Engineering Connection Assessment

P2466 Prominence Solar Project Connection

PR Development Limited Partnership

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The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

NOTE:

The conclusions and recommendations in this report are based on the results presented in *Attachment A: Engineering Connection Assessment: Study Results*, which was prepared by a third party consultant in accordance with the AESO Connection Process.

The AESO has reviewed the *Engineering Connection Assessment: Study Results*, and finds it acceptable for the purpose of assessing the potential impacts of the proposed connection on the performance of the Alberta interconnected electric system.

Contents

1 Introduction 1
1.1 Project Overview 1
2 Assessment Scope 2
2.1 Objectives 2
2.2 Existing System 2
2.3 Study Area 2
3 Connection Alternatives 3
3.1 Overview 3
3.2 Connection Alternatives Examined 3
3.3 Connection Alternatives Selected for Further Study 13
3.4 Connection Alternatives Not Selected for Further Study 13
4 Assessment Approach 14
4.1 Standards, Criteria and Assumptions 14
4.2 Studies Performed 14
4.2.1 Power Flow Studies 15
4.2.2 Transient Stability Studies 15
4.2.3 Short-Circuit Current Level Studies 16
4.3 Mitigation Measure Development and Evaluation 16
4.3.1 Post-Mitigation Studies 16
4.3.2 Constraint Effective Factor Studies 16
5 Interpretation of Results 17
5.1 Results Overview 17
5.2 Pre-Project Study Results 21
5.2.1 Category A Conditions 21
5.2.2 Category B Conditions 21
5.3 Post-Project Study Results 21
5.3.1 Category A Conditions 21
5.3.2 Category B Conditions 22
5.4 Post-Project Sensitivity Study Results 22
5.4.1 Category A Conditions 22
5.4.2 Category B Conditions 23
5.5 Mitigation Measures 23
5.5.1 Pre-Project 23
5.5.2 Post-Project 23
5.5.3 Post-Project Sensitivity 23
6 Project Dependencies 25
7 Conclusions and Recommendations 26

Tables

Table 4-1: Connection Study Scenarios 14
Table 5-1: Summary of Reliability Criteria Violations, Project Impact and Mitigation Measures 18
Table 5-2: Thermal Criteria Violations under the N-0 Condition in the SP post-Project scenario 21
Table 5-3: Thermal Criteria Violations under the N-0 Condition in the SP post-Project sensitivity scenario 2 22

Figures

Figure 3-1: Connection Alternative 1 4
Figure 3-2: Connection Alternative 2 6
Figure 3-3: Connection Alternative 3 8
Figure 3-4: Connection Alternative 4 9
Figure 3-5: Connection Alternative 5 10
Figure 3-6: Connection Alternative 6 11
Figure 3-7: Connection Alternative 7 12

Attachments

Attachment A: Engineering Connection Assessment Results

1 Introduction

This AESO Engineering Connection Assessment describes the engineering studies that were completed to assess the impact of the Project (as defined below) on the performance of the Alberta interconnected electric system (AIES). This report also provides the AESO's conclusions and recommendations based on the results of the engineering studies.

Attached to this Engineering Connection Assessment are the results of the engineering studies (see Attachment A) and the scope and methodology used to perform the studies (see Attachment A1 to Attachment A). These attachments provide details regarding the technical criteria, assumptions, and methods for performing these engineering studies, and the results of the engineering studies.

1.1 Project Overview

PR Development Limited Partnership (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its proposed Prominence Solar (Facility) to the AIES.

The Facility includes a proposed collector substation, to be designated Elder 1057S Substation.

The Market Participant's request includes: a request for a new system access service in the area, with a Rate STS, *Supply Transmission Service*, contract capacity of 80 MW and a Rate DTS, *Demand Transmission Service*, contract capacity of 1 MW; and a request for transmission development (collectively, the Project).

The scheduled in-service date (ISD) for the Project is September 5, 2025.

2 Assessment Scope

2.1 Objectives

The objectives of the AESO Engineering Connection Assessment are as follows:

- Assess the impact of the Project on the performance of the AIES.
- Evaluate Project connection alternatives and identify the AESO's preferred alternative.
- Recommend mitigation measures, if required, to reliably connect the Project to the AIES.
- Identify Project dependencies, including any TFO projects or AESO plans to expand or enhance the transmission system that must be completed prior to connection.

2.2 Existing System

Geographically, the Project is located in the AESO planning area Lethbridge (Area 54), which is part of the AESO South planning region. Lethbridge (Area 54) is surrounded by the planning areas of Stavely (Area 49), Vauxhall (Area 52), Glenwood (Area 55), and Fort Macleod (Area 53).

From a transmission system perspective, Lethbridge (Area 54) consists primarily of a 240 kV and 138 kV transmission system. Lethbridge (Area 54) is connected to Stavely (Area 49) through a 138 kV transmission line and two 240 kV transmission lines, connected to Vauxhall (Area 52) through a 138 kV transmission line, connected to Glenwood (Area 55) through two 138 kV transmission lines and connected to Fort Macleod (Area 53) through two 138 kV transmission lines and two 240 kV transmission lines.

Existing constraints in the South planning region are managed in accordance with the procedures set out in Section 302.1 of the ISO rules, *Real Time Transmission Constraint Management* (TCM Rule).

2.3 Study Area

The Study Area for the Project consists of the AESO Planning area of Stavely (Area 49), Vauxhall (Area 52), Lethbridge (Area 54) and Glenwood (Area 55), including the tie lines connecting these planning areas to the rest of the AIES. All transmission facilities within the Study Area will be studied and monitored for violations of the Reliability Criteria (defined in Section 3.1 of Attachment A1).

3 Connection Alternatives

3.1 Overview

The AESO, in consultation with the TFO in the Study Area and the Market Participant, examined seven transmission alternatives to meet the Market Participant's request for system access service, as detailed in Section 3.2.

3.2 Connection Alternatives Examined

Below is a description of the developments associated with the transmission alternatives that were examined for the Project.

Alternative 1 – T-tap connection to the 138 kV transmission line 172L (Coaldale 254S – North Lethbridge 370S)

