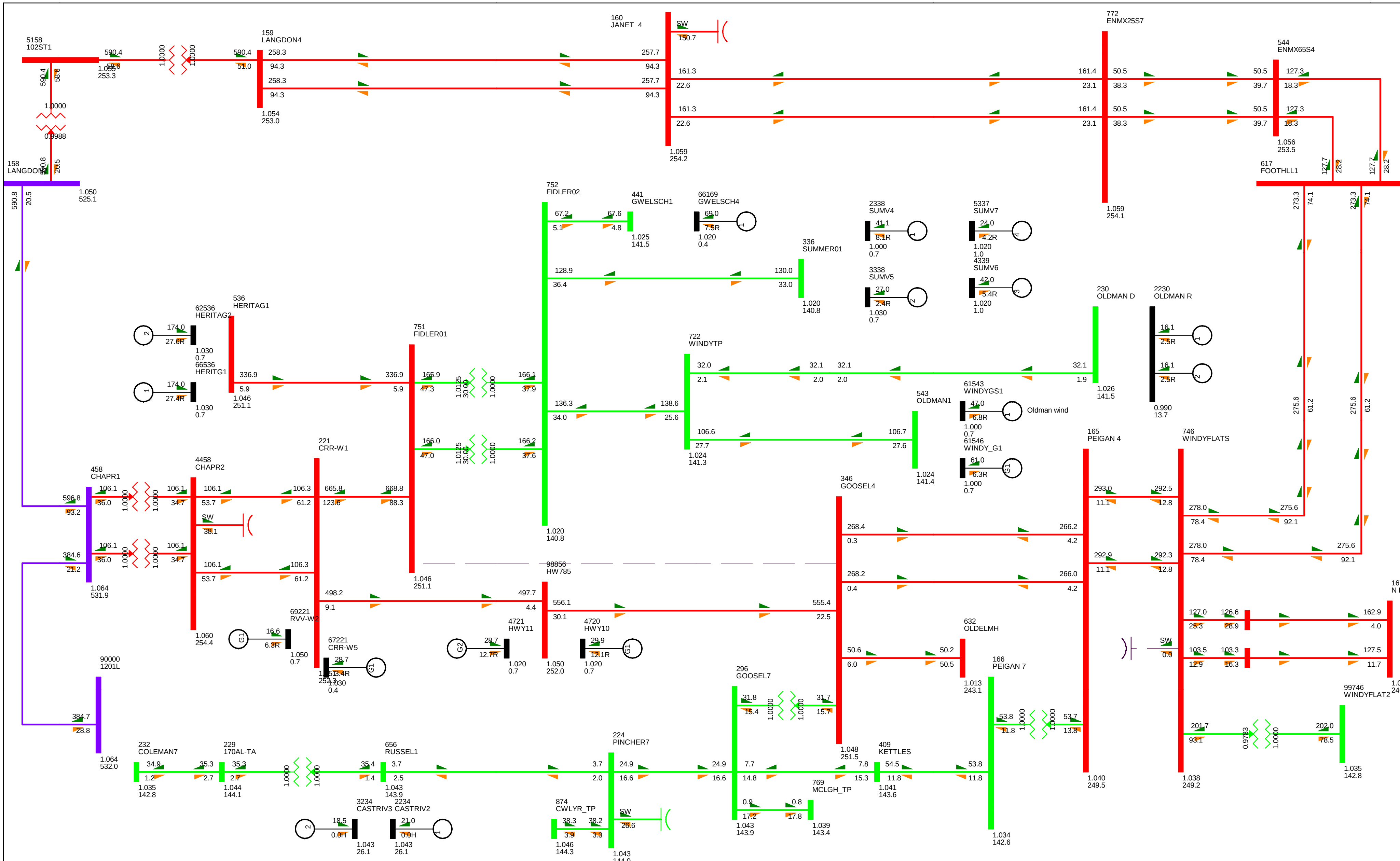


FIGURE C-5-6 - CONTINGENCY 994L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -393.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

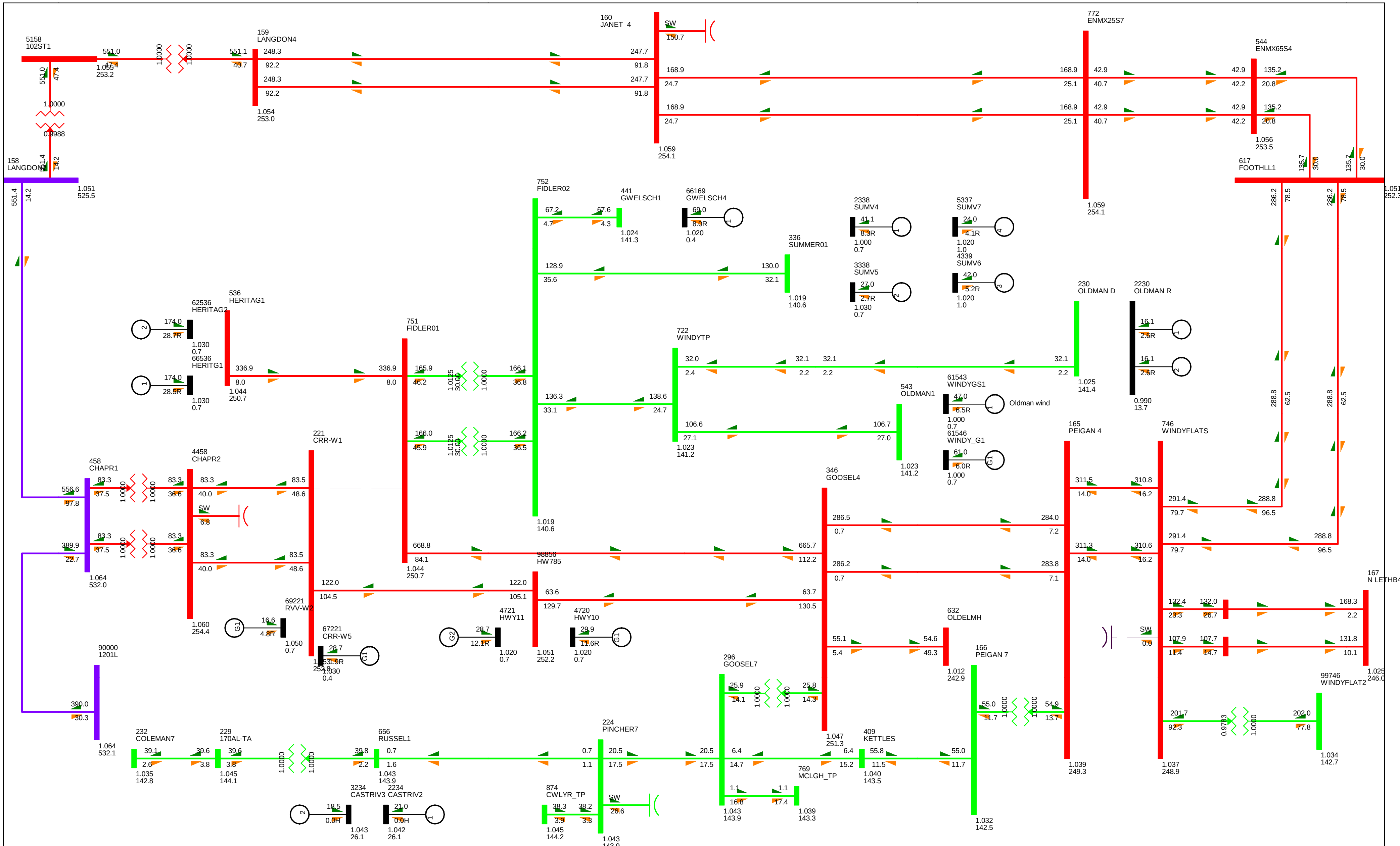


FIGURE C-5-7 - CONTINGENCY 1071L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -393.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

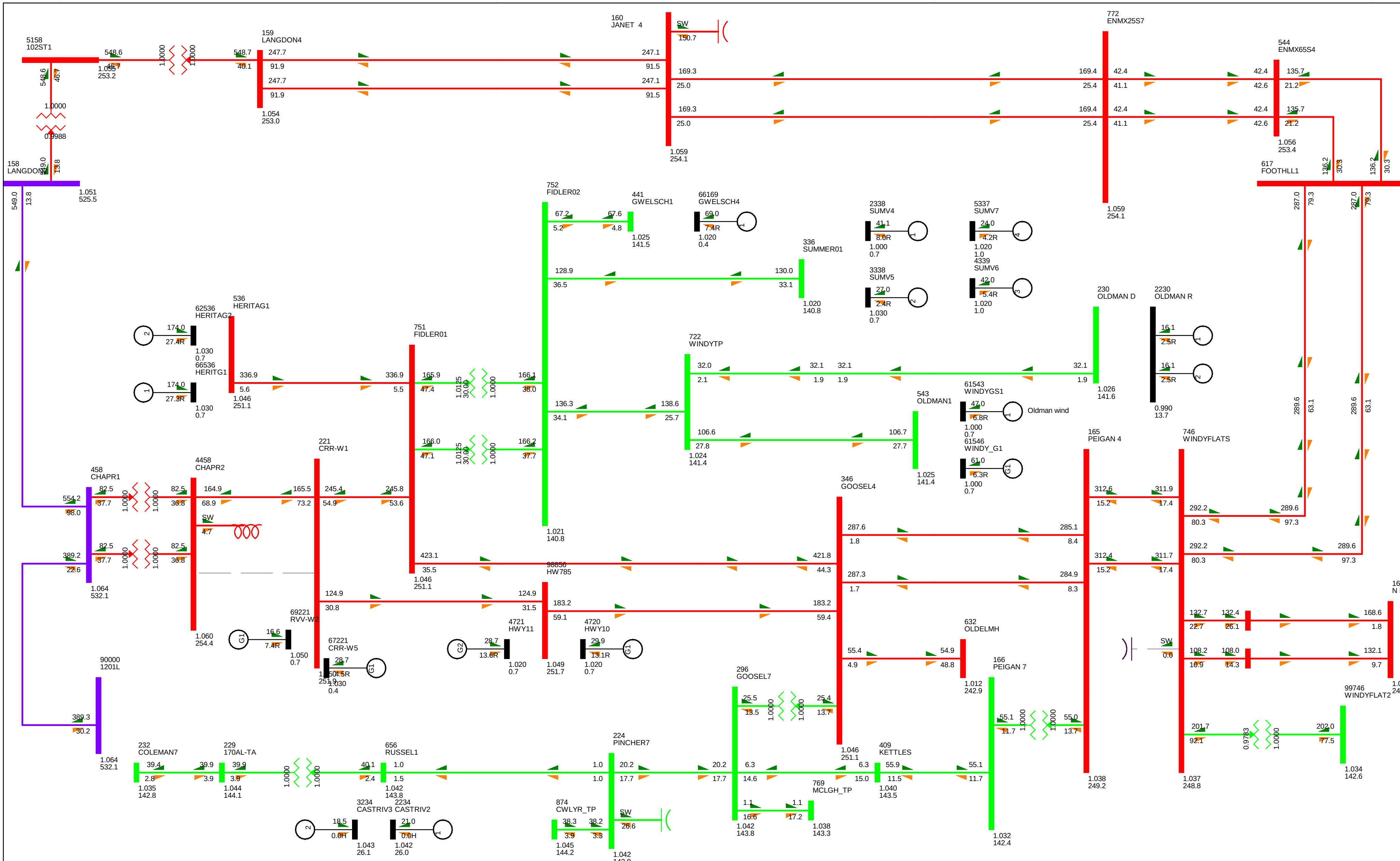


FIGURE C-5-8 - CONTINGENCY 1004L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

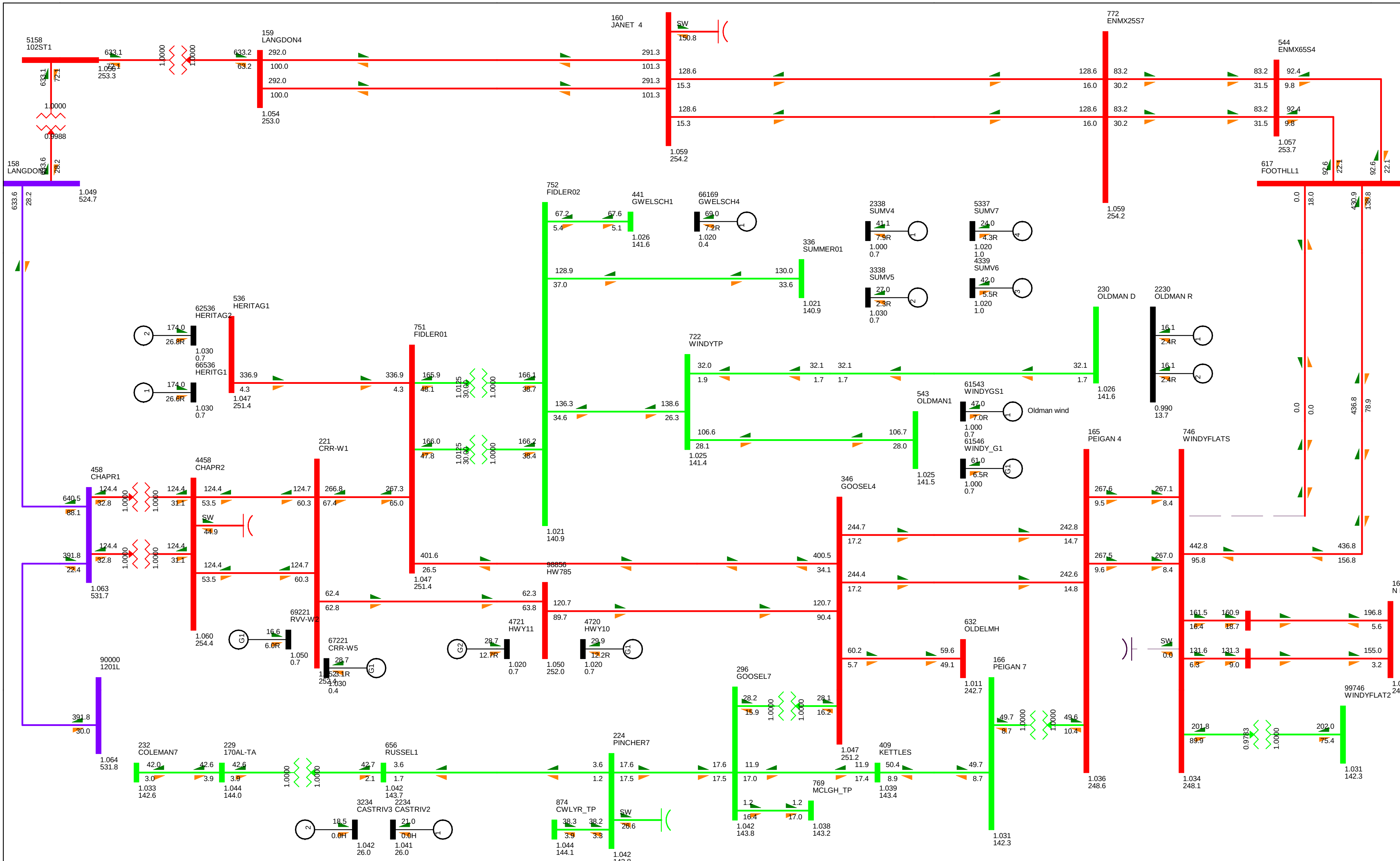


FIGURE C-5-9 - CONTINGENCY 1037L 2022 SP ALT2-400 IM TUE, JUN 26 2012 18:47	**Fidler Connection**	Bus - VOLTAGE (kV/PU) Branch - MW/Mvar Equipment - MW/Mvar 100.0%RATEA 1.120OV 0.950UV kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000 BC Export : -397.4 MW SA Export : -0.1 MW MH Export : 0.0 MW

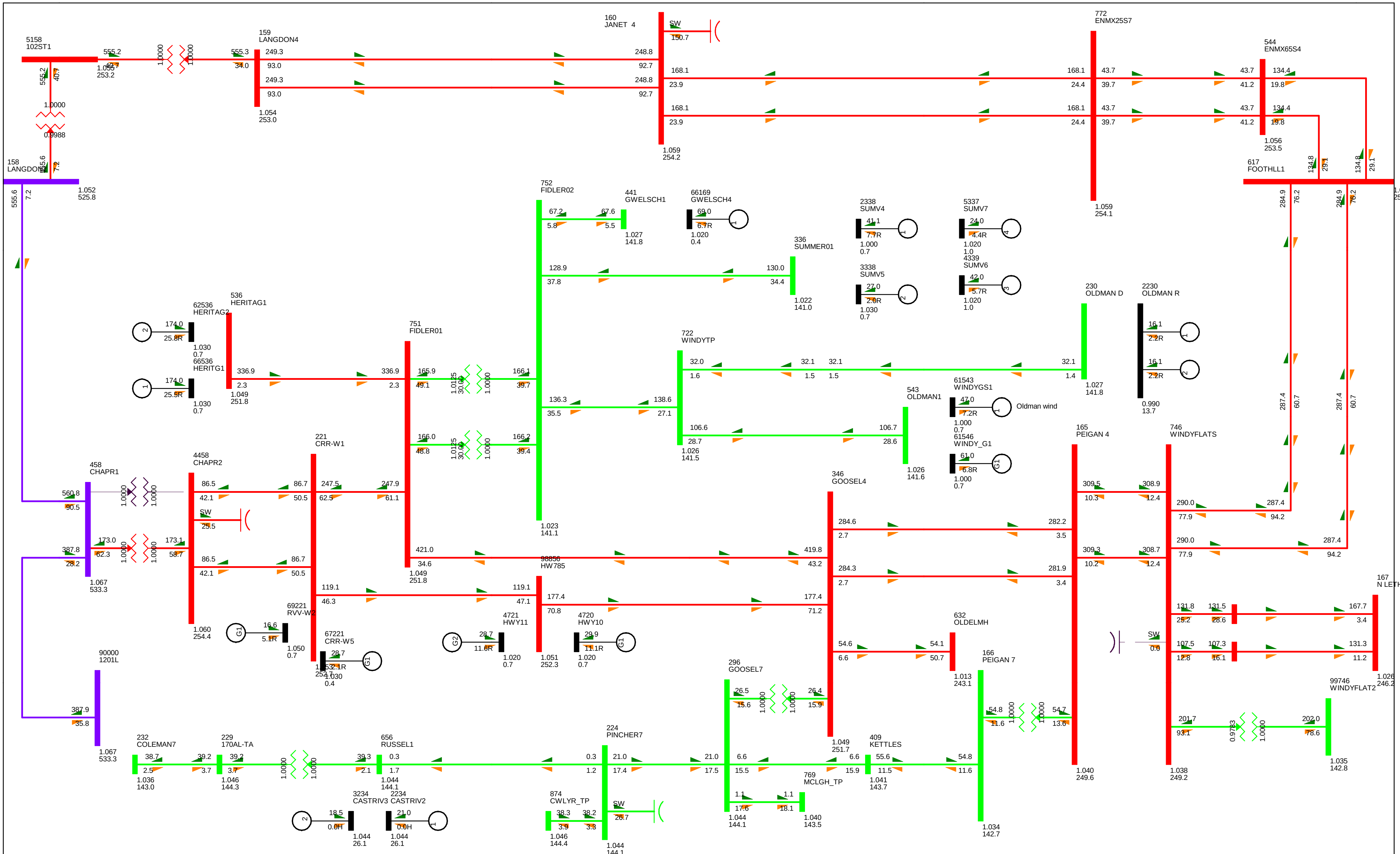


FIGURE C-5-10 - CONTINGENCY CHAPELXMER
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

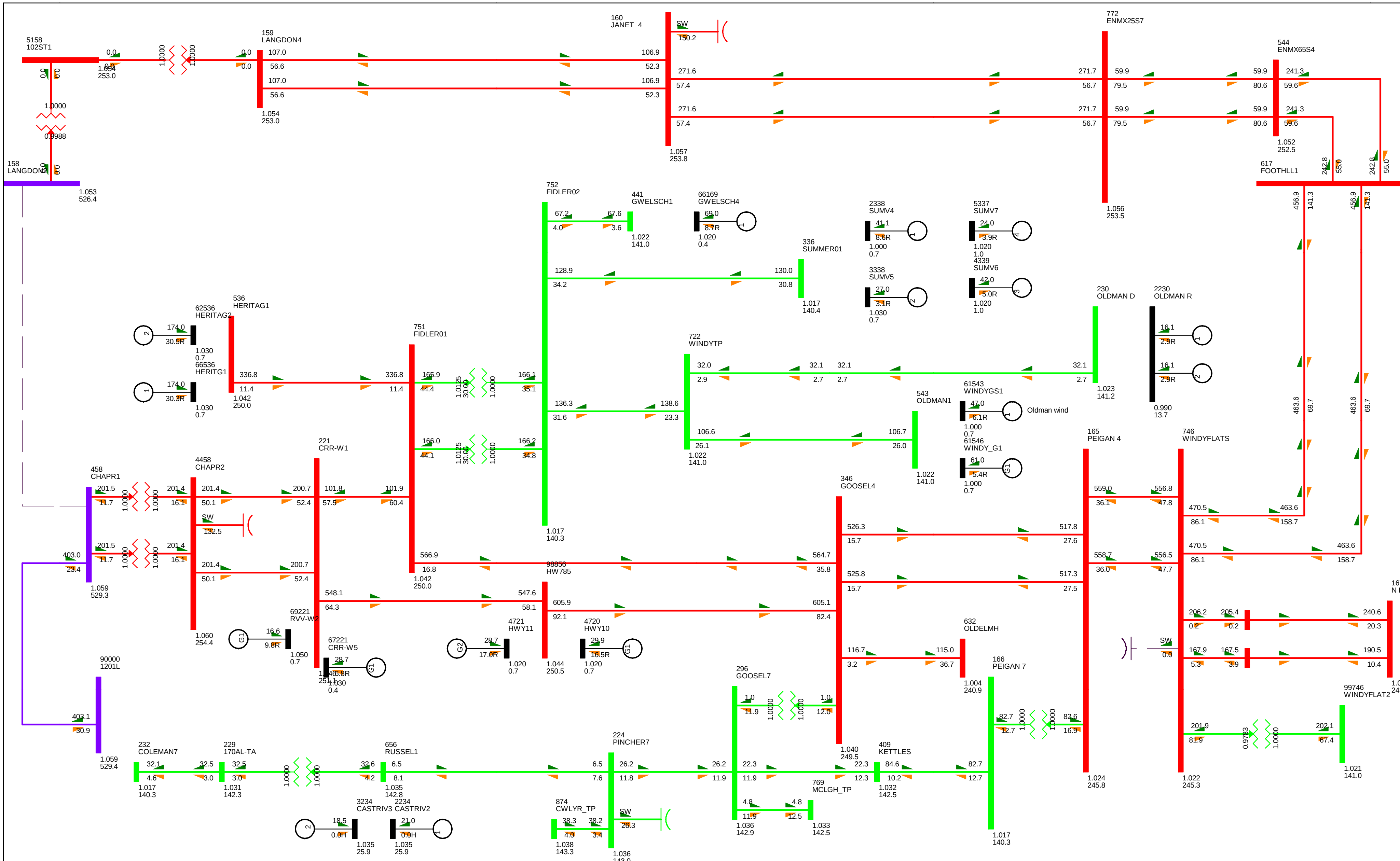


FIGURE C-5-11 - CONTINGENCY 1201L
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:47

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -443.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

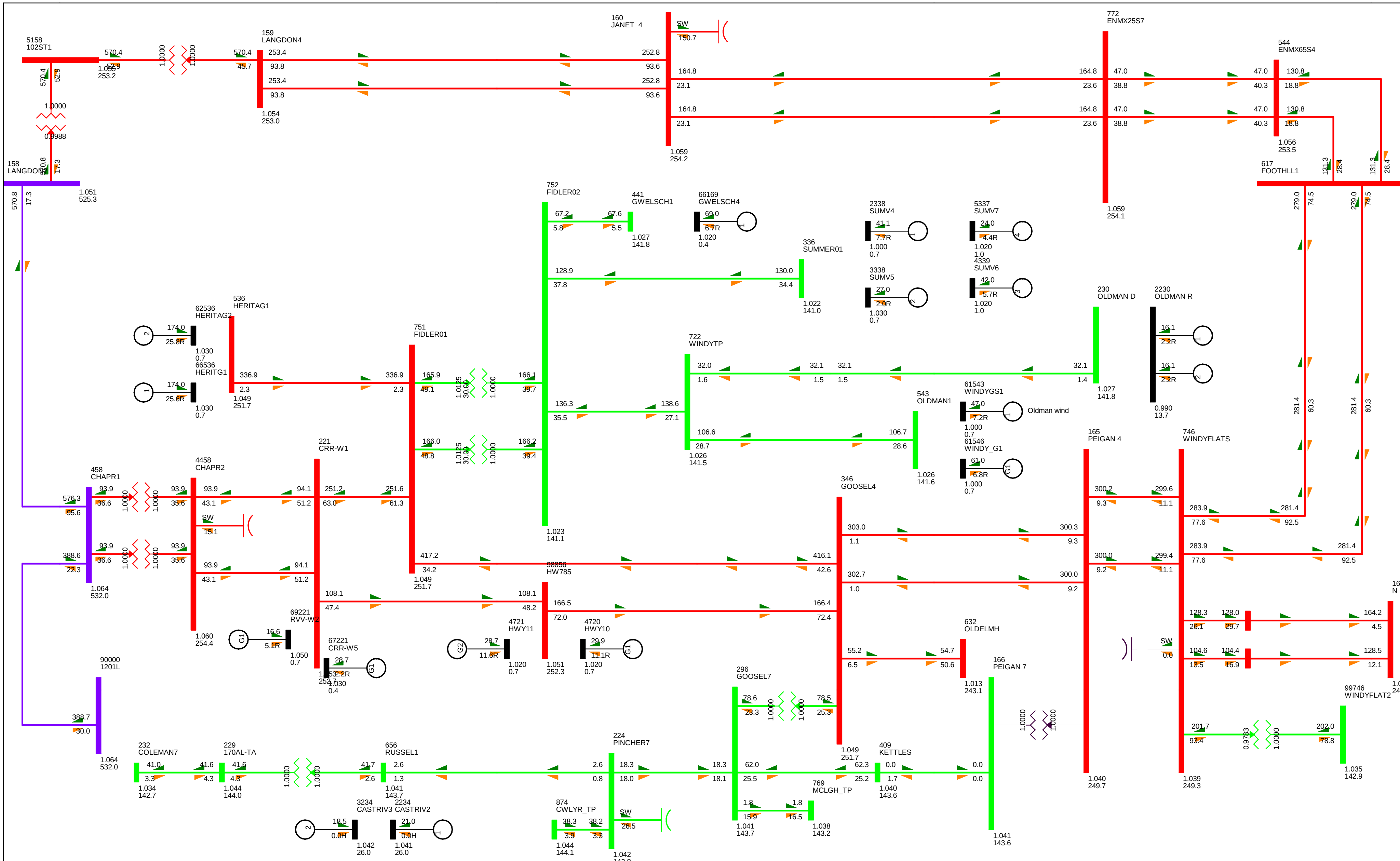


FIGURE C-5-12 - CONTINGENCY PEIXMER
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

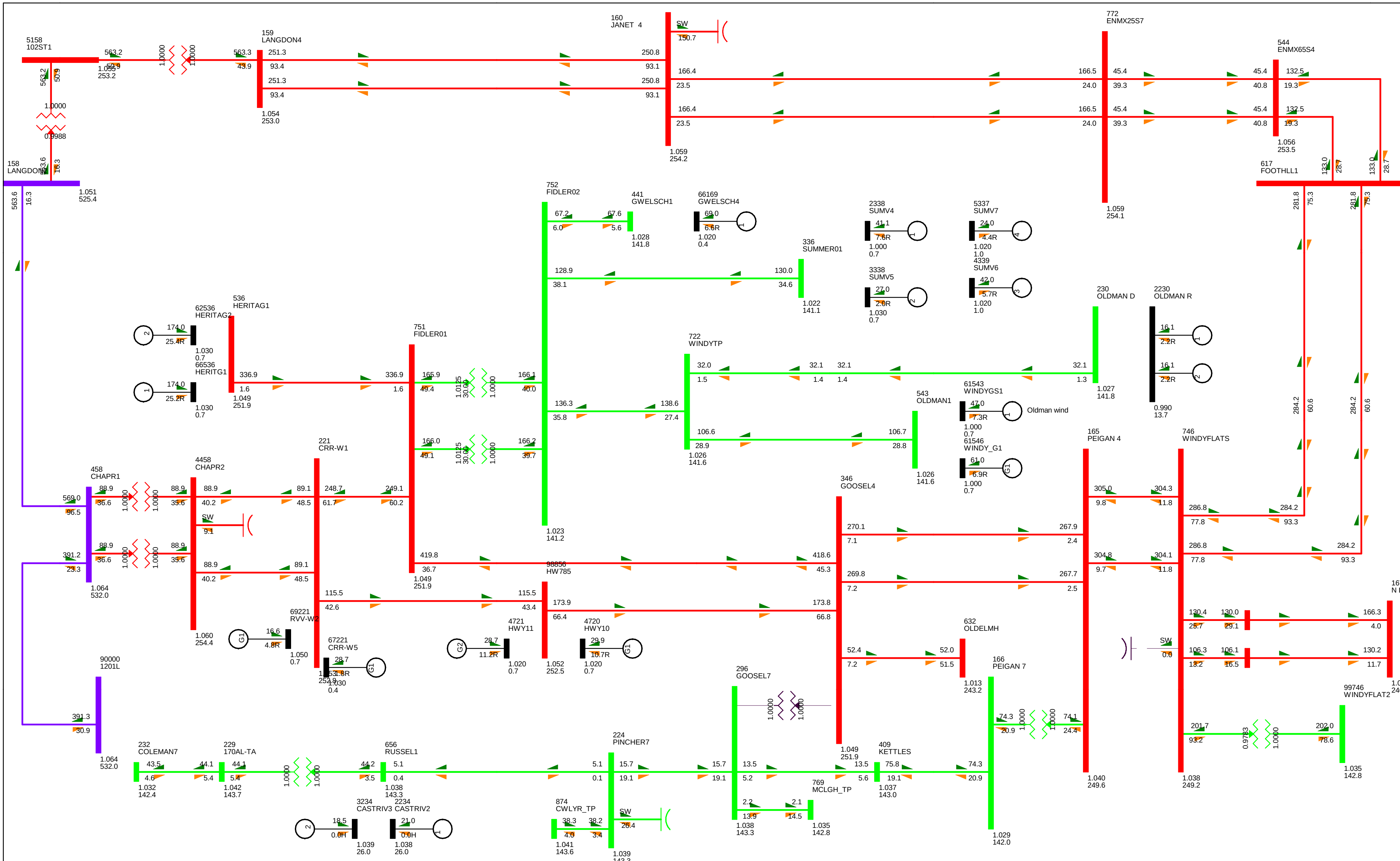


FIGURE C-5-13 - CONTINGENCY GLXMER
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:48

Fidler Connection

BC Export : -392.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

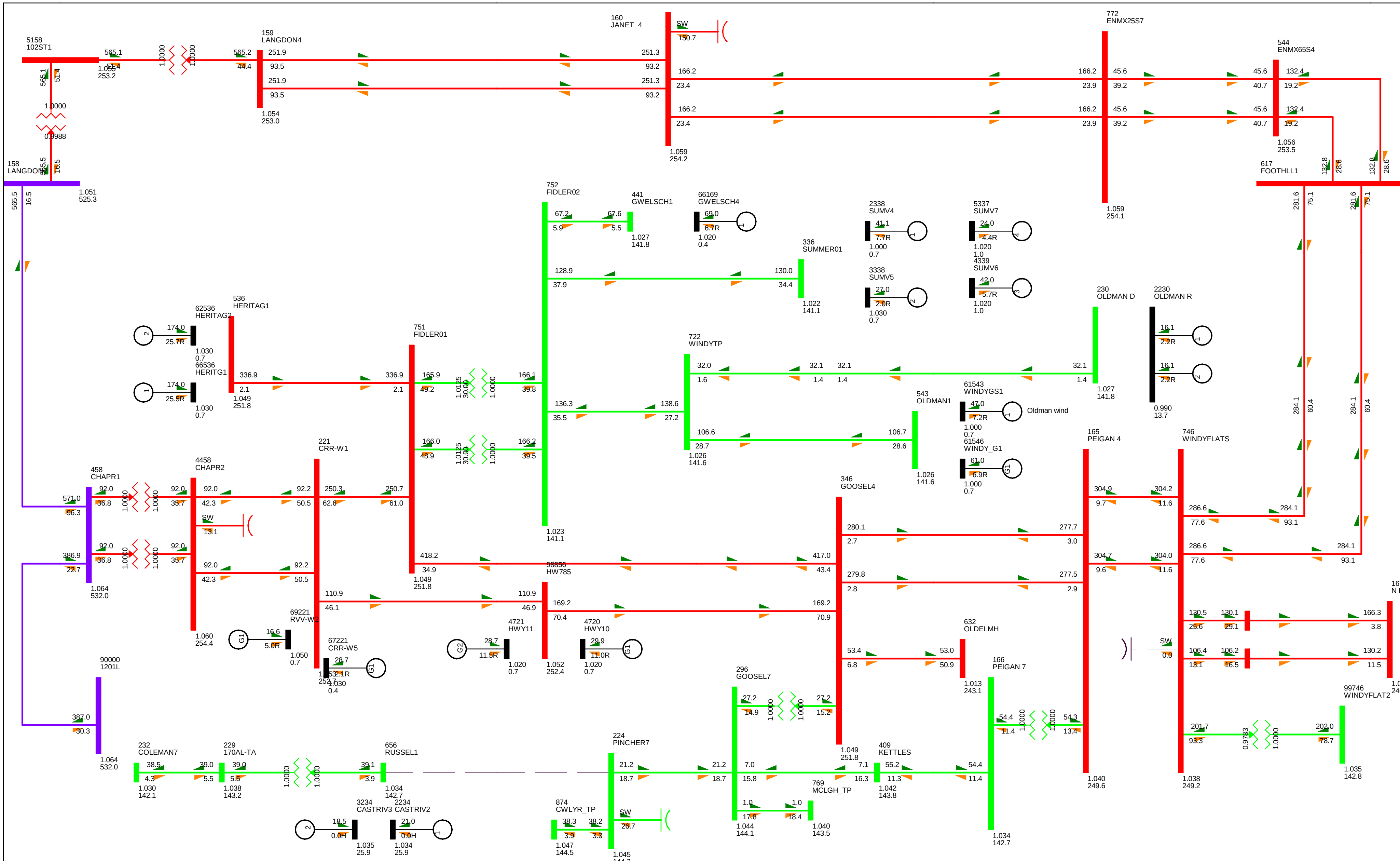


FIGURE C-5-14 - CONTINGENCY 170LRTOPC
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -391.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

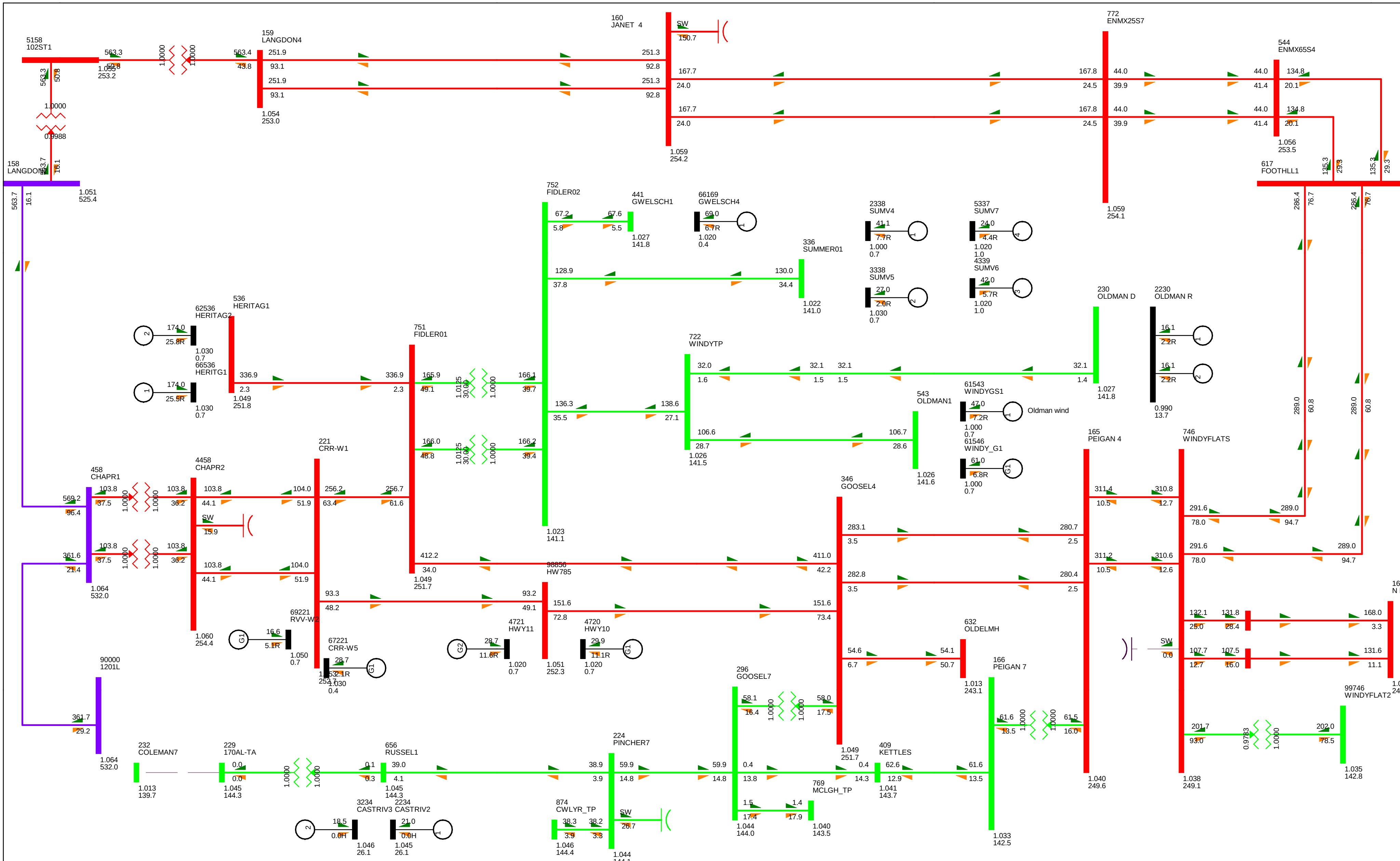


FIGURE C-5-15 - CONTINGENCY 170LRTOC
2022 SP ALT2-400 IM
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -392.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

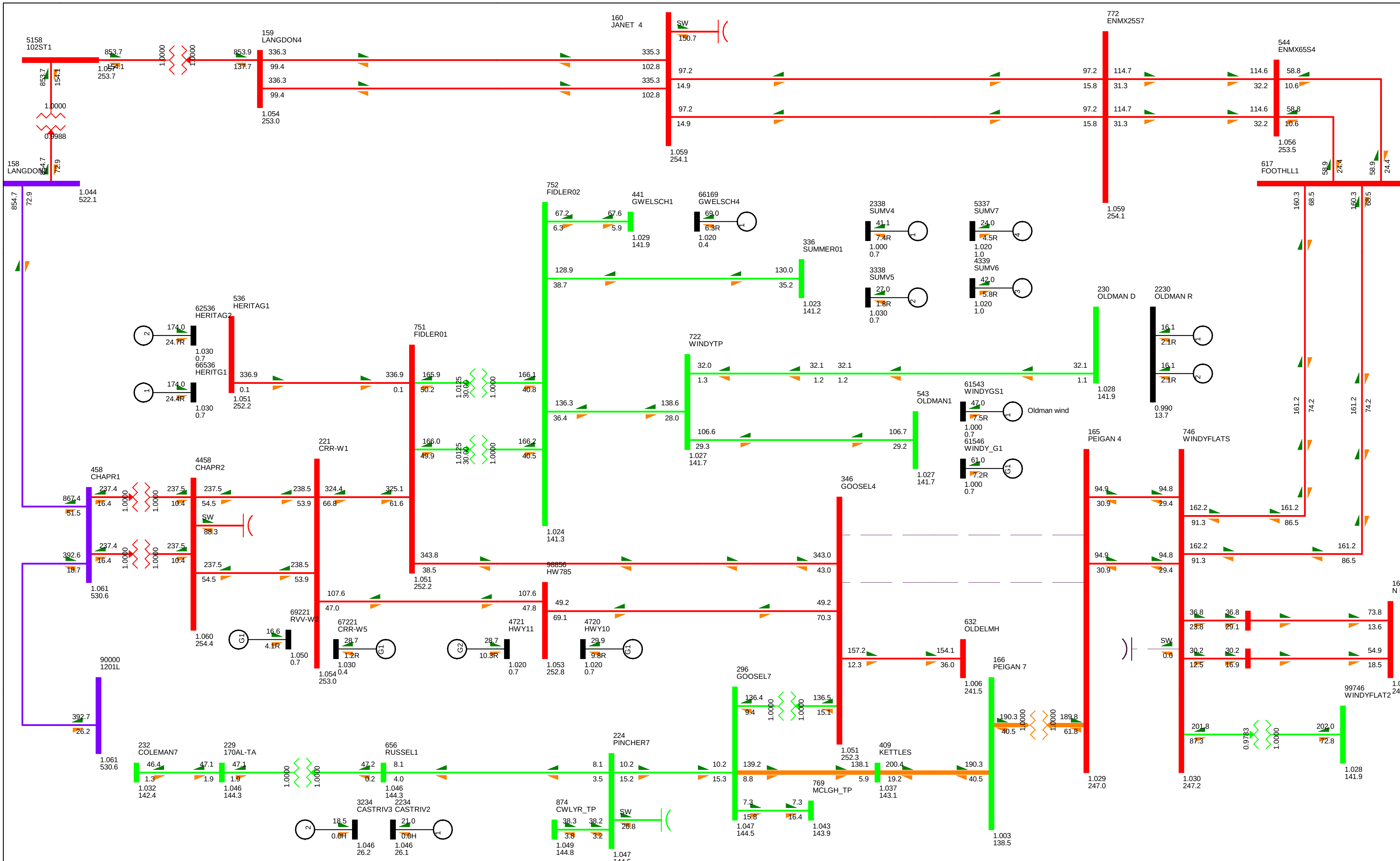


FIGURE C-5-16 - CONTINGENCY 95556L
2022 SP ALT2-400 IM
WED, OCT 10 2012 16:05

Fidler Connection

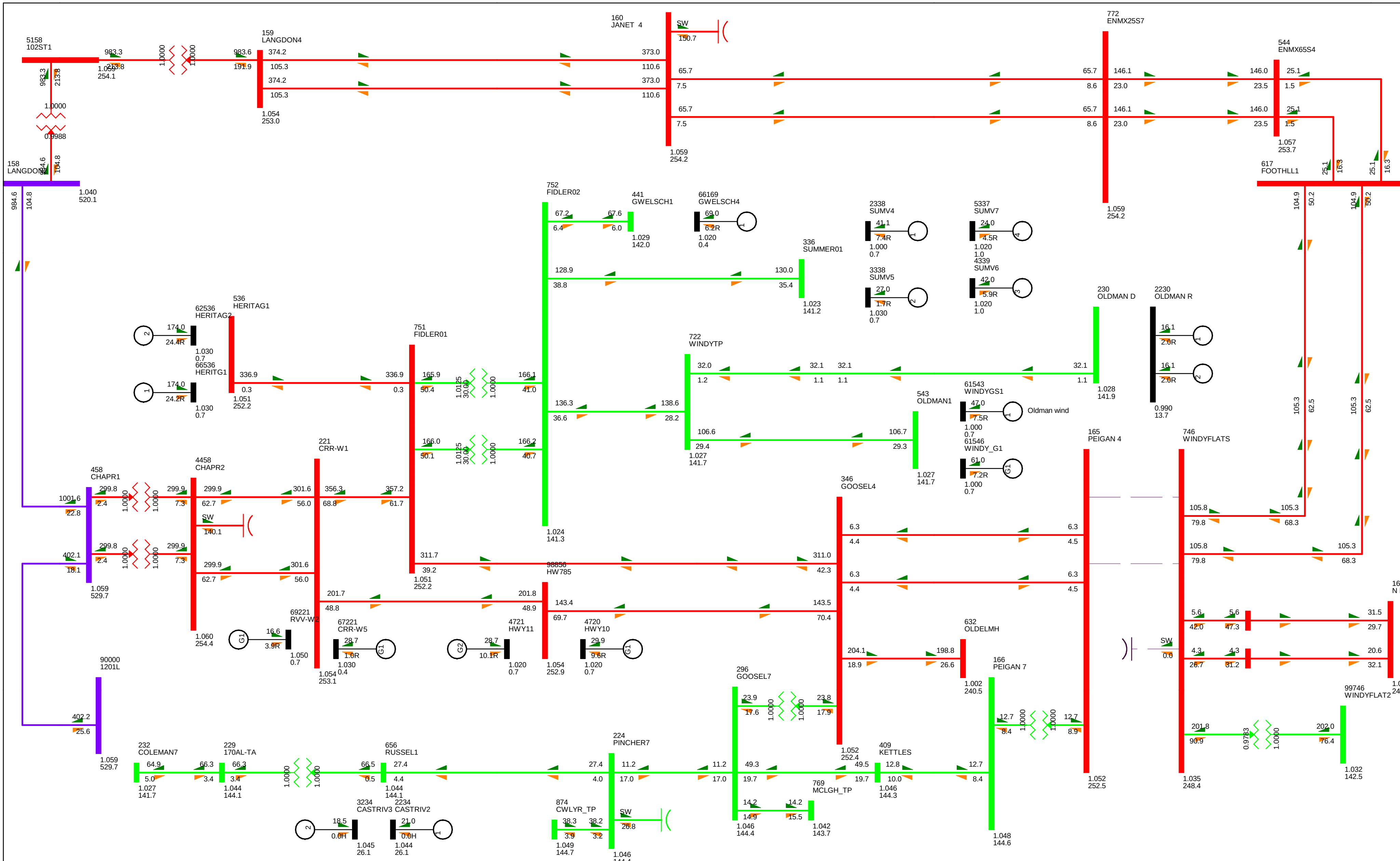


FIGURE C-5-17 - CONTINGENCY PEIWF
2022 SP ALT2-400 IM
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -405.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

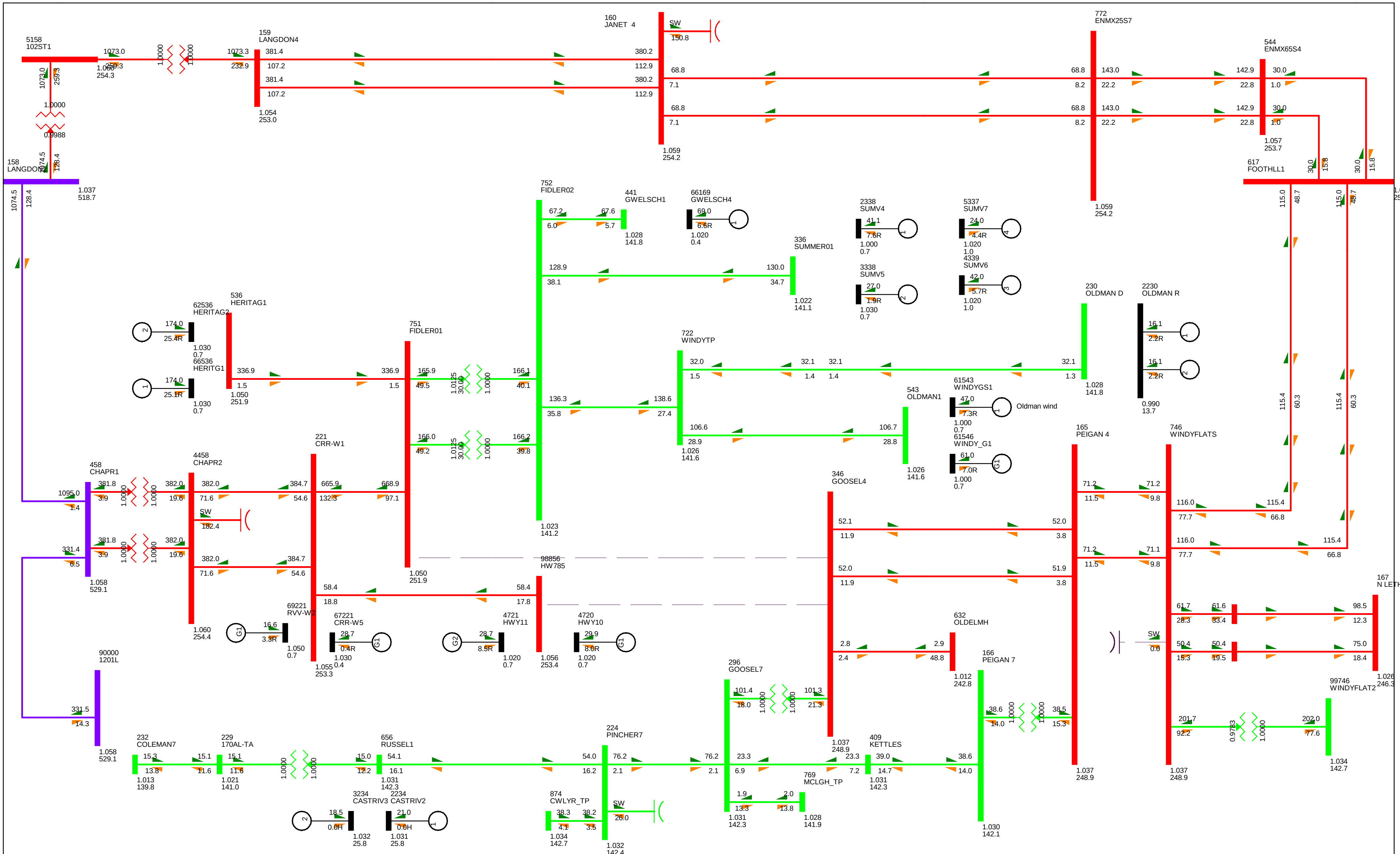


FIGURE C-5-18 - CONTINGENCY GLTOH
2022 SP ALT2-400 IM
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -394.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

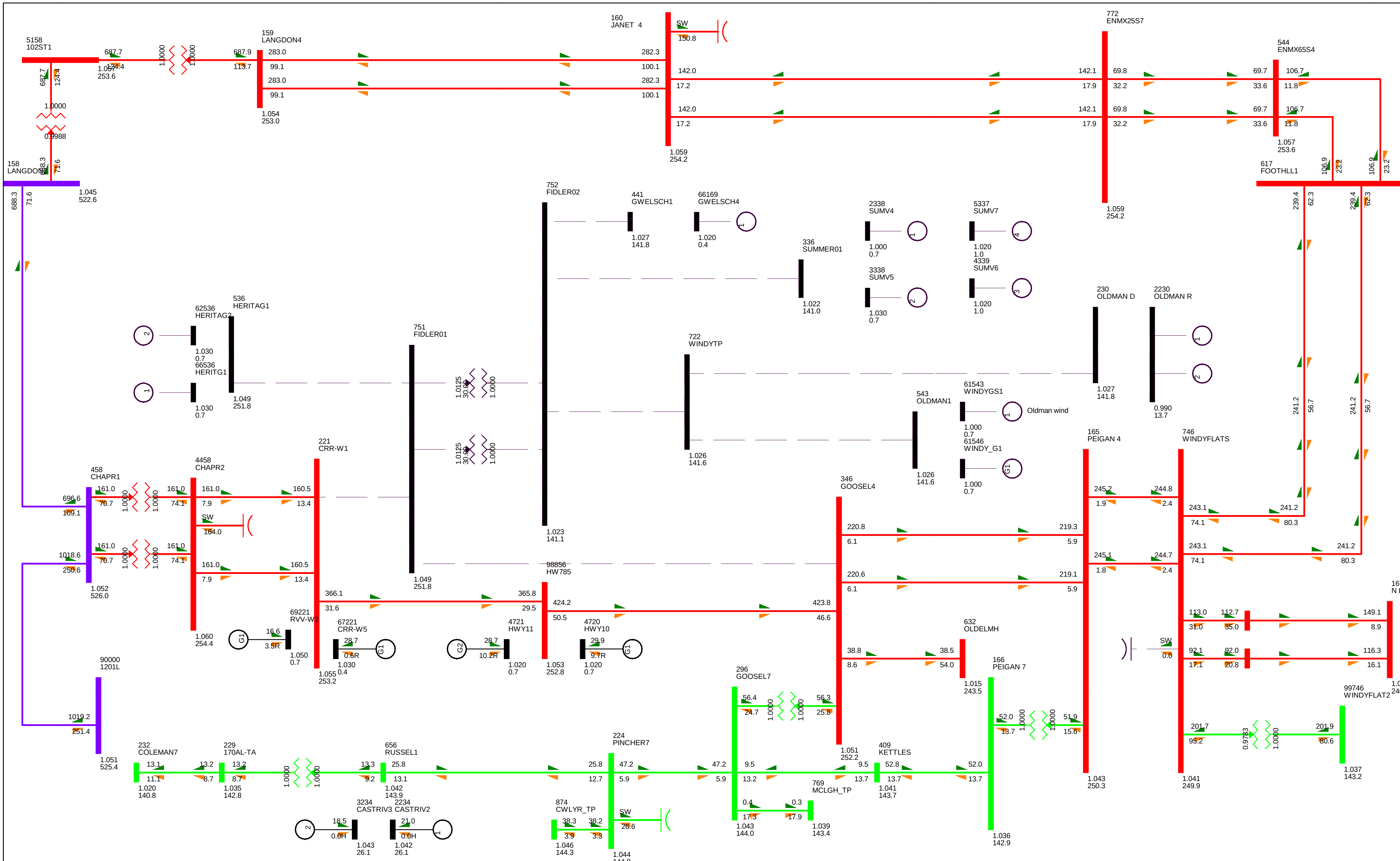


FIGURE C-5-19 - CONTINGENCY CRRTOCHAPEL
2022 SP ALT2-400 IM
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -1055.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

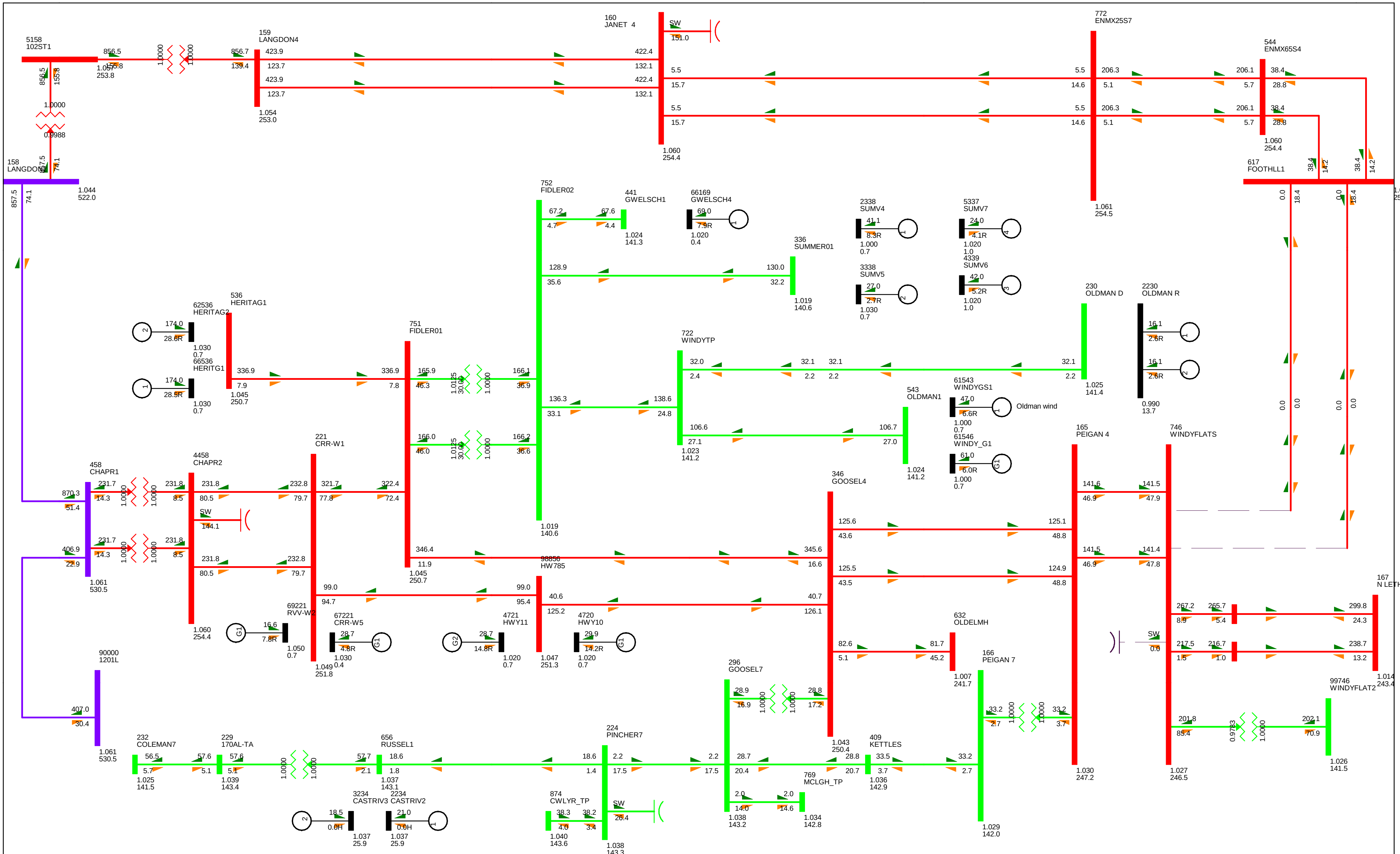


FIGURE C-5-20 - CONTINGENCY 1037L1038L 2022 SP ALT2-400 IM WED, OCT 10 2012 16:05	**Fidler Connection**	Bus - VOLTAGE (kV/PU) Branch - MW/Mvar Equipment - MW/Mvar 100.0%RATEA 1.120OV 0.950UV kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000 BC Export : -412.3 MW SA Export : -0.1 MW MH Export : 0.0 MW

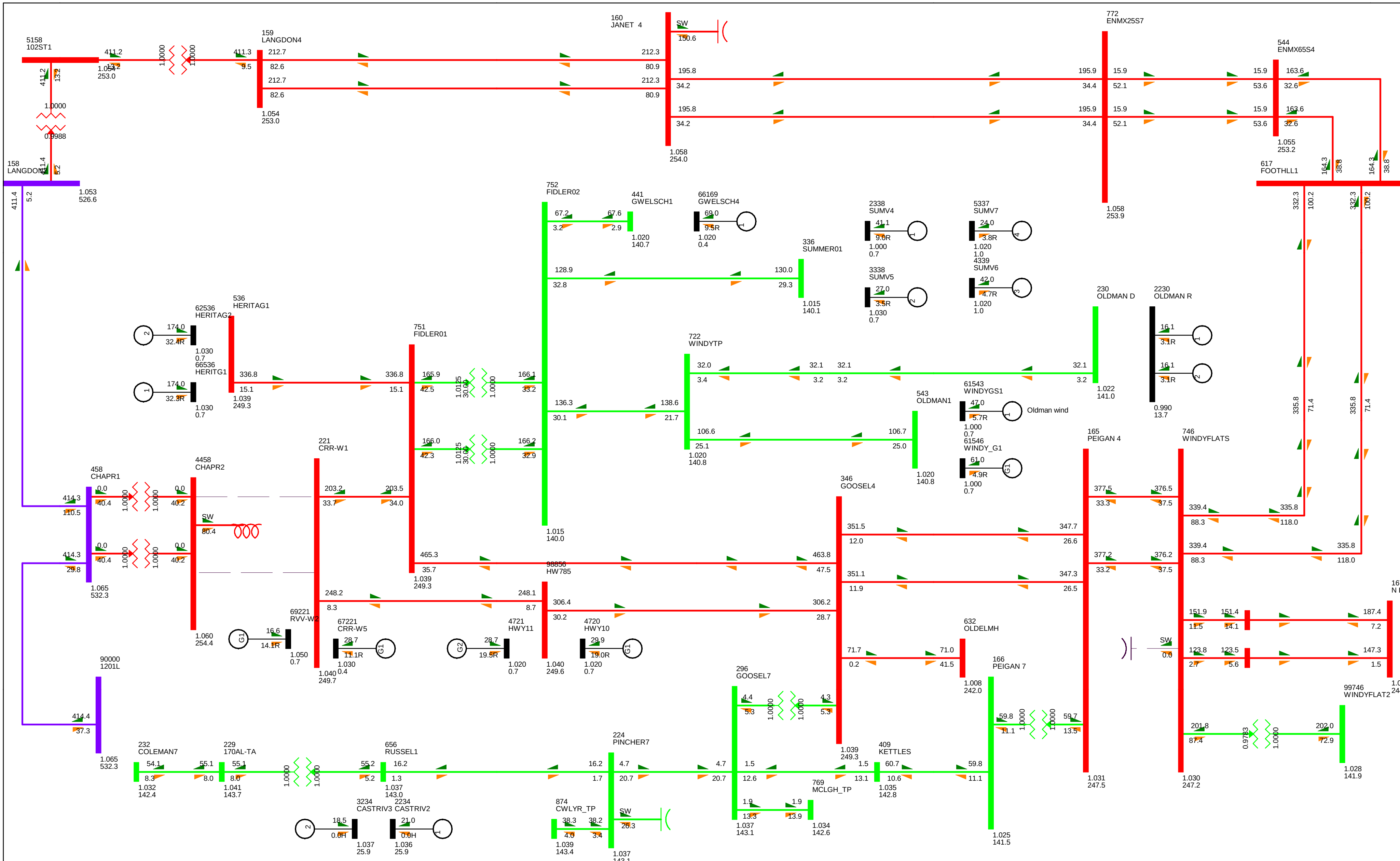


FIGURE C-5-21 - CONTINGENCY CRRTOCHAPEL
2022 SP ALT2-400 IM
WED, OCT 10 2012 16:26

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -401.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

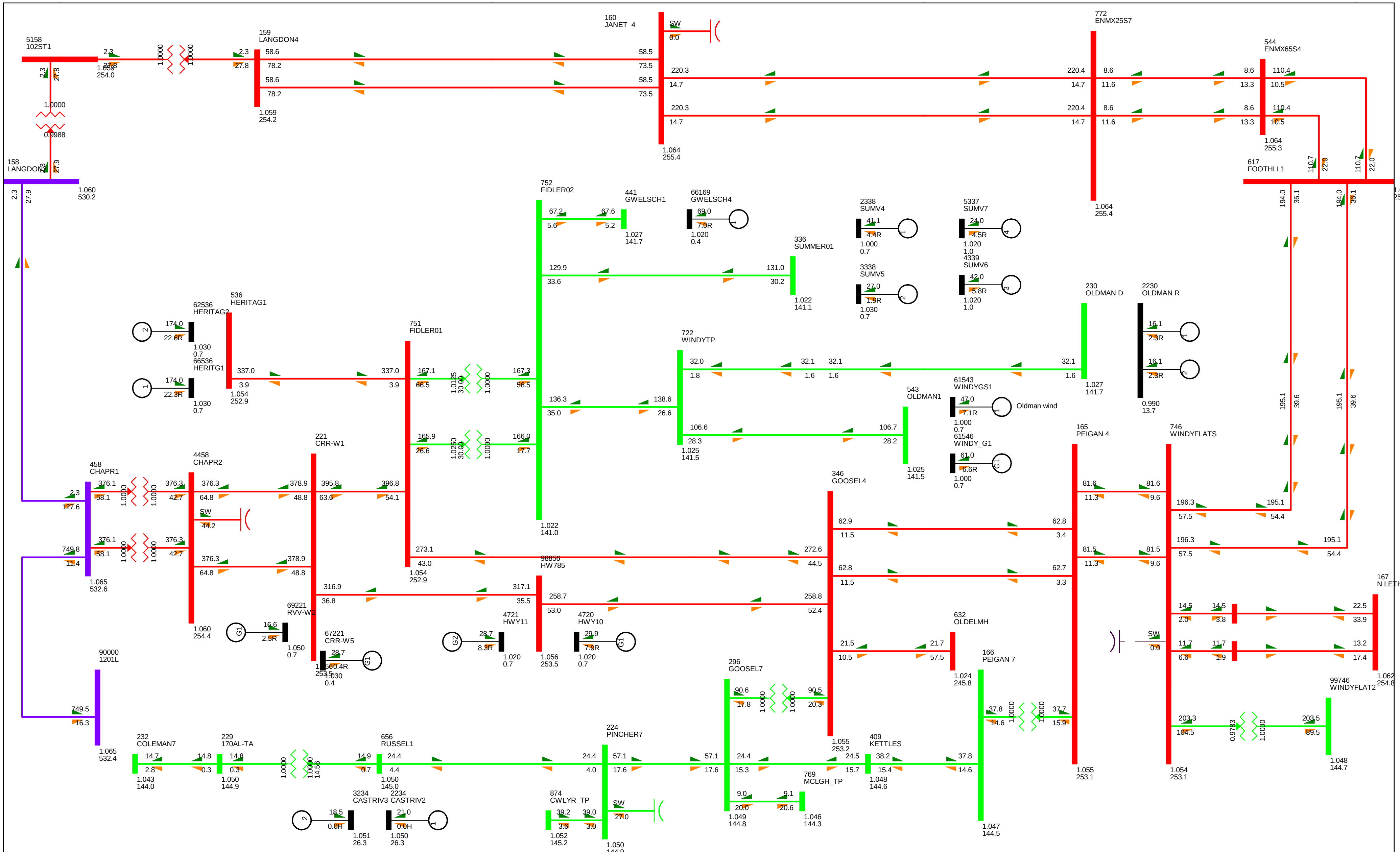


FIGURE C-6-1 - SYSTEM NORMAL
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

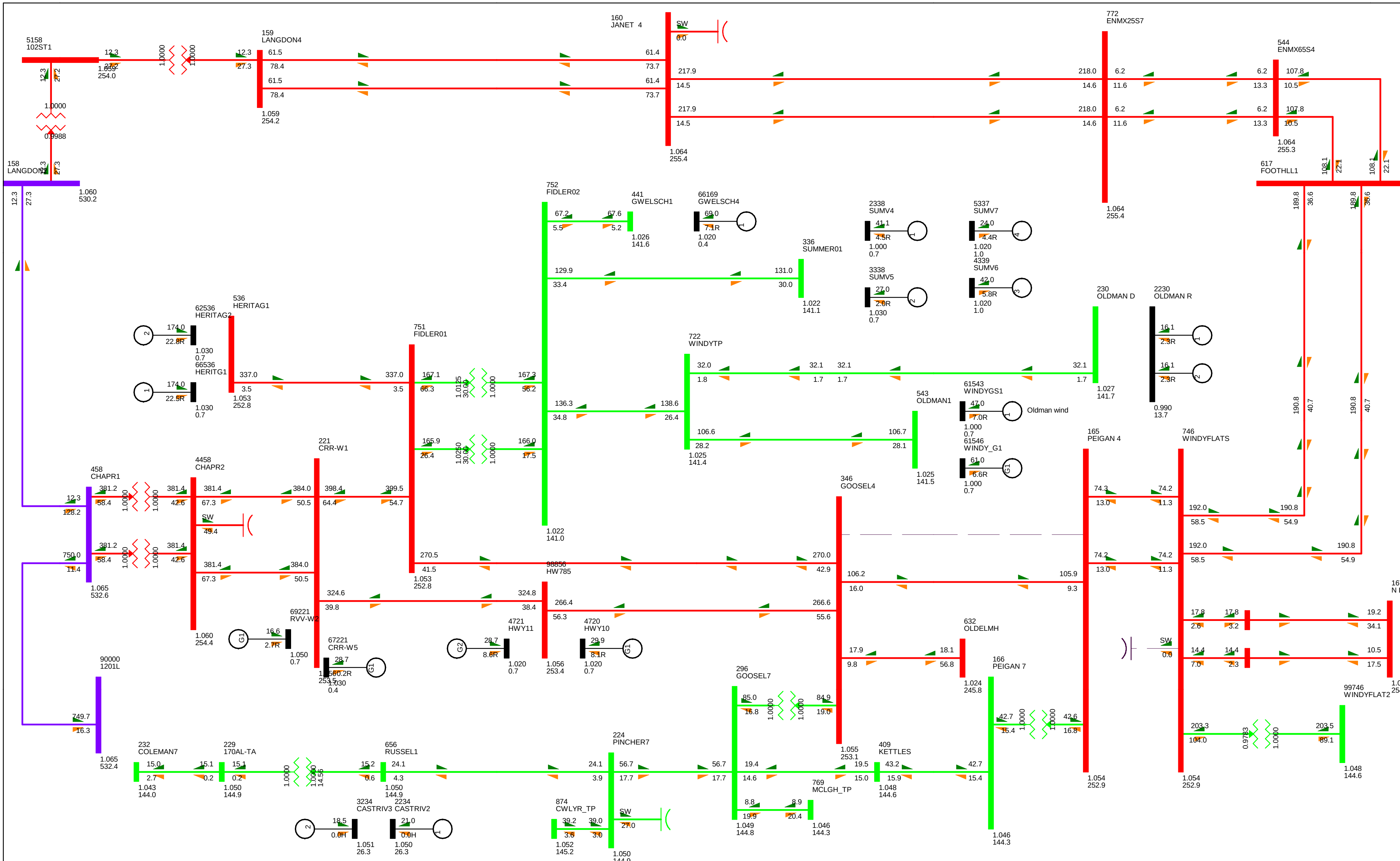


FIGURE C-6-2 - CONTINGENCY 955L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

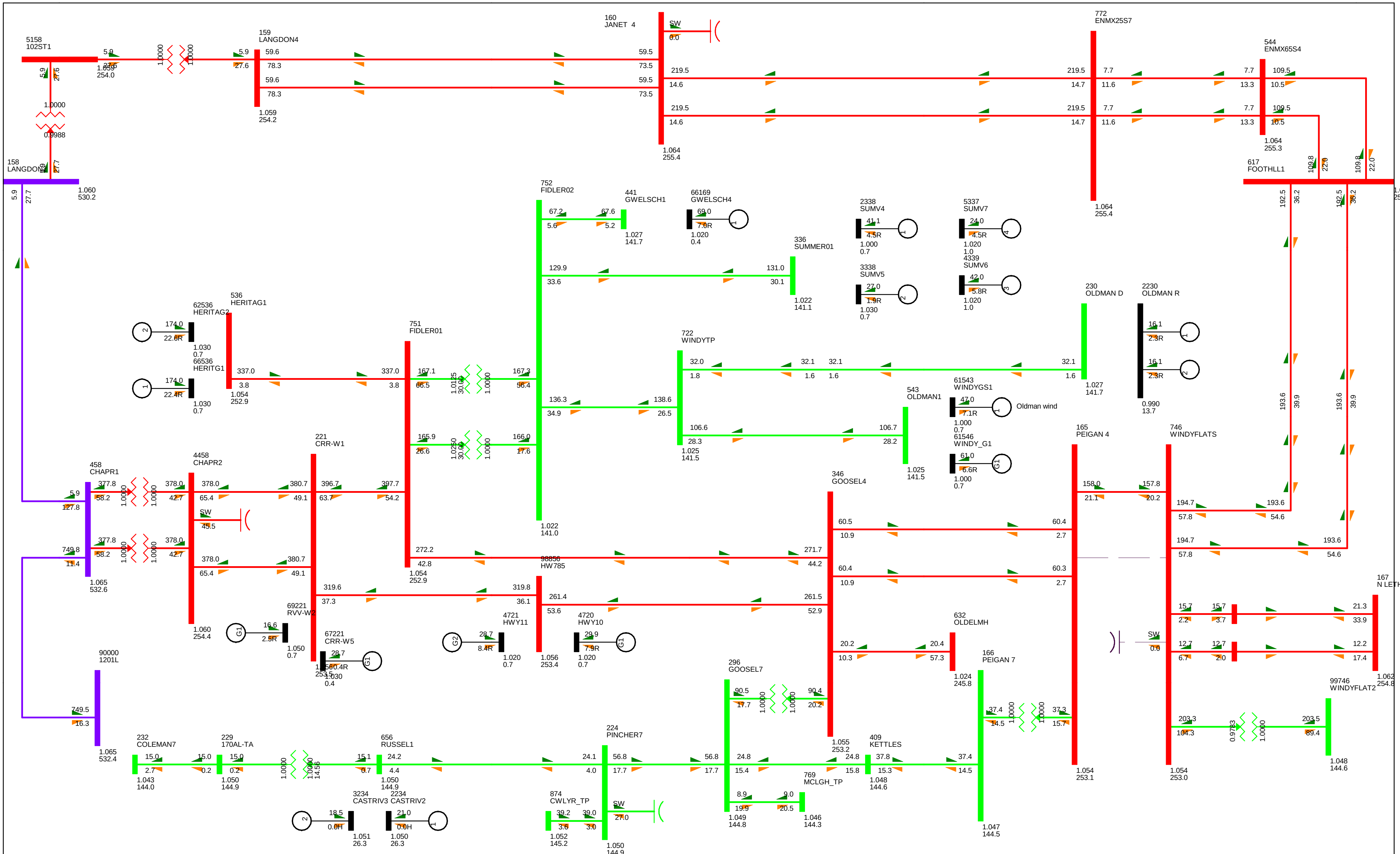


FIGURE C-6-3 - CONTINGENCY 1048L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

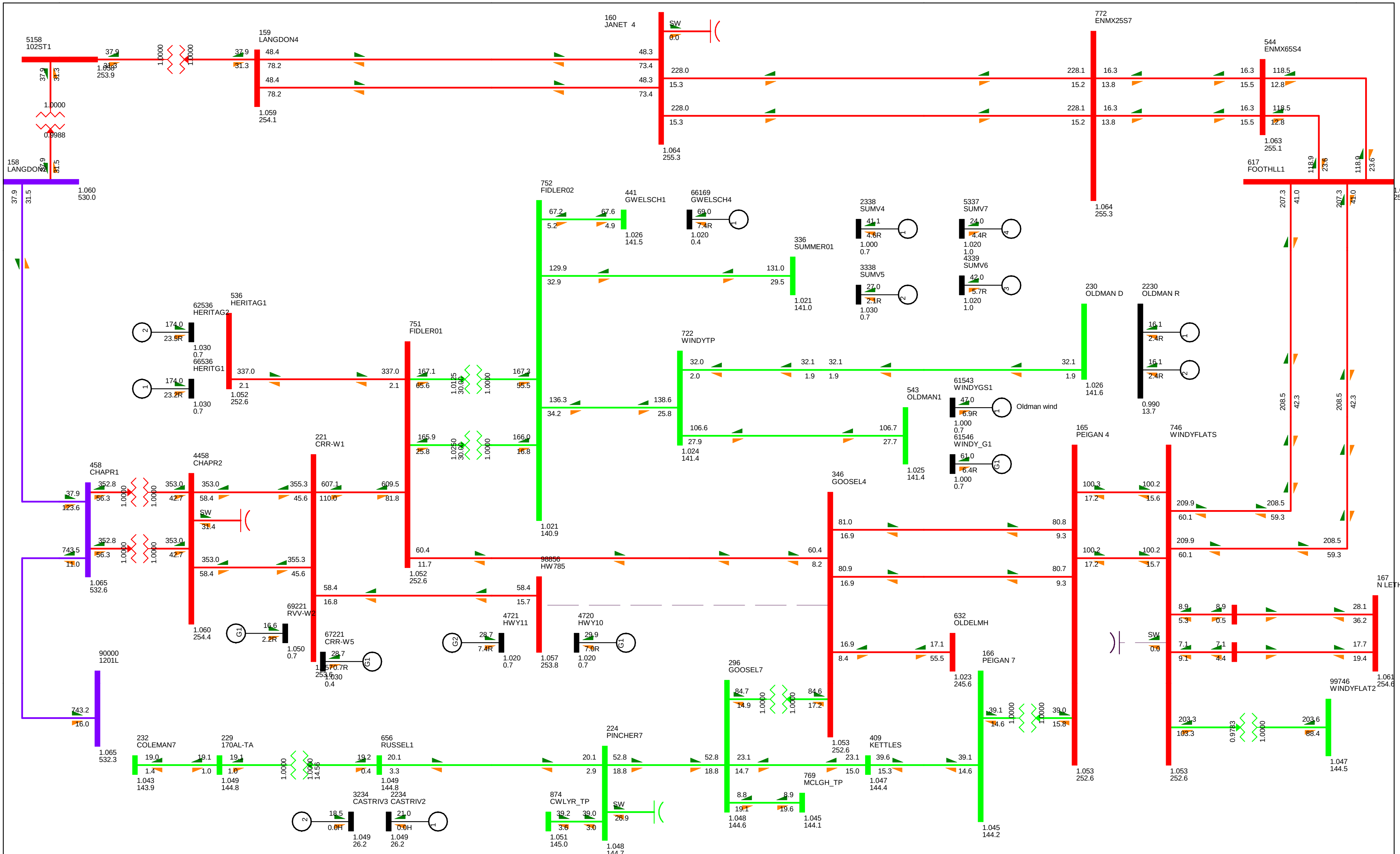


FIGURE C-6-4 - CONTINGENCY 1072L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 773.1 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

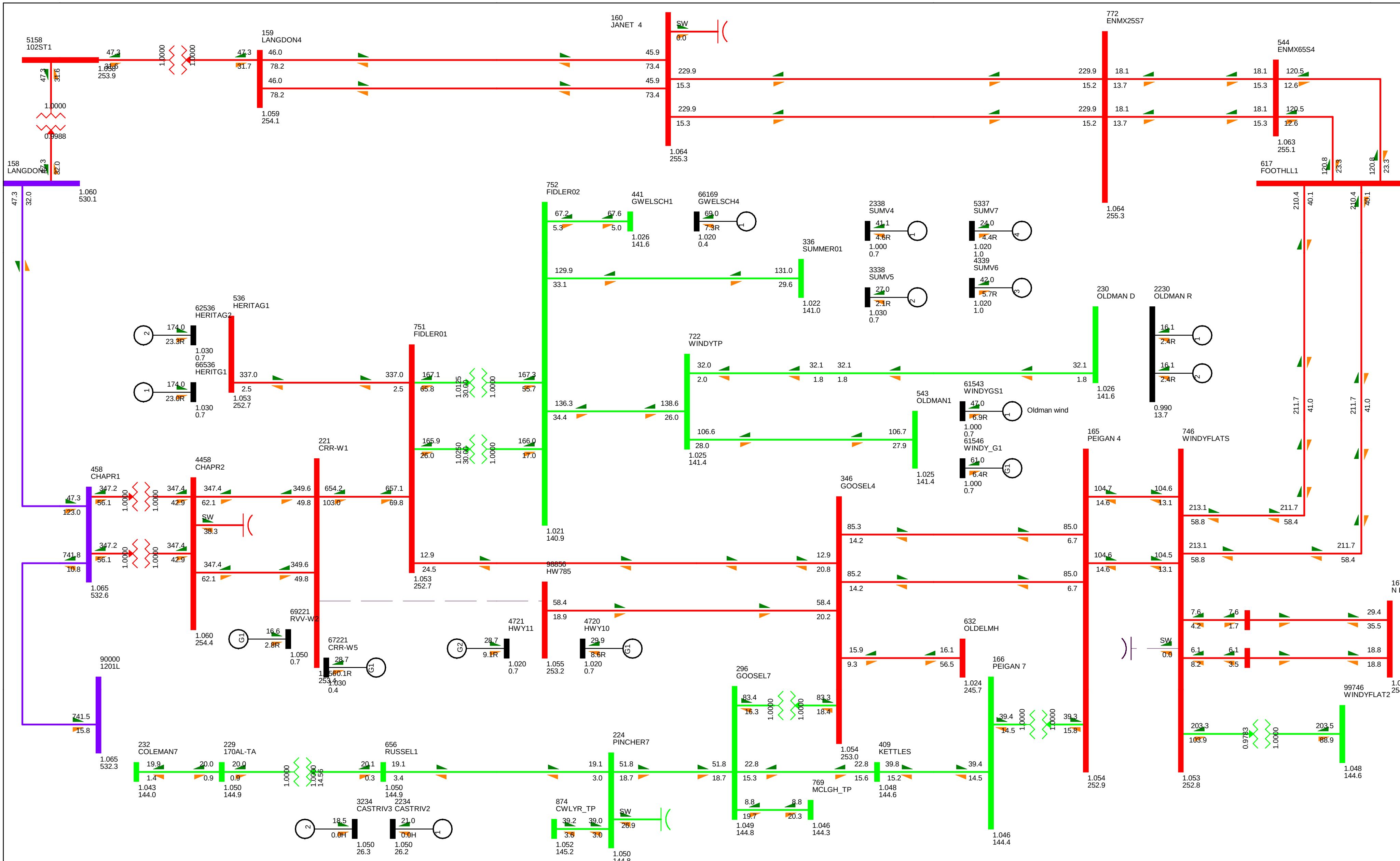


FIGURE C-6-5 - CONTINGENCY 1072LCTOH
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

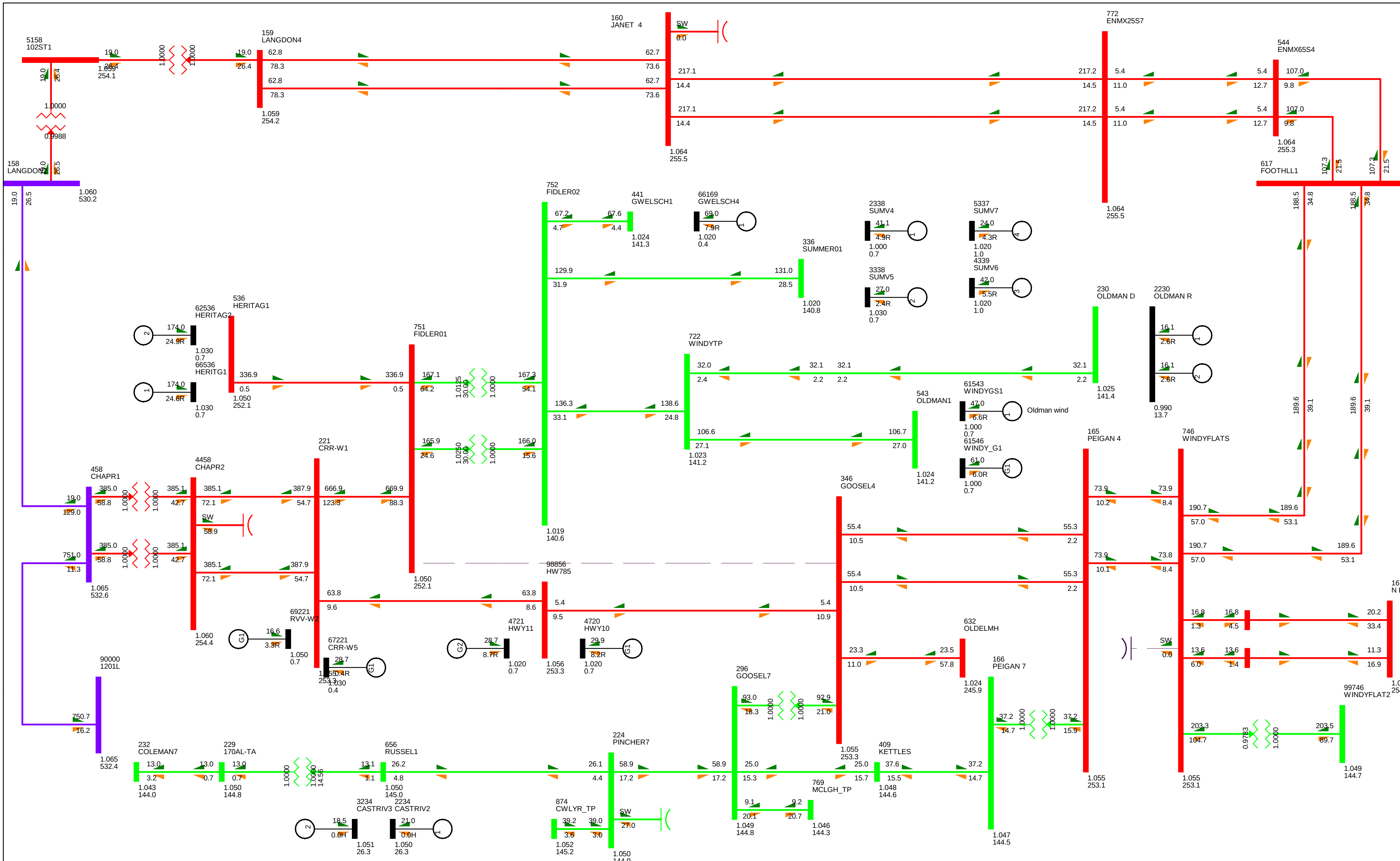


FIGURE C-6-6 - CONTINGENCY 994L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

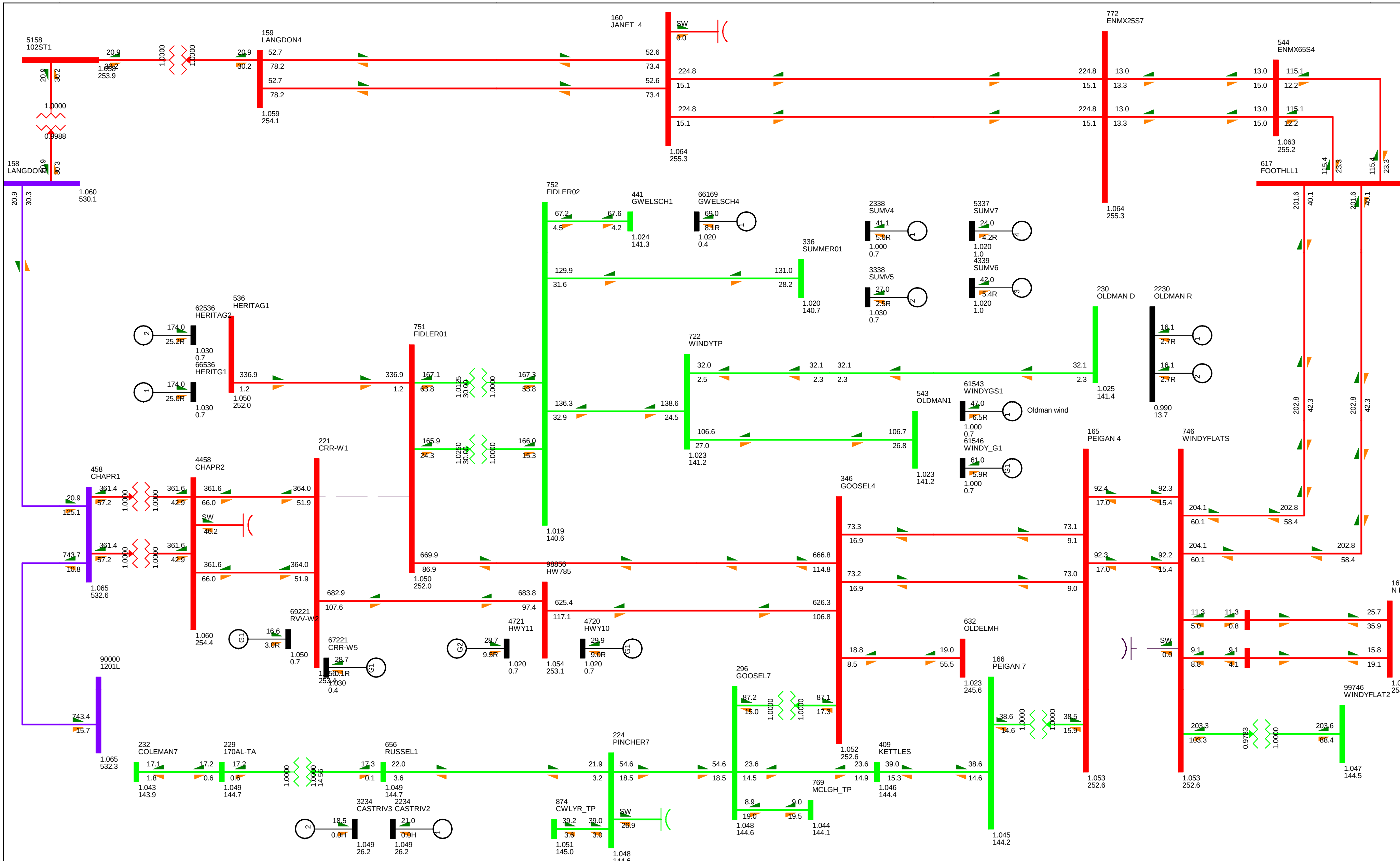


FIGURE C-6-7 - CONTINGENCY 1071L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 771.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

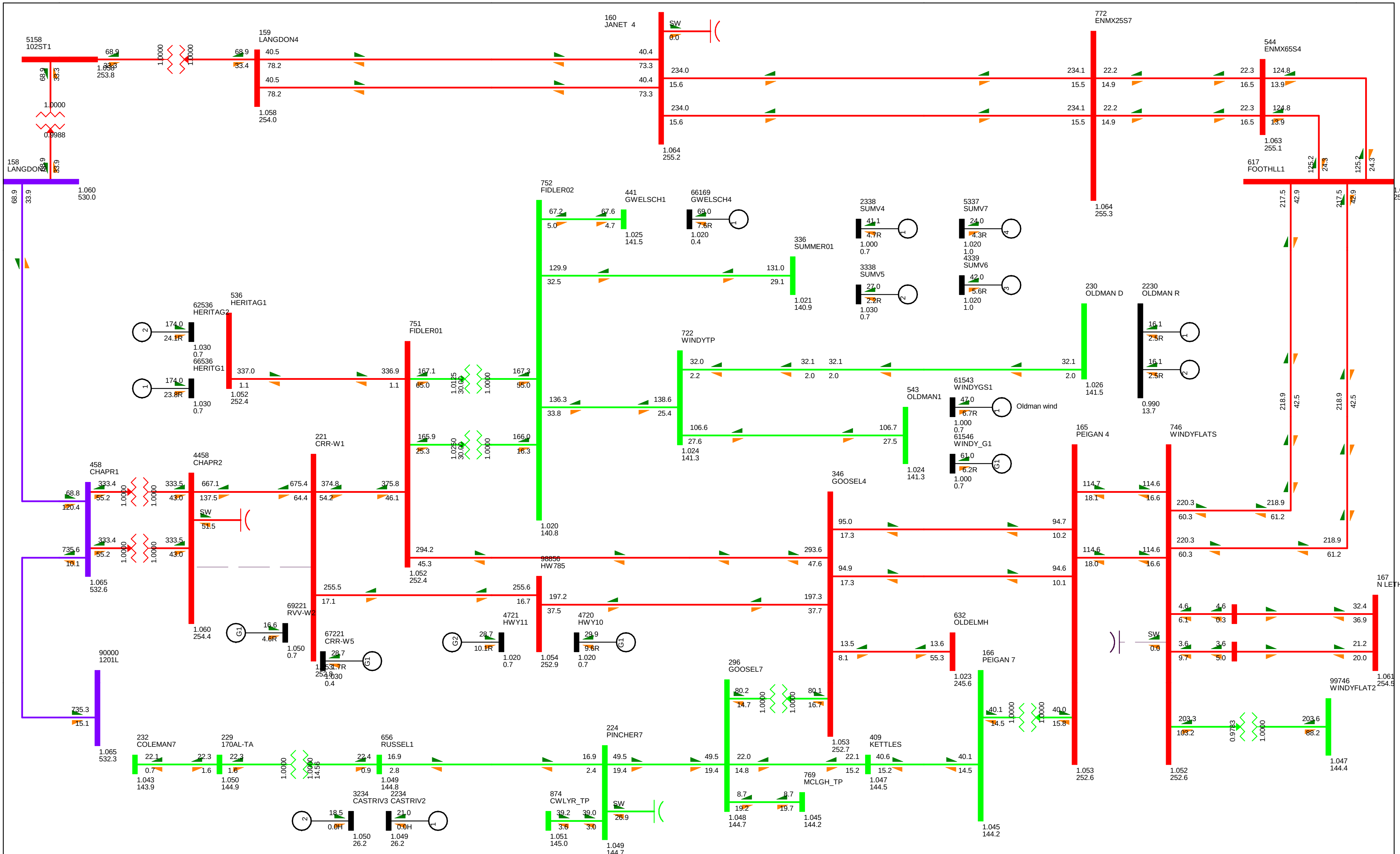


FIGURE C-6-8 - CONTINGENCY 1004L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

BC Export : 768.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

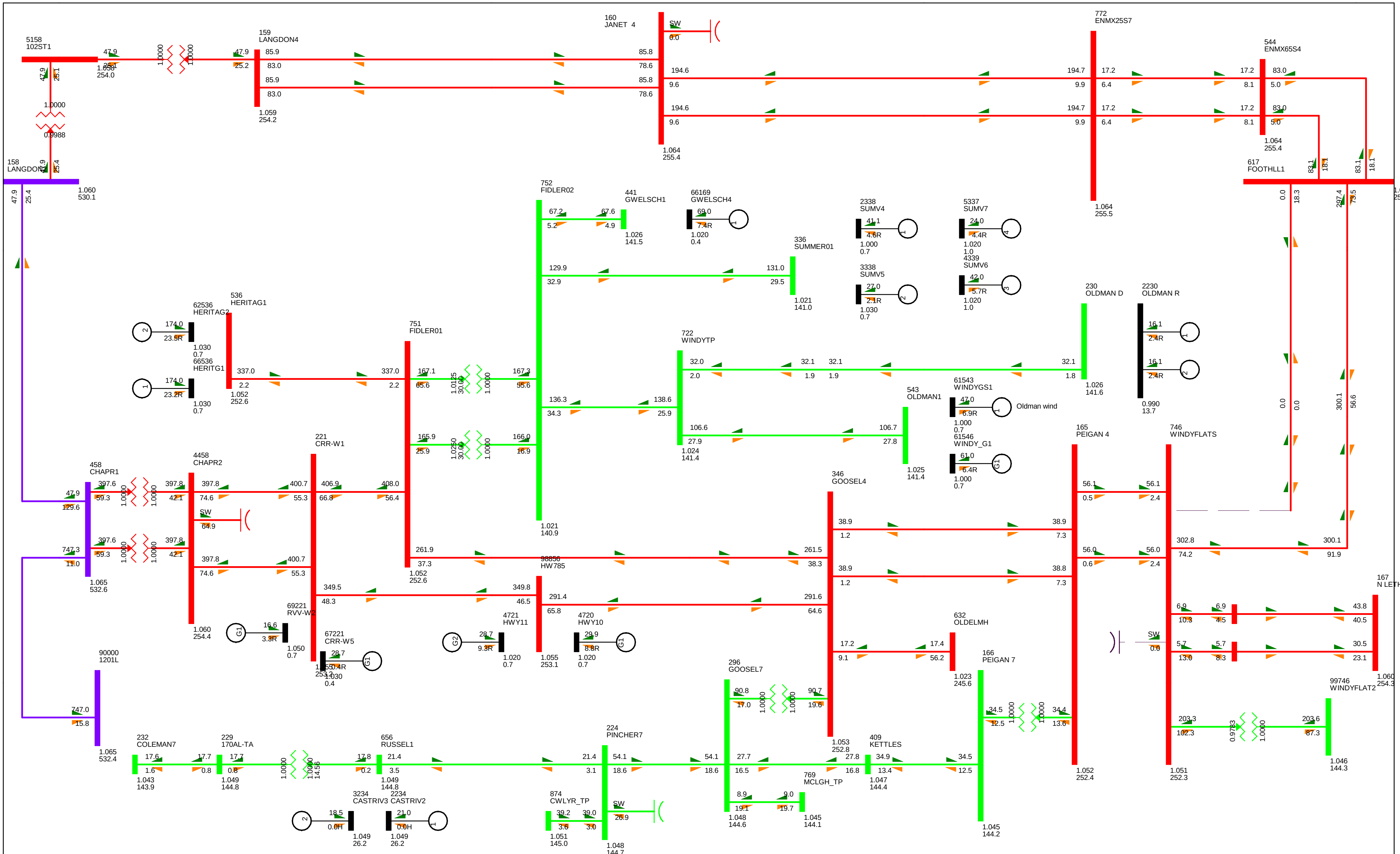


FIGURE C-6-9 - CONTINGENCY 1037L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 771.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

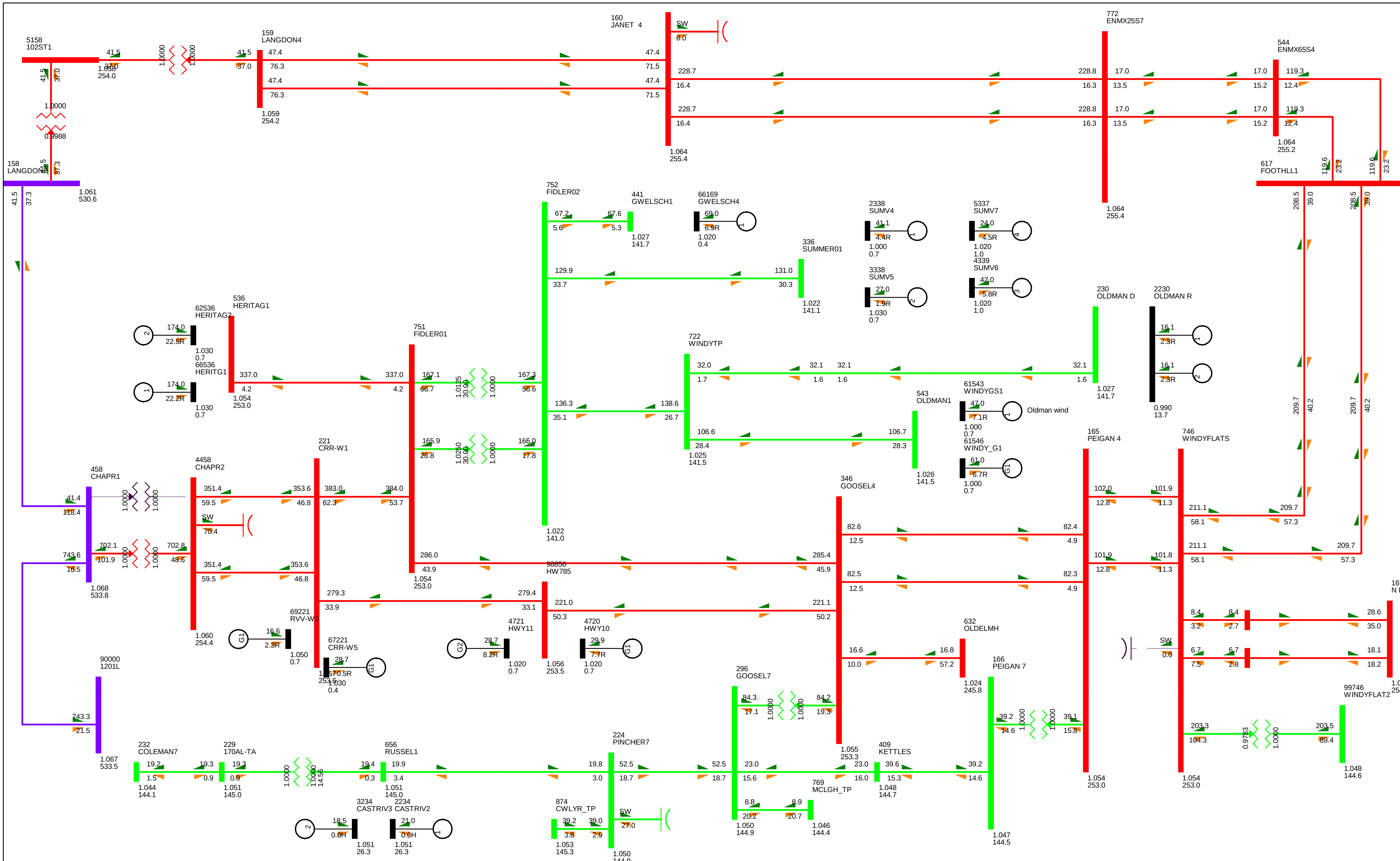


FIGURE C-6-10 - CONTINGENCY CHAPELXMER
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 773.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