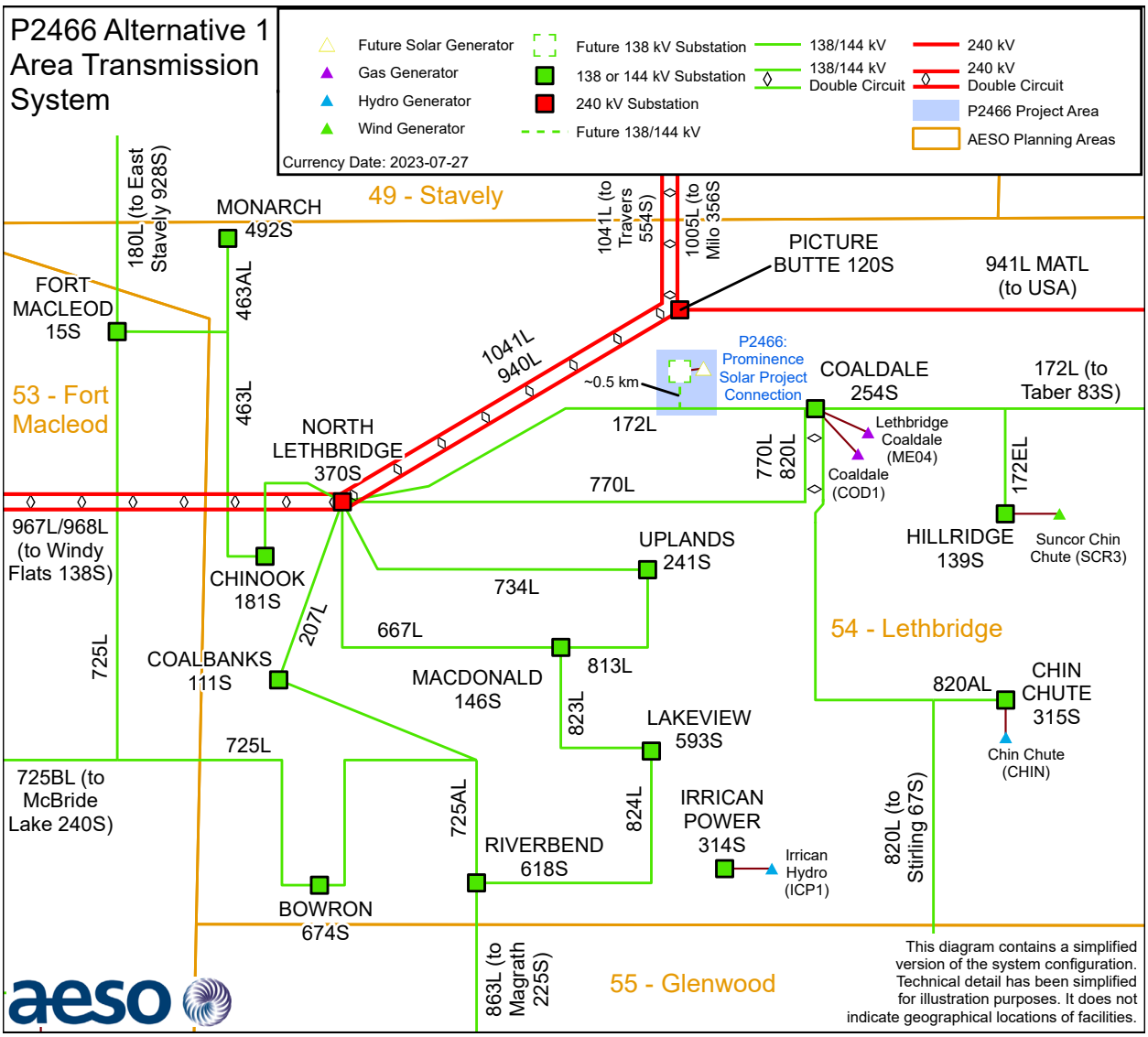
This alternative included the following developments:

- Add a 138 kV circuit, approximately 0.5 km[1] in length, to connect the Facility to the existing 138 kV transmission line 172L (between Coaldale 254S and North Lethbridge 370S substations) using a T-tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-1.

[1] Exact line length to be determined by TFO

Figure 3-1: Connection Alternative 1



Alternative 2 – T-tap connection to the 138 kV transmission line 770L

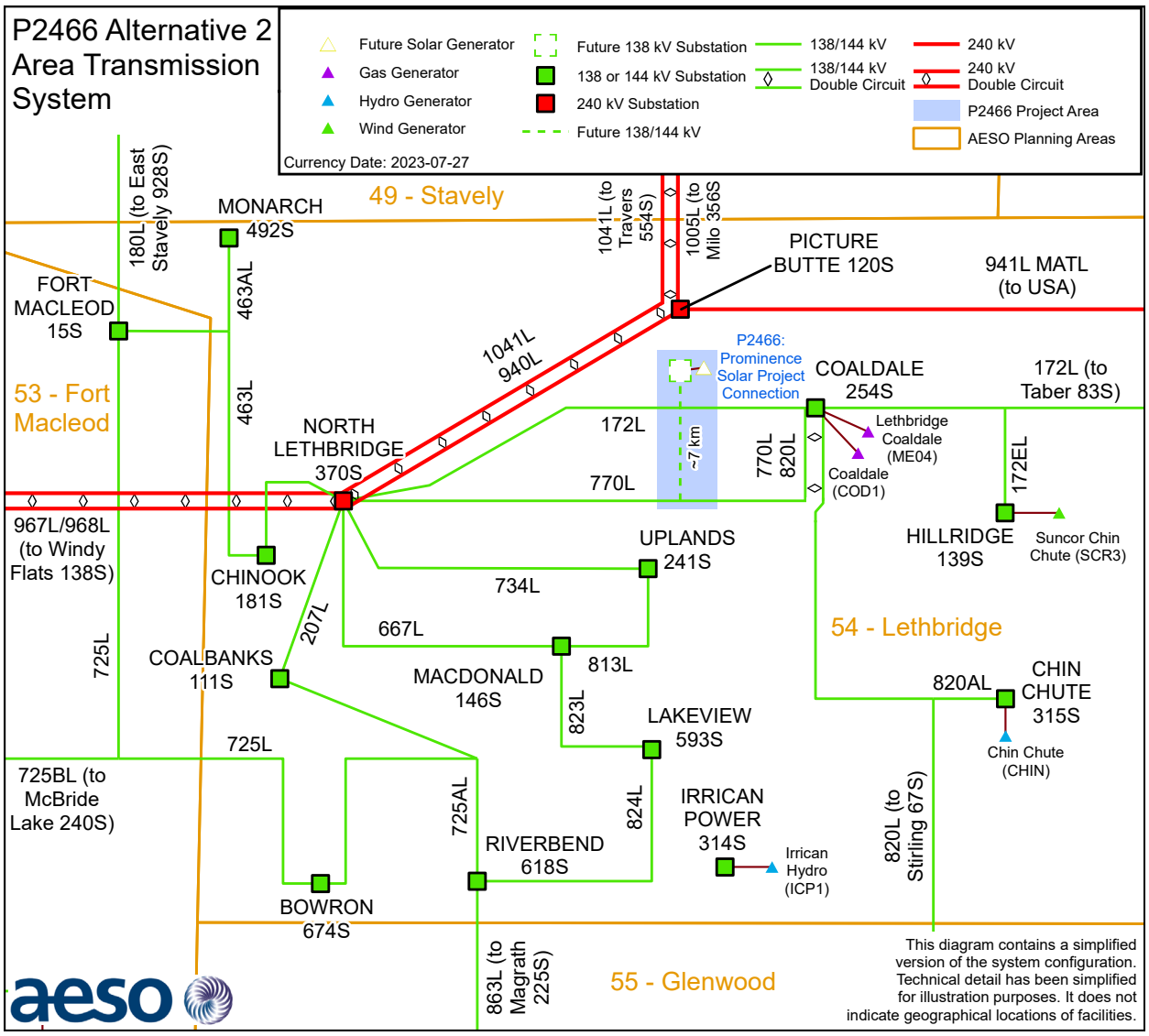
This alternative included the following developments:

- Add a 138 kV circuit, approximately 7 km[2] in length, to connect the Facility to the existing 138 kV transmission line 770L (between Coaldale 254S and North Lethbridge 370S substations) using a T-tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-2.

[2] Exact line length to be determined by TFO

Figure 3-2: Connection Alternative 2



Alternative 3 – Radial 138 kV connection to the Uplands 241S substation

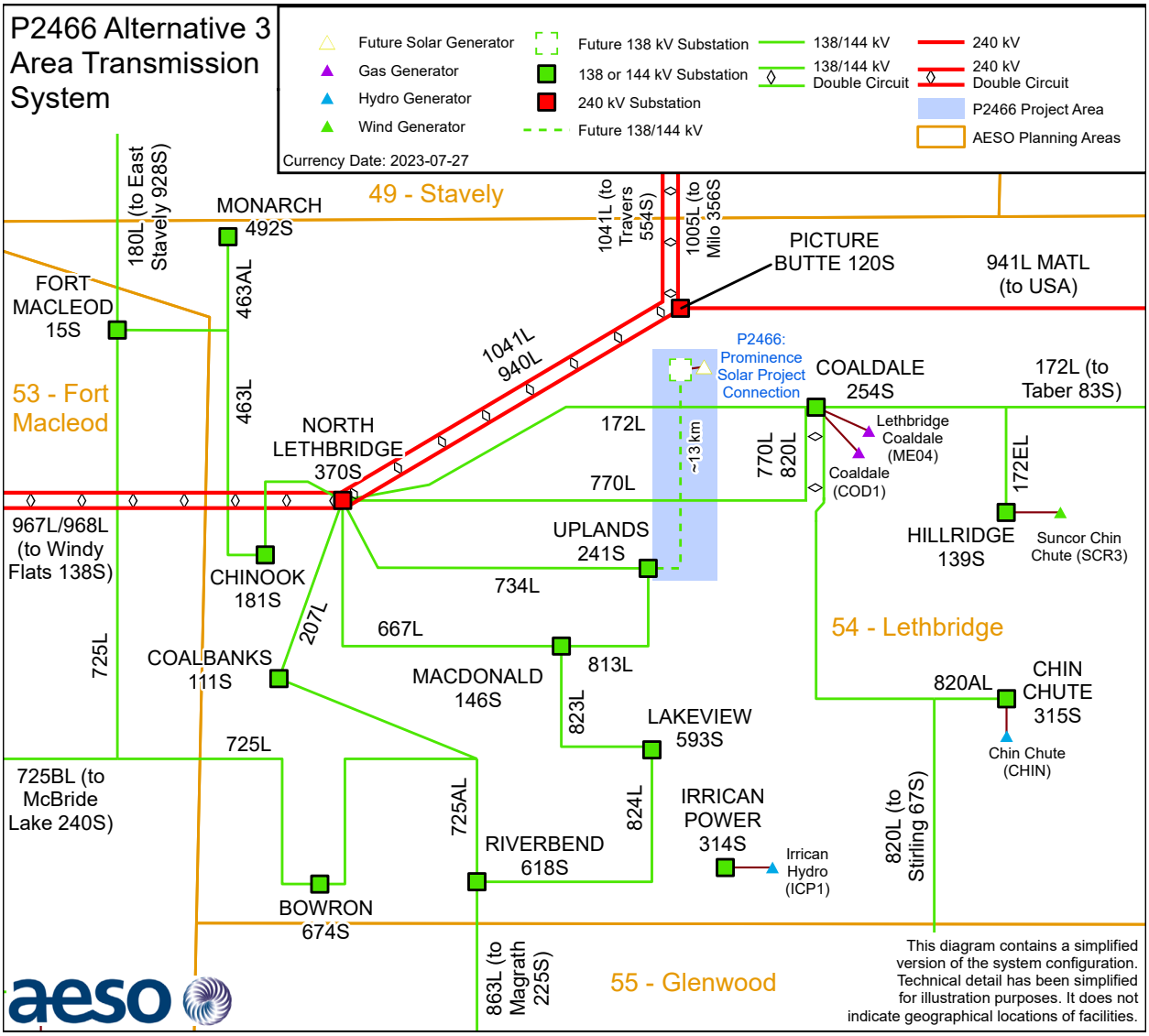
This alternative included the following developments:

- Modify the existing Uplands 241S substation, including adding one 138 kV circuit breaker;
- Add a 138 kV circuit, approximately 13 km[3] in length, to connect the Facility to the Uplands 241S substation using a radial configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-3.

[3] Exact line length to be determined by TFO

Figure 3-3: Connection Alternative 3



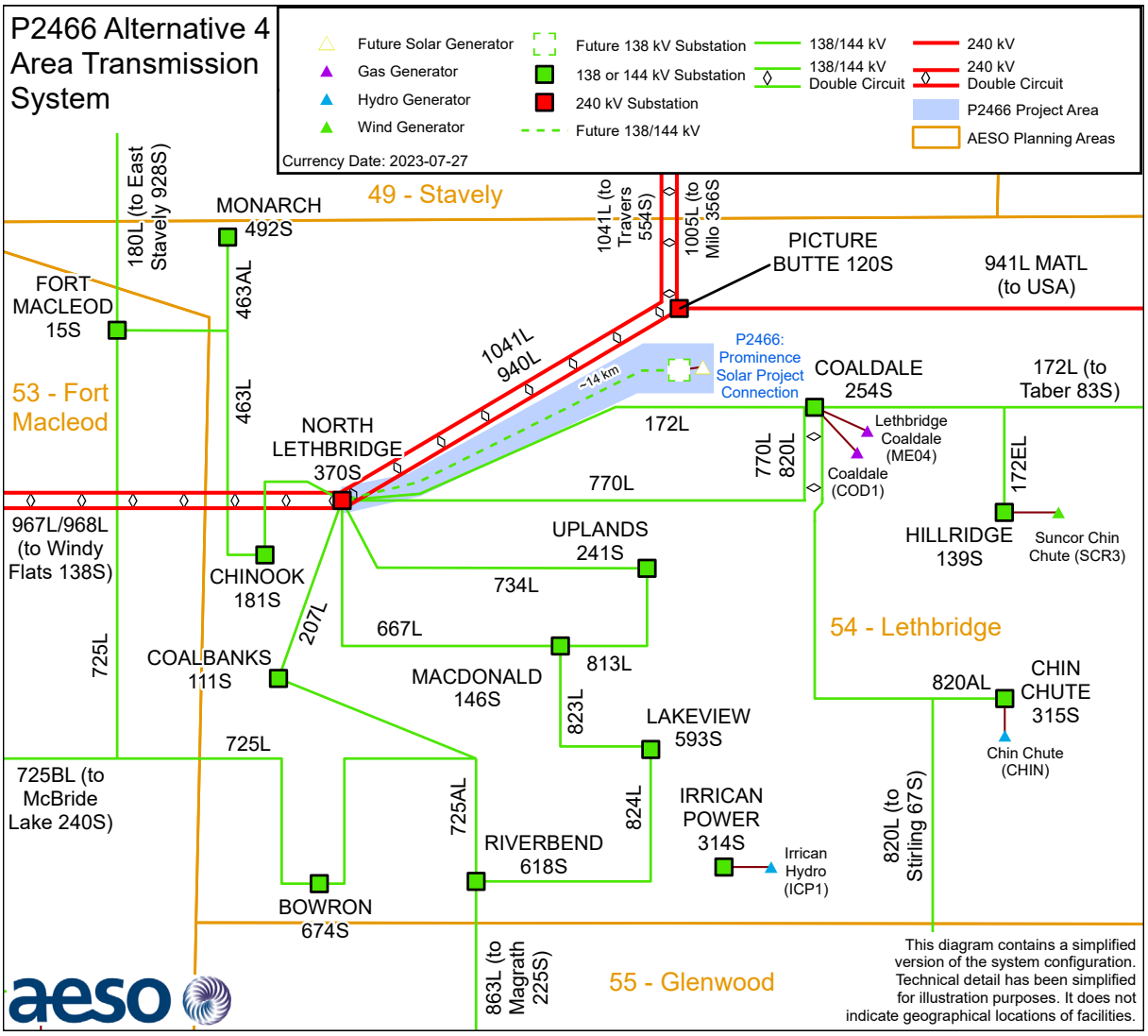
Alternative 4 – Radial 138 kV connection to the North Lethbridge 370S substation

This alternative included the following developments:

- Modify the existing North Lethbridge 370S substation, including adding one 138 kV circuit breaker;
- Add a 138 kV circuit, approximately 14 km[4] in length, to connect the Facility to the North Lethbridge 370S substation using a radial configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-4.