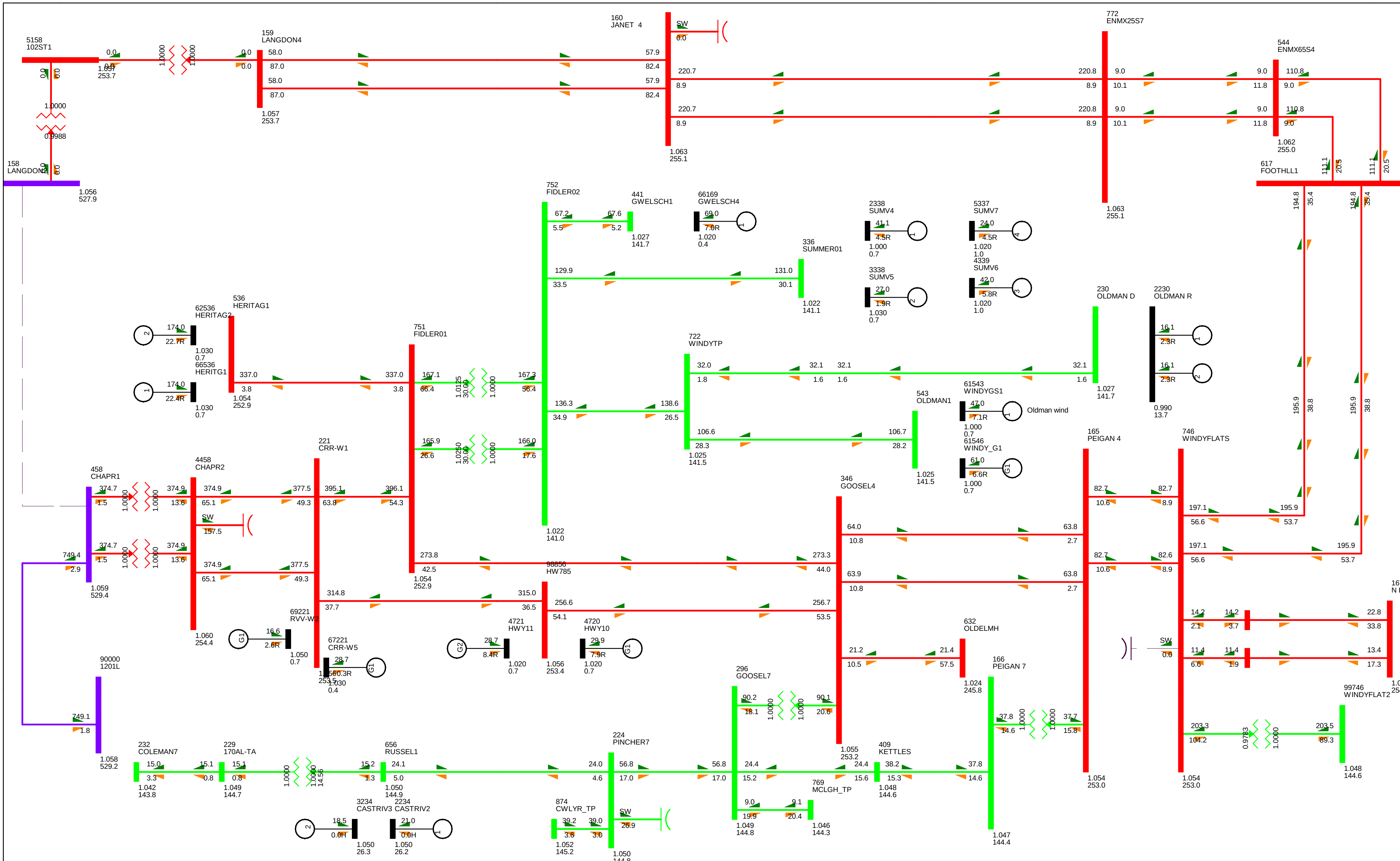


FIGURE C-6-11 - CONTINGENCY 1201L
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

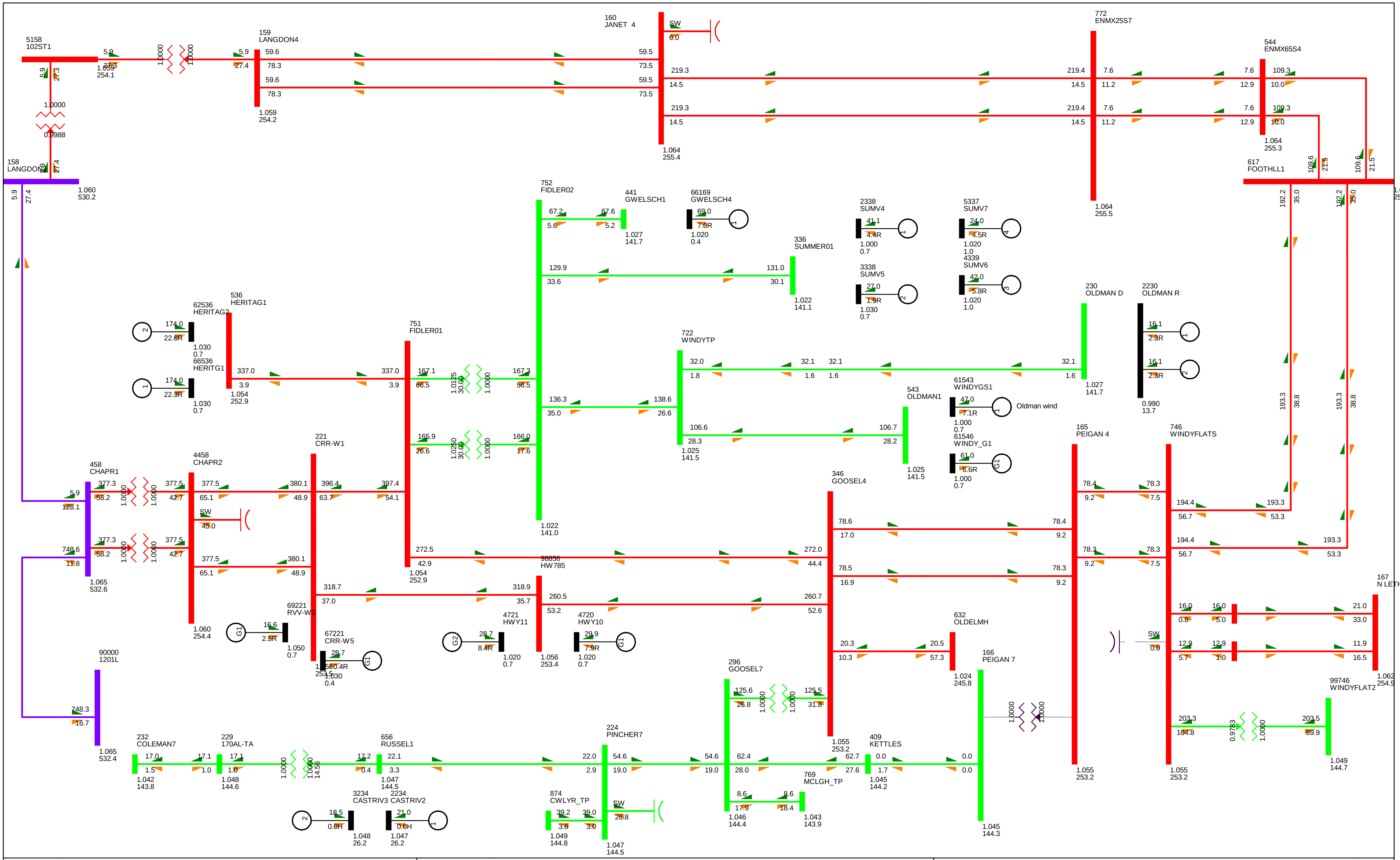


FIGURE C-6-12 - CONTINGENCY PEIXMER
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

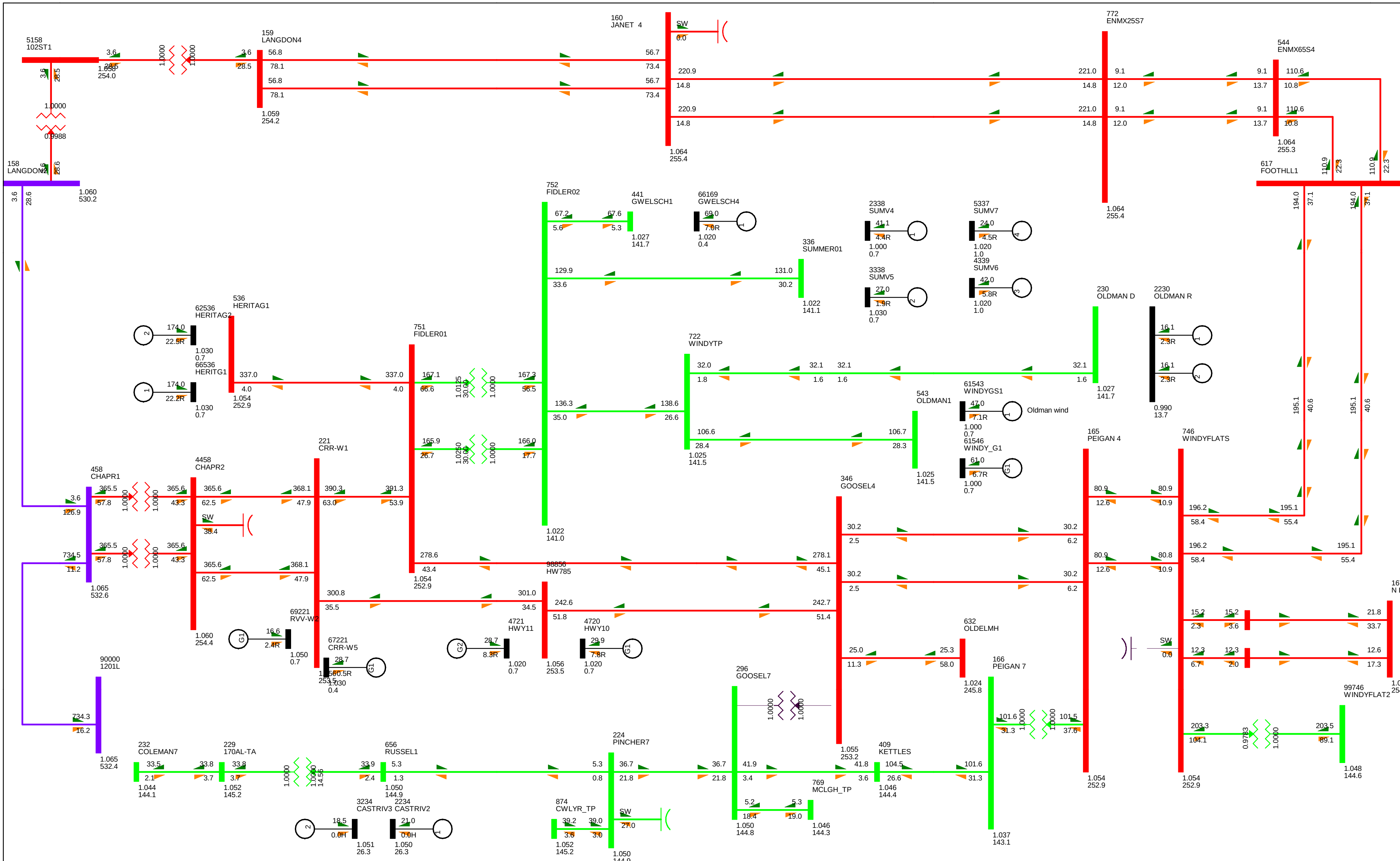


FIGURE C-6-13 - CONTINGENCY GLXMER
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

BC Export : 772.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

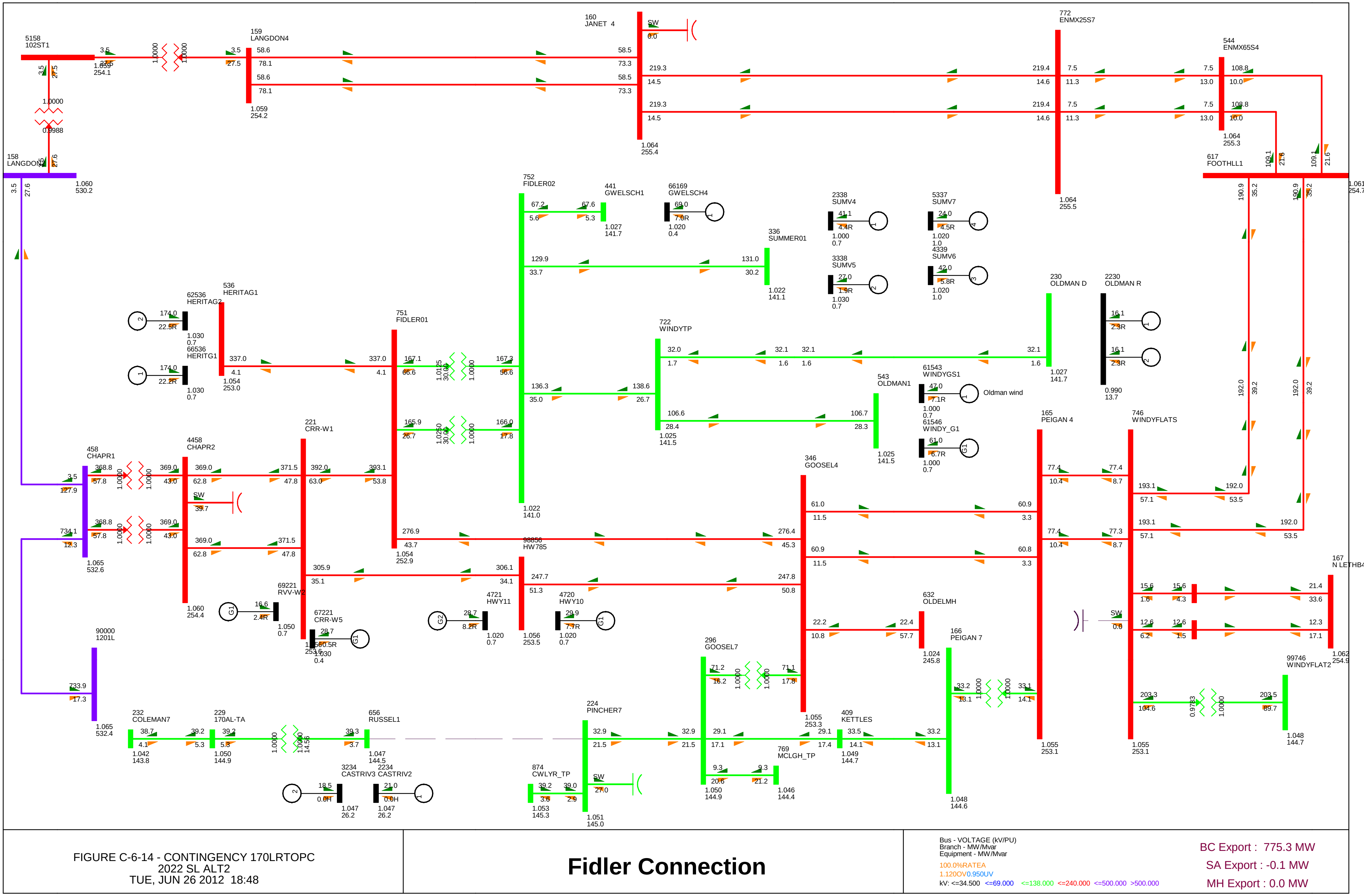


FIGURE C-6-14 - CONTINGENCY 170LRTOPC
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

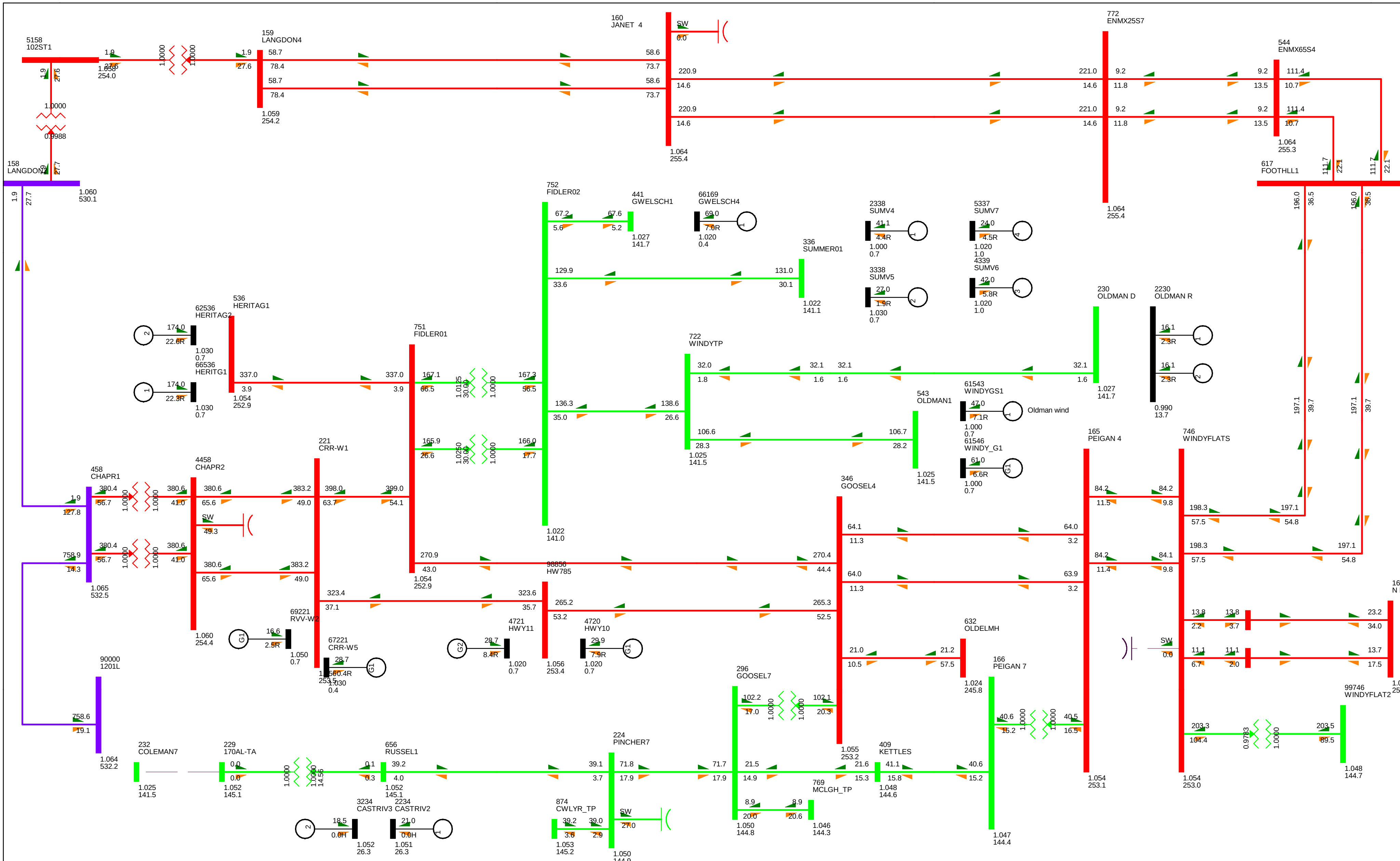


FIGURE C-6-15 - CONTINGENCY 170LRTOC
2022 SL ALT2
TUE, JUN 26 2012 18:48

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

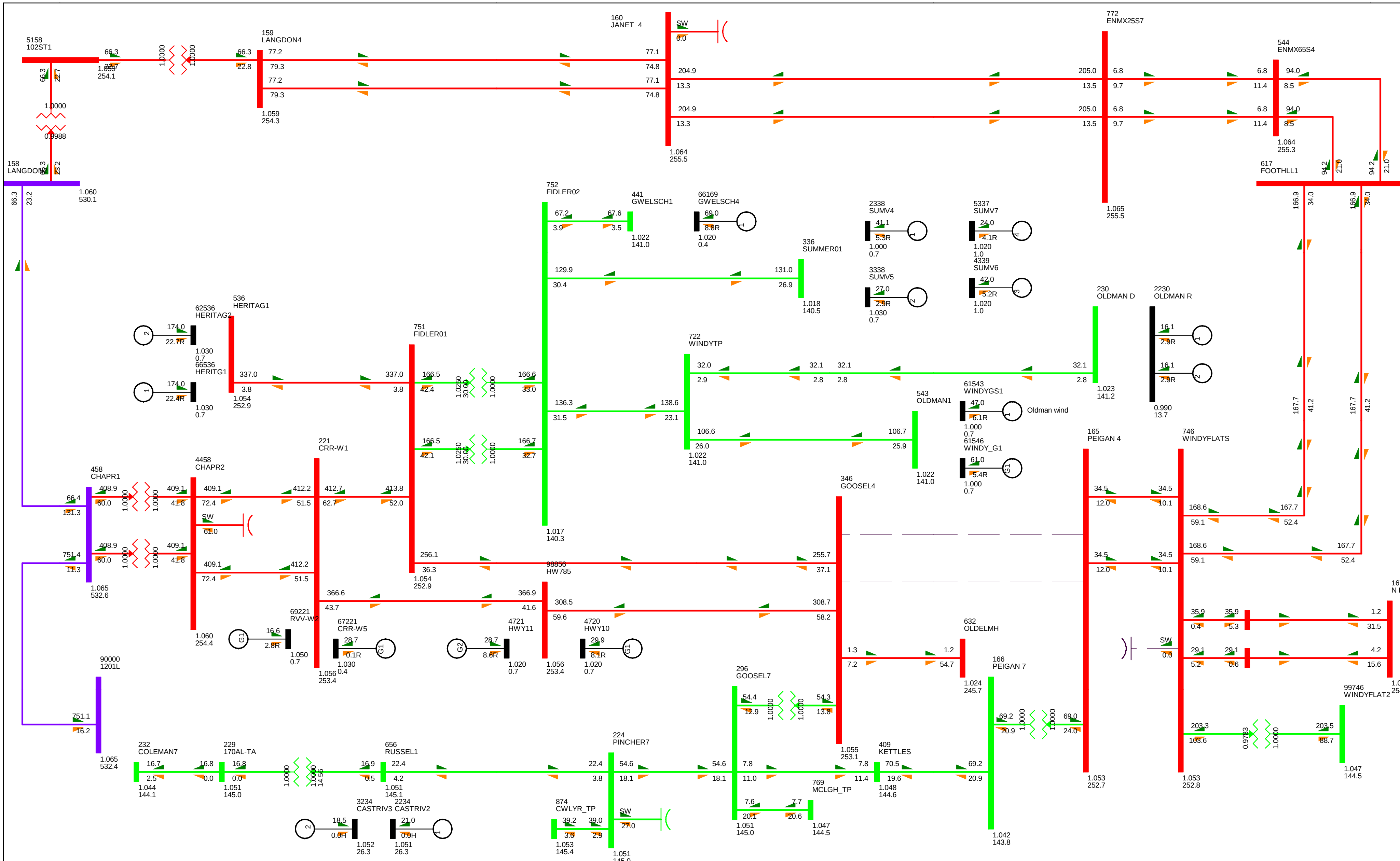


FIGURE C-6-16 - CONTINGENCY 95556L
2022 SL ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 774.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

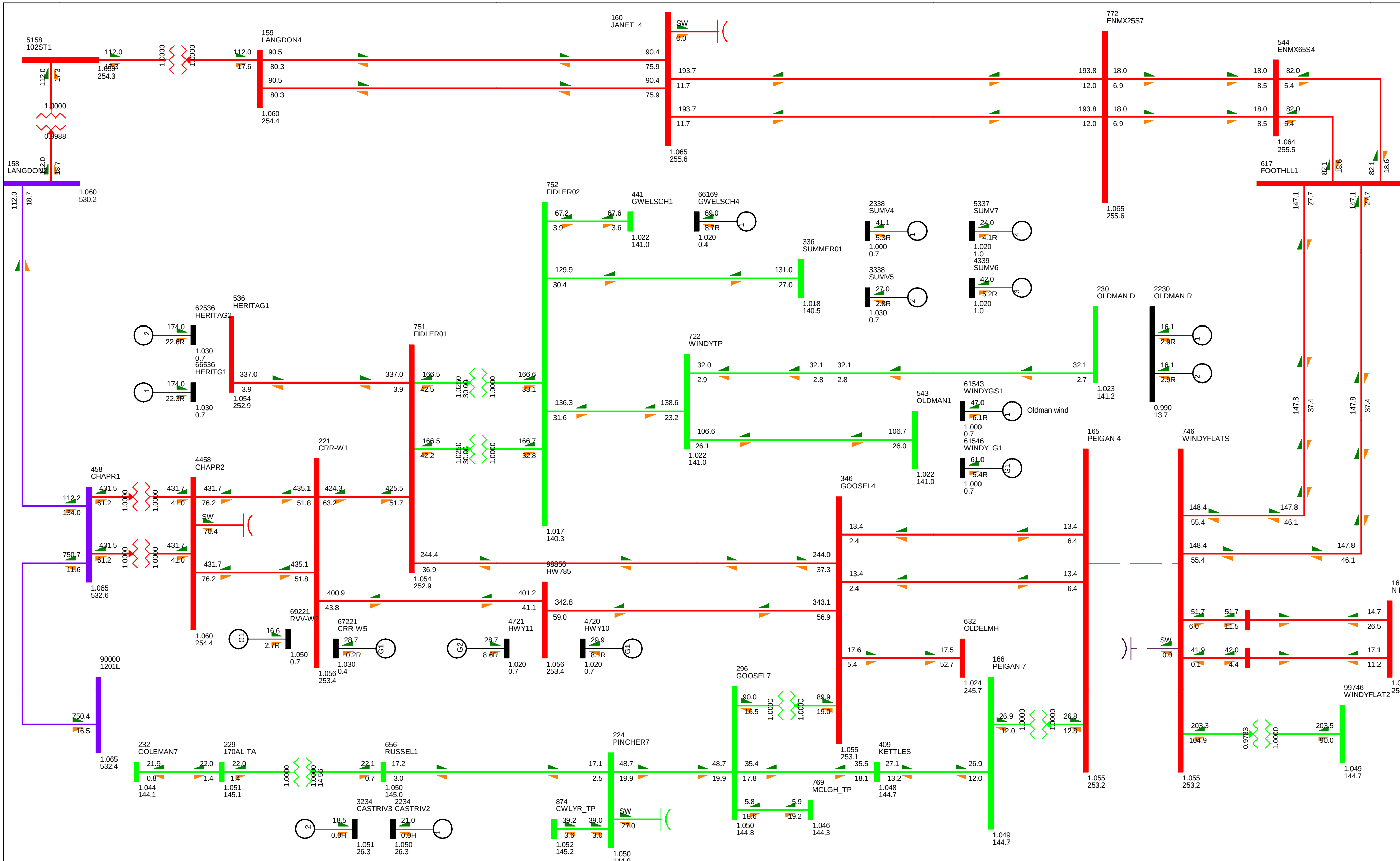


FIGURE C-6-17 - CONTINGENCY PEIWF
2022 SL ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 775.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

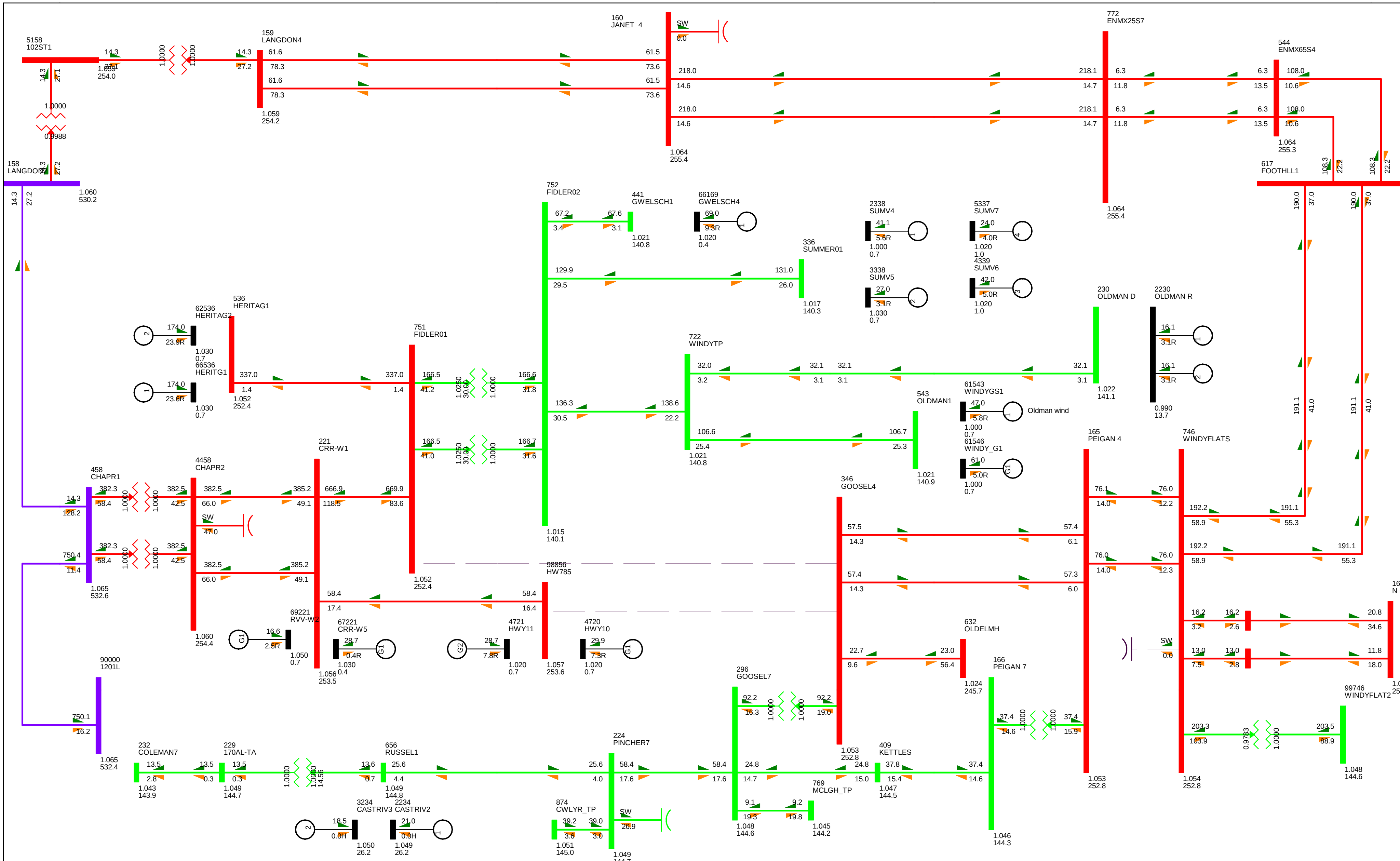


FIGURE C-6-18 - CONTINGENCY GLTOH
2022 SL ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 773.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

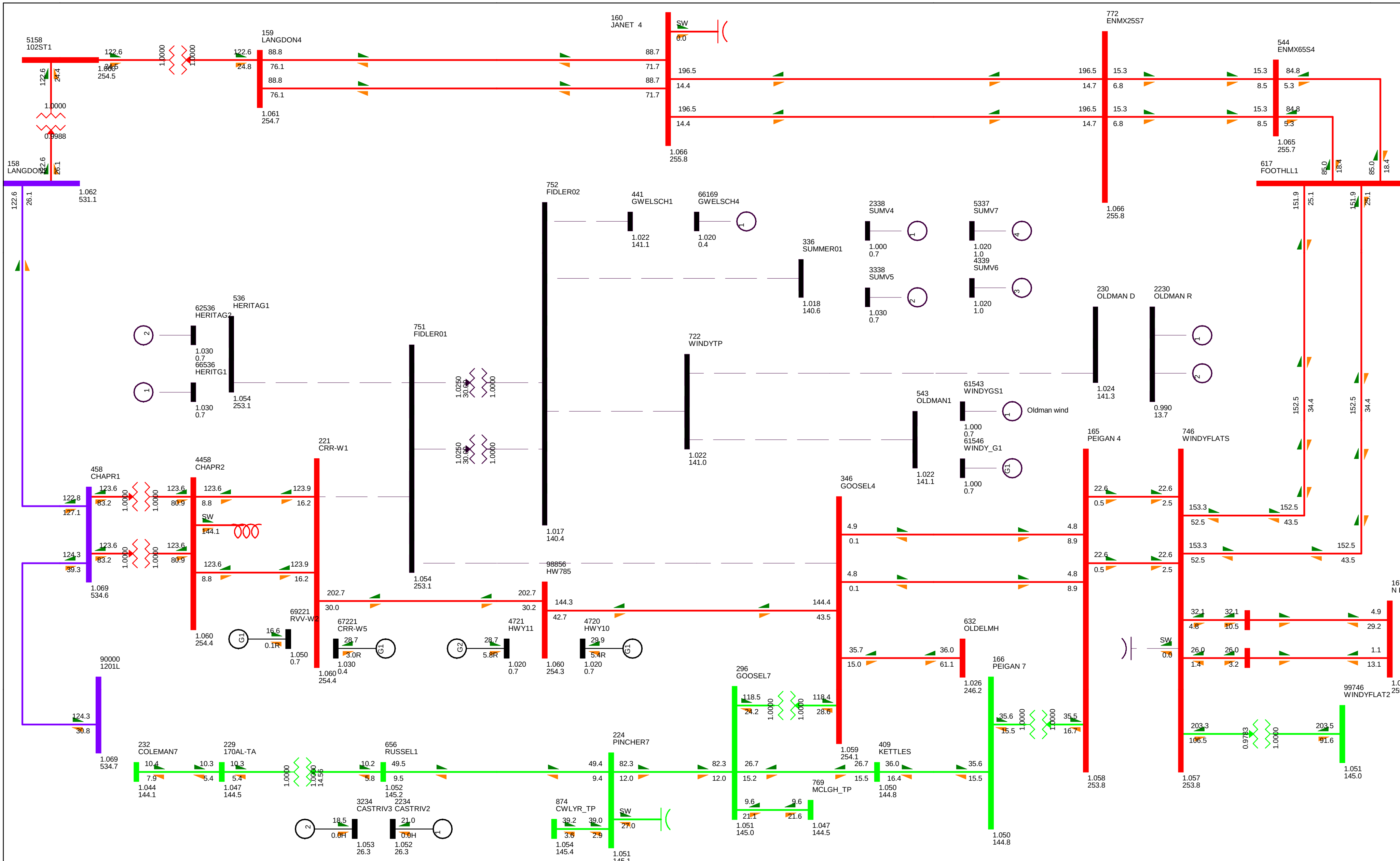


FIGURE C-6-19 - CONTINGENCY CRRTOCHAPEL
2022 SL ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 115.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

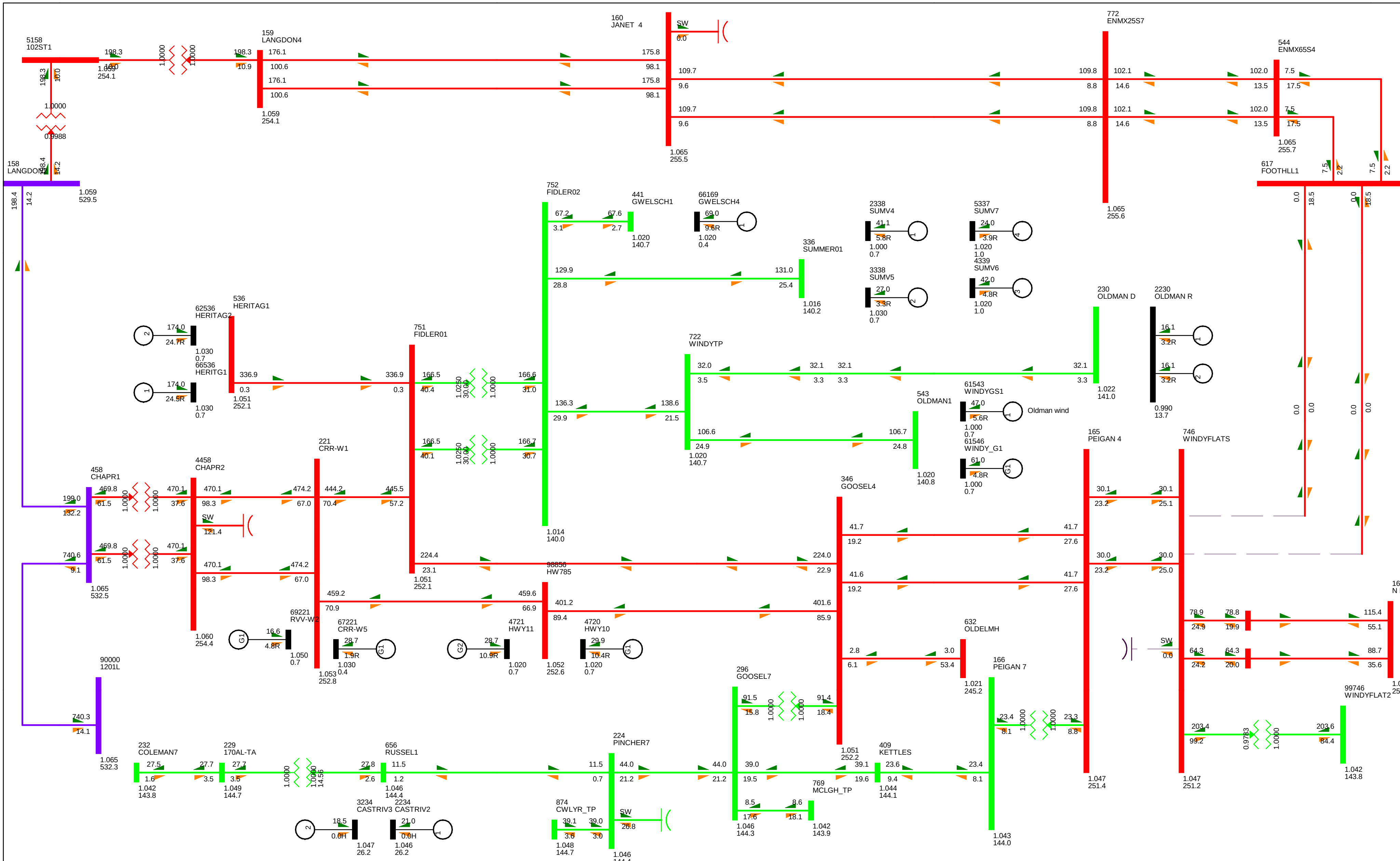


FIGURE C-6-20 - CONTINGENCY 1037L1038L
2022 SL ALT2
WED, OCT 10 2012 16:05

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 764.3 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

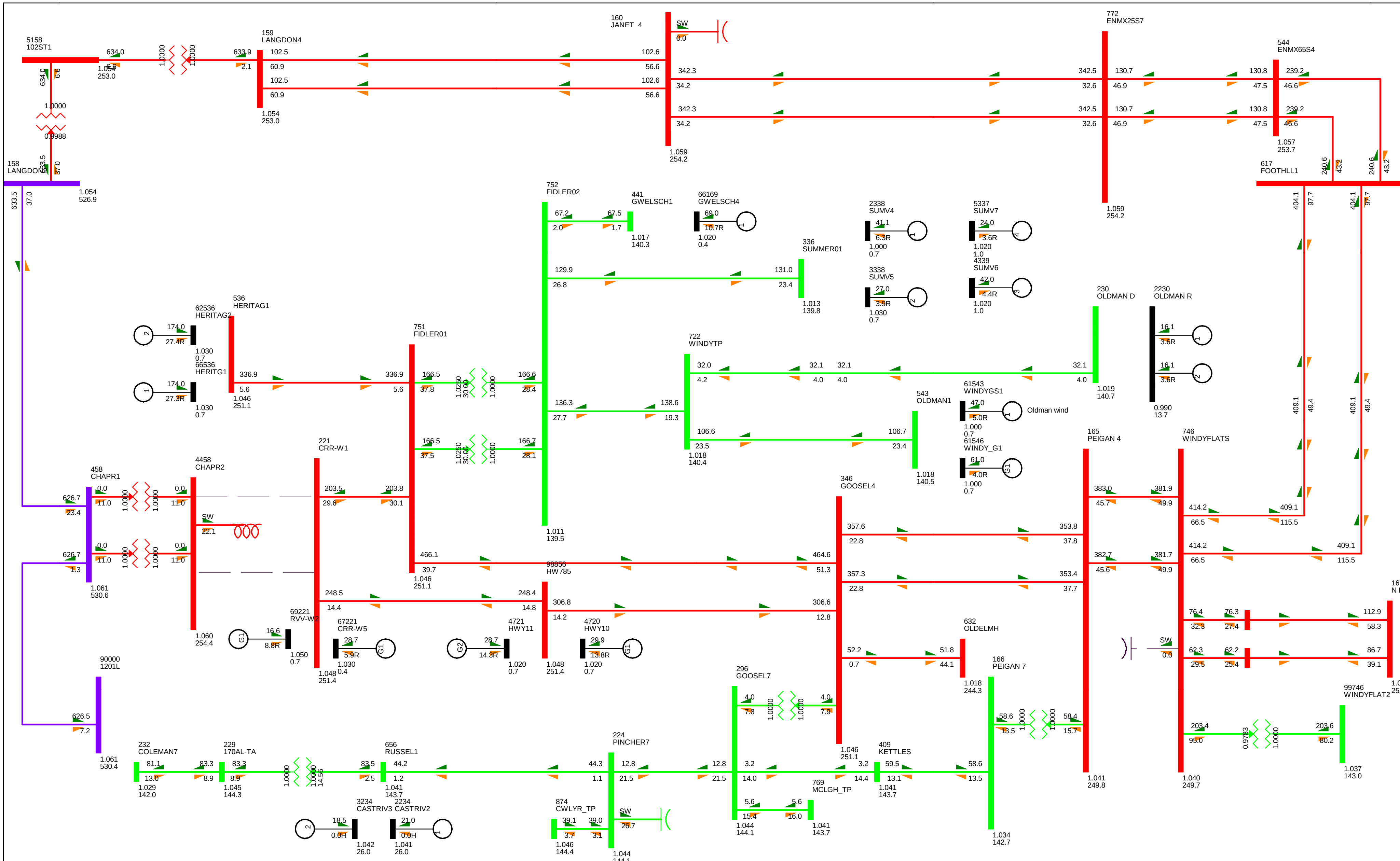


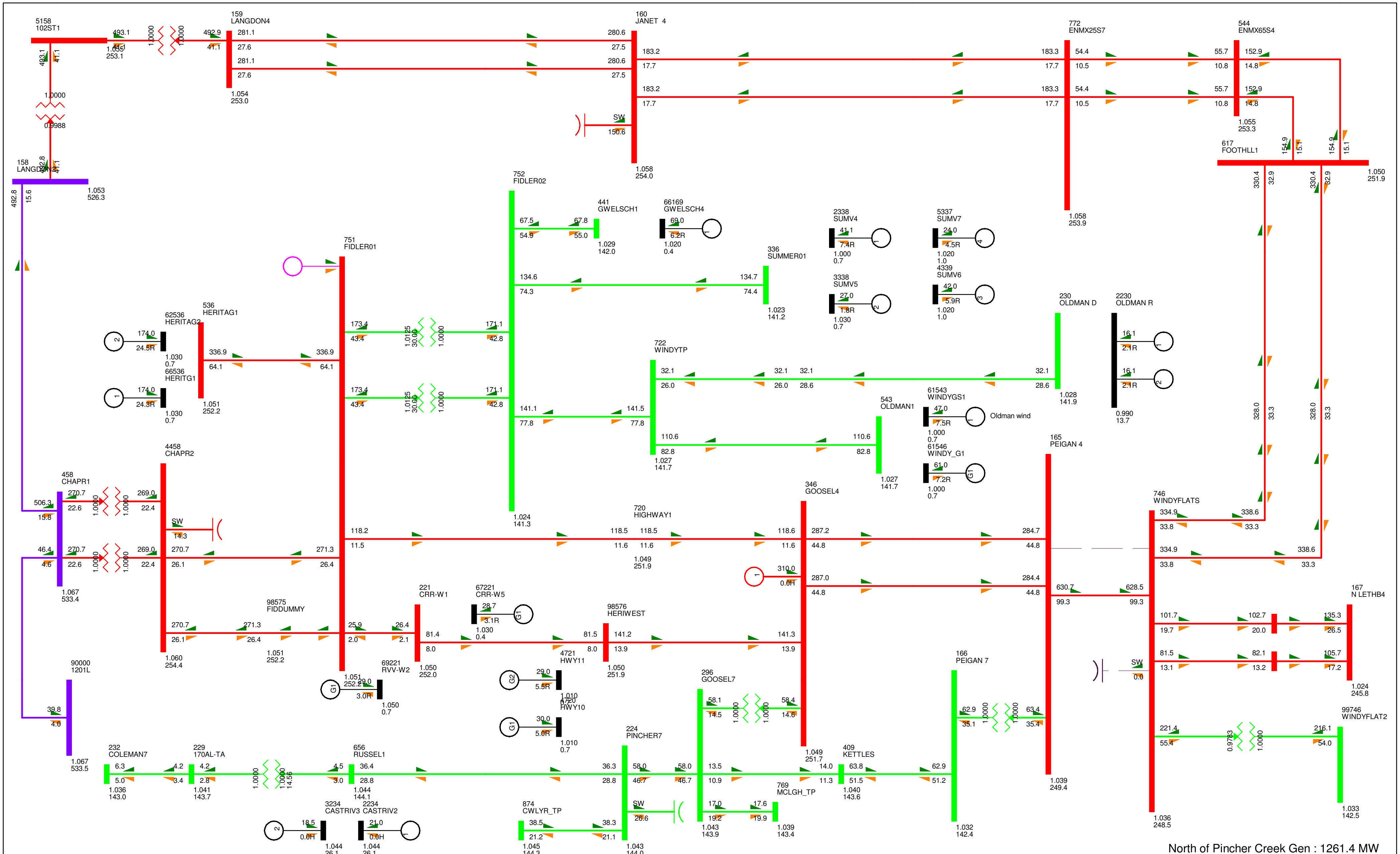
FIGURE C-6-21 - CONTINGENCY CRRTOCHAPEL
2022 SL ALT2
WED, OCT 10 2012 16:26

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 724.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:47:35
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:862--1-0-0-0
FRI, AUG 24 2012 17:09

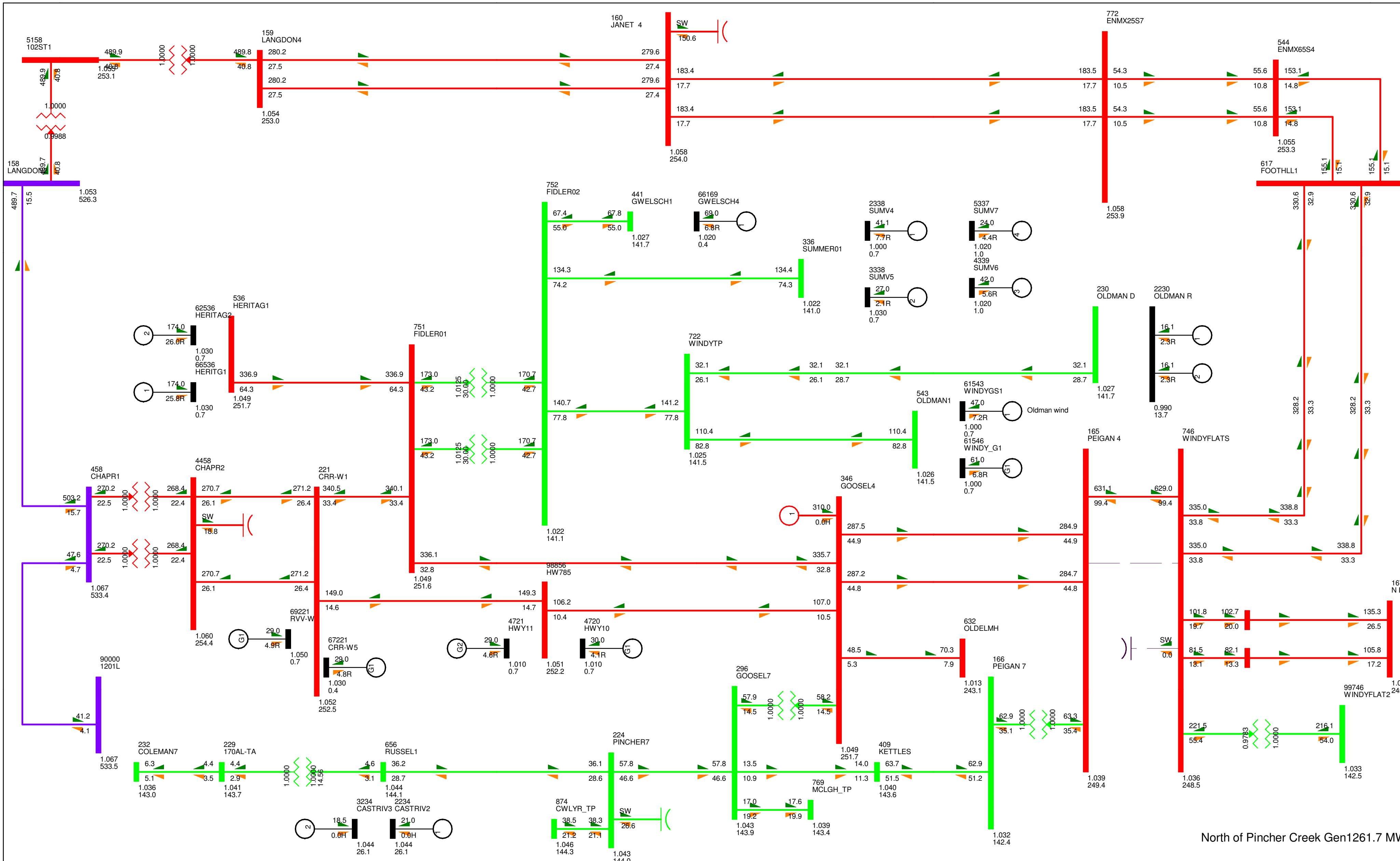
Figure C-7-1

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 6.7 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

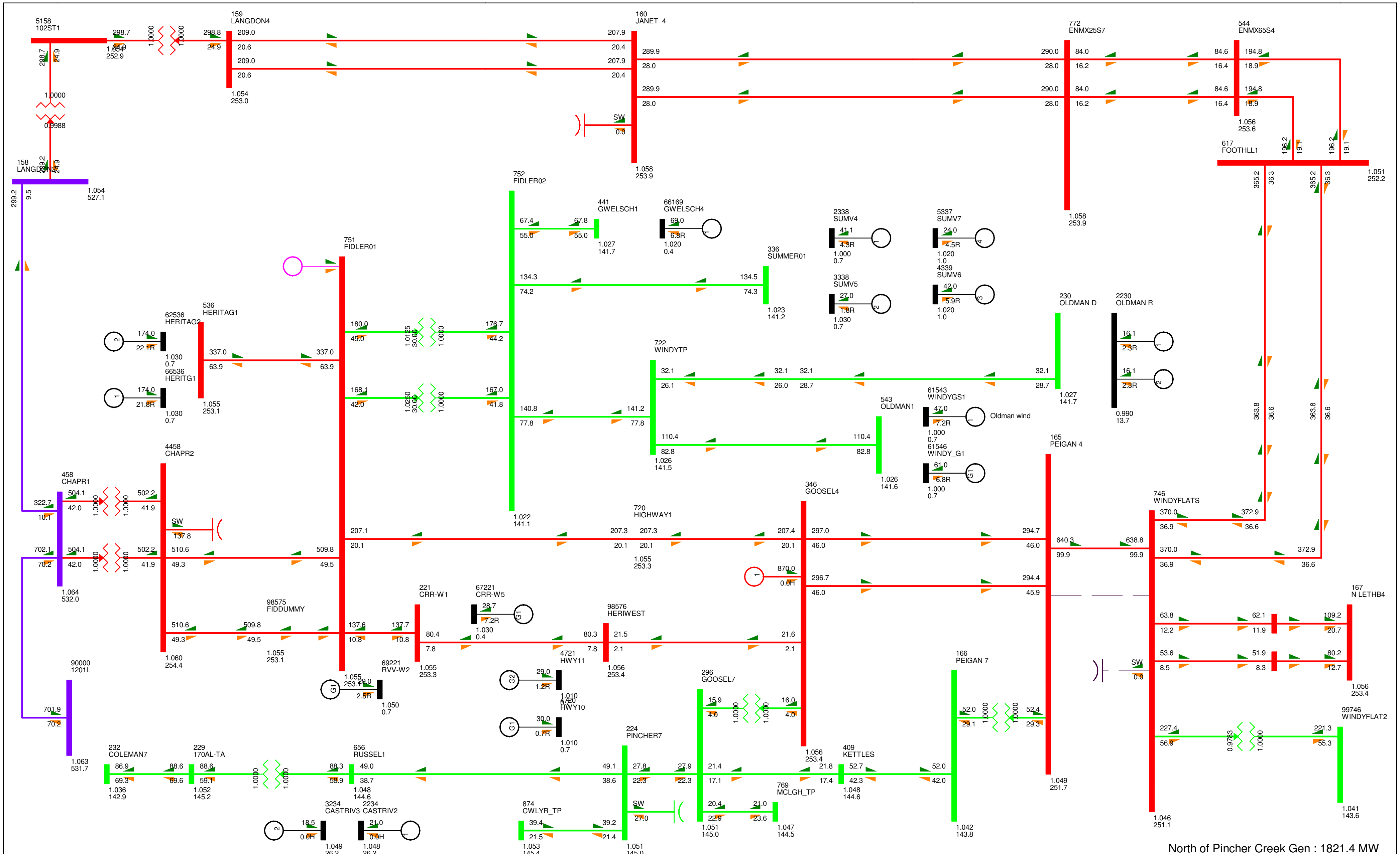


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:47:35
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:862--1-0-0-0
FRI, AUG 24 2012 17:06

Figure C-7-2
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 8.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



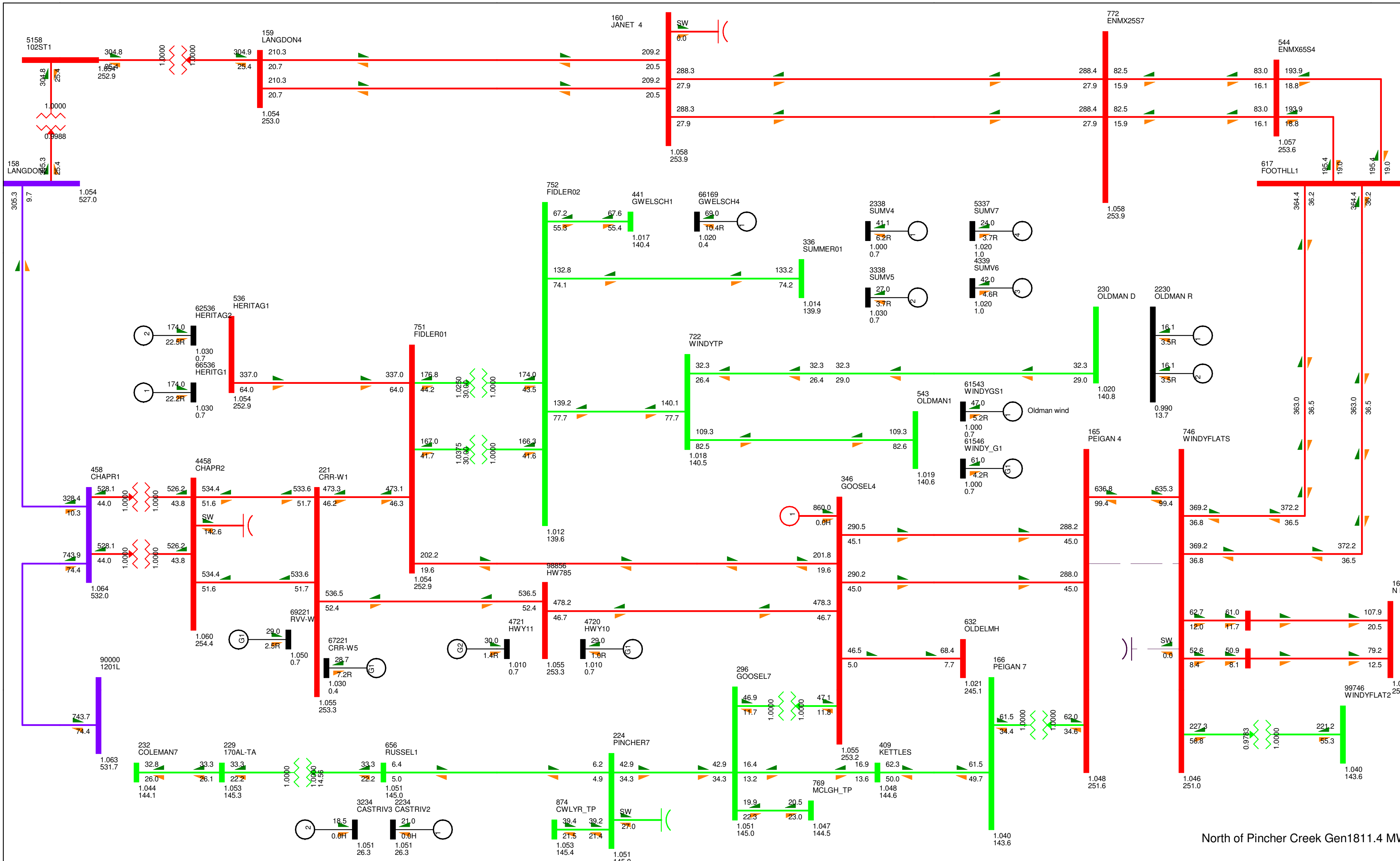
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
FRI, AUG 24 2012 17:12

Figure C-7-3
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 760.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



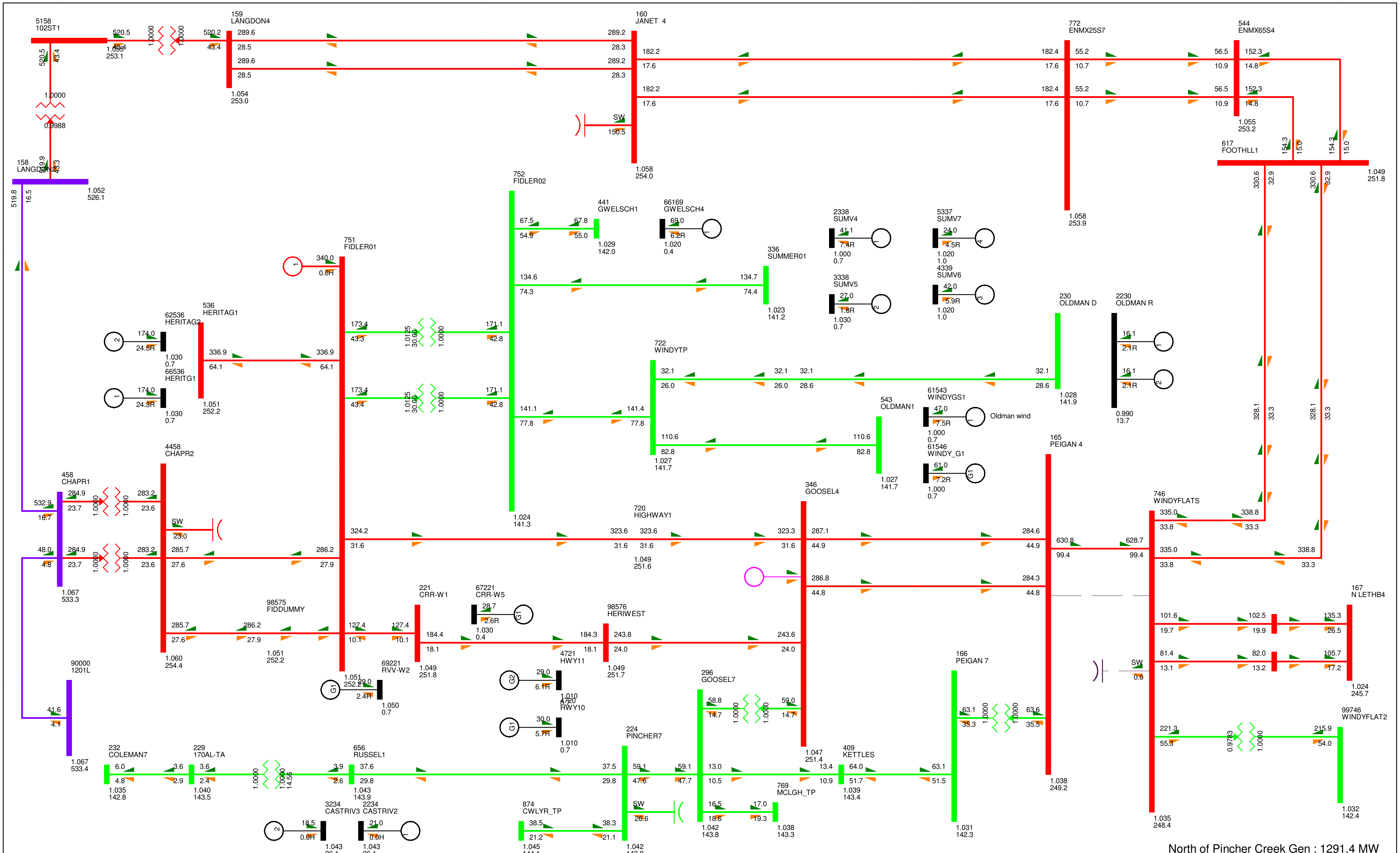
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
FRI, AUG 24 2012 17:14

Figure C-7-4
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 764.5 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



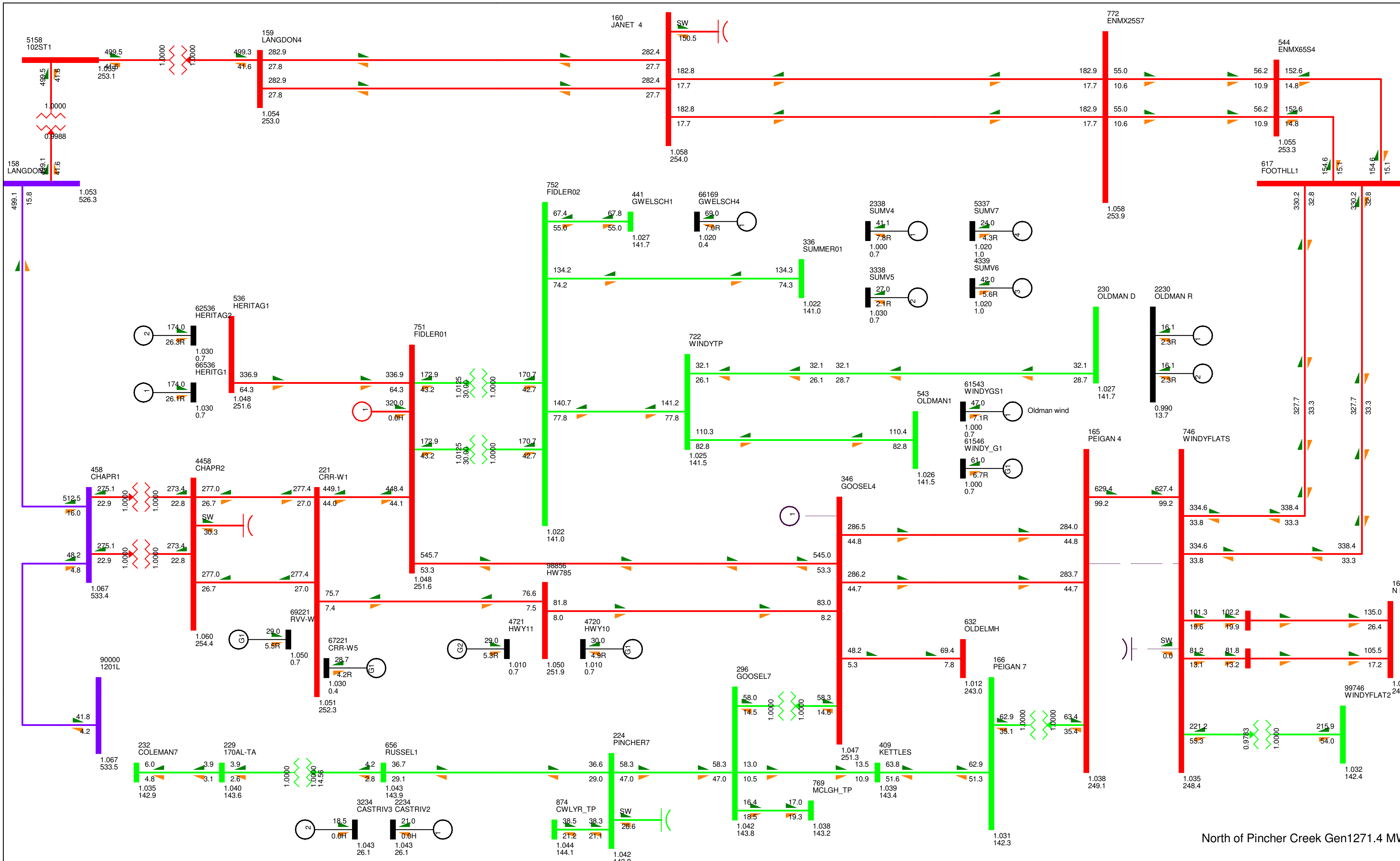
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:47:35
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:862--1-0-0-0
FRI, AUG 24 2012 17:18

Figure C-7-5

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 6.9 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



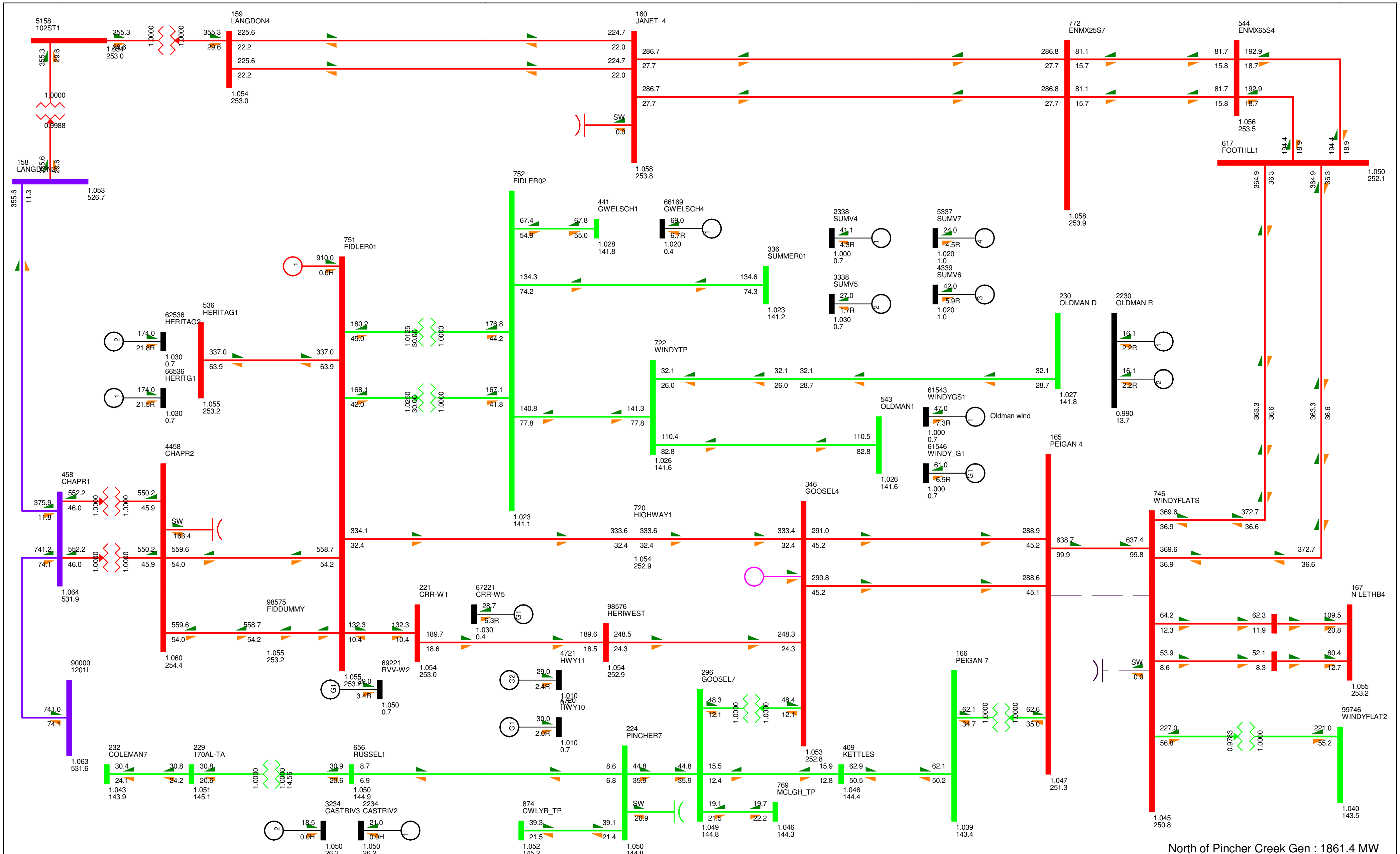
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:47:35
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:862--1-0-0-0
FRI, AUG 24 2012 17:16

Figure C-7-6
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 9.0 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



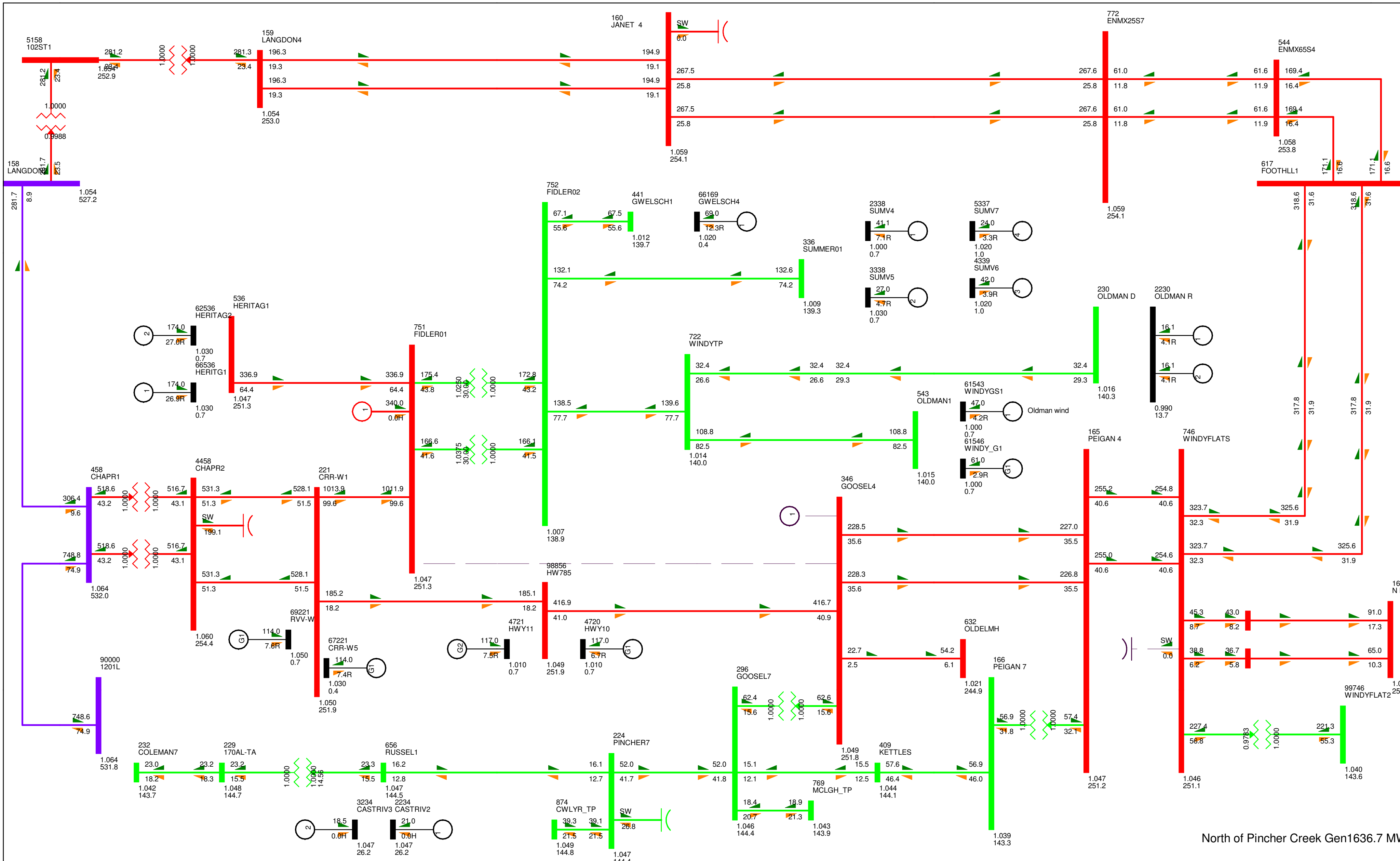
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
FRI, AUG 24 2012 17:20

Figure C-7-7

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar
100.0%RATEA
1.120OV0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 757.6 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

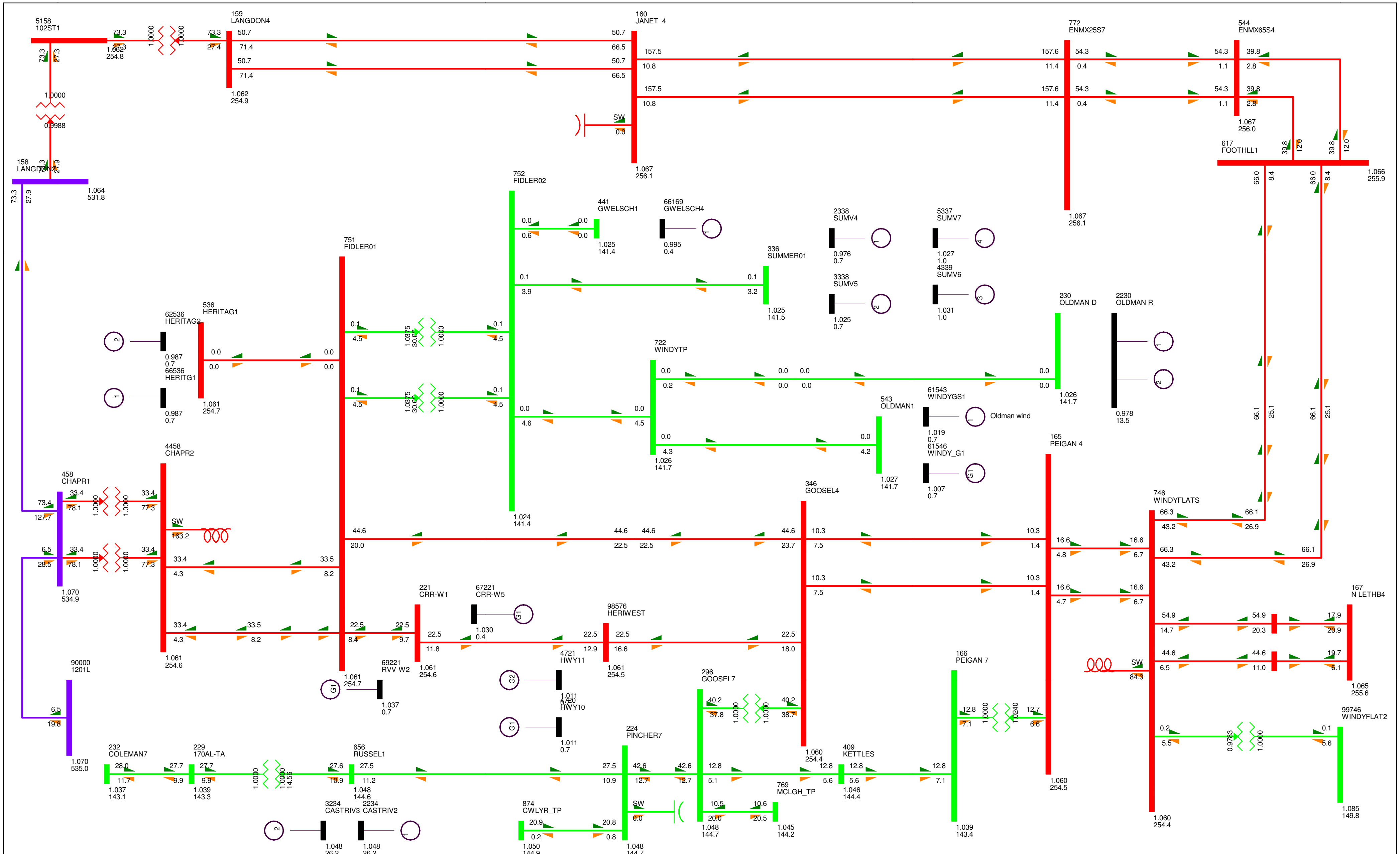


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
FRI, AUG 24 2012 17:23

Figure C-7-8
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MVA/% OF RATE A
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : 764.4 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

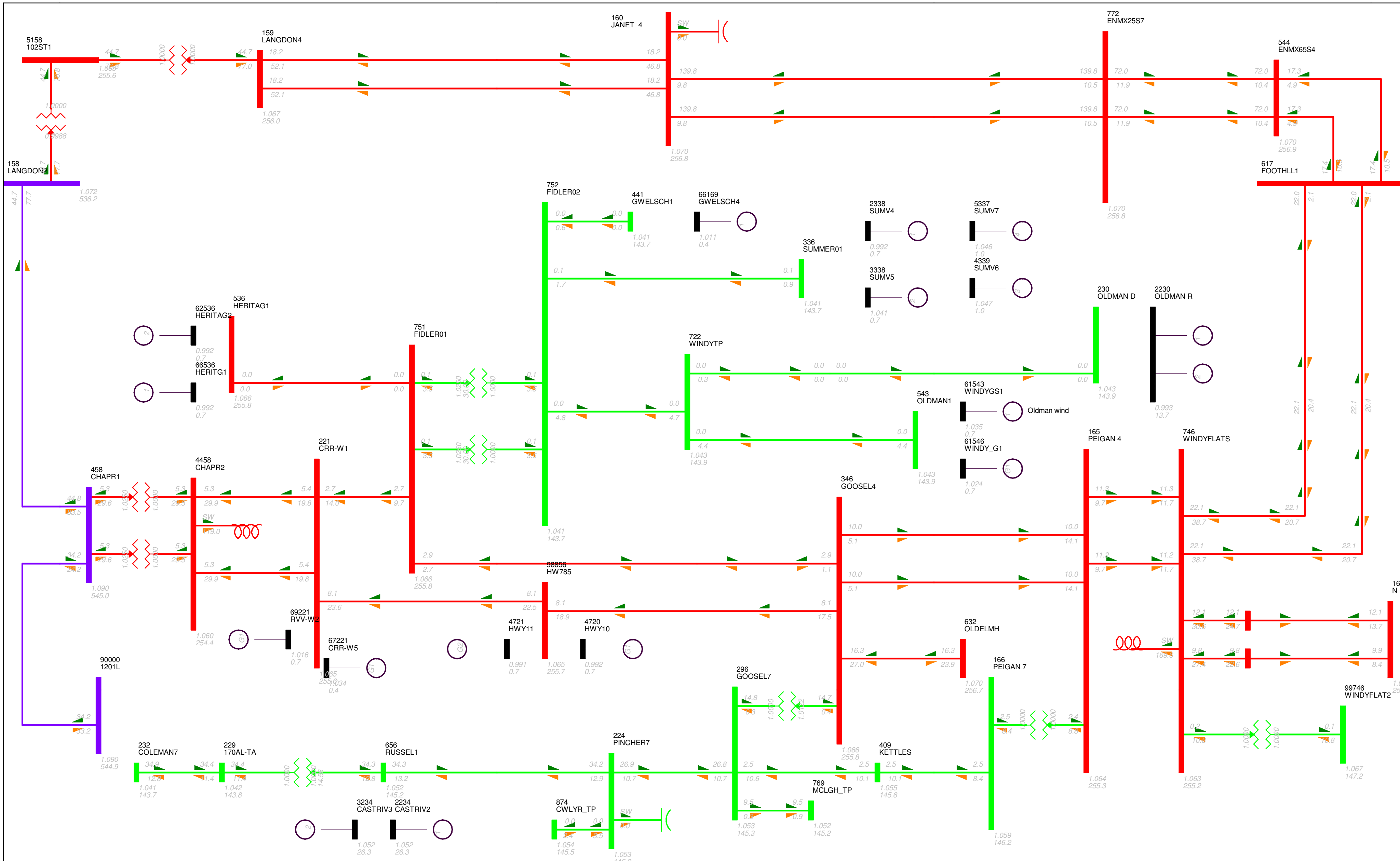


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
MON, OCT 01 2012 17:19

Figure C-8-1
Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -25.8 MW
SA Export : -0.1 MW
MH Export : 0.0 MW



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222--1-0-0-0
MON, OCT 01 2012 17:20

Figure C-8-2

Fidler Connection

Bus - VOLTAGE (kV/PU)
Branch - MW/Mvar
Equipment - MW/Mvar

100.0%RATEA
1.120OV 0.950UV
kV: <=34.500 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

BC Export : -57.2 MW
SA Export : -0.1 MW
MH Export : 0.0 MW

ATTACHMENT B

Dynamic Stability Analysis (2022 SATR Alternative 1)

Category B Fault Analysis Results

Category B fault analysis was performed for the proposed Fidler development. Category B faults are defined as three-phase faults of a transmission line or transformer with normal clearing time (5 cycles at near end and 7 cycles at far end). Table B-1 summarizes the fault descriptions and results for the Category B fault analysis. Specific transient simulation plots for Category B contingencies can be found in Attachment B.

TABLE B-1

STABILITY RESULTS FOR CATEGORY B FAULTS

Case ID	**Alternative**	**Contingency**	**Observations**
E-B01	1	955L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
E-B02	1	1072L 240kV line (Goose Lake 103S to HYW785)	System stable Good voltage recovery
E-B03	1	1048L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
E-B04	1	994L 240kV line (Goose Lake 103S to Fidler 312S)	System stable Good voltage recovery
E-B05	1	1071L 240kV line (CRR 205S to Fidler 312S)	System stable Good voltage recovery
E-B06	1	1037L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
E-B07	1	1004L 240kV line (Fidler 312S to Chapel Rock 491S)	System stable Good voltage recovery
E-B08	1	1201L 500kV line (Chapel Rock 491S to Langdon)	System stable Good voltage recovery

Category C5 Fault Analysis Results

Category C5 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C5 faults are defined as double line-to-ground faults of a double circuited transmission tower with normal clearing time. Table B-2 summarizes the fault descriptions and results for the Category C5 fault analysis. Specific transient simulation plots for Category C5 contingencies can be found in this Attachment.

TABLE B-2

STABILITY RESULTS FOR CATEGORY C5 FAULTS

Case ID	Alternative	Description	Observations
E-C501	1	955L/956L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
E-C502	1	1048L/1049L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
E-C503	1	1072L/1071L 240kV line (CRR 205S to Goose Lake 103S and Fidler 312S)	System stable Good voltage recovery
E-C504	1	994L/1071L 240kV line (Fidler to CRR 205S and Goose Lake 103S)	System stable Good voltage recovery
E-C505	1	1072L /994L 240kV line (Goose Lake 103S to Fidler 312S and CRR 205S)	System stable Good voltage recovery
E-C506	1	1037L/1038L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
E-C507	1	1004L/992L 240kV line (Fidler 312S to Chapel Rock 491S)	System stable Good voltage recovery

Category C7 Fault Analysis

Category C7 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C7 faults are defined as single line-to-ground faults of transmission lines with delayed clearing time (stuck breaker condition). Category C7 fault analysis was performed for Goose Lake 103S, Fidler 312S, Castle Rock Ridge 205S and Chapel Rock 491S. These three substations are 240 kV switching substations with breaker-and-a half configurations. For each substation, the fault location was assumed to be on the 240 kV line. This fault location was then simulated for with a stuck breaker at the near end substation as the worst case condition. For breaker-and-a half substation configurations, middle breaker stuck of each diameter was considered as the worst case scenario because it will cause another line on the same diameter trip with delay clearing time. 13 cycles was used for delay clearing time in this study.

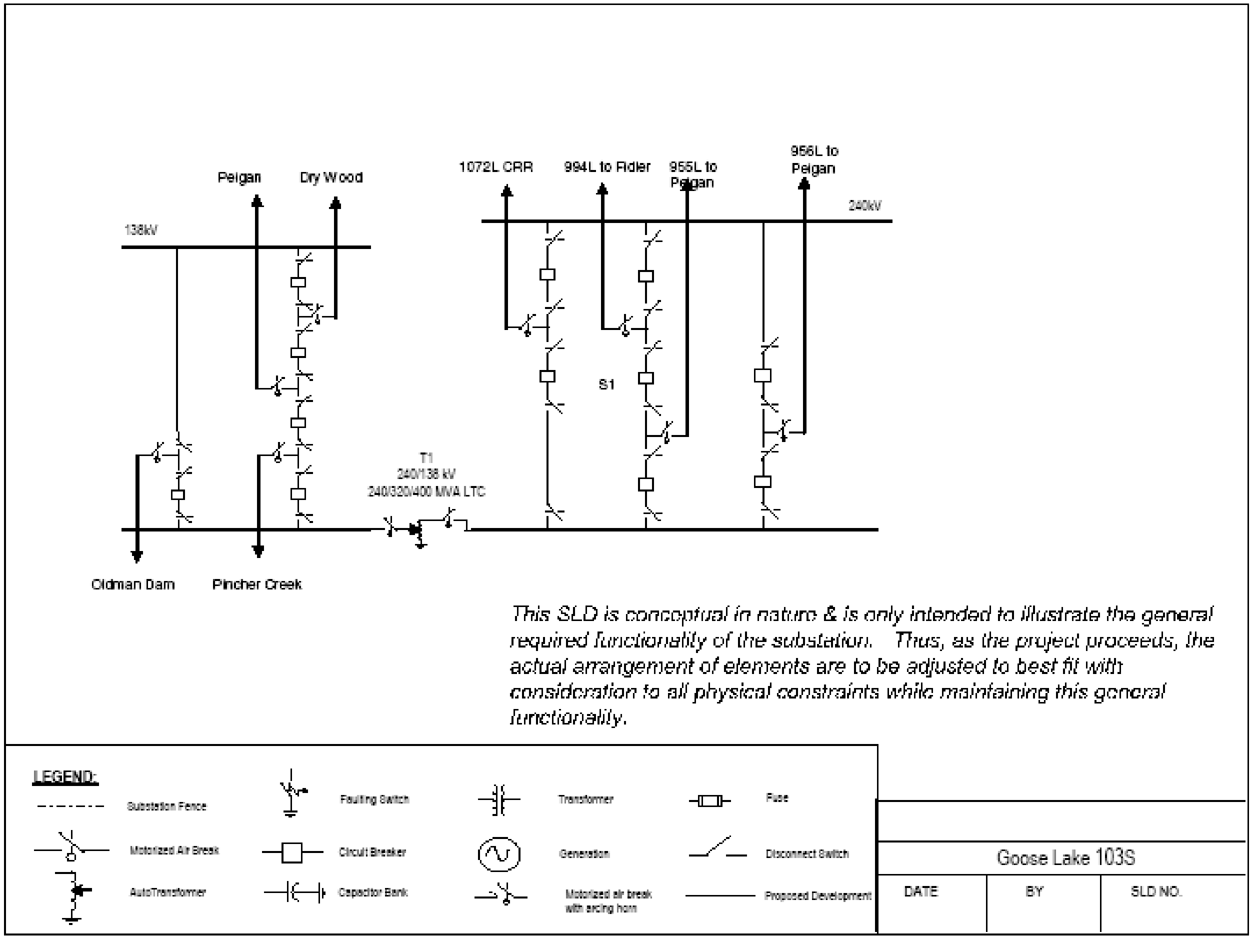
Figure B-1 to B-5 show substation configuration where the Category C7 faults were applied. Each of the stuck breaker conditions considered are labeled with a breaker number in the figure. Table B-3 summarizes the fault descriptions and results for the Category C7 faults. Specific transient simulation plots for Category C7 contingencies can be found in this attachment.

TABLE B-3

STABILITY RESULTS FOR CATEGORY C7 FAULTS

Case ID	Alternative	Description	Stuck Breaker#	Observations
E-C701	1	Single line fault at Goose Lake 240kV 955L to Peigan 7 cycles: trip bkr on 955L at Peigan 13 cycles: trip 994L and 955L Clear fault.	S1	System stable Good voltage recovery
E-C702	1	Single line fault at Fidler on 240kV 994L to Goose Lake 7 cycles: trip bkr on 994L at Goose Lake 13 cycles: trip 994L and 992L to Chapel Rock Clear fault.	S2	System stable Good voltage recovery
E-C703	1	Single line fault at CRR on 240kV 1072L to Goose Lake 7 cycles: trip bkr on 1072 at Goose Lake 13 cycles: trip 1072L and CRR wind farm Clear fault.	S3	System stable Good voltage recovery

Figure B-1



Peigan
Dry Wood
138kV
1072L CRR
994L to Fidler
955L to Peigan
956L to Peigan
240kV
S1
T1
240/138 kV
240/320/400 MVA LTC
Oldman Dam
Pincher Creek
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Fuse
Motorized Air Break
Circuit Breaker
Generation
Disconnect Switch
AutoTransformer
Capacitor Bank
Motorized air break with arcing horn
Proposed Development
Goose Lake 103S
DATE
BY
SLD NO.

Figure B-2

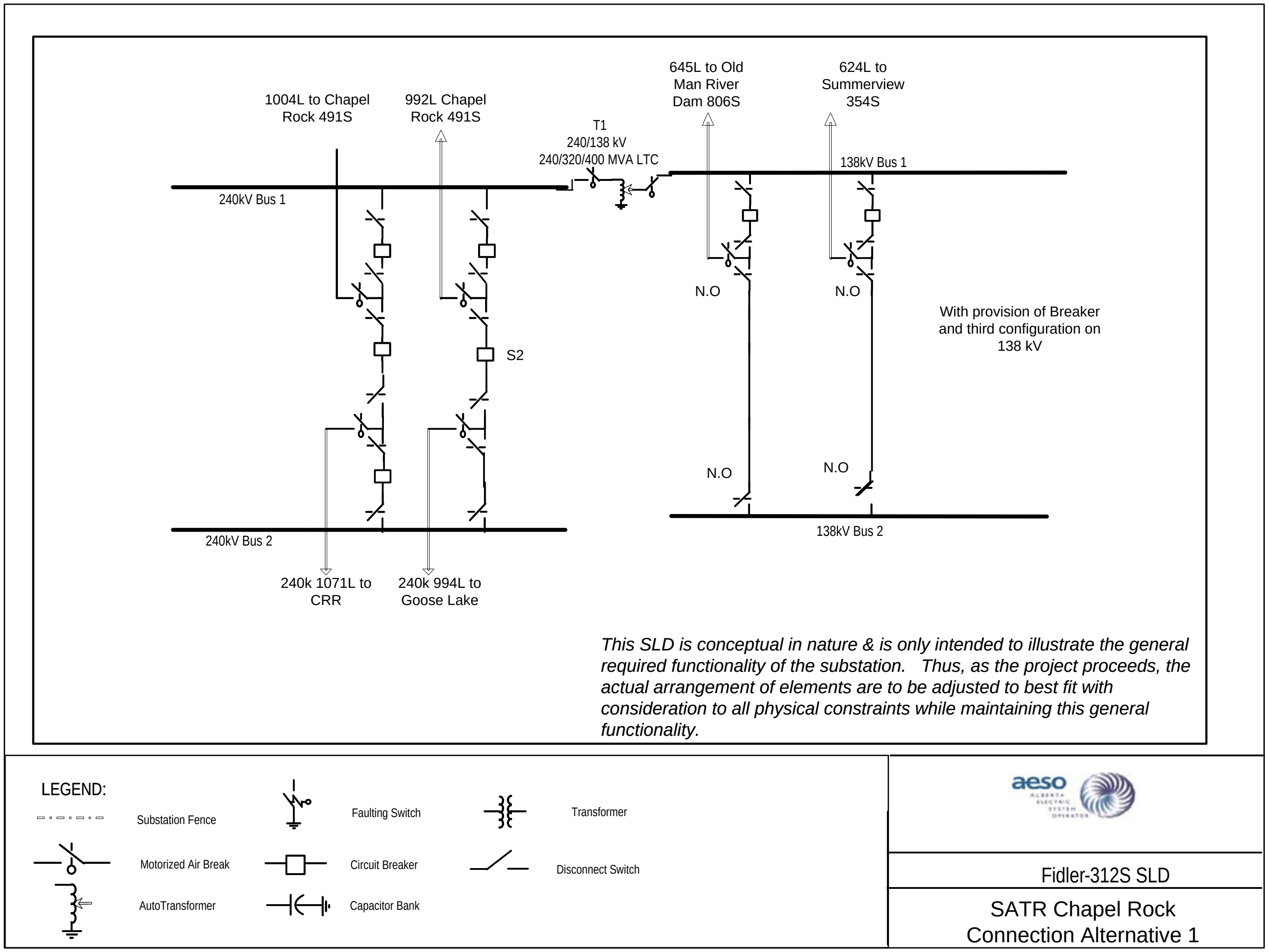
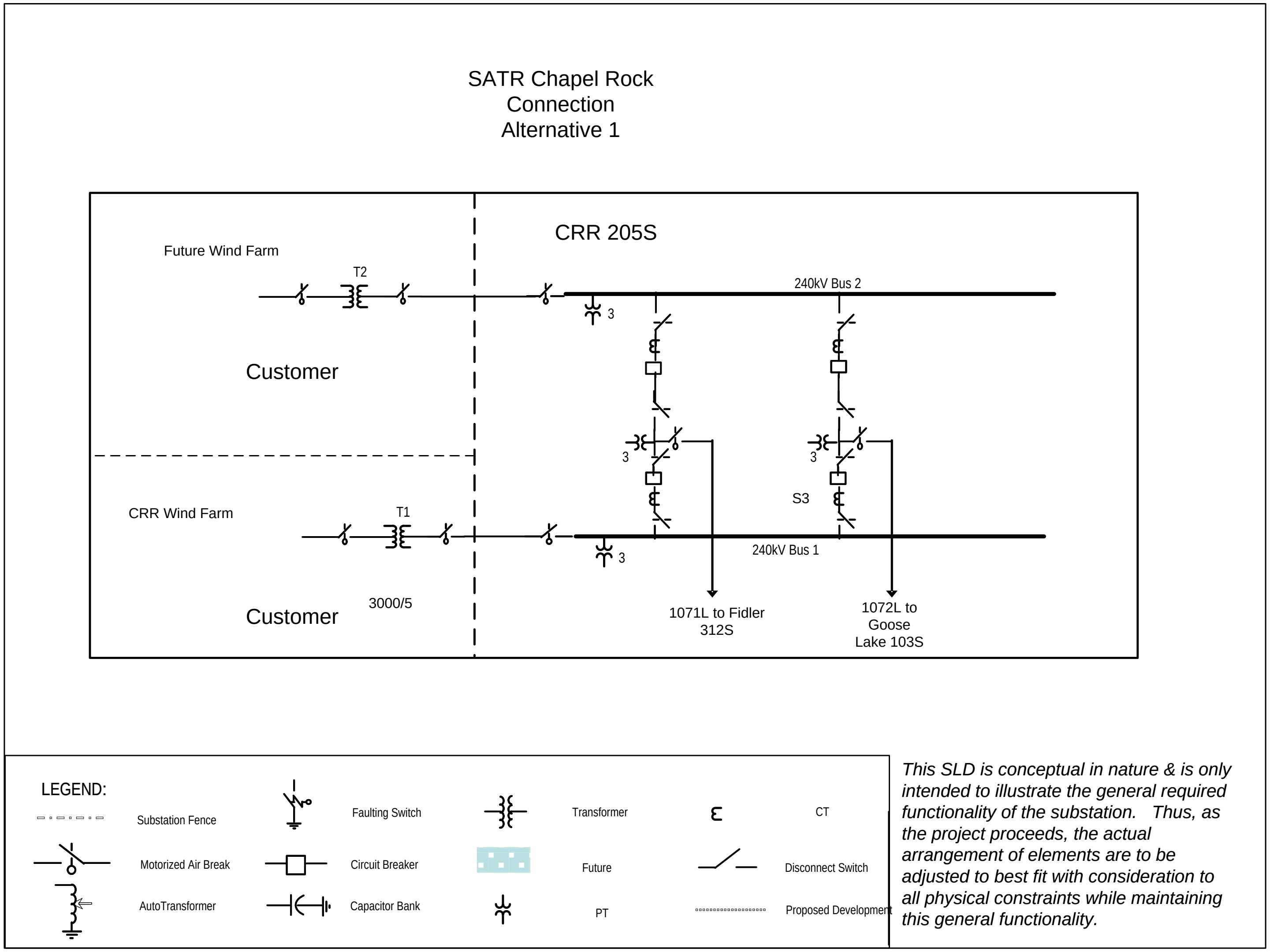

1004L to Chapel Rock 491S
992L Chapel Rock 491S
T1
240/138 kV
240/320/400 MVA LTC
645L to Old Man River Dam 806S
624L to Summerview 354S
138kV Bus 1
240kV Bus 1
N.O
N.O
With provision of Breaker and third configuration on 138 kV
S2
N.O
N.O
240kV Bus 2
138kV Bus 2
240k 1071L to CRR
240k 994L to Goose Lake
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Motorized Air Break
Circuit Breaker
Disconnect Switch
AutoTransformer
Capacitor Bank
aeso
ALBERTA ELECTRIC SYSTEM OPERATOR
Fidler-312S SLD
SATR Chapel Rock
Connection Alternative 1

Figure B-3



SATR Chapel Rock
Connection
Alternative 1
CRR 205S
Future Wind Farm
T2
240kV Bus 2
3
Customer
3
3
S3
CRR Wind Farm
T1
240kV Bus 1
3
3000/5
Customer
1071L to Fidler
312S
1072L to
Goose
Lake 103S
LEGEND:
Substation Fence
Faulting Switch
Transformer
CT
Motorized Air Break
Circuit Breaker
Future
Disconnect Switch
AutoTransformer
Capacitor Bank
PT
Proposed Development
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.

Category B Fault Analysis Results

Category B fault analysis was performed for the proposed Fidler development. Category B faults are defined as three-phase faults of a transmission line or transformer with normal clearing time (5 cycles at near end and 7 cycles at far end). Table B-1 summarizes the fault descriptions and results for the Category B fault analysis. Specific transient simulation plots for Category B contingencies can be found in Attachment B.

TABLE B-1

STABILITY RESULTS FOR CATEGORY B FAULTS

Case ID	**Alternative**	**Contingency**	**Observations**
E-B01	1	955L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
E-B02	1	1072L 240kV line (Goose Lake 103S to HYW785)	System stable Good voltage recovery
E-B03	1	1048L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
E-B04	1	994L 240kV line (Goose Lake 103S to Fidler 312S)	System stable Good voltage recovery
E-B05	1	1071L 240kV line (CRR 205S to Fidler 312S)	System stable Good voltage recovery
E-B06	1	1037L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
E-B07	1	1004L 240kV line (Fidler 312S to Chapel Rock 491S)	System stable Good voltage recovery
E-B08	1	1201L 500kV line (Chapel Rock 491S to Langdon)	System stable Good voltage recovery

Category C5 Fault Analysis Results

Category C5 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C5 faults are defined as double line-to-ground faults of a double circuited transmission tower with normal clearing time. Table B-2 summarizes the fault descriptions and results for the Category C5 fault analysis. Specific transient simulation plots for Category C5 contingencies can be found in this Attachment.

TABLE B-2

STABILITY RESULTS FOR CATEGORY C5 FAULTS

Case ID	Alternative	Description	Observations
E-C501	1	955L/956L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
E-C502	1	1048L/1049L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
E-C503	1	1072L/1071L 240kV line (CRR 205S to Goose Lake 103S and Fidler 312S)	System stable Good voltage recovery
E-C504	1	994L/1071L 240kV line (Fidler to CRR 205S and Goose Lake 103S)	System stable Good voltage recovery
E-C505	1	1072L /994L 240kV line (Goose Lake 103S to Fidler 312S and CRR 205S)	System stable Good voltage recovery
E-C506	1	1037L/1038L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
E-C507	1	1004L/992L 240kV line (Fidler 312S to Chapel Rock 491S)	System stable Good voltage recovery

Category C7 Fault Analysis

Category C7 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C7 faults are defined as single line-to-ground faults of transmission lines with delayed clearing time (stuck breaker condition). Category C7 fault analysis was performed for Goose Lake 103S, Fidler 312S, Castle Rock Ridge 205S and Chapel Rock 491S. These three substations are 240 kV switching substations with breaker-and-a half configurations. For each substation, the fault location was assumed to be on the 240 kV line. This fault location was then simulated for with a stuck breaker at the near end substation as the worst case condition. For breaker-and-a half substation configurations, middle breaker stuck of each diameter was considered as the worst case scenario because it will cause another line on the same diameter trip with delay clearing time. 13 cycles was used for delay clearing time in this study.

Figure B-1 to B-5 show substation configuration where the Category C7 faults were applied. Each of the stuck breaker conditions considered are labeled with a breaker number in the figure. Table B-3 summarizes the fault descriptions and results for the Category C7 faults. Specific transient simulation plots for Category C7 contingencies can be found in this attachment.