Figure 3-4: Connection Alternative 4



[4] Exact line length to be determined by TFO

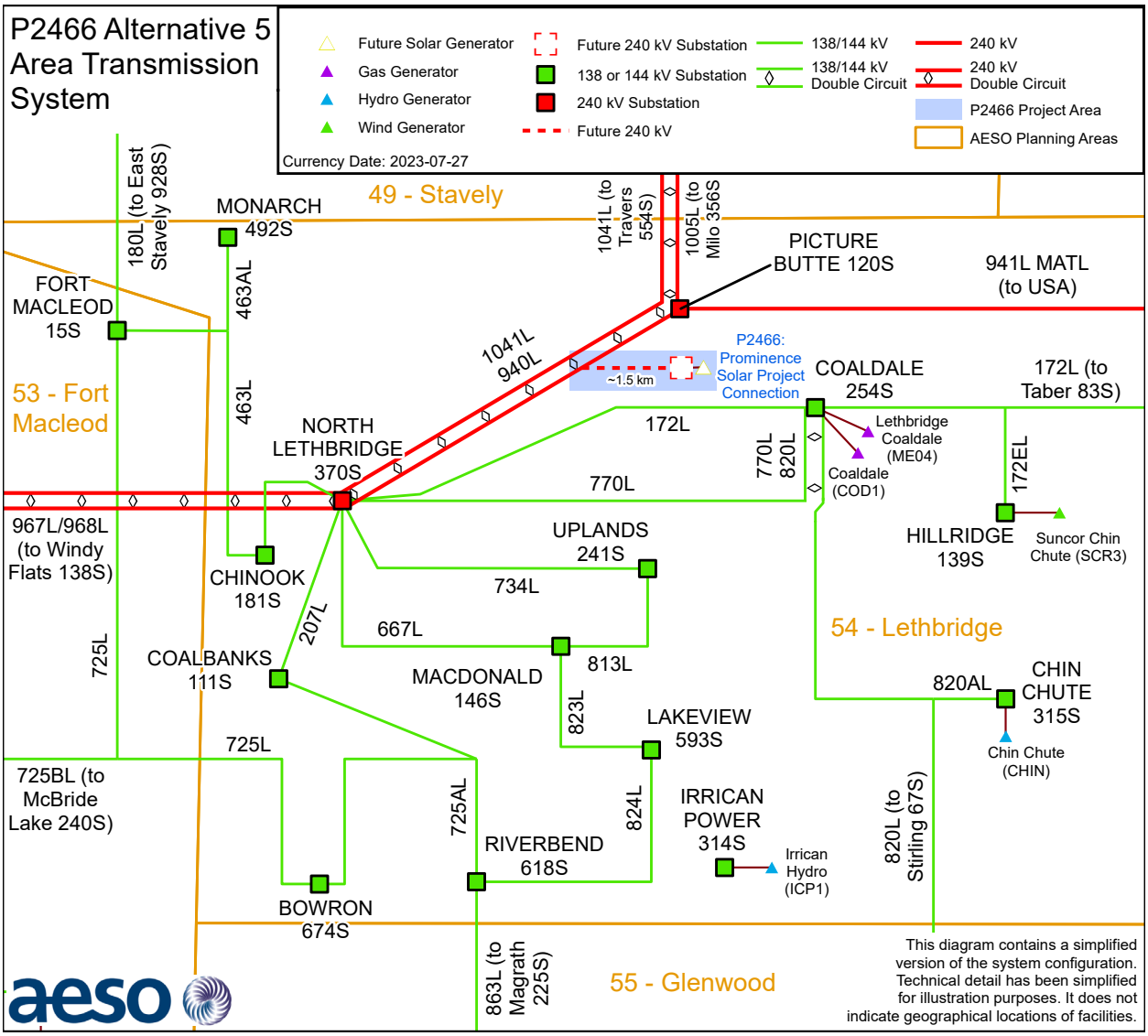
Alternative 5 – T-tap connection to the 240 kV transmission line 940L

This alternative included the following developments:

- Add a 240 kV circuit, approximately 1.5 km[5] in length, to connect the Facility to the existing 240 kV transmission line 940L (between Picture Butte 120S and North Lethbridge 370S substations) using a T-tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-5.

Figure 3-5: Connection Alternative 5



[5] Exact line length to be determined by TFO

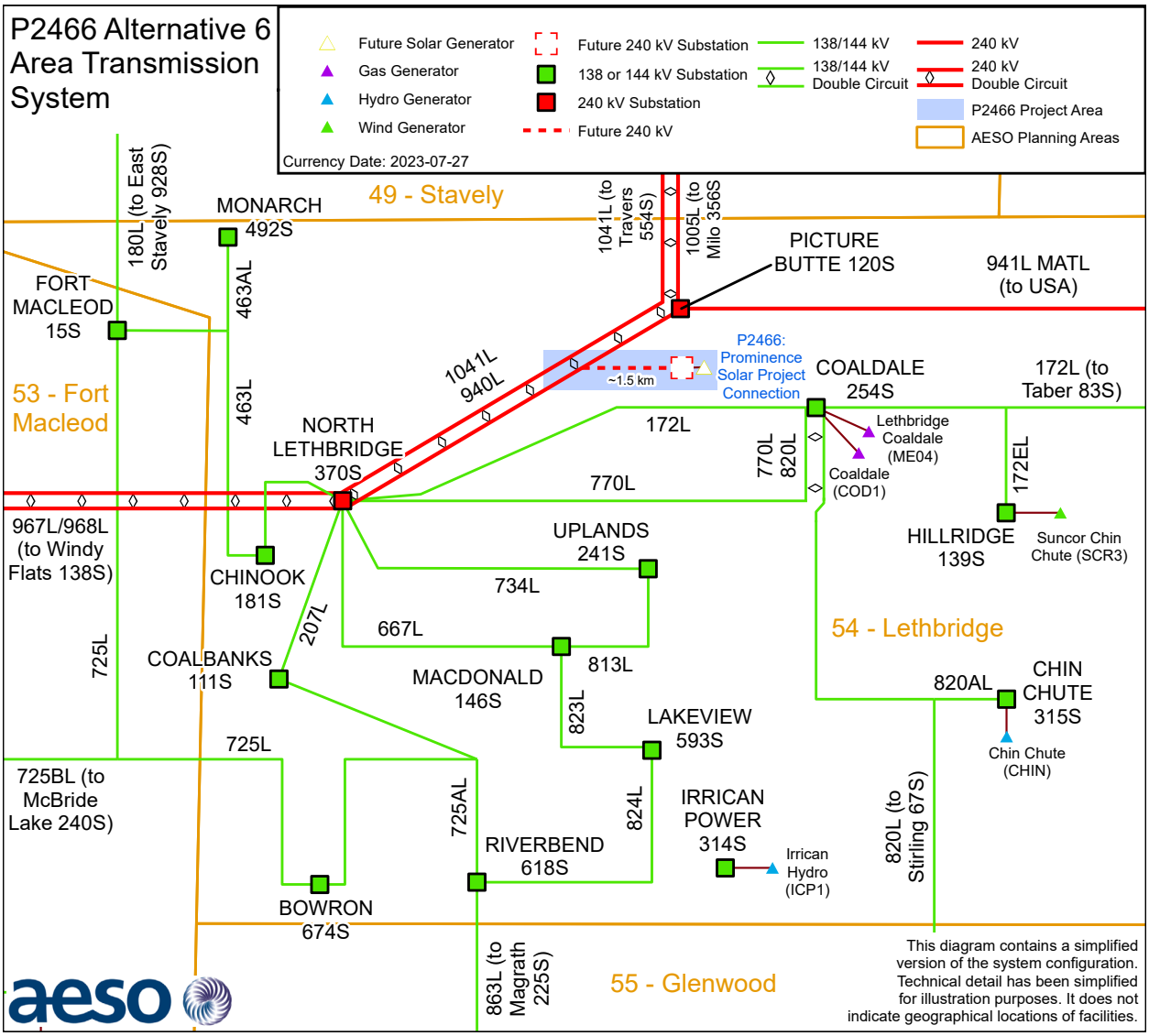
Alternative 6 – T-tap connection to the 240 kV transmission line 1041L

This alternative included the following developments:

- Add a 240 kV circuit, approximately 1.5 km[6] in length, to connect the Facility to the existing 240 kV transmission line 1041L (between Travers 554S and North Lethbridge 370S substations) using a T-Tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-6.

Figure 3-6: Connection Alternative 6



[6] Exact line length to be determined by TFO

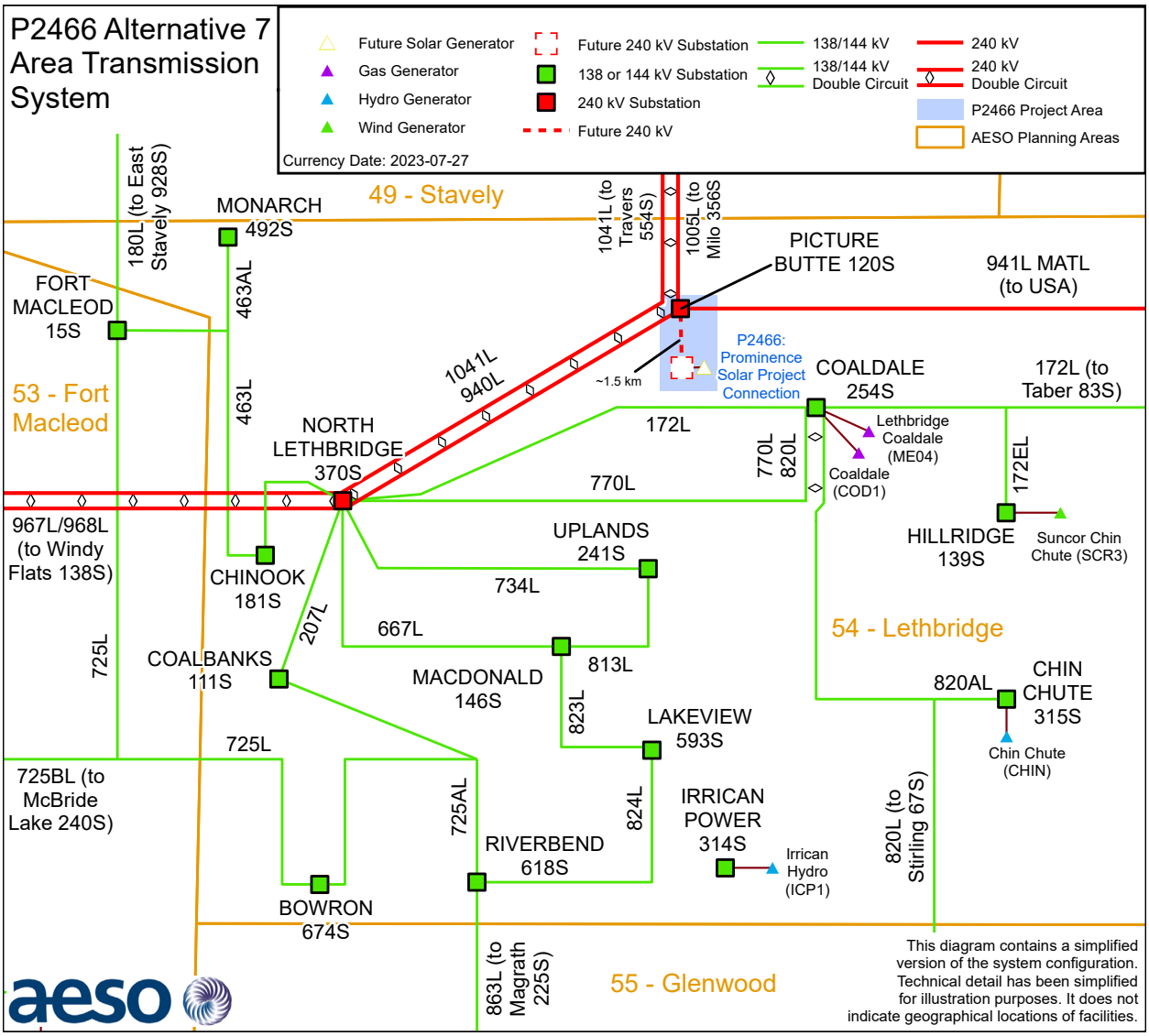
Alternative 7 – Radial 240 kV connection to the Picture Butte 120S substation

This alternative included the following developments:

- Modify the existing Picture Butte 120S substation, including adding one 240 kV circuit breaker;
- Add a 240 kV circuit, approximately 1.5 km[7] in length, to connect the Facility to the Picture Butte 120S substation using a radial configuration; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in in Figure 3-7.

Figure 3-7: Connection Alternative 7



[7] Exact line length to be determined by TFO

3.3 Connection Alternatives Selected for Further Study

Alternatives 1 is considered technically feasible and was selected for further study.

3.4 Connection Alternatives Not Selected for Further Study

Alternatives 2, 3, 4, 5, 6 and 7 would involve increased transmission development and hence, increased cost, compared to Alternative 1. Therefore, Alternatives 2, 3, 4, 5, 6 and 7 were ruled out.

4 Assessment Approach

4.1 Standards, Criteria and Assumptions

A detailed description of the standards, criteria, and assumptions that were used for the connection assessment is provided in Attachment A (see Attachment A1).

4.2 Studies Performed

At the time of studies, the scheduled ISD for the Project was April 19, 2024. Therefore, studies were performed using scenarios for 2024 Summer Light (SL) and 2024 Summer Peak (SP). During the course of the studies, the ISD of the Project was changed to September 5, 2025. The use of 2024 SL and 2024 SP scenarios will not materially impact the results or findings of the engineering study.

In addition to studying the main scenarios (scenarios 1 to 4), the AESO also chose to run sensitivity studies to include additional projects in the Study Area (scenarios 6 to 13). P2323, P2324, P2325 and P2326 (Fortis Taber 83S DER Solar 1 – 4), P2511 COL Chinook 181S DER Solar and P2490 TransAlta Tempest Wind were included in the sensitivity scenarios to identify the transmission system performance with the additional projects included.

Short-circuit studies were performed using the 2024 SP pre-Project scenario, 2024 SP and 2031 WP post-Project scenarios.

Table 4-1 lists the study scenarios. Post-Project scenarios reflect the final requested Rate STS contract capacity of 80 MW at the Elder 1057S Substation.

Table 4-1: Connection Study Scenarios

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
Pre-Project					
1	2024 Summer Light (SL)	High Solar (HS)	2024 SL HS Pre-Project	0	0
2	2024 Summer Peak (SP)	High Solar (HS)	2024 SP HS Pre-Project	0	0
Post-Project					
3	2024 Summer Light (SL)	High Solar (HS)	2024 SL HS Post-Project	1	80
4	2024 Summer Peak (SP)	High Solar (HS)	2024 SP HS Post-Project	1	80
5	2031 Winter Peak (WP)	All Study Area Generators In-Service	2031 WP Post-Project	1	80
Pre-Project Sensitivity 1 with P2323, P2324, P2325, P2326 and P2511					
6	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Pre-Project Sensitivity 1	0	0

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
7	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Pre-Project Sensitivity 1	0	0
Post-Project Sensitivity 1 with P2323, P2324, P2325, P2326 and P2511					
8	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Post-Project Sensitivity 1	1	80
9	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Post-Project Sensitivity 1	1	80
Pre-Project Sensitivity 2 with P2490, P2323, P2324, P2325, P2326 and P2511					
10	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Pre-Project Sensitivity 2	0	0
11	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Pre-Project Sensitivity 2	0	0
Post-Project Sensitivity 2 with P2490, P2323, P2324, P2325, P2326 and P2511					
12	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Post-Project Sensitivity 2	1	80
13	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Post-Project Sensitivity 2	1	80

The AESO Planning Region load forecasts used for the connection studies were based on the AESO's 2021 Long-term Outlook (2021 LTO).

4.2.1 Power Flow Studies

The purpose of the power flow studies is to identify and quantify any thermal and voltage criteria violations in the Study Area.