TABLE B-3

STABILITY RESULTS FOR CATEGORY C7 FAULTS

Case ID	Alternative	Description	Stuck Breaker#	Observations
E-C701	1	Single line fault at Goose Lake 240kV 955L to Peigan 7 cycles: trip bkr on 955L at Peigan 13 cycles: trip 994L and 955L Clear fault.	S1	System stable Good voltage recovery
E-C702	1	Single line fault at Fidler on 240kV 994L to Goose Lake 7 cycles: trip bkr on 994L at Goose Lake 13 cycles: trip 994L and 992L to Chapel Rock Clear fault.	S2	System stable Good voltage recovery
E-C703	1	Single line fault at CRR on 240kV 1072L to Goose Lake 7 cycles: trip bkr on 1072 at Goose Lake 13 cycles: trip 1072L and CRR wind farm Clear fault.	S3	System stable Good voltage recovery

Figure B-1

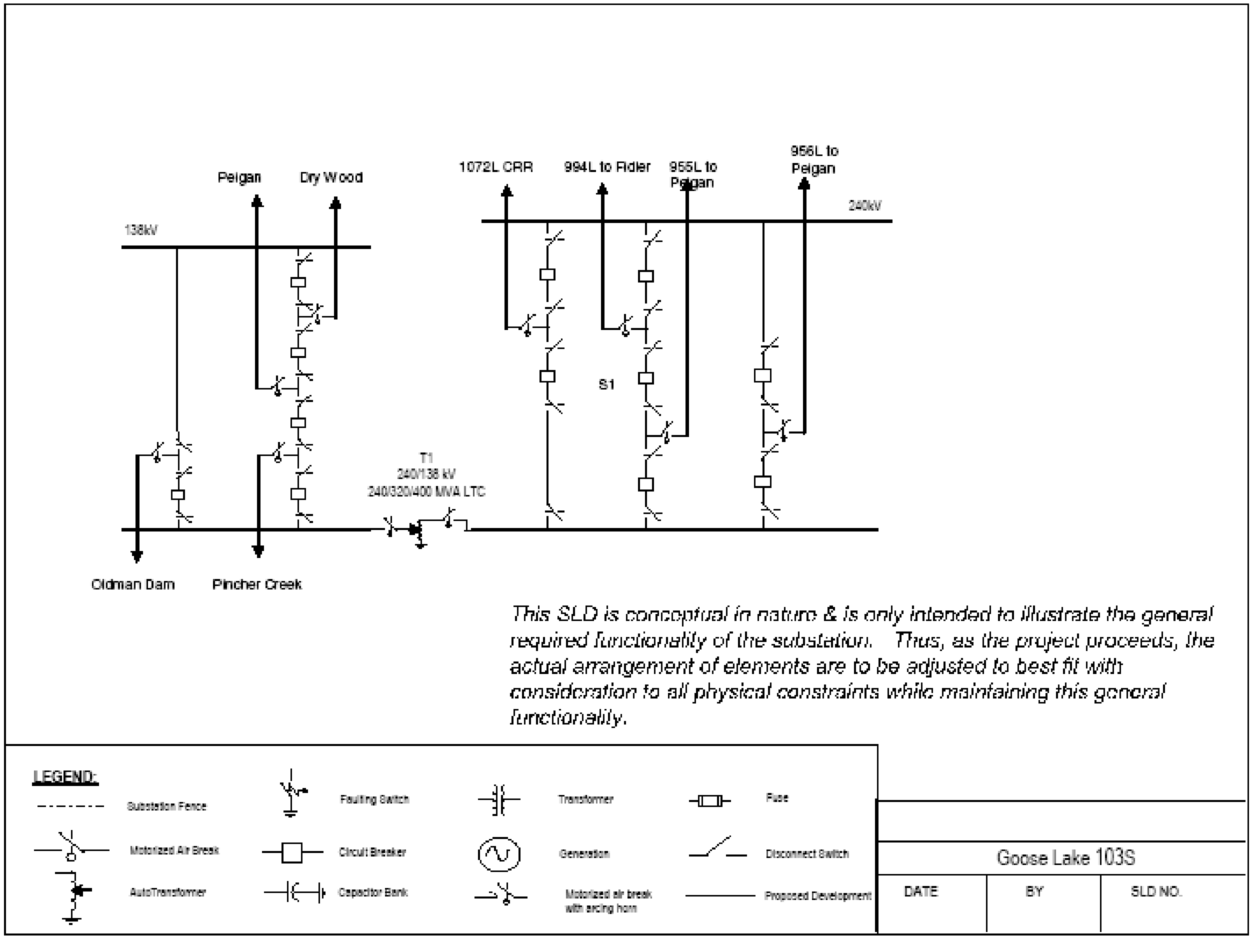

Peigan
Dry Wood
1072L CRR
994L to Fidler
955L to Peigan
956L to Peigan
240kV
138kV
S1
T1
240/138 kV
240/320/400 MVA LTC
Oldman Dam
Pincher Creek
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Fuse
Motorized Air Break
Circuit Breaker
Generation
Disconnect Switch
AutoTransformer
Capacitor Bank
Motorized air break with arcing horn
Proposed Development
Goose Lake 103S
DATE
BY
SLD NO.

Figure B-2

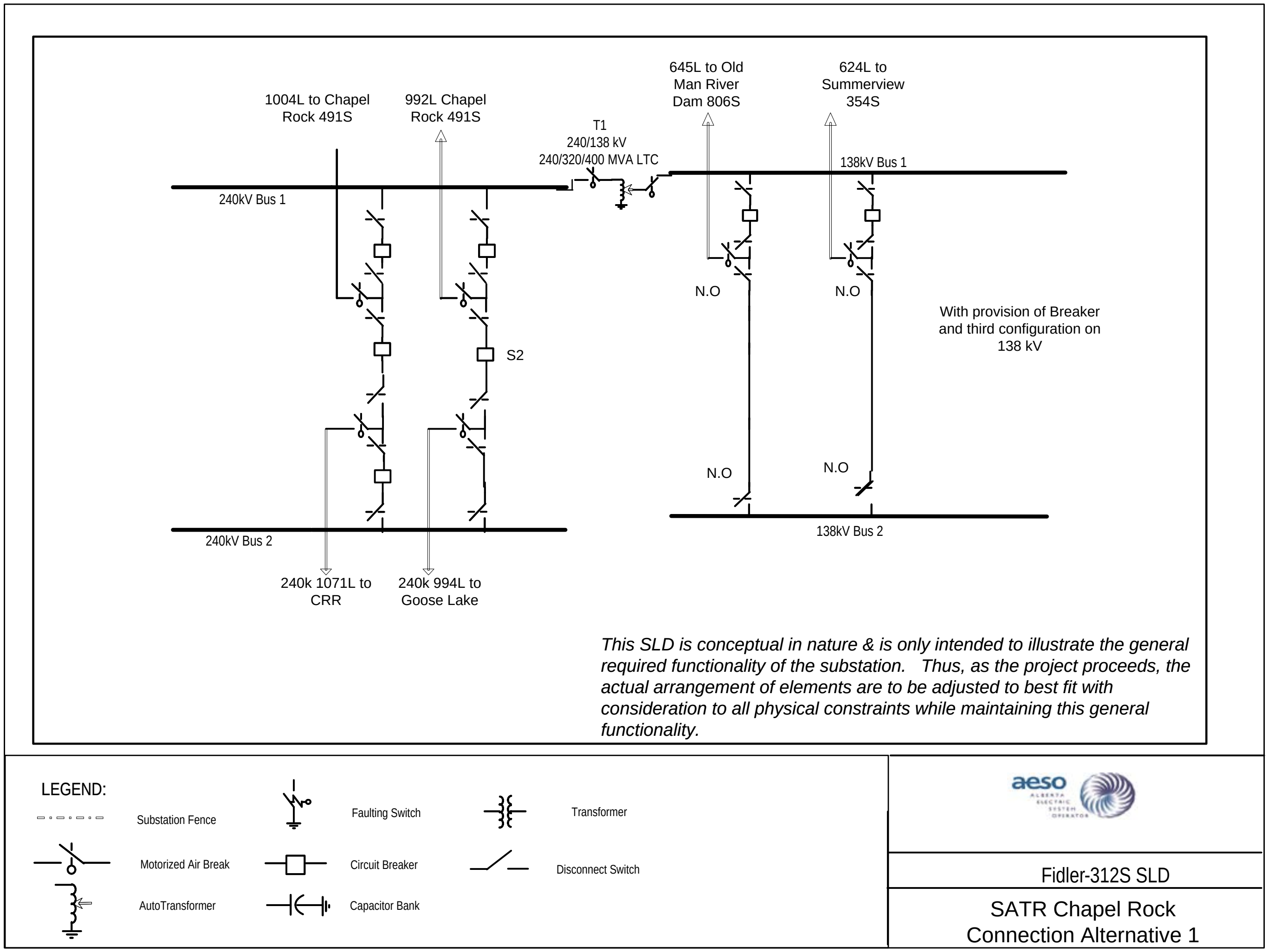
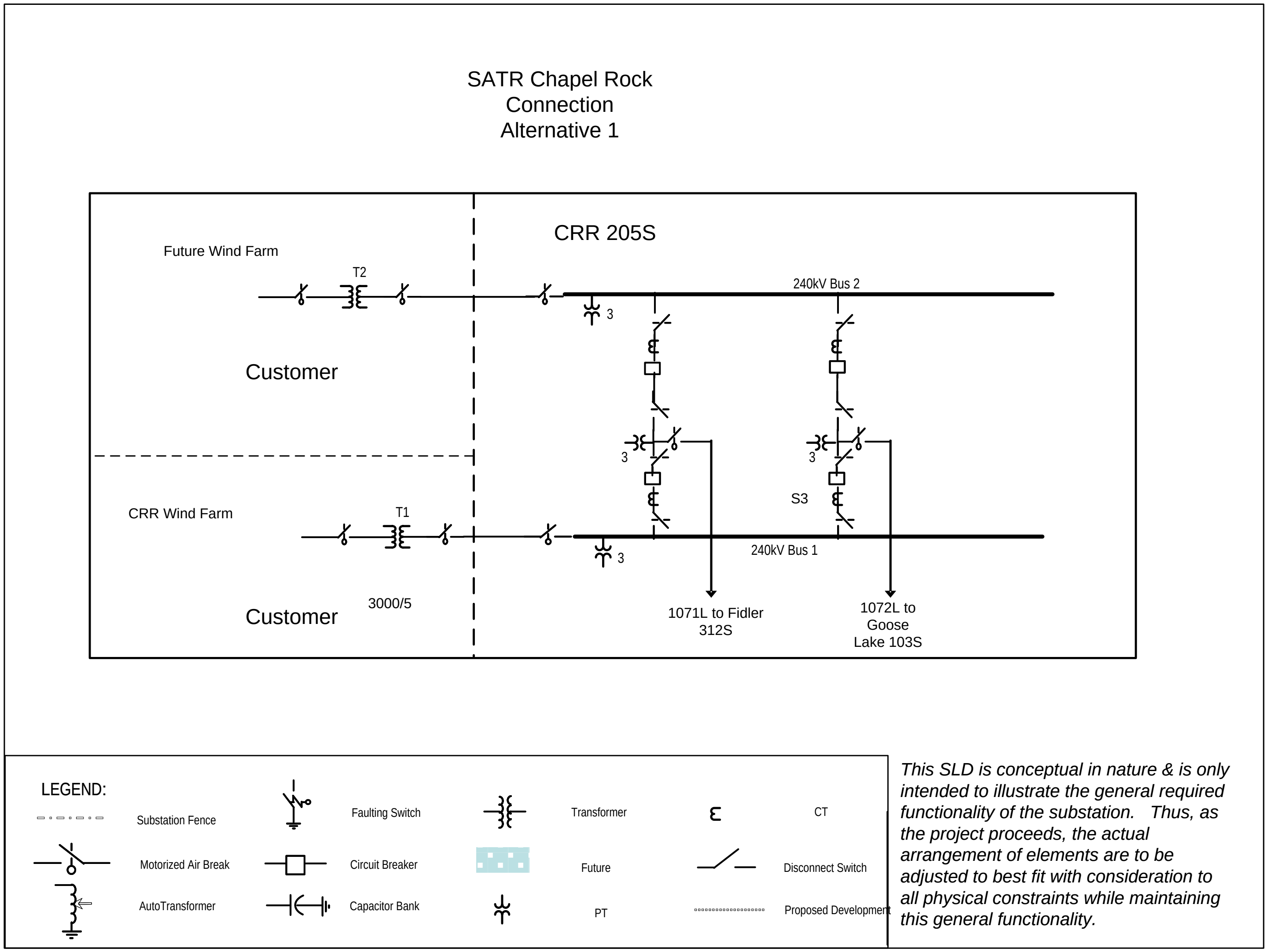
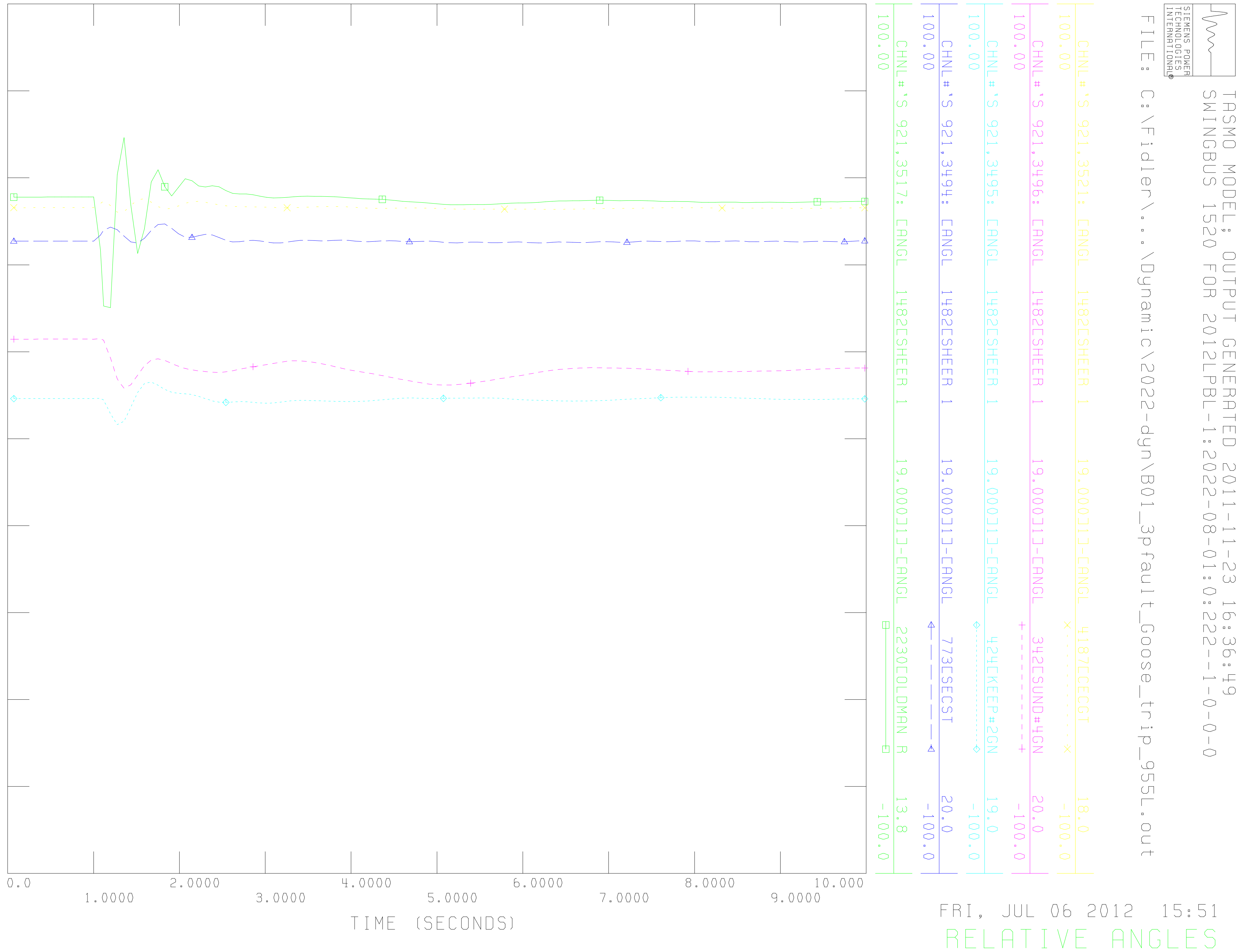

1004L to Chapel Rock 491S
992L Chapel Rock 491S
T1
240/138 kV
240/320/400 MVA LTC
645L to Old Man River Dam 806S
624L to Summerview 354S
138kV Bus 1
240kV Bus 1
N.O
N.O
With provision of Breaker and third configuration on 138 kV
S2
N.O
N.O
240kV Bus 2
138kV Bus 2
240k 1071L to CRR
240k 994L to Goose Lake
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Motorized Air Break
Circuit Breaker
Disconnect Switch
AutoTransformer
Capacitor Bank
aeso
ALBERTA ELECTRIC SYSTEM OPERATOR
Fidler-312S SLD
SATR Chapel Rock
Connection Alternative 1

Figure B-3


SATR Chapel Rock
Connection
Alternative 1
CRR 205S
Future Wind Farm
T2
240kV Bus 2
3
Customer
3
3
S3
CRR Wind Farm
T1
240kV Bus 1
3
3000/5
Customer
1071L to Fidler 312S
1072L to Goose Lake 103S
LEGEND:
Substation Fence
Faulting Switch
Transformer
CT
Motorized Air Break
Circuit Breaker
Future
Disconnect Switch
AutoTransformer
Capacitor Bank
PT
Proposed Development
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.



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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000J1J-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000J1J-CANGL 773CSECST 20.0
100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000J1J-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0
1.0000
2.0000
3.0000
4.0000
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7.0000
8.0000
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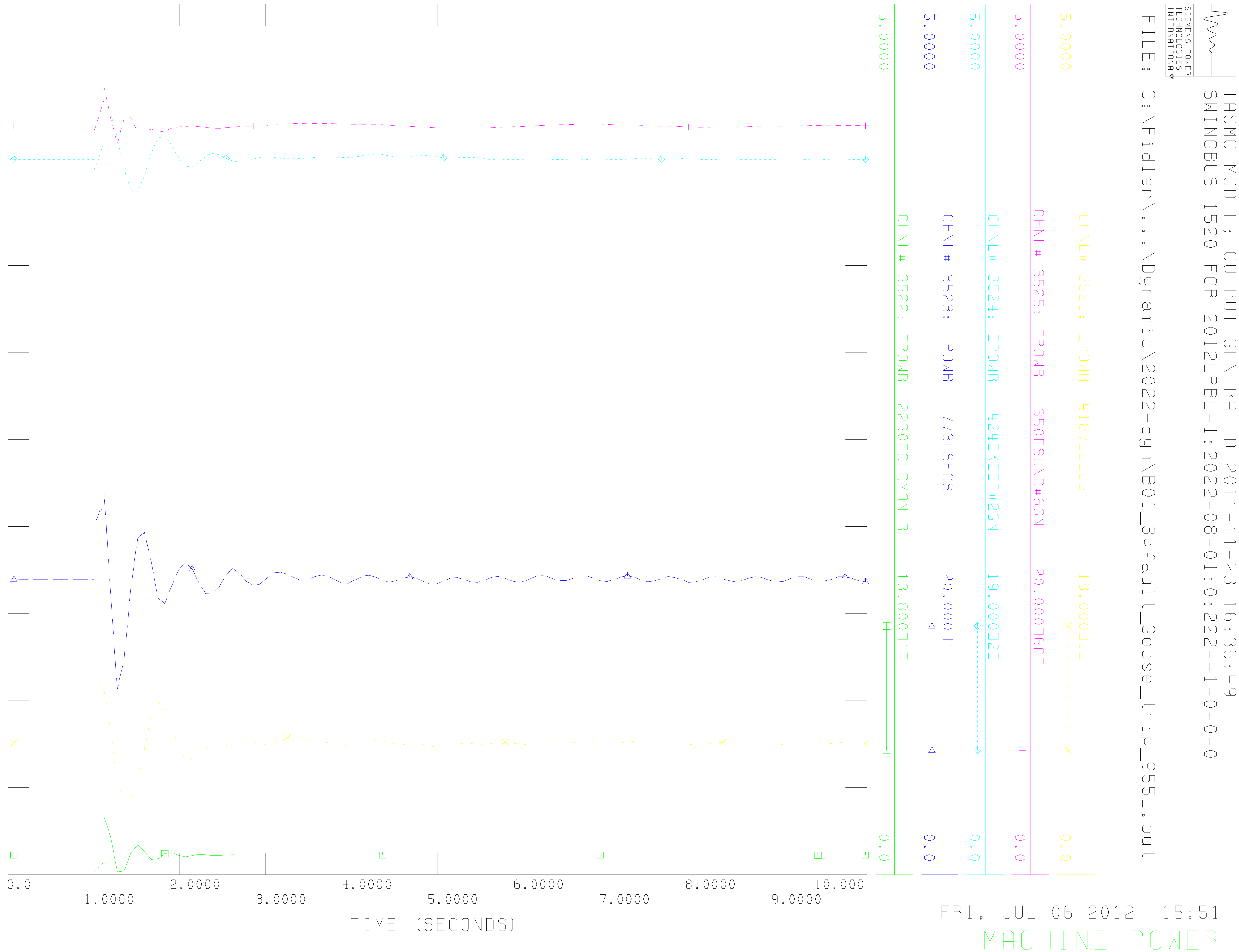
TIME (SECONDS)
FRI, JUL 06 2012 15:51
RELATIVE ANGLES


SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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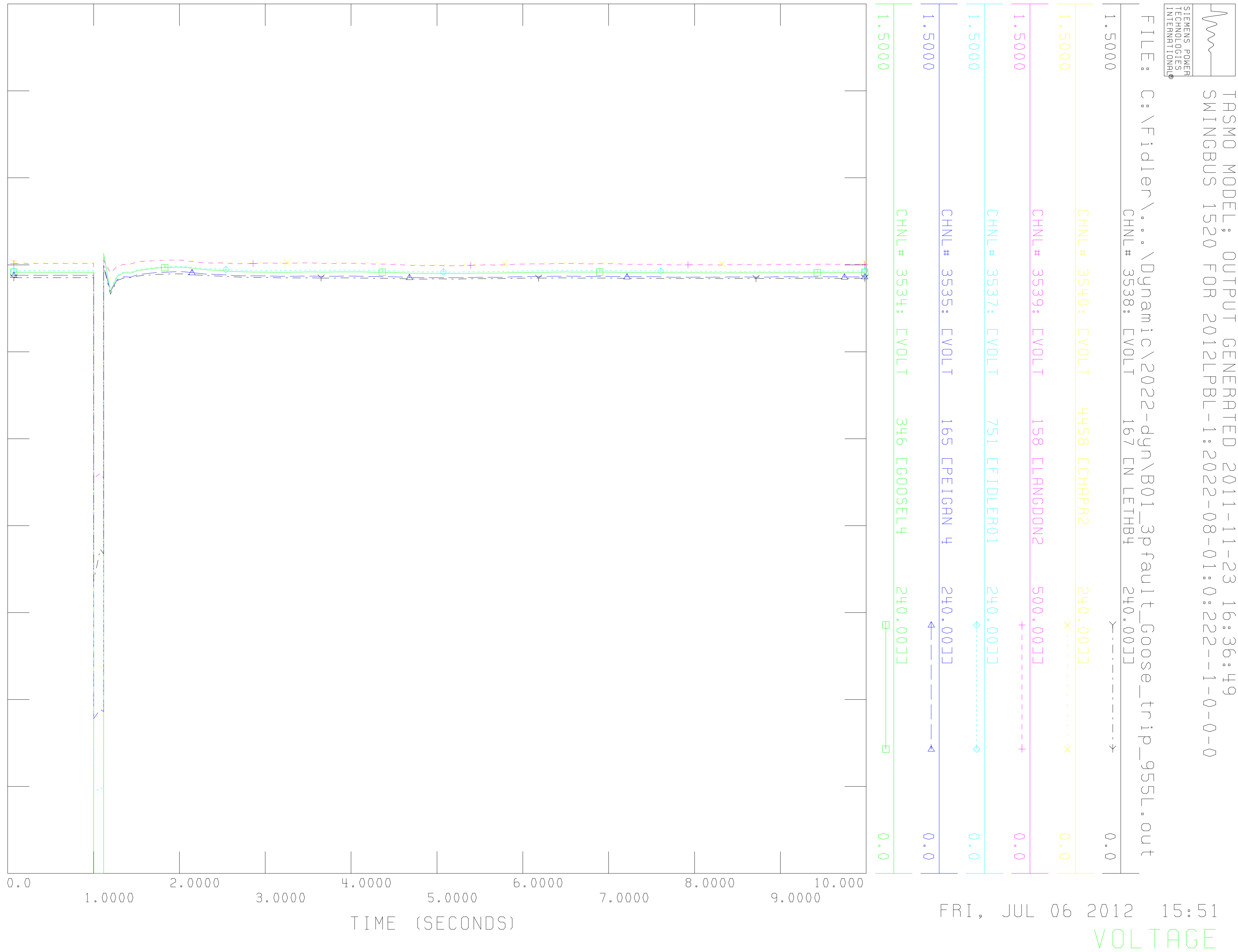
5.0000
0.0
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
5.0000
0.0
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
5.0000
0.0
CHNL# 3523: [POWR 773[SECST 20.000]1]
5.0000
0.0
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
6.0000
7.0000
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B01_3pfault_Goose_trip_955L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
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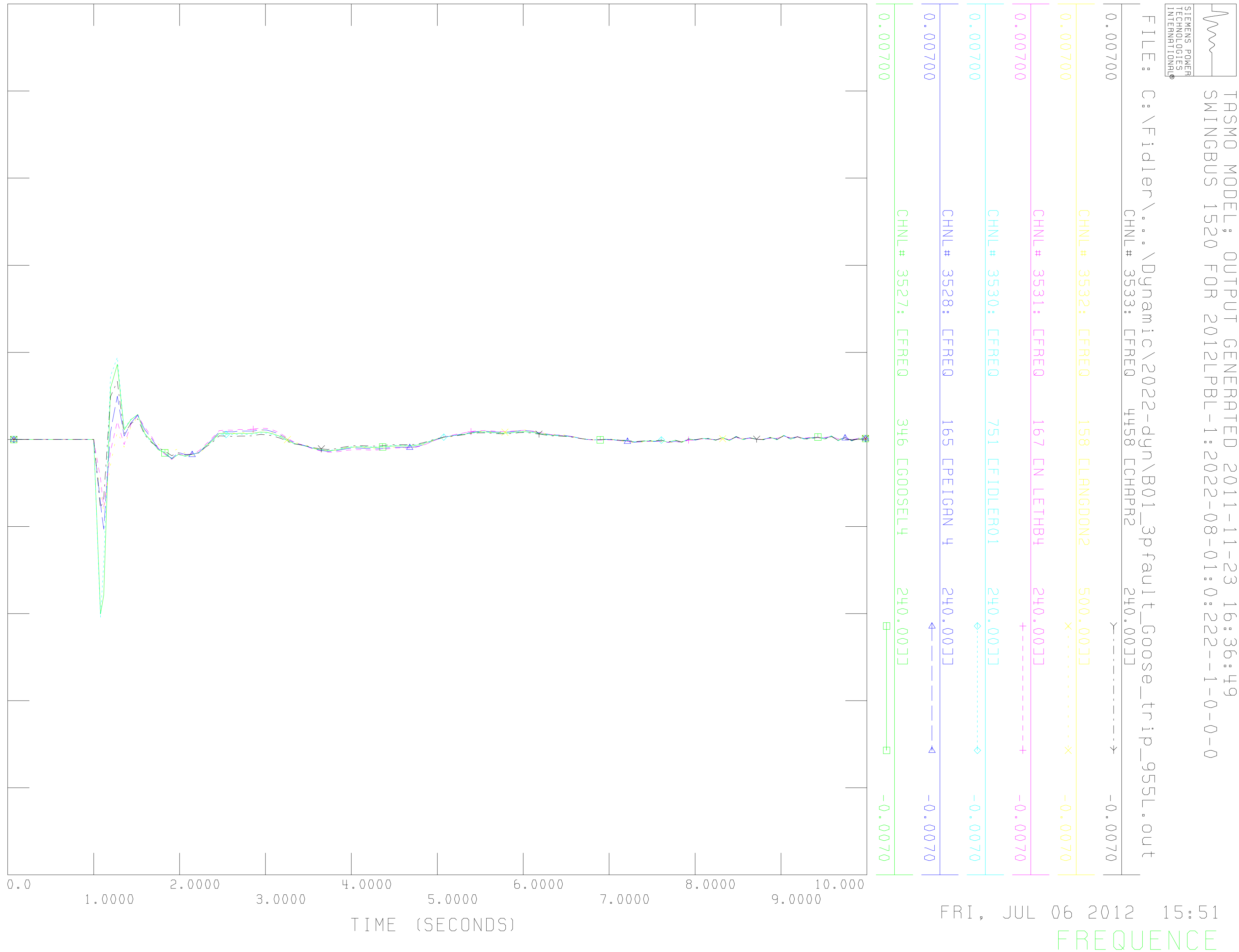
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B01_3pfault_Goose_trip_955L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]]
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CHNL# 3532: [FREQ 158 [LANGDON2 500.00]]
0.00700 -0.0070
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]]
0.00700 -0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]]
0.00700 -0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]]
0.00700 -0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]]
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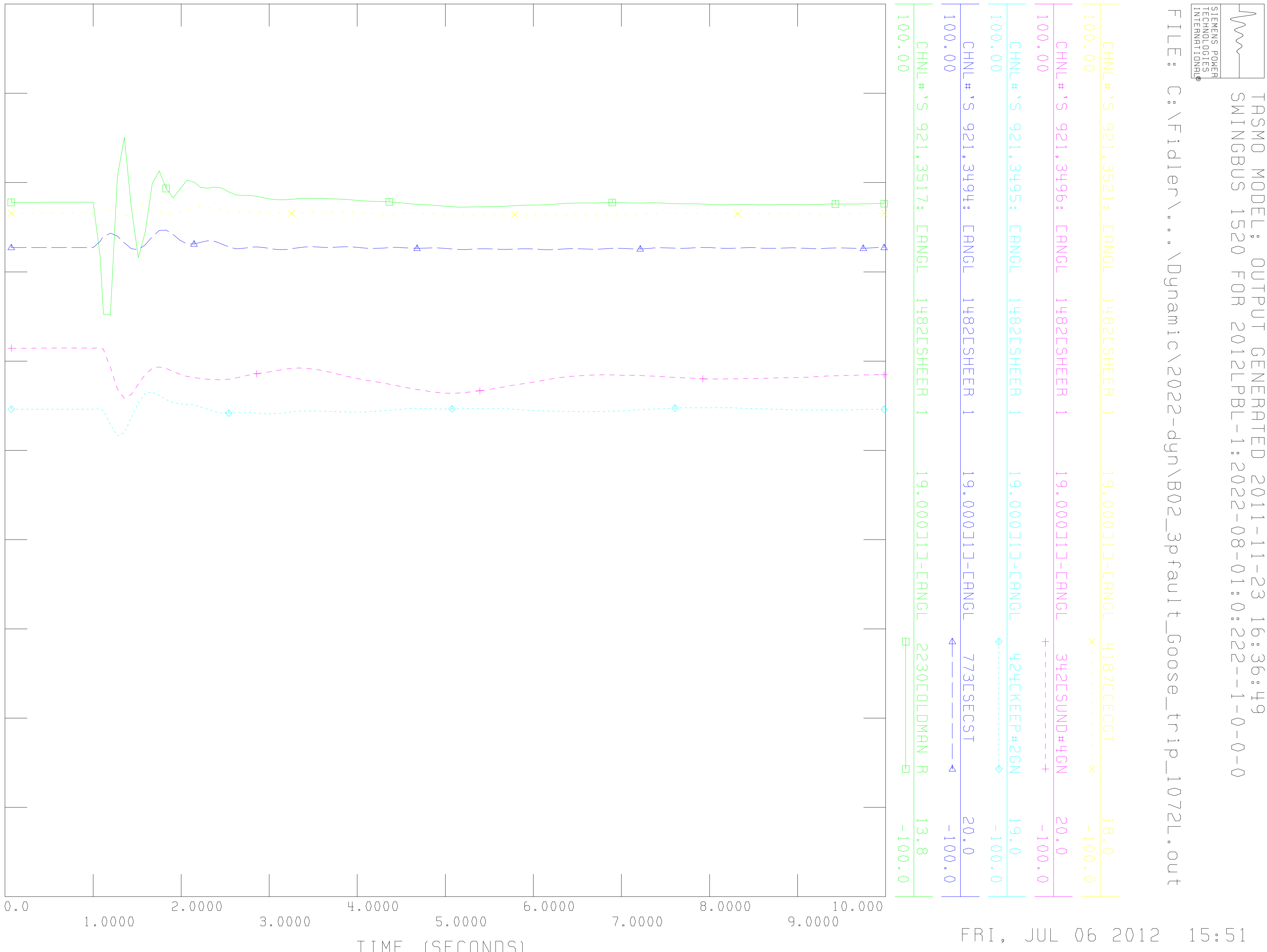
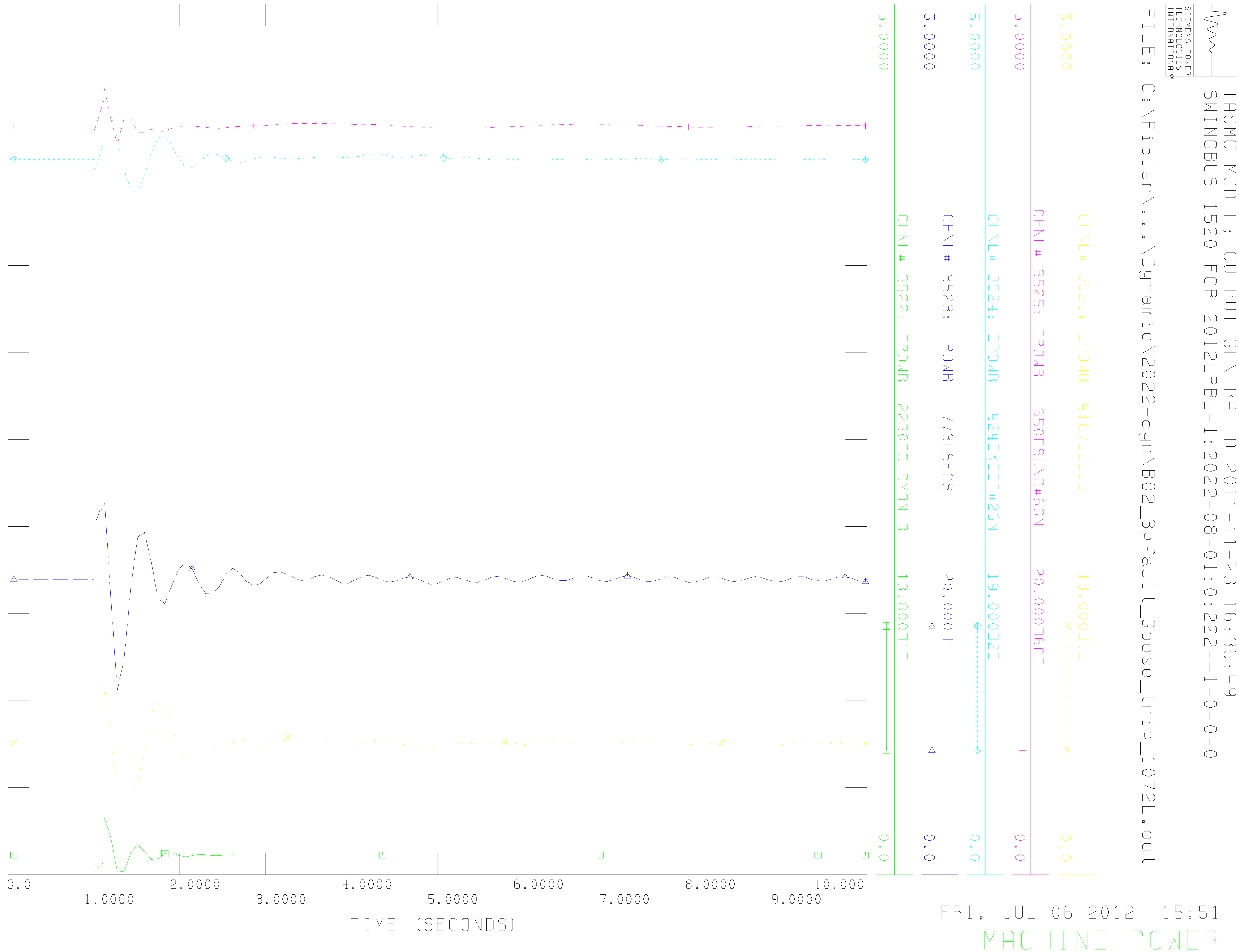


FRI, JUL 06 2012 15:51

RELATIVE ANGLES



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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
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5.0000
CHNL# 3525: [POWR 350CSUND#6GN 20.000]6A]
0.0
5.0000
CHNL# 3524: [POWR 424CKEEP#2GN 19.000]2]
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5.0000
CHNL# 3523: [POWR 773ESECST 20.000]1]
0.0
5.0000
CHNL# 3522: [POWR 2230COLDMAN R 13.800]1]
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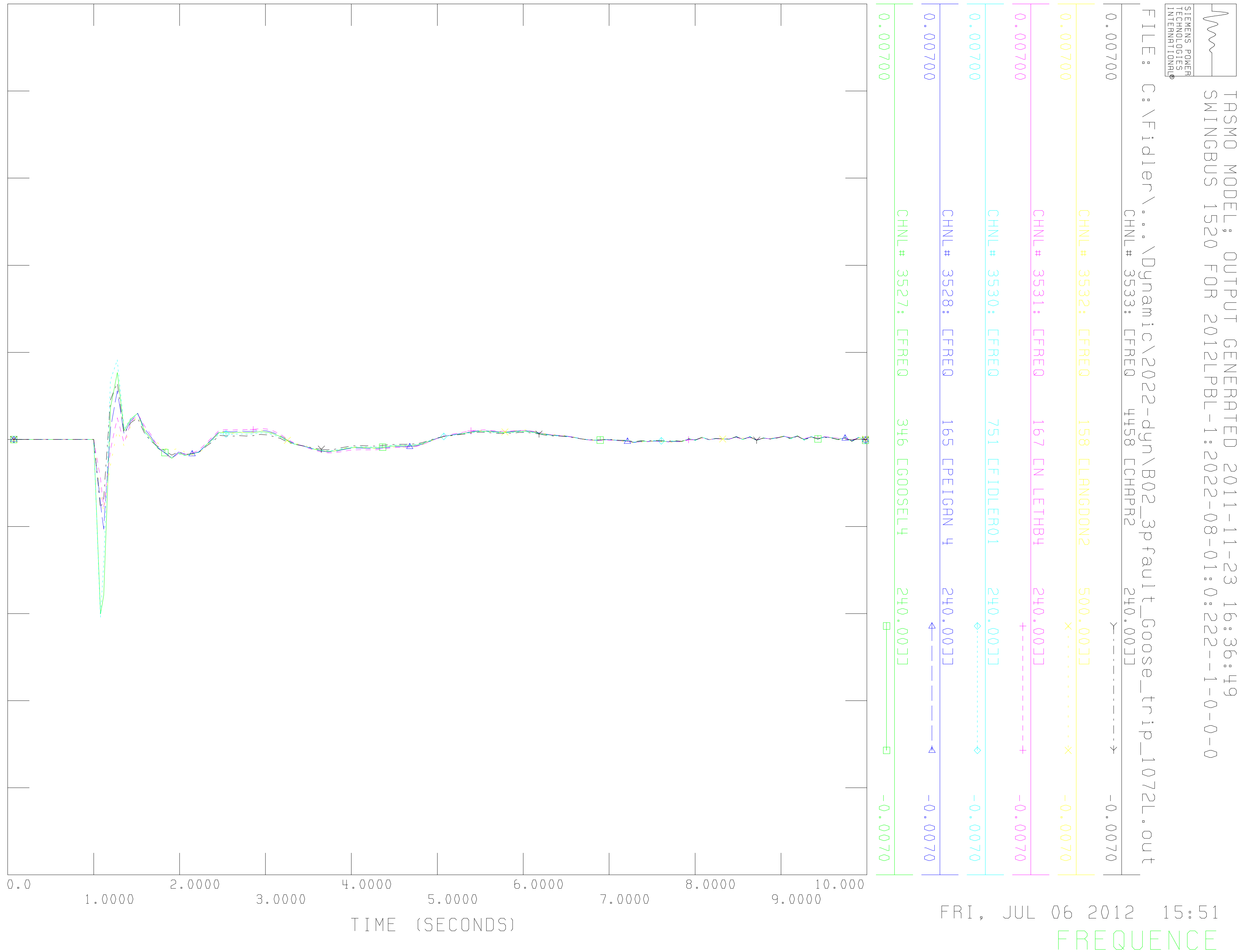
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
0.00700 CHNL# 3533: CFREQ 4458 [CHAPR2 240.00] -0.0070
0.00700 CHNL# 3532: CFREQ 158 [LANGDON2 500.00] -0.0070
0.00700 CHNL# 3531: CFREQ 167 [N LETHB4 240.00] -0.0070
0.00700 CHNL# 3530: CFREQ 751 [FIDLER01 240.00] -0.0070
0.00700 CHNL# 3528: CFREQ 165 [PEIGAN 4 240.00] -0.0070
0.00700 CHNL# 3527: CFREQ 346 [GOOSEL4 240.00] -0.0070
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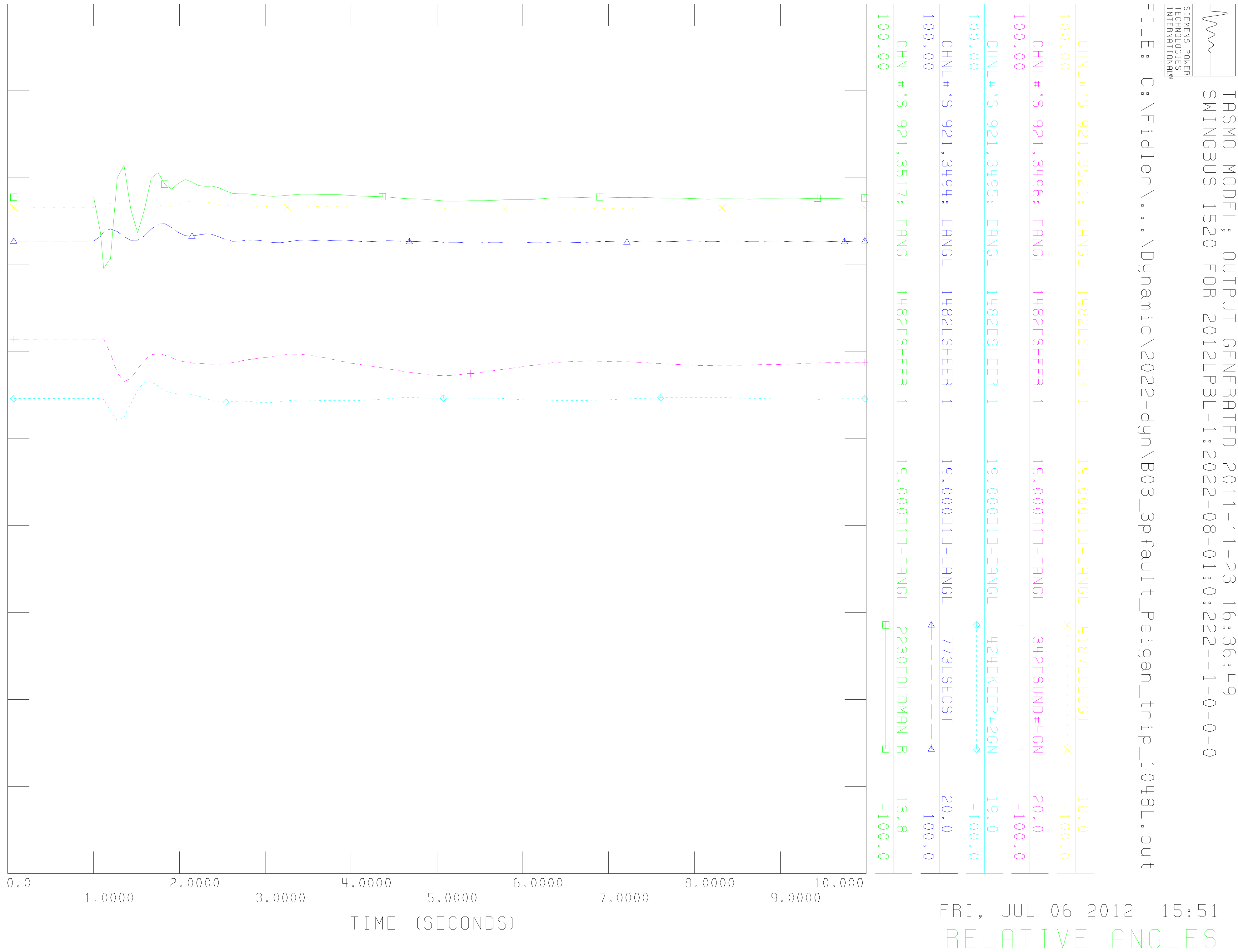
TIME (SECONDS)
FRI, JUL 06 2012 15:51
FREQUENCE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL#'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CECGT 18.0 100.00 -100.0
CHNL#'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0 100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0 100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0 100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8 100.00 -100.0
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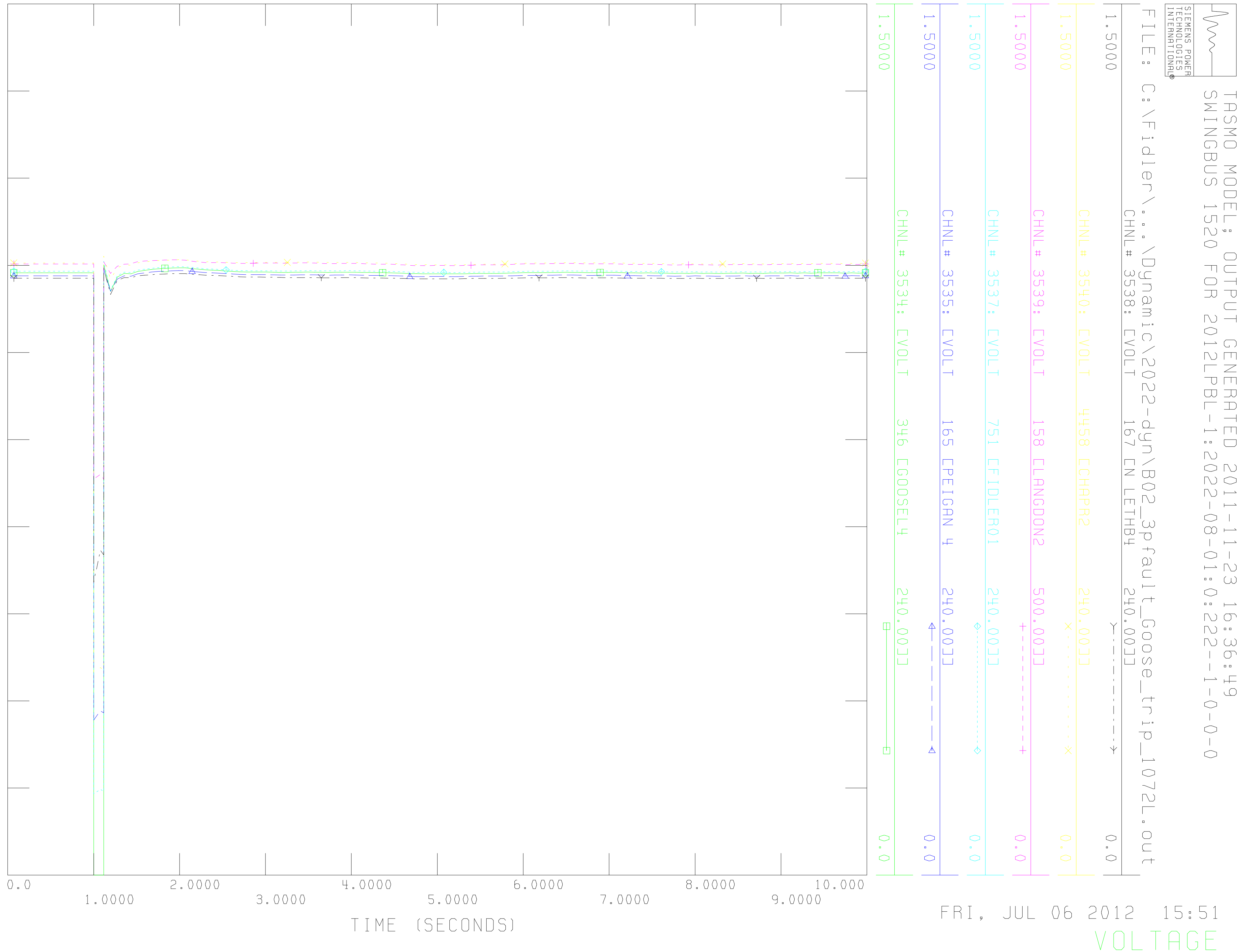
TIME (SECONDS)
FRI, JUL 06 2012 15:51
RELATIVE ANGLES



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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
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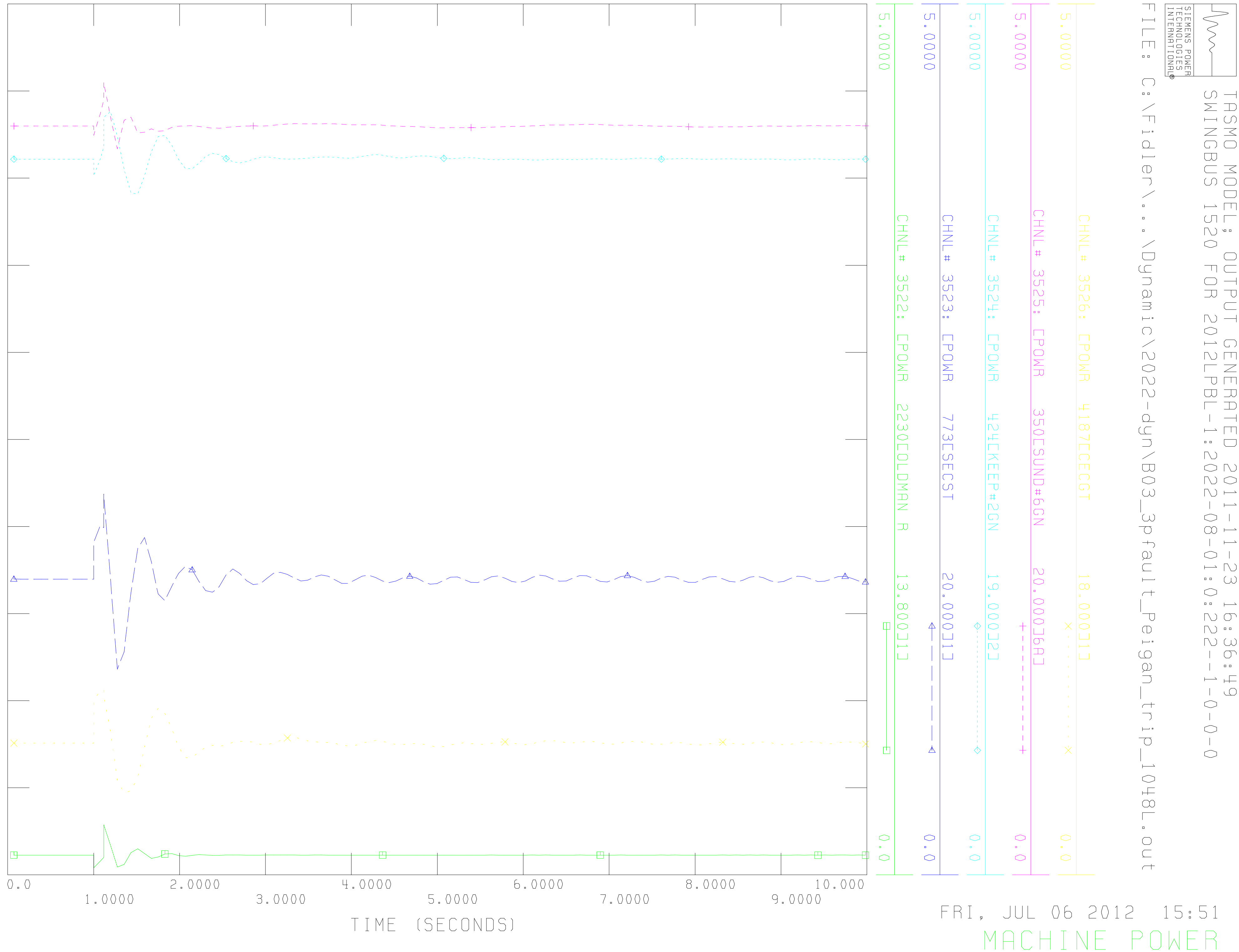
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[CEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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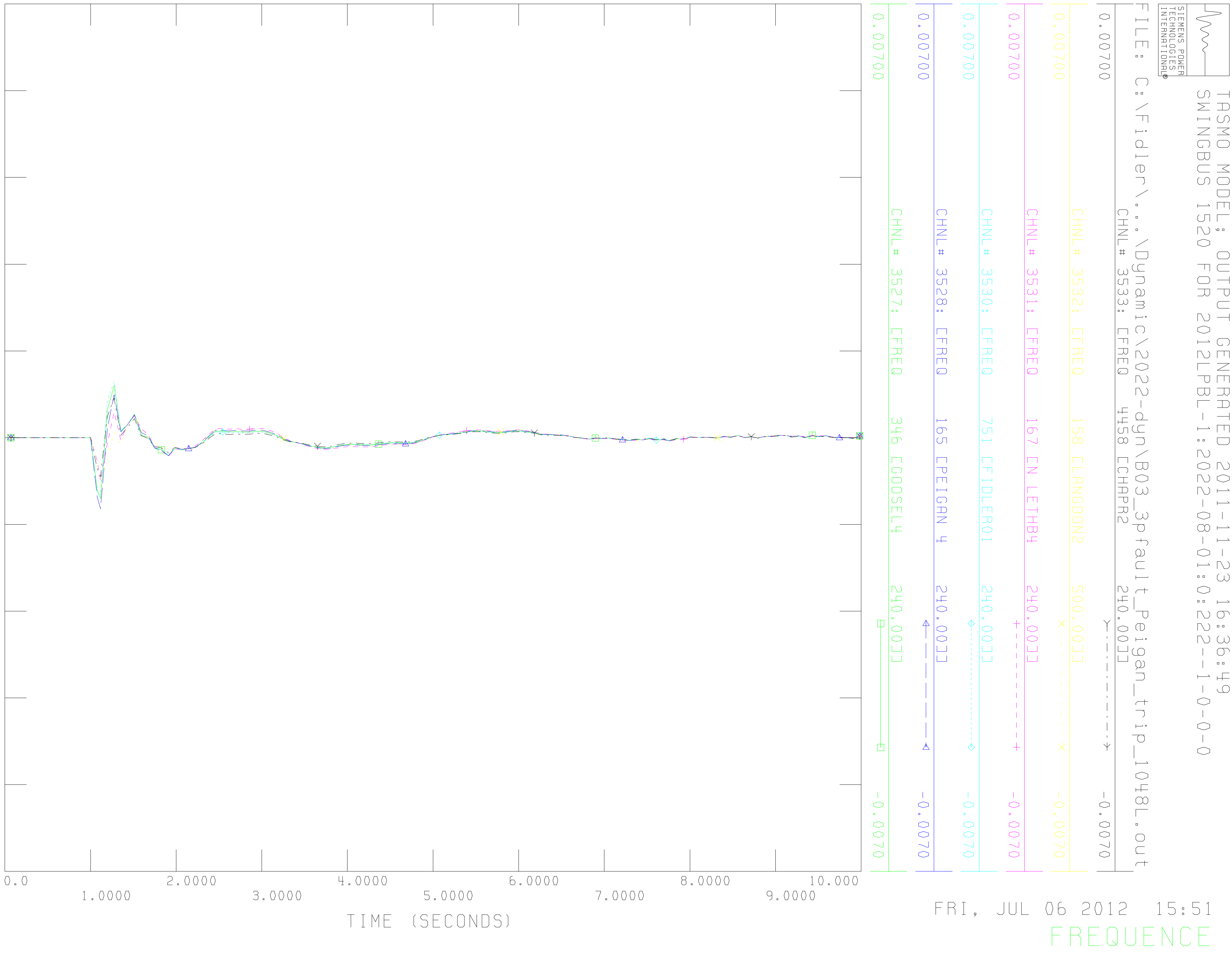
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B03_3pfault_Peigan_trip_1048L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3533: CFREQ 4458 CCHAPR2 240.00]
CHNL# 3532: CFREQ 158 CLANGDON2 500.00]
CHNL# 3531: CFREQ 167 CN LETHB4 240.00]
CHNL# 3530: CFREQ 751 CFIDLER01 240.00]
CHNL# 3528: CFREQ 165 CPEIGAN 4 240.00]
CHNL# 3527: CFREQ 346 CGOOSEL4 240.00]
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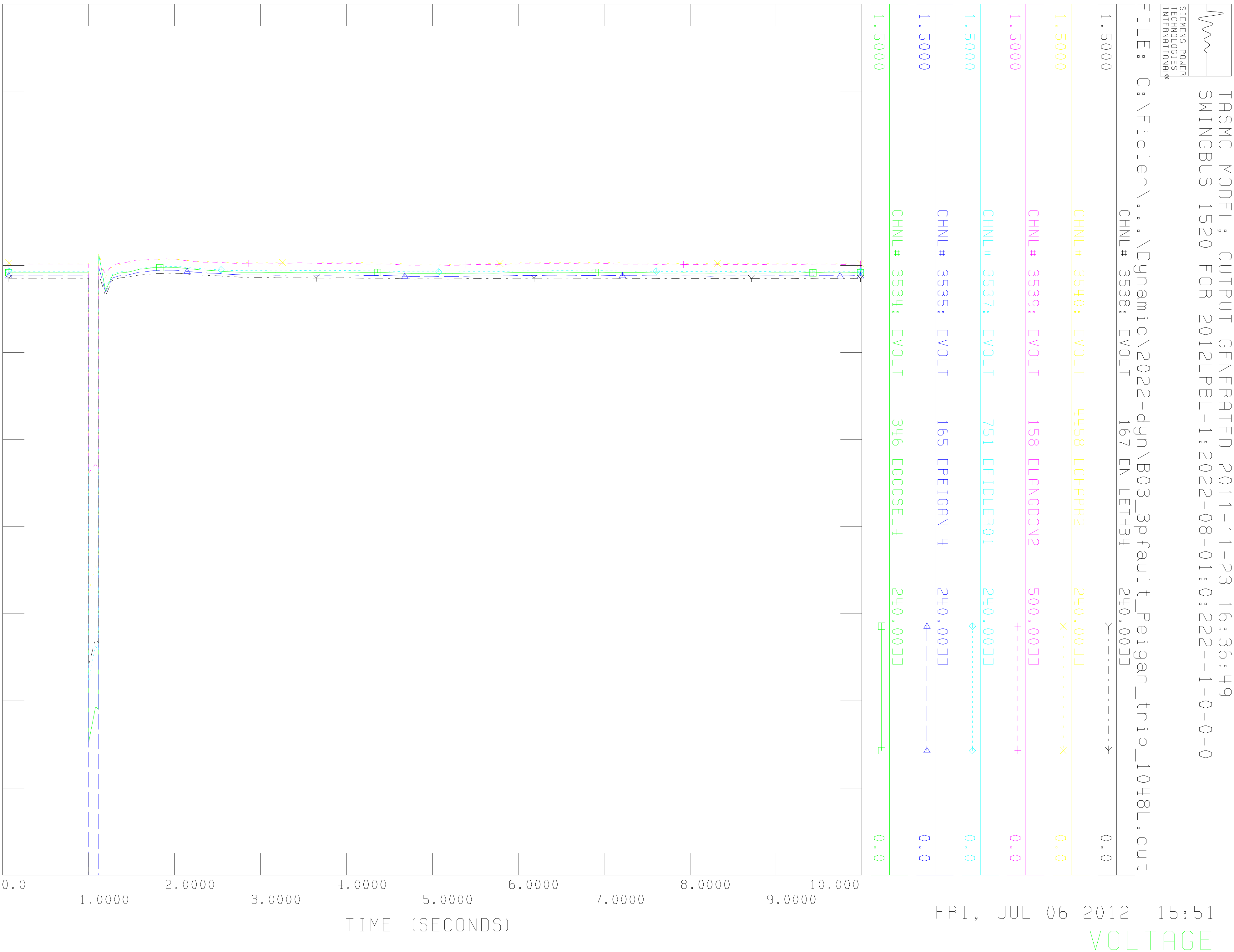
TIME (SECONDS)
FRI, JUL 06 2012 15:51
FREQUENCE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B03_3pfault_Peigan_trip_1048L.out
1.5000 CHNL# 3538: [VOLT 167 [N LETHB4 240.00]] 0.0
1.5000 CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]] 0.0
1.5000 CHNL# 3539: [VOLT 158 [LANGDON2 500.00]] 0.0
1.5000 CHNL# 3537: [VOLT 751 [FIDLER01 240.00]] 0.0
1.5000 CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]] 0.0
1.5000 CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]] 0.0
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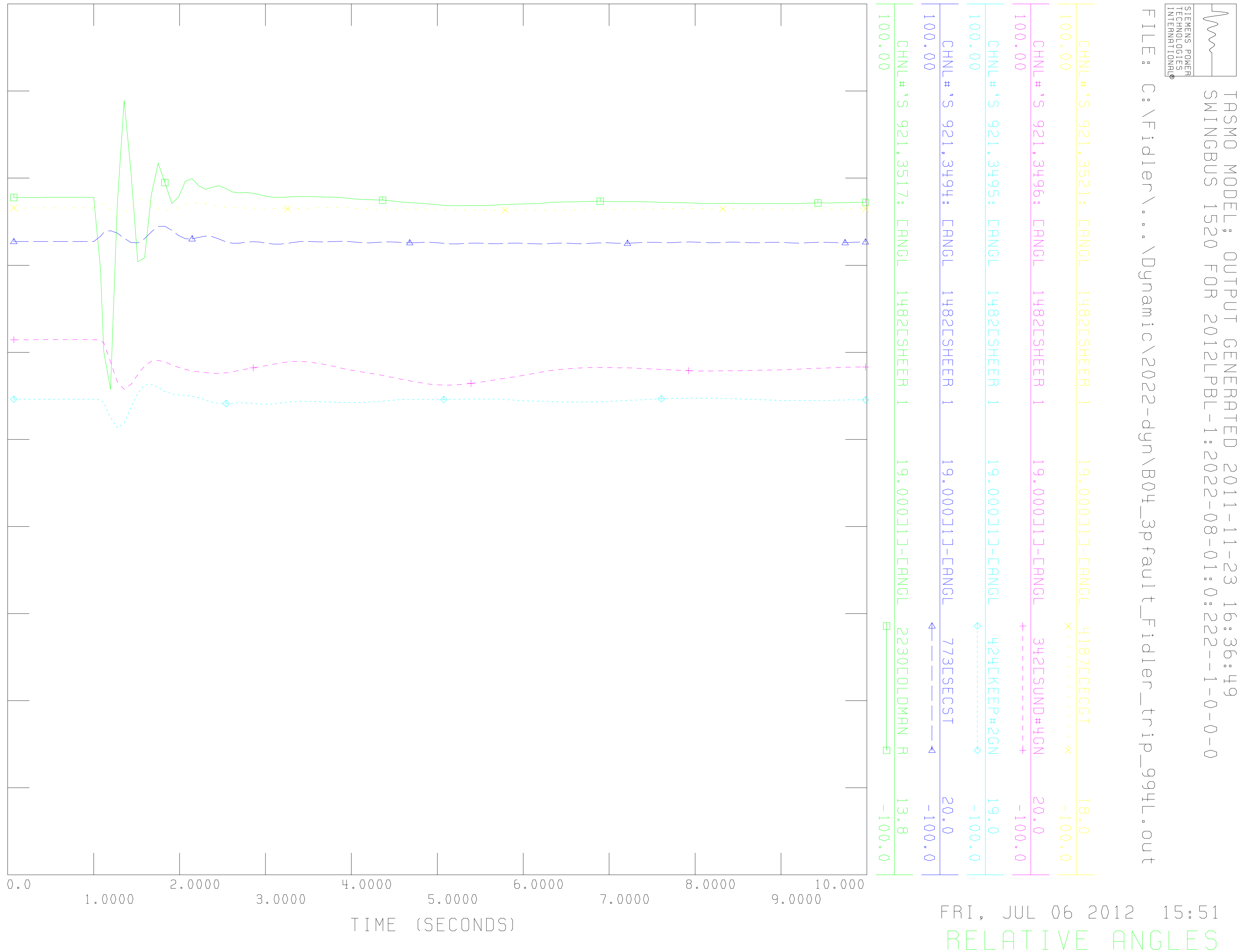
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
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CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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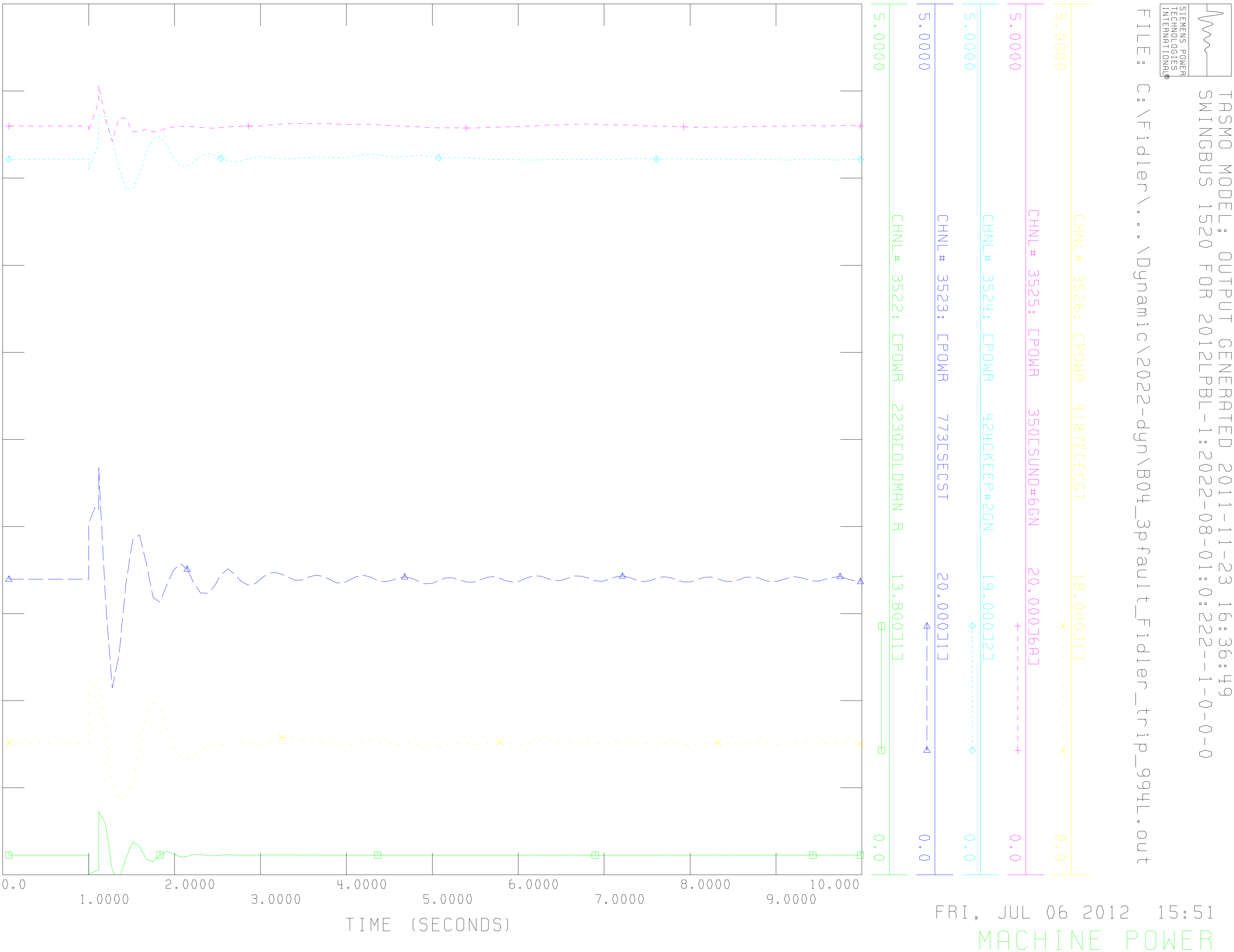
FRI, JUL 06 2012 15:51
RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_994L.out
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
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CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
5.0000 0.0
CHNL# 3523: [POWR 773[SECST 20.000]1]
5.0000 0.0
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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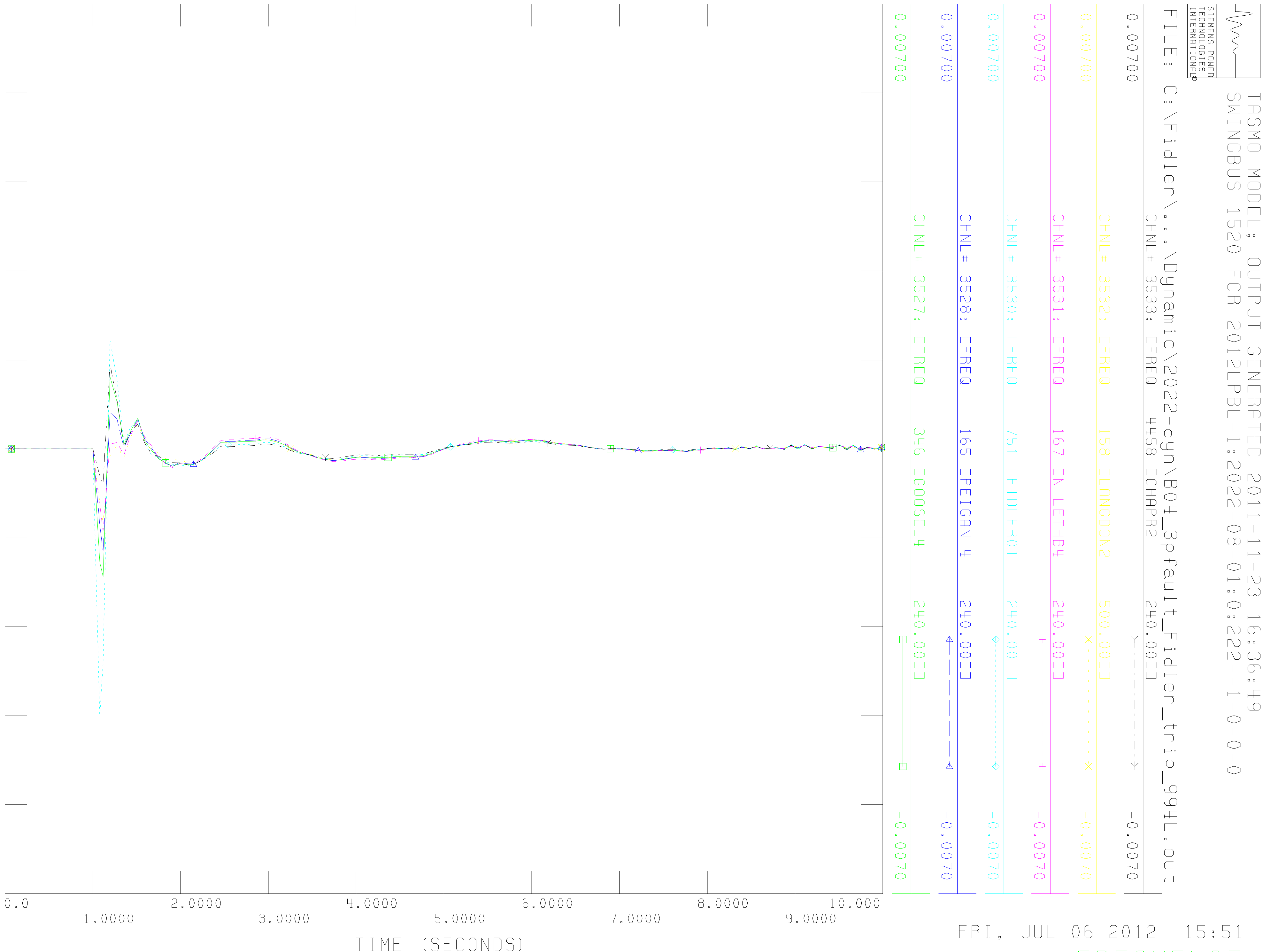
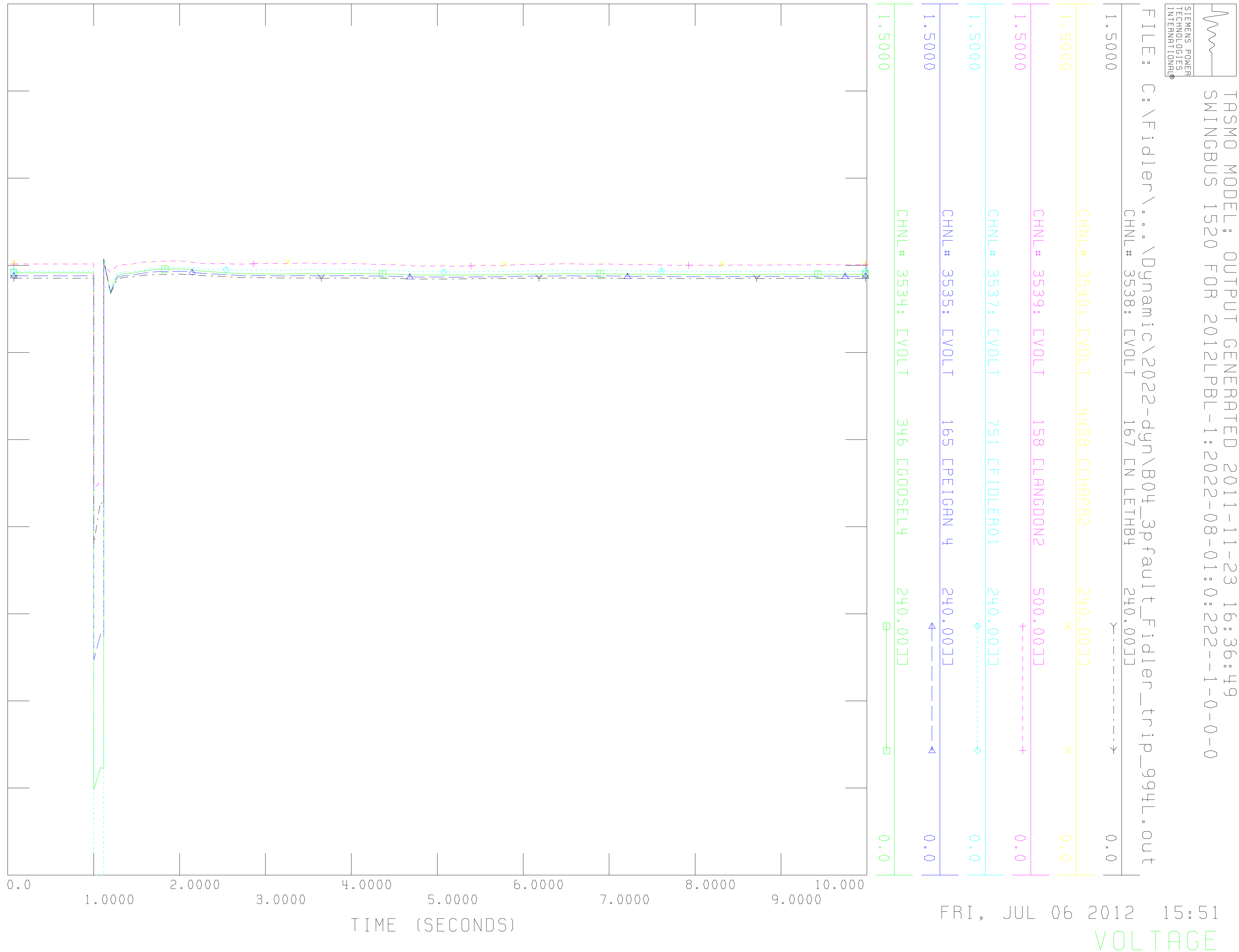
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER



FRI, JUL 06 2012 15:51

FREQUENCE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_94L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]
1.5000
0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]
1.5000
0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
1.5000
0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
1.5000
0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
1.5000
0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
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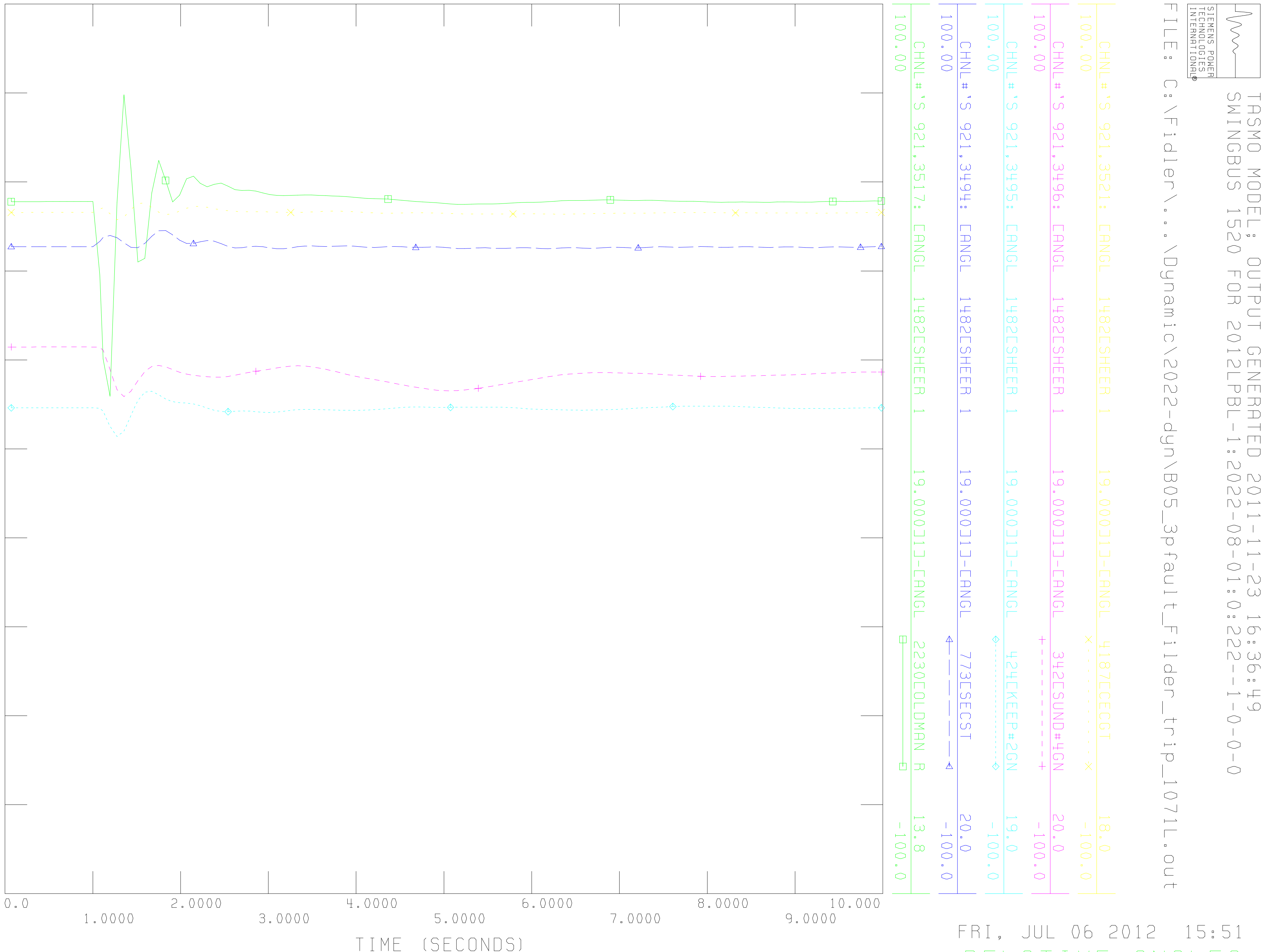
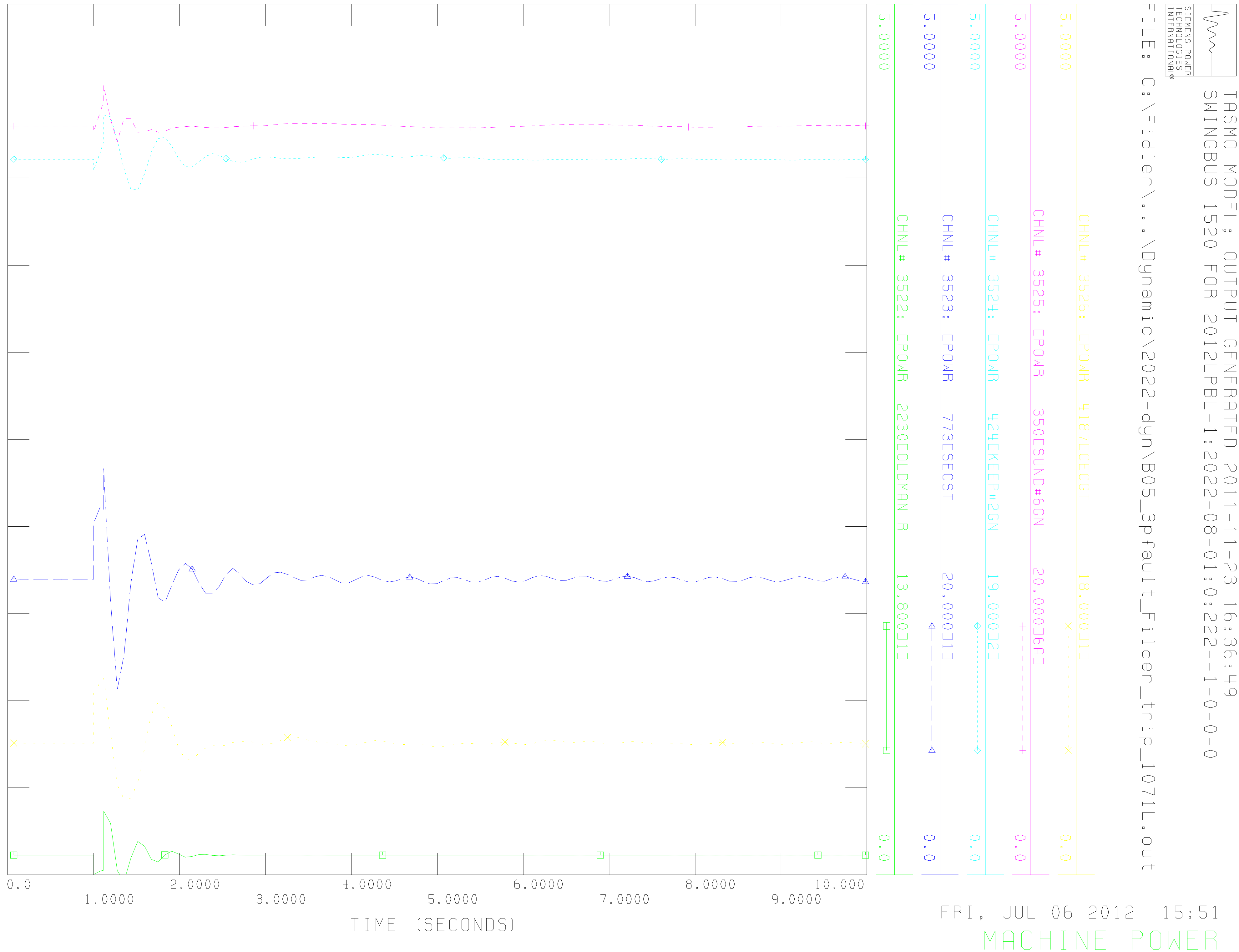
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE



FRI, JUL 06 2012 15:51

RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B05_3pfault_Fider_trip_1071L.out
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CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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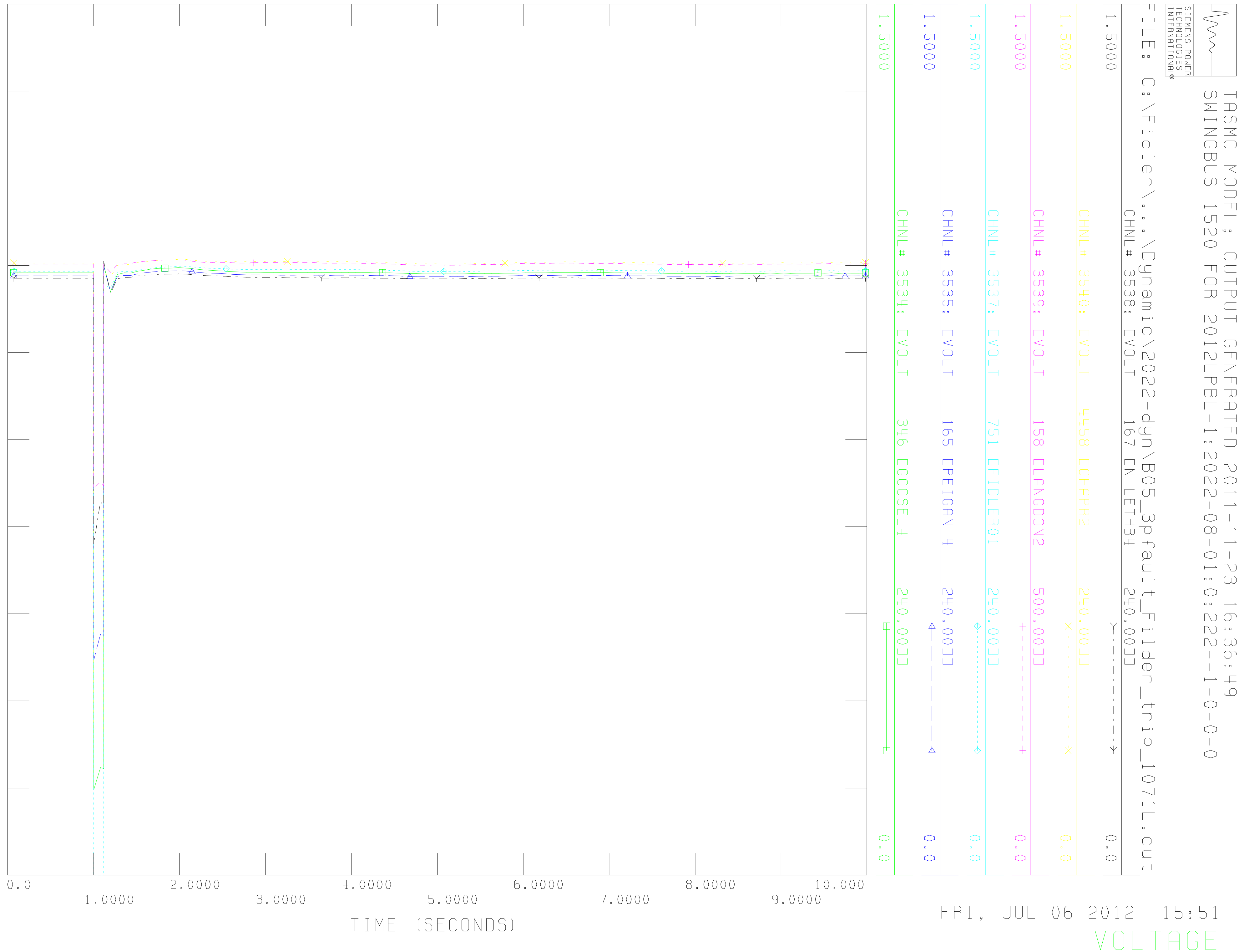
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B05_3pfault_Filder_trip_1071L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
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CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000
0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
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0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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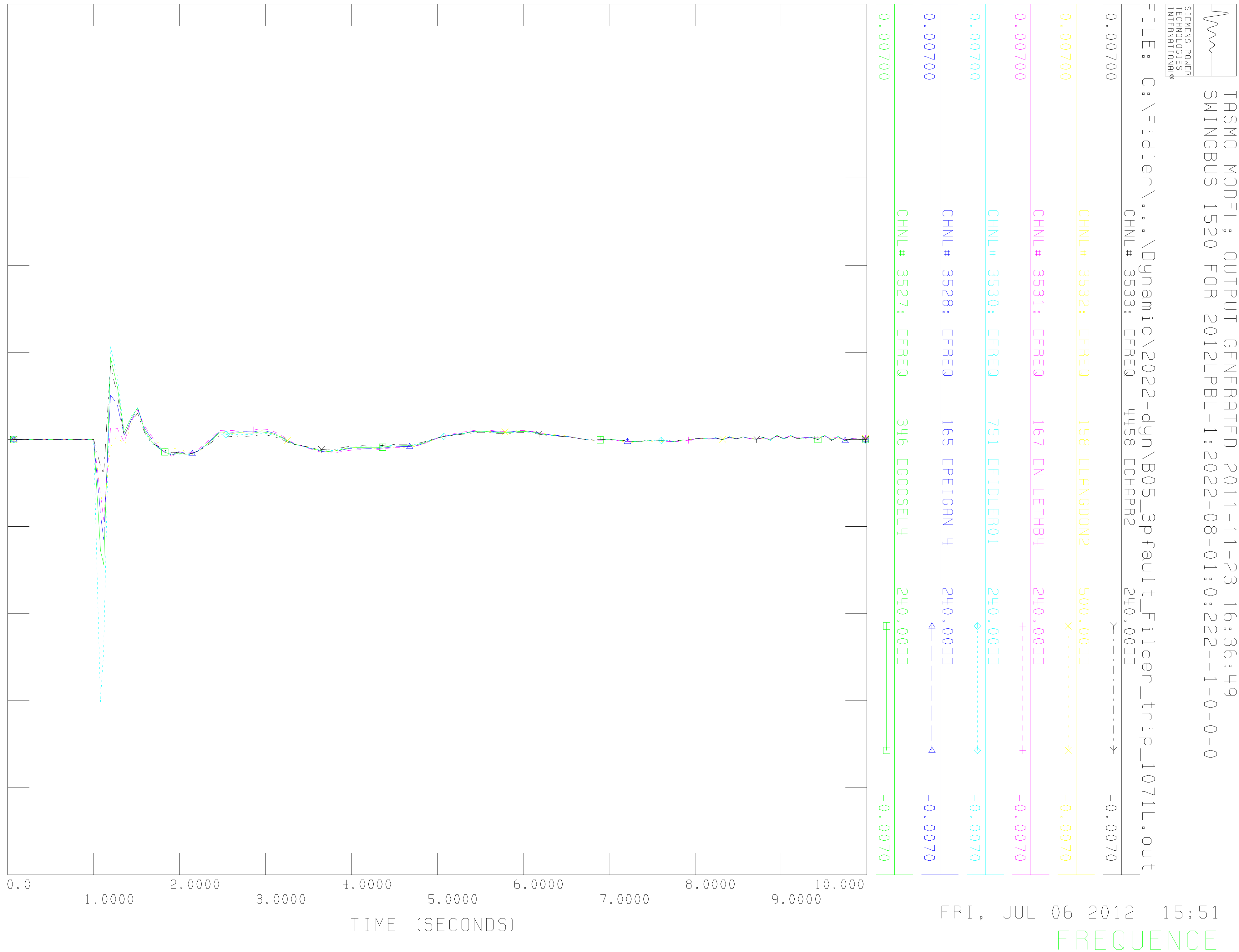
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B05_3pfault_Fidler_trip_1071L.out
0.00700 CHNL# 3533: [FREQ 4458 [CHAPR2 240.00] -0.0070
0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.00] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.00] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.00] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.00] -0.0070
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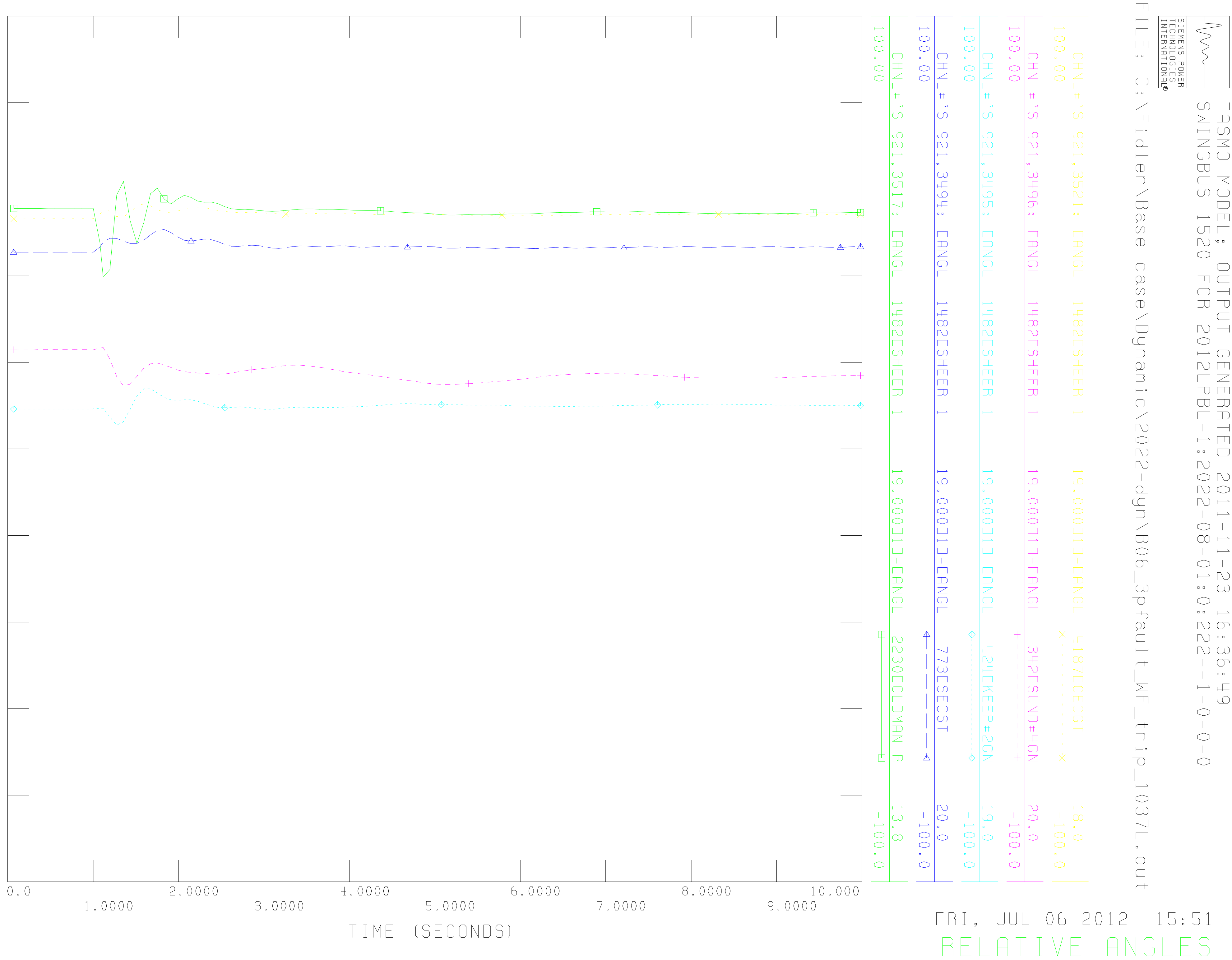
FRI, JUL 06 2012 15:51
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CCECGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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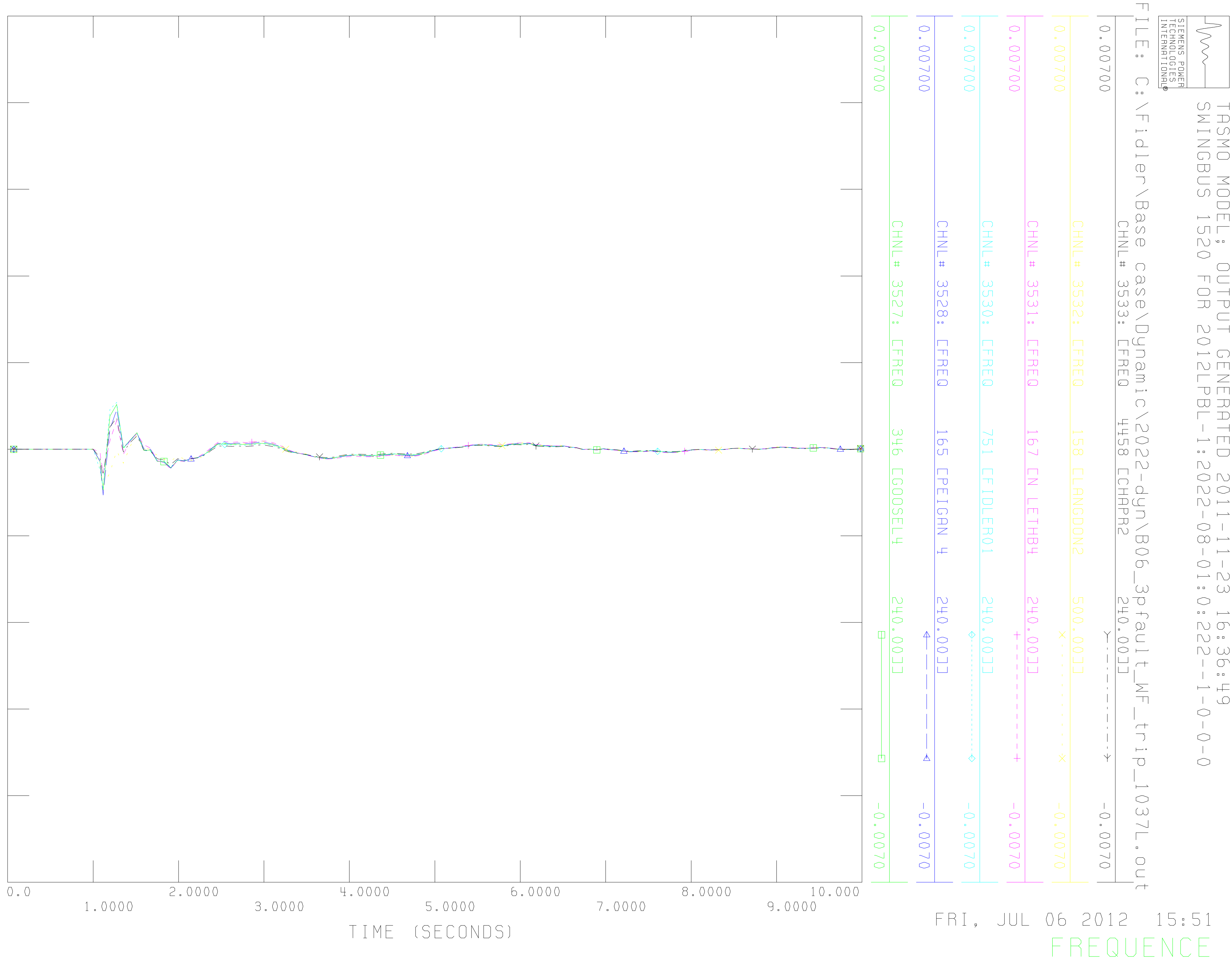
TIME (SECONDS)
FRI, JUL 06 2012 15:51
RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.00] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.00] -0.0070
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0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.00] -0.0070
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FRI, JUL 06 2012 15:51
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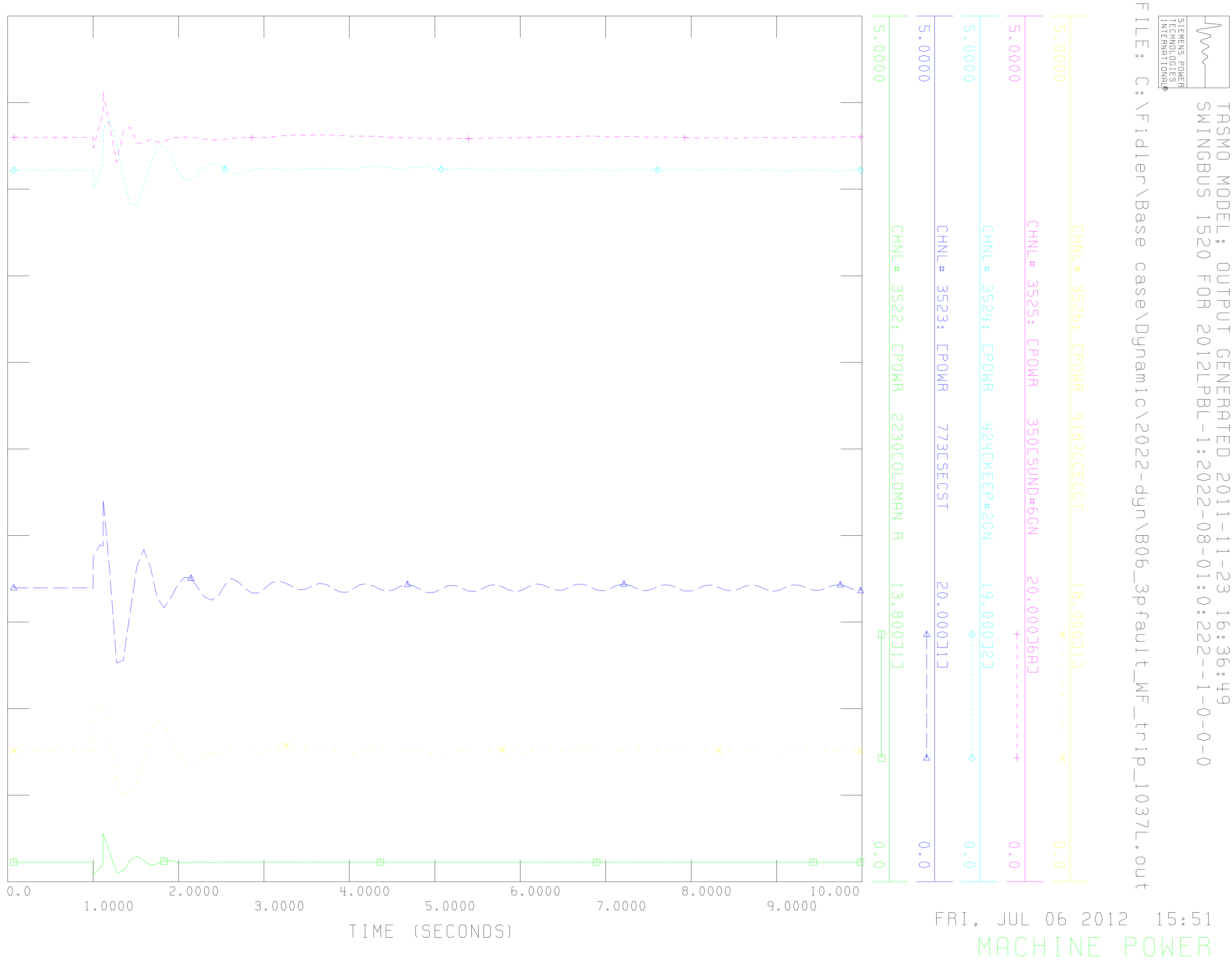

SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
5.0000 CHNL# 3526: [POWR 4187[EEGT 18.000]1] 0.0
5.0000 CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A] 0.0
5.0000 CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2] 0.0
5.0000 CHNL# 3523: [POWR 773[SECST 20.000]1] 0.0
5.0000 CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1] 0.0
0.0
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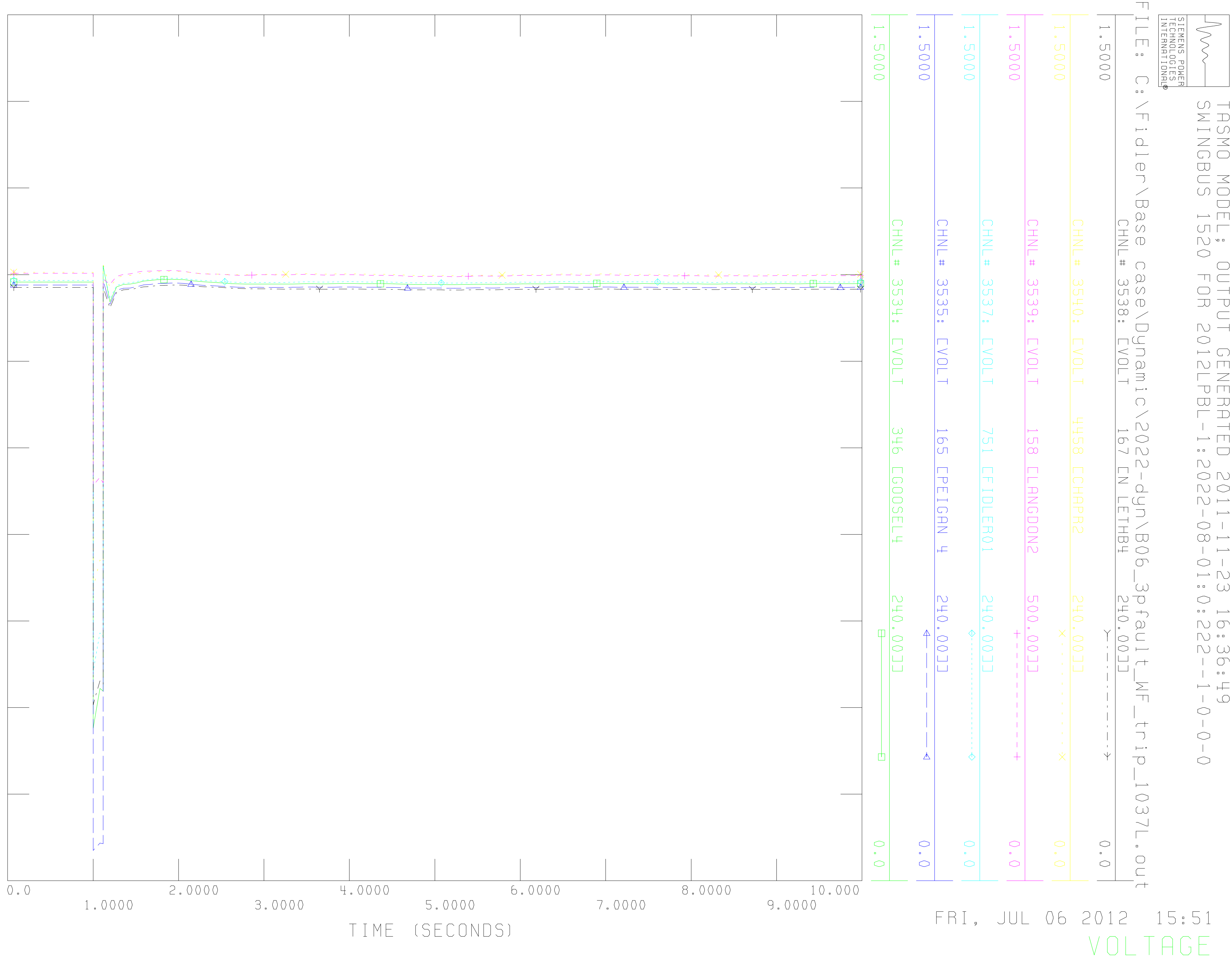
10.000
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
1.5000 0.0
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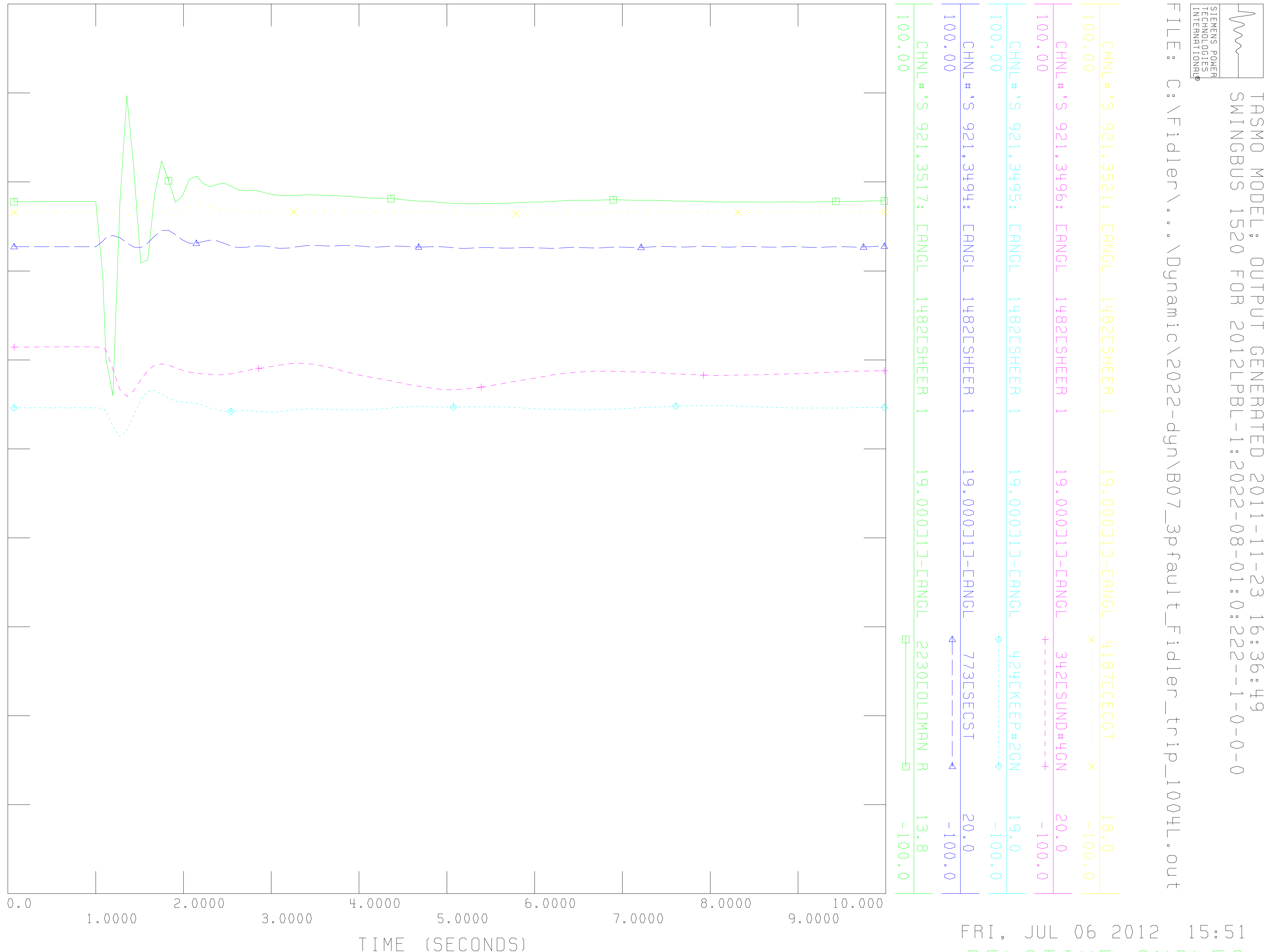
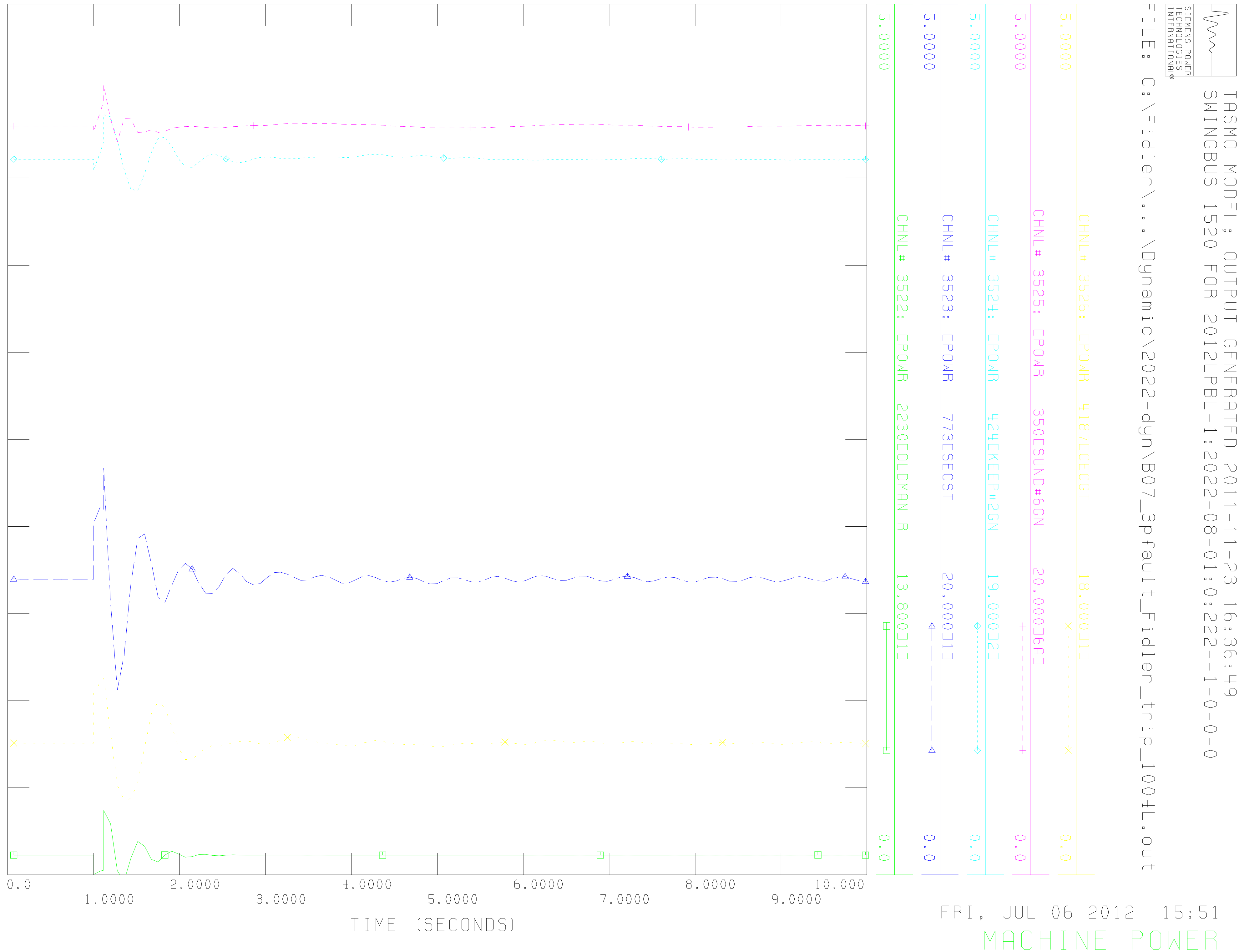
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE



FRI, JUL 06 2012 15:51

RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B07_3pfault_Fidler_trip_1004L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
5.0000 CHNL# 3526: [POWR 4187[EEGT 18.000]1] 0.0
5.0000 CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A] 0.0
5.0000 CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2] 0.0
5.0000 CHNL# 3523: [POWR 773[SECST 20.000]1] 0.0
5.0000 CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1] 0.0
0.0
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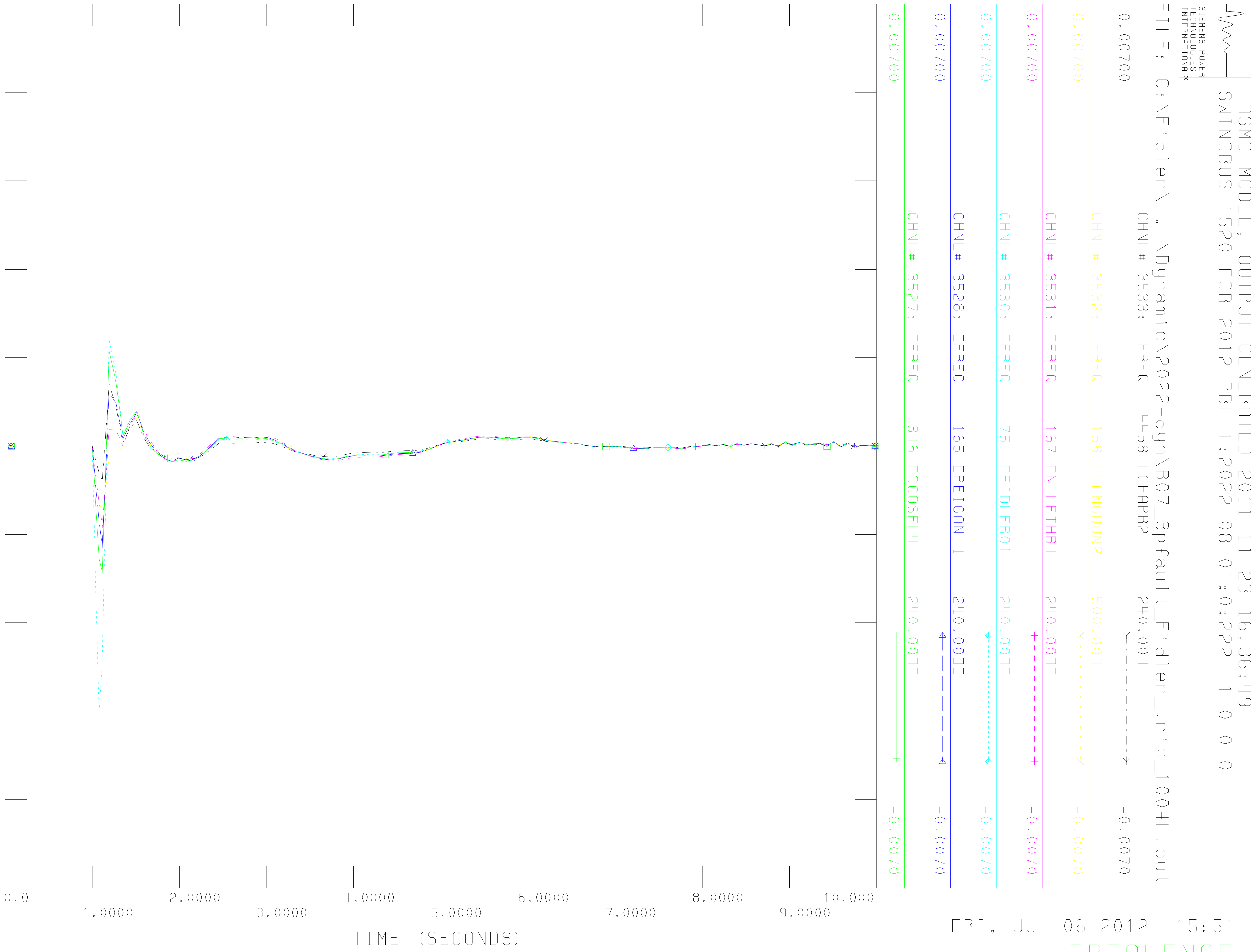
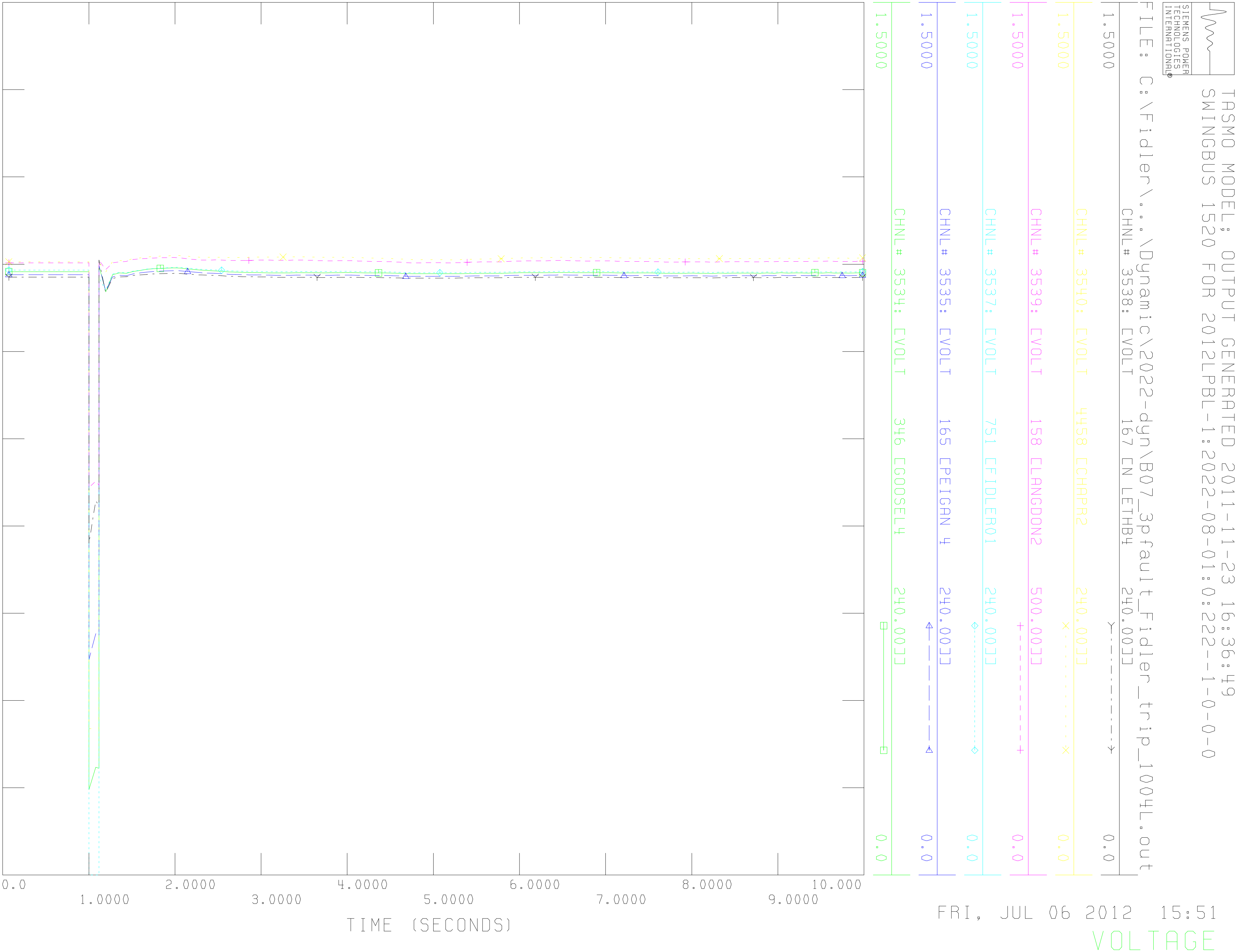
10.000
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER



FRI, JUL 06 2012 15:51

FREQUENCE



SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B07_3pfault_Fidler_trip_1004L.out
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1.5000 CHNL# 3540: [VOLT 4458 [CHAPR2 240.00] 0.0
1.5000 CHNL# 3539: [VOLT 158 [LANGDON2 500.00] 0.0
1.5000 CHNL# 3537: [VOLT 751 [FIDLER01 240.00] 0.0
1.5000 CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00] 0.0
1.5000 CHNL# 3534: [VOLT 346 [GOOSEL4 240.00] 0.0
0.0
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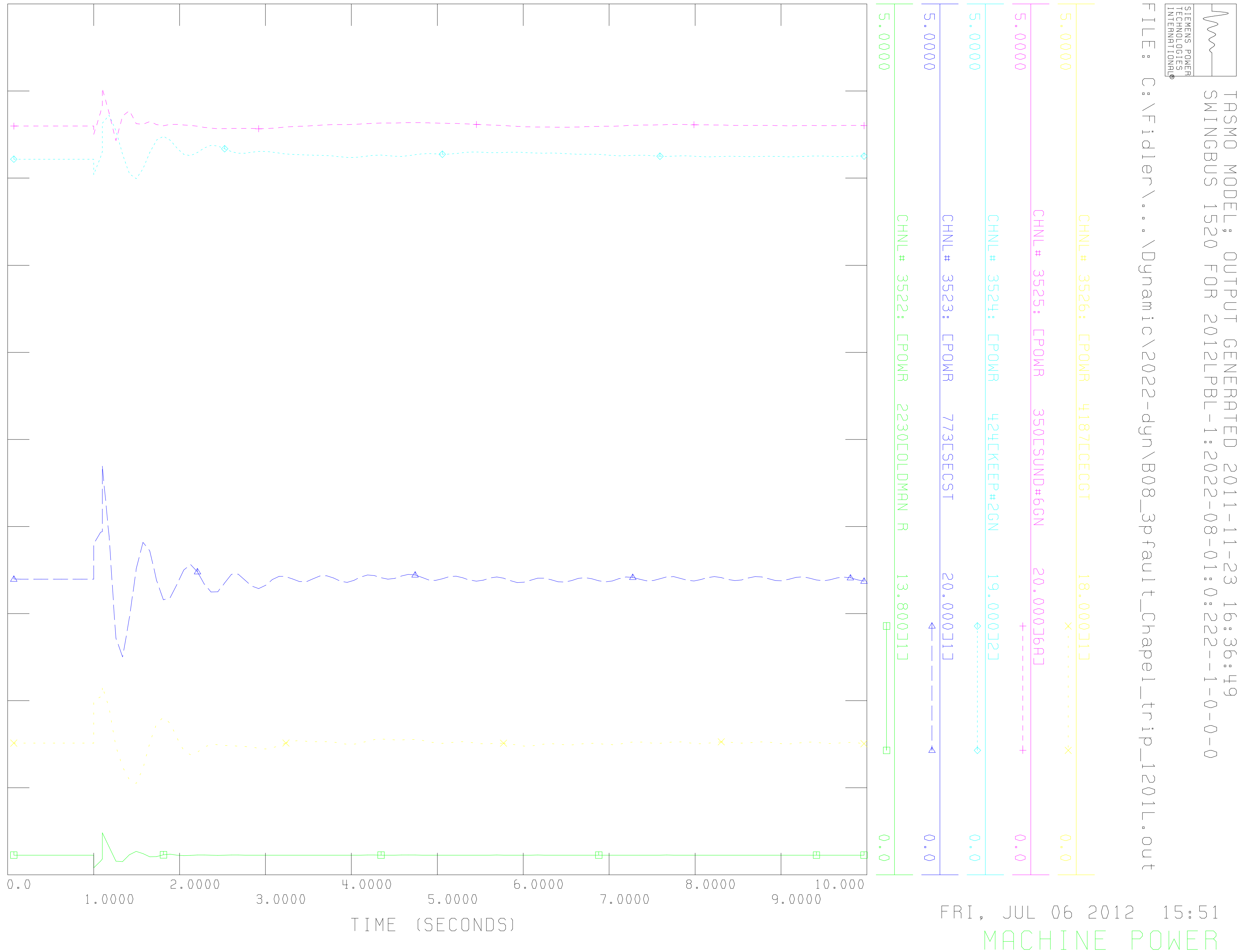
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B08_3pfault_Chapel_trip_1201L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[EECGT 18.000]1]
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0.0
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
5.0000
0.0
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
5.0000
0.0
CHNL# 3523: [POWR 773[SECST 20.000]1]
5.0000
0.0
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
0.0
0.0
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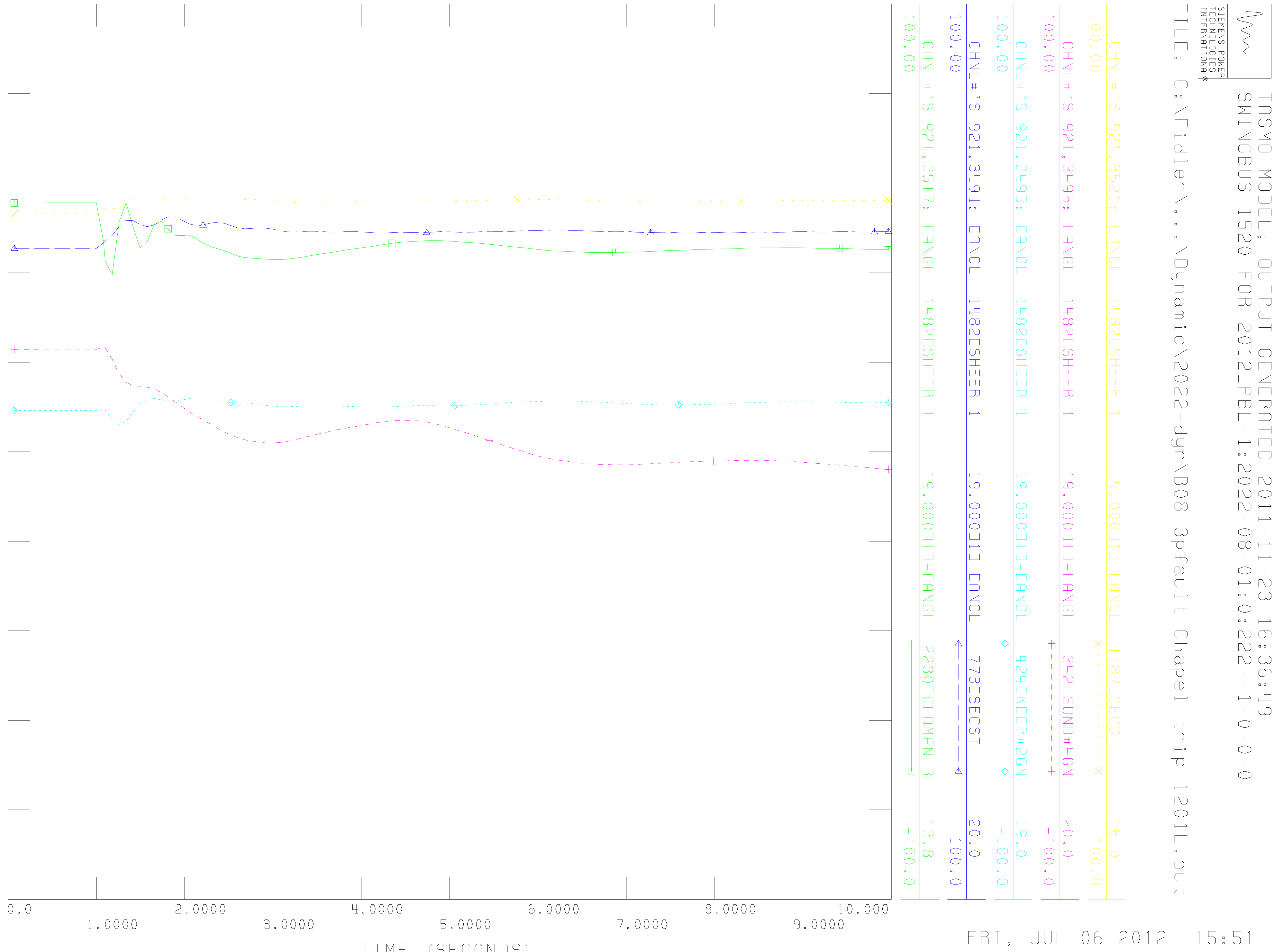
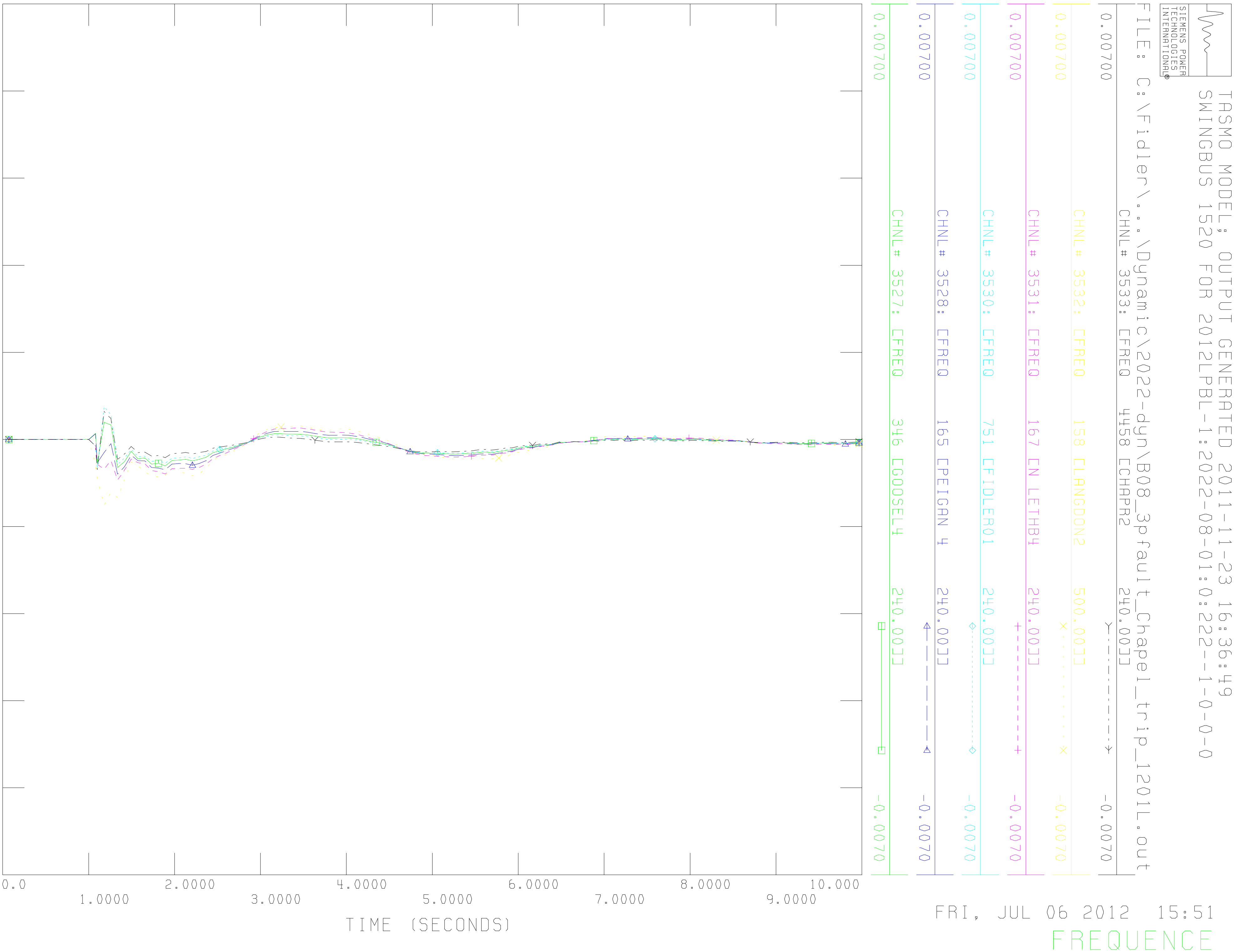
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 15:51
MACHINE POWER



FRI, JUL 06 2012 15:51

RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B08_3pfault_Chapel_trip_1201L.out
CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]
0.00700 -0.0070
CHNL# 3532: [FREQ 158 [LANGDON2 500.00]
0.00700 -0.0070
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
0.00700 -0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
0.00700 -0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
0.00700 -0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
0.00700 -0.0070
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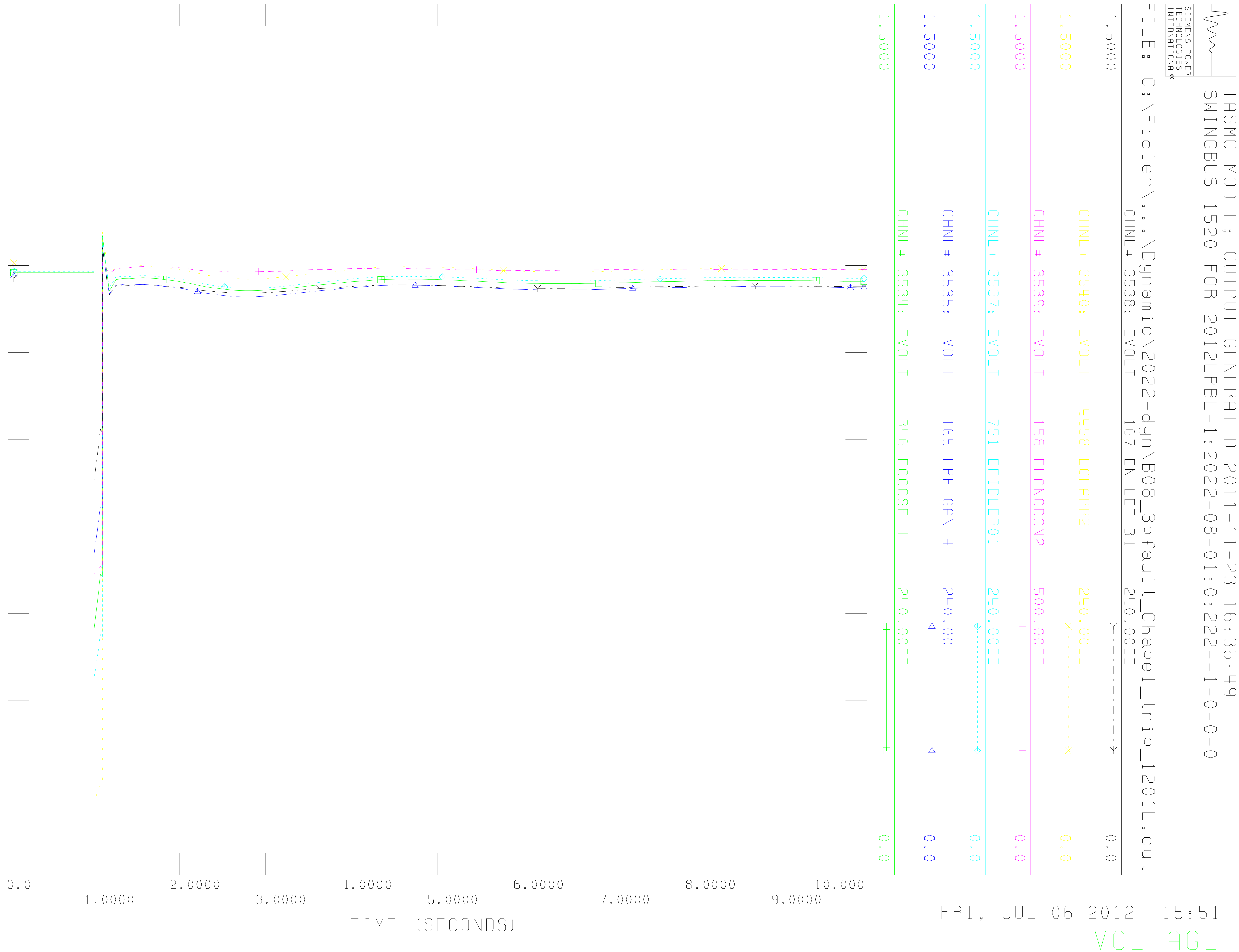
TIME (SECONDS)
FRI, JUL 06 2012 15:51
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B08_3pfault_Chapel_trip_1201L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
0.0
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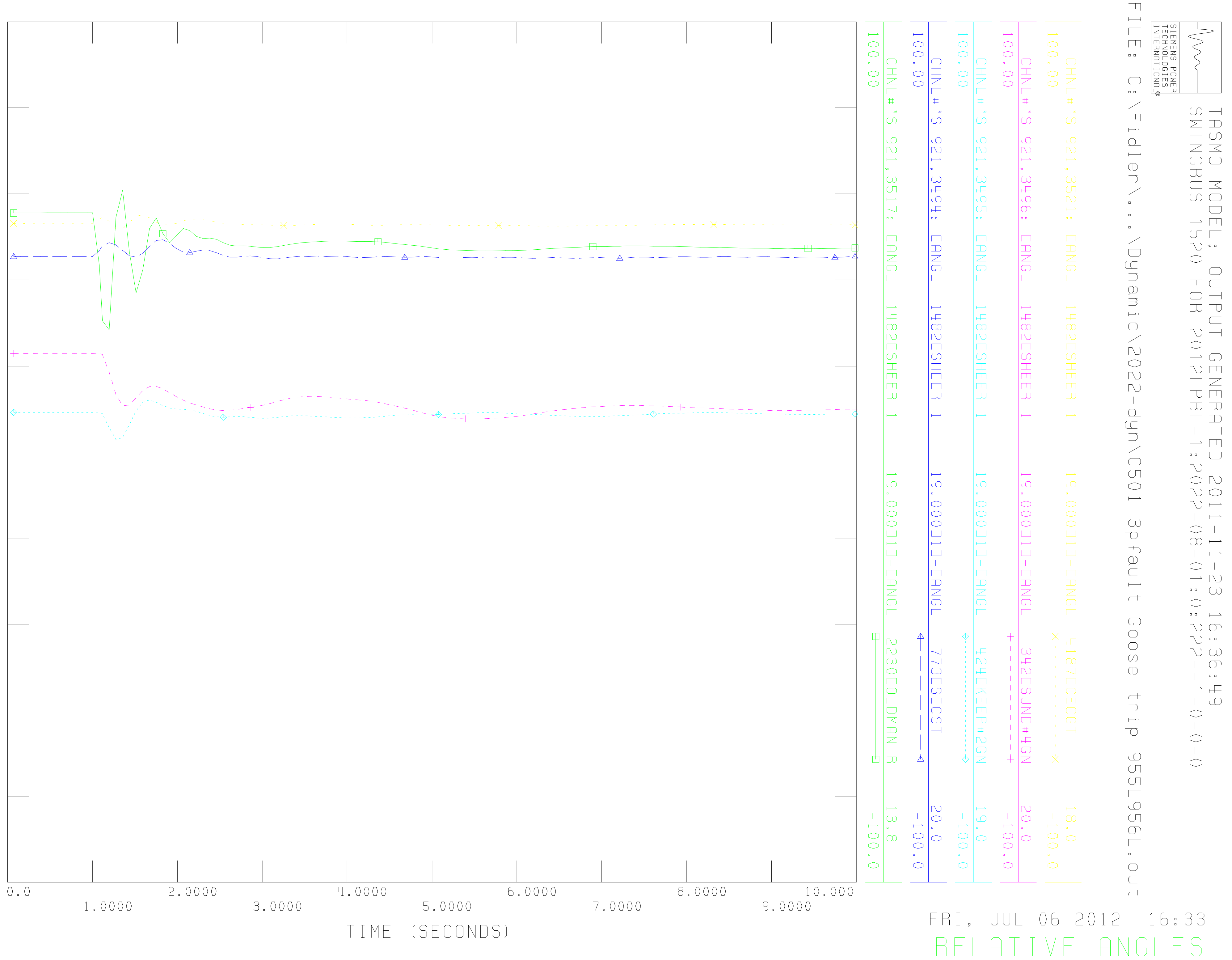
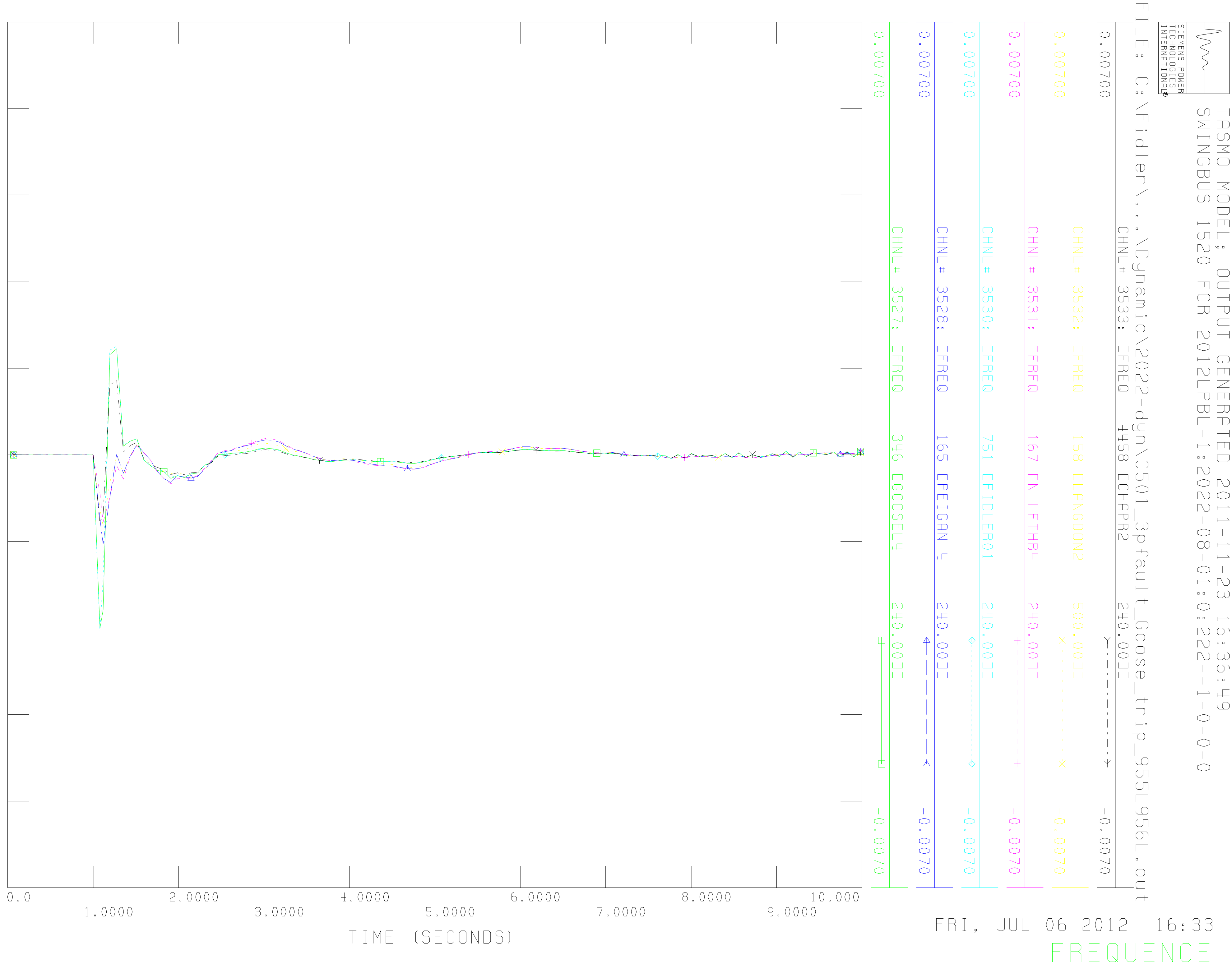
TIME (SECONDS)
FRI, JUL 06 2012 15:51
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C501_3pfault_Goose_trip_955L956L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000J1J-CANGL 4187CECGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000J1J-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000J1J-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000J1J-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000J1J-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:33
RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\..\Dynamic\2022-dyn\C501_3pfault_Goose_trip_955L956L.out
CHNL# 3533: CFREQ 4458 CCHAPR2 240.00]
CHNL# 3532: CFREQ 158 CLANGDON2 500.00]
CHNL# 3531: CFREQ 167 CN LETHB4 240.00]
CHNL# 3530: CFREQ 751 CFIDLER01 240.00]
CHNL# 3528: CFREQ 165 CPEIGAN 4 240.00]
CHNL# 3527: CFREQ 346 CGOOSEL4 240.00]
0.00700
-0.0070
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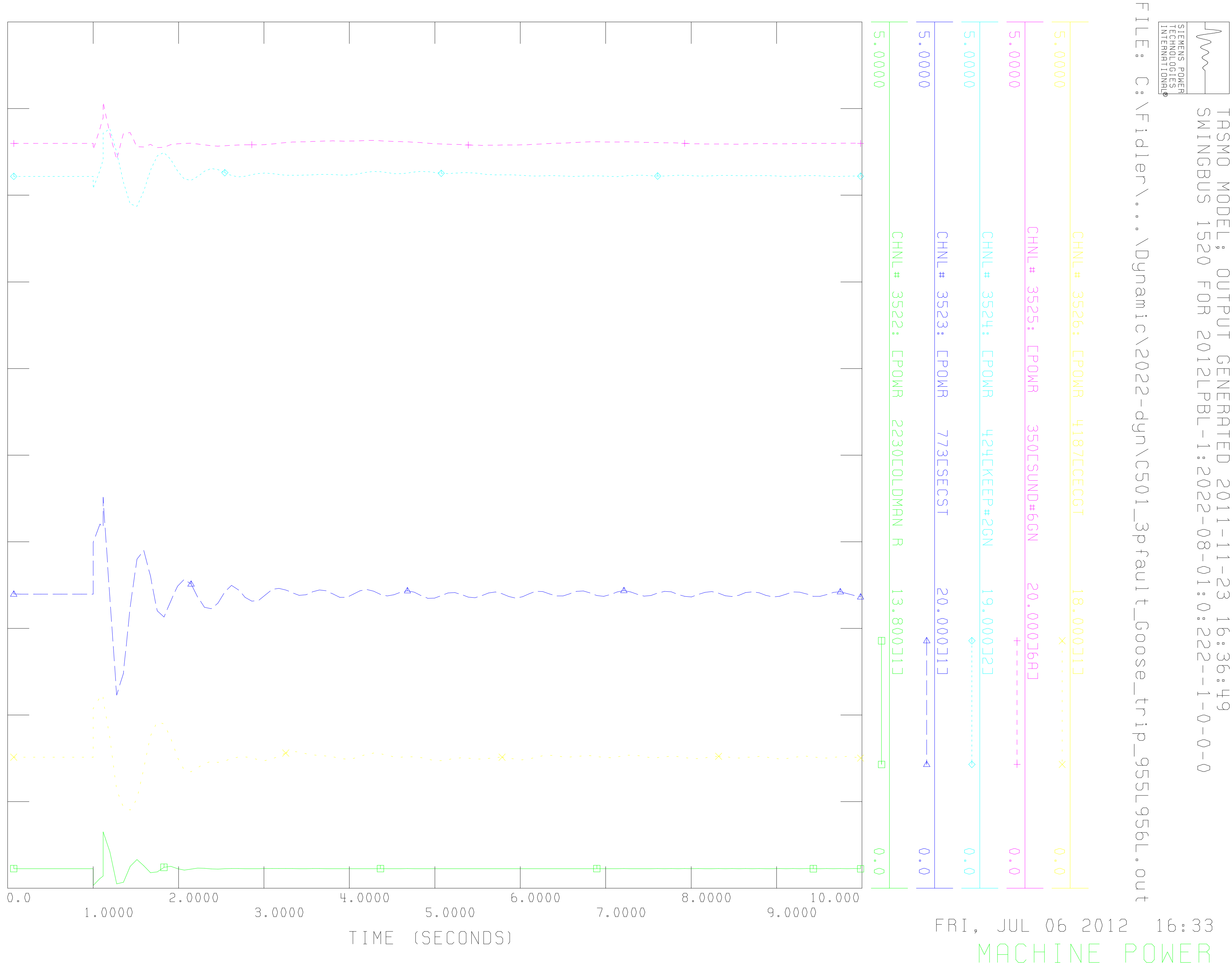
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C501_3pfault_Goose_trip_955L956L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3522: [POWR 2230COLDMAN R 13.800]1]
CHNL# 3523: [POWR 773ESECST 20.000]1]
CHNL# 3524: [POWR 424CKEEP#2GN 19.000]2]
CHNL# 3525: [POWR 350CSUND#6GN 20.000]6A]
CHNL# 3526: [POWR 4187CEEGT 18.000]1]
5.0000
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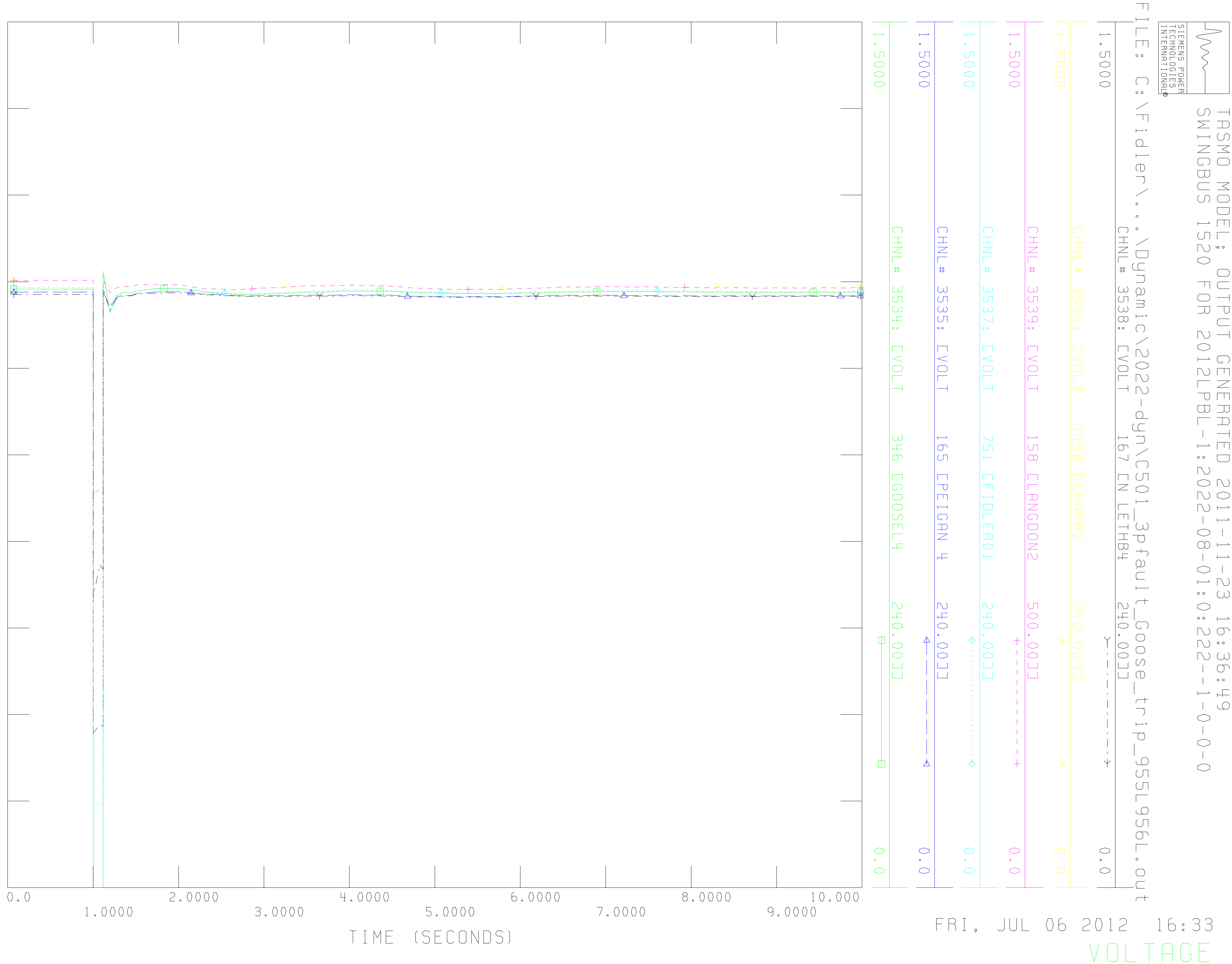
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C501_3pfault_Goose_trip_955L956L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
1.5000 0.0
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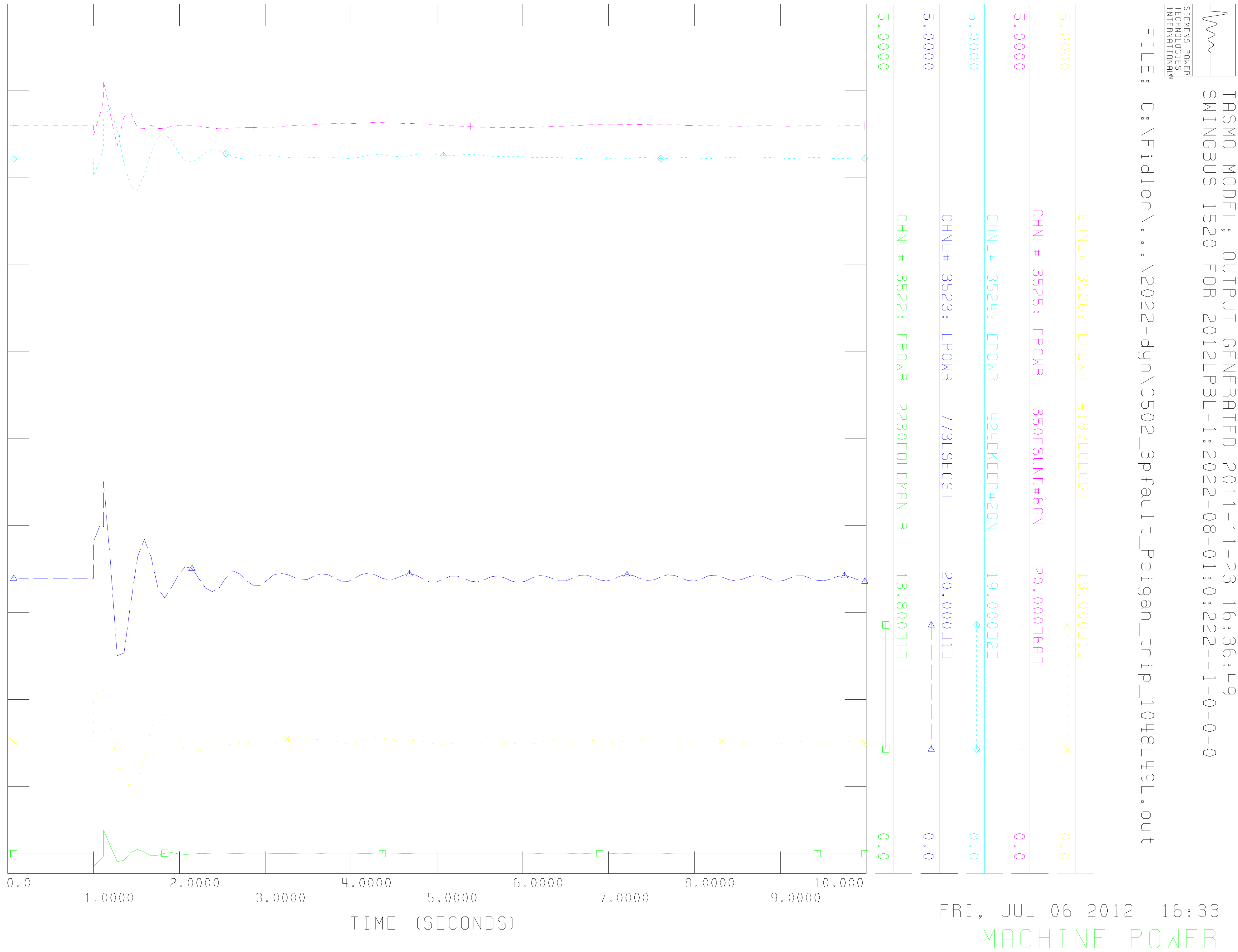
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C502_3pfault_Peigan_trip_1048L49L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187CEEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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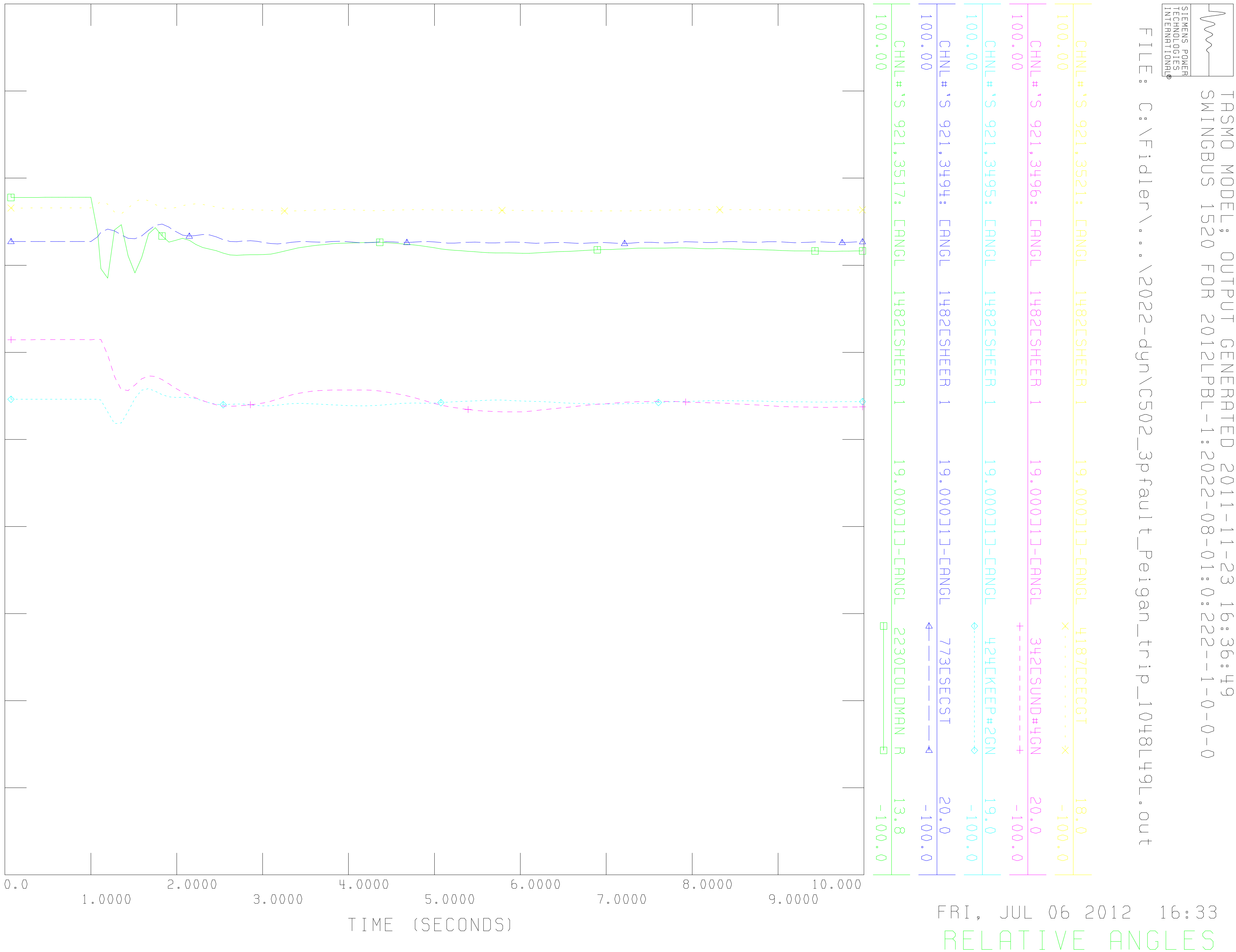
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C502_3pfault_Peigan_trip_1048L49L.out
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CCEGT 18.0
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CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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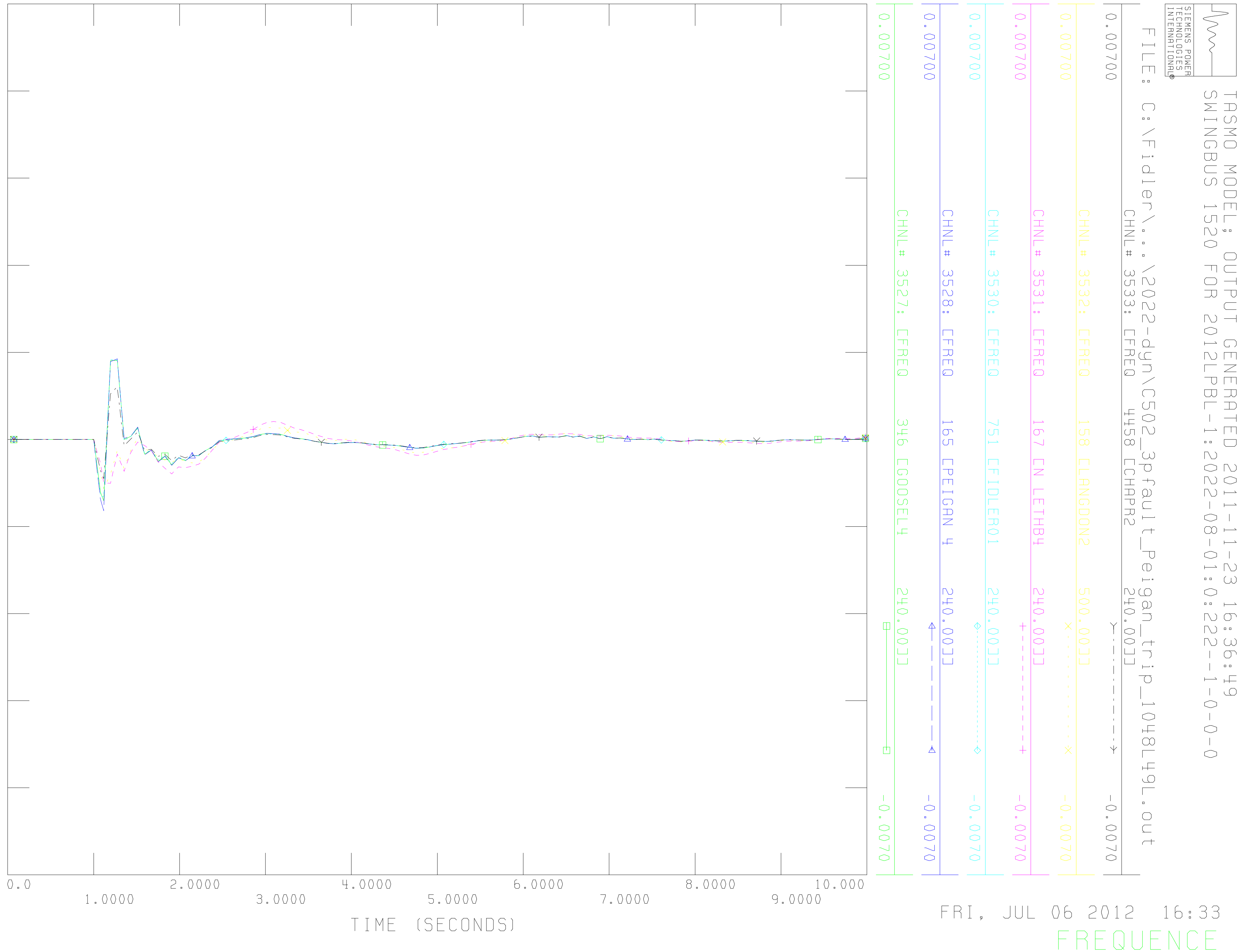
TIME (SECONDS)
FRI, JUL 06 2012 16:33
RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C502_3pfault_Peigan_trip_1048L49L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]
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CHNL# 3532: [FREQ 158 [LANGDON2 500.00]
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-0.0070
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
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-0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
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-0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
0.00700
-0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
0.00700
-0.0070
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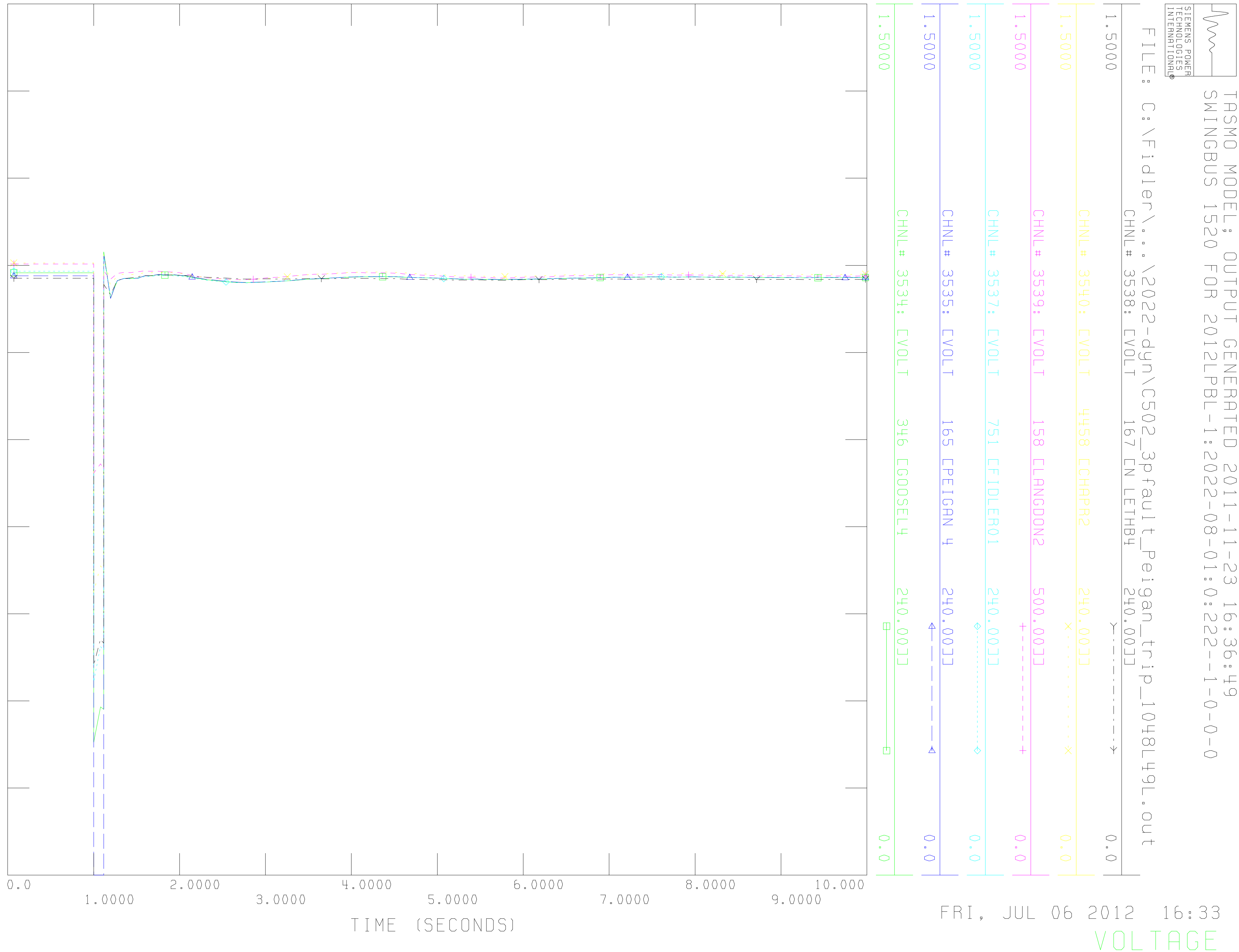
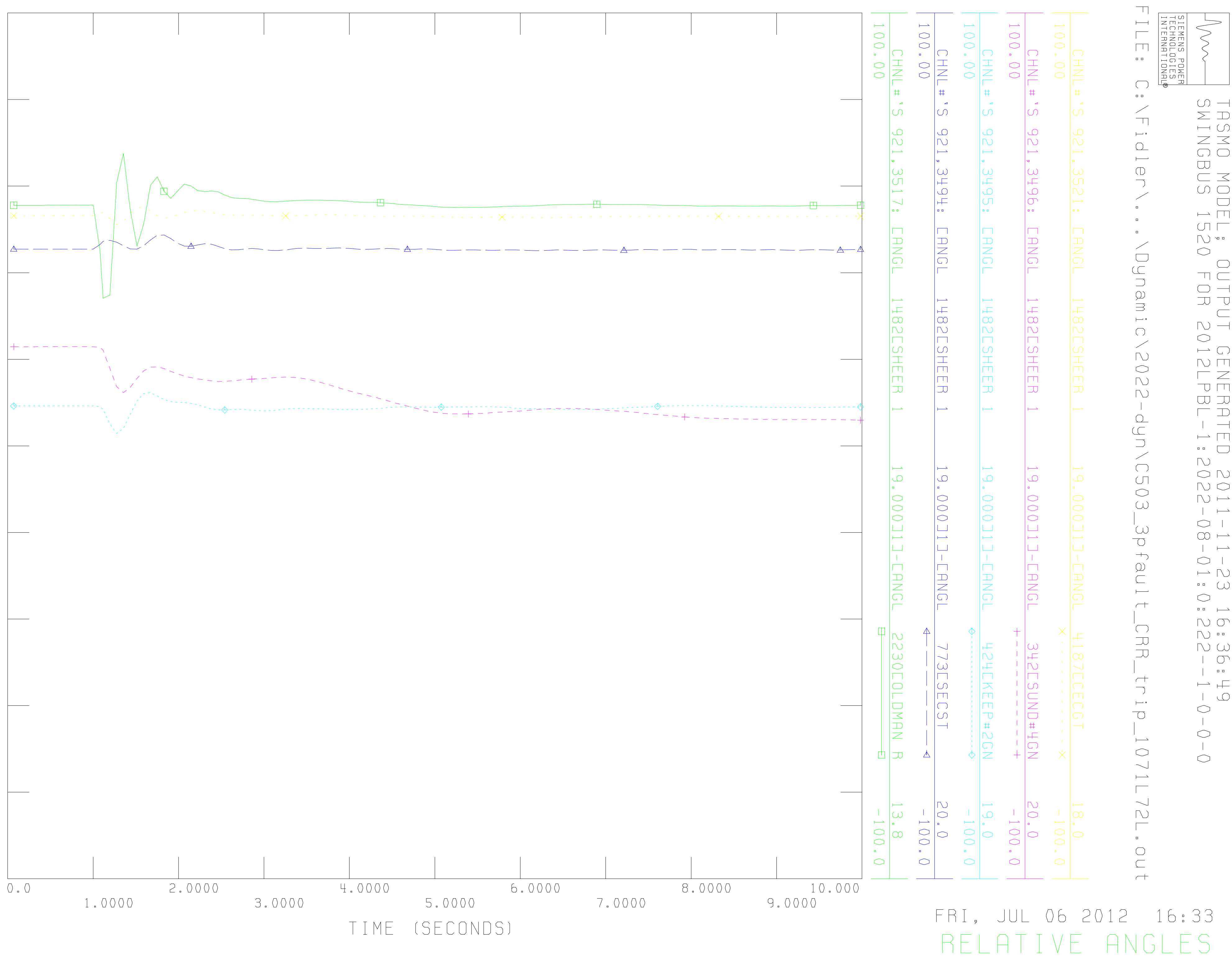
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE


SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C502_3pfault_Peigan_trip_1048L49L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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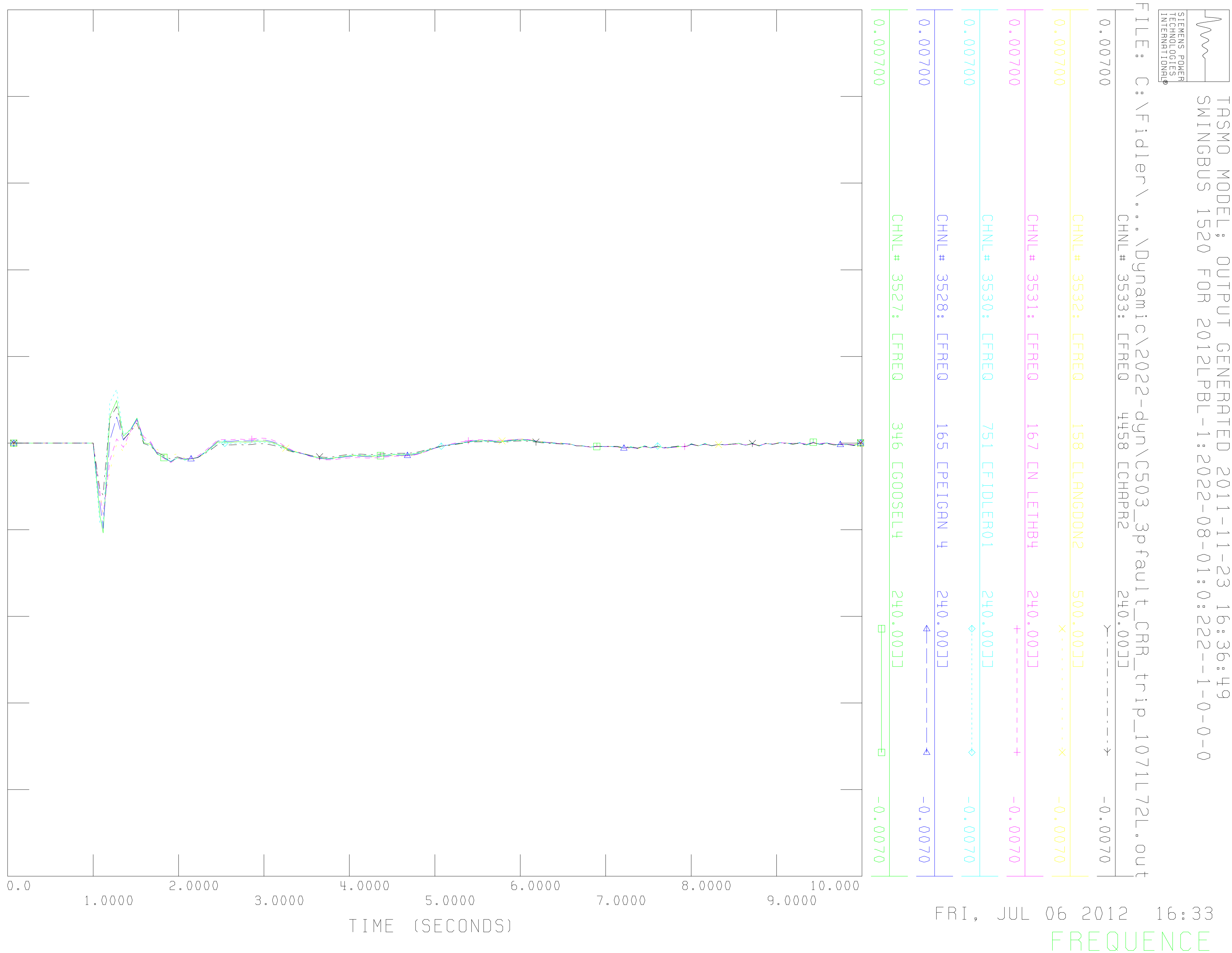
TIME (SECONDS)
FRI, JUL 06 2012 16:33
RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
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CHNL# 3532: CFREQ 158 [LANGDON2 500.00]
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CHNL# 3531: CFREQ 167 [N LETHB4 240.00]
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CHNL# 3530: CFREQ 751 [FIDLER01 240.00]
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CHNL# 3528: CFREQ 165 [PEIGAN 4 240.00]
-0.0070
0.00700
CHNL# 3527: CFREQ 346 [GOOSEL4 240.00]
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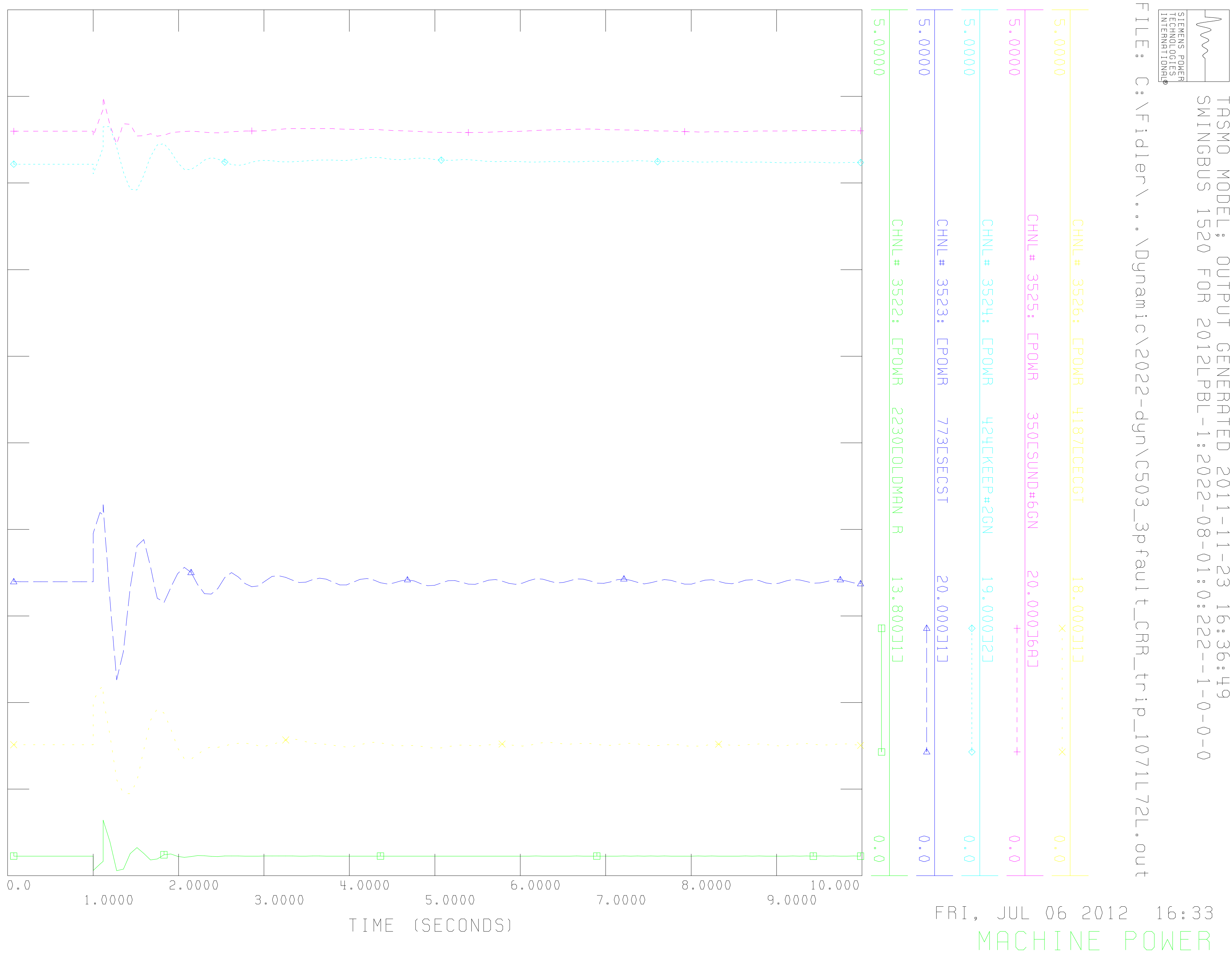
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[CCGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
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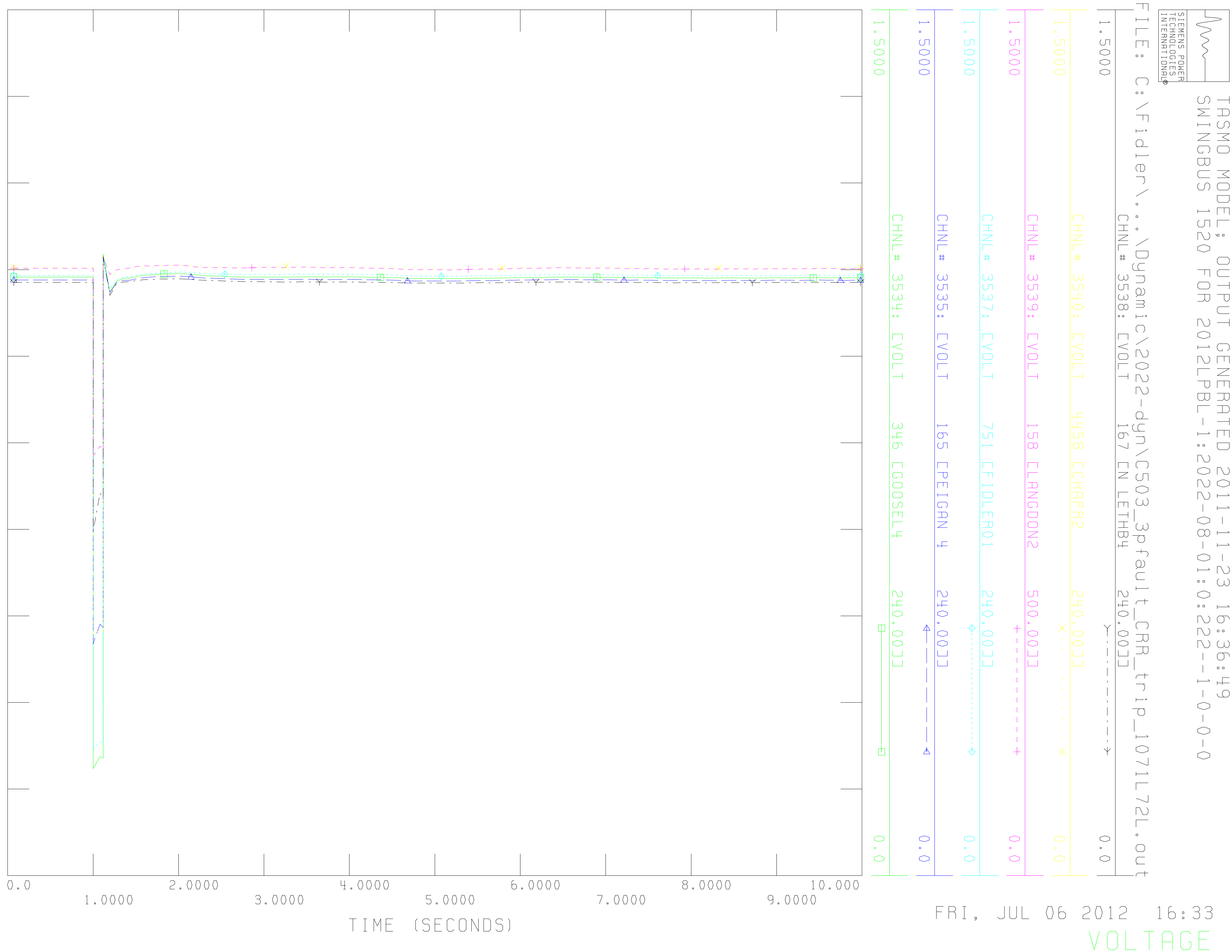
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
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0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000
0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000
0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000
0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000
0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000
0.0
0.0
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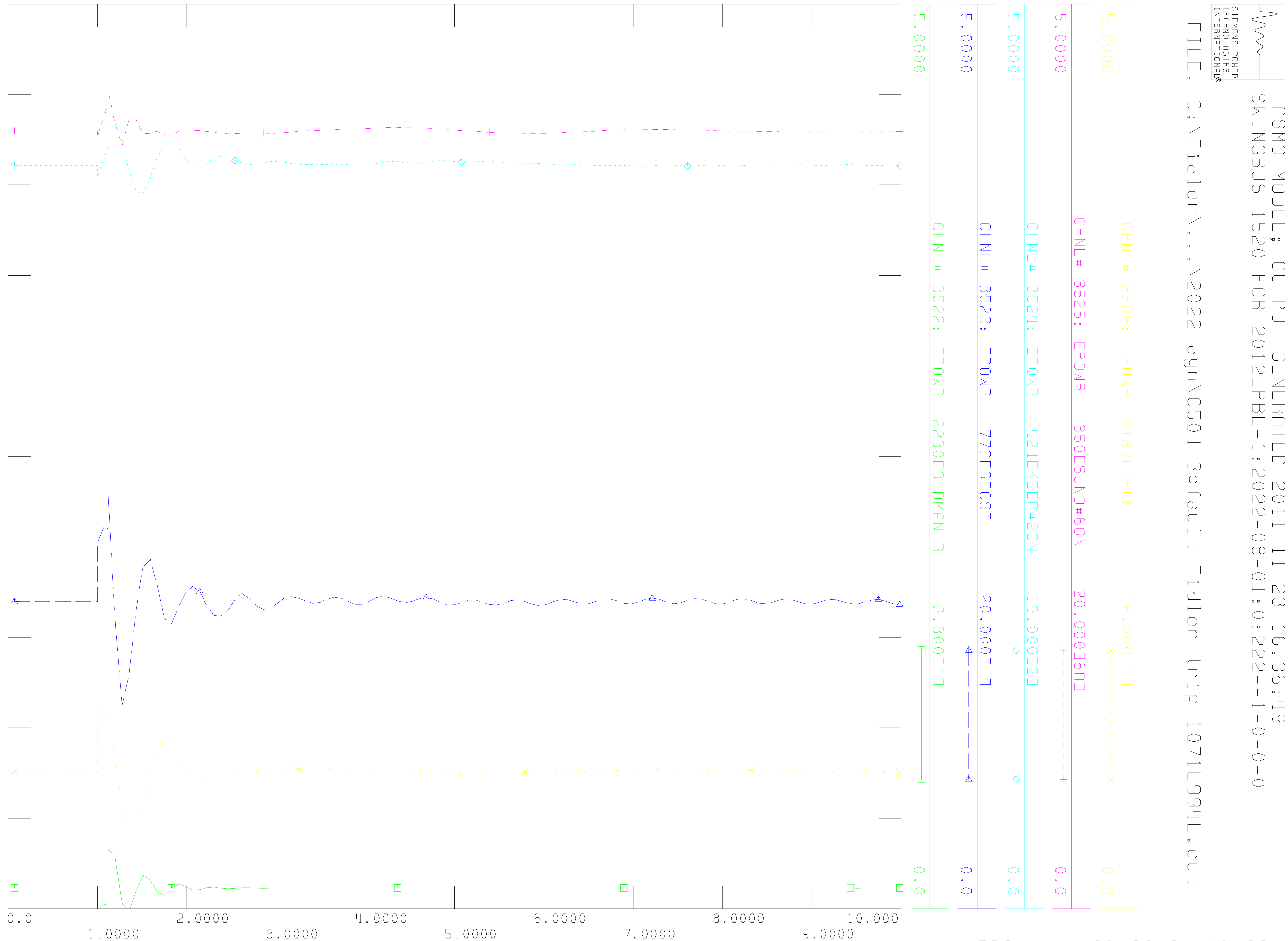
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



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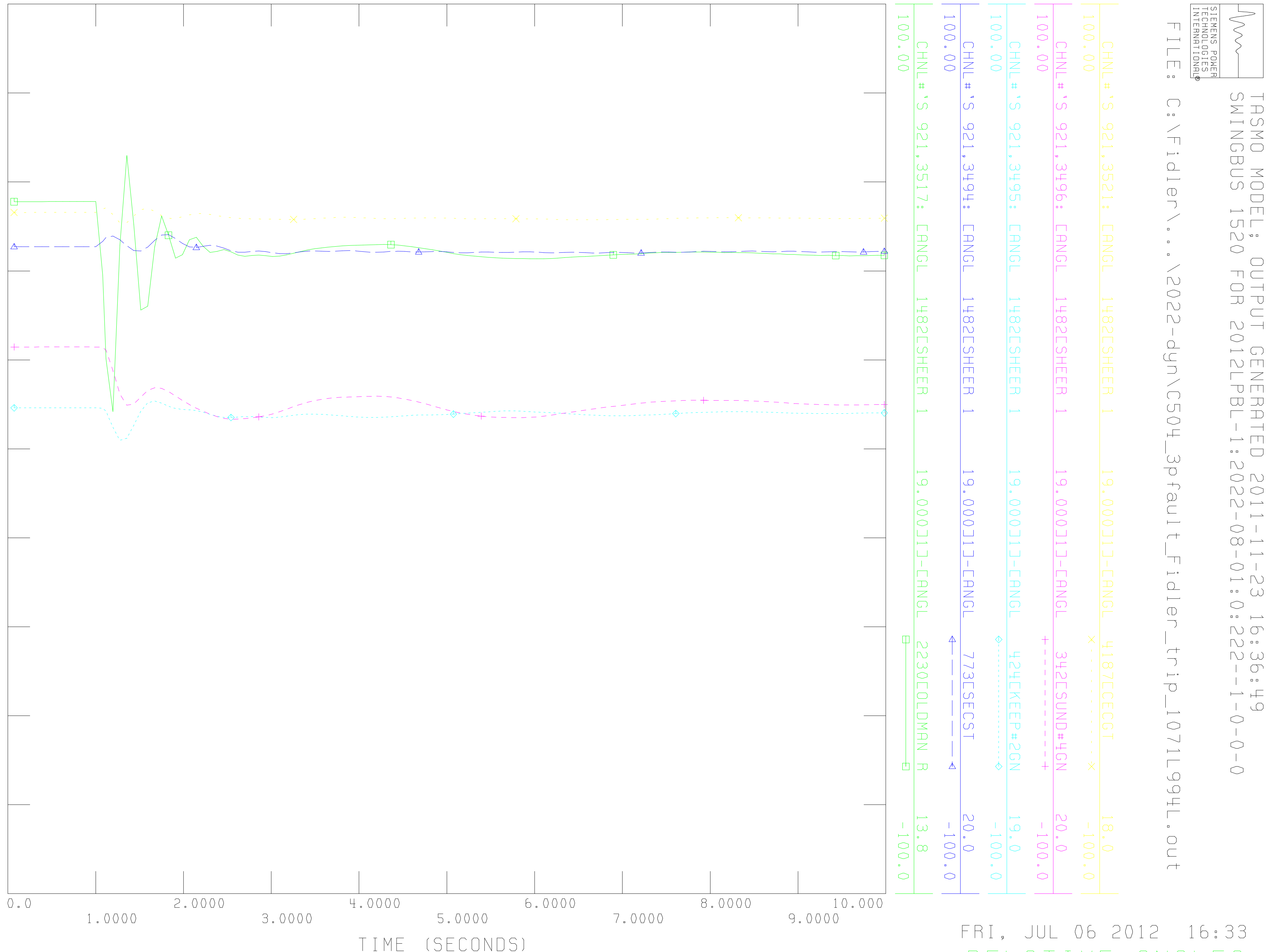
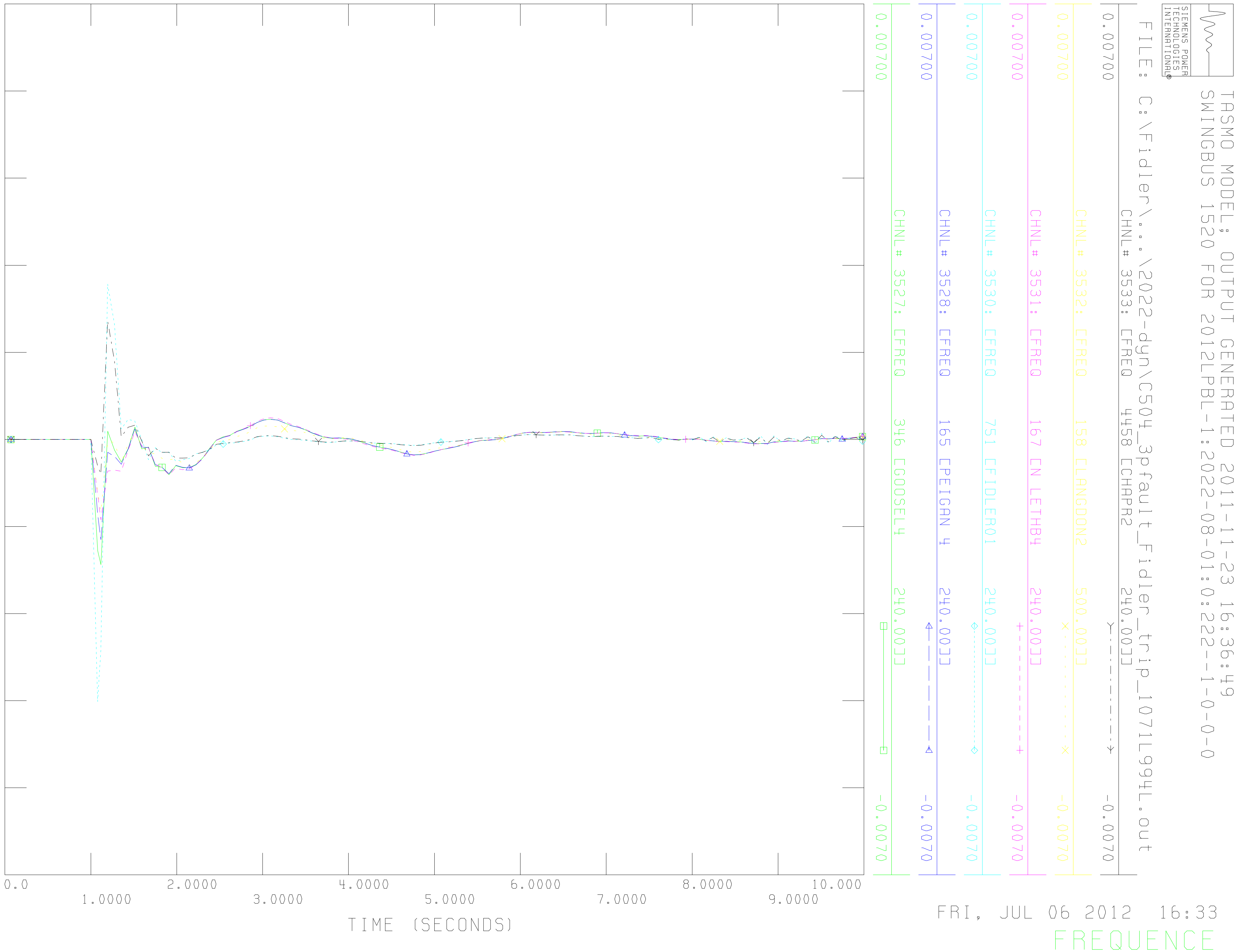
MACHINE POWER



FRI, JUL 06 2012 16:33

RELATIVE ANGLES



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3530: [FREQ 751 [FIDLER01 240.0]]
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CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]]
0.00700
-0.0070
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0.00700
-0.0070
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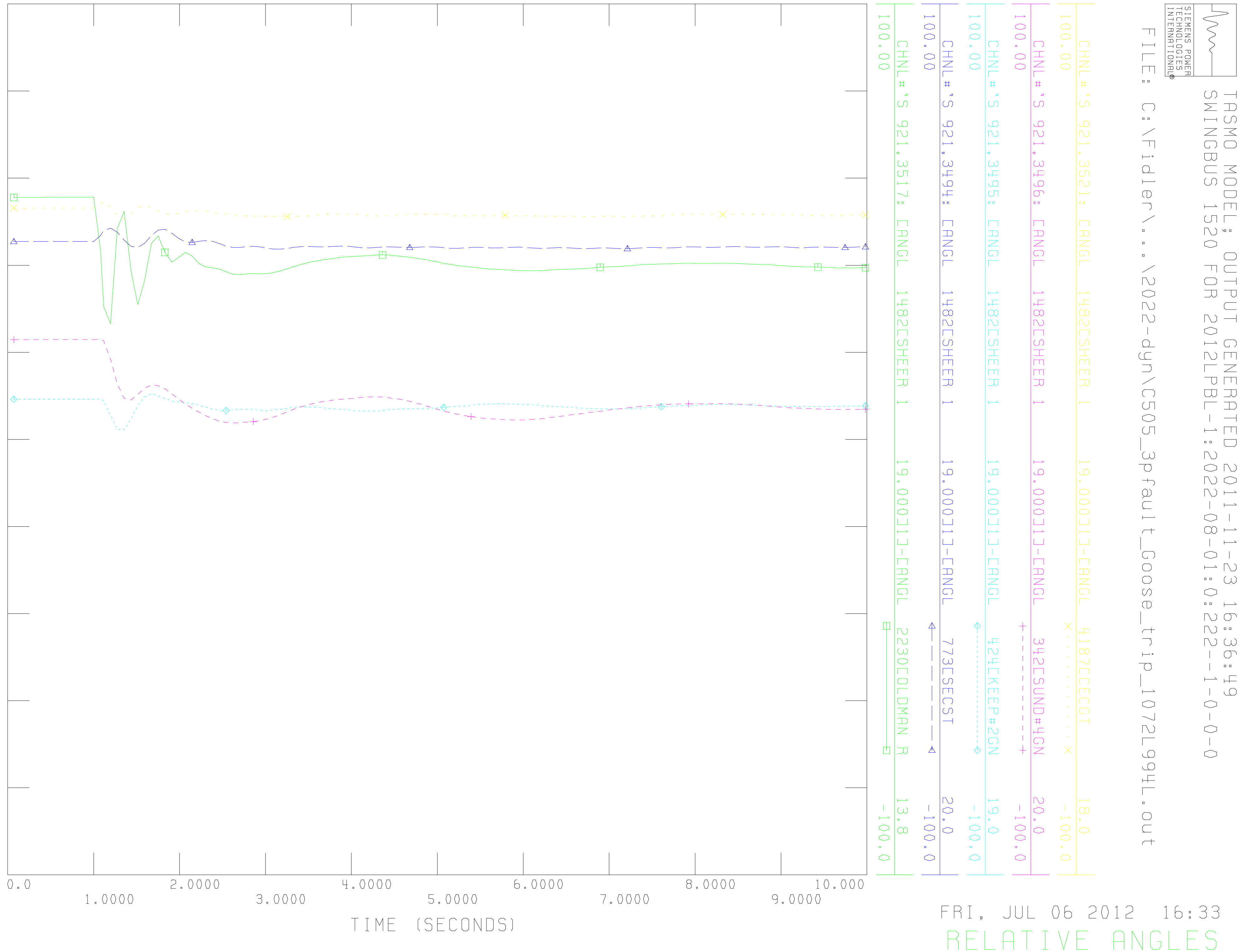
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\2022-dyn\C505_3pfault_Goose_trip_1072L94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CCEGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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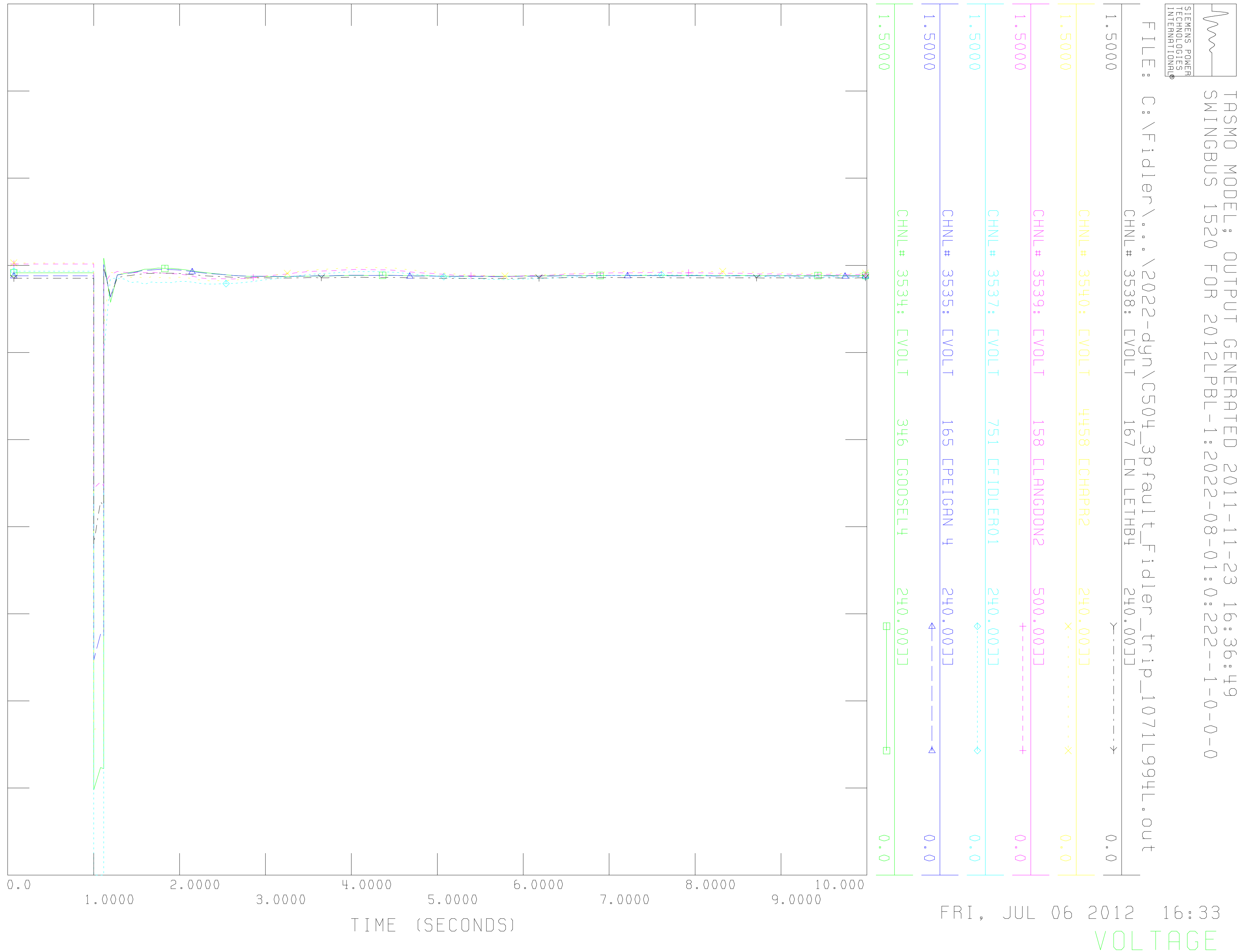
TIME (SECONDS)
FRI, JUL 06 2012 16:33
RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C504_3pfault_Fidler_trip_1071L994L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]] 1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]] 1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]] 1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]] 1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]] 1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]] 1.5000 0.0
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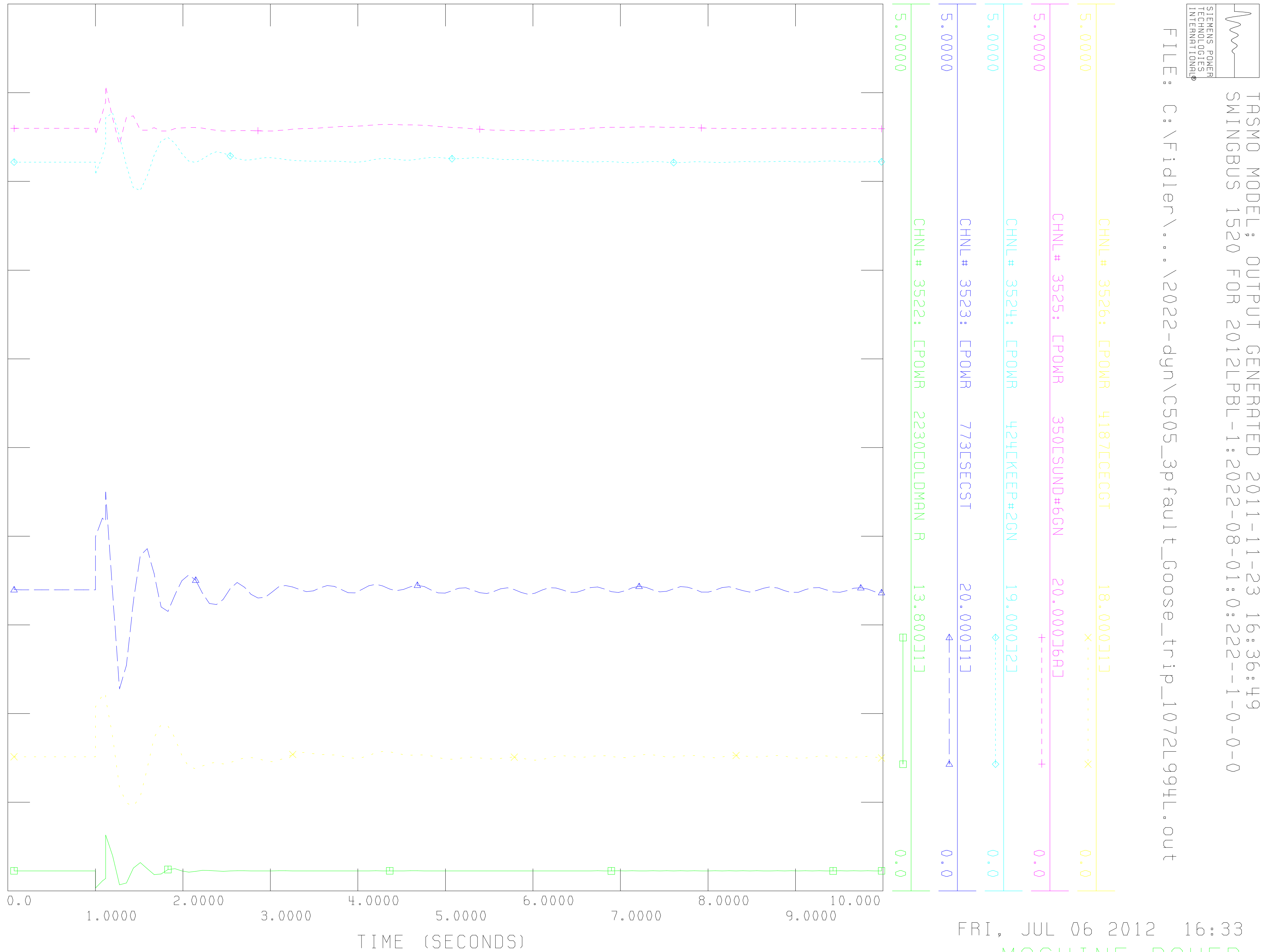
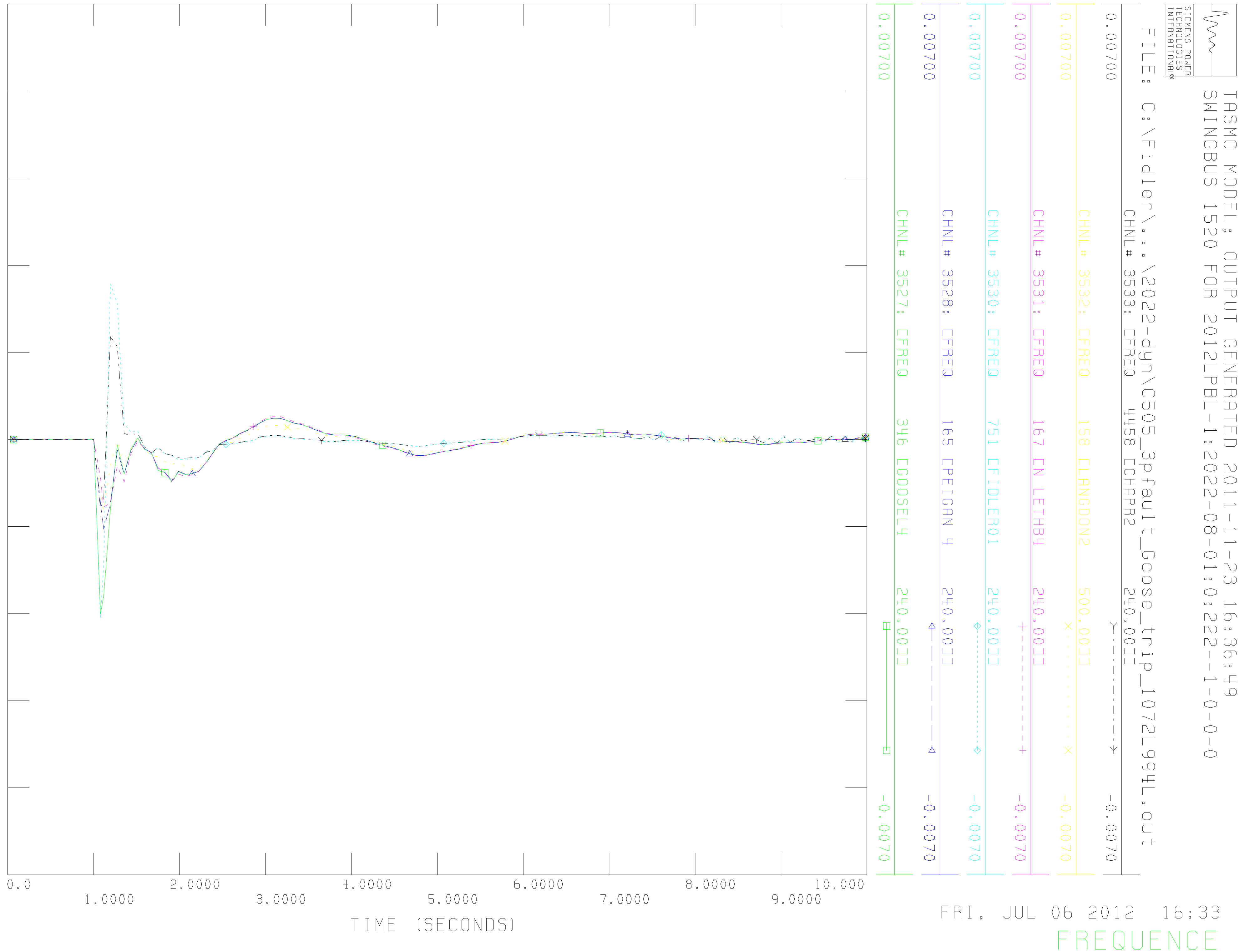
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