In addition, power flow studies are also used to identify POD low voltage bus voltage deviations beyond the limits listed in Table 3-1 of Attachment A1.[8]

Power flow studies were performed for 2024 Summer Light (SL) and 2024 Summer Peak (SP) pre-Project main and sensitivity scenarios (scenarios 1, 2, 6, 7, 10 and 11), and for 2024 SL and 2024 SP post-Project main and sensitivity scenarios (scenarios 3, 4, 8, 9, 12 and 13). Sensitivity scenarios 10 to 13 were only studied under Category A condition to identify the potential for thermal criteria violations with the additional projects included.

4.2.2 Transient Stability Studies

The purpose of the transient stability studies is to assess the post-Project stability of the transmission system after three-phase to ground faults are applied on select transmission lines in the Study Area.

[8] The AESO's desired post-contingency voltage deviations for low voltage busses represent guidelines rather than criteria. A POD bus voltage deviation that exceeds the desired limits shown in Table 3-1 of Attachment A1 does not represent a Reliability Criteria violation. Mitigation measures would not be developed to specifically address POD bus voltage deviations that exceed the desired values in Table 3-1 of Attachment A1.

Transient stability studies were performed for 2024 SL and 2024 SP post-Project (Scenario 3 and 4) and post-project sensitivity 1 scenarios (Scenario 8 and 9).

4.2.3 Short-Circuit Current Level Studies

The purpose of short-circuit current level studies is to determine the expected system short-circuit current levels in the vicinity of the Project.

Short circuit studies were performed for the 2024 SP pre-Project scenario, 2024 SP and 2031 WP post-Project scenarios.

4.3 Mitigation Measure Development and Evaluation

As explained in Section 6 of Attachment A1, mitigation measures were developed to address system performance issues that were identified in the post-Project scenarios. Studies performed to assess the effectiveness of mitigation measures are briefly outlined below.

4.3.1 Post-Mitigation Studies

Power flow studies were performed to assess the impact of the Project on the performance of the AIES following implementation of the AESO's proposed mitigation measures.

4.3.2 Constraint Effective Factor Studies

Constraint effective factor studies were used to determine the generator and load constraint effective factors and to identify the most effective generators or loads to manage thermal criteria violations that were observed under Category B conditions.

5 Interpretation of Results

5.1 Results Overview

This section provides an assessment of the impact of the Project on the performance of the AIES. The Reliability Criteria violations observed during the connection assessment studies, and the proposed mitigation measures are summarized in Table 5-1.

- Section 5.2 includes an overview of the pre-Project studies results.
- Section 5.3 includes an overview of the post-Project studies results.
- Section 5.4 includes a description of the proposed mitigation measures to address observed Reliability Criteria violations.
- Section 5.5 includes an overview of the post-mitigation studies results.

Detailed study results are provided in Attachment A.

Table 5-1: Summary of Reliability Criteria Violations, Project Impact and Mitigation Measures

Scenario	Type of Reliability Criteria Violation		Contingency (System Element Lost)	Details of Violation	Project Impact	Pre-Project Mitigation Measures	Post-Project Mitigation Measures
	Pre-Project	Post-Project					
2024 Summer Light (SL)	Thermal - below emergency rating	Thermal - below emergency rating	161L/161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL - Fort Macleod 15S)	Marginally reduced violation	Real-time operational practices (RTOPs)	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (Chinook 181S - 463AL)	Materially reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - above emergency rating	Thermal - above emergency rating	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 42	RAS 42
	None	Thermal - below emergency rating	924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RAS 42
	None	Thermal - below emergency rating	67ST2 (Stirling 67S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 126, RAS 42	RAS 126, RAS 42
2024 Summer Peak (SP)	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	180L (Granum 604S tap - Fort Macleod 15S Bus 237)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	System Normal (N-0)	924L (Langdon 102S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	927L (Langdon 102S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	725L/725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	725L/725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (463AL tap - Fort Macleod 15S)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - below emergency rating	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)	725L (Bowron 674S - 725BL)	Marginally reduced violation	RAS 169	RTOPs
	Thermal - below emergency rating	None	674ST1 or T2 (Boron 674S Transformer T1 and T2)	172L (Chinook 181S - North Lethbridge 370S)	Removed violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (Chinook 181S - 463AL tap)	Marginally reduced violation	RAS 178	RAS 178
	Thermal - above emergency rating	Thermal - above emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (463AL - Fort Macleod 15S)	Marginally reduced violation	RAS 178	RAS 178
	Thermal - above emergency rating	Thermal - above emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 36, RAS 42	RAS 36, RAS 42
	None	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	New violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - below emergency rating	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	Materially reduced violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - above emergency rating	Thermal - above emergency rating	863L/891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 42	RAS 42
	Thermal - below emergency rating	None	935L (Cassils 324S - Milo 356S)	180L (180AL - Fort Macleod 15S)	Removed violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	Materially increased violation	RAS 175	RAS 175
	None	Thermal - below emergency rating	924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	Materially increased violation	RAS 175	RAS 175
	None	Thermal - below emergency rating	927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOP
	Thermal - below emergency rating	None	940L (North Lethbridge 370S - Picture Butte 120S)	180L (180AL - Fort Macleod 15S)	Removed violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	610L (Fincastle 336S - Taber 83S)	879L (879AL - Bowmanton 244S)	Marginally reduced violation	RAS 180	RAS 180
	Thermal - below emergency rating	None	172L (Chinook 181S - North Lethbridge 370S)	725L (Bowron 674S - 725BL tap)	Removed violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	225ST1 (Magrath 225S Transformer)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 126, RAS 42	RAS 126, RAS 42
	None	Thermal - below emergency rating	158ST2 (Vauxhall 158S Transformer T2)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	257ST1 (Hull 257S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs

Scenario	Type of Reliability Criteria Violation		Contingency (System Element Lost)	Details of Violation	Project Impact	Pre-Project Mitigation Measures	Post-Project Mitigation Measures
	Pre-Project	Post-Project					
	None	Thermal - above emergency rating	770L (Coaldale 254S - North Lethbridge 370S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	New RAS 608
	None	Thermal - below emergency rating	935L (Cassils 324S - Milo 356S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	923L (Milo 356S - Newell 2075S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	507L (Taber 83S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	763L (Vauxhall 158S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
2024 Summer Light (SL) Sensitivity 1	None	Thermal - below emergency rating	158ST2 (Vauxhall 158S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (Chinook 181S - 463AL tap)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - above emergency rating	Thermal - above emergency rating	863L/891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 42	RAS 42
	None	Thermal - below emergency rating	820L (Coaldale 254S - Chin Chute 315S - Stirling 67S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RAS 42
	None	Thermal - below emergency rating	370ST3 (North Lethbridge 370S Transformer T3)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	370ST5 (North Lethbridge 370S Transformer T5)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	370ST6 (North Lethbridge 370S Transformer T6)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	161L/161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL - Fort Macleod 15S)	Marginally increased violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	763L (Vauxhall 158S - Hull 257S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	67ST2 (Stirling 67S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 126, RAS 42	RAS 126, RAS 42
2024 Summer Peak (SP) Sensitivity 1	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	180L (Granum 604S tap - Fort Macleod 15S Bus 237)	Materially reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	924L (Langdon 102S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	927L (Langdon 102S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	System Normal (N-0)	172L (North Lethbridge 370S - 172FL tap)	Materially increased violation	None	RTOPs
	Thermal - below emergency rating	None	725L/725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	Removed violation	RTOPs	None
	Thermal - below emergency rating	Thermal - below emergency rating	725L/725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (463AL - Fort Macleod 15S)	Materially reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - below emergency rating	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)	725L (Bowron 674S - 725BL)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	172L (Chinook 181S - North Lethbridge 370S)	Materially reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (Chinook 181S - 463AL tap)	Marginally reduced violation	RAS 178	RAS 178
	Thermal - above emergency rating	Thermal - above emergency rating	674ST1 or T2 (Boron 674S Transformer T1 and T2)	463L (463AL tap - Fort Macleod 15S)	Marginally reduced violation	RAS 178	RAS 178
	Thermal - above emergency rating	Thermal - above emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 36, RAS 42	RAS 36, RAS 42
	None	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	New violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - below emergency rating	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	Materially reduced violation	RAS 36, RAS 42	RAS 36, RAS 42
	Thermal - above emergency rating	Thermal - above emergency rating	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 42	RAS 42
	Thermal - below emergency rating	None	935L (Cassils 324S - Milo 356S)	180L (180AL - Fort Macleod 15S)	Removed violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	Materially increased violation	RAS 175	RAS 175
	None	Thermal - below emergency rating	924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	Materially increased violation	RAS 175	RAS 175
	None	Thermal - below emergency rating	927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - below emergency rating	None	940L (North Lethbridge 370S - Picture Butte 120S)	180L (180AL - Fort Macleod 15S)	Removed violation	RTOPs	RTOPs