FRI, JUL 06 2012 16:33

MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C505_3pfault_Goose_trip_1072L94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
0.00700 CHNL# 3533: [FREQ 4458 [CHAPR2 240.00] -0.0070
0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.00] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.00] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.00] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.00] -0.0070
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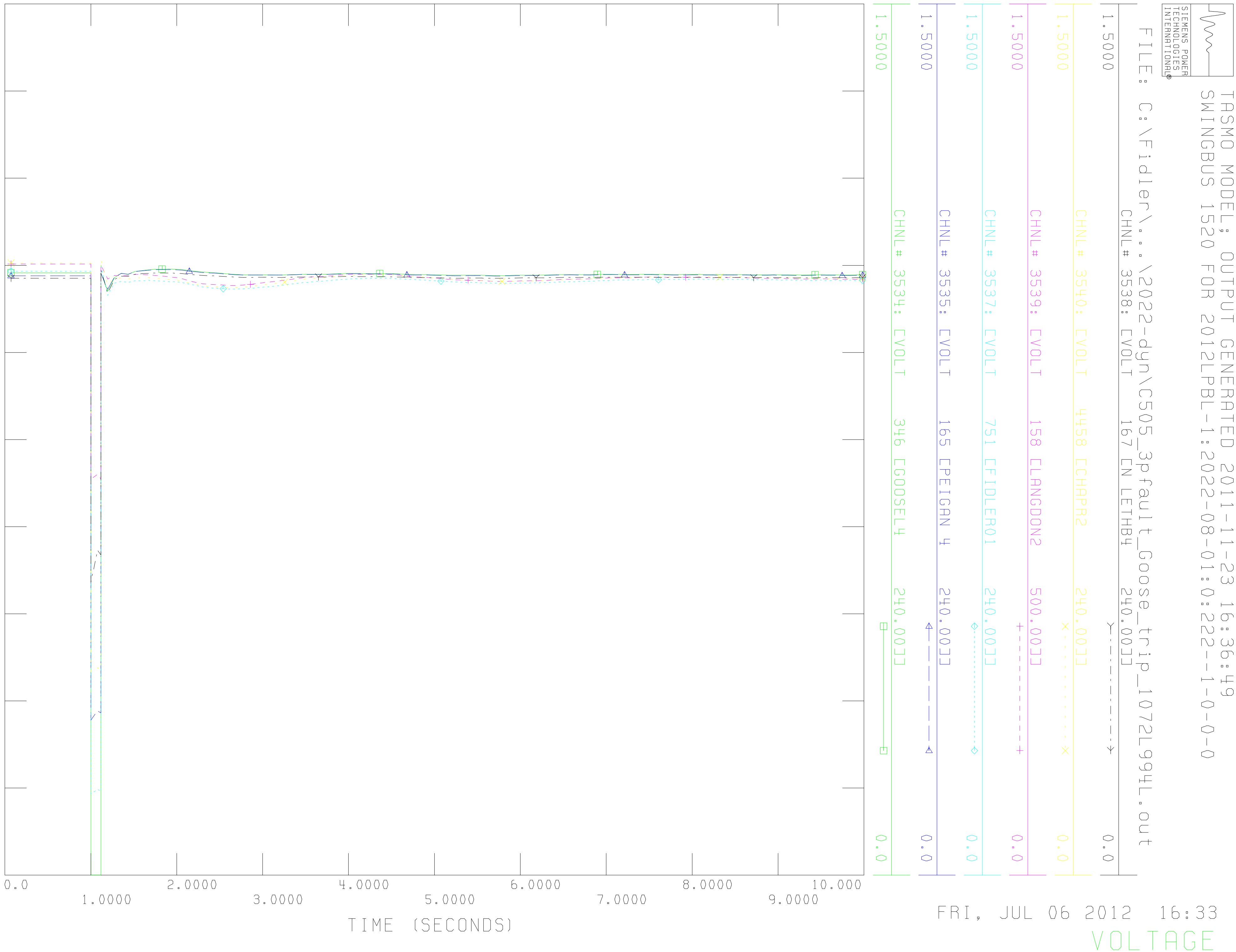
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C505_3pfault_Goose_trip_1072L94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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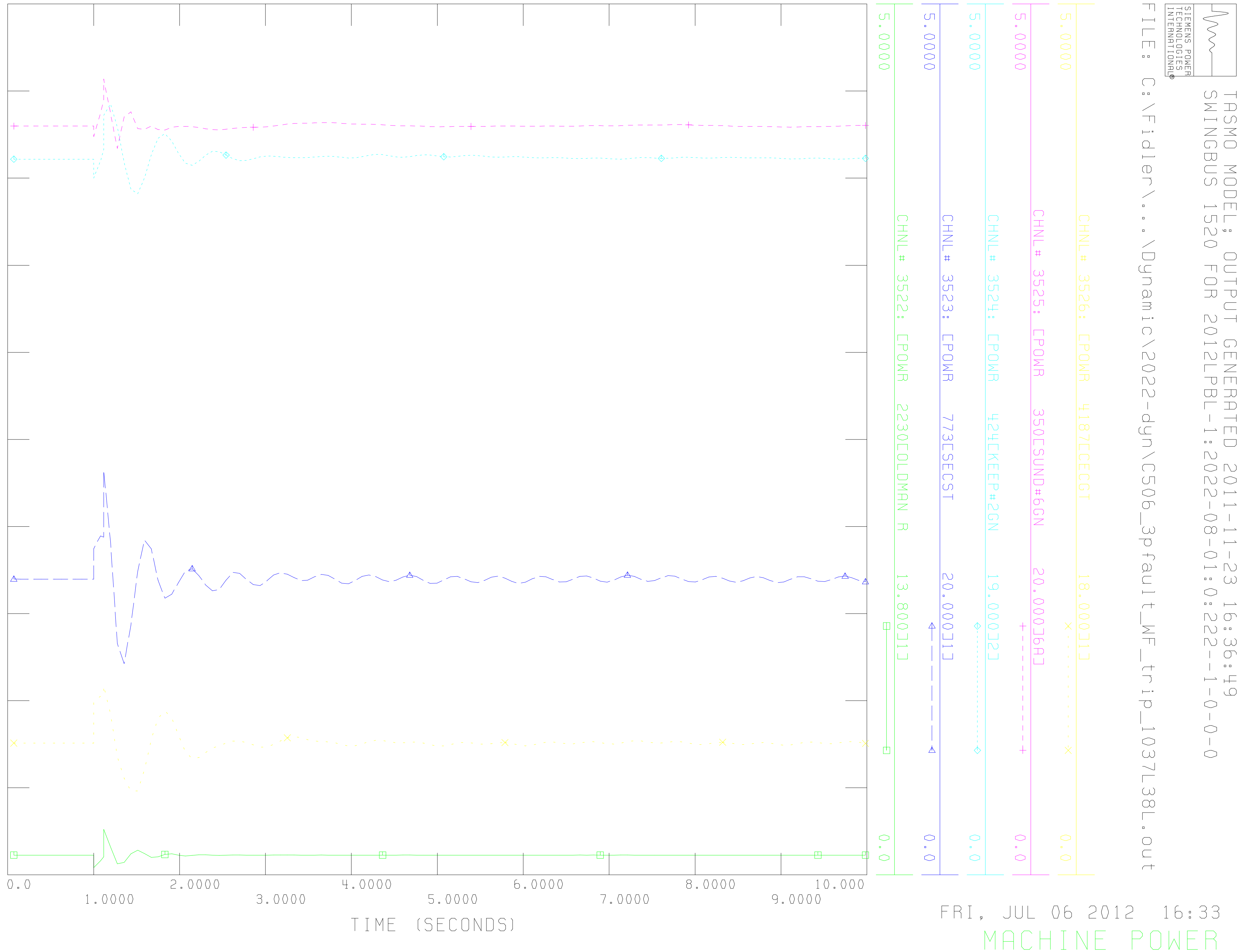
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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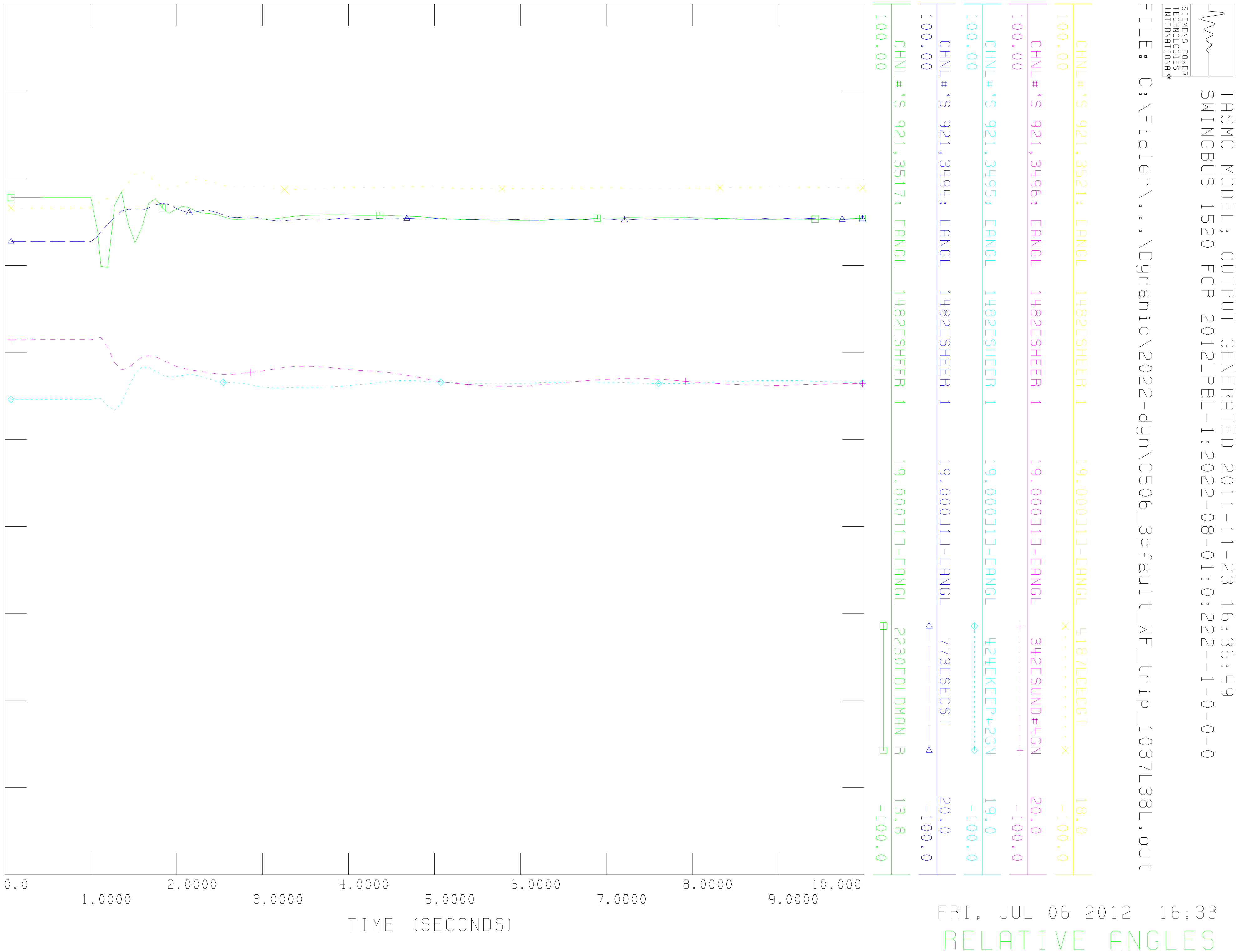
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C506_3pfault_WF_trip_1037L38L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CECGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
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CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
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100.00 -100.0
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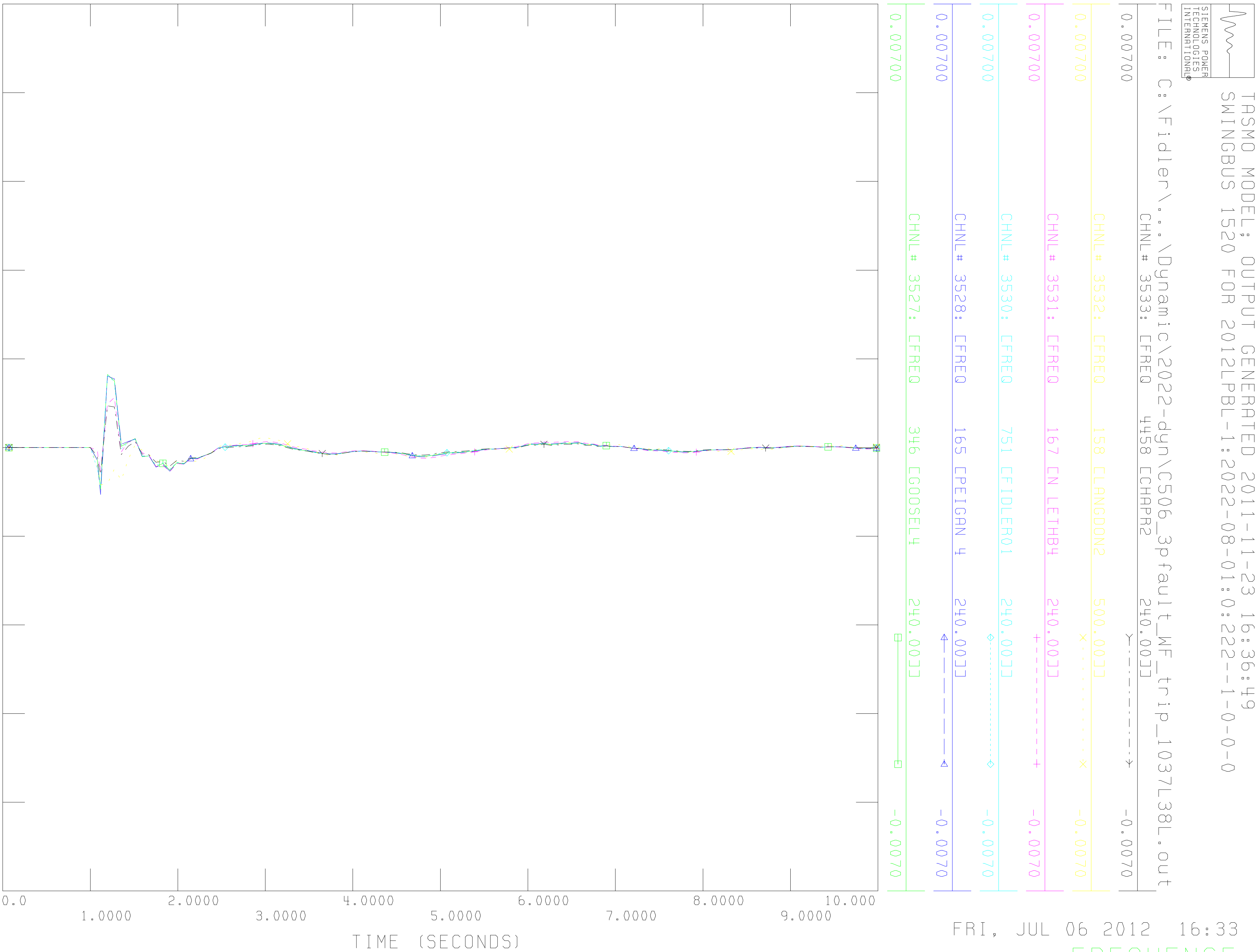
TIME (SECONDS)
FRI, JUL 06 2012 16:33
RELATIVE ANGLES



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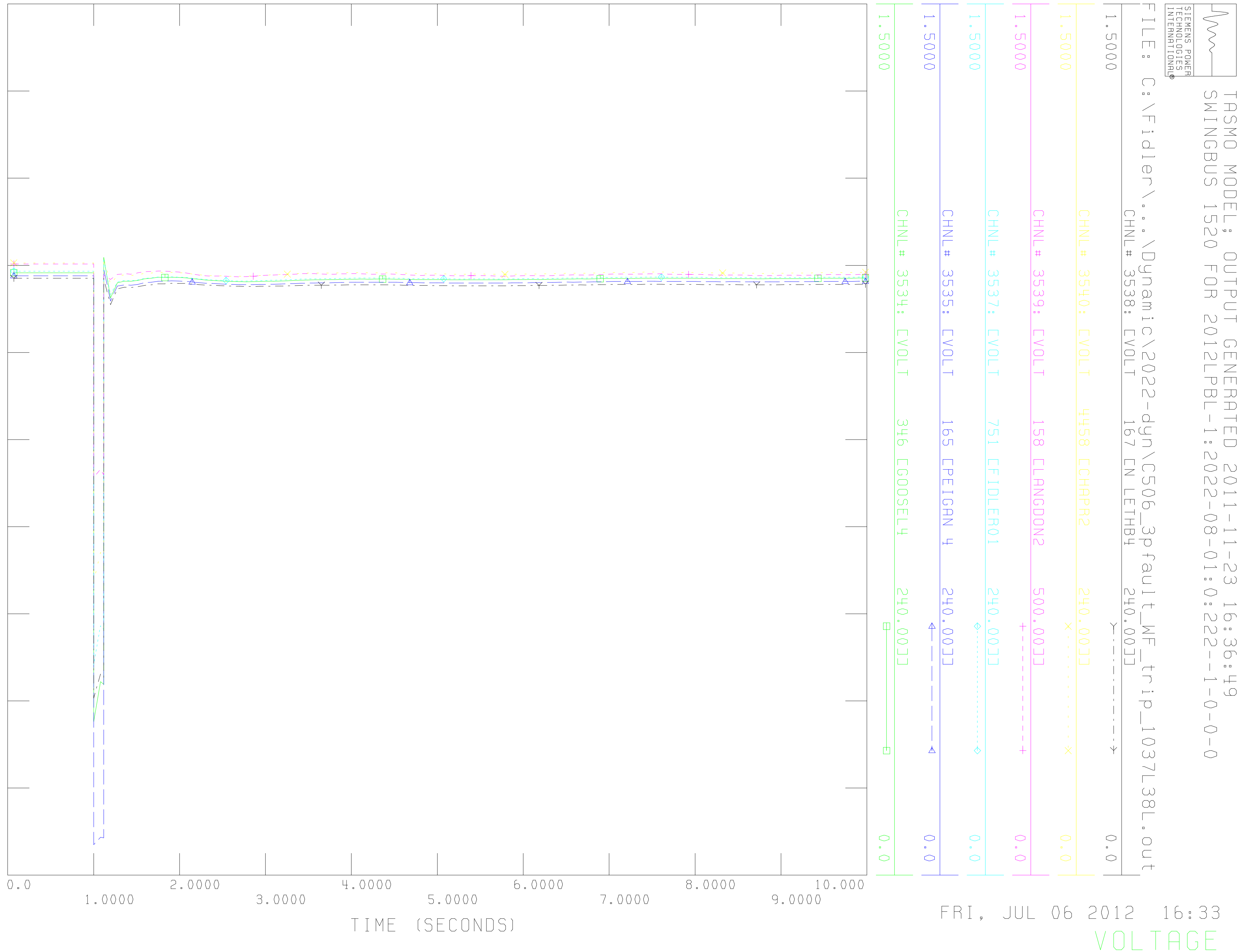
FREQUENCE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C506_3pfault_WF_trip_1037L38L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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1.5000 CHNL# 3540: [VOLT 4458 [CHAPR2 240.00] 0.0
1.5000 CHNL# 3539: [VOLT 158 [LANGDON2 500.00] 0.0
1.5000 CHNL# 3537: [VOLT 751 [FIDLER01 240.00] 0.0
1.5000 CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00] 0.0
1.5000 CHNL# 3534: [VOLT 346 [GOOSEL4 240.00] 0.0
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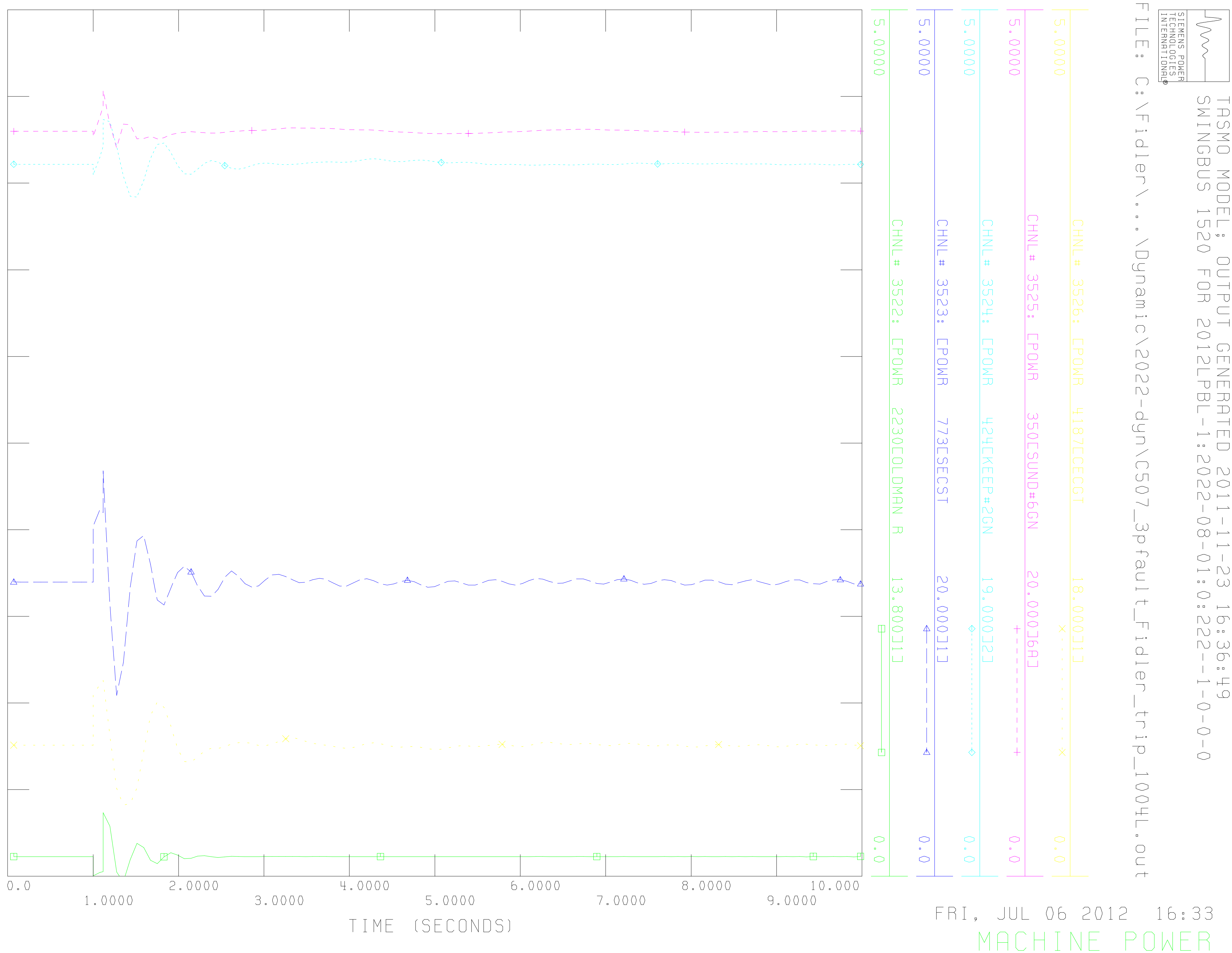
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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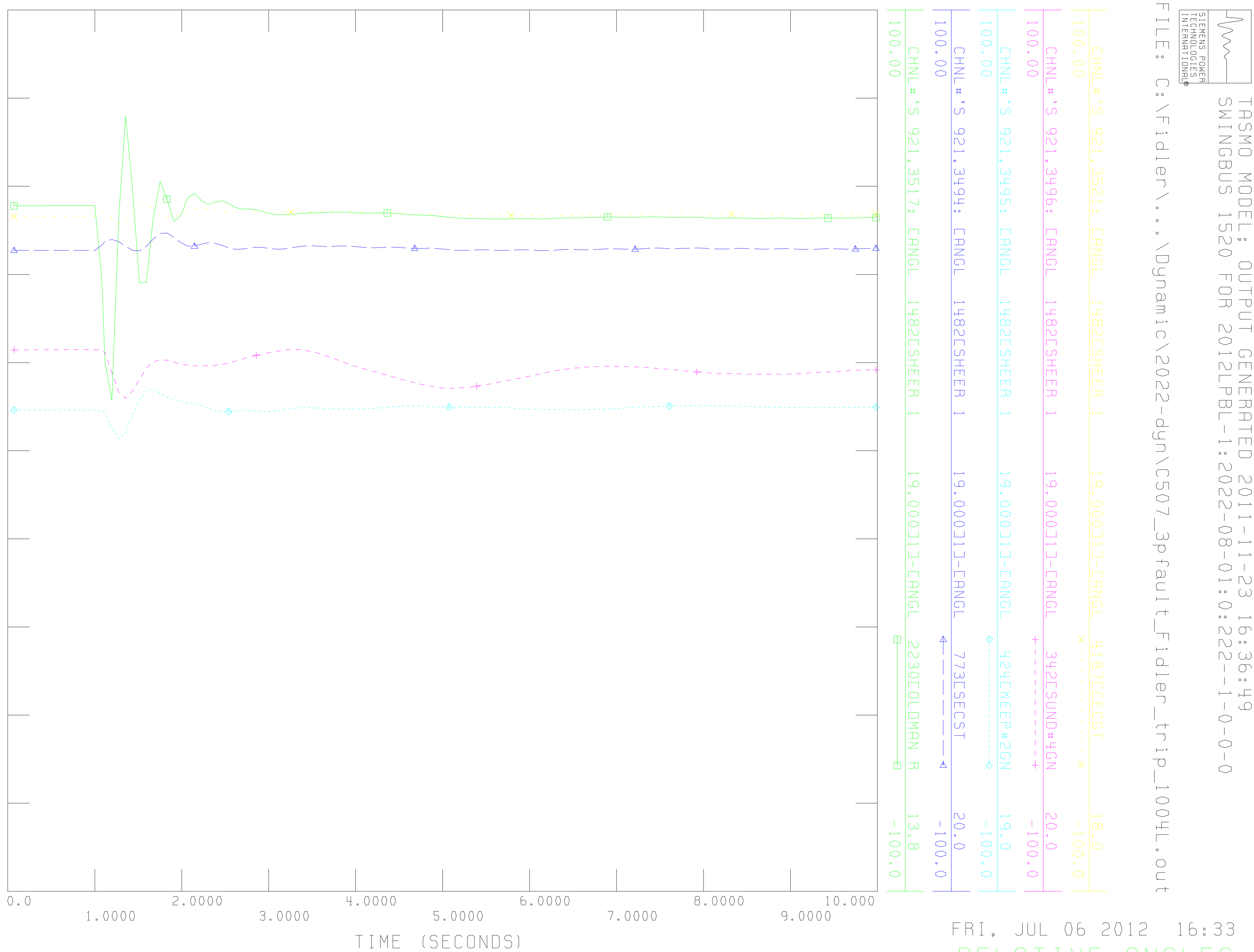
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER



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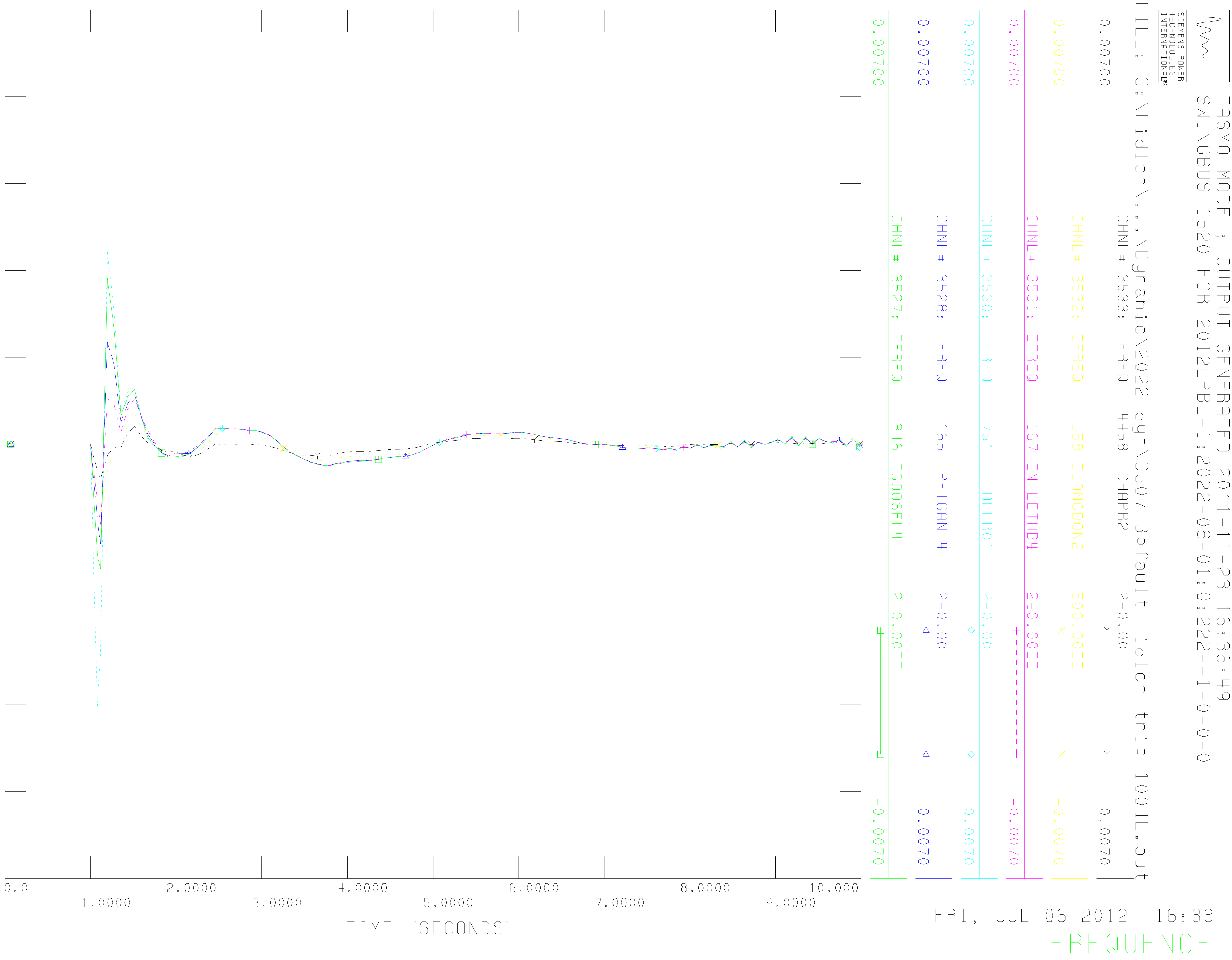
RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
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CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
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CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
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CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
0.00700 -0.0070
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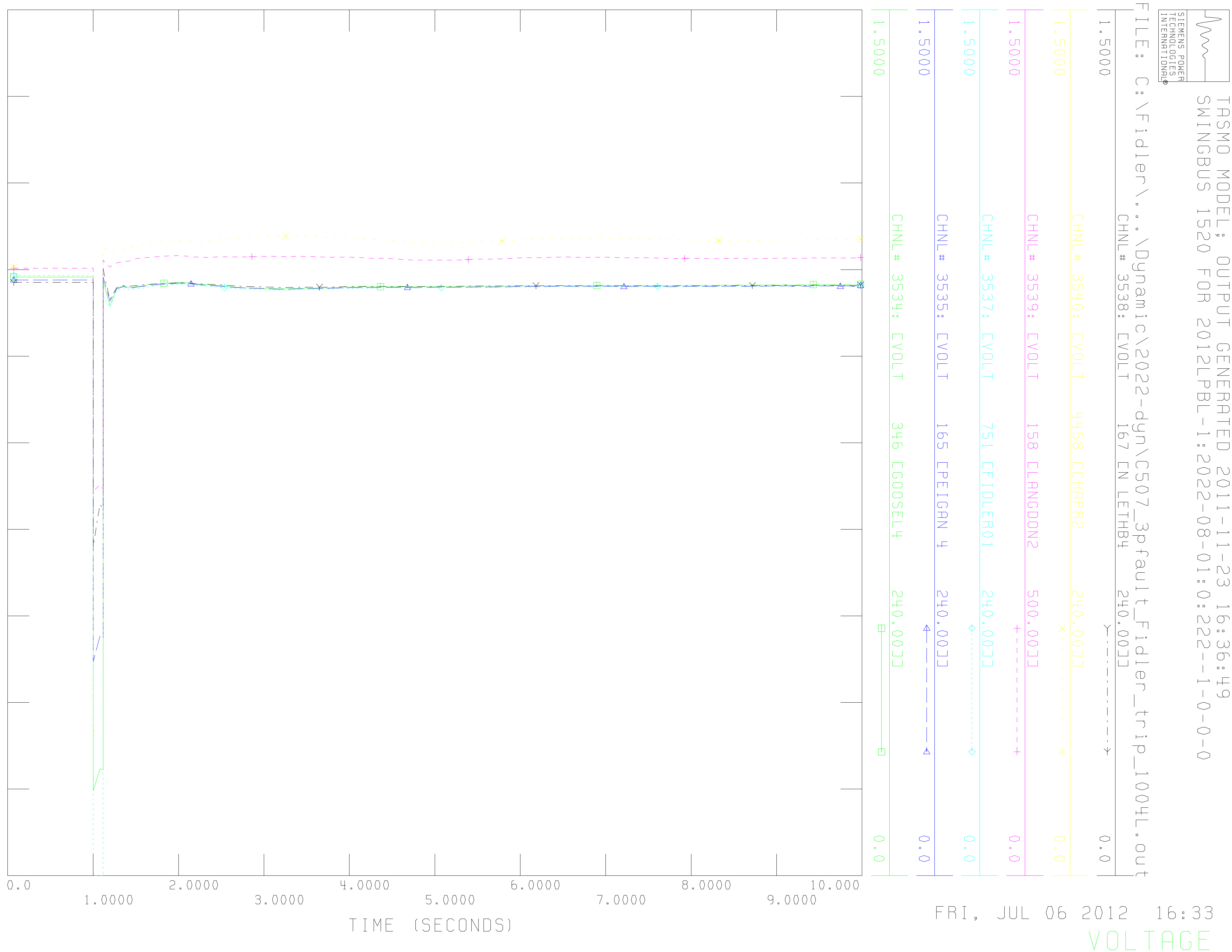
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE


SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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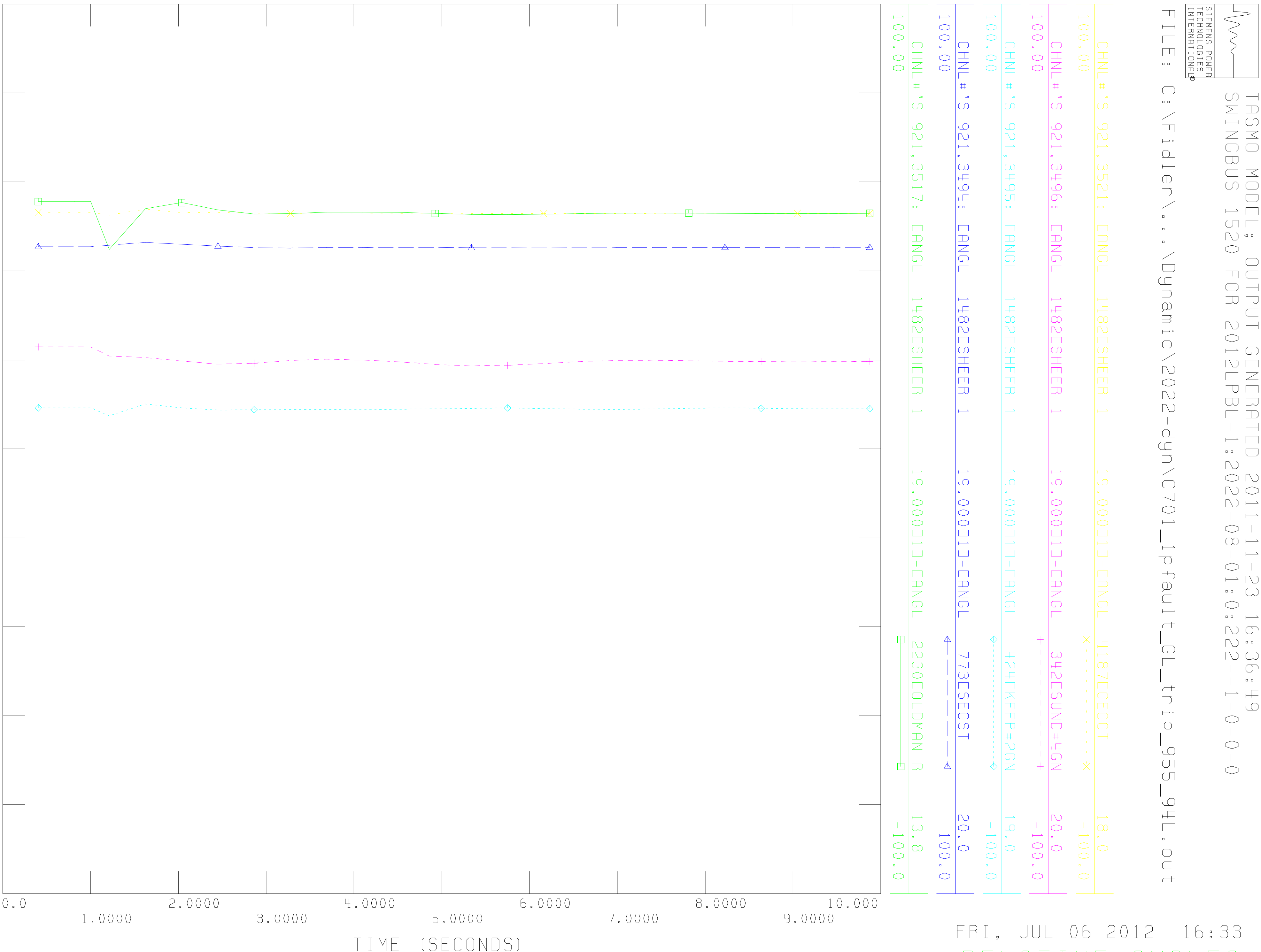
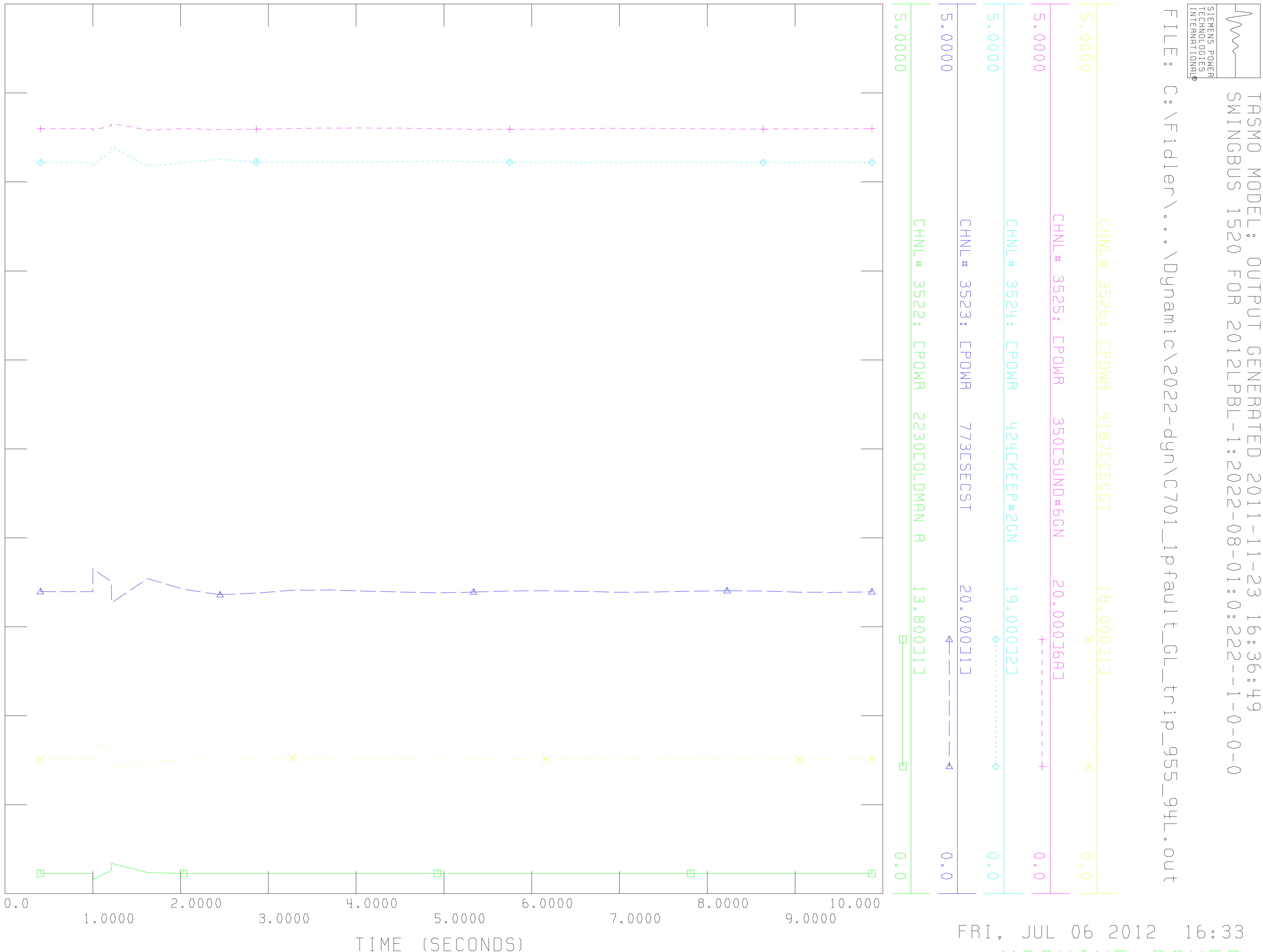
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



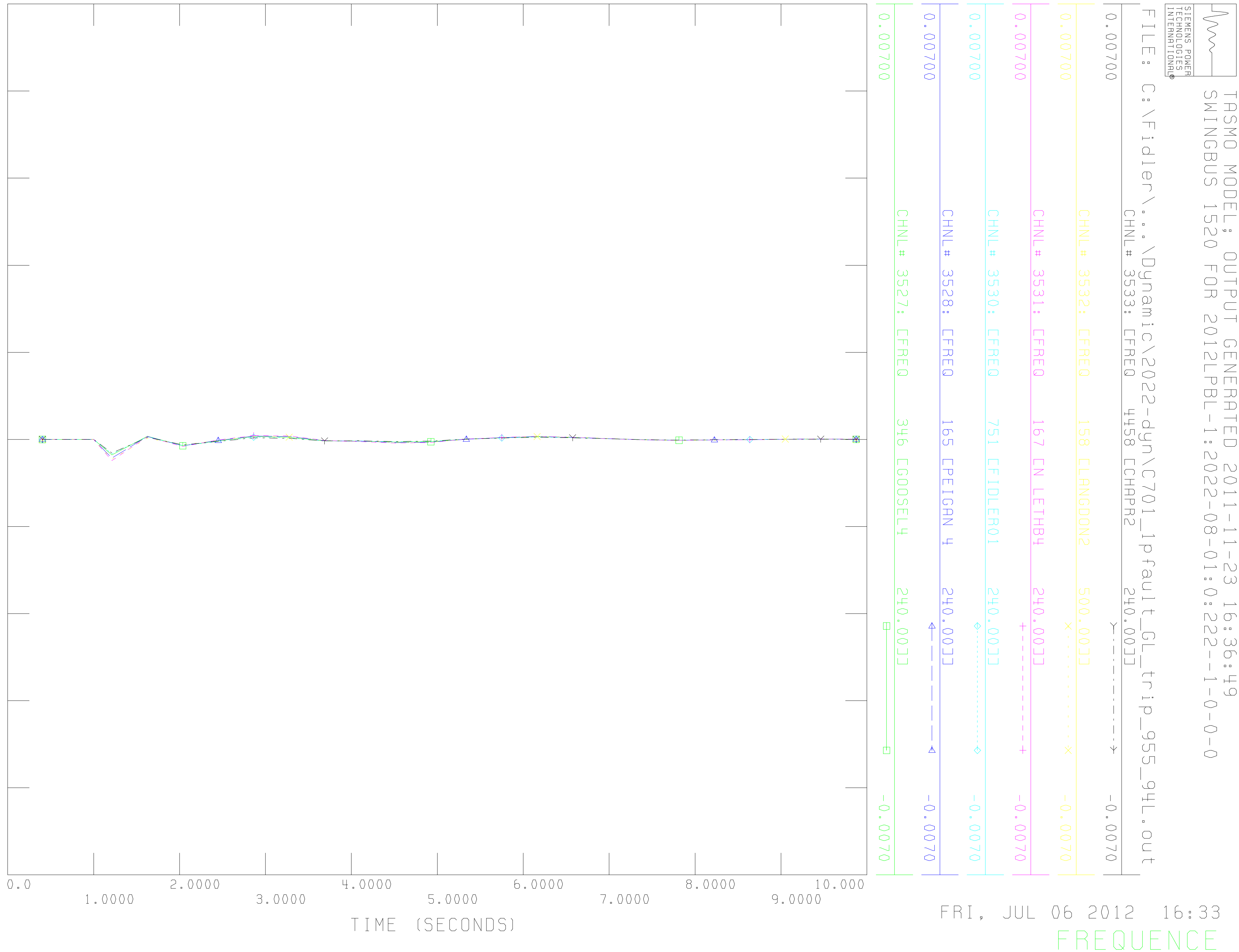
FRI, JUL 06 2012 16:33

RELATIVE ANGLES



FRI, JUL 06 2012 16:33

MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3532: CFREQ 158 CLANGDON2 500.0]
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-0.0070
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CHNL# 3530: CFREQ 751 CFIDLER01 240.0]
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CHNL# 3528: CFREQ 165 CPEIGAN 4 240.0]
0.00700
-0.0070
CHNL# 3527: CFREQ 346 CGOOSEL4 240.0]
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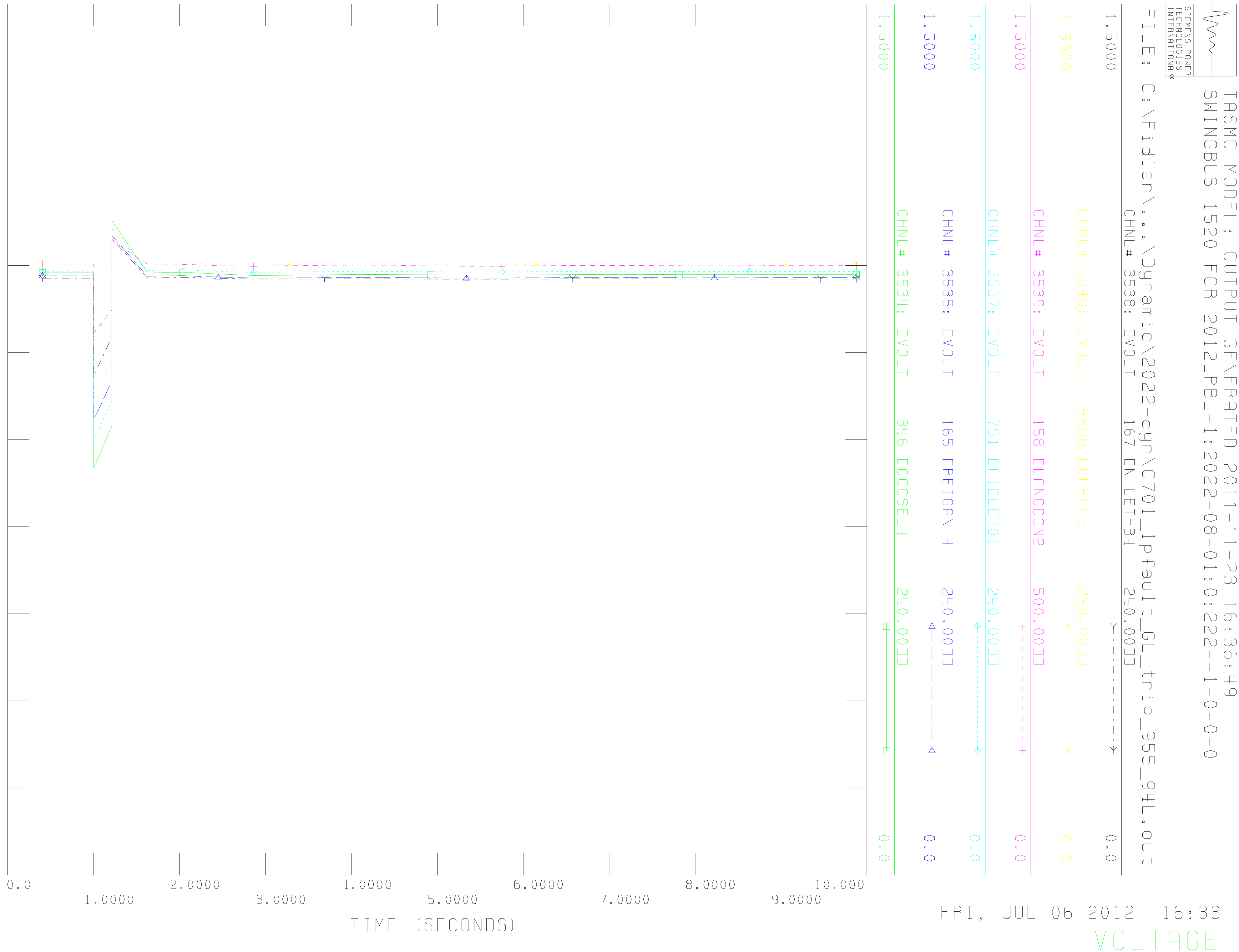
TIME (SECONDS)
FRI, JUL 06 2012 16:33
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C701_1pfault_GL_trip_955_94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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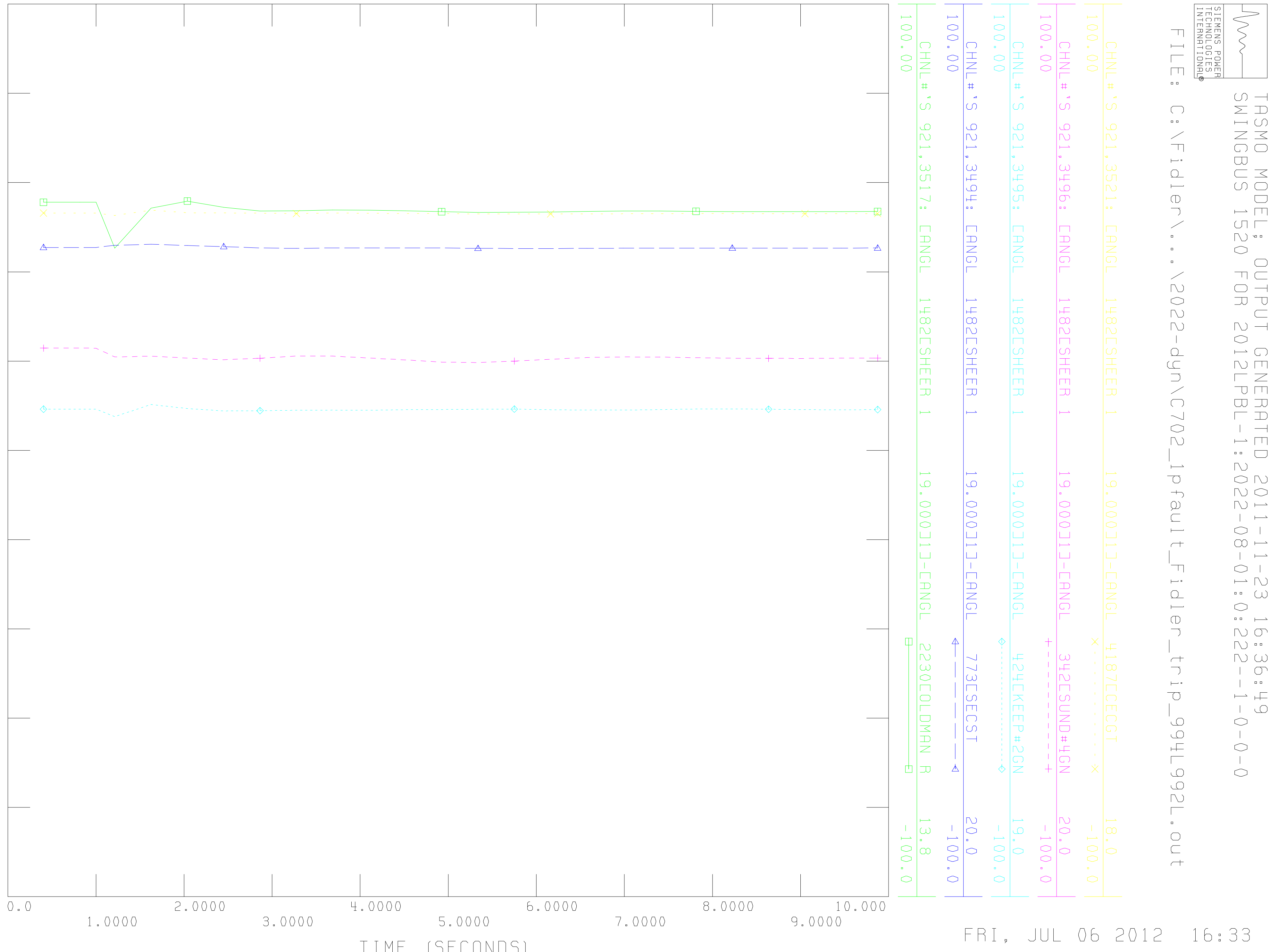
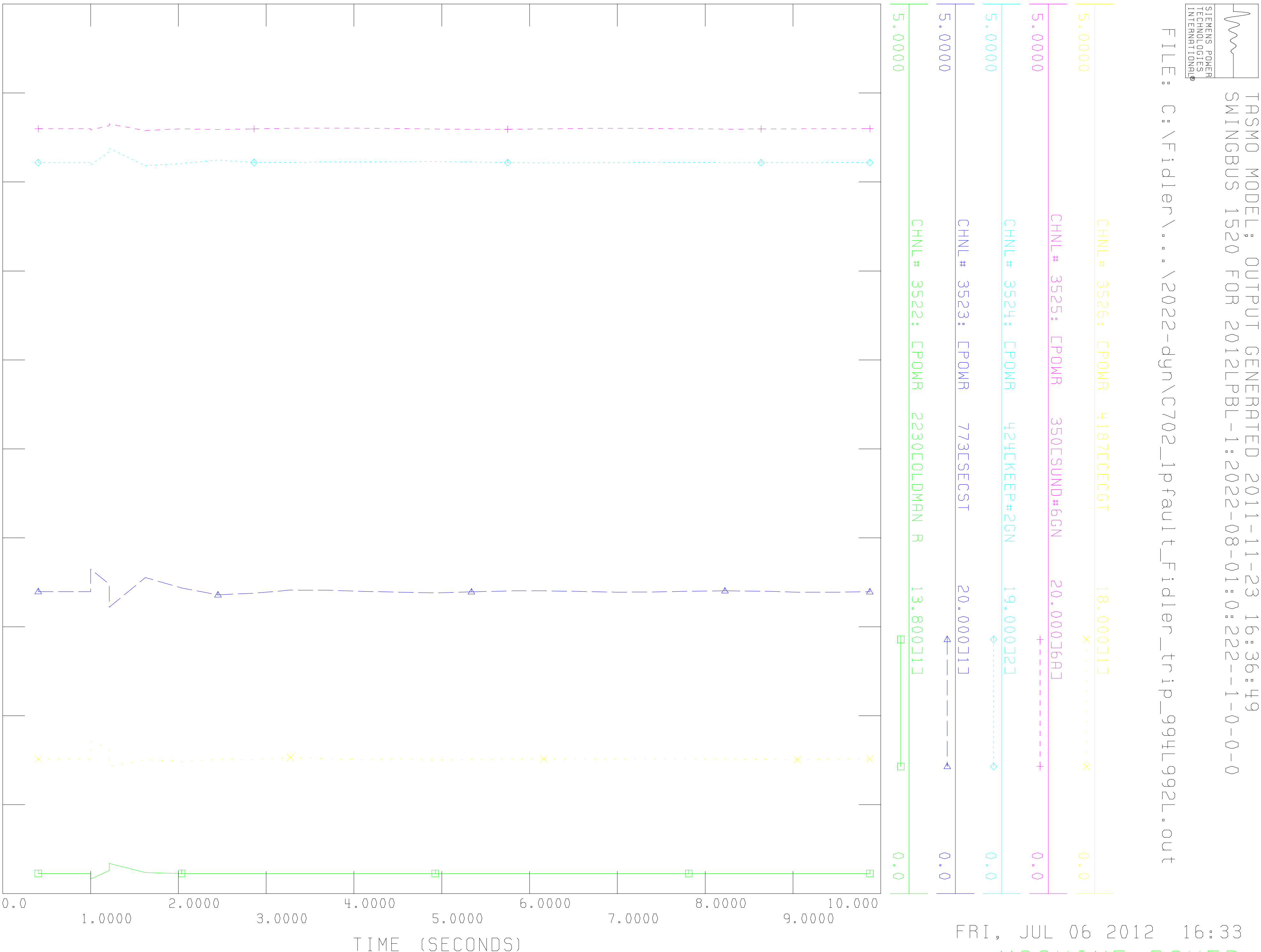
TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE



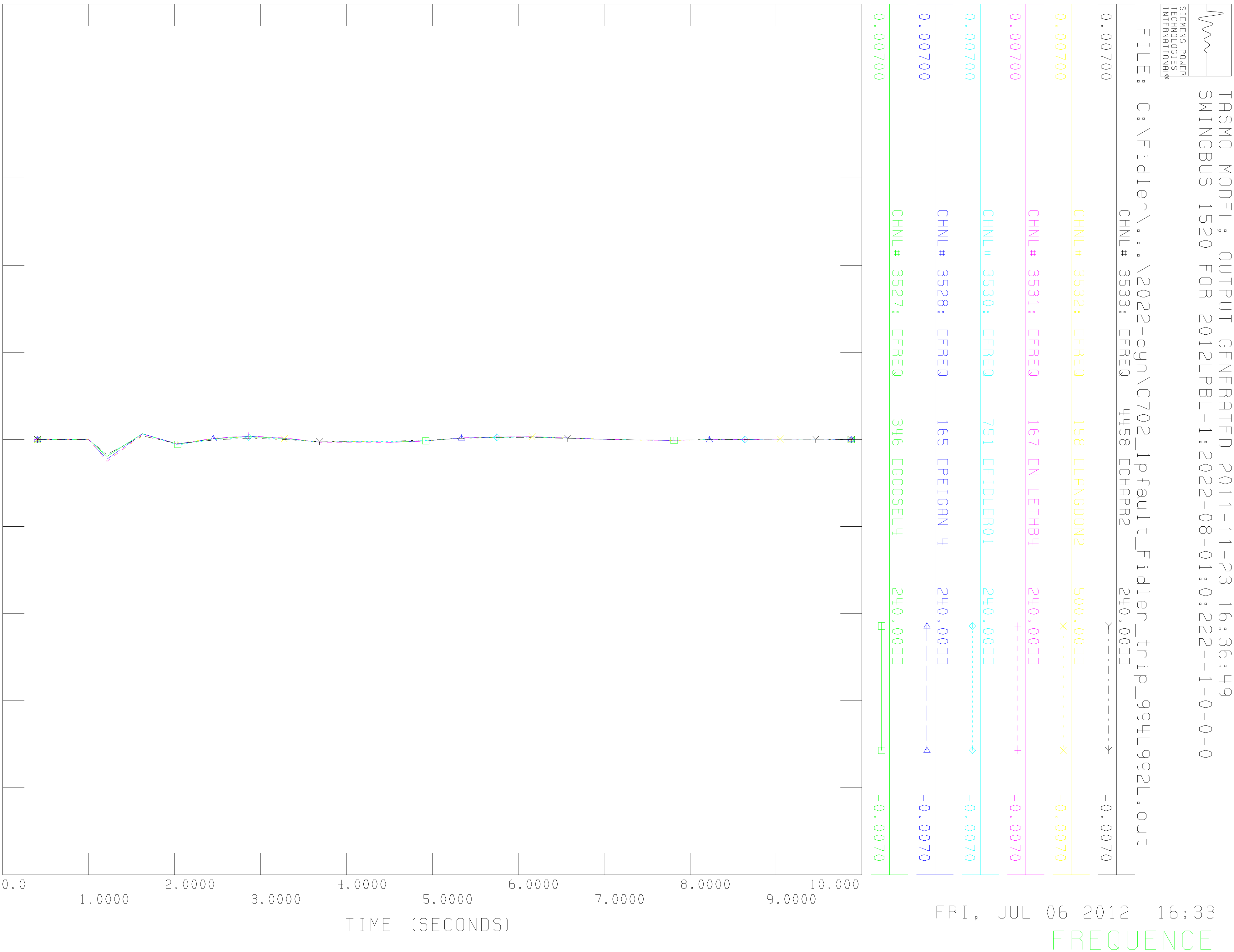
FRI, JUL 06 2012 16:33

RELATIVE ANGLES



FRI, JUL 06 2012 16:33

MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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CHNL# 3531: [FREQ 167 [N LETHB4 240.00]]
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]]
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]]
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]]
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-0.0070
0.0
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2.0000
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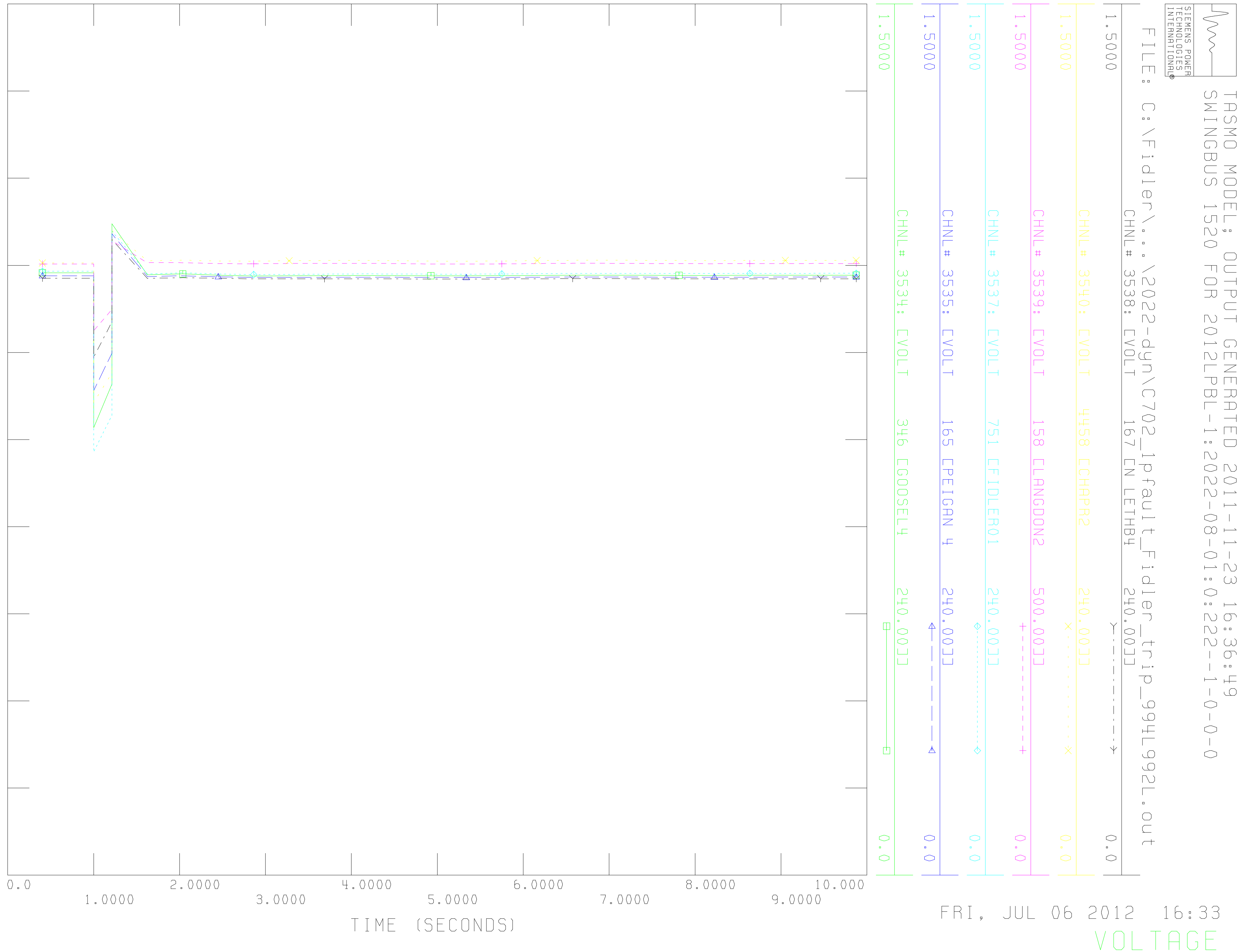

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1.5000
0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
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0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000
0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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0.0
0.0
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2.0000
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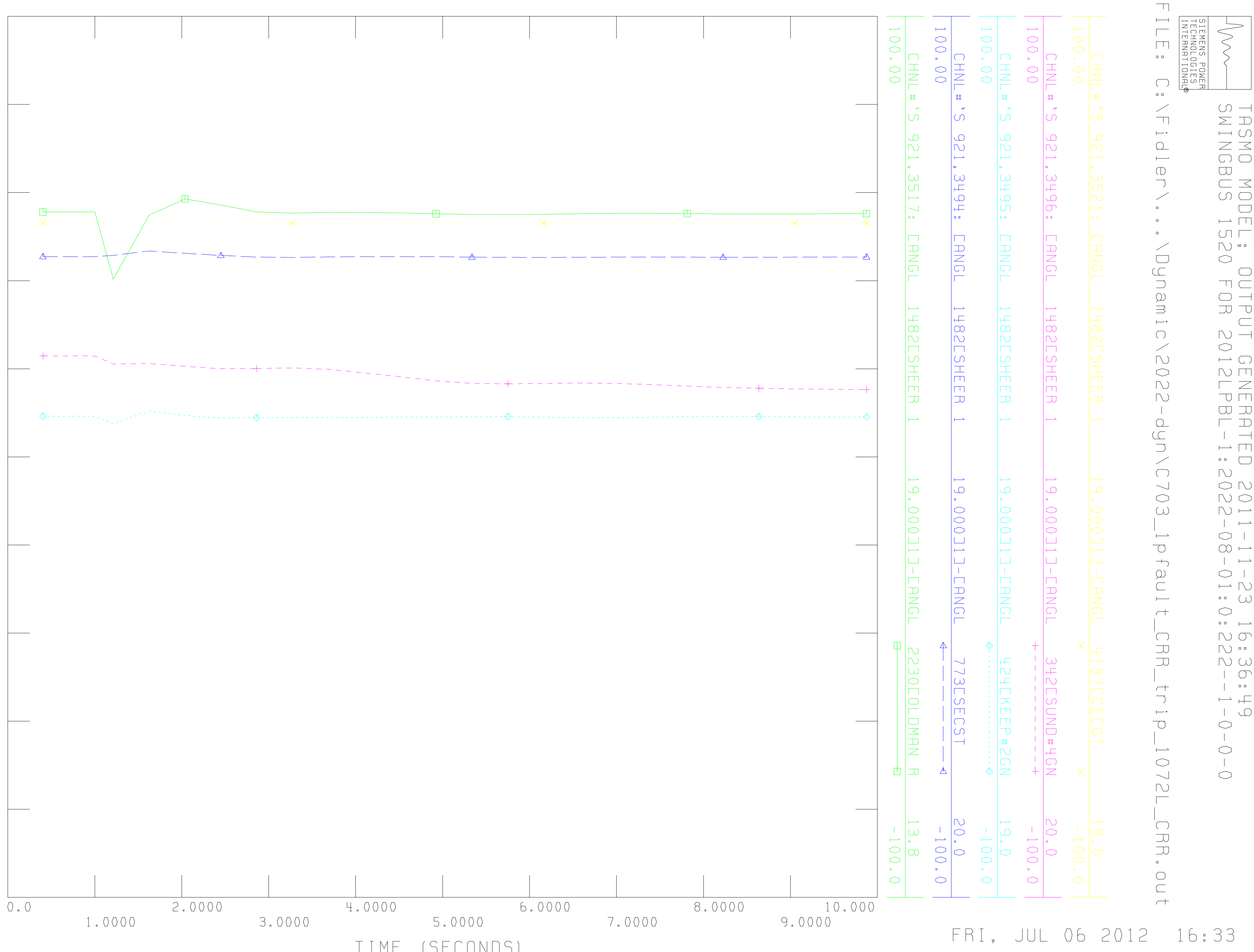
VOLTAGE



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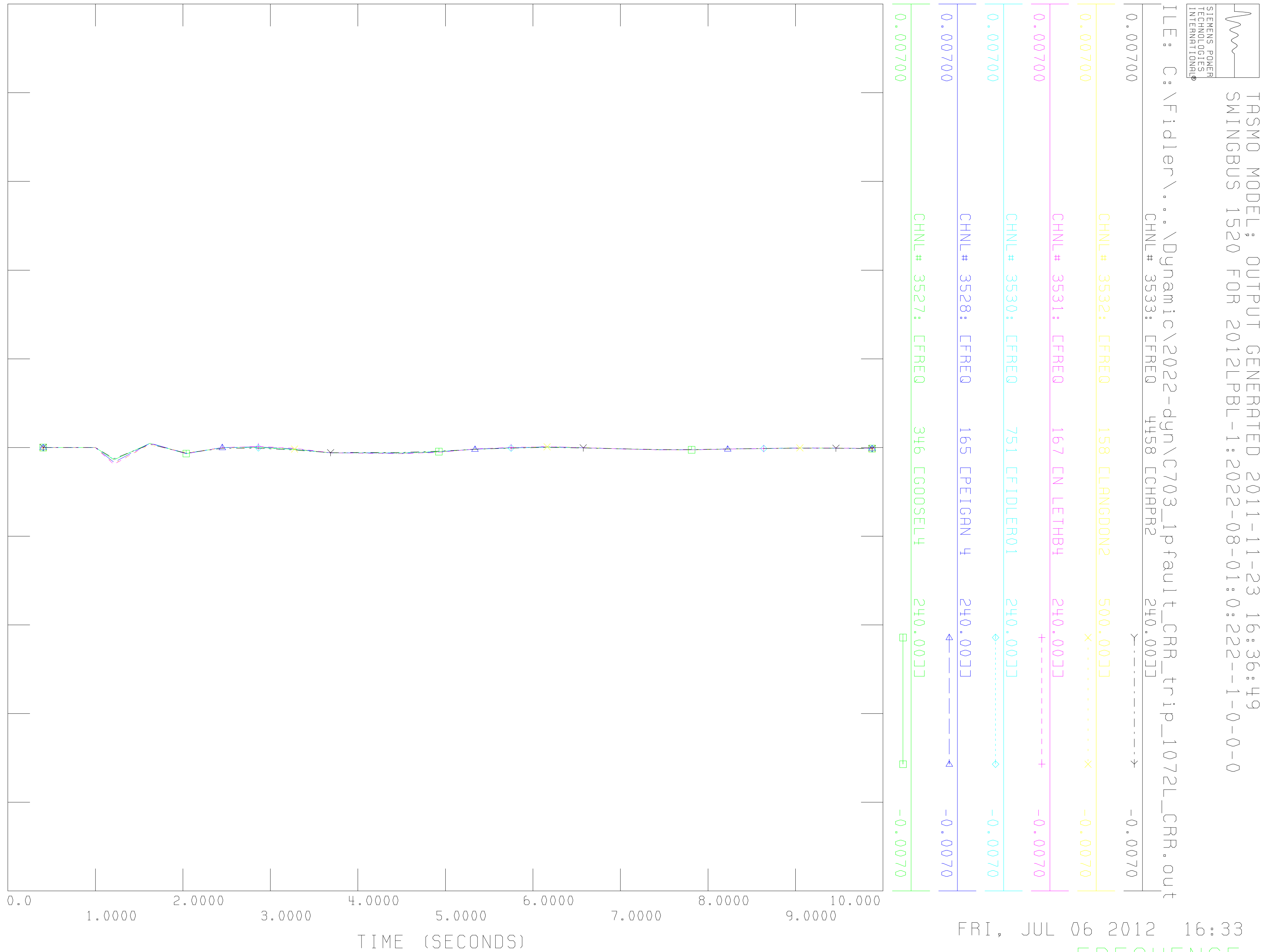
RELATIVE ANGLES



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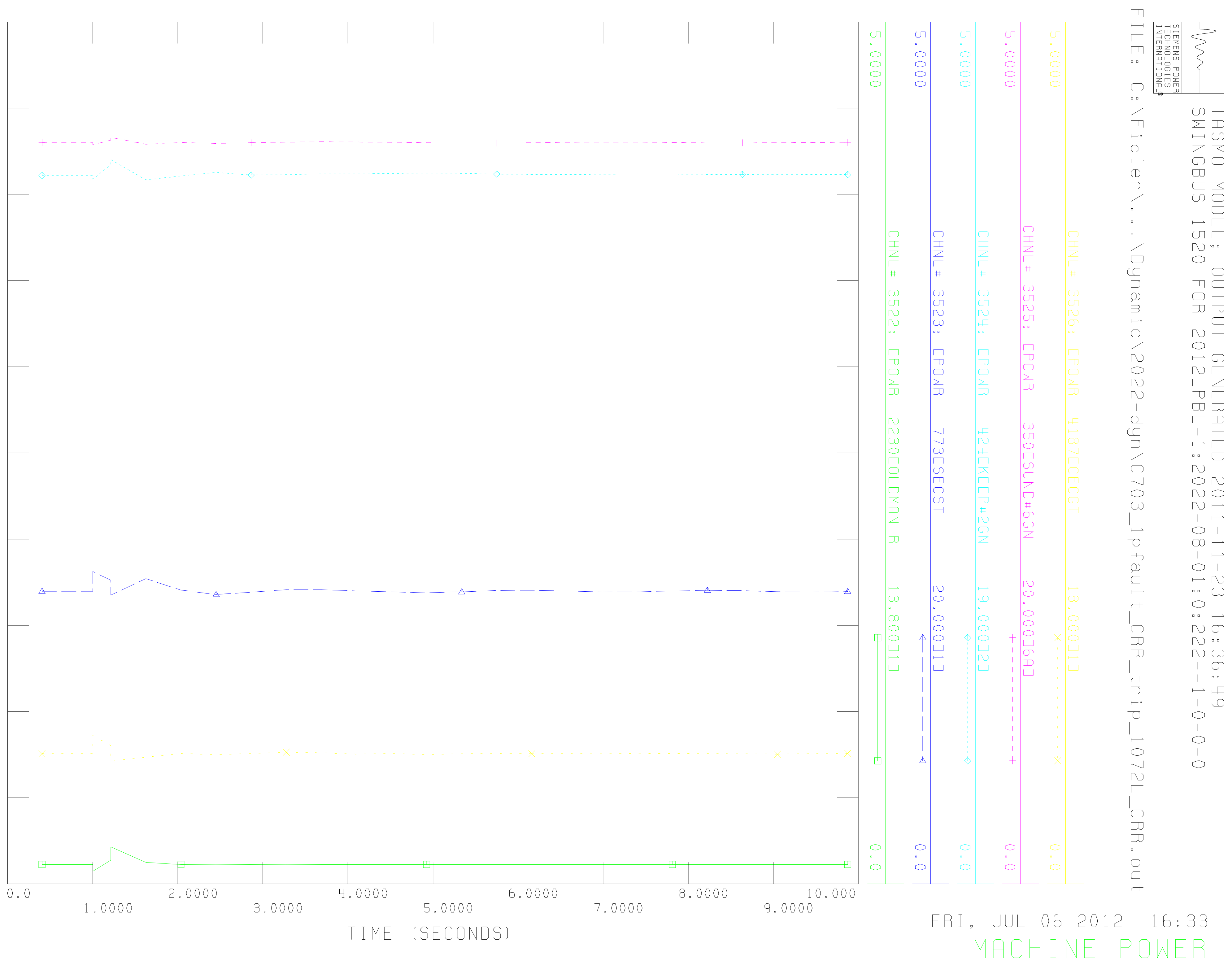
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CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
5.0000 0.0
CHNL# 3526: [POWR 4187[EECGT 18.000]1]
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0.0
1.0000
2.0000
3.0000
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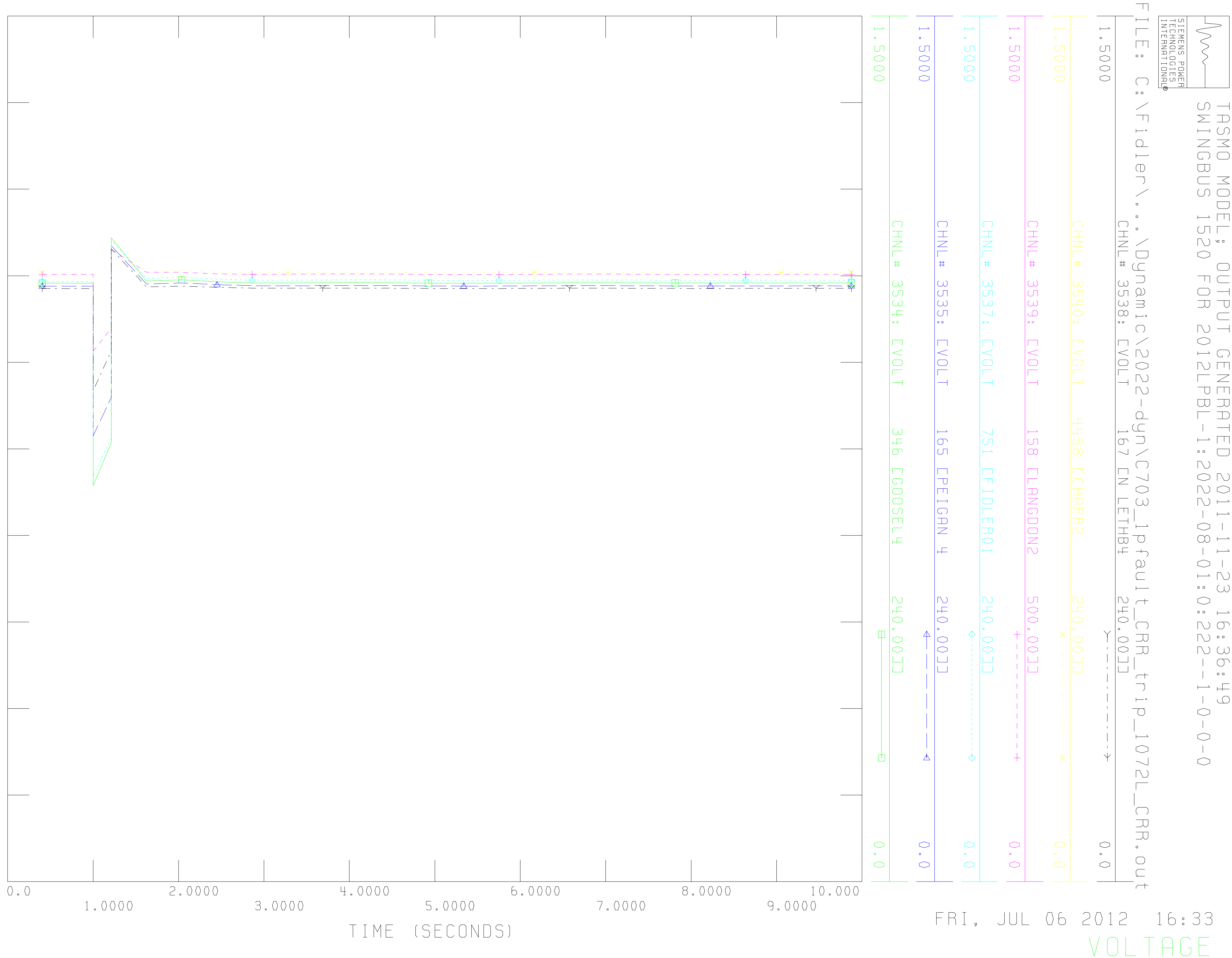
TIME (SECONDS)
FRI, JUL 06 2012 16:33
MACHINE POWER


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
1.5000 0.0
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TIME (SECONDS)
FRI, JUL 06 2012 16:33
VOLTAGE

ATTACHMENT C
Dynamic Stability Analysis (2022 SATR Alternative 2)

Category B Fault Analysis Results

Category B fault analysis was performed for the proposed Fidler development. Category B faults are defined as three-phase faults of a transmission line or transformer with normal clearing time (5 cycles at near end and 7 cycles at far end). Table C-1 summarizes the fault descriptions and results for the Category B fault analysis. Specific transient simulation plots for Category B contingencies can be found in Attachment C.

TABLE C-1

STABILITY RESULTS FOR CATEGORY B FAULTS

Case ID	Alternative	Contingency	Observations
F-B01	2	955L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
F-B02	2	1072L 240kV line (Goose Lake 103S to HYW785)	System stable Good voltage recovery
F-B03	2	1048L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
F-B04	2	994L 240kV line (Goose Lake 103S to Fidler 312S)	System stable Good voltage recovery
F-B05	2	1071L 240kV line (CRR 205S to Fidler 312S)	System stable Good voltage recovery
F-B06	2	1037L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
F-B07	2	1004L 240kV line (CRR 205S to Chapel Rock 491S)	System stable Good voltage recovery
F-B08	2	1201L 500kV line (Chapel Rock 491S to Langdon)	System stable Good voltage recovery

Category C5 Fault Analysis Results

Category C5 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C5 faults are defined as double line-to-ground faults of a double circuited transmission tower with normal clearing time. TABLE C summarizes the fault descriptions and results for the Category C5 fault analysis. Specific transient simulation plots for Category C5 contingencies can be found in this Attachment C.

TABLE C-2

STABILITY RESULTS FOR CATEGORY C5 FAULTS

Case ID	**Alternative**	**Description**	**Observations**
F-C501	2	955L/956L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
F-C502	2	1048L/1049L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
F-C503	2	1072L/1071L 240kV line (CRR 205S to Goose Lake 103S and Fidler 312S)	System stable Good voltage recovery
F-C504	2	994L/1071L 240kV line (Fidler to CRR 205S and Goose Lake 103S)	Loss up to 694 MWl generation connecting to the system via 1071L/994L to Goose Lake System stable Good voltage recovery
F-C505	2	1072L /994L 240kV line (Goose Lake 103S to Fidler 312S and CRR 205S)	System stable Good voltage recovery
F-C506	2	1037L/1038L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
F-C507	2	1004L/992L 240kV line (CRR 205S to Chapel Rock 491S)	System stable Good voltage recovery

Category C7 Fault Analysis

Category C7 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C7 faults are defined as single line-to-ground faults of transmission lines with delayed clearing time (stuck breaker condition). Category C7 fault analysis was performed for Goose Lake 103S, Fidler 312S, Castle Rock Ridge 205S and Chapel Rock 491S. These three substations are 240 kV switching substations with breaker-and-a half configurations. For each substation, the fault location was assumed to be on the 240 kV line. This fault location was then simulated for with a stuck breaker at the near end substation as the worst case condition. For breaker-and-a half substation configurations, middle breaker stuck of each diameter was considered as the worst case scenario because it will cause another line on the same diameter trip with delay clearing time. 13 cycles was used for delay clearing time in this study.

Figure C-1 to C-3 show substation configuration where the Category C7 faults were applied. Each of the stuck breaker conditions considered are labeled with a breaker number in the figure. TABLE C-3 summarizes the fault descriptions and results for the Category C7 faults. Specific transient simulation plots for Category C7 contingencies can be found in this attachment.

TABLE C-3

STABILITY RESULTS FOR CATEGORY C7 FAULTS

Case ID	Alternative	Description	Stuck Breaker#	Observations
F-C701	2	Single line fault at Goose Lake 240kV 955L to Peigan 7 cycles: trip bkr on 955L at Peigan 13 cycles: trip 994L and 955L Clear fault.	S1	System stable Good voltage recovery
F-C702	2	Single line fault at Fidler on 240kV 994L to Goose Lake 7 cycles: trip bkr on 994L at Goose Lake 13 cycles: trip 994L Clear fault.	S4	System stable Good voltage recovery
F-C703	2	Single line fault at CRR on 240kV 1004L to Chapel Rock 7 cycles: trip bkr on 1004 at Chapel Rock 13 cycles: trip 1004L and CRR wind farm Clear fault.	S5	System stable Good voltage recovery

Figure C-1

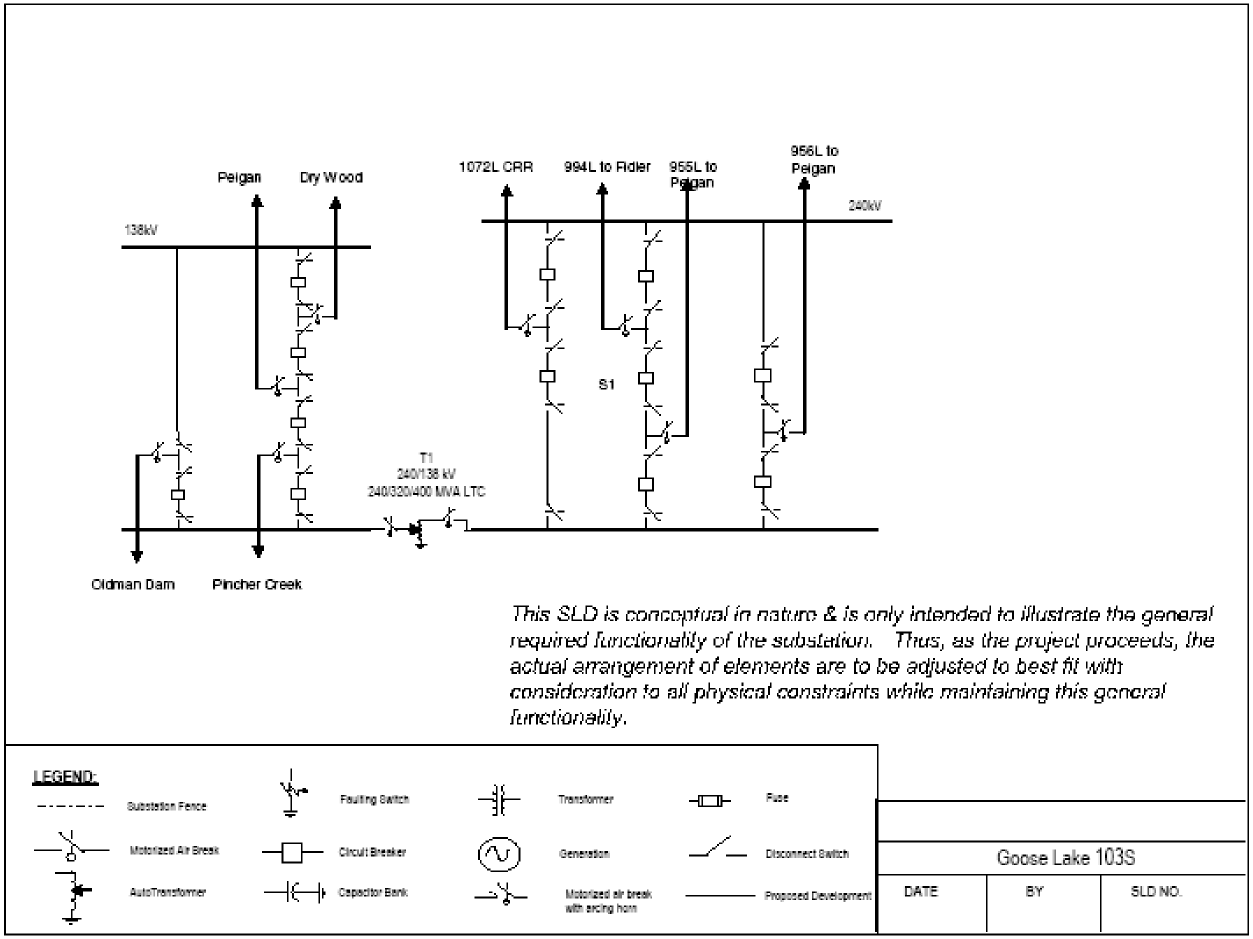

Peigan
Dry Wood
1072L CRR
994L to Fidler
955L to Peigan
956L to Peigan
240kV
138kV
S1
T1
240/138 kV
240/320/400 MVA LTC
Oldman Dam
Pincher Creek
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Fuse
Motorized Air Break
Circuit Breaker
Generation
Disconnect Switch
AutoTransformer
Capacitor Bank
Motorized air break with arcing horn
Proposed Development
Goose Lake 103S
DATE
BY
SLD NO.

Figure C-2

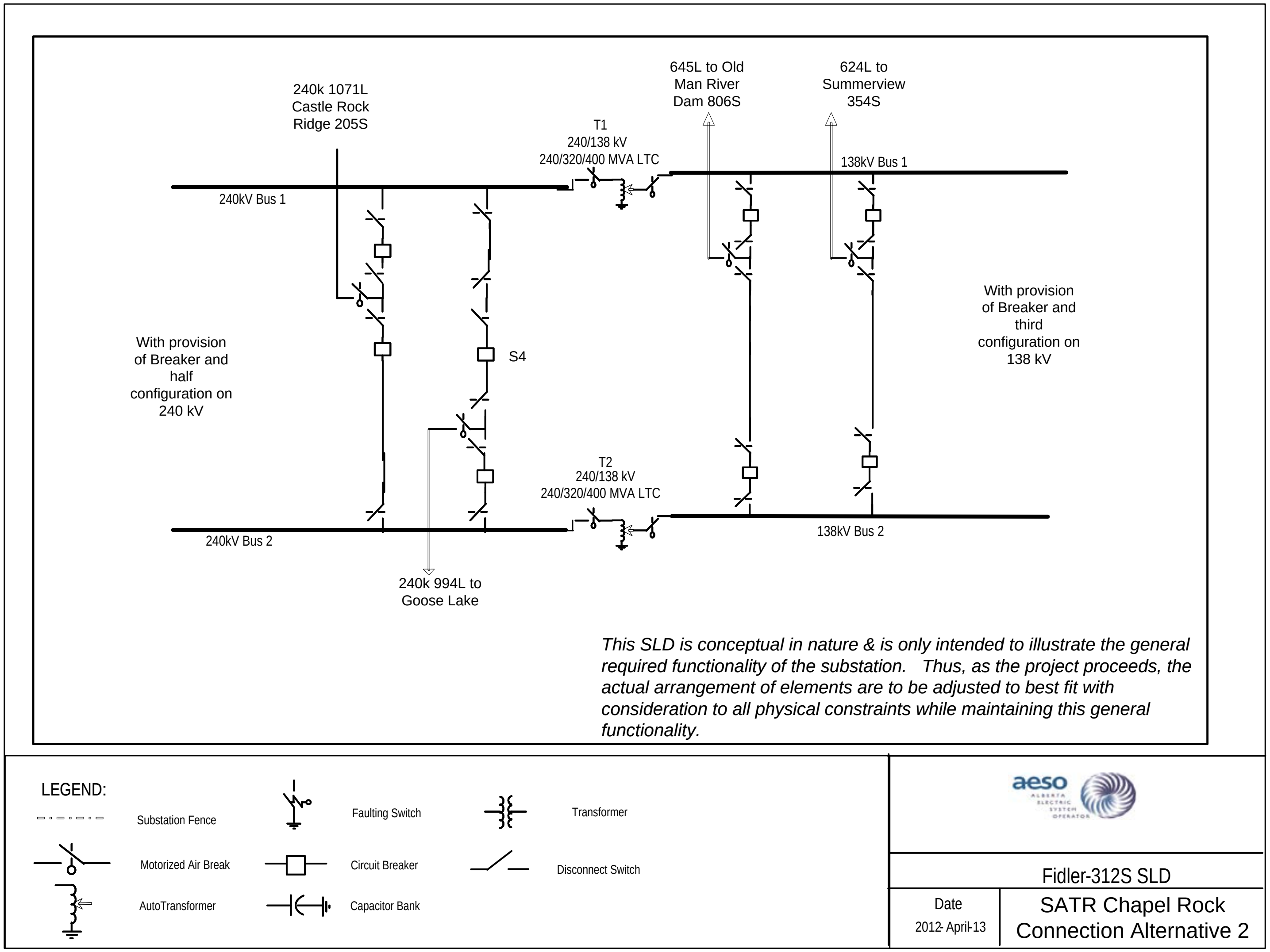
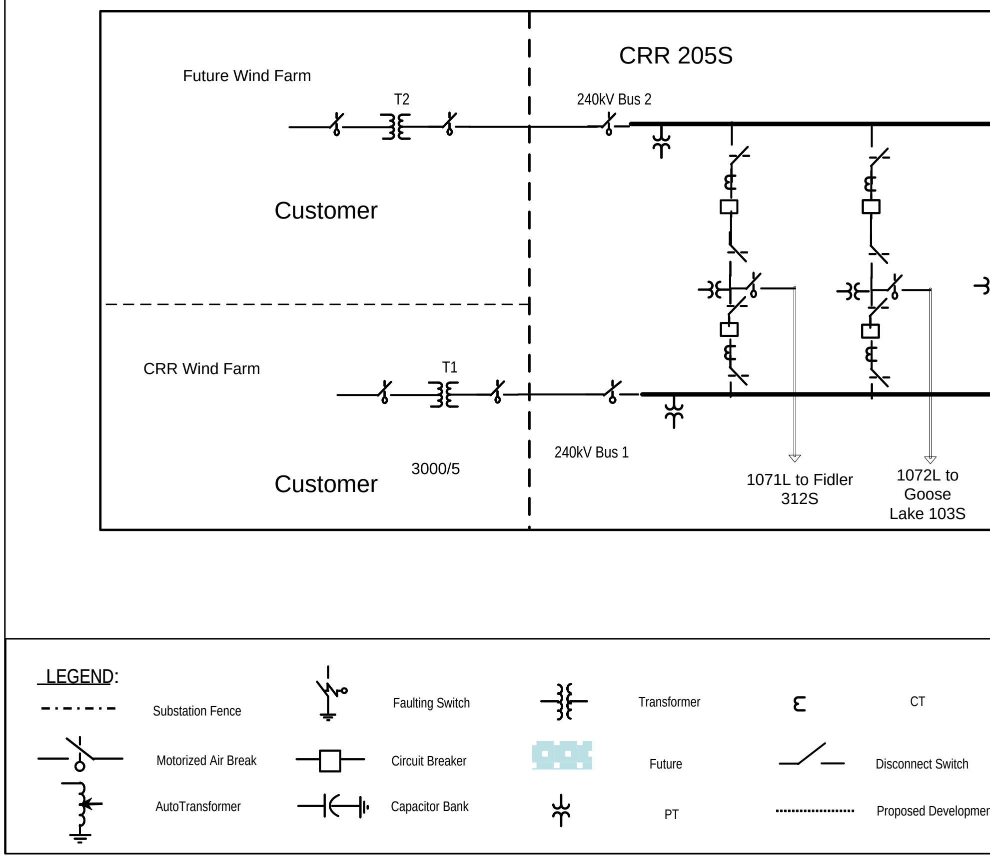

240k 1071L
Castle Rock
Ridge 205S
T1
240/138 kV
240/320/400 MVA LTC
645L to Old
Man River
Dam 806S
624L to
Summerview
354S
138kV Bus 1
240kV Bus 1
With provision
of Breaker and
half
configuration on
240 kV
S4
With provision
of Breaker and
third
configuration on
138 kV
T2
240/138 kV
240/320/400 MVA LTC
240kV Bus 2
138kV Bus 2
240k 994L to
Goose Lake
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Motorized Air Break
Circuit Breaker
Disconnect Switch
AutoTransformer
Capacitor Bank
aeso
ALBERTA ELECTRIC SYSTEM OPERATOR
Fidler-312S SLD
Date
2012- April-13
SATR Chapel Rock
Connection Alternative 2

Figure C-3

SATR Chapel Rock
Connection
Alternative 2



This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.