Scenario	Type of Reliability Criteria Violation		Contingency (System Element Lost)	Details of Violation	Project Impact	Pre-Project Mitigation Measures	Post-Project Mitigation Measures
	Pre-Project	Post-Project					
	Thermal - below emergency rating	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	Marginally increased violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	None	Thermal - below emergency rating	968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	610L (Fincastle 336S - Taber 83S)	879L (879AL - Bowmanton 244S)	Marginally reduced violation	RAS 180	RAS 180
	Thermal - below emergency rating	Thermal - below emergency rating	172L (Chinook 181S - North Lethbridge 370S)	725L (Bowron 674S - 725BL)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RAS 126, RAS 42	RAS 126, RAS 42
	None	Thermal - below emergency rating	158ST2 (Vauxhall 158S Transformer T2)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	257ST1 (Hull 257S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	618ST1 (Riverbend 618S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - above emergency rating	770L (Coaldale 254S - North Lethbridge 370S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	New RAS 608
	None	Thermal - below emergency rating	935L (Cassils 324S - Milo 356S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	923L (Milo 356S - Newell 2075S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	940L (North Lethbridge 370S - Picture Butte 120S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	507L (Taber 83S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	763L (Vauxhall 158S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	941L (Montana - Picture Butte 120S)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	225ST1 (Magrath 225S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
	None	Thermal - below emergency rating	254ST2 (Coaldale 254S Transformer T2)	172L (North Lethbridge 370S - 172FL tap)	New violation	None	RTOPs
2024 Summer Peak (SP) Sensitivity 2	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	225L (Glenwood 229S - Spring Coulee 385S)	Materially increased violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	180L (Granum 604S tap - Fort Macleod 15S Bus 237)	Materially reduced violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	924L (Langdon 102S - Milo 356S)	Marginally reduced violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	927L (Langdon 102S - Milo 356S)	Marginally reduced violation	RTOPs	RTOPs
	None	Thermal - above emergency rating	System Normal (N-0)	172L (North Lethbridge 370S - 172FL tap)	Materially increased violation	None	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	172L (Coaldale 254S – 172EL tap)	Materially reduced violation	RTOPs	RTOPs

Notes:

- Marginally increased (or marginally decreased) refers to a percent loading difference (post-Project percent loading minus pre-Project percent loading) between 0% and 3% (or -3%).
- Materially increased (or materially decreased) refers to a percent loading difference (post-Project percent loading minus pre-Project percent loading) above or equal to 3% (or below or equal to -3%).
- RAS 175, 42, 126,178, 169, 180 and 36 are all existing RASs.
- RAS 608 is a new proposed RAS to trip this project (P2466) when 172L (North Lethbridge 370S – 172FL tap) overloads above emergency rating.

5.2 Pre-Project Study Results

5.2.1 Category A Conditions

With the inclusion of additional projects planning to connect in the South region, Category A thermal criteria violations were observed on the 240 kV transmission lines 924L and 927L, 138 kV transmission line 180L and 69 kV transmission line 225L (385S Spring Coulee – 229S Glenwood) in the SP pre-project scenario (scenario 2).

The short-circuit fault levels were found to be within the typical capabilities of the nearby facilities.

5.2.2 Category B Conditions

The pre-Project power flow studies identified a number of thermal violations under Category B conditions (i.e., loss of a single system element).

No reliability criteria violations or voltage deviations were observed that were beyond the limits listed in Table 3-1 of Attachment A1 (hereafter referred to as point of delivery (POD) bus voltage deviations) under Category B conditions.

5.3 Post-Project Study Results

5.3.1 Category A Conditions

With the addition of the Project, no new thermal violations were observed under N-0 system conditions. Thermal reliability criteria violations under Category A conditions were observed on the 240 kV transmission lines 924L and 927L, 138 kV transmission line 180L, and 69 kV transmission line 225L (385S Spring Coulee – 229S Glenwood) in the SP Post-project scenario (scenario 4). A summary of thermal criteria violations observed under N-0 system conditions is shown in Table 5-2.

Table 5-2: Thermal Criteria Violations under the N-0 Condition in the SP post-Project scenario

Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
			Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
924L (Langdon 102S - Milo 356S)	547.05	656	650.07	118.83	664.24	121.42	2.59
927L (Langdon 102S - Milo 356S)	576	691	652.42	113.27	666.65	115.74	2.47
225L (Glenwood 229S - Spring Coulee 385S)	22	24	26.22	119.2	27.82	126.46	7.26
180L (180AL tap – Fort Macleod 15S)	120	132	148.67	123.89	145.53	121.27	-2.62

Table 5-2 indicates that the project does not have material impact on the N-0 thermal criteria violations in the Study Area. The project's impact on 924L and 927L thermal criteria violations is less than three percent. The approximate 7% impact of the project on 225L congestion is translated to an additional ~1.5 MVA of loading on this line due to its low thermal rating. In addition, the Project is expected to reduce the loading on the 138 kV transmission line 180L.

Post-Project short-circuit fault levels were not significantly higher than pre-Project levels. The long-term short circuit levels were found to be within the designed capabilities of the nearby facilities.

5.3.2 Category B Conditions

Post-Project power flow studies identified a number of system performance issues under Category B conditions, namely: thermal criteria violations.

No reliability criteria violations or POD bus voltage deviations were observed under Category B conditions.

5.4 Post-Project Sensitivity Study Results

5.4.1 Category A Conditions

With the addition of the Project and Connection Projects P2323, P2324, P2325 and P2326 and P2511 Category A thermal criteria violations were observed on the 240 kV transmission lines 924L and 927L, 138 kV transmission lines 180L and 172L (North Lethbridge 370S – Elder 1057S tap), and 69 kV transmission line 225L (385S Spring Coulee – 229S Glenwood) in the SP Post-project sensitivity scenario 1 (scenario 9). Similar violations with addition of thermal overload on 138 kV transmission line 172L (Coaldale 254S – Chin Chute 315S tap) were also observed in the SP Post-project sensitivity scenario 2, which includes P2490 in addition to the projects listed above (scenario 13). A summary of thermal criteria violations under N-0 system conditions observed in scenario 13 is shown in Table 5-3.