Category B Fault Analysis Results

Category B fault analysis was performed for the proposed Fidler development. Category B faults are defined as three-phase faults of a transmission line or transformer with normal clearing time (5 cycles at near end and 7 cycles at far end). Table C-1 summarizes the fault descriptions and results for the Category B fault analysis. Specific transient simulation plots for Category B contingencies can be found in Attachment C.

TABLE C-1

STABILITY RESULTS FOR CATEGORY B FAULTS

Case ID	Alternative	Contingency	Observations
F-B01	2	955L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
F-B02	2	1072L 240kV line (Goose Lake 103S to HYW785)	System stable Good voltage recovery
F-B03	2	1048L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
F-B04	2	994L 240kV line (Goose Lake 103S to Fidler 312S)	System stable Good voltage recovery
F-B05	2	1071L 240kV line (CRR 205S to Fidler 312S)	System stable Good voltage recovery
F-B06	2	1037L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
F-B07	2	1004L 240kV line (CRR 205S to Chapel Rock 491S)	System stable Good voltage recovery
F-B08	2	1201L 500kV line (Chapel Rock 491S to Langdon)	System stable Good voltage recovery

Category C5 Fault Analysis Results

Category C5 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C5 faults are defined as double line-to-ground faults of a double circuited transmission tower with normal clearing time. TABLE C summarizes the fault descriptions and results for the Category C5 fault analysis. Specific transient simulation plots for Category C5 contingencies can be found in this Attachment C.

TABLE C-2

STABILITY RESULTS FOR CATEGORY C5 FAULTS

Case ID	**Alternative**	**Description**	**Observations**
F-C501	2	955L/956L 240kV line (Goose Lake 103S to Peigan 59S)	System stable Good voltage recovery
F-C502	2	1048L/1049L 240kV line (Peigan 59S to Windy Flats 138S)	System stable Good voltage recovery
F-C503	2	1072L/1071L 240kV line (CRR 205S to Goose Lake 103S and Fidler 312S)	System stable Good voltage recovery
F-C504	2	994L/1071L 240kV line (Fidler to CRR 205S and Goose Lake 103S)	Loss up to 694 MWl generation connecting to the system via 1071L/994L to Goose Lake System stable Good voltage recovery
F-C505	2	1072L /994L 240kV line (Goose Lake 103S to Fidler 312S and CRR 205S)	System stable Good voltage recovery
F-C506	2	1037L/1038L 240kV line (Foothills 237S to Windy Flats 138S)	System stable Good voltage recovery
F-C507	2	1004L/992L 240kV line (CRR 205S to Chapel Rock 491S)	System stable Good voltage recovery

Category C7 Fault Analysis

Category C7 fault analysis was performed for 2022 summer peak case with the Fidler development. Category C7 faults are defined as single line-to-ground faults of transmission lines with delayed clearing time (stuck breaker condition). Category C7 fault analysis was performed for Goose Lake 103S, Fidler 312S, Castle Rock Ridge 205S and Chapel Rock 491S. These three substations are 240 kV switching substations with breaker-and-a half configurations. For each substation, the fault location was assumed to be on the 240 kV line. This fault location was then simulated for with a stuck breaker at the near end substation as the worst case condition. For breaker-and-a half substation configurations, middle breaker stuck of each diameter was considered as the worst case scenario because it will cause another line on the same diameter trip with delay clearing time. 13 cycles was used for delay clearing time in this study.

Figure C-1 to C-3 show substation configuration where the Category C7 faults were applied. Each of the stuck breaker conditions considered are labeled with a breaker number in the figure. TABLE C-3 summarizes the fault descriptions and results for the Category C7 faults. Specific transient simulation plots for Category C7 contingencies can be found in this attachment.

TABLE C-3

STABILITY RESULTS FOR CATEGORY C7 FAULTS

Case ID	Alternative	Description	Stuck Breaker#	Observations
F-C701	2	Single line fault at Goose Lake 240kV 955L to Peigan 7 cycles: trip bkr on 955L at Peigan 13 cycles: trip 994L and 955L Clear fault.	S1	System stable Good voltage recovery
F-C702	2	Single line fault at Fidler on 240kV 994L to Goose Lake 7 cycles: trip bkr on 994L at Goose Lake 13 cycles: trip 994L Clear fault.	S4	System stable Good voltage recovery
F-C703	2	Single line fault at CRR on 240kV 1004L to Chapel Rock 7 cycles: trip bkr on 1004 at Chapel Rock 13 cycles: trip 1004L and CRR wind farm Clear fault.	S5	System stable Good voltage recovery

Figure C-1

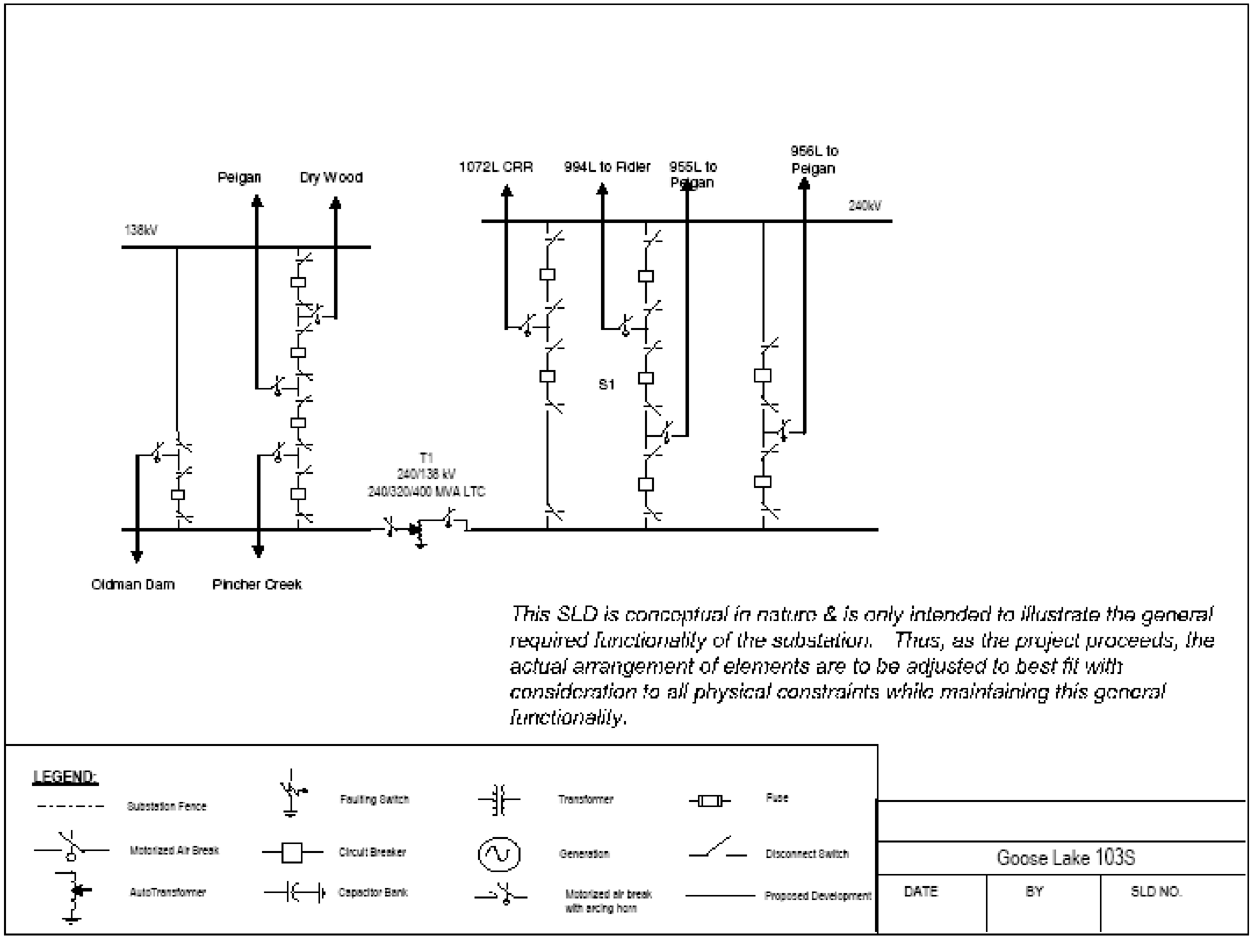

Peigan
Dry Wood
1072L CRR
994L to Fidler
955L to Peigan
956L to Peigan
138kV
240kV
S1
T1
240/138 kV
240/320/400 MVA LTC
Oldman Dam
Pincher Creek
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Fuse
Motorized Air Break
Circuit Breaker
Generation
Disconnect Switch
AutoTransformer
Capacitor Bank
Motorized air break with arcing horn
Proposed Development
Goose Lake 103S
DATE
BY
SLD NO.

Figure C-2

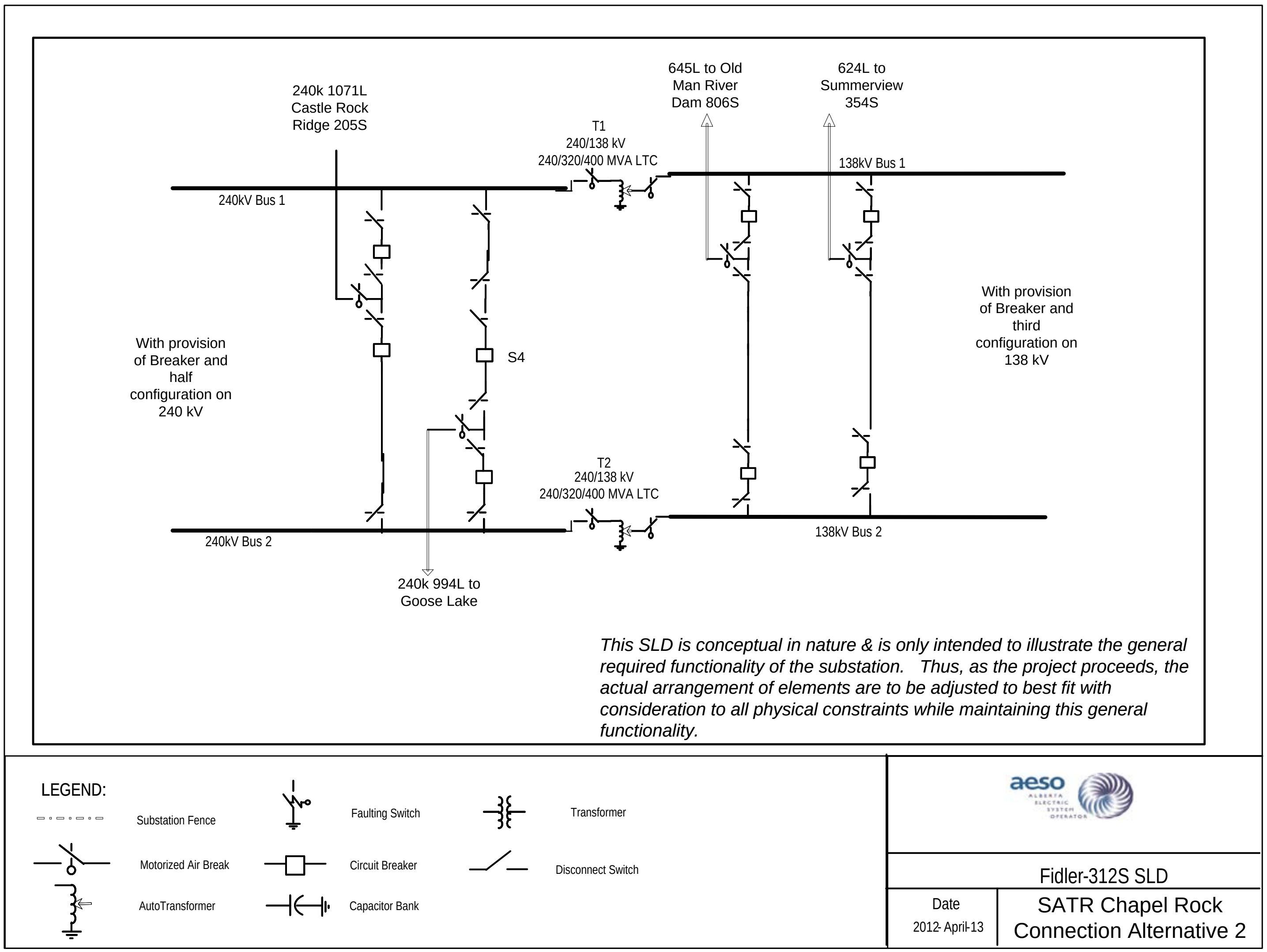
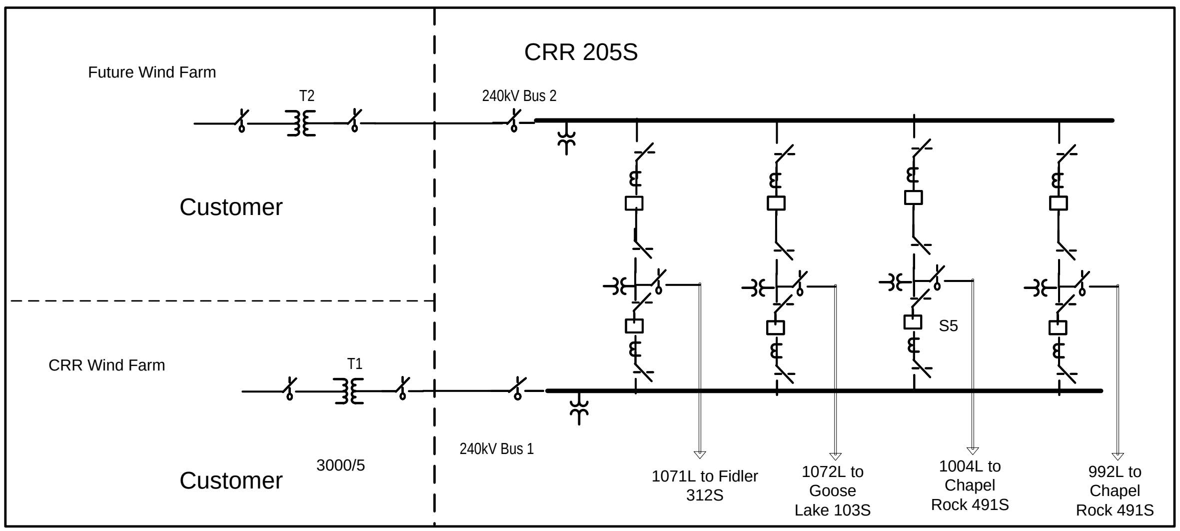
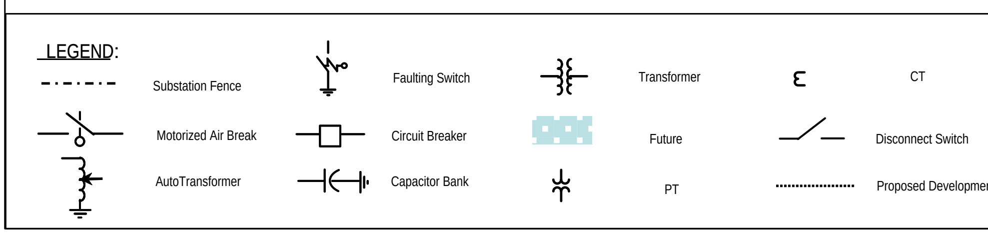

240k 1071L
Castle Rock
Ridge 205S
T1
240/138 kV
240/320/400 MVA LTC
645L to Old
Man River
Dam 806S
624L to
Summerview
354S
138kV Bus 1
240kV Bus 1
With provision
of Breaker and
half
configuration on
240 kV
S4
With provision
of Breaker and
third
configuration on
138 kV
T2
240/138 kV
240/320/400 MVA LTC
240kV Bus 2
138kV Bus 2
240k 994L to
Goose Lake
This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.
LEGEND:
Substation Fence
Faulting Switch
Transformer
Motorized Air Break
Circuit Breaker
Disconnect Switch
AutoTransformer
Capacitor Bank
aeso
ALBERTA ELECTRIC SYSTEM OPERATOR
Fidler-312S SLD
Date
2012- April-13
SATR Chapel Rock
Connection Alternative 2

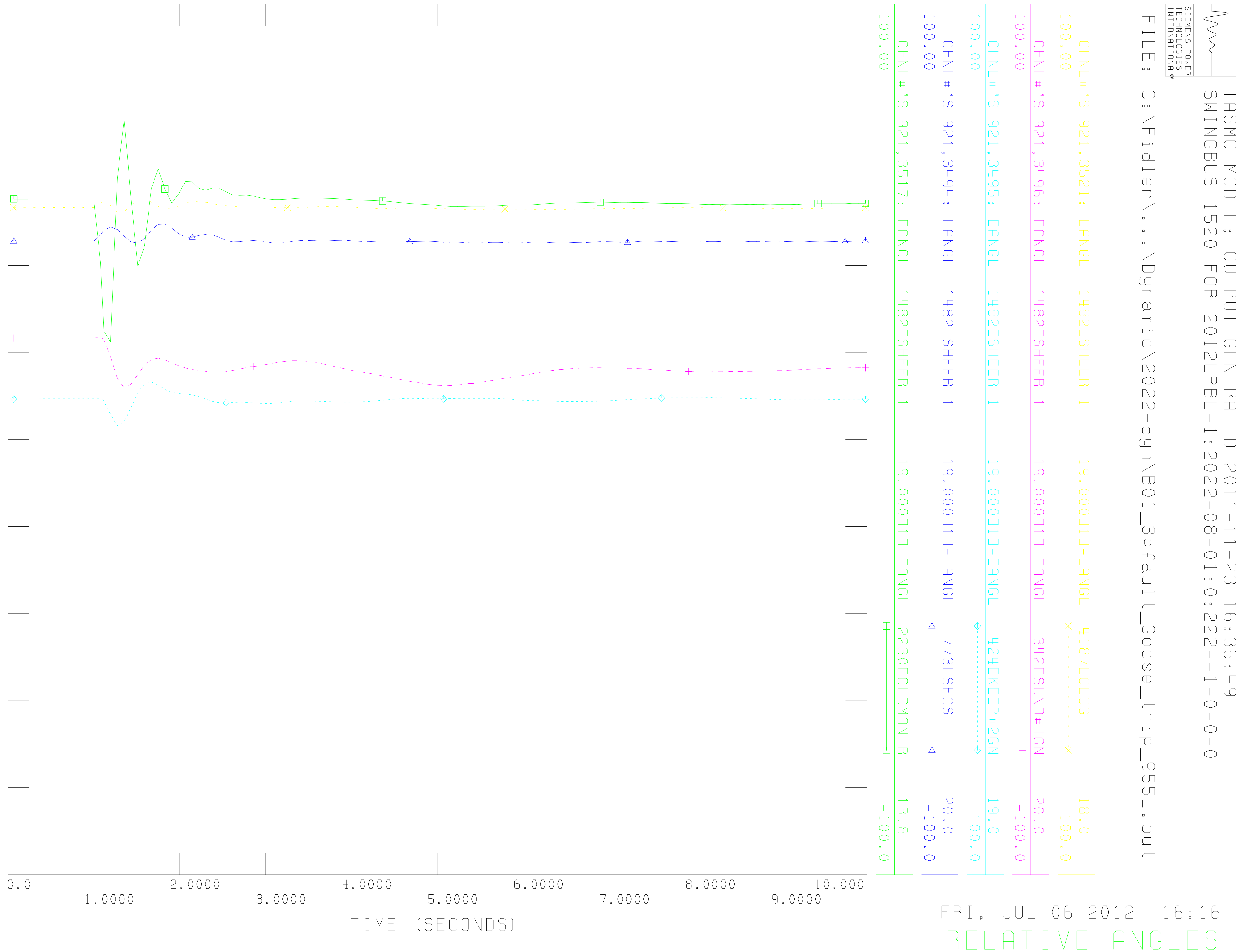
Figure C-3

SATR Chapel Rock
Connection
Alternative 2





This SLD is conceptual in nature & is only intended to illustrate the general required functionality of the substation. Thus, as the project proceeds, the actual arrangement of elements are to be adjusted to best fit with consideration to all physical constraints while maintaining this general functionality.



SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
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CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
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CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
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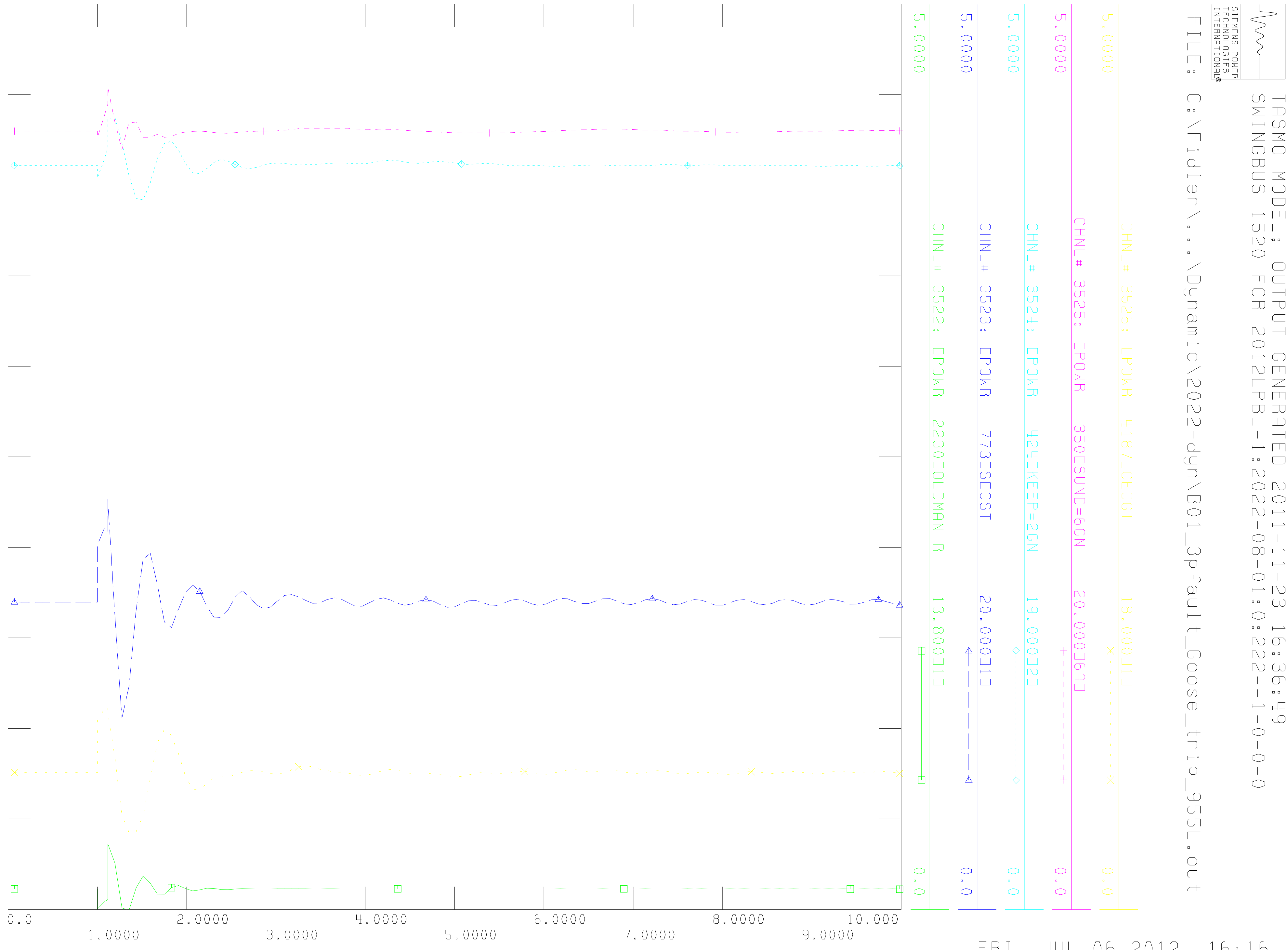
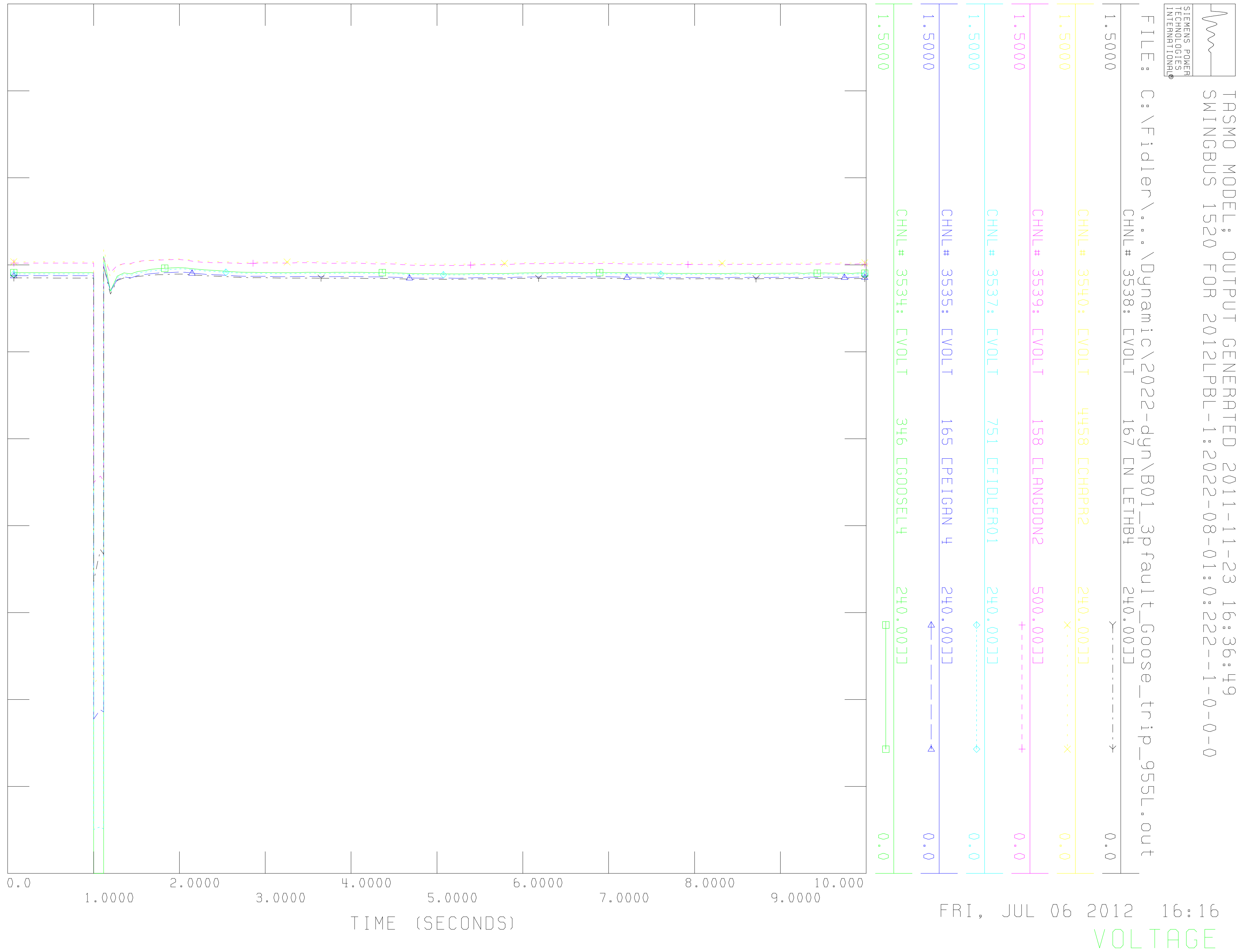
FRI, JUL 06 2012 16:16
RELATIVE ANGLES



FRI, JUL 06 2012 16:16

MACHINE POWER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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
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CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000
0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000
0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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0.0
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2.0000
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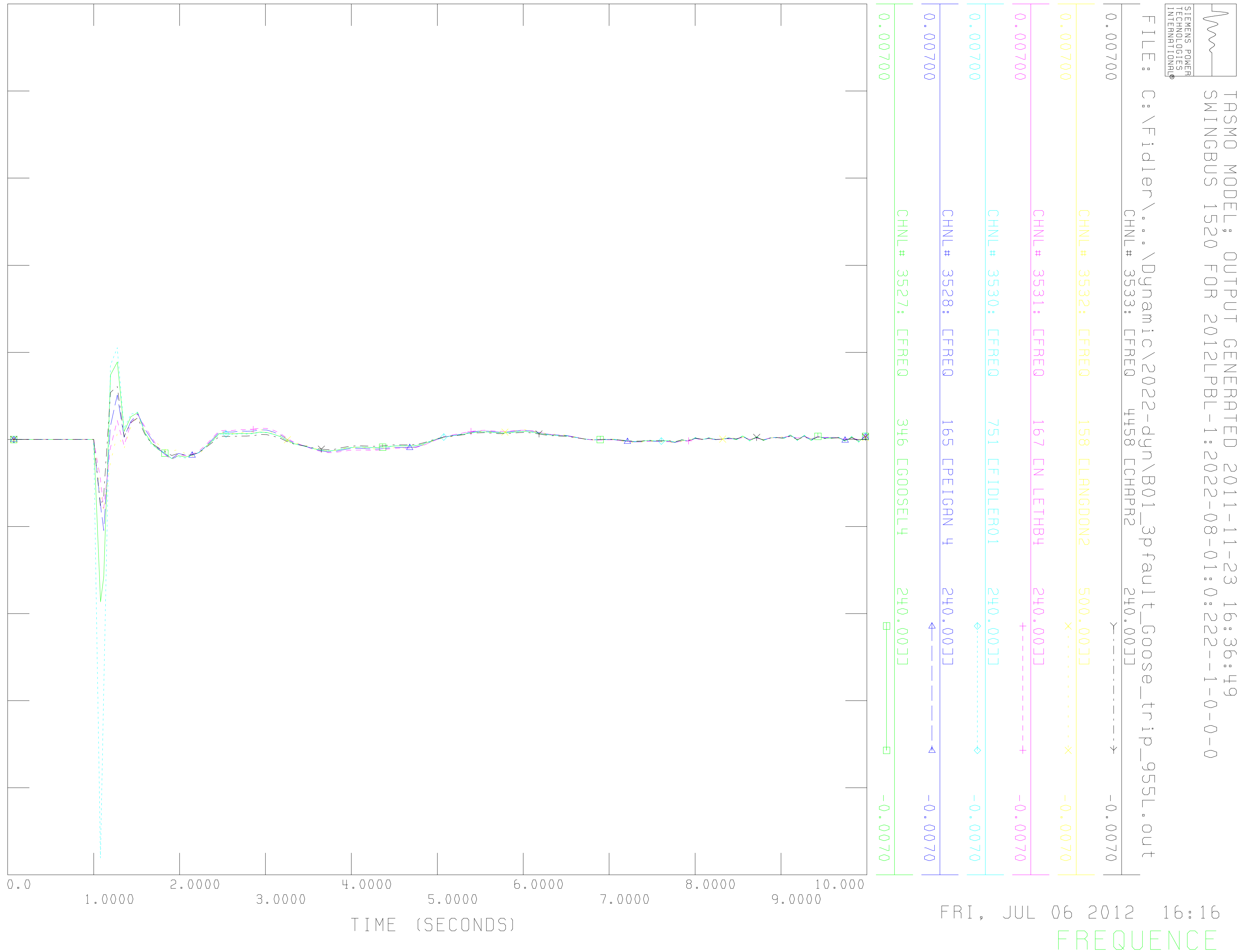
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE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CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]]
CHNL# 3532: [FREQ 158 [LANGDON2 500.00]]
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]]
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]]
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]]
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]]
0.00700
-0.0070
0.0
1.0000
2.0000
3.0000
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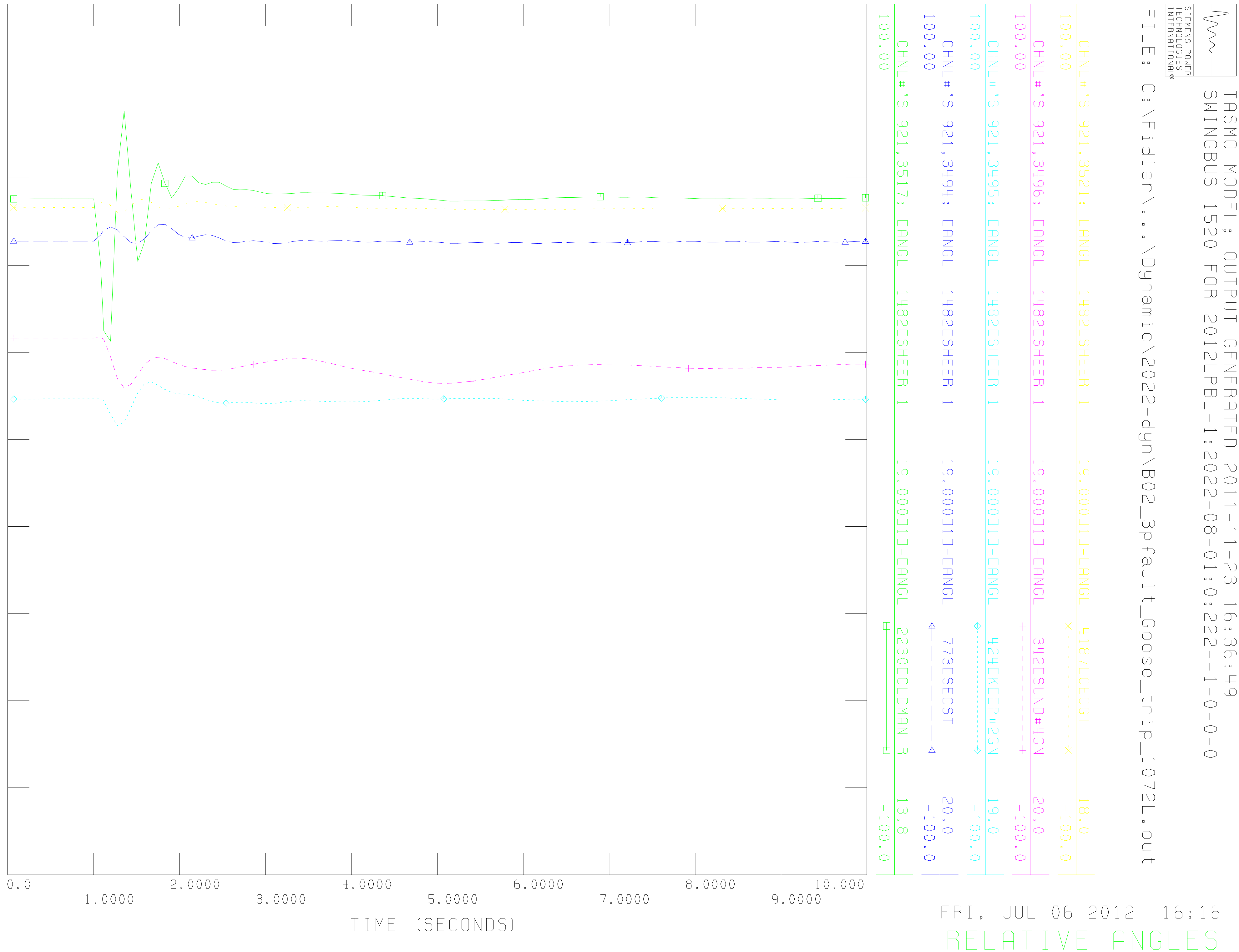
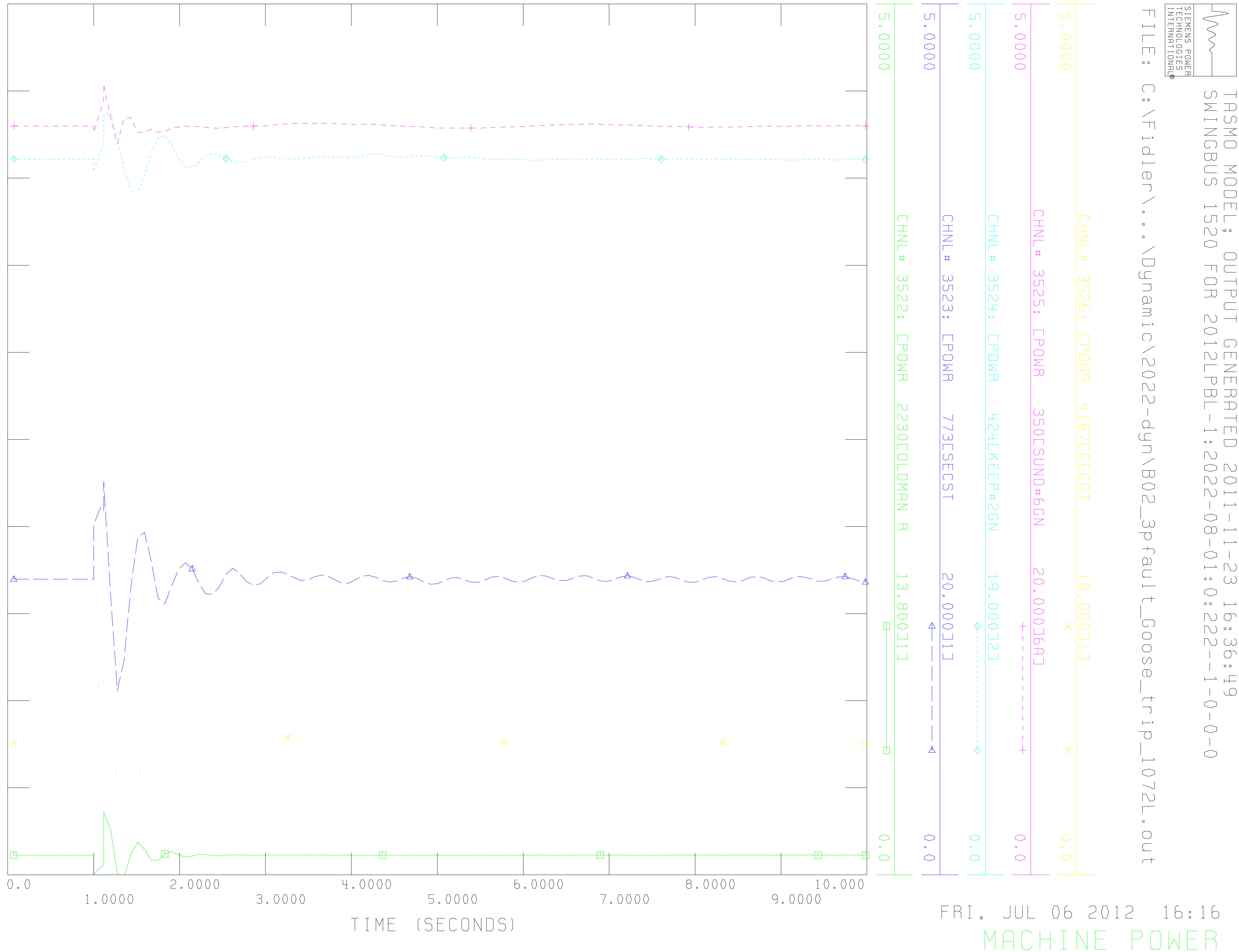
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL#'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CECGT 18.0
100.00 -100.0
CHNL#'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
6.0000
7.0000
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[CEC GT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
0.0
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
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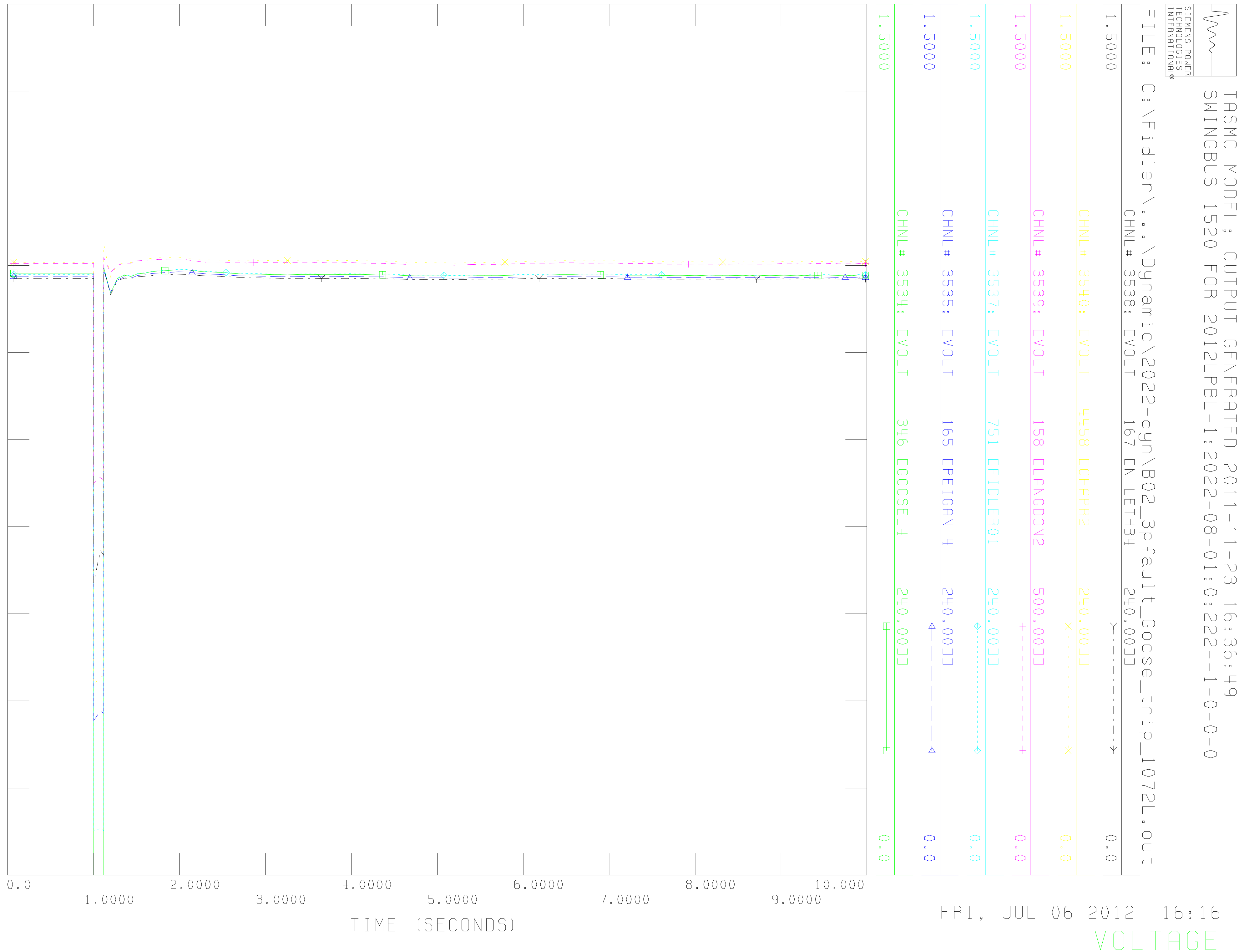
7.0000
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]
1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
1.5000 0.0
0.0
1.0000
2.0000
3.0000
4.0000
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6.0000
7.0000
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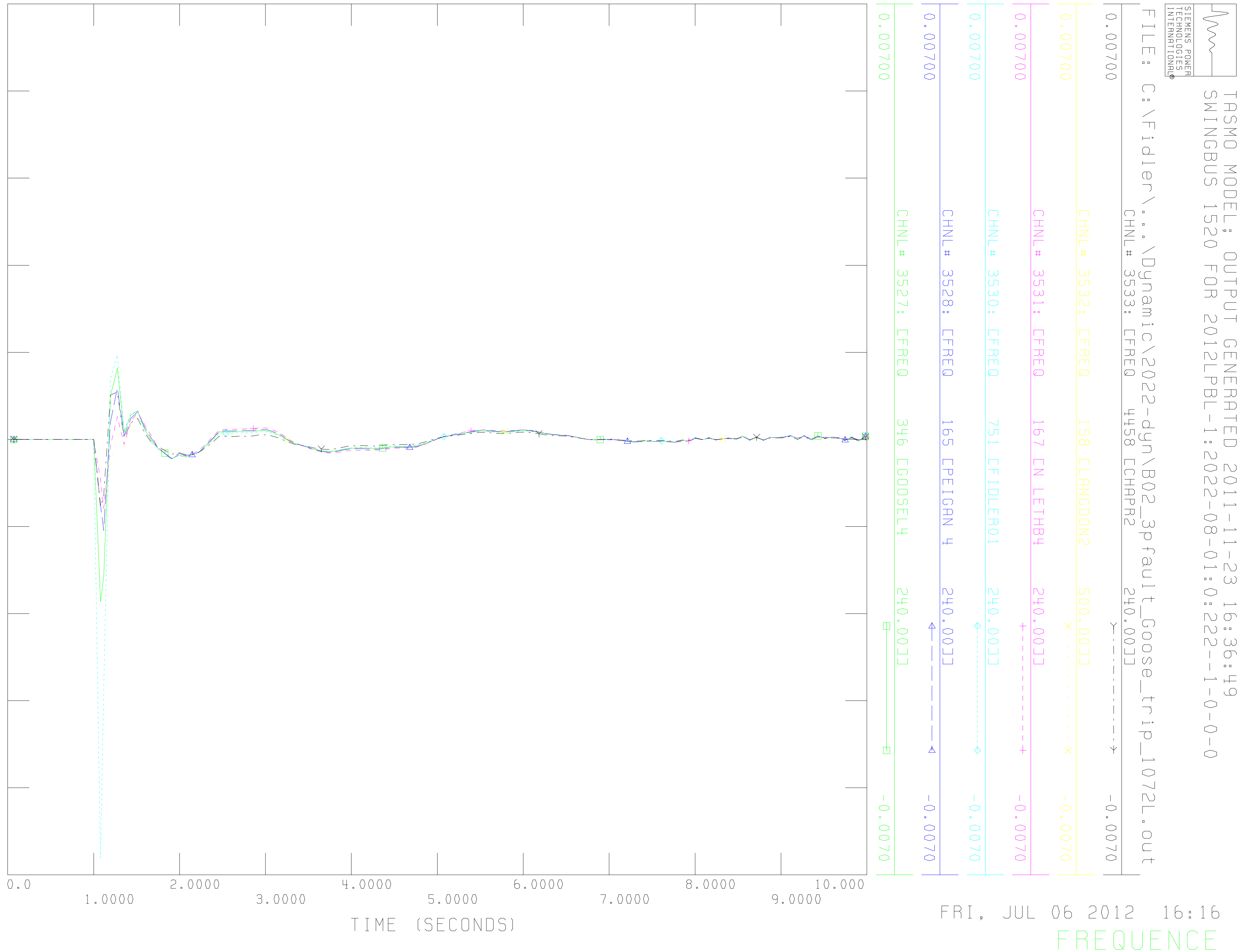
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B02_3pfault_Goose_trip_1072L.out
0.00700
CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]
-0.0070
0.00700
CHNL# 3532: [FREQ 158 [LANGDON2 500.00]
-0.0070
0.00700
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
-0.0070
0.00700
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
-0.0070
0.00700
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
-0.0070
0.00700
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
-0.0070
0.0
1.0000
2.0000
3.0000
4.0000
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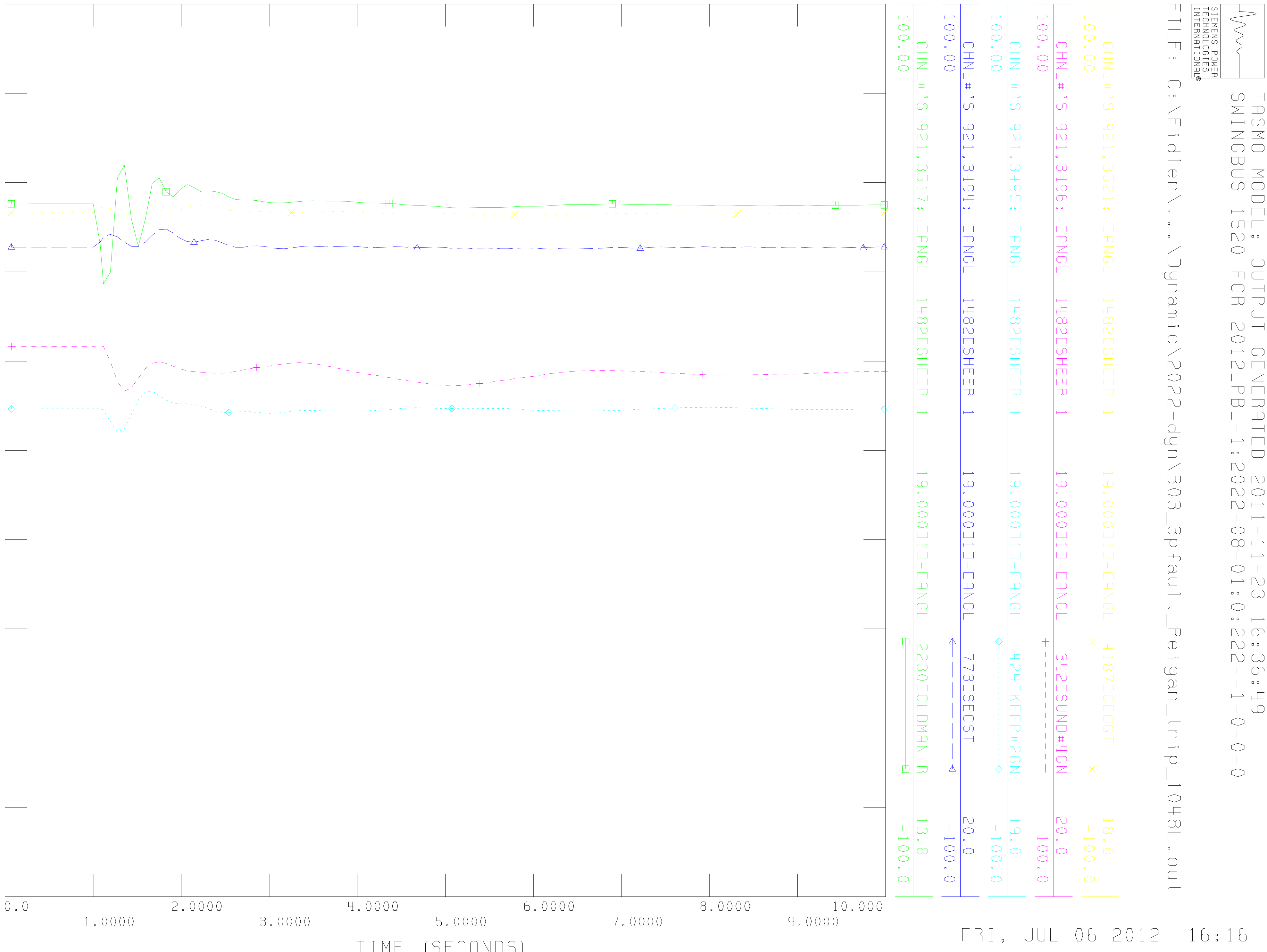
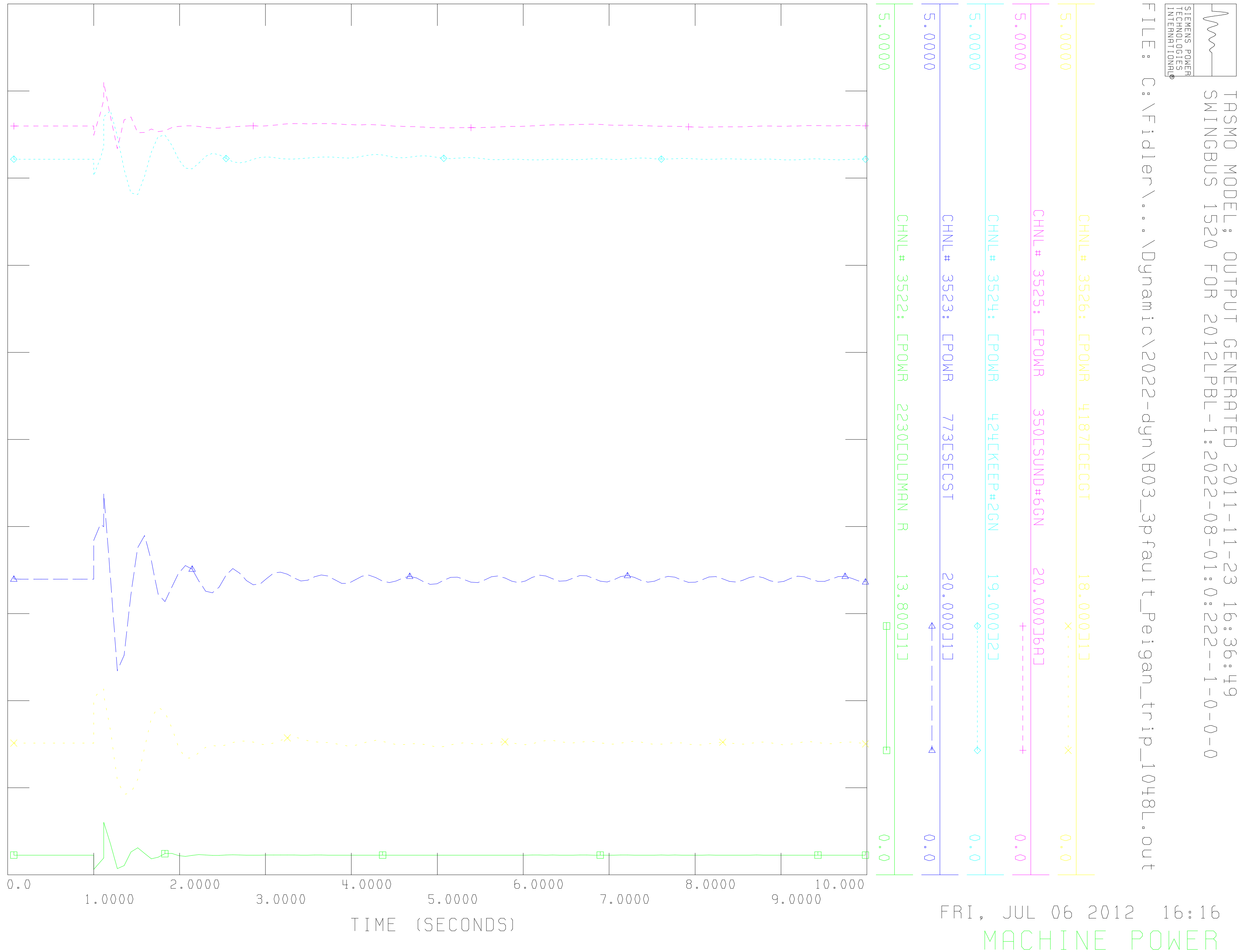
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE



FRI, JUL 06 2012 16:16

RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B03_3pfault_Peigan_trip_1048L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
5.0000
5.0000
5.0000
5.0000
0.0
0.0
0.0
0.0
0.0
0.0
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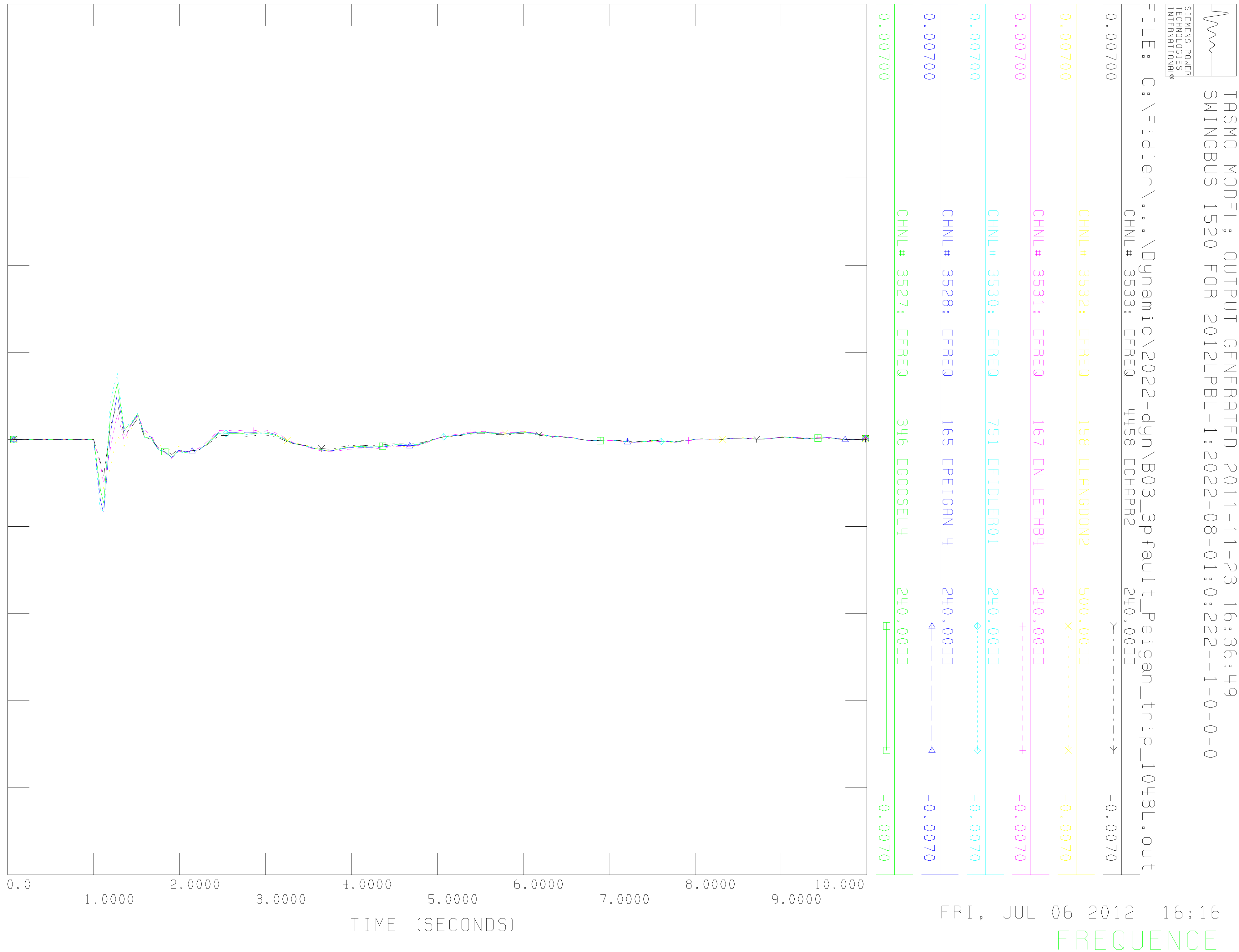
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B03_3pfault_Peigan_trip_1048L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]
CHNL# 3532: [FREQ 158 [LANGDON2 500.00]
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
0.00700
-0.0070
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
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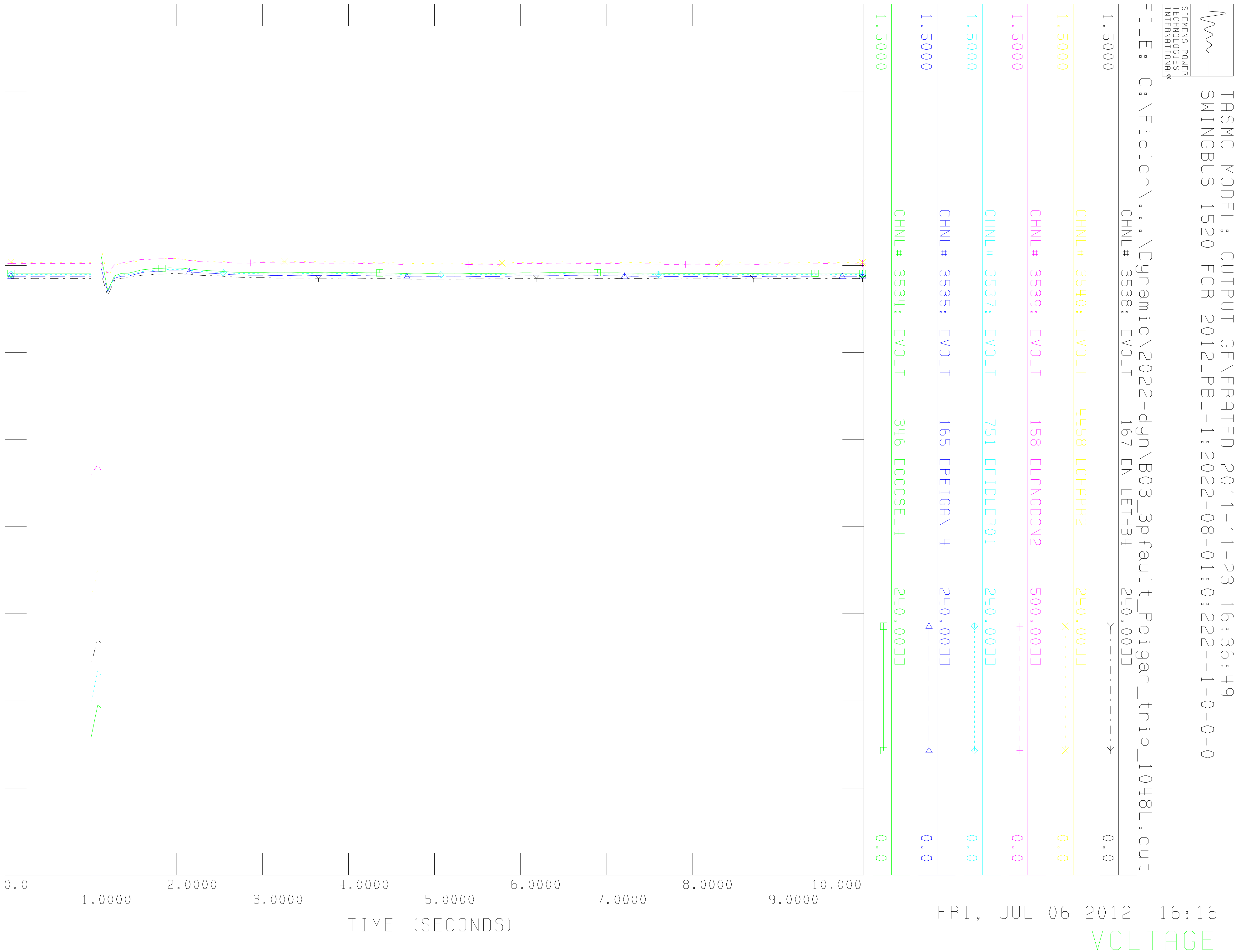
7.0000
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B03_3pfault_Peigan_trip_1048L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000
0.0
0.0
1.0000
2.0000
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5.0000
6.0000
7.0000
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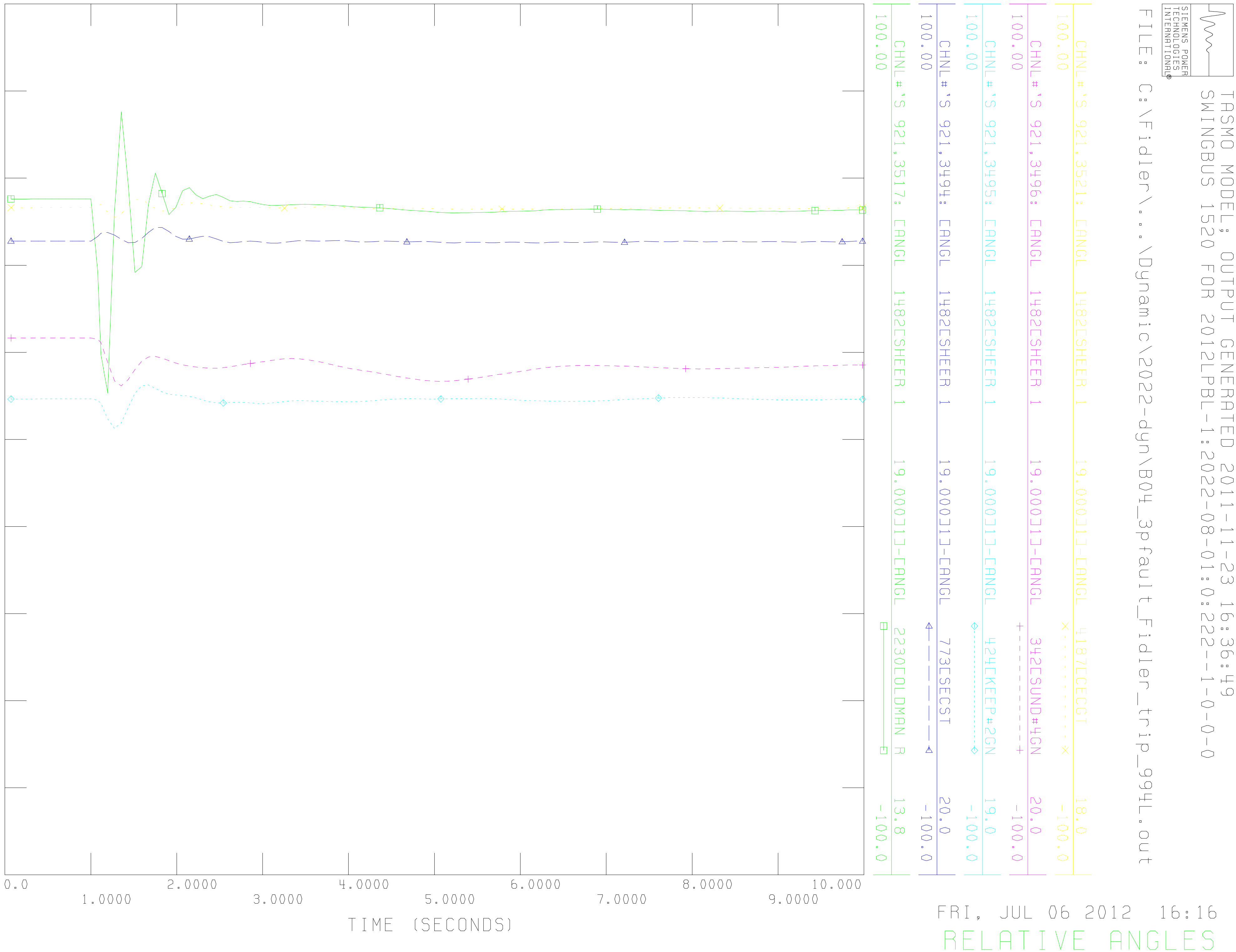
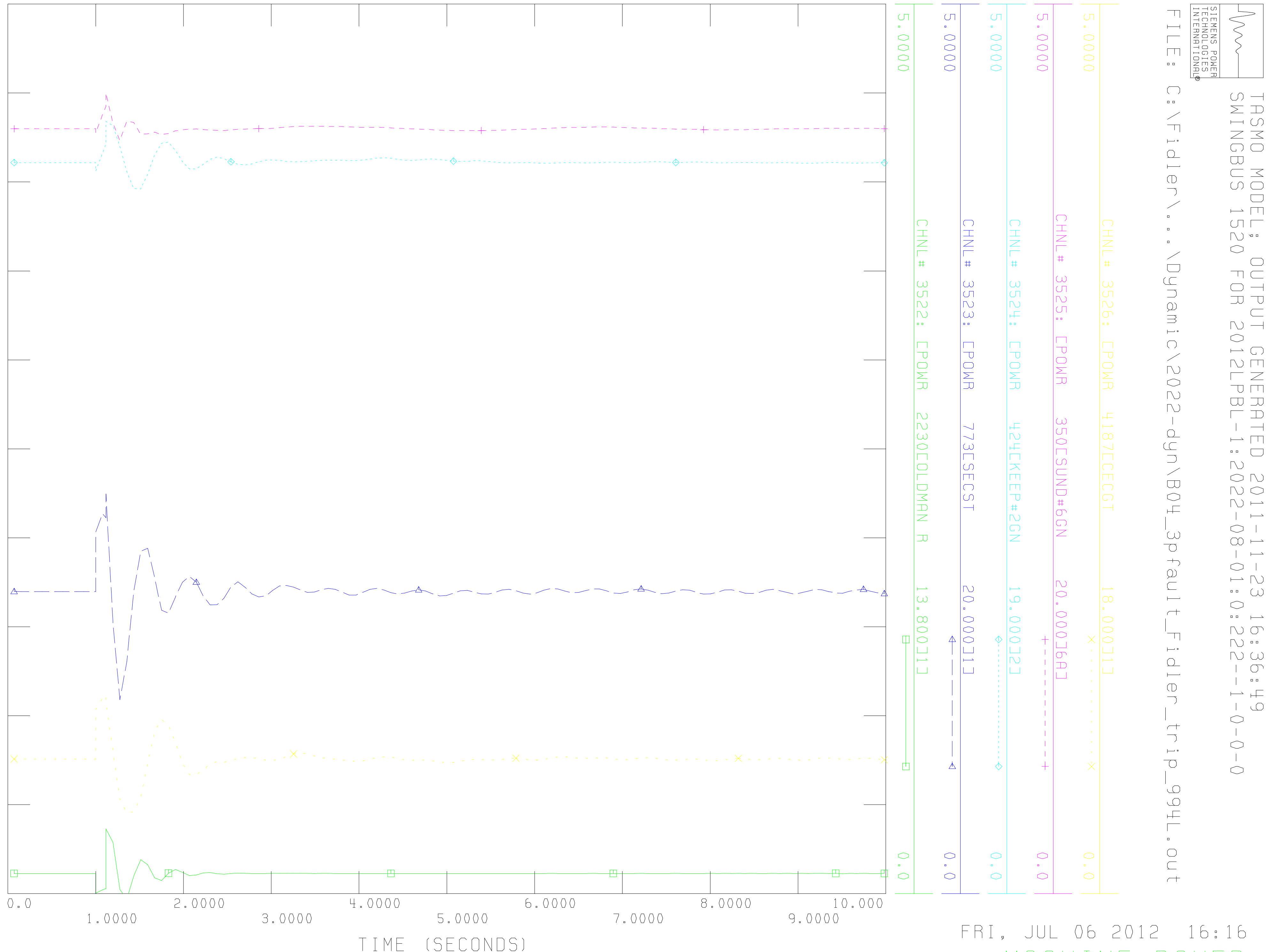
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_994L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CECGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
RELATIVE ANGLES


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_994L.out
5.0000
CHNL# 3526: [POWR 4187[CEGT 18.000]1]
0.0
5.0000
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
0.0
5.0000
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
0.0
5.0000
CHNL# 3523: [POWR 773[SECST 20.000]1]
0.0
5.0000
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
0.0
0.0
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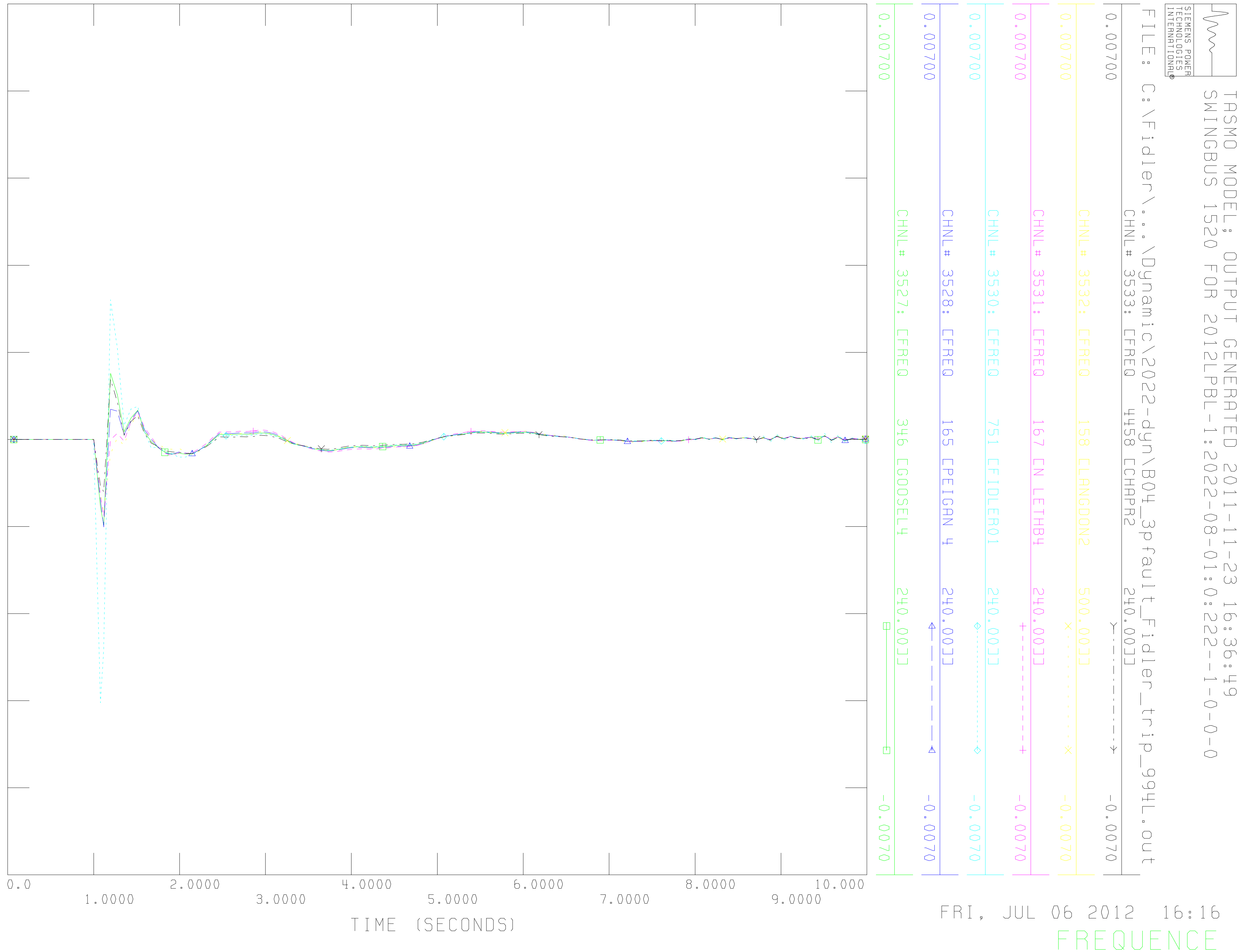
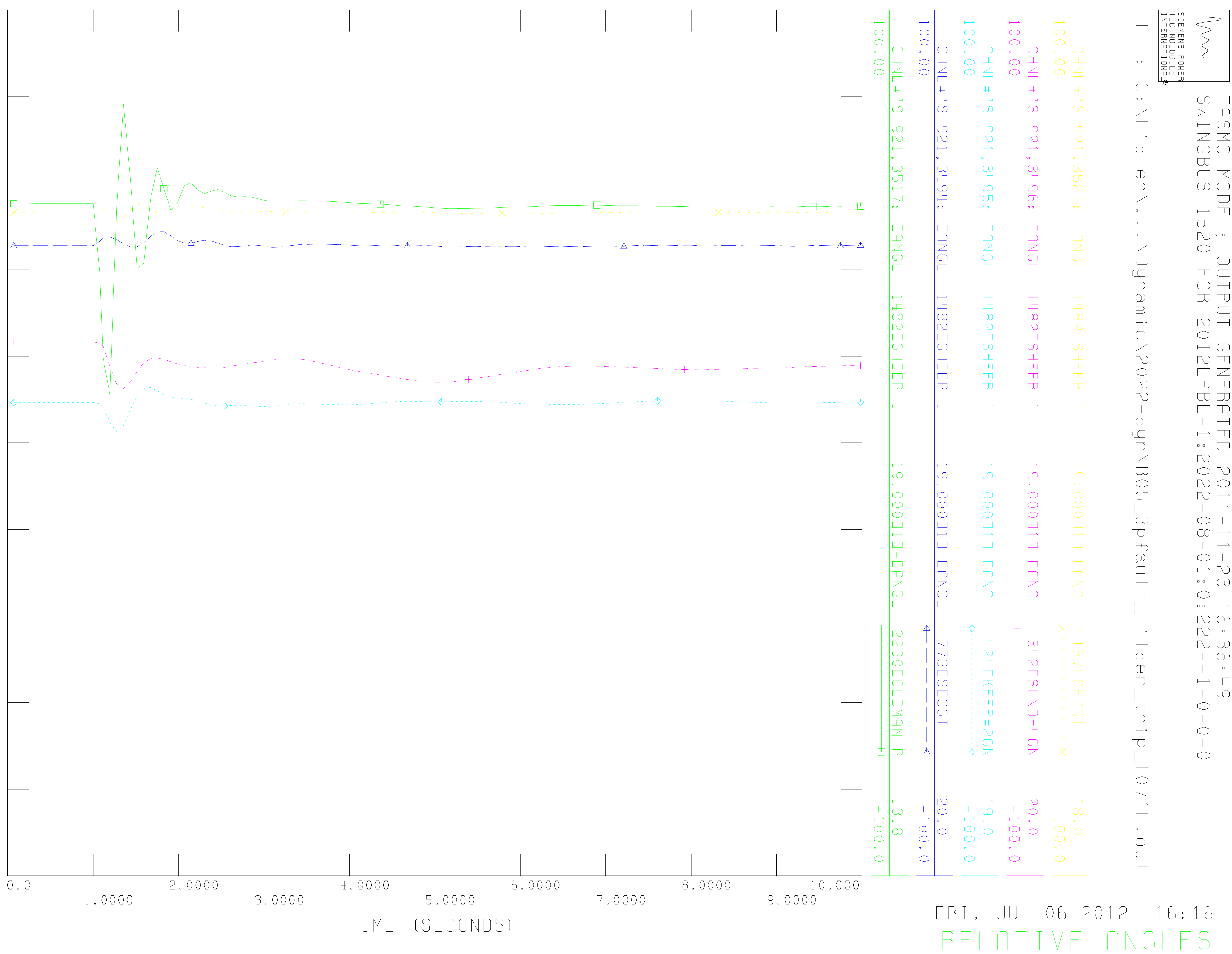
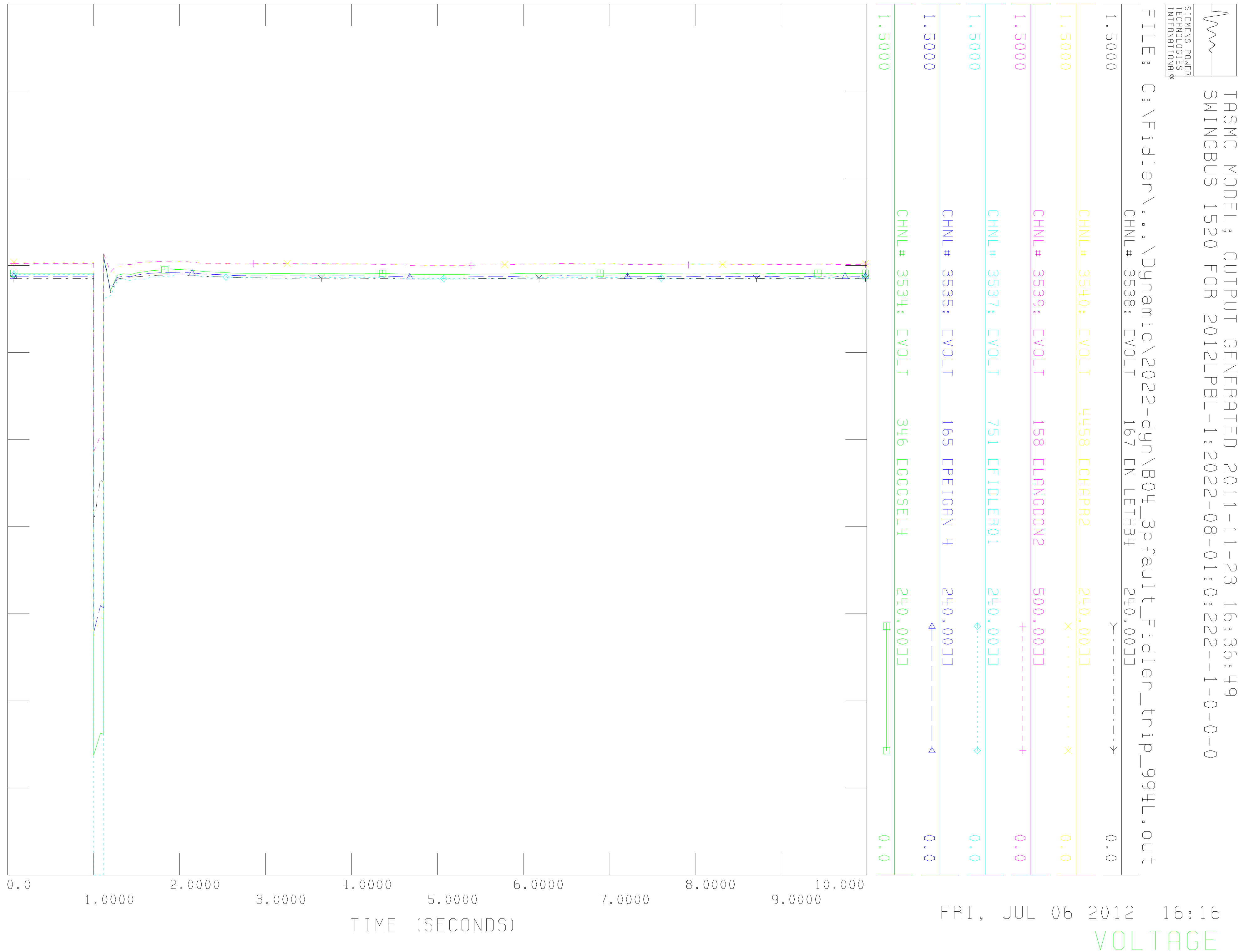
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER



SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_94L.out
CHNL# 3533: CFREQ 4458 [CHAPR2 240.00]
0.00700 -0.0070
CHNL# 3532: CFREQ 158 [LANGDON2 500.00]
0.00700 -0.0070
CHNL# 3531: CFREQ 167 [N LETHB4 240.00]
0.00700 -0.0070
CHNL# 3530: CFREQ 751 [FIDLER01 240.00]
0.00700 -0.0070
CHNL# 3528: CFREQ 165 [PEIGAN 4 240.00]
0.00700 -0.0070
CHNL# 3527: CFREQ 346 [GOOSEL4 240.00]
0.00700 -0.0070
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B05_3pfault_Fidler_trip_1071L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
CHNL #'S 921,3521: CANGL 1482ESHEER 1 19.000JJJ-CANGL 4187ECEGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482ESHEER 1 19.000JJJ-CANGL 342ESUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482ESHEER 1 19.000JJJ-CANGL 424EKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482ESHEER 1 19.000JJJ-CANGL 773ESECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482ESHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
RELATIVE ANGLES



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B04_3pfault_Fidler_trip_94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
0.0
1.0000
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5.0000
6.0000
7.0000
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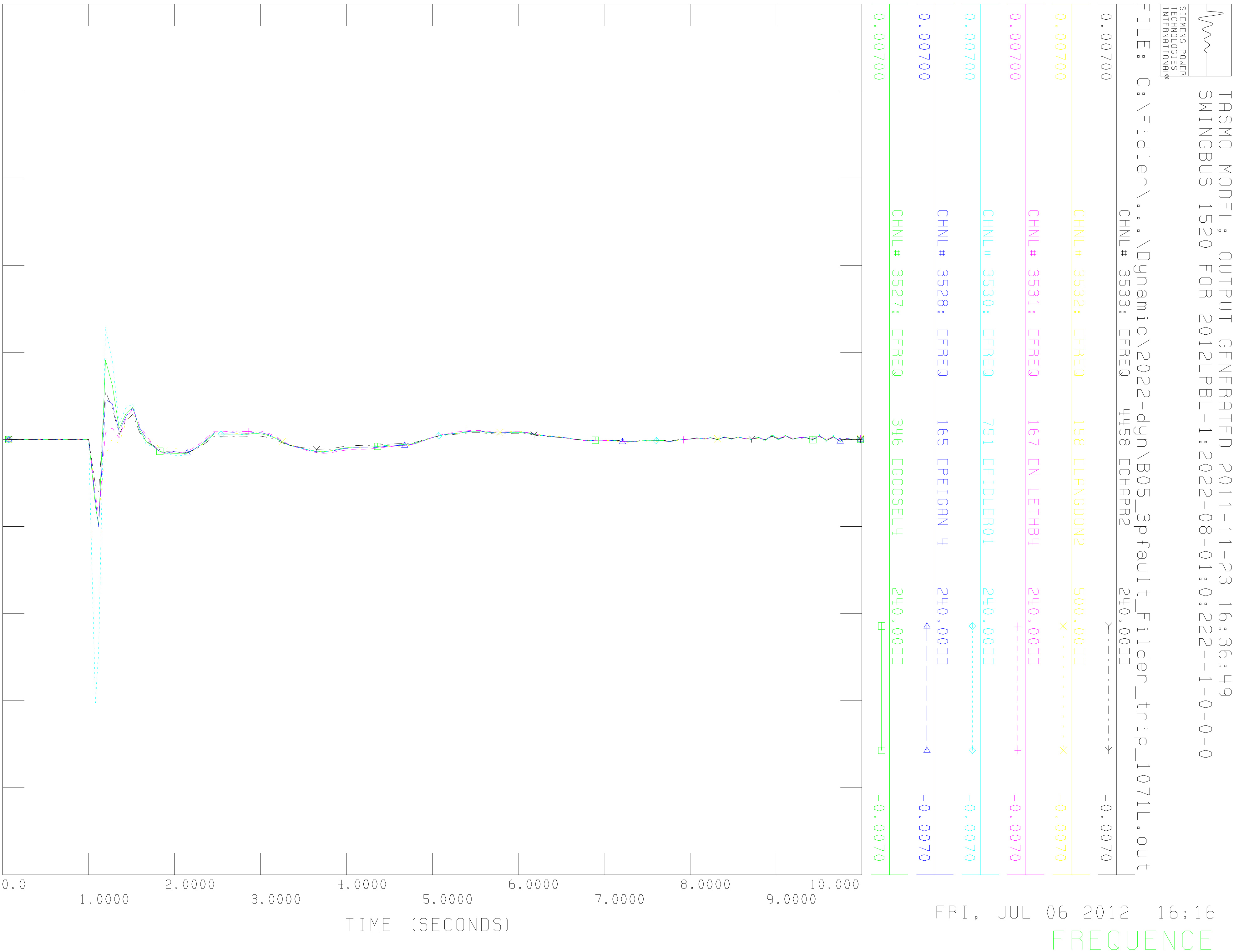
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\B05_3pfault_Filder_trip_1071L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3533: [FREQ 4458 [CHAPR2 240.0]]
CHNL# 3532: [FREQ 158 [LANGDON2 500.0]]
CHNL# 3531: [FREQ 167 [N LETHB4 240.0]]
CHNL# 3530: [FREQ 751 [FIDLER01 240.0]]
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]]
CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]]
0.00700
-0.0070
0.0
1.0000
2.0000
3.0000
4.0000
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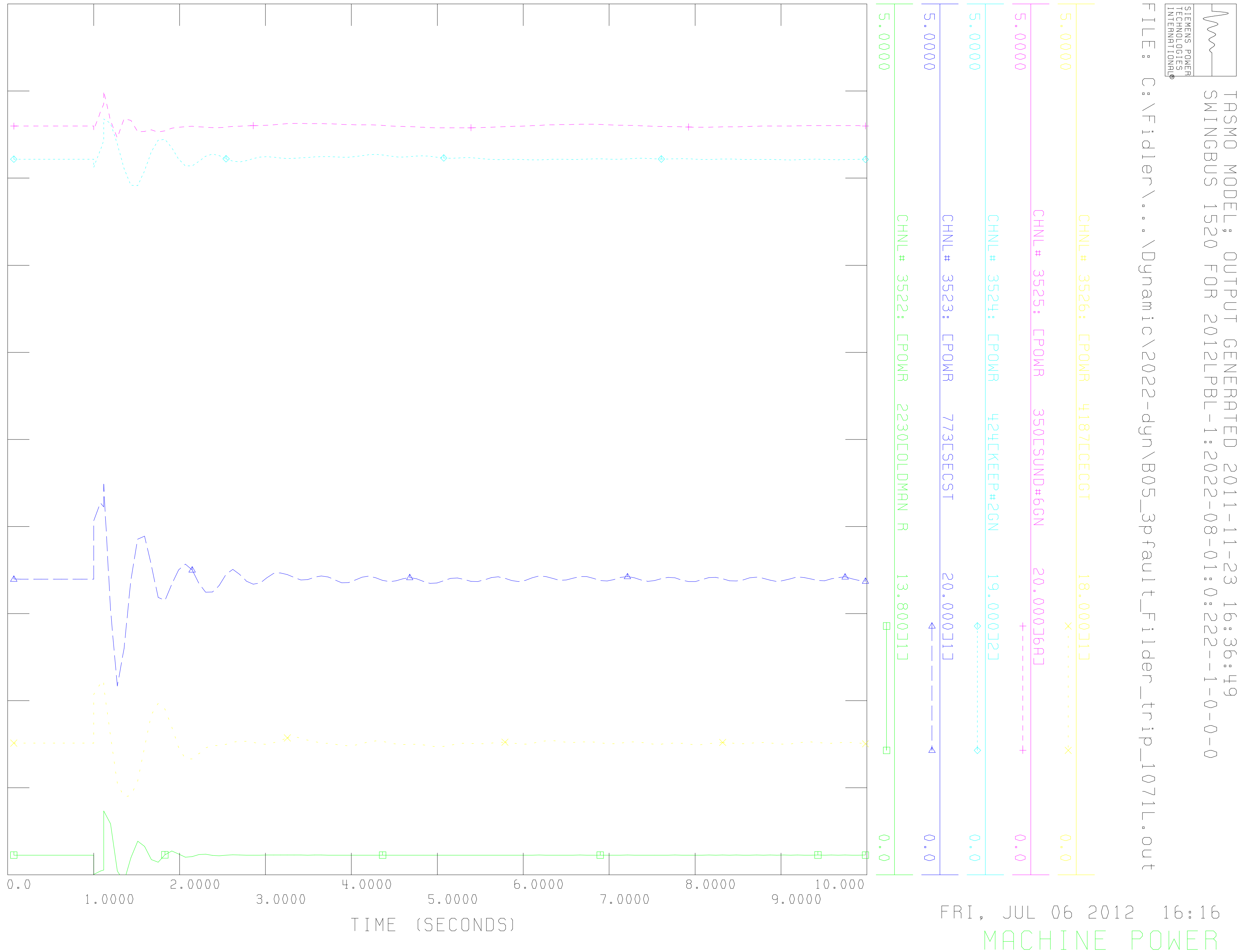
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
FILE: C:\Fidler\..\Dynamic\2022-dyn\B05_3pfault_Fidler_trip_1071L.out
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
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7.0000
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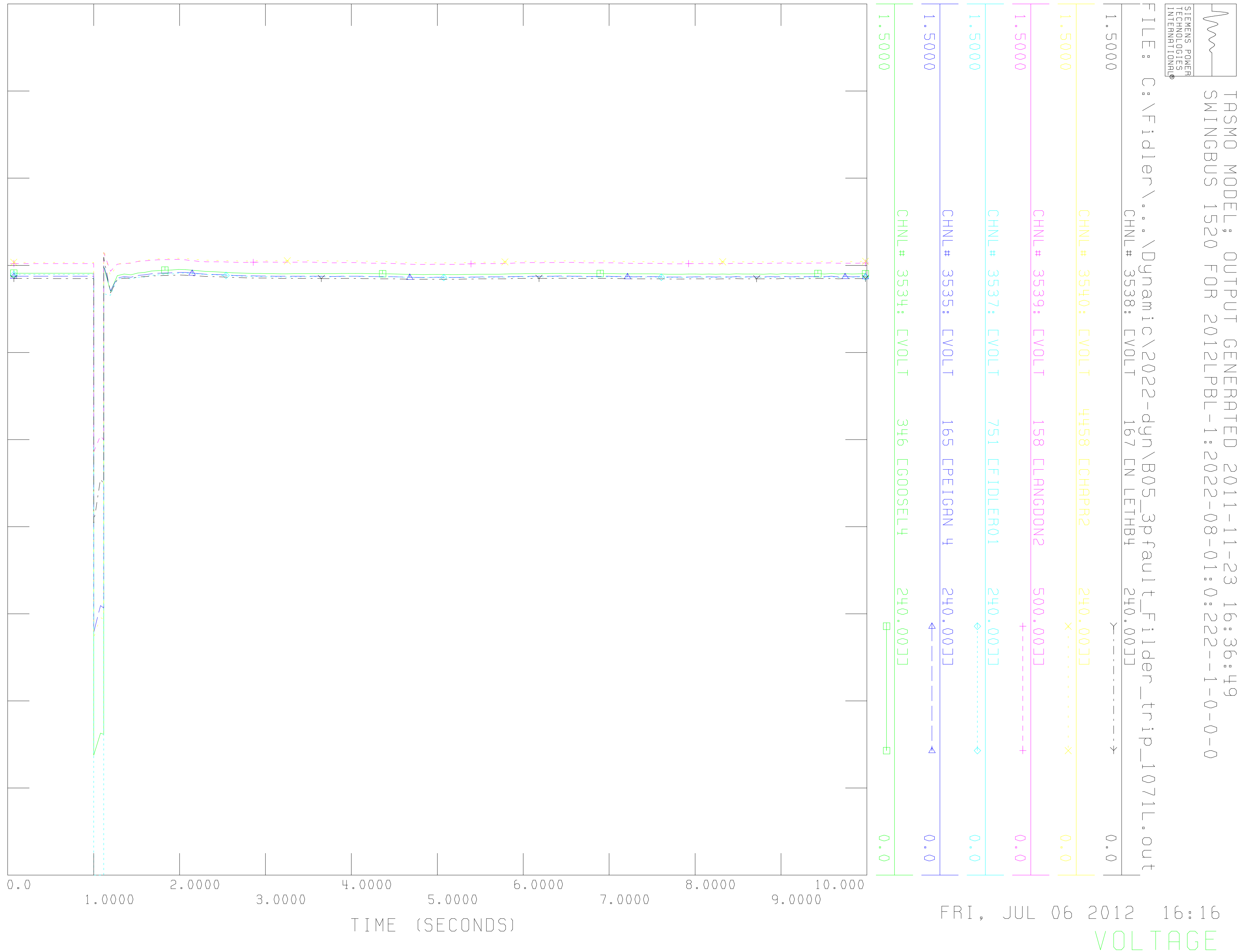
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
FILE: C:\Fidler\...\Dynamic\2022-dyn\B05_3pfault_Filder_trip_1071L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
1.5000 0.0
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
0.0
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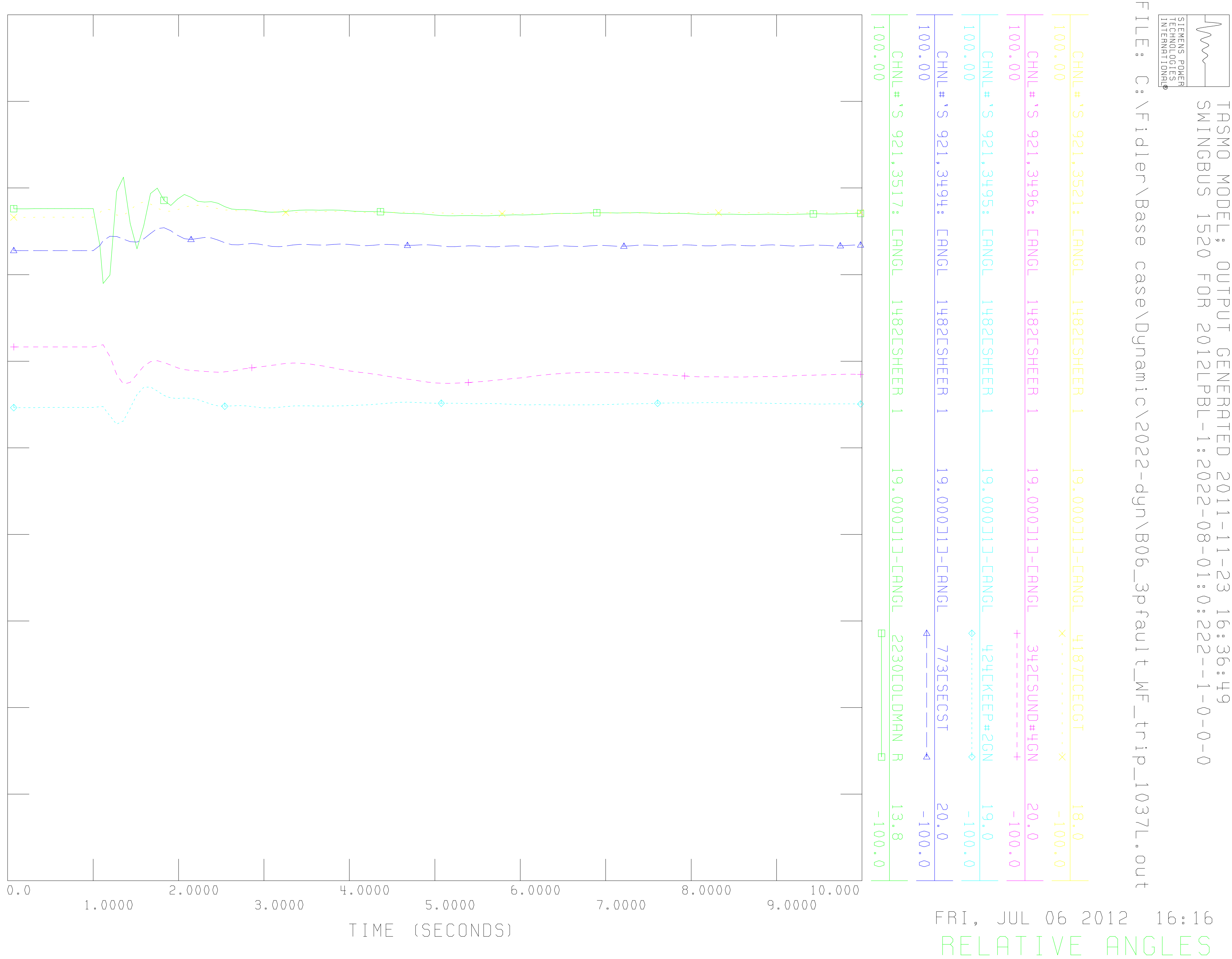
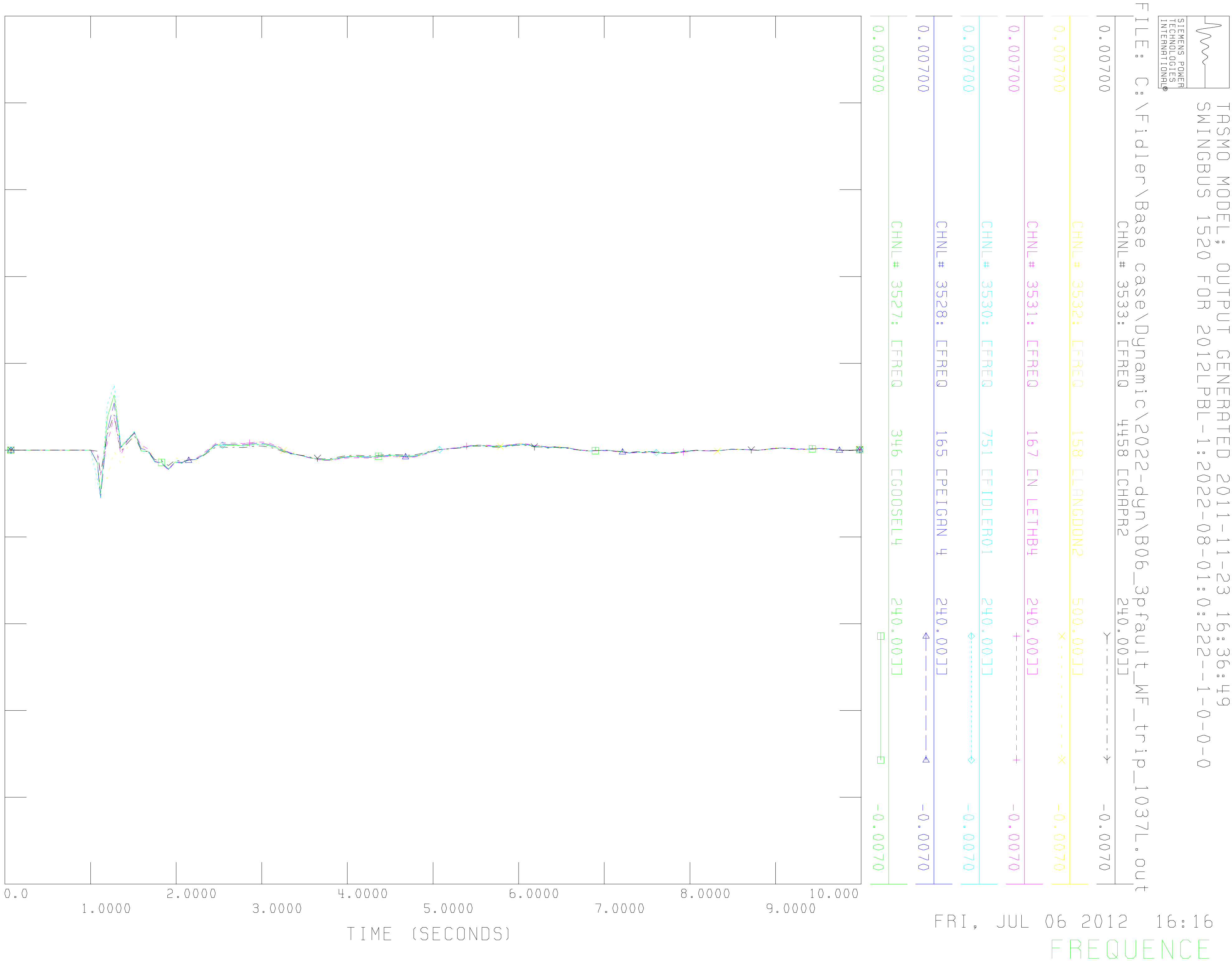
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL #'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CECGT 18.0
100.00 -100.0
CHNL #'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL #'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL #'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL #'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
0.0 1.0000 2.0000 3.0000 4.0000 5.0000 6.0000 7.0000 8.0000 9.0000 10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:16
RELATIVE ANGLES



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
0.00700 CHNL# 3533: [FREQ 4458 [CHAPR2 240.0]] -0.0070
0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.0]] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.0]] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.0]] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]] -0.0070
0.0
1.0000
2.0000
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4.0000
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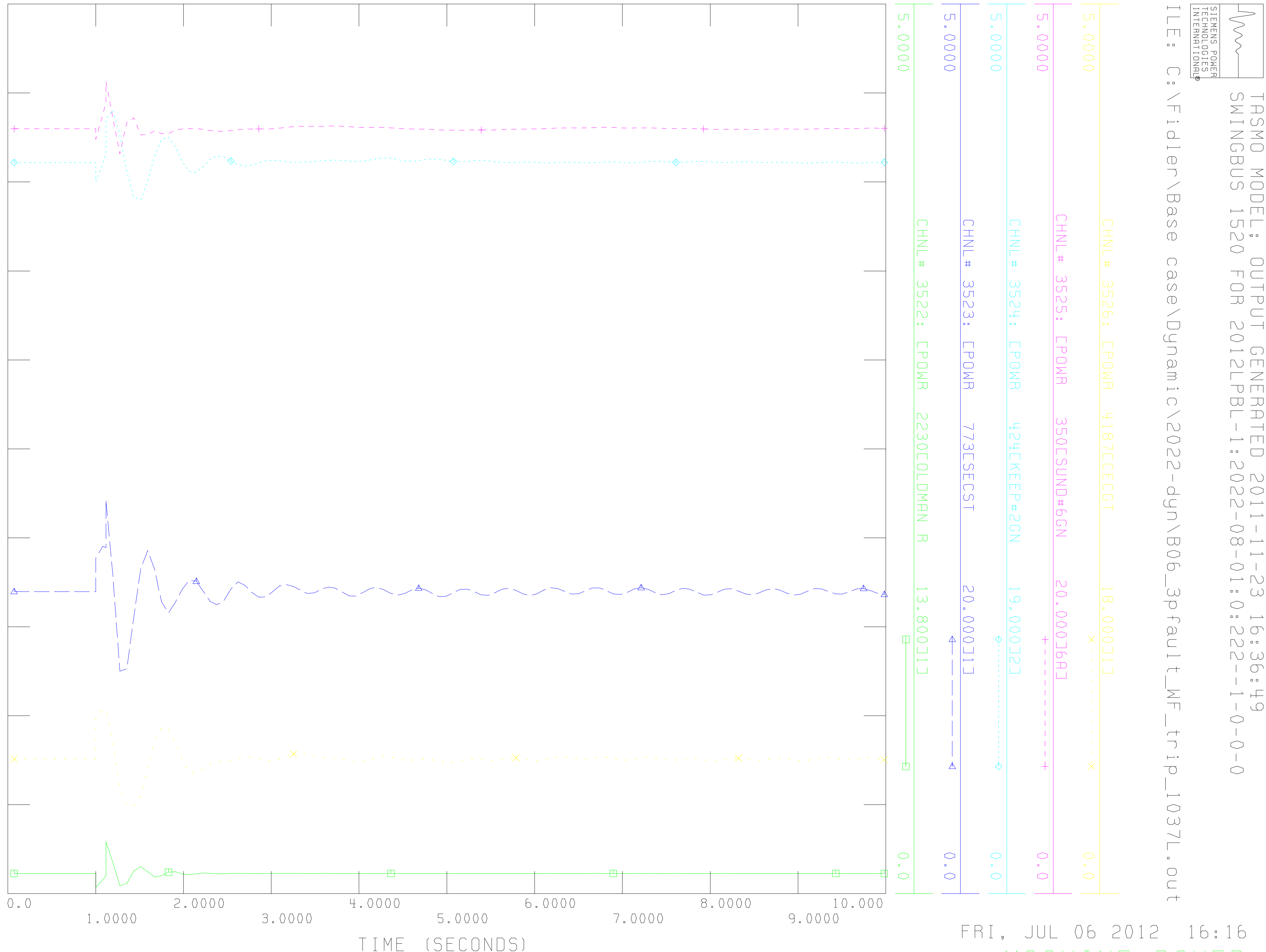
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
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0.0
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
5.0000
0.0
CHNL# 3523: [POWR 773[SECST 20.000]1]
5.0000
0.0
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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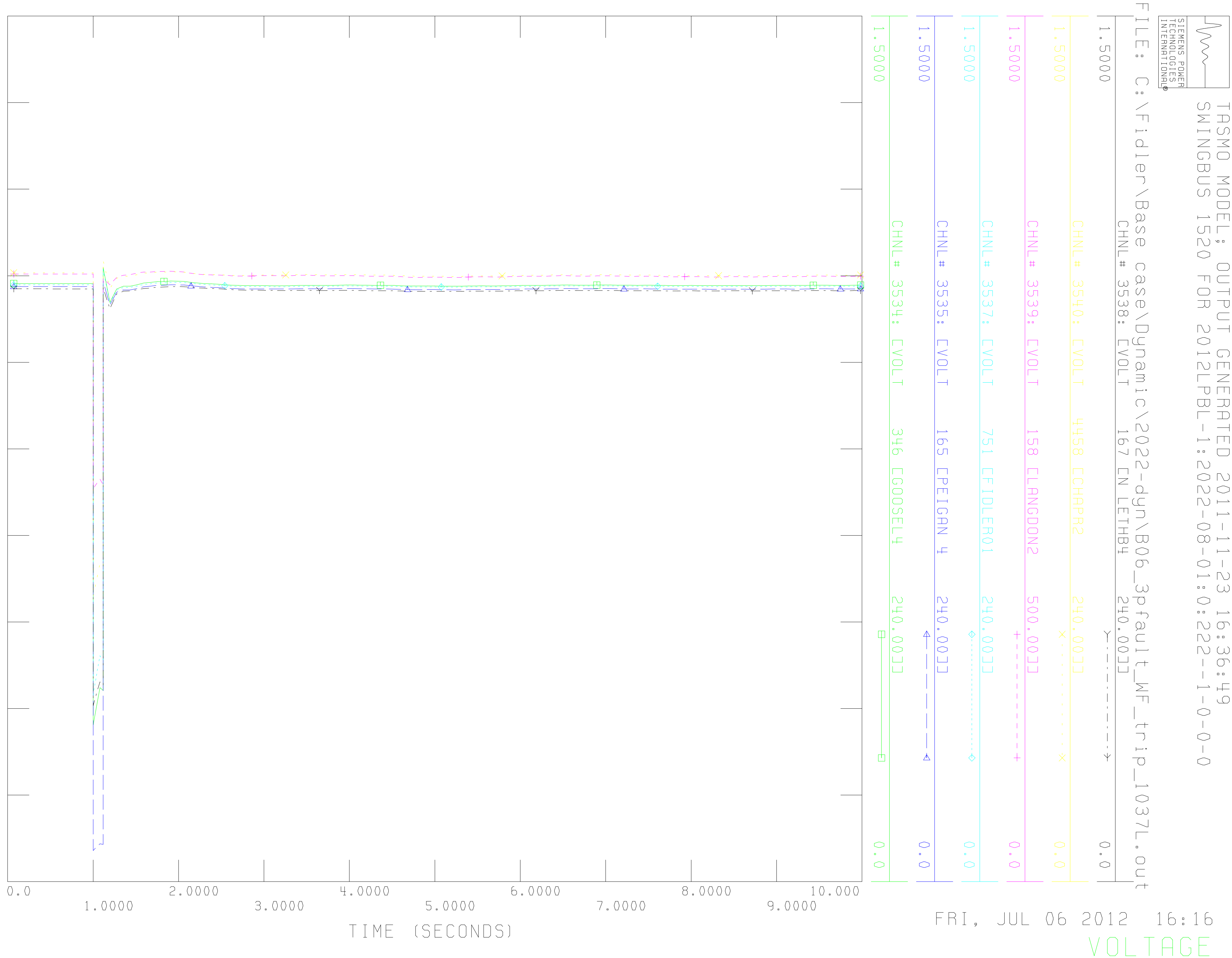
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B06_3pfault_WF_trip_1037L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000
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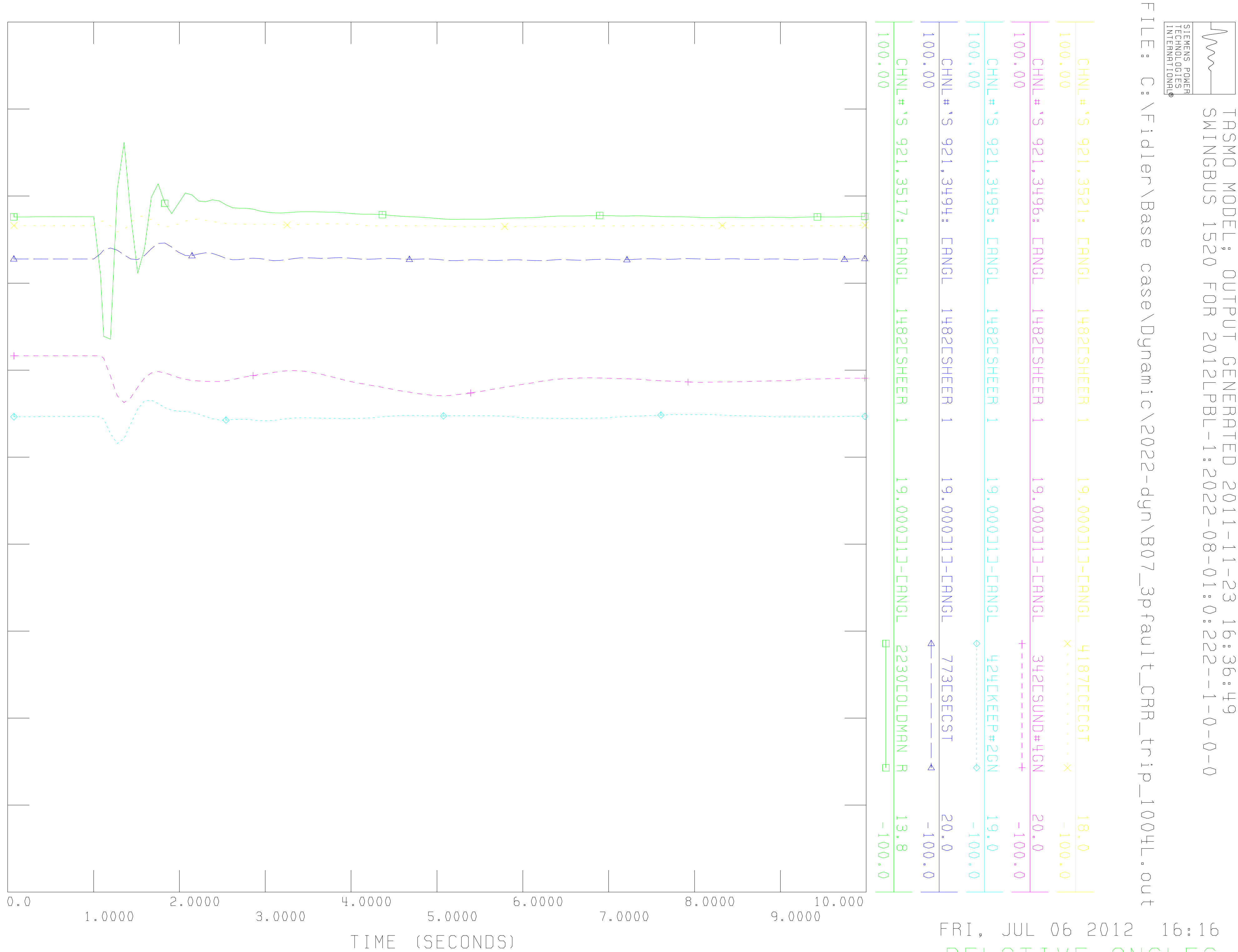
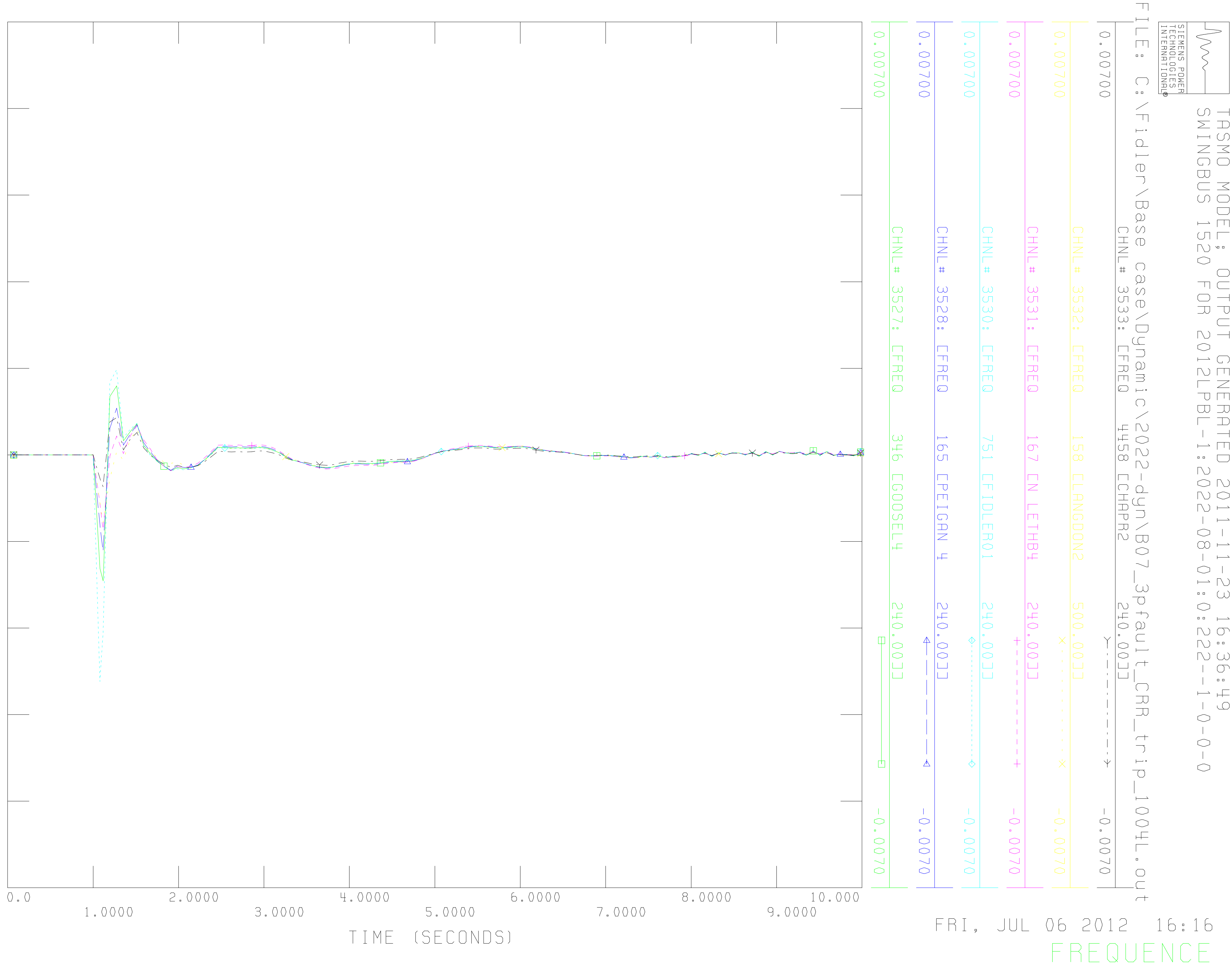
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE



FRI, JUL 06 2012 16:16

RELATIVE ANGLES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CHNL# 3532: CFREQ 158 CLANGDON2 500.00] 0.00700 -0.0070
CHNL# 3531: CFREQ 167 CN LETHB4 240.00] 0.00700 -0.0070
CHNL# 3530: CFREQ 751 CFIDLER01 240.00] 0.00700 -0.0070
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CHNL# 3527: CFREQ 346 CGOOSEL4 240.00] 0.00700 -0.0070
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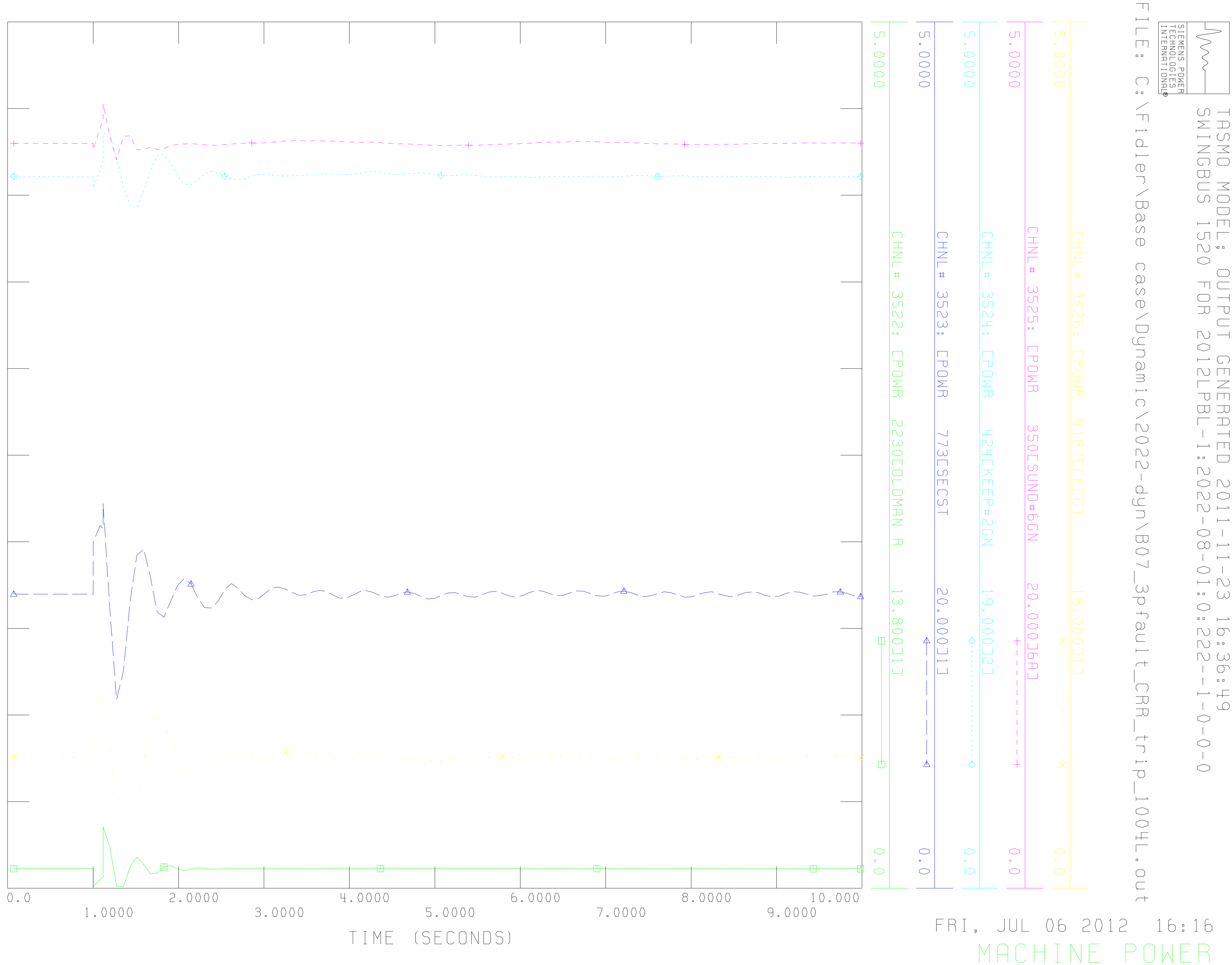
TIME (SECONDS)
FRI, JUL 06 2012 16:16
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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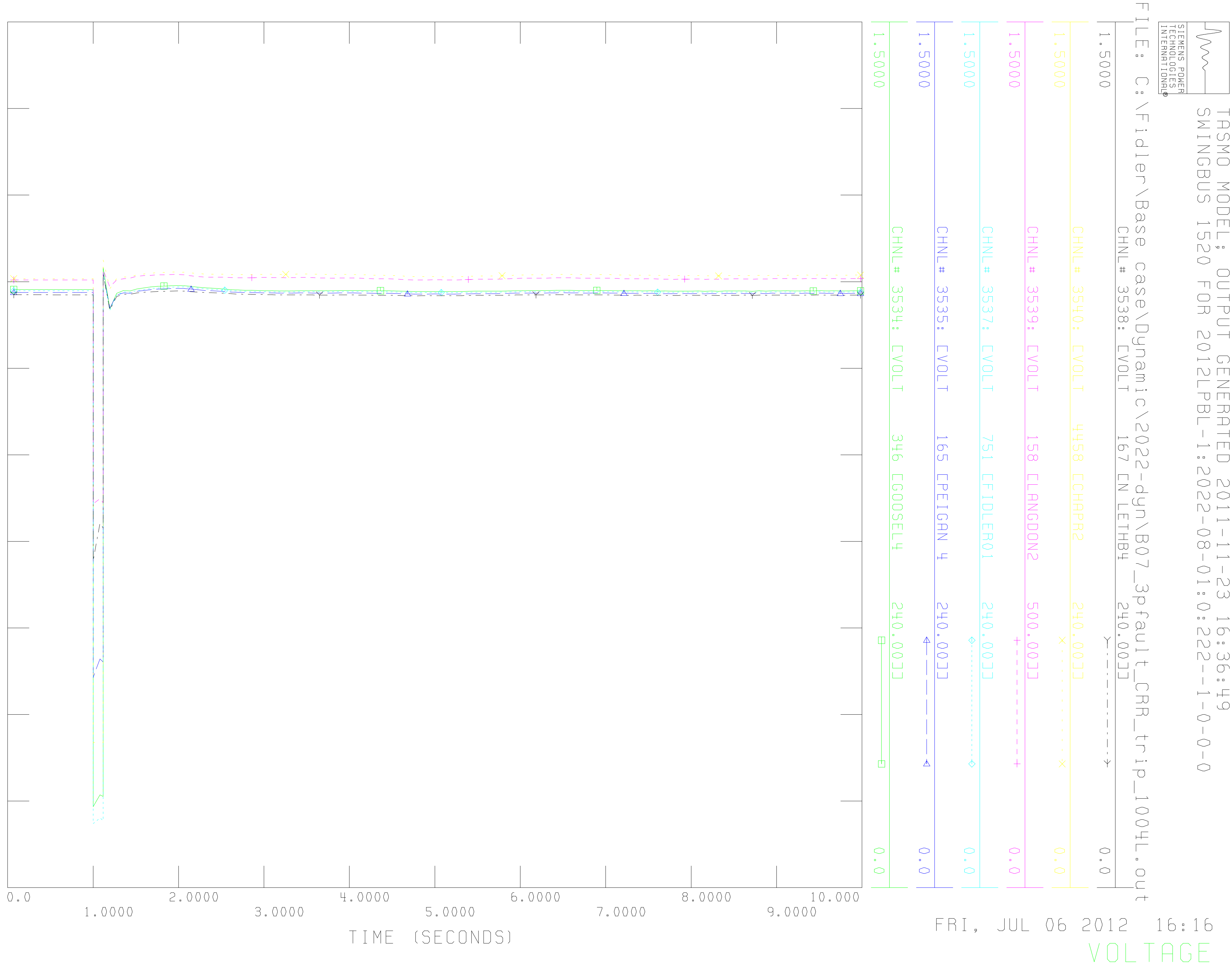
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER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FILE: C:\Fidler\Base case\Dynamic\2022-dyn\B07_3pfault_CRR_trip_1004L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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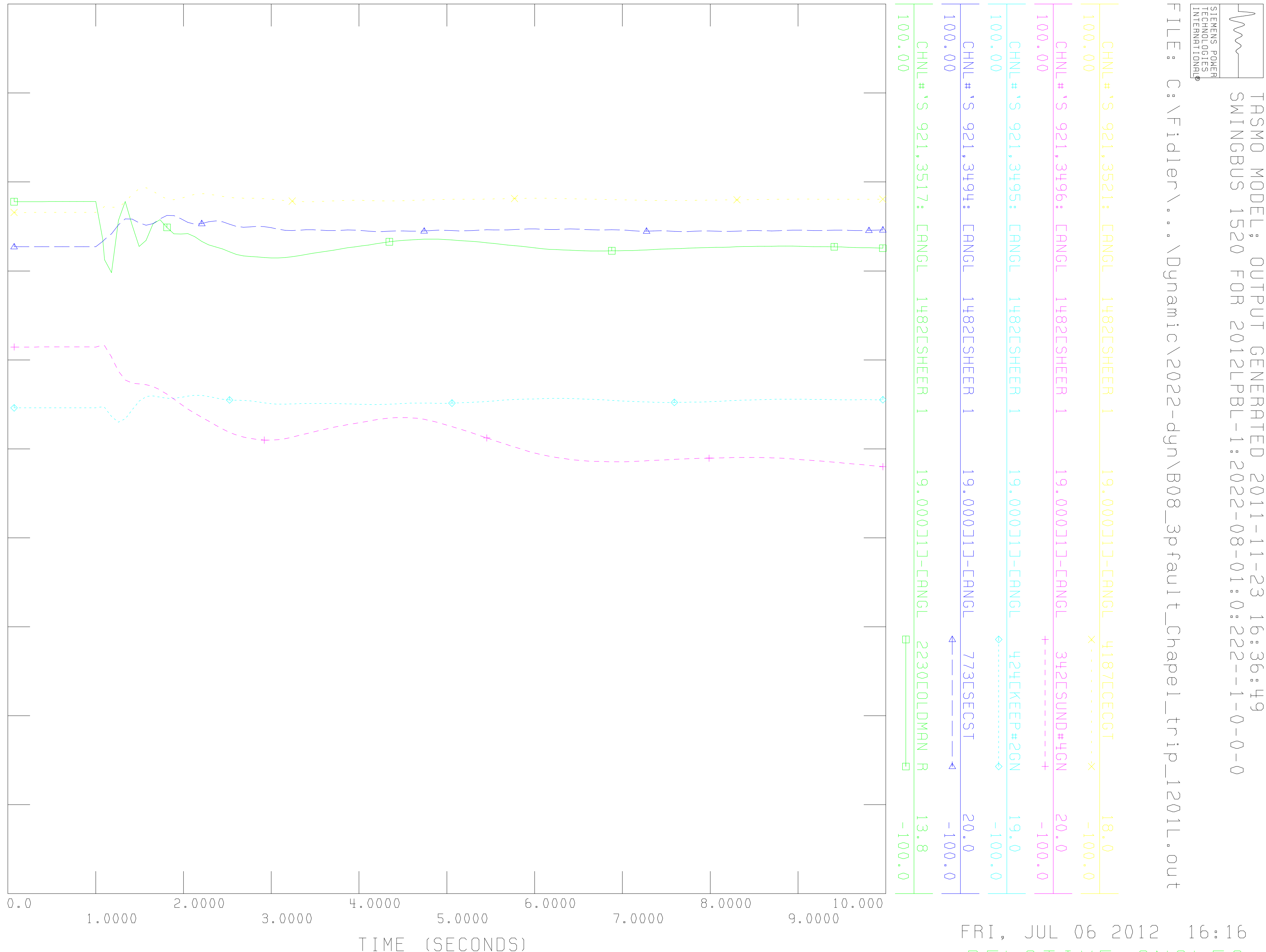
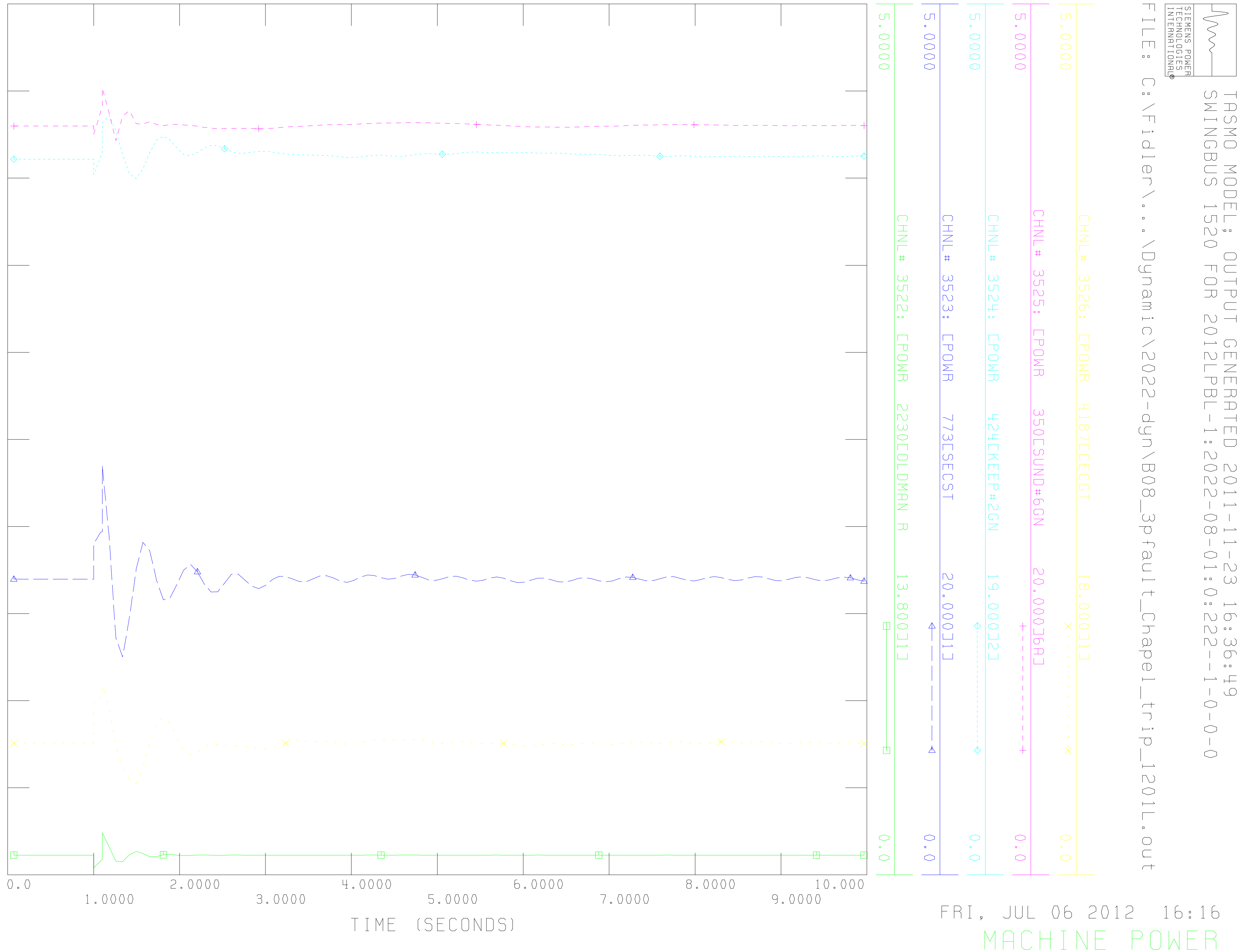
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE



FRI, JUL 06 2012 16:16

RELATIVE ANGLES



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CHNL# 3523: [POWR 773ESECST 20.000]1] 5.0000 0.0
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2] 5.0000 0.0
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A] 5.0000 0.0
CHNL# 3526: [POWR 4187[EEGT 18.000]1] 5.0000 0.0
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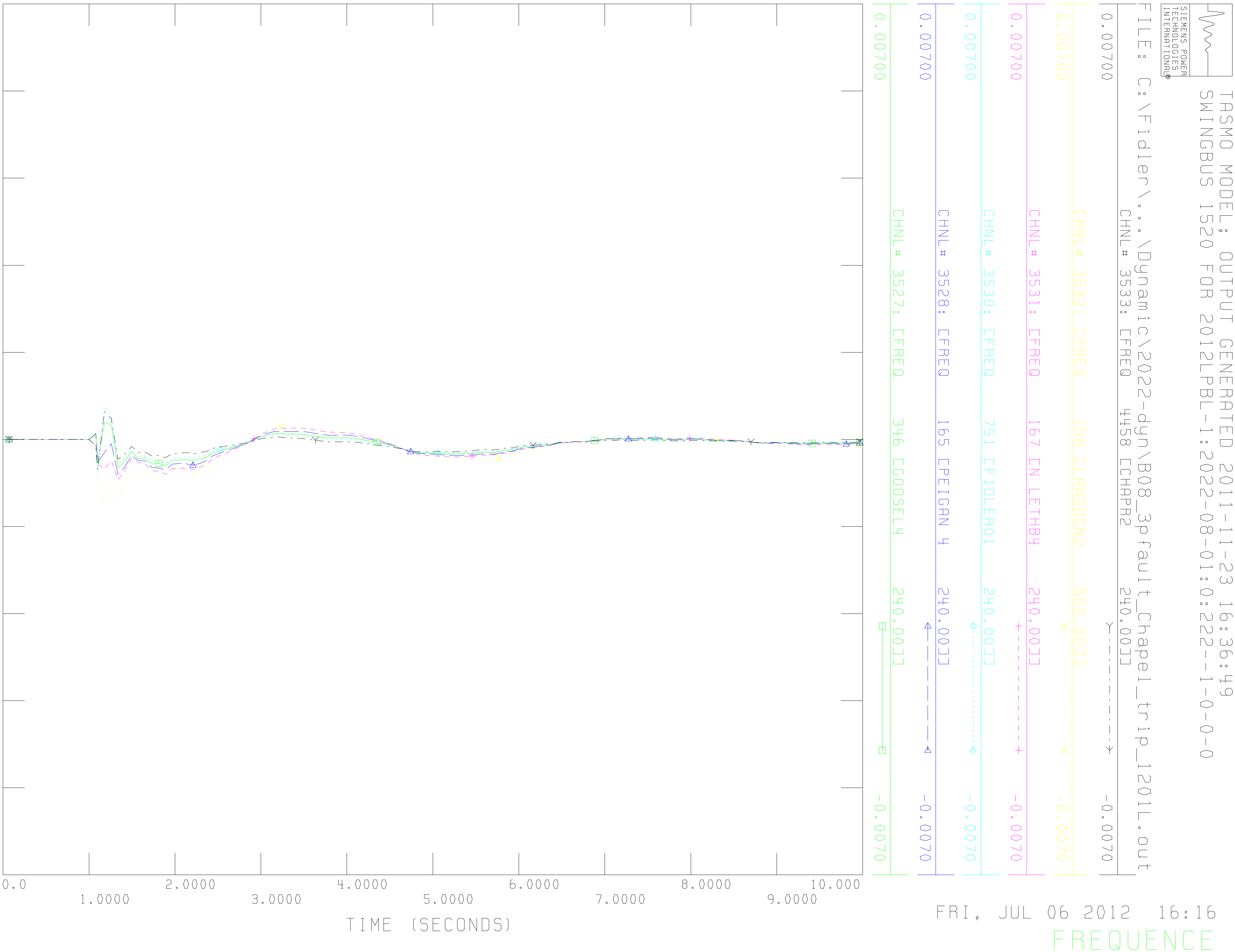
TIME (SECONDS)
FRI, JUL 06 2012 16:16
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\B08_3pfault_Chapel_trip_1201L.out
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CHNL# 3532: [FREQ 158 [LANGDON2 500.0]]
0.00700 -0.0070
CHNL# 3531: [FREQ 167 [N LETHB4 240.0]]
0.00700 -0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.0]]
0.00700 -0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]]
0.00700 -0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]]
0.00700 -0.0070
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TIME (SECONDS)
FRI, JUL 06 2012 16:16
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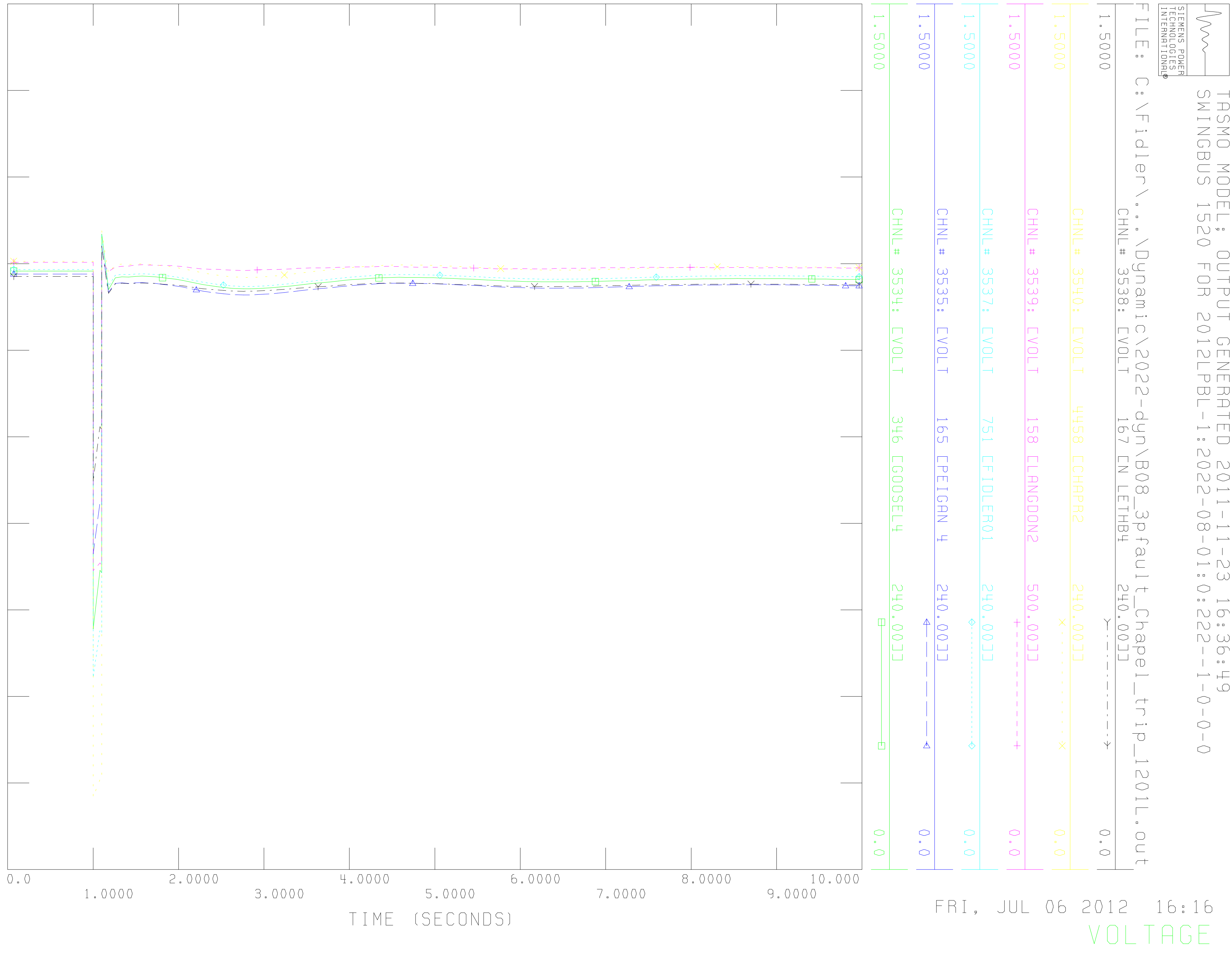

TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\...\Dynamic\2022-dyn\B08_3pfault_Chapel_trip_1201L.out
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]] 1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]] 1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]] 1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]] 1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]] 1.5000 0.0
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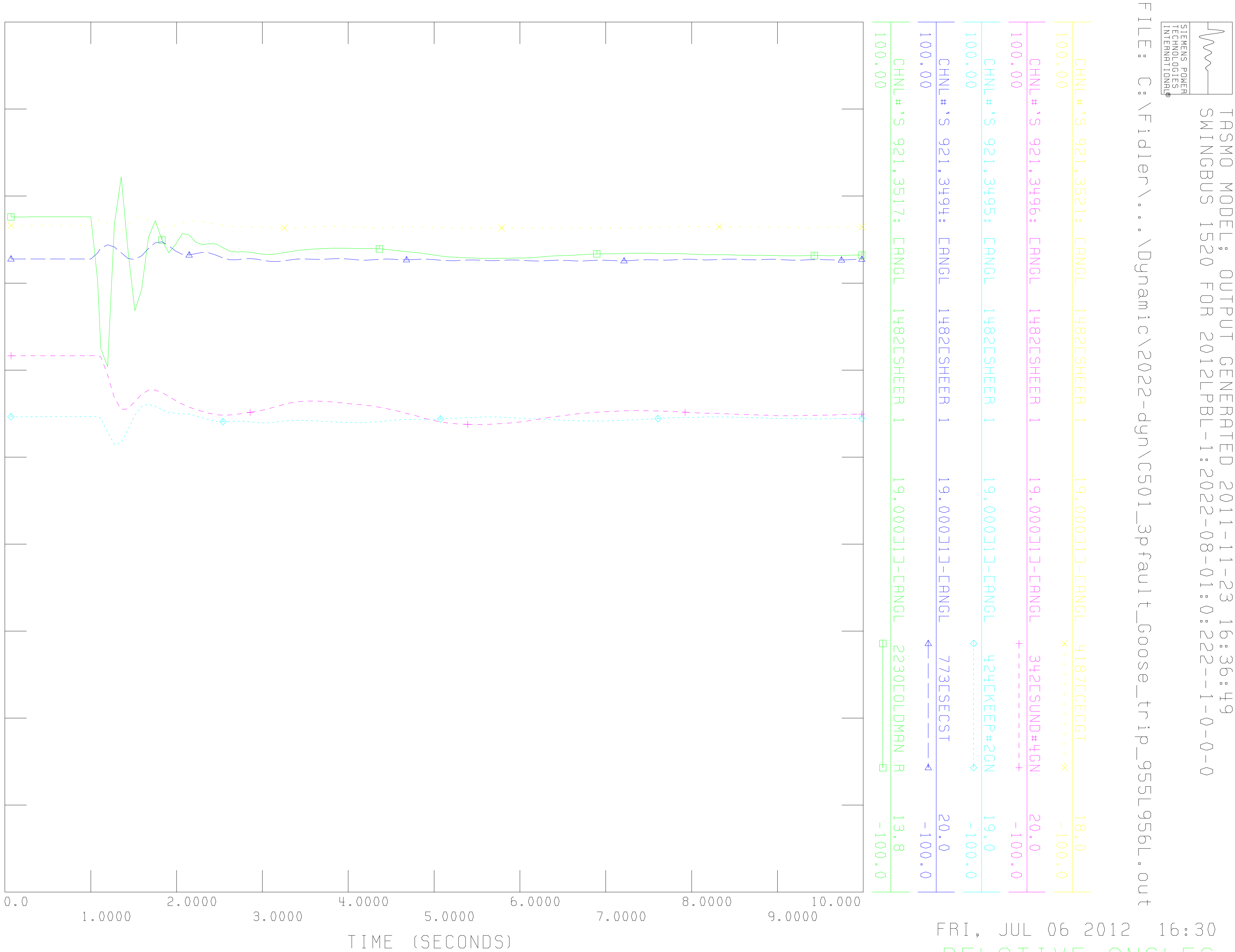
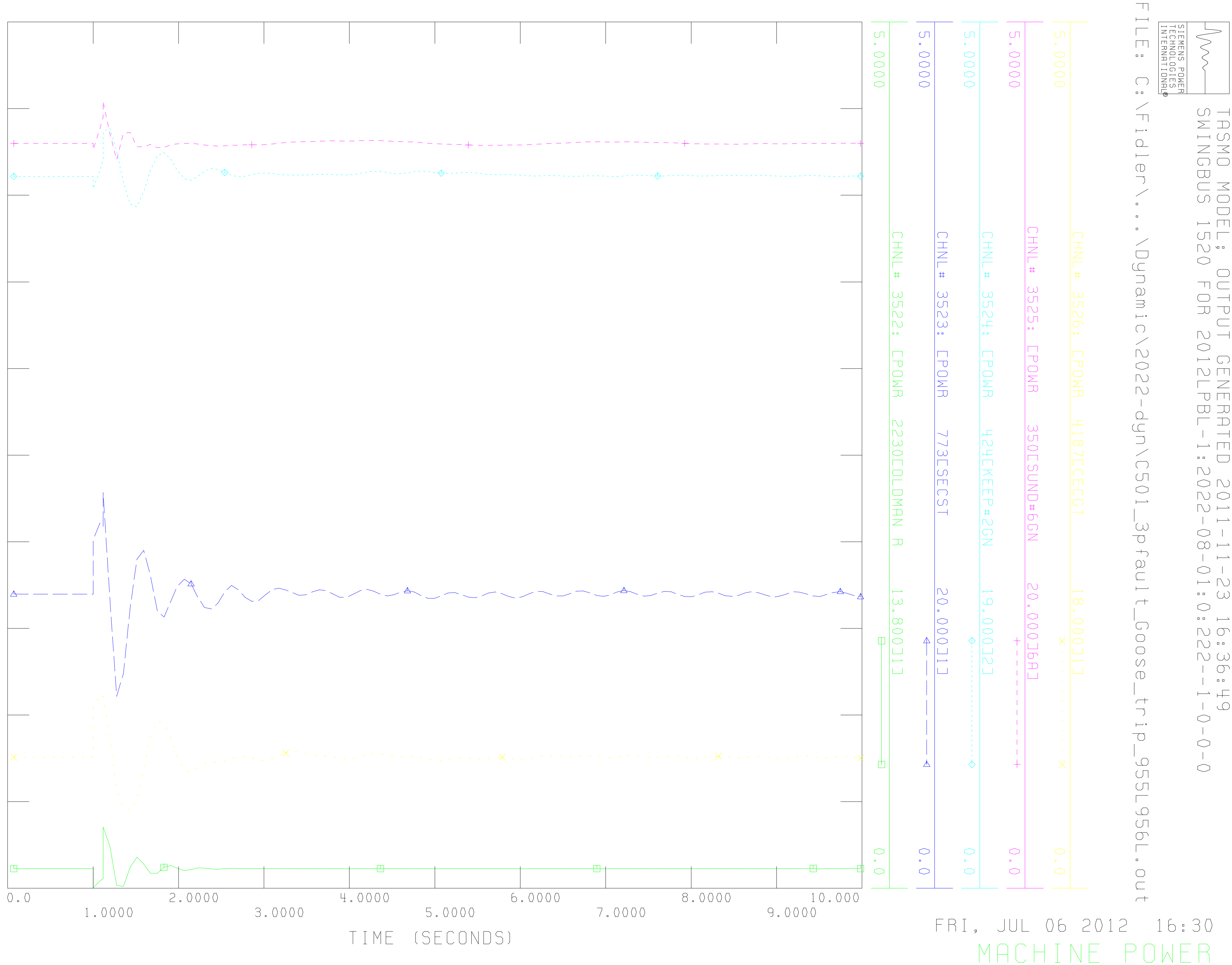
TIME (SECONDS)
FRI, JUL 06 2012 16:16
VOLTAGE



FRI, JUL 06 2012 16:30

RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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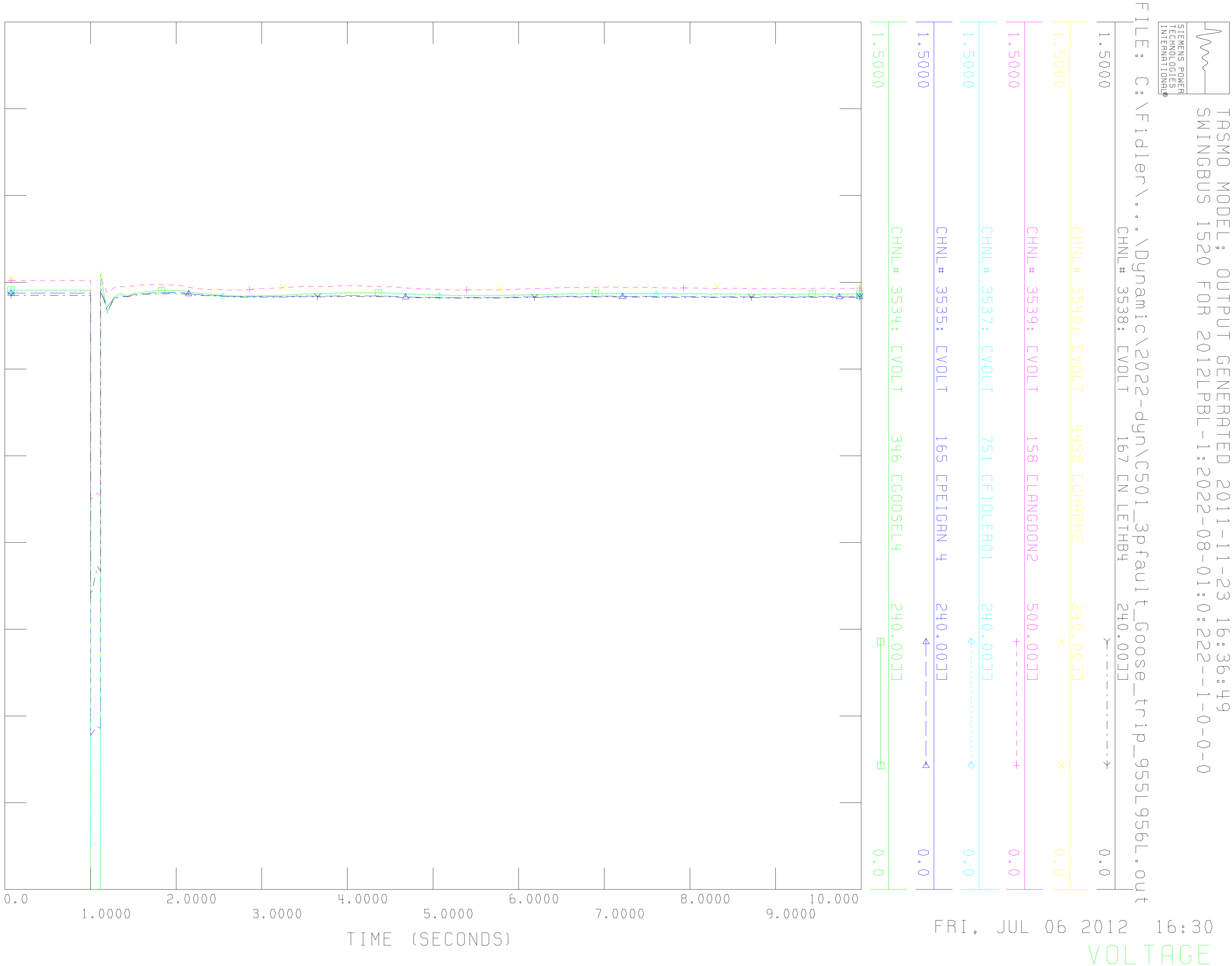
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C501_3pfault_Goose_trip_955L956L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]
CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]
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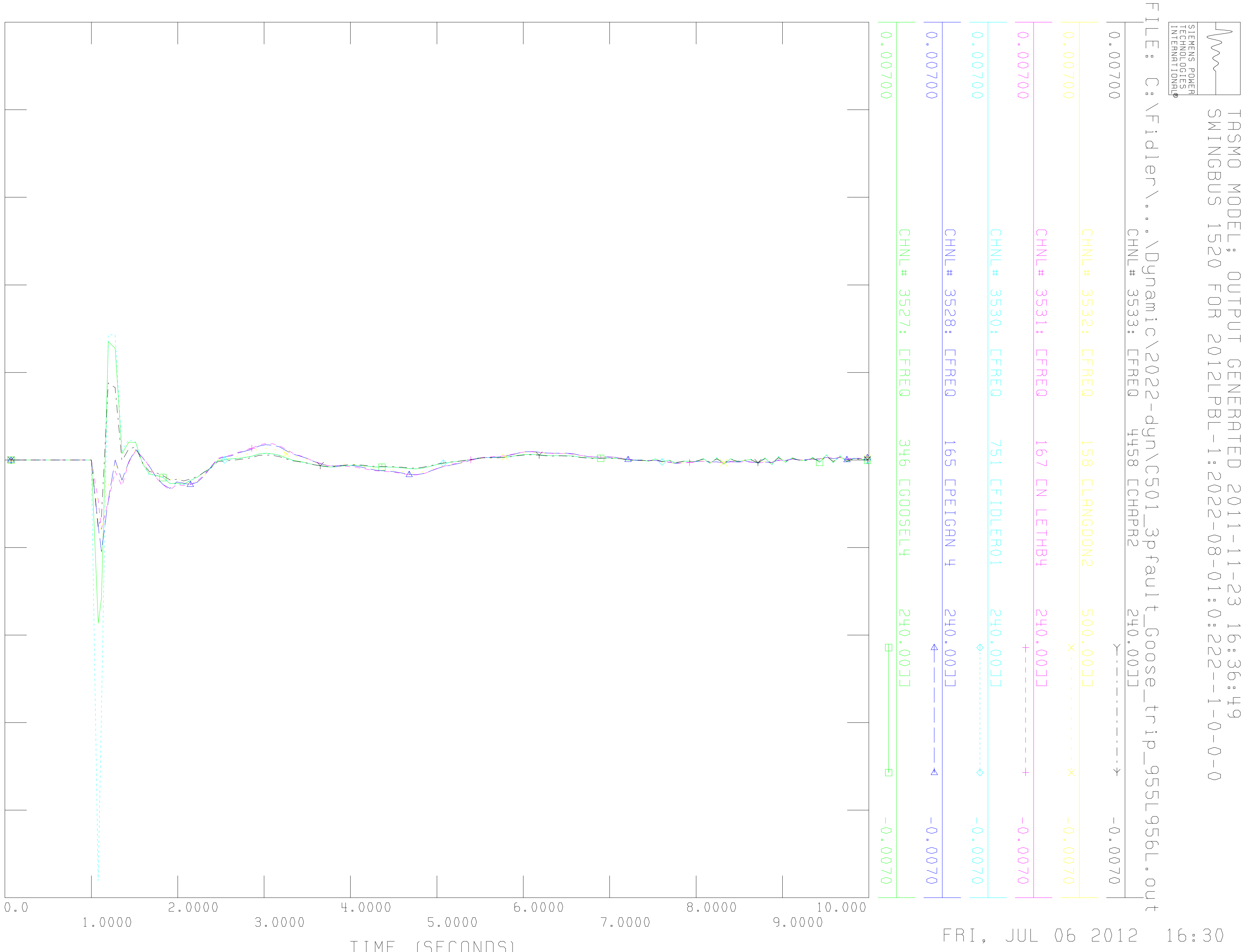
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE



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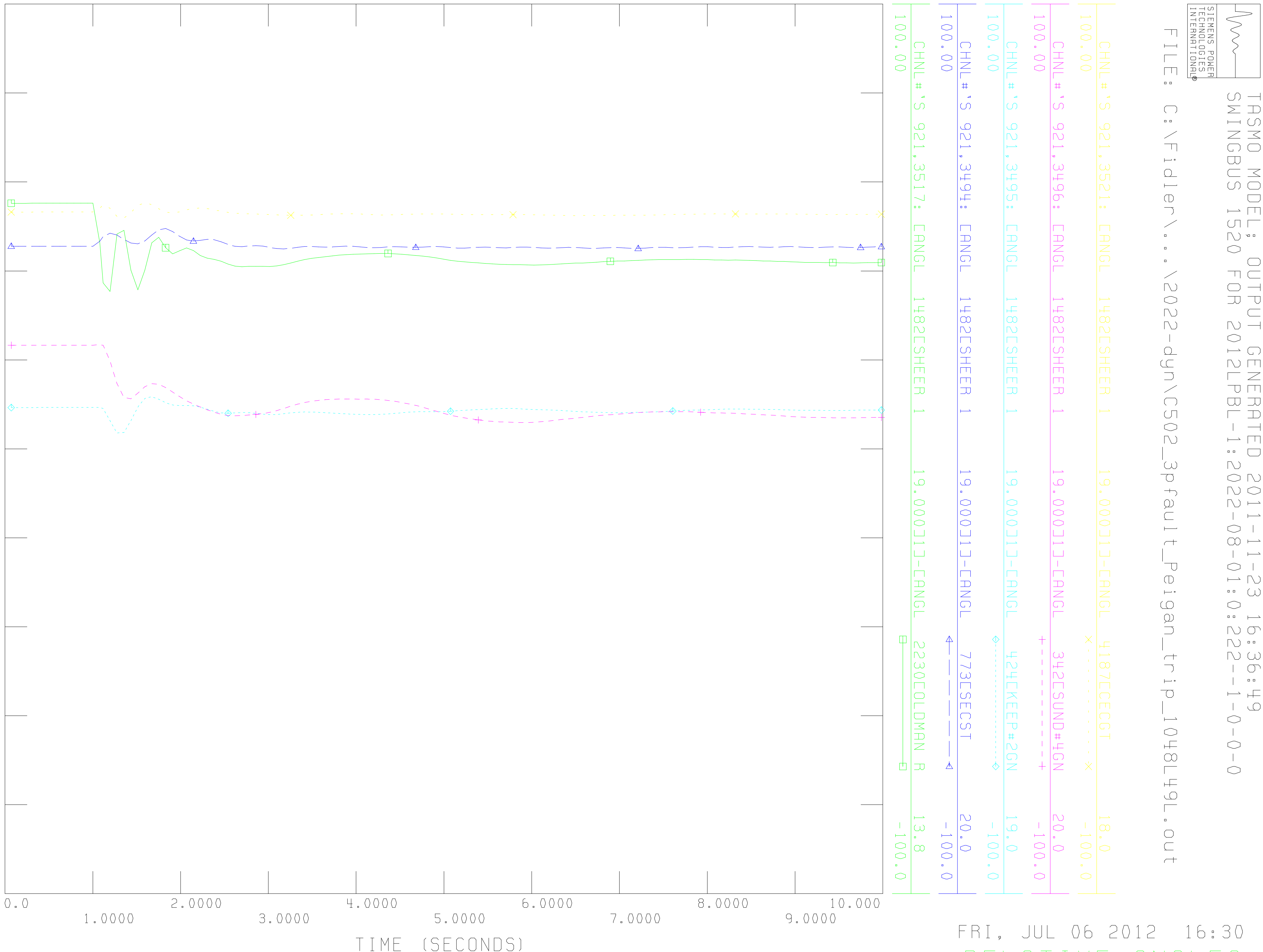
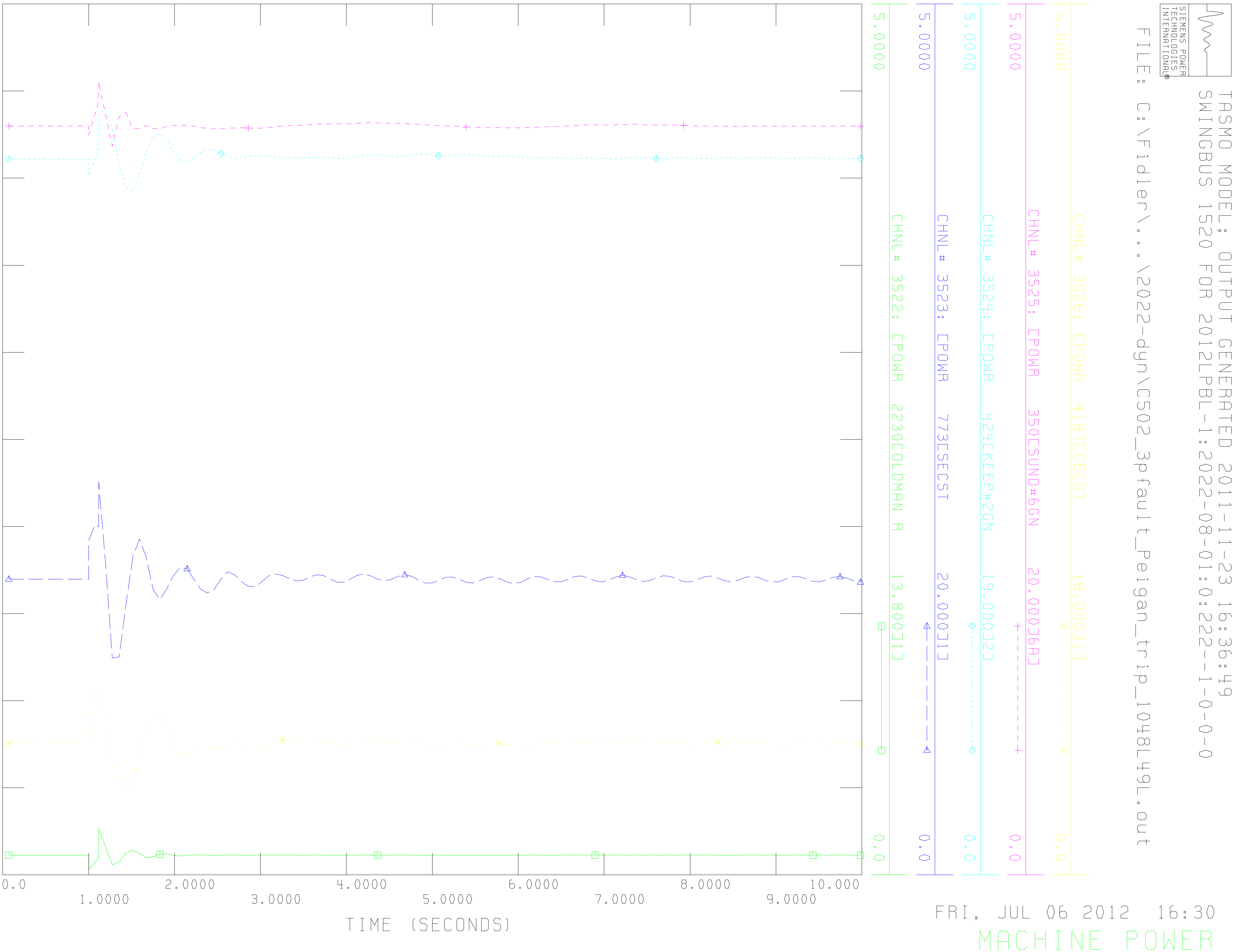


FRI, JUL 06 2012 16:30

RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3523: [POWR 773ESECST 20.000]1]
CHNL# 3524: [POWR 424CKEEP#2GN 19.000]2]
CHNL# 3525: [POWR 350CSUND#6GN 20.000]6A]
CHNL# 3526: [POWR 4187CEEGT 18.000]1]
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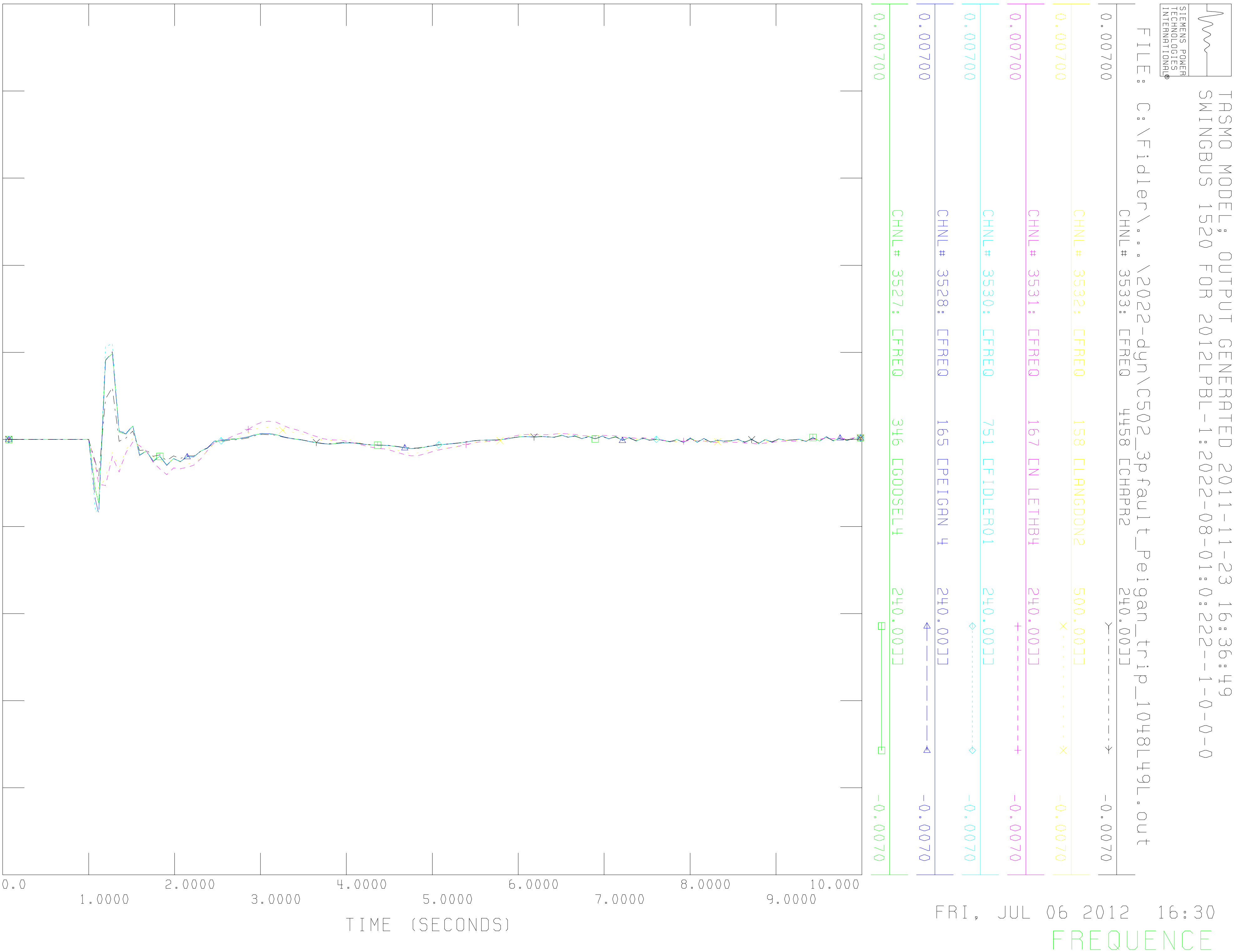
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER


SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C502_3pfault_Peigan_trip_1048L49L.out
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CHNL# 3532: [FREQ 158 [LANGDON2 500.0]]
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CHNL# 3531: [FREQ 167 [N LETHB4 240.0]]
0.00700 -0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.0]]
0.00700 -0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]]
0.00700 -0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]]
0.00700 -0.0070
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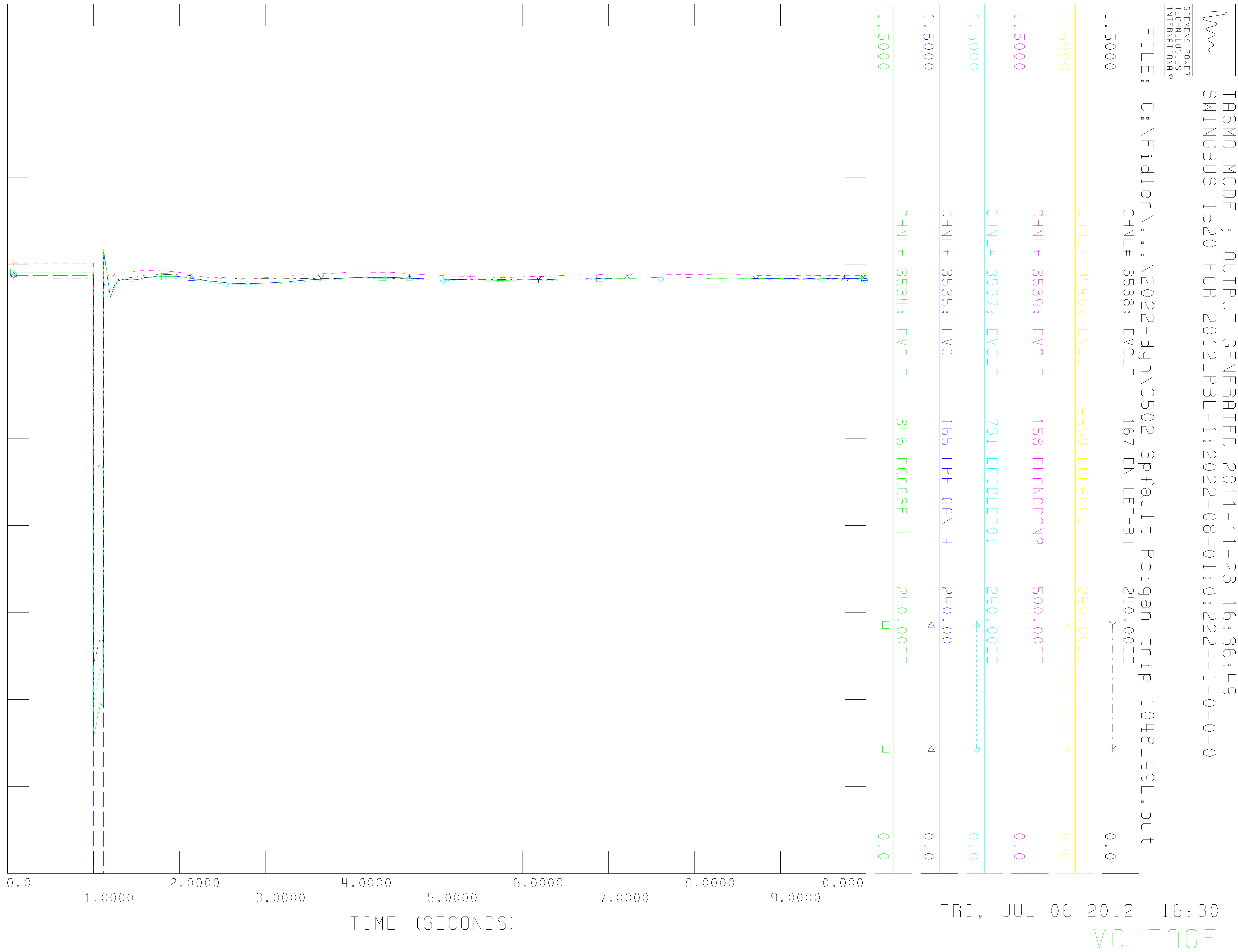
TIME (SECONDS)
FRI, JUL 06 2012 16:30
FREQUENCE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
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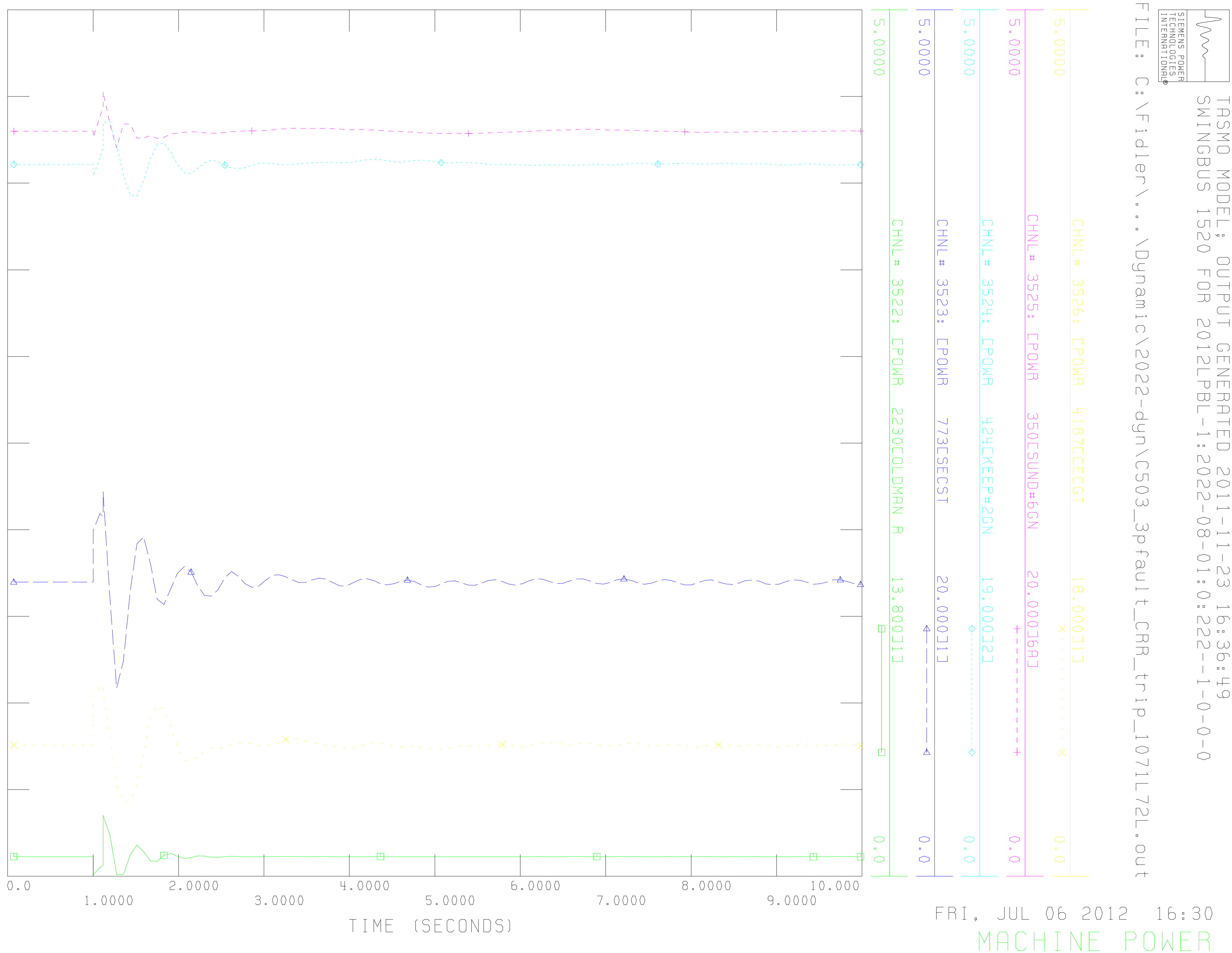
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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5.0000 CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A] 0.0
5.0000 CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2] 0.0
5.0000 CHNL# 3523: [POWR 773[SECST 20.000]1] 0.0
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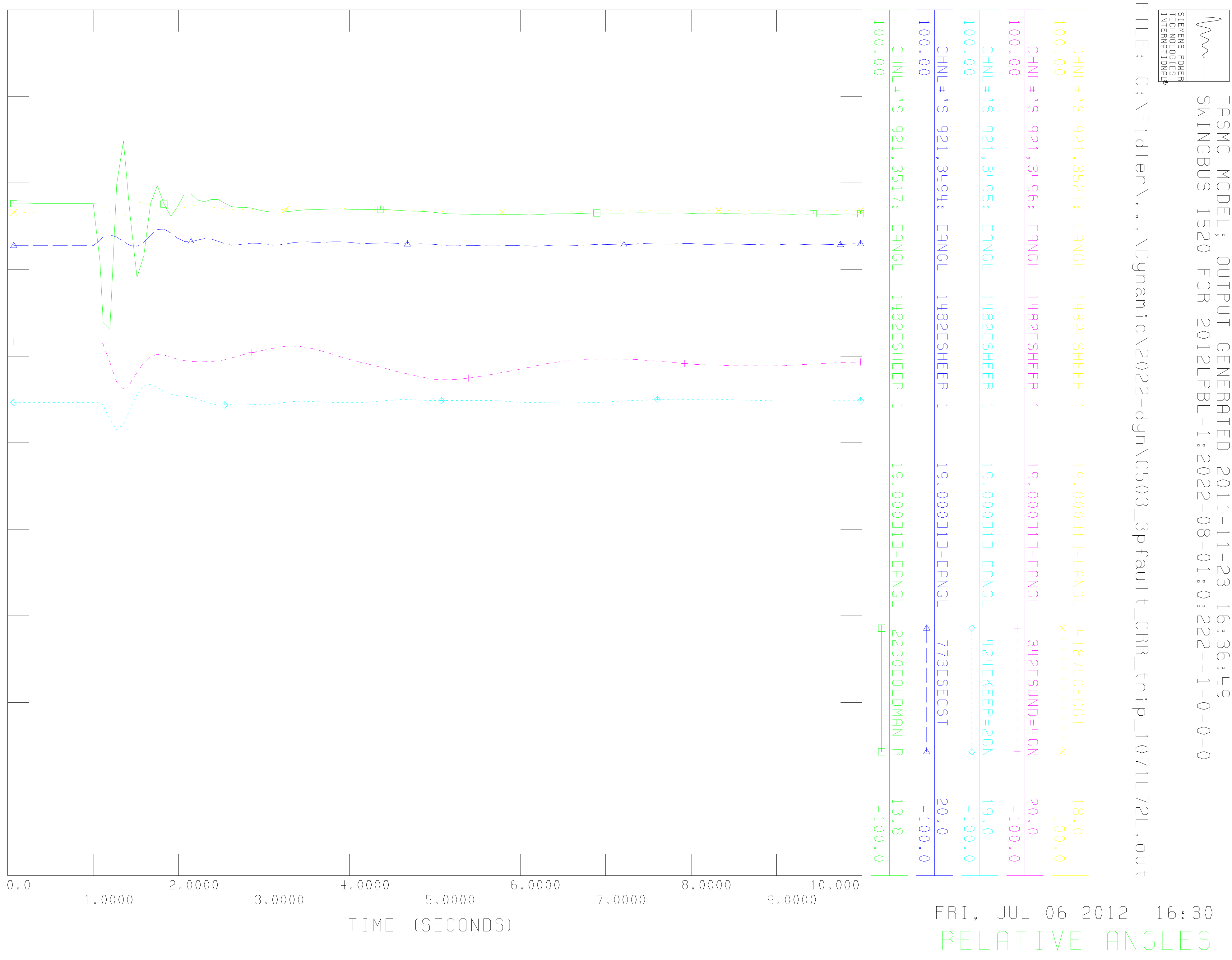
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL#'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
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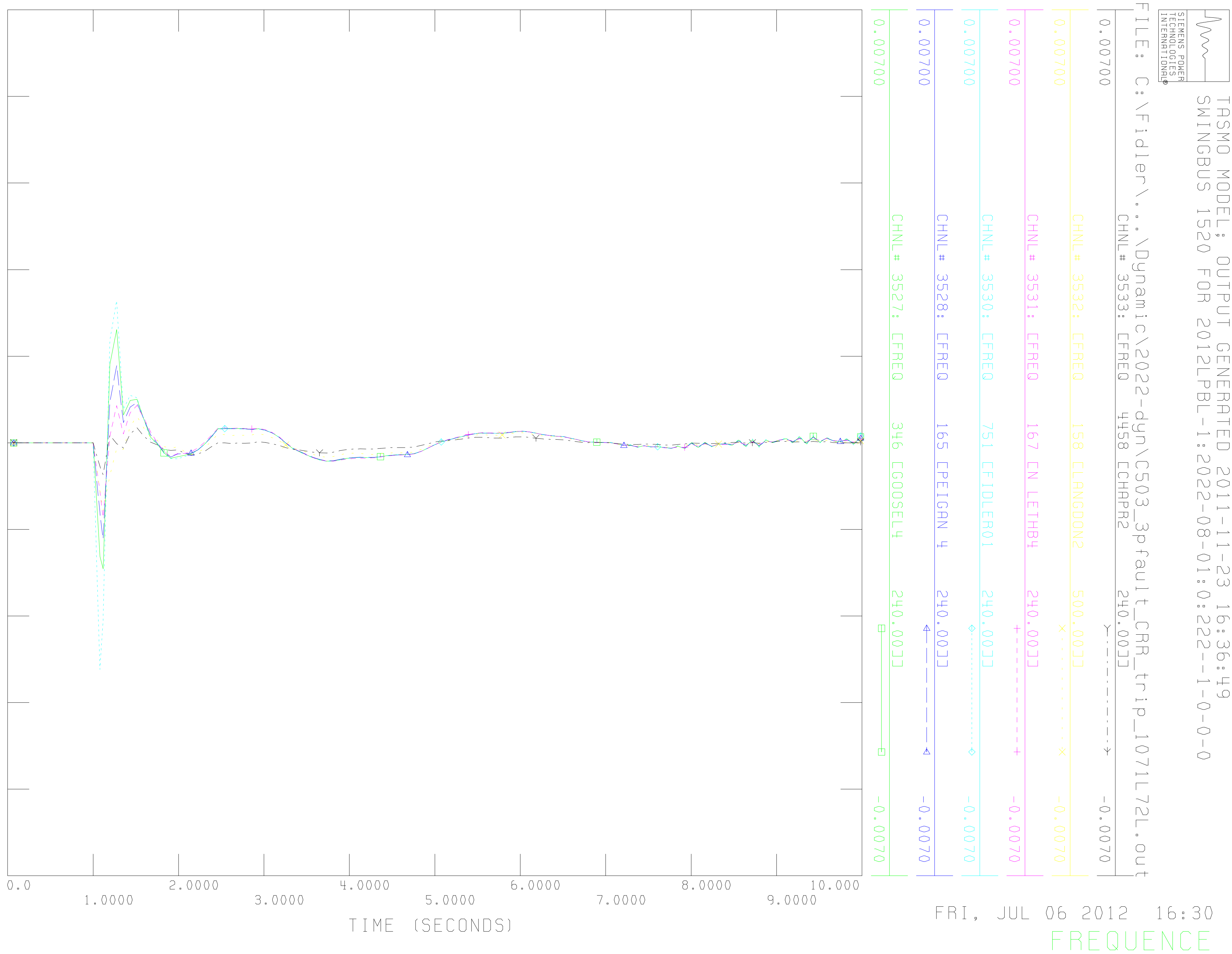
FRI, JUL 06 2012 16:30
RELATIVE ANGLES


SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
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CHNL# 3532: [FREQ 158 [LANGDON2 500.00]
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CHNL# 3531: [FREQ 167 [N LETHB4 240.00]
0.00700 -0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]
0.00700 -0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]
0.00700 -0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]
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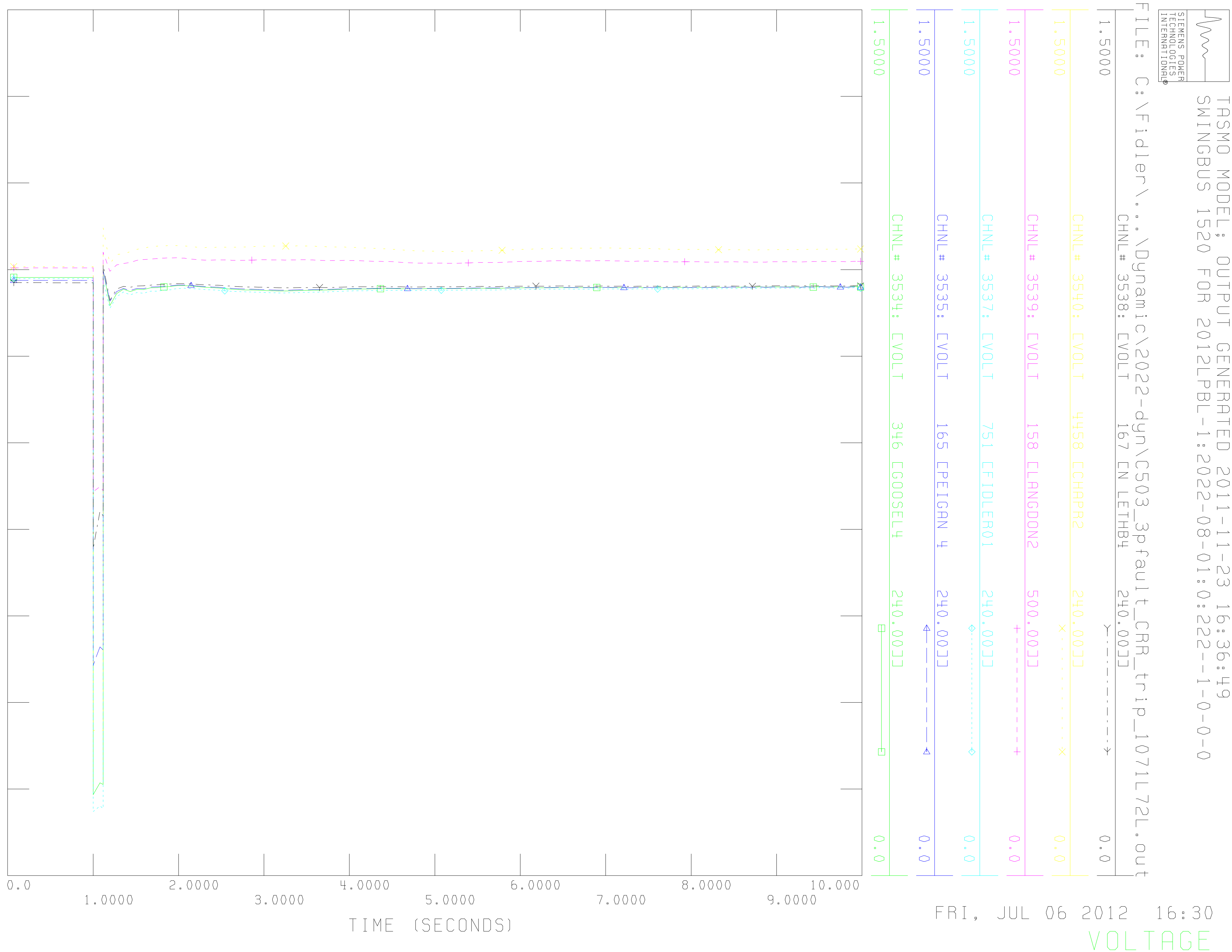
TIME (SECONDS)
FRI, JUL 06 2012 16:30
FREQUENCE


SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C503_3pfault_CRR_trip_1071L72L.out
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1.5000 CHNL# 3539: [VOLT 158 [LANGDON2 500.00] 0.0
1.5000 CHNL# 3537: [VOLT 751 [FIDLER01 240.00] 0.0
1.5000 CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00] 0.0
1.5000 CHNL# 3534: [VOLT 346 [GOOSEL4 240.00] 0.0
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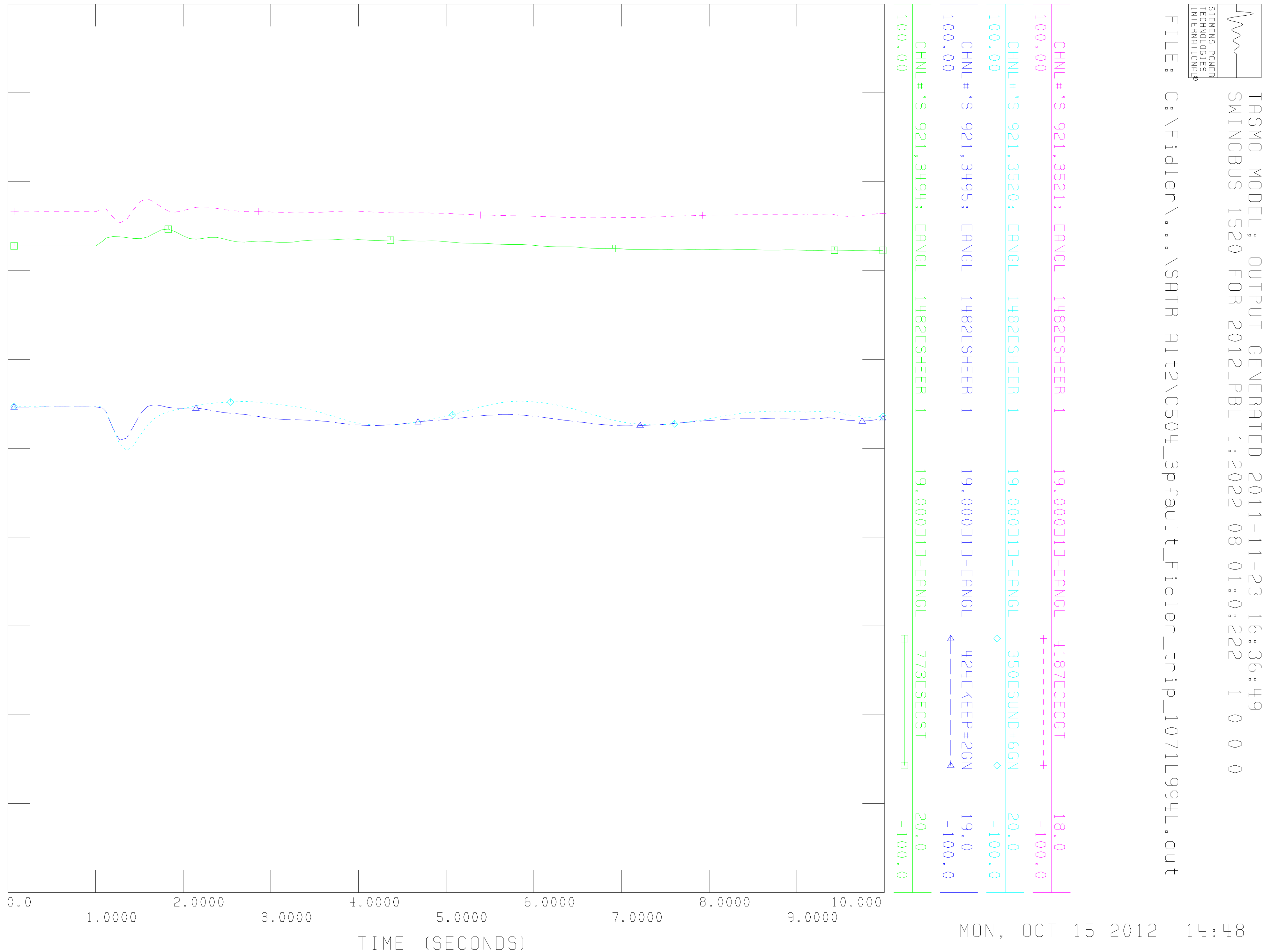
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL#'S 921,3520: CANGL 1482CSHEER 1 19.000JJJ-CANGL 350CSUND#6GN 20.0
100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
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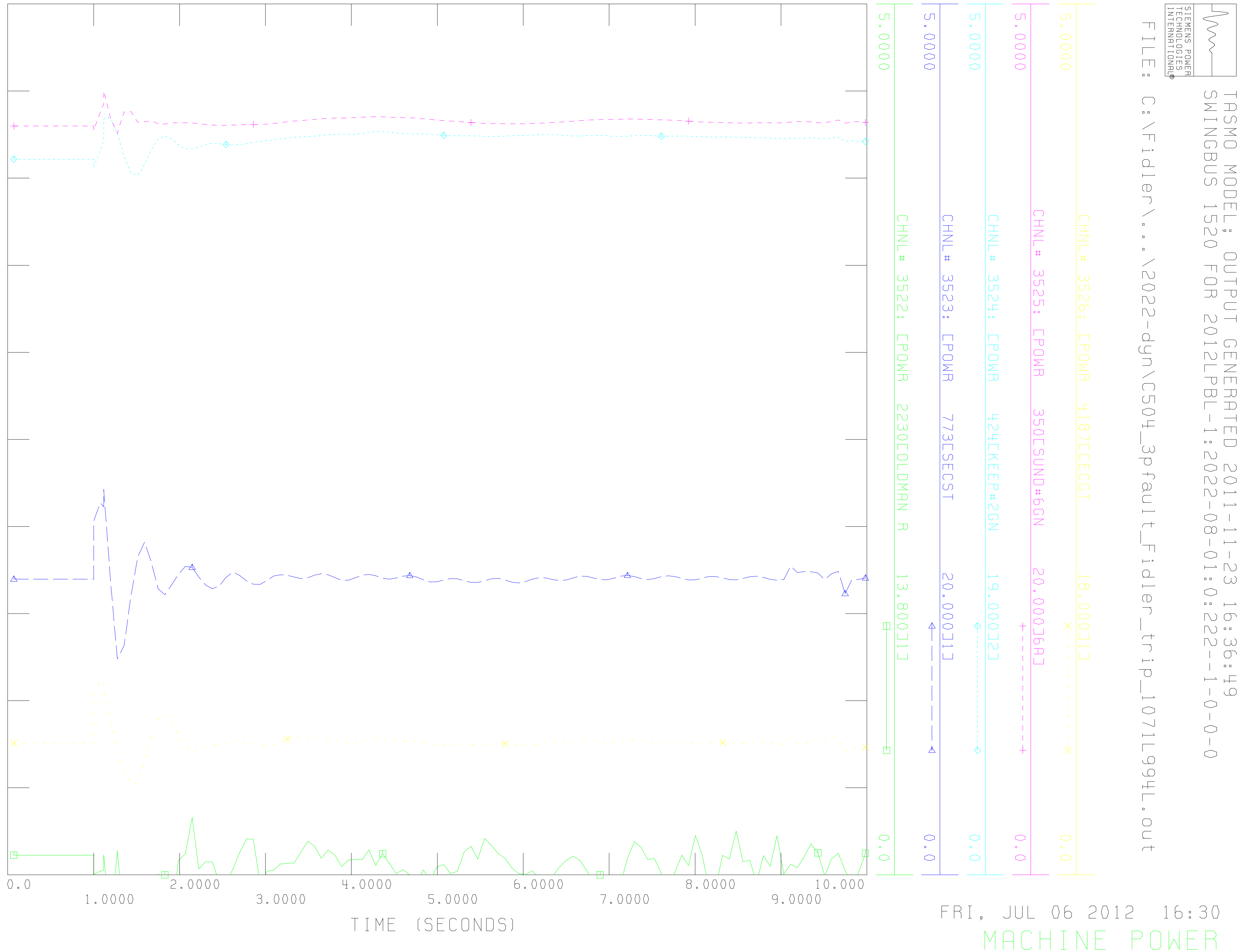
TIME (SECONDS)
MON, OCT 15 2012 14:48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FILE: C:\Fidler\...\2022-dyn\C504_3pfault_Fidler_trip_1071L994L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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0.0
CHNL# 3523: [POWR 773SECST 20.000]1]
5.0000
0.0
CHNL# 3524: [POWR 424KEEP#2GN 19.000]2]
5.0000
0.0
CHNL# 3525: [POWR 350SUND#6GN 20.000]6A]
5.0000
0.0
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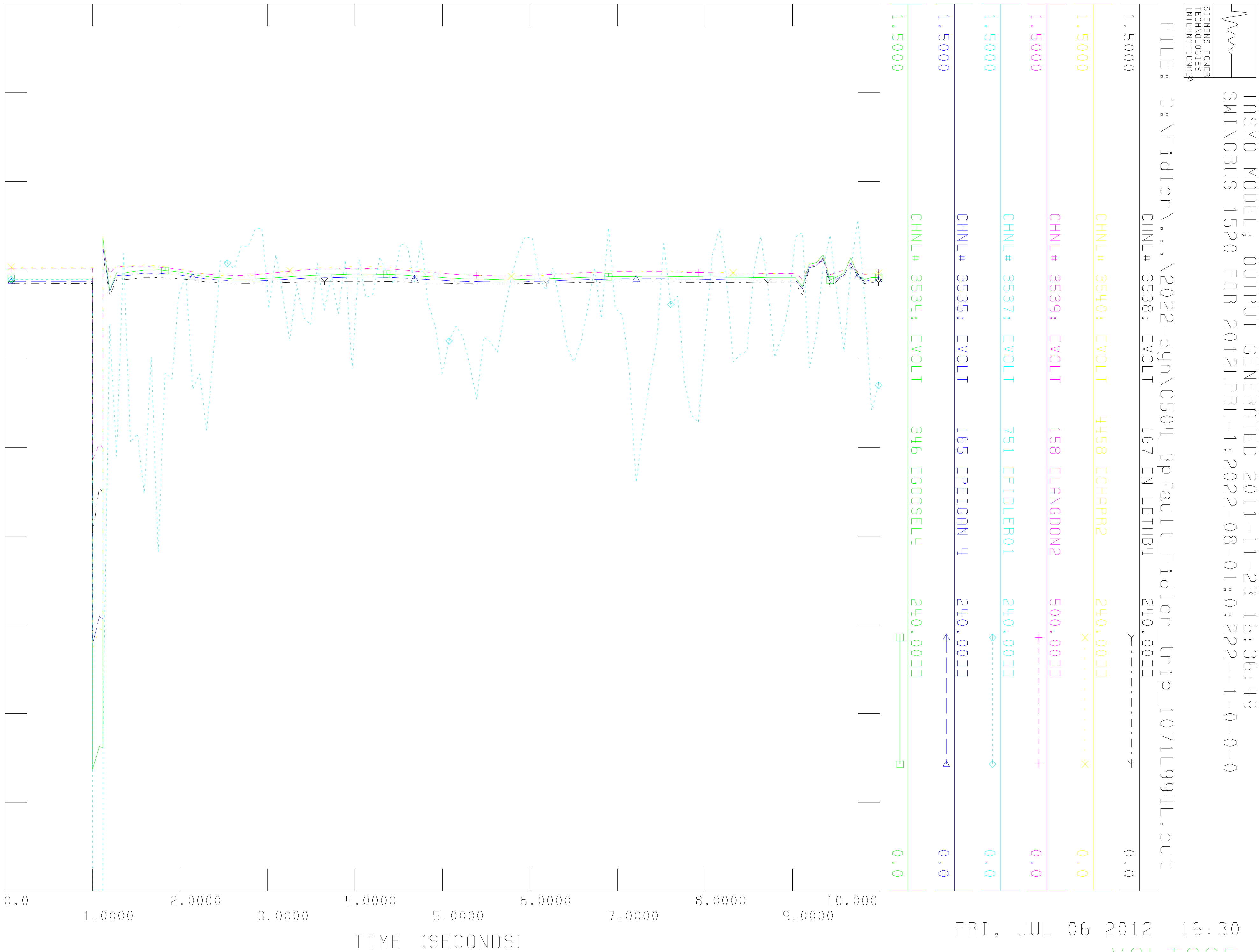
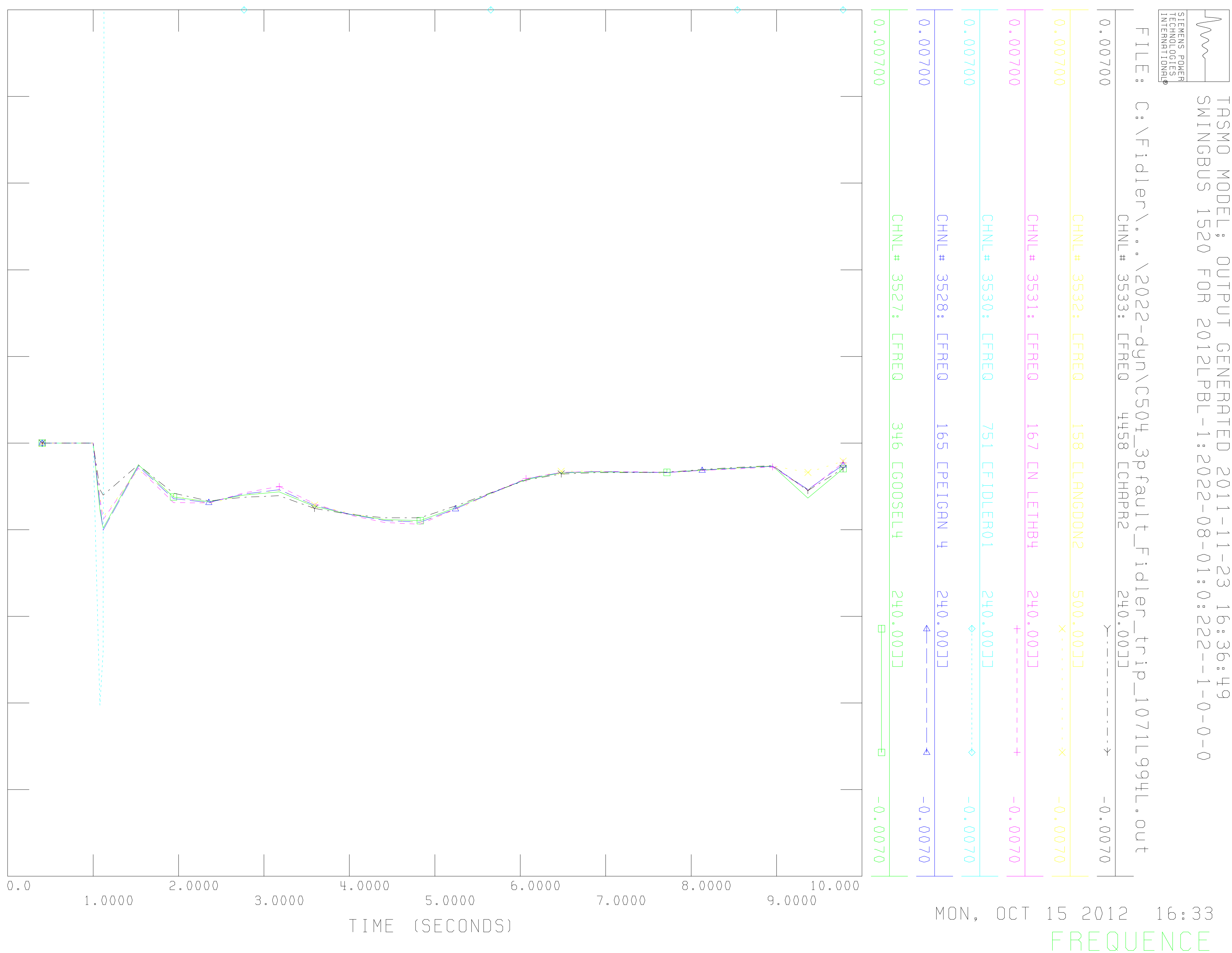
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER



FRI, JUL 06 2012 16:30

VOLTAGE



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C504_3pfault_Fidler_trip_1071L94L.out
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0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.00] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.00] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.00] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.00] -0.0070
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TIME (SECONDS)
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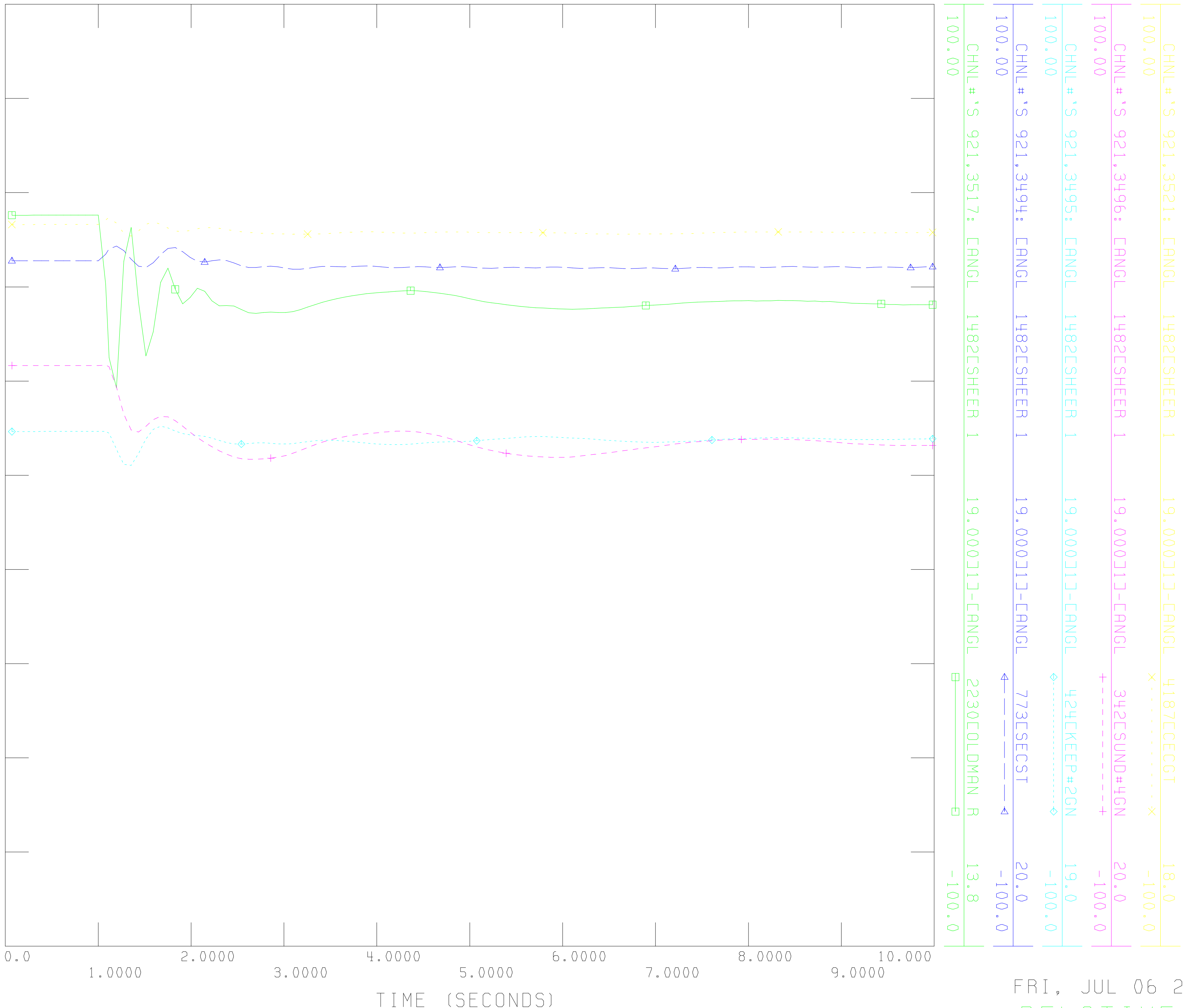
FREQUENCE



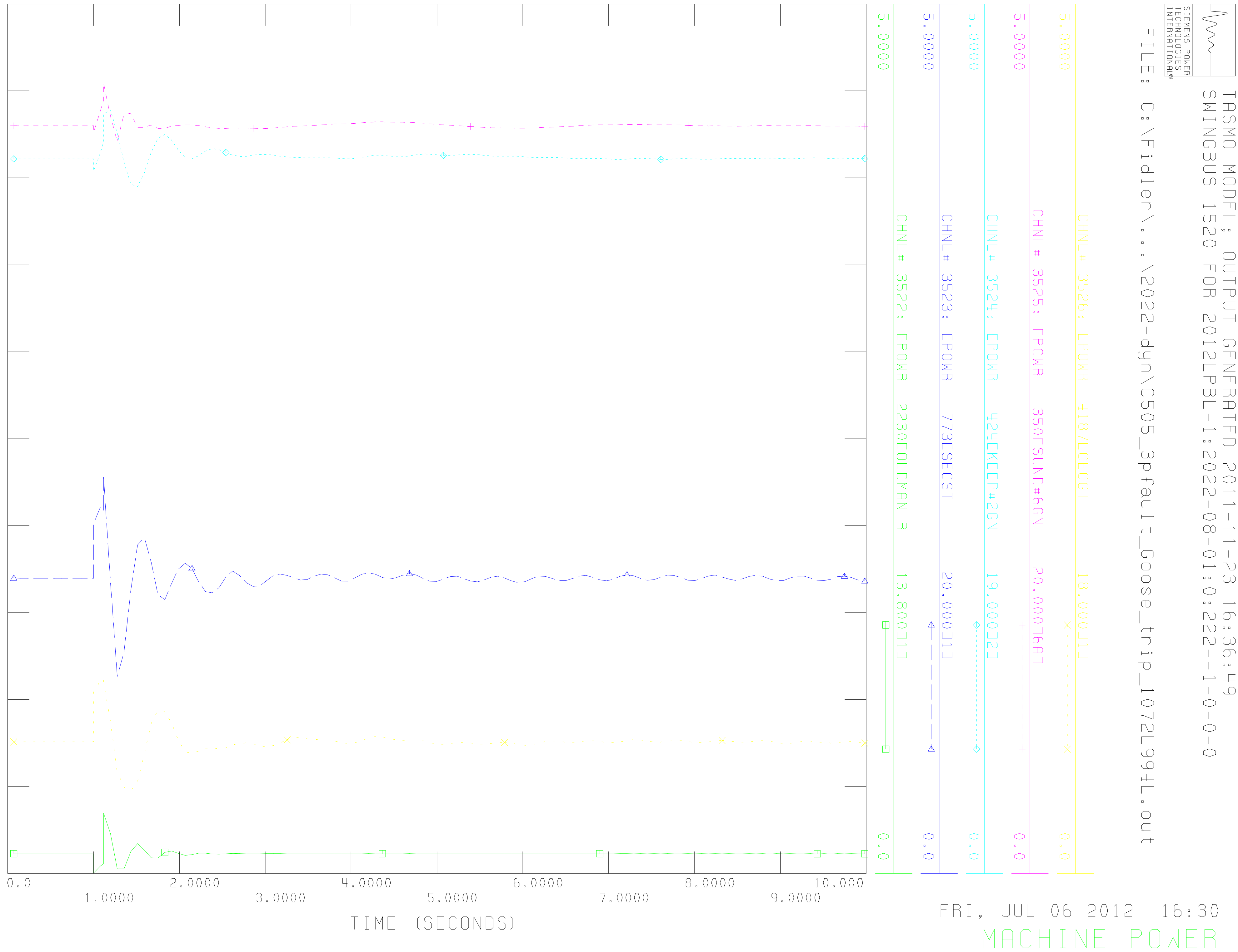
FILE: C:\Fidler\...\2022-dyn\C505_3pfault_Goose_trip_1072L94L.out

SIEMENS POWER TECHNOLOGIES INTERNATIONAL®

TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0

FRI, JUL 06 2012 16:30

RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\2022-dyn\C505_3pfault_Goose_trip_1072L994L.out
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CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
5.0000
0.0
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
5.0000
0.0
CHNL# 3523: [POWR 773[SECST 20.000]1]
5.0000
0.0
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
5.0000
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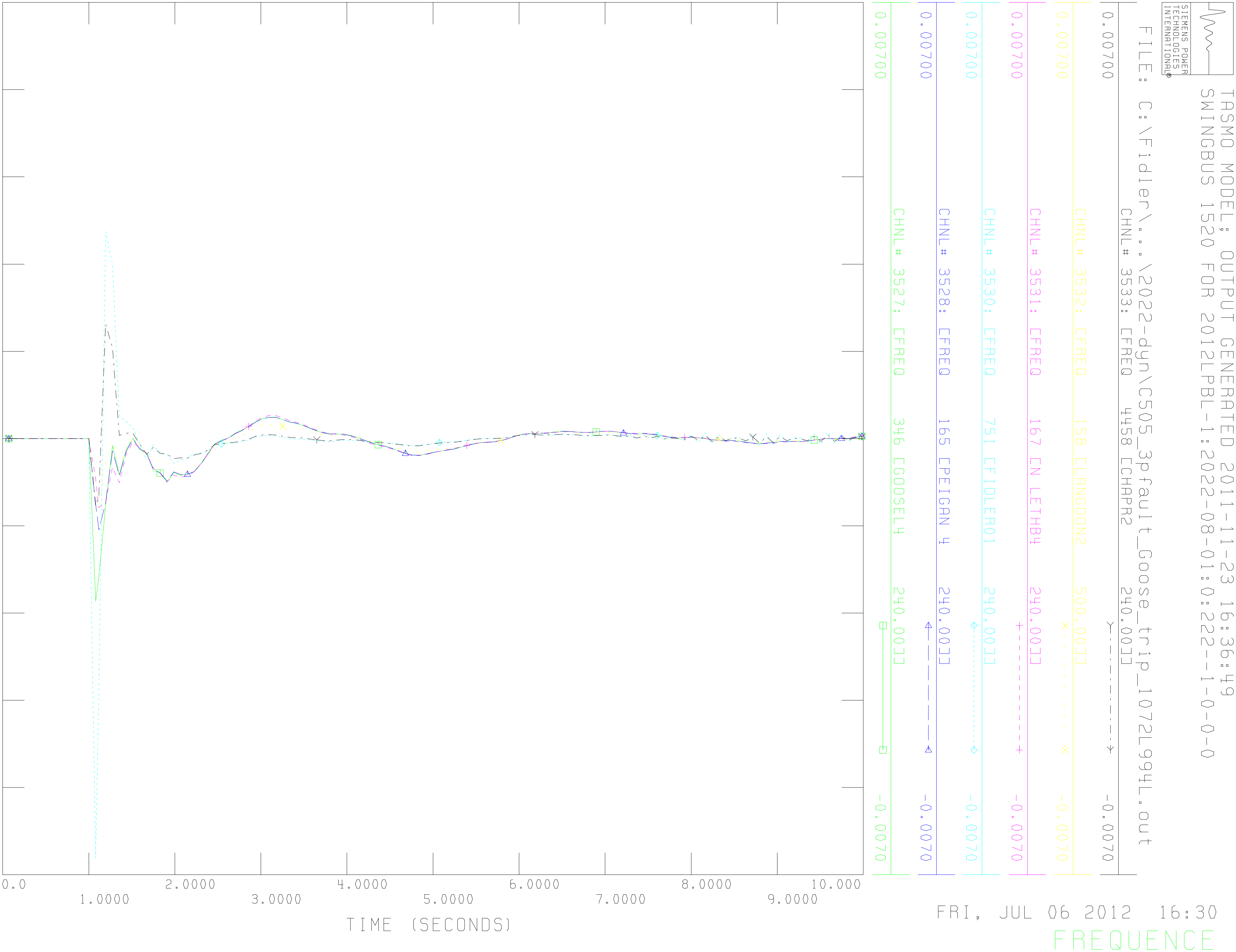
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C505_3pfault_Goose_trip_1072L94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
0.00700 CHNL# 3533: [FREQ 4458 [CHAPR2 240.0]] -0.0070
0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.0]] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.0]] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.0]] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]] -0.0070
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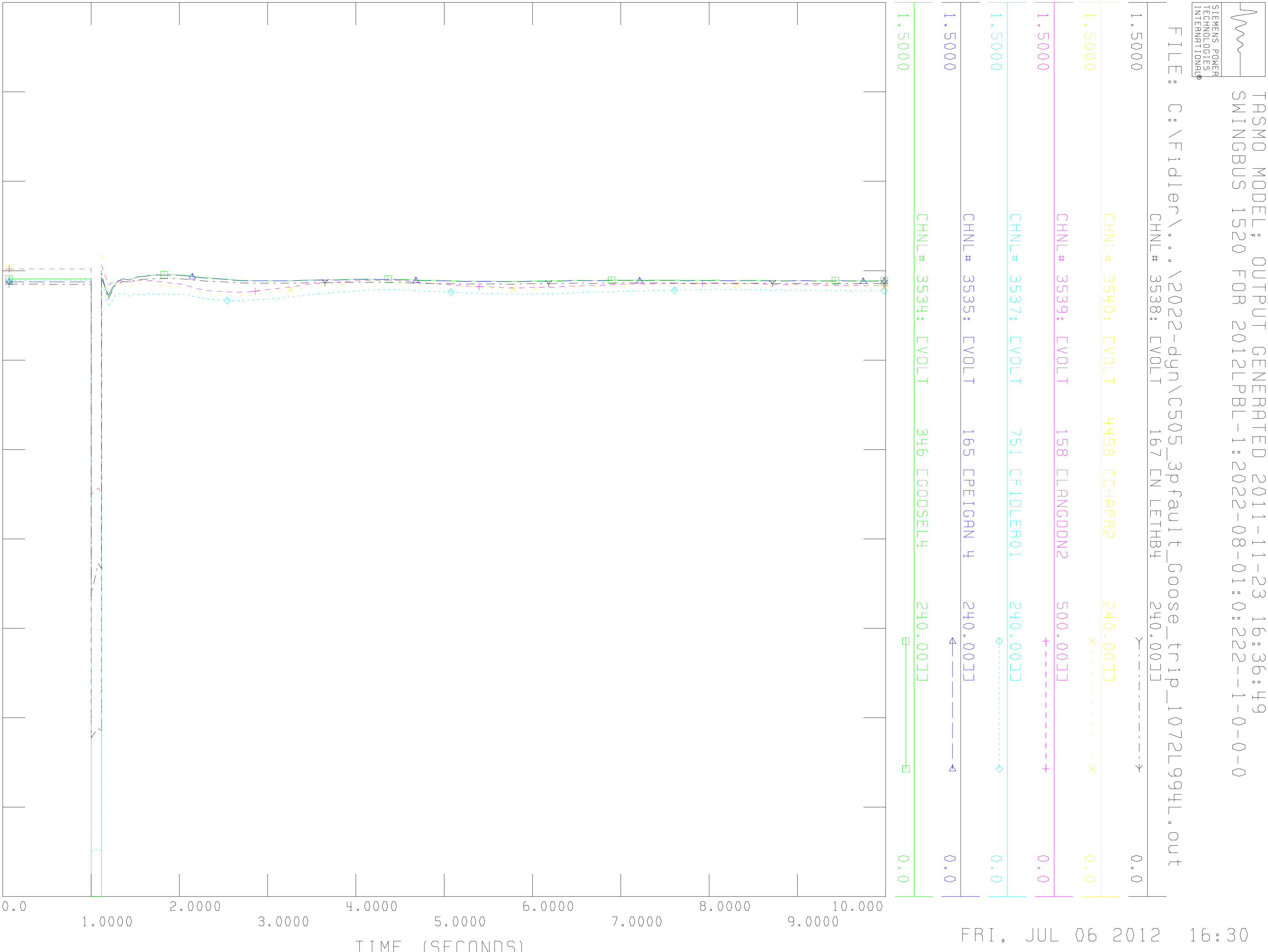
TIME (SECONDS)
FRI, JUL 06 2012 16:30
FREQUENCE



SIEMENS POWER TECHNOLOGIES INTERNATIONAL®
TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\2022-dyn\C505_3pfault_Goose_trip_1072L994L.out
CHNL# 3538: [VOLT 167 [N LETHB4 240.00]]
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000
0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000
0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
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0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000
0.0
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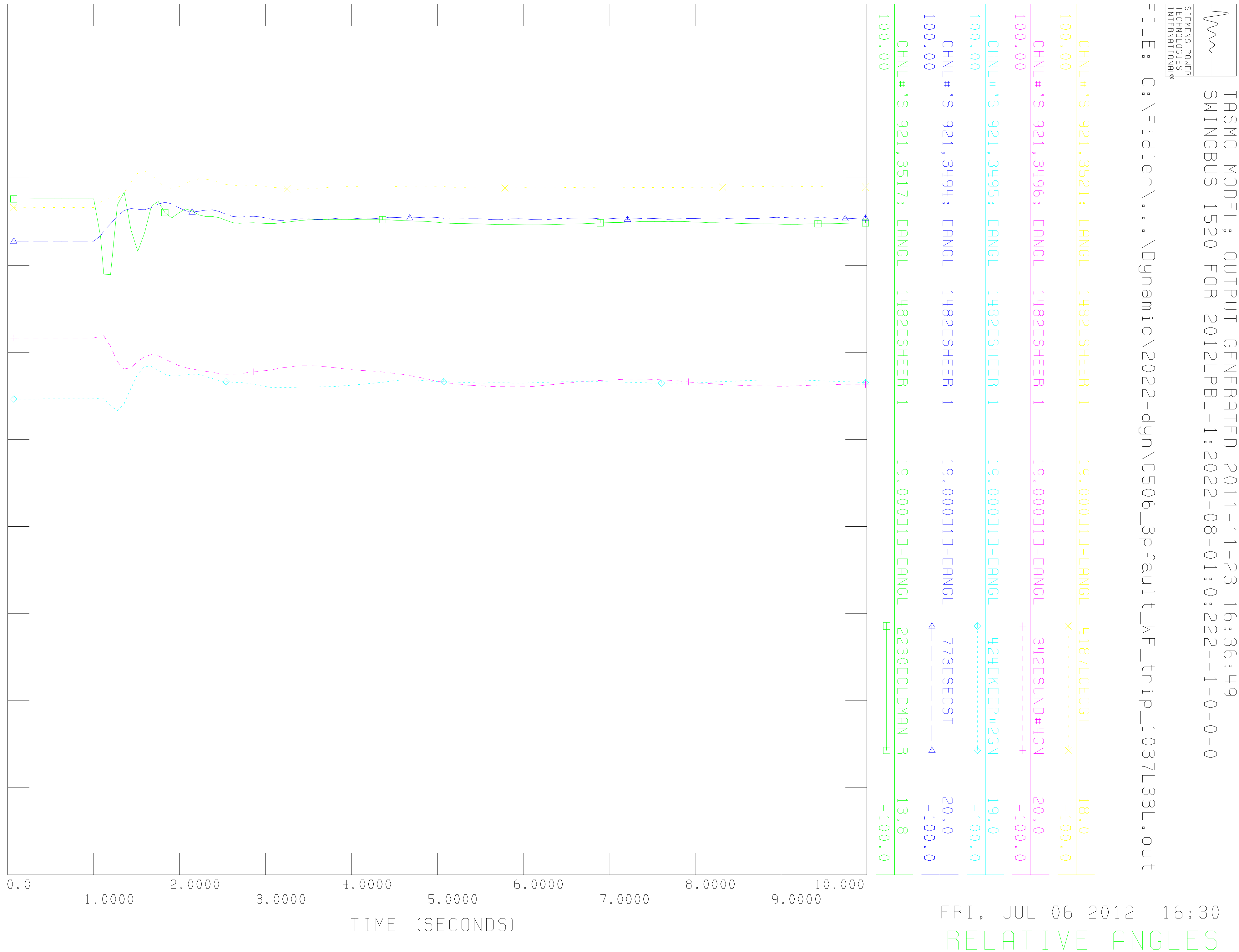
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C506_3pfault_WF_trip_1037L38L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL#'S 921,3521: CANGL 1482CSHEER 1 19.000JJJ-CANGL 4187CCEGT 18.0
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CHNL#'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
100.00 -100.0
CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
100.00 -100.0
CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
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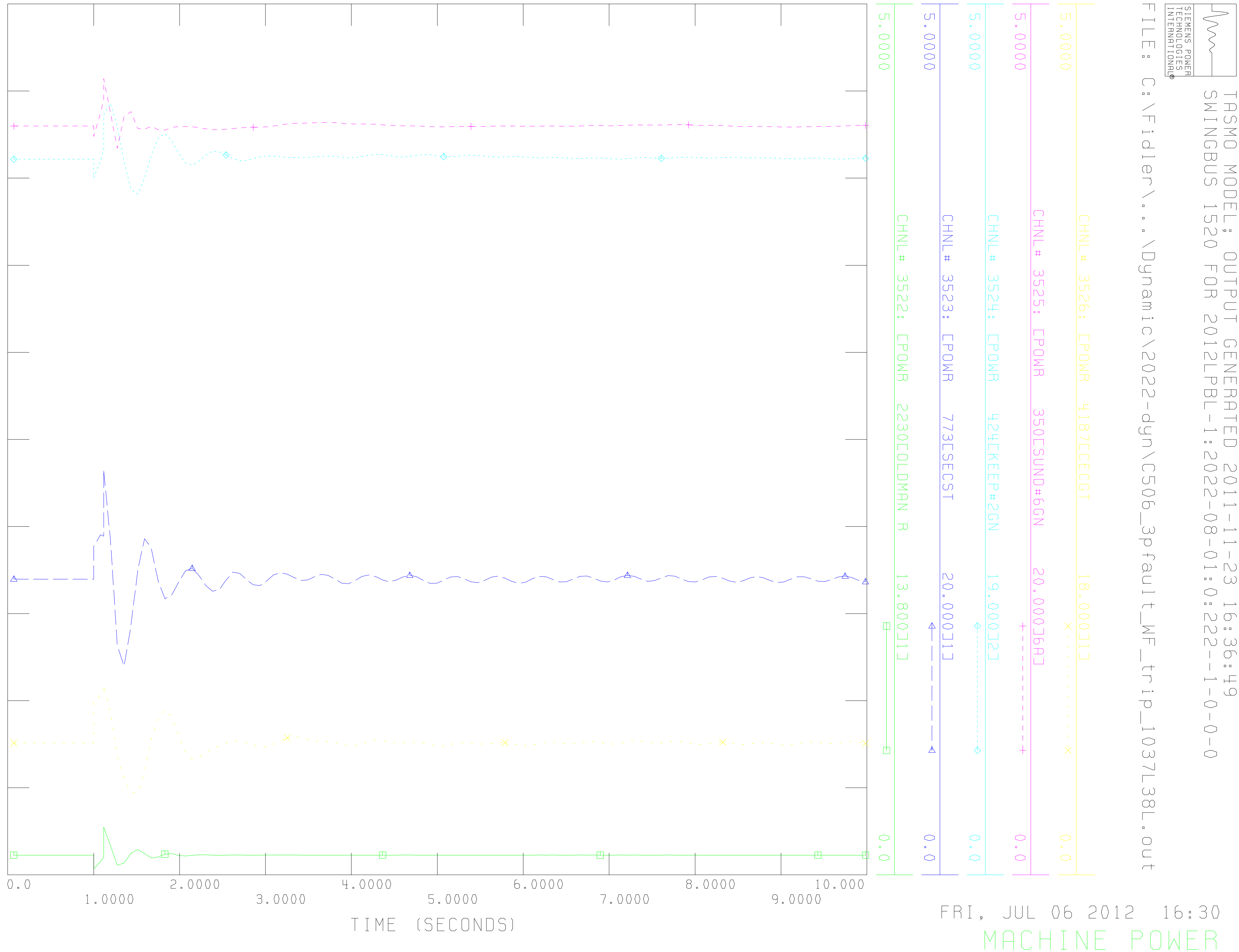
TIME (SECONDS)
FRI, JUL 06 2012 16:30
RELATIVE ANGLES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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C506_3pfault_WF_trip_1037L38L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[CECGT 18.000]1]
CHNL # 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL # 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL # 3523: [POWR 773[SECST 20.000]1]
CHNL # 3522: [POWR 2230[OLDMAN R 13.800]1]
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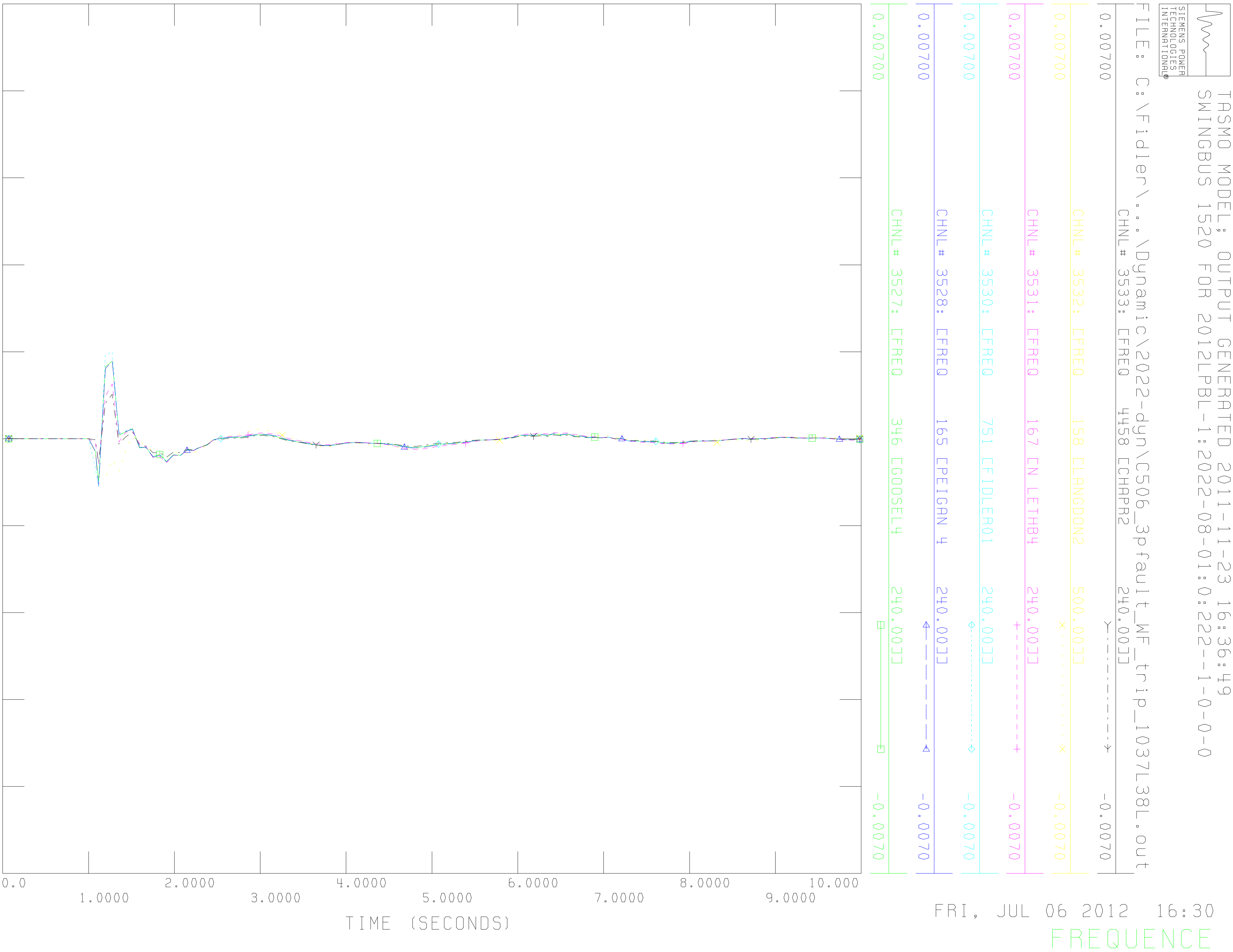
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
FILE: C:\Fidler\..\Dynamic\2022-dyn\C506_3pfault_WF_trip_1037L38L.out
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0.00700 CHNL# 3532: [FREQ 158 [LANGDON2 500.0]] -0.0070
0.00700 CHNL# 3531: [FREQ 167 [N LETHB4 240.0]] -0.0070
0.00700 CHNL# 3530: [FREQ 751 [FIDLER01 240.0]] -0.0070
0.00700 CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]] -0.0070
0.00700 CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]] -0.0070
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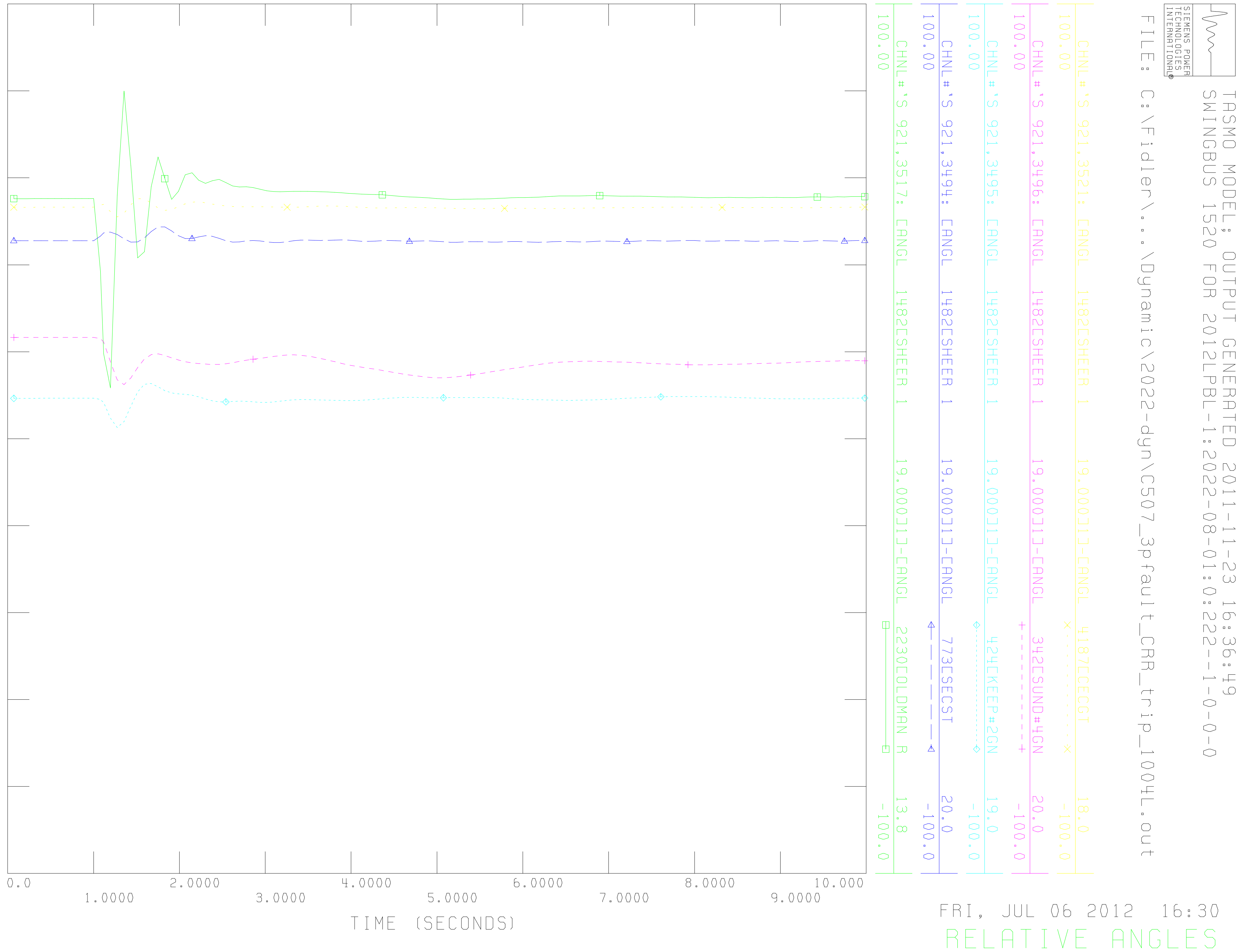

TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
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CHNL#'S 921,3496: CANGL 1482CSHEER 1 19.000JJJ-CANGL 342CSUND#4GN 20.0
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CHNL#'S 921,3495: CANGL 1482CSHEER 1 19.000JJJ-CANGL 424CKEEP#2GN 19.0
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CHNL#'S 921,3494: CANGL 1482CSHEER 1 19.000JJJ-CANGL 773CSECST 20.0
100.00 -100.0
CHNL#'S 921,3517: CANGL 1482CSHEER 1 19.000JJJ-CANGL 2230COLDMAN R 13.8
100.00 -100.0
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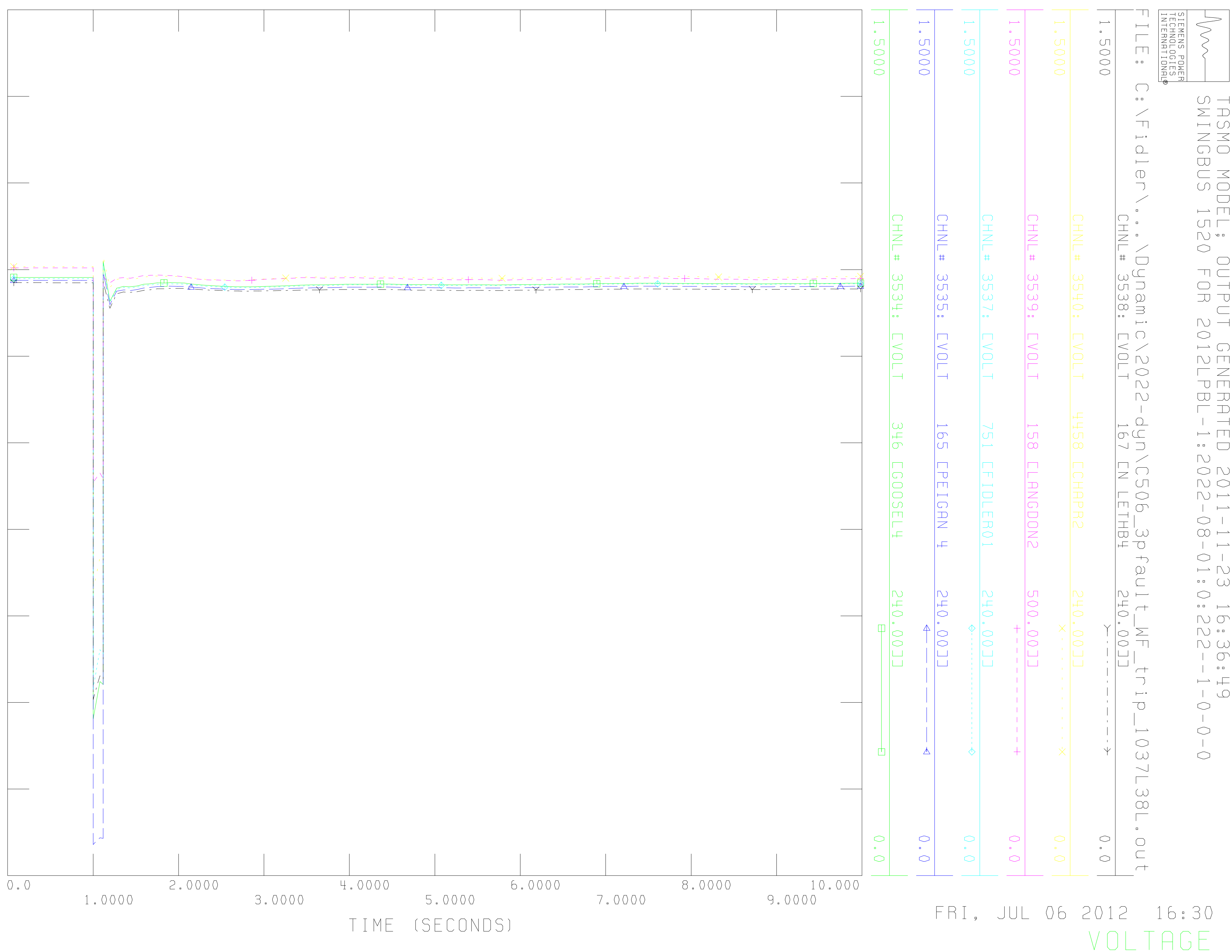
FRI, JUL 06 2012 16:30
RELATIVE ANGLES



SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3540: [VOLT 4458 [CHAPR2 240.00]]
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CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
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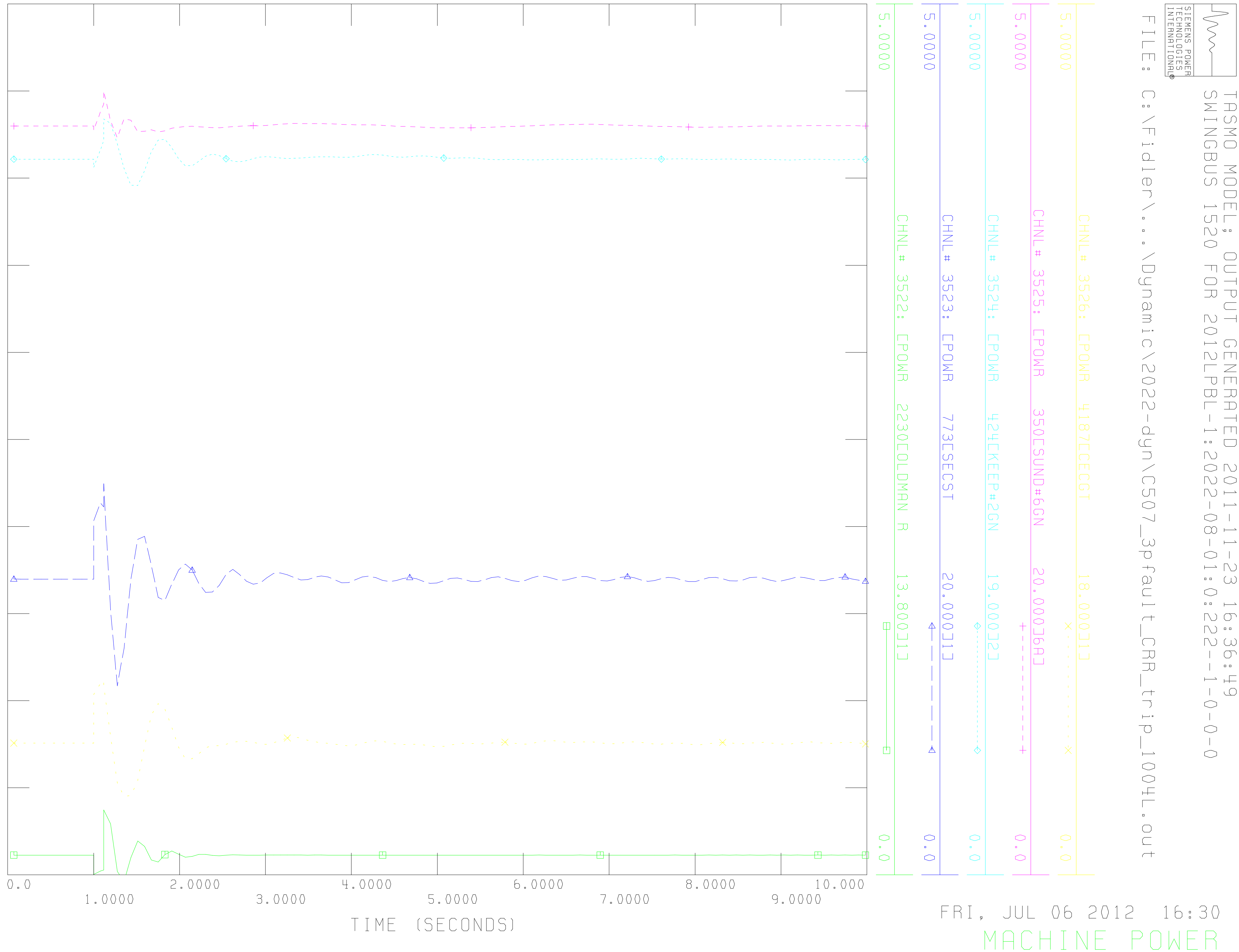
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE



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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3523: [POWR 773SECST 20.000]1]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
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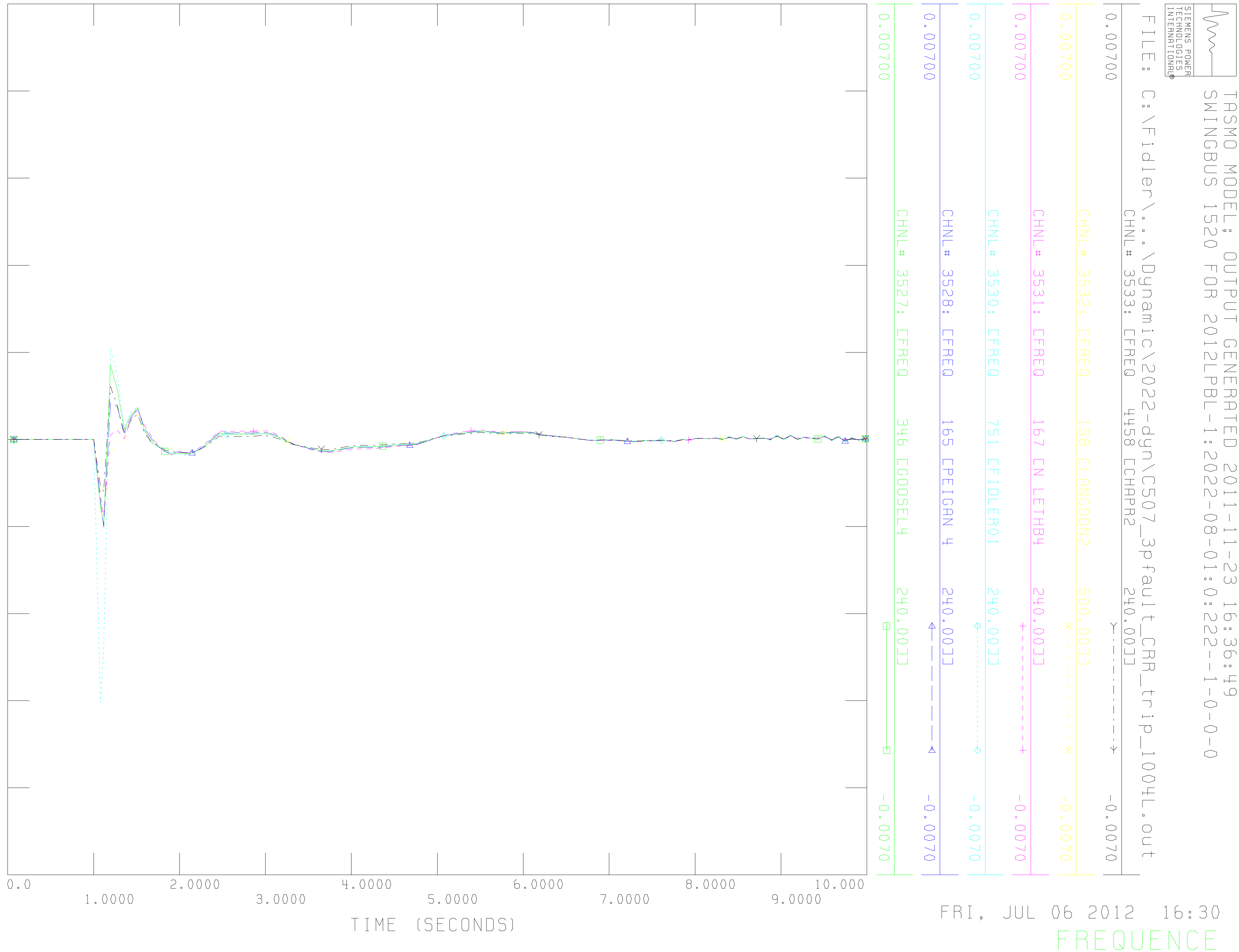
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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CHNL# 3532: [FREQ 158 [LANGDON2 500.00]]
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CHNL# 3531: [FREQ 167 [N LETHB4 240.00]]
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-0.0070
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]]
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-0.0070
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]]
0.00700
-0.0070
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]]
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-0.0070
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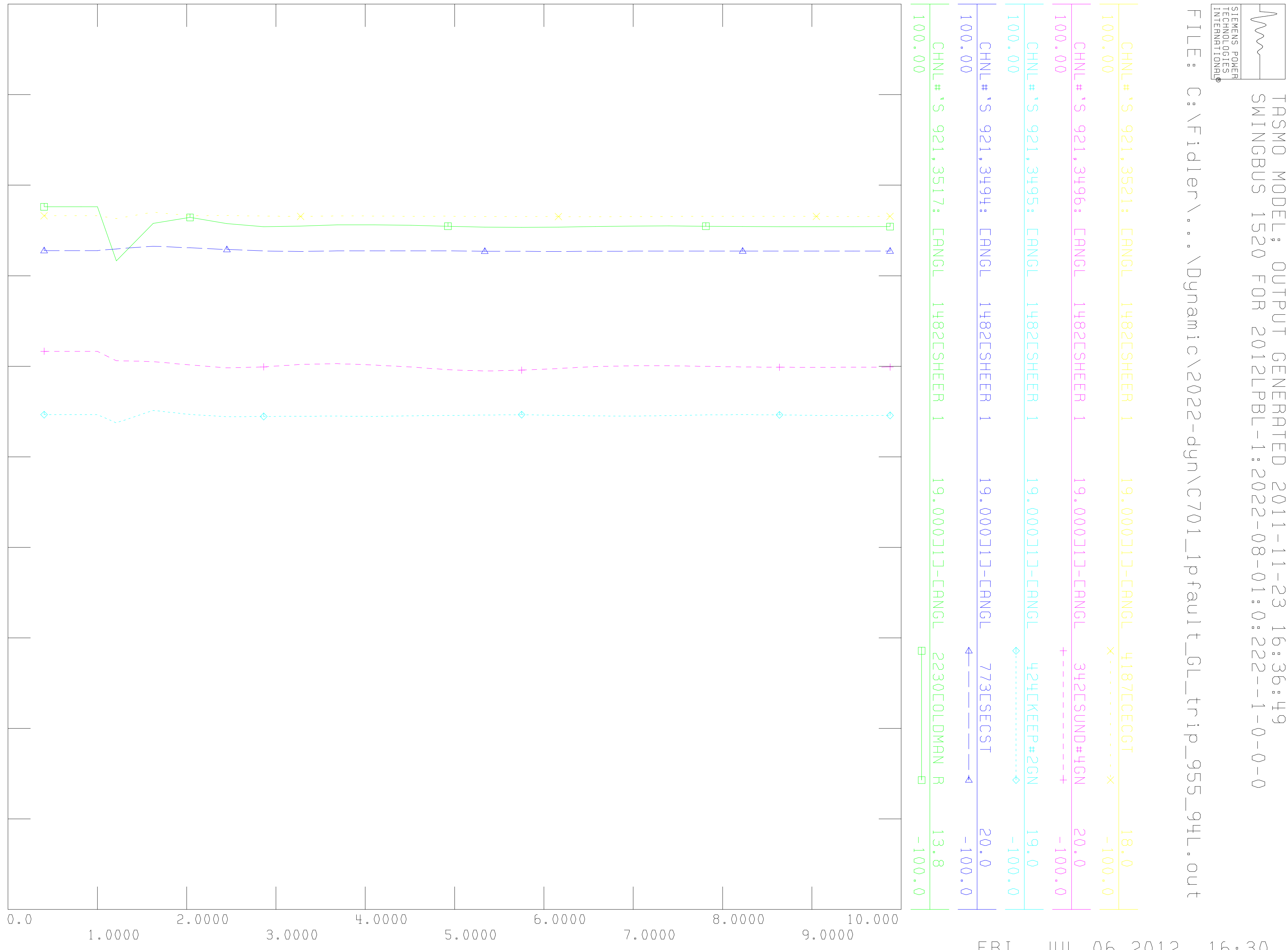
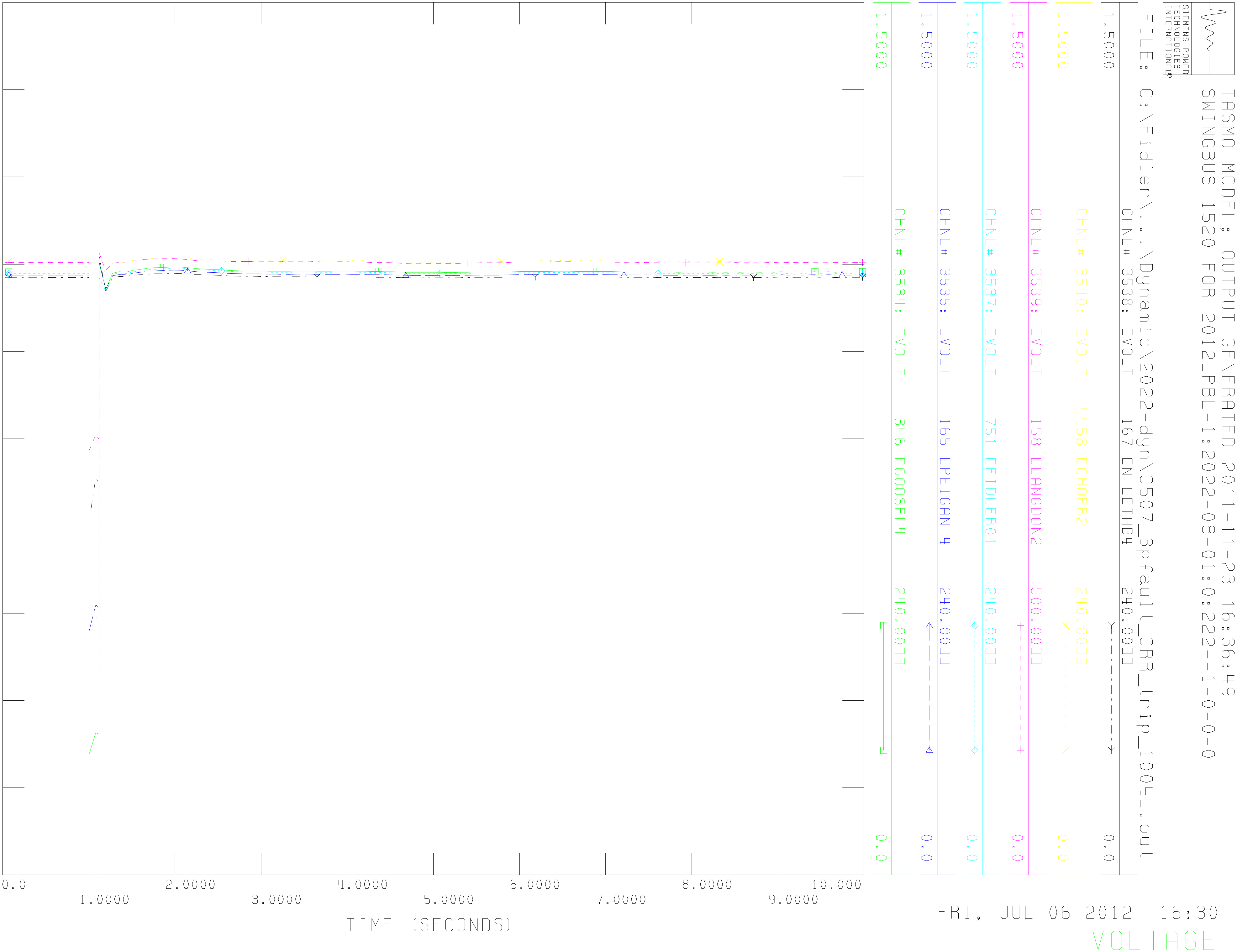
TIME (SECONDS)
FRI, JUL 06 2012 16:30
FREQUENCE



RELATIVE ANGLES


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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1.5000
0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
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CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
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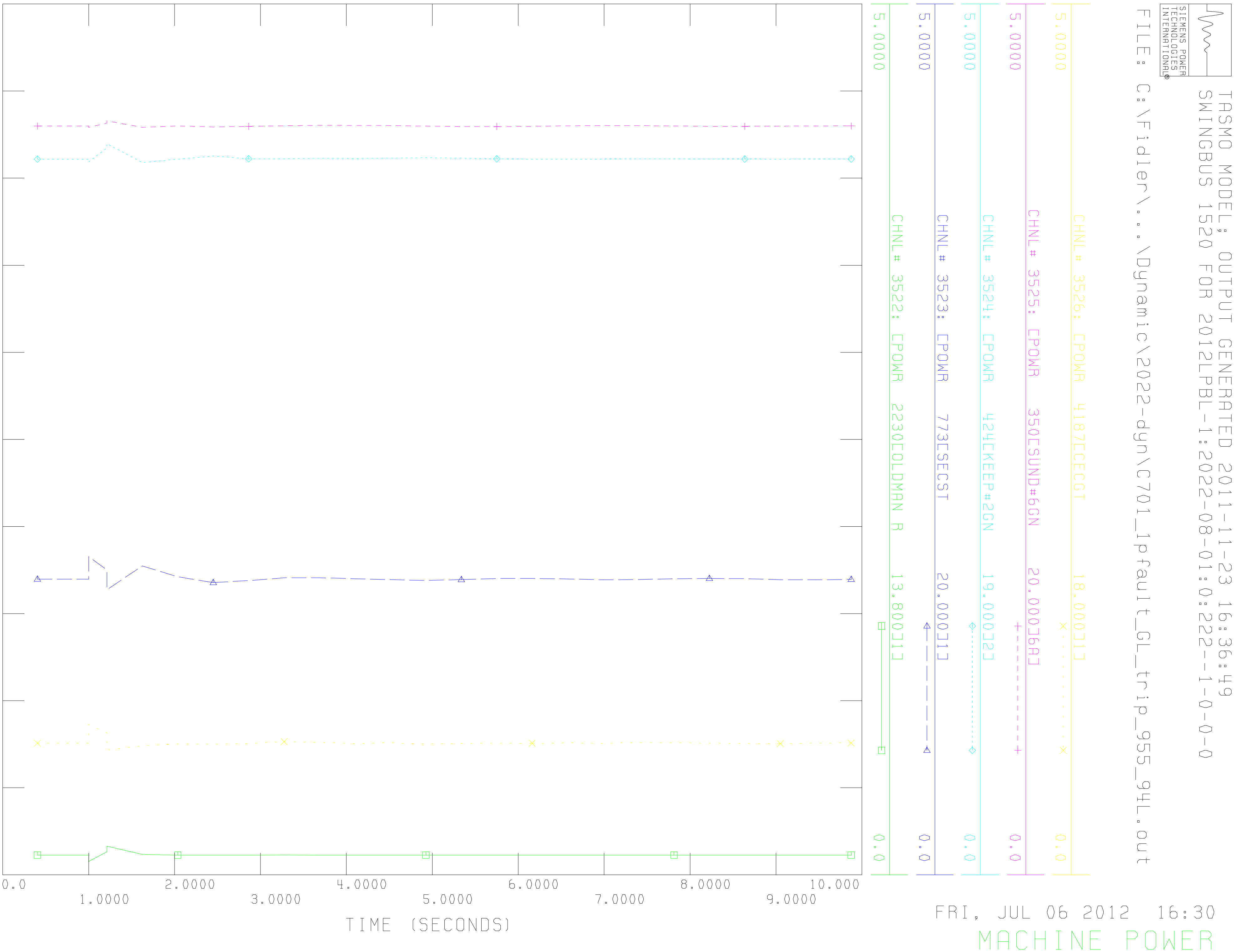
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\...\Dynamic\2022-dyn\C701_1pfault_GL_trip_955_94L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
CHNL# 3526: [POWR 4187[EEGT 18.000]1]
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
CHNL# 3523: [POWR 773[SECST 20.000]1]
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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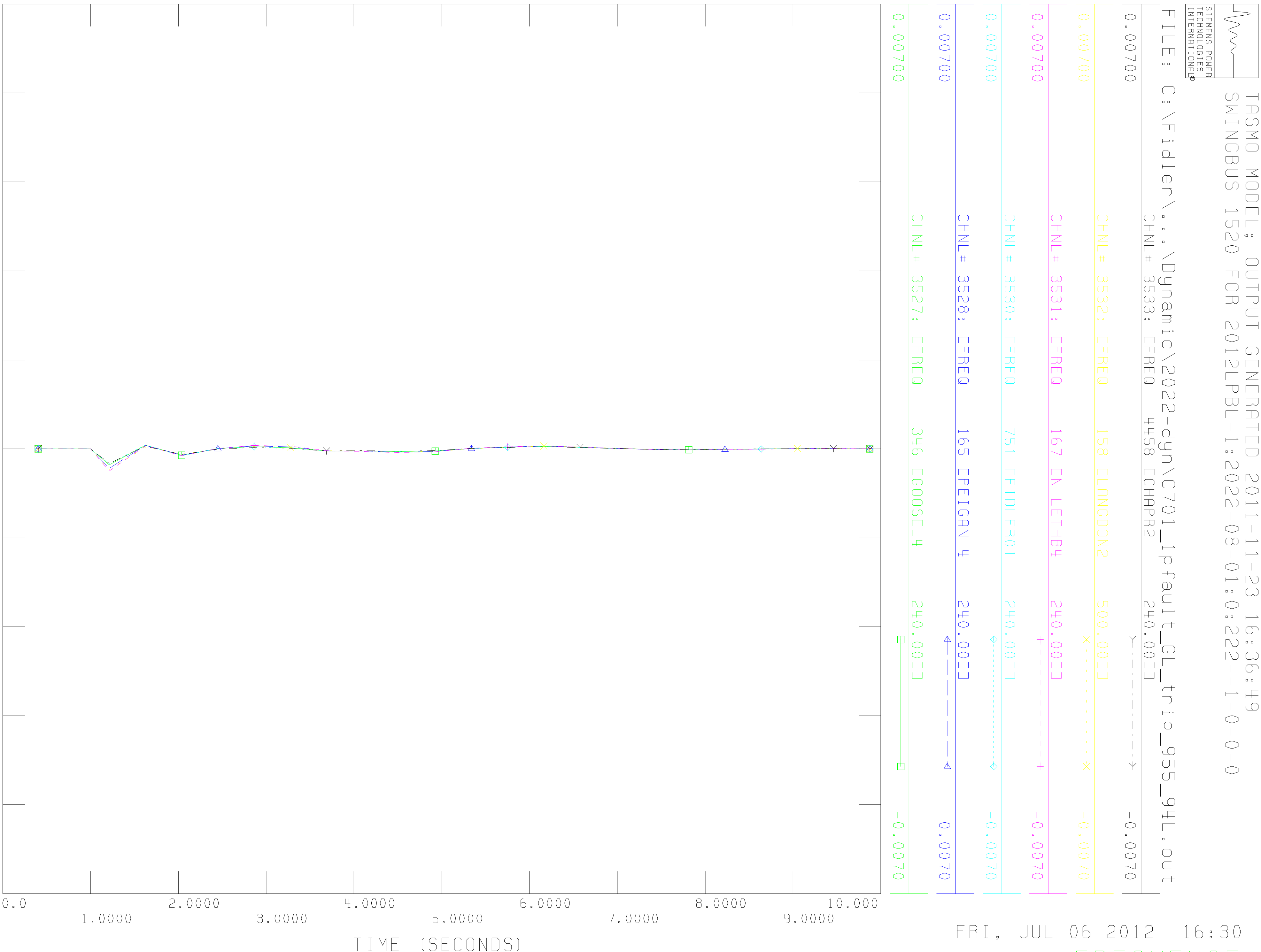
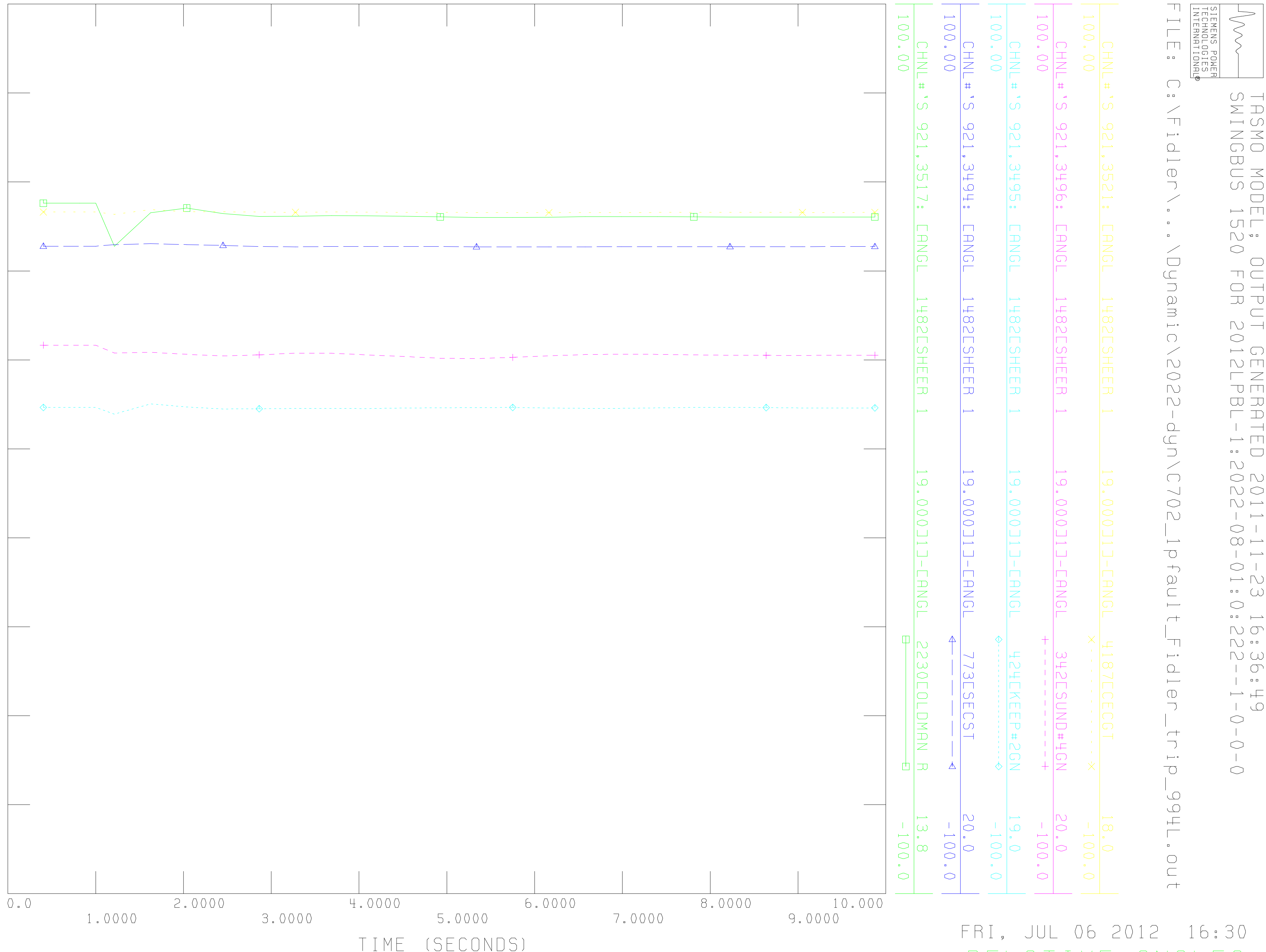
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER



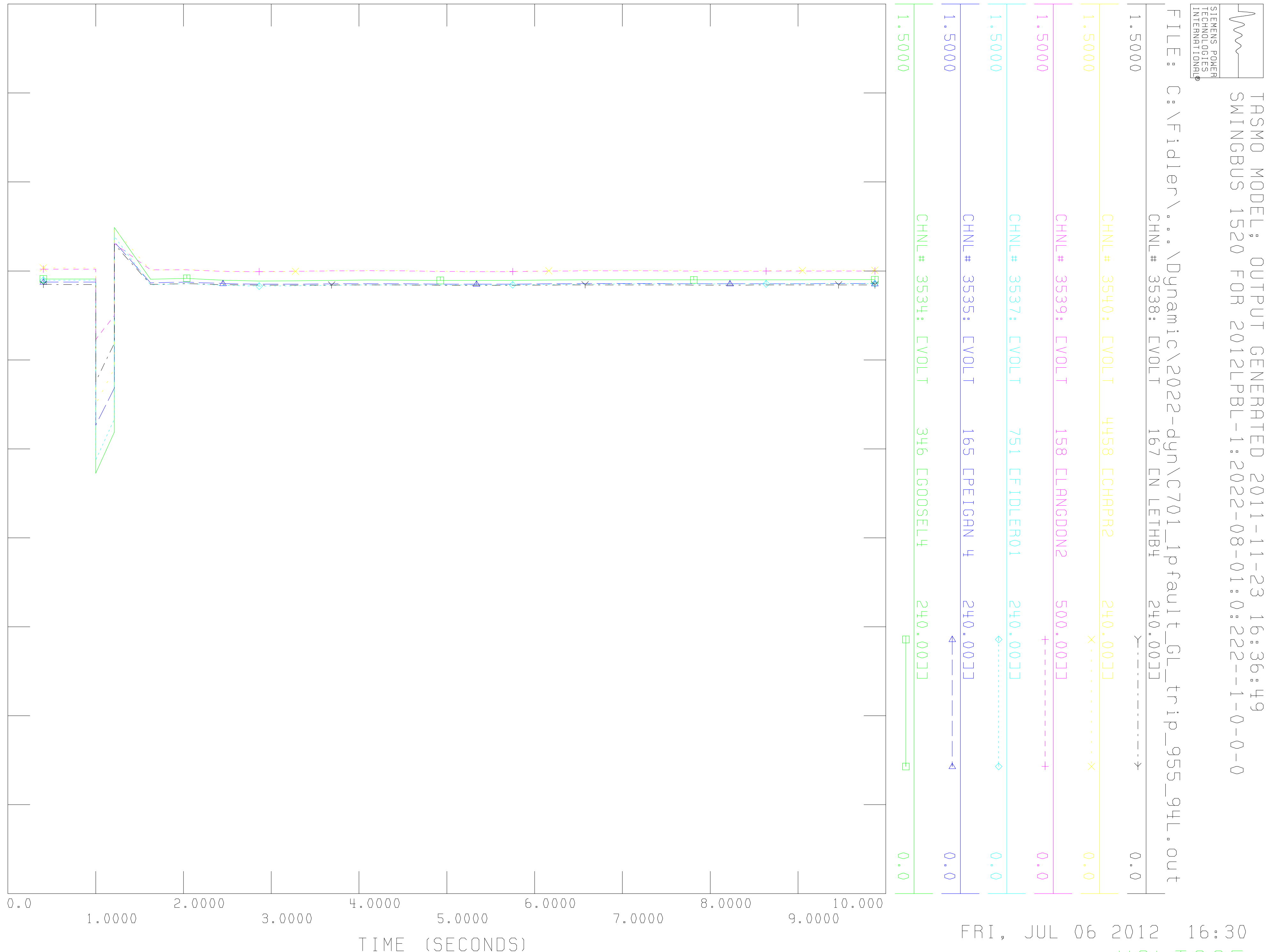
FRI, JUL 06 2012 16:30

FREQUENCE



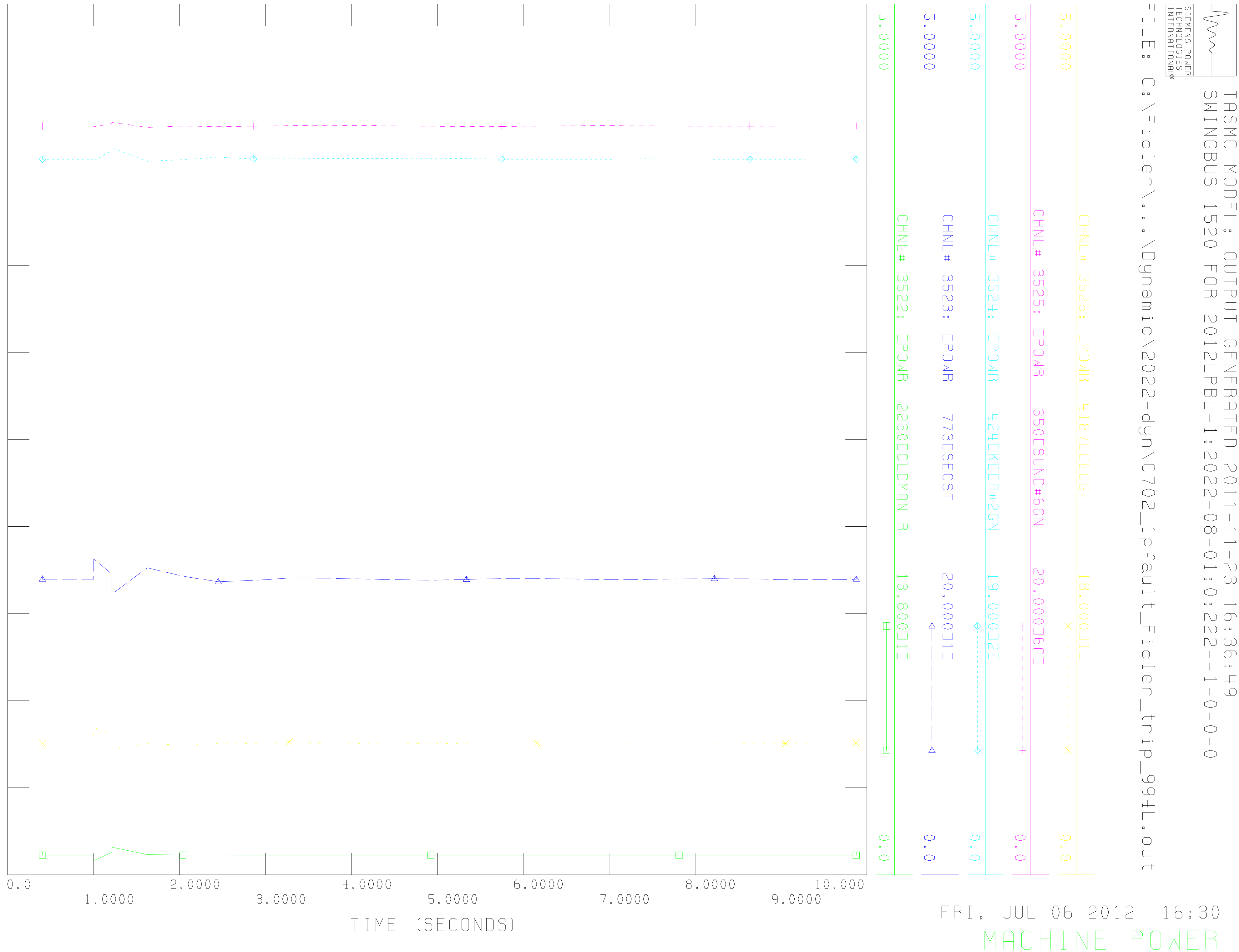
FRI, JUL 06 2012 16:30

RELATIVE ANGLES



FRI, JUL 06 2012 16:30

VOLTAGE


TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
FILE: C:\Fidler\..\Dynamic\2022-dyn\C702_1pfault_Fidler_trip_994L.out
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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5.0000 CHNL # 3525: [POWR 350[SUND#6GN 20.000]6A] 0.0
5.0000 CHNL # 3524: [POWR 424[KEEP#2GN 19.000]2] 0.0
5.0000 CHNL # 3523: [POWR 773[SECST 20.000]1] 0.0
5.0000 CHNL # 3522: [POWR 2230[OLDMAN R 13.800]1] 0.0
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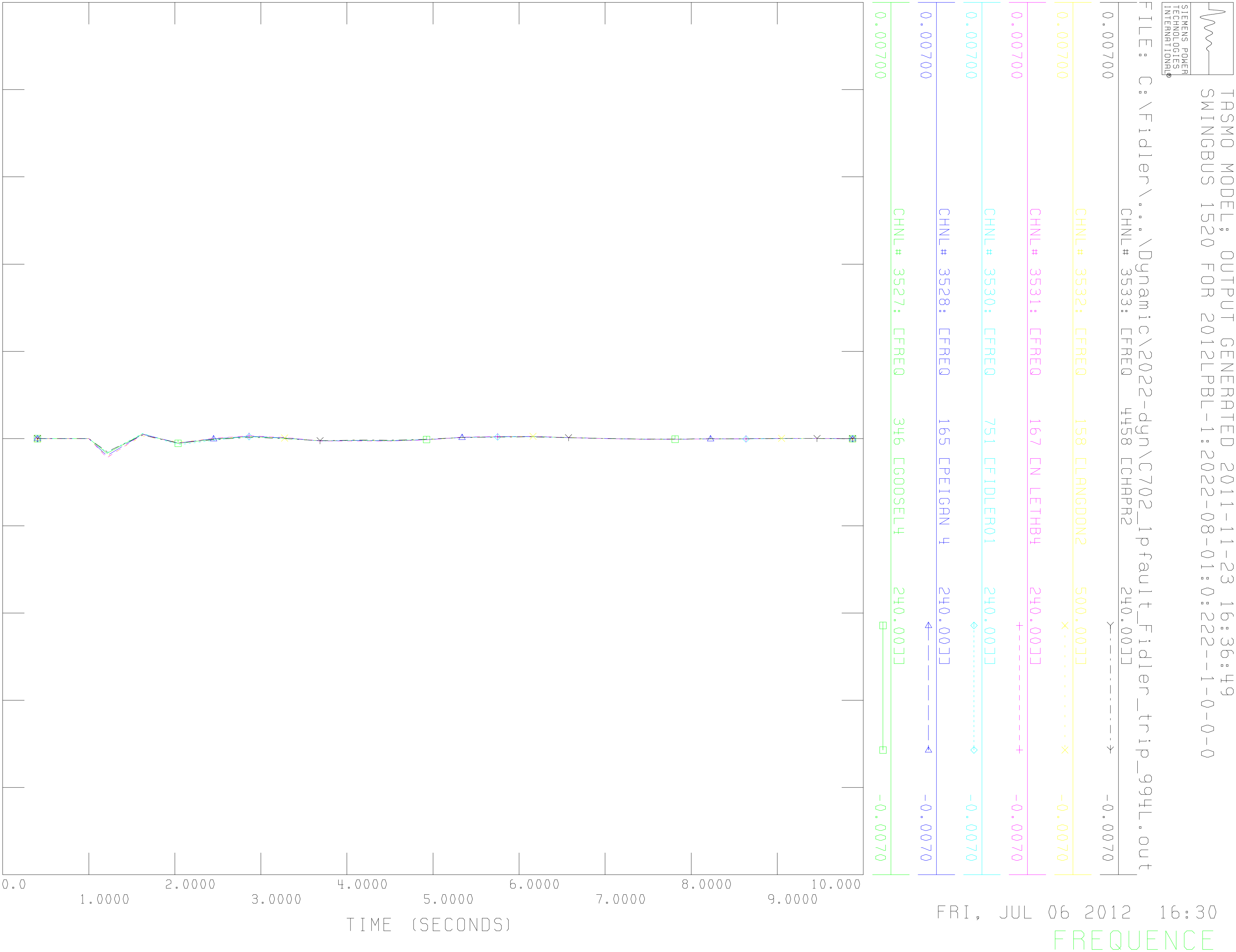
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER



TASMO MODEL; OUTPUT GENERATED 2011-11-23 16:36:49
SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3533: [FREQ 4458 [CHAPR2 240.00]]
CHNL# 3532: [FREQ 158 [LANGDON2 500.00]]
CHNL# 3531: [FREQ 167 [N LETHB4 240.00]]
CHNL# 3530: [FREQ 751 [FIDLER01 240.00]]
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.00]]
CHNL# 3527: [FREQ 346 [GOOSEL4 240.00]]
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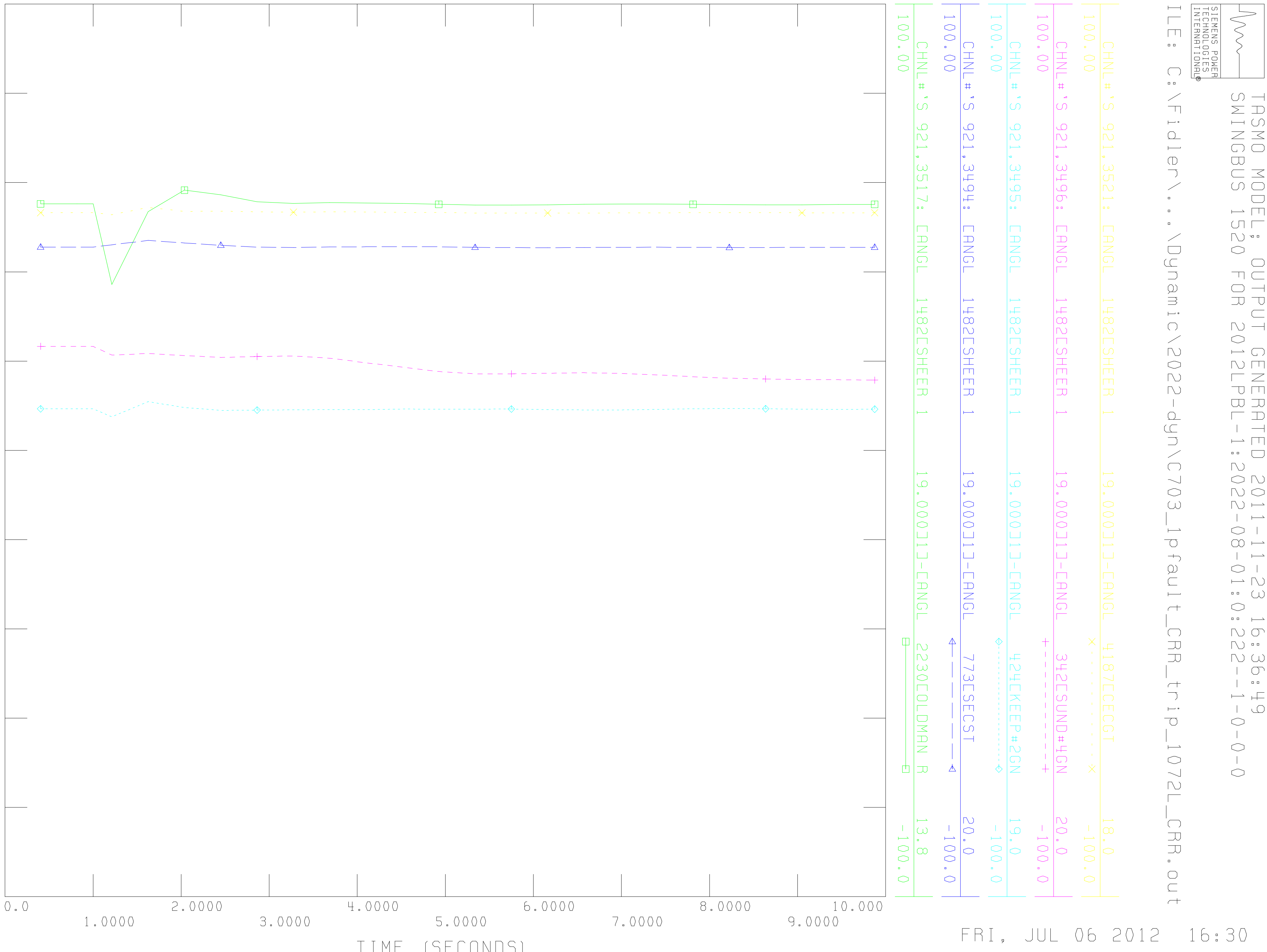
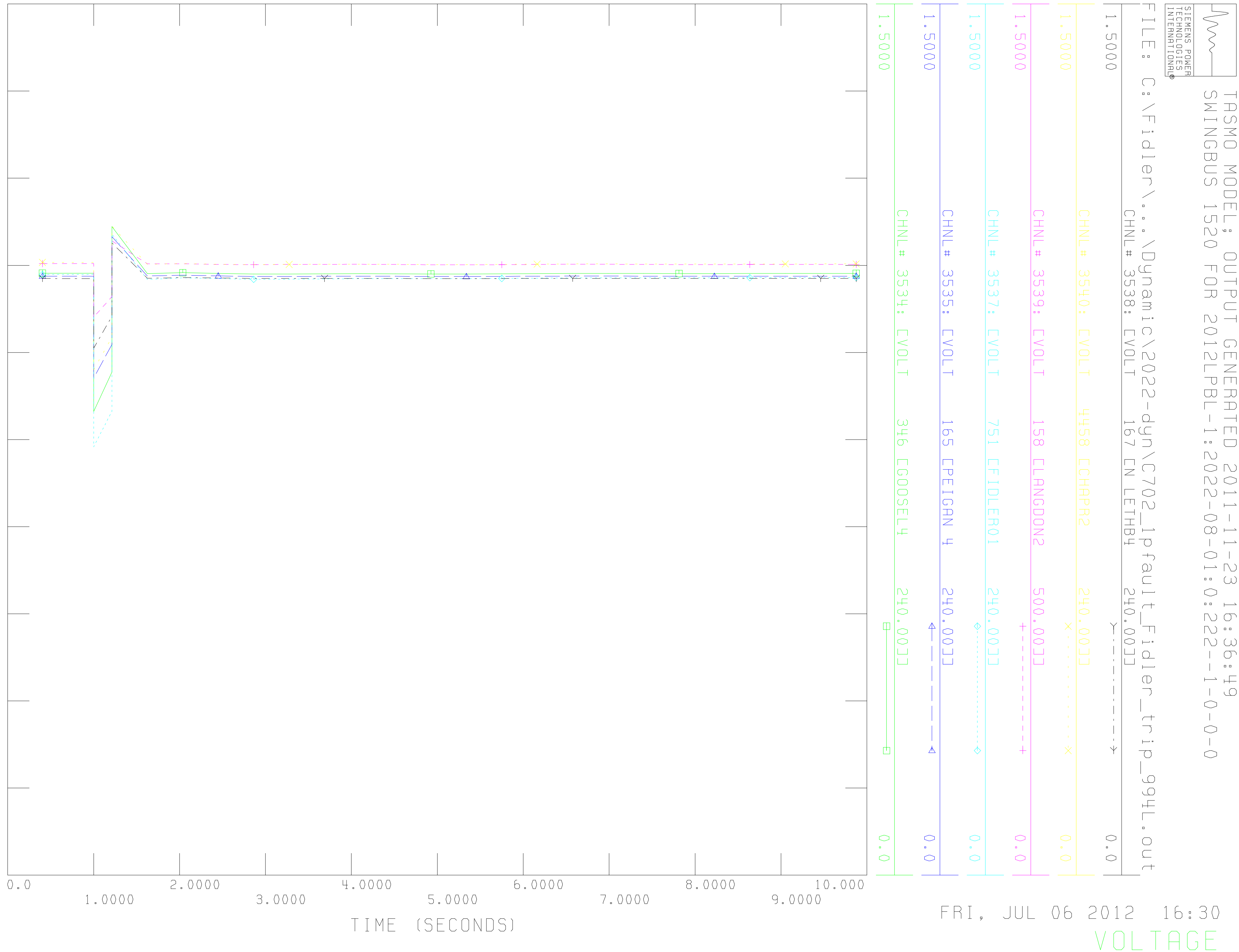
-0.0070
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
6.0000
7.0000
8.0000
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:30
FREQUENCE



FRI, JUL 06 2012 16:30

RELATIVE ANGLES



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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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1.5000 0.0
CHNL# 3539: [VOLT 158 [LANGDON2 500.00]]
1.5000 0.0
CHNL# 3537: [VOLT 751 [FIDLER01 240.00]]
1.5000 0.0
CHNL# 3535: [VOLT 165 [PEIGAN 4 240.00]]
1.5000 0.0
CHNL# 3534: [VOLT 346 [GOOSEL4 240.00]]
1.5000 0.0
0.0
1.0000
2.0000
3.0000
4.0000
5.0000
6.0000
7.0000
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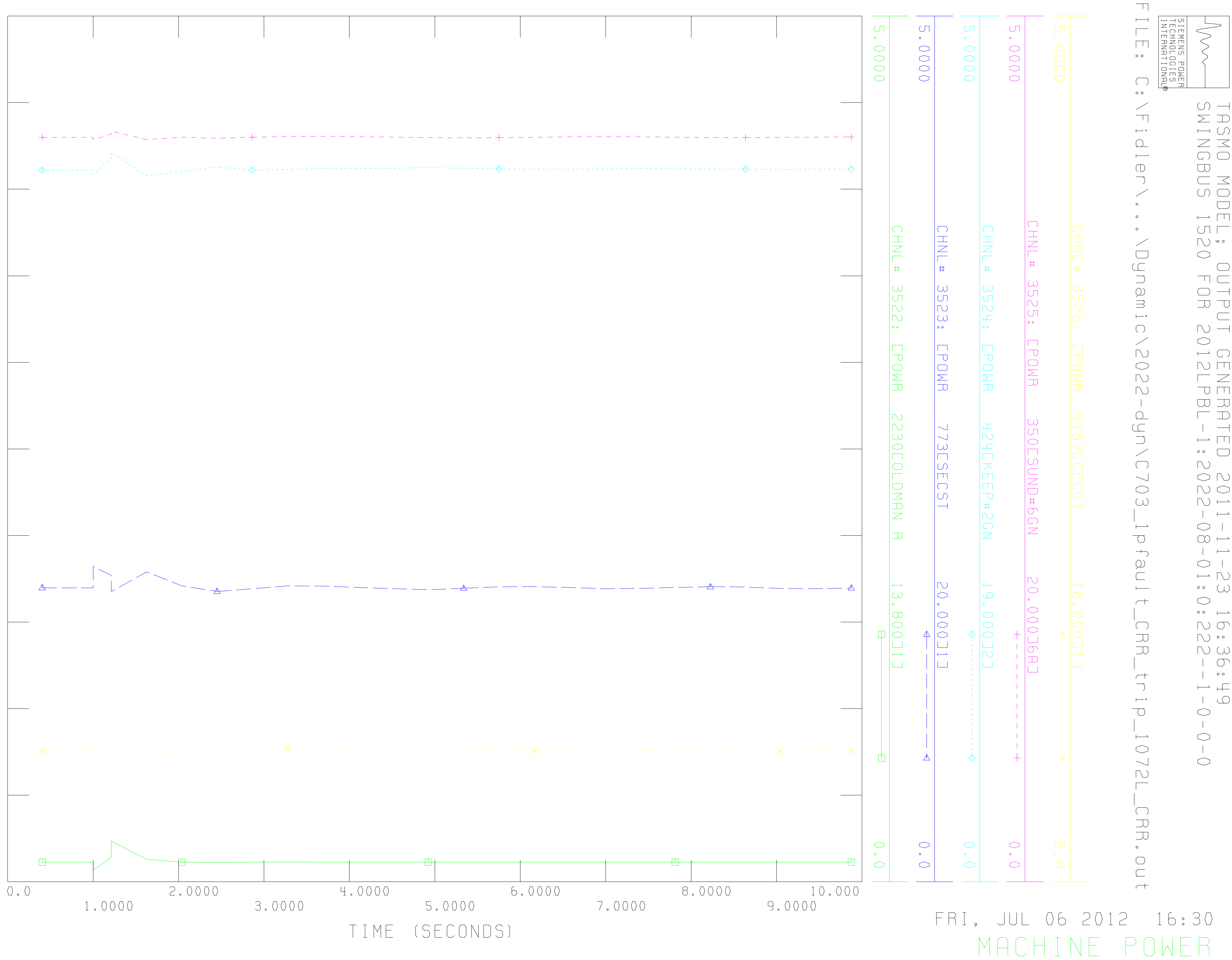
9.0000
10.000
TIME (SECONDS)
FRI, JUL 06 2012 16:30
VOLTAGE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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
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SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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5.0000
CHNL# 3525: [POWR 350[SUND#6GN 20.000]6A]
0.0
5.0000
CHNL# 3524: [POWR 424[KEEP#2GN 19.000]2]
0.0
5.0000
CHNL# 3523: [POWR 773[SECST 20.000]1]
0.0
5.0000
CHNL# 3522: [POWR 2230[OLDMAN R 13.800]1]
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0.0
1.0000
2.0000
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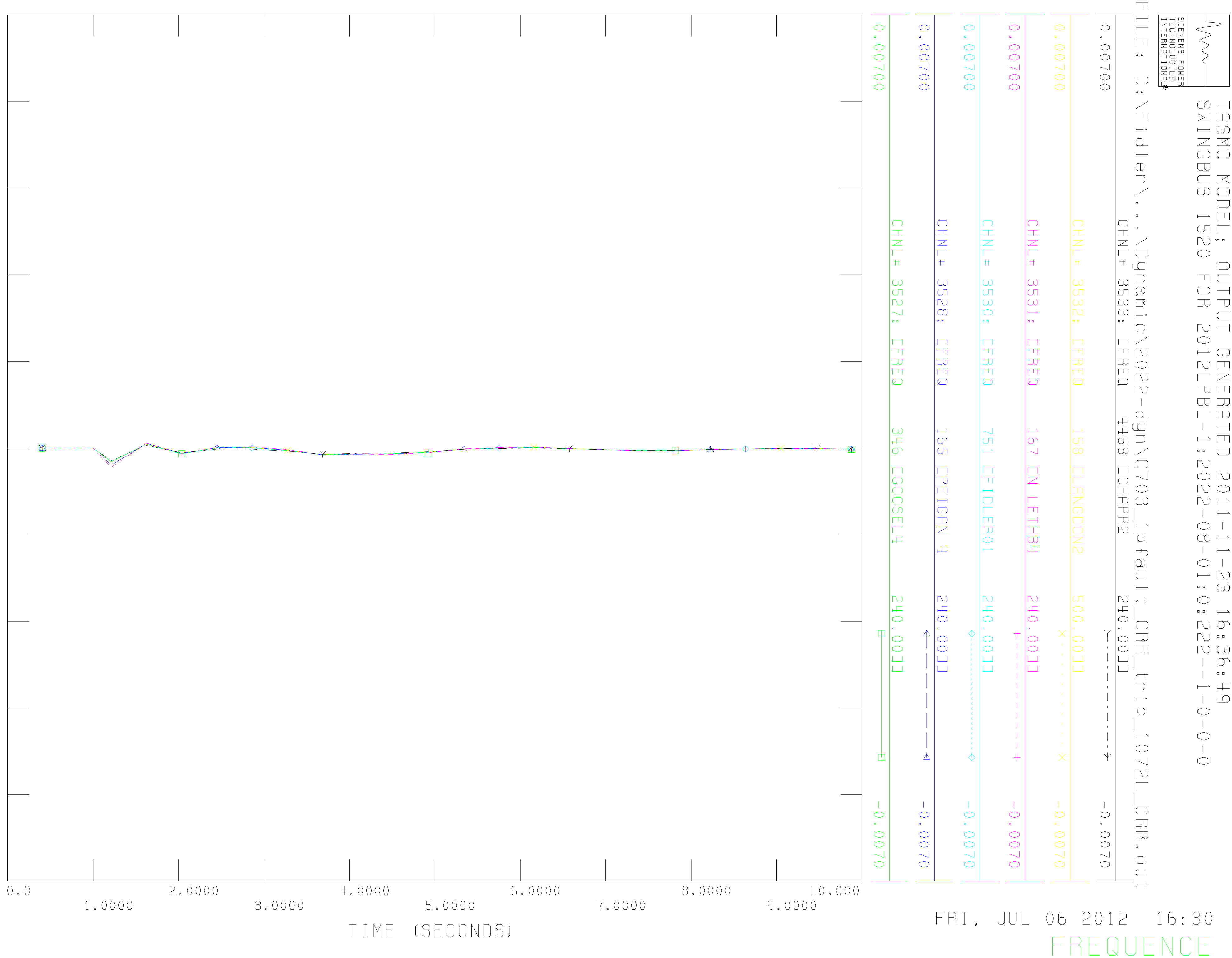
TIME (SECONDS)
FRI, JUL 06 2012 16:30
MACHINE POWER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SWINGBUS 1520 FOR 2012LPBL-1:2022-08-01:0:222-1-0-0-0
SIEMENS POWER TECHNOLOGIES INTERNATIONAL
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CHNL# 3532: [FREQ 158 [LANGDON2 500.0]]
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0.00700
CHNL# 3531: [FREQ 167 [N LETHB4 240.0]]
-0.0070
0.00700
CHNL# 3530: [FREQ 751 [FIDLER01 240.0]]
-0.0070
0.00700
CHNL# 3528: [FREQ 165 [PEIGAN 4 240.0]]
-0.0070
0.00700
CHNL# 3527: [FREQ 346 [GOOSEL4 240.0]]
-0.0070
0.0
1.0000
2.0000
3.0000
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TIME (SECONDS)
FRI, JUL 06 2012 16:30
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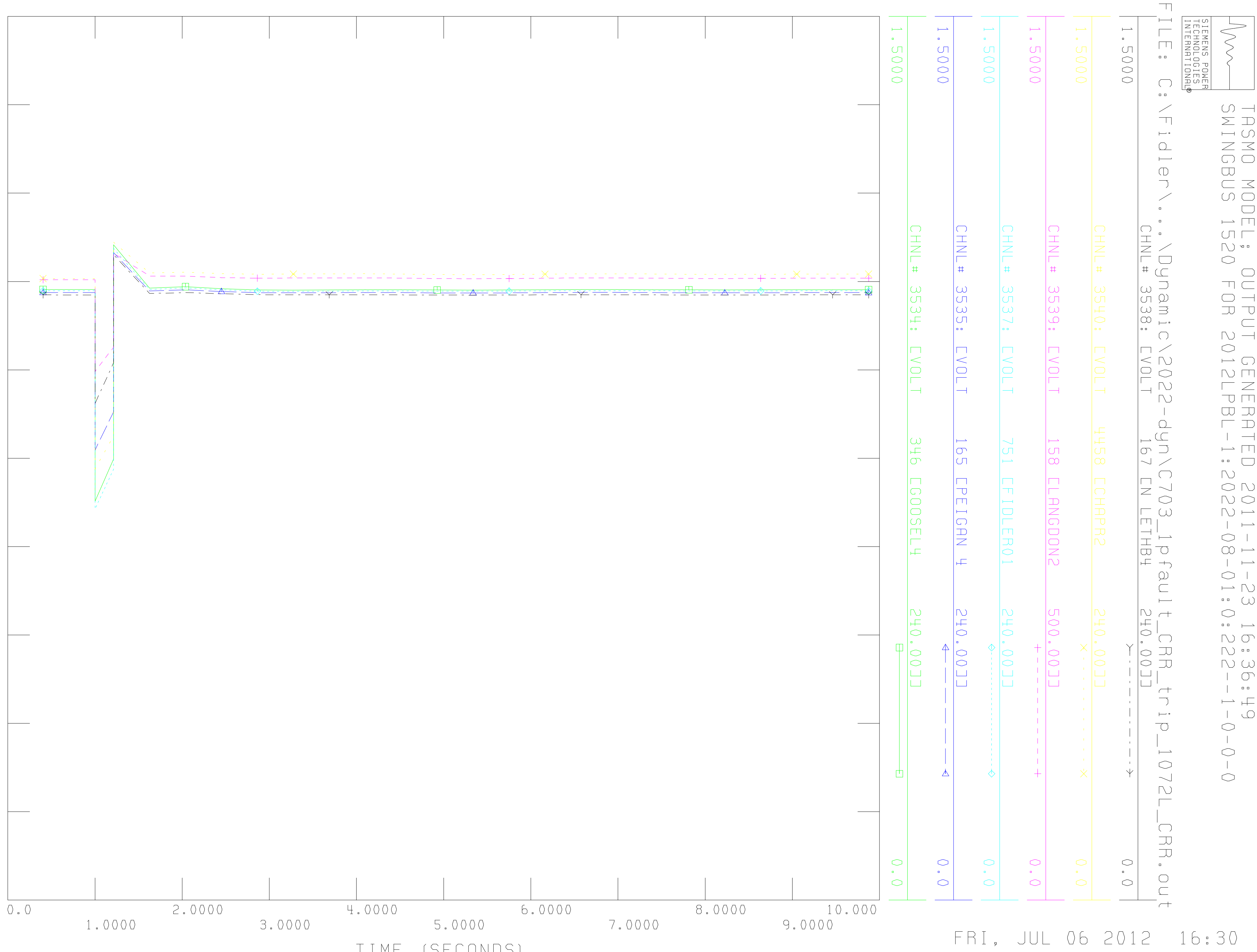

FRI, JUL 06 2012 16:30

VOLTAGE

ATTACHMENT D

Short Circuit Analysis

Table D-1: Estimated Maximum Short Circuit Current Levels (2022) - SART Alternative 1

Substation	Base Voltage (kV)	Pre-fault Voltage (p.u.)	3-phase		Single-phase-to-ground	
			Positive Sequence Impedance (p.u.) [1]	Current (kA)	Zero Sequence Impedance (p.u.) [1]	Current (kA)
Summerview 354S	138	1.016	0.006034+j0.043846	9.6	0.019500+j0.114562	6.2
Goose Lake 103S	138	1.025	0.003587+j0.032670	13.1	0.004459+j0.043254	11.8
Coleman 799S	138	1.028	0.032165+j0.124658	3.3	0.054583+j0.249048	2.5
Castle River 239S	138	1.025	0.007531+j0.046057	9.2	0.015995+j0.084180	7.2
Oldman River 806S	138	1.024	0.014098+j0.070895	5.8	0.009492+j0.086190	5.5
Fidler 312S	138	1.020	0.001804+j0.015559	15.6	0.000772+j0.027121	15.5
Goose Lake 103S	240	1.031	0.001932+j0.014951	16.5	0.003290+j0.021106	14.4
Fidler 312S	240	1.013	0.001804+j0.015559	15.9	0.004208+j0.025550	13.0
Chapel Rock 491S	240	1.041	0.001666+j0.016380	15.2	0.00644+j0.03622	10.7
Castle Rock Ridge	240	1.033	0.002018+j0.017534	14.1	0.000428+j0.011721	15.8

Note: 1) per unit (p.u.) quantities are on 100MVA base.

Table D-2: Estimated Maximum Short Circuit Current Levels (2022)- SART Alternative 2

Substation	Base Voltage (kV)	Pre-fault Voltage (p.u.)	3-phase		Single-phase-to-ground	
			Positive Sequence Impedance (p.u.) [1]	Current (kA)	Zero Sequence Impedance (p.u.) [1]	Current (kA)
Summerview 354S	138	1.016	0.006148+j0.045167	9.3	0.011055+j0.079591	7.4
Goose Lake 103S	138	1.025	0.003557+j0.032557	13.1	0.004597+j0.044481	11.7
Coleman 799S	138	1.028	0.032161+j0.124646	3.3	0.054433+j0.248869	2.5

Castle River 239S	138	1.025	0.007510+j0.045968	9.2	0.016004+j0.084999	7.1
Oldman River 806S	138	1.024	0.014177+j0.072182	5.8	0.009546+j0.085959	5.5
Fidler 312S	138	1.020	0.002124+j0.028842	14.7	0.000856+j0.025158	15.2
Goose Lake 103S	240	1.031	0.003557+j0.032557	16.7	0.003416+j0.022751	14.1
Fidler 312S	240	1.013	0.002124+j0.028842	14.0	0.004974+j0.030288	11.2
Chapel Rock 491S	240	1.041	0.001664+j0.016366	15.2	0.005354+j0.031626	11.6
Castle Rock Ridge	240	1.033	0.001798+j0.015518	15.9	0.000449+j0.011428	17.4

Note: 1) per unit (p.u.) quantities are on 100MVA base.

Disclaimer

Short circuit current calculation is based on modeling information provided to the AESO by third parties. Short circuit estimation is subject to change. The information provided in this study is not intended to be used as the sole source of information for electrical equipment specification and the design of public or worker safety-grounding systems.