Table 5-3: Thermal Criteria Violations under the N-0 Condition in the SP post-Project sensitivity scenario 2

Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
			Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
924L (Langdon 102S – Milo 356S)	547.05	656	674.39	123.28	664.51	121.47	-1.81
927L (Langdon 102S – Milo 356S)	576	691	676.84	117.51	666.92	115.78	-1.72
225L (Glenwood 229S – Spring Coulee 385S)	22	24	28.2	128.16	29.28	133.08	4.91
172L (Coaldale 254S – 172EL tap)	119.03	131	126.24	106.06	122.34	102.78	-3.28
180L (180AL – Fort Macleod 15S)	120	132	145.15	120.96	140.37	116.97	-3.98
172L (Lethbridge North 370S – 172FL tap)	119.03	131	97.90	82.200	152.78	128.36	46.16

Table 5-3 indicates that the project has a material impact on N-0 thermal criteria violations on 172L (North Lethbridge 370S – 172 FL tap) following the inclusion of the Project and additional projects planning to connect in the South region. Although studies show the Project's impact on 924L and 927L N-0 loading is negative, the Project could still have minimal contribution to 924L/927L thermal loading, depending on the load and generation profiles in the Study Area. The project's contribution on 225L loading is negligible and

close to 1 MVA. In addition, the Project is expected to reduce loading on the 138 kV lines 180L and 172L (Coaldale 254S – 172 EL tap).

5.4.2 Category B Conditions

Post-Project power flow studies identified a number of system performance issues under Category B conditions, namely: thermal criteria violations.

No reliability criteria violations or POD bus voltage deviations were observed under Category B conditions.

5.5 Mitigation Measures

This section discusses the AESO's proposed mitigation measures to address the system performance issues that were identified in the pre-Project and post-Project scenarios.

5.5.1 Pre-Project

The thermal reliability criteria violations observed under Category A conditions on the 240 kV transmission lines 924L and 927L, 138 kV transmission line 180L and 69 kV transmission line 225L (385S Spring Coulee – 229S Glenwood) can be managed by applying the TCM Rule to curtail generation as required until such a time that system developments are in place to alleviate congestion. If the AESO determines congestion is likely to occur, the AESO will file an application for an "exception" under Section 15(2) of the *Transmission Regulation.*

Prior to connection of the Project, most of the observed Category B thermal criteria violations can be managed using real-time operational practices (RTOPs). The remaining thermal criteria violations can be mitigated with the existing RASs 175, 42, 36, 169, 180, 126, and 178.

5.5.2 Post-Project

The post-connection assessment identified the same system performance issues that were identified in the pre-connection assessment, under certain Category A conditions. These thermal criteria violations can be managed by applying the TCM Rule to curtail generation as required until such a time that system developments are in place to alleviate congestion. If the AESO determines congestion is likely to occur, the AESO will file an application for an "exception" under Section 15(2) of the *Transmission Regulation*.

After connection of the Project most of the thermal criteria violations observed under Category B conditions can be mitigated by using RTOPs, and existing RASs 175, 42, 36, 169, 180, 126 and 178.

The post-connection assessment indicates that one new RAS is required to mitigate the observed new thermal criteria violations under Category B conditions. A new RAS, hereafter referred to as "RAS 608", is required to mitigate thermal criteria violations on the 138 kV transmission line 172L (370S North Lethbridge – Elder 1057S tap) under certain Category B conditions.

5.5.3 Post-Project Sensitivity

Following the addition of several more projects in the south region (P2323, P2324, P2325, P2326, P2511 and P2490[9]), thermal criteria violations were observed under Category A conditions on the 138 kV transmission line 172L (North Lethbridge 370S – Elder 1057S tap) and on 172L (Coaldale 254S – Chin

[9] P2490 is only included in scenarios 12 and 13.

Chute 315S tap) in addition to thermal criteria violations observed in the post-project scenarios (see section 5.5.2). These thermal criteria violations can be managed by applying the TCM Rule to curtail generation as required until such a time that system developments are in place to alleviate congestion. If the AESO determines congestion is likely to occur, the AESO will file an application for an “exception” under Section 15(2) of the *Transmission Regulation*.

After connection of the Project, the thermal criteria violations observed under Category B conditions can be mitigated by using RTOPs, existing RASs 175, 42, 36, 169, 180, 126 and 178, and new RAS 608.

.

6 Project Dependencies

The Project does not require the completion of any other AESO plans to expand or enhance the transmission system prior to connection.

7 Conclusions and Recommendations

Based on the study results, Alternative 1 is technically viable. The connection assessment identified a number of pre-Project and post-Project system performance issues.

The connection assessment uses credible worst-case conditions to assess the impact of the Facility connecting on the Alberta interconnected electric system. Category A thermal criteria violations were observed under these credible worst-case load and generation forecast conditions; however, in most cases the contribution of the Project to the thermal overloads is expected to be minimal. The probability of Category A thermal criteria violations materializing is highly dependent upon the production profile of the Facility and the energization of other generation facilities in the area. Closer to the ISD, if the AESO determines that congestion will arise under Category A conditions, the AESO may make an application to the AUC to obtain approval for an “exception” under Section 15(2) of the *Transmission Regulation*.

Thermal criteria violations were observed under Category B conditions in pre- and post-Project scenarios. The identified system performance issues can be mitigated through the use of existing RASs 175, 42, 36, 180, 126, 178, and 169, new RAS 608 and real-time operational practices (RTOPs), as appropriate. With implementation of these mitigation measures, connecting the project with the preferred alternative does not adversely affect the performance of the AIES.

The AESO recommends proceeding with the Project using Alternative 1 as the preferred alternative to respond to the Market Participant’s request for system access service. RTOPs and the RASs mentioned above are recommended to mitigate the identified system performance issues.

Alternative 1 involves adding a 138 kV circuit, approximately 0.5 km in length, to connect the Facility to the existing 138 kV transmission line 172L (between North Lethbridge 370S and Coaldale 254S) through a T-tap configuration. The conductor used for the 138 kV circuit should have a minimum thermal rating no less than 89 MVA which is based on the proposed MARP of the Facility.

Attachment A:
Engineering Connection Assessment Results

Engineering Connection Assessment: Study Results

P2466 PR Prominence Solar Facility

PR Development Limited Partnership

Date: **July 6, 2023**
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Contents

1. Introduction 1
2. Pre-Project Study Results 2
2.1. Power Flow Studies 2
2.1.1. Scenario 1: 2024 Summer Light Pre-Project 2
2.1.2. Scenario 2: 2024 Summer Peak Pre-Project 3
2.1.3. Scenario 6: 2024 Summer Light Pre-Project Sensitivity 5
2.1.4. Scenario 7: 2024 Summer Peak Pre-Project Sensitivity 6
2.1.5. Scenario 10: 2024 Summer Light Pre-Project Sensitivity 9
2.1.6. Scenario 11: 2024 Summer Peak Pre-Project Sensitivity 9
3. Post-Project Study Results 10
3.1. Power Flow Studies 10
3.1.1. Scenario 3: 2024 Summer Light Post-Project 10
3.1.2. Scenario 4: 2024 Summer Peak Post-Project 12
3.1.3. Scenario 8: 2024 Summer Light Post-Project Sensitivity 15
3.1.4. Scenario 9: 2024 Summer Peak Post-Project Sensitivity 17
3.1.5. Scenario 12: 2024 Summer Light Post-Project Sensitivity 22
3.1.6. Scenario 13: 2024 Summer Peak Post-Project Sensitivity 22
3.2. Transient Stability Studies 22
3.2.1. Scenario 8: 2024 Summer Light Sensitivity Post-Project 25
3.2.2. Scenario 9: 2024 Summer Peak Sensitivity Post-Project 26
4. Short Circuit Studies 28
4.1. Pre-Project Results 28
4.1.1. Scenario 2: 2024 Summer Peak Pre-Project 28
4.2. Post-Project Results 29
4.2.1. Scenario 4: 2024 Summer Peak Post-Project 29
4.2.2. Scenario 5: 2031 Winter Peak Post-Project 29
5. Mitigation Measure Development and Evaluation 30
5.1. Pre-Project 30
5.2. Post-Project 31
5.3. Evaluation of Mitigation Measures 33
5.3.1. Scenario 3: Summer Light Post-Project Post-RAS 33
5.3.2. Scenario 4: Summer Peak Post-Project Post-RAS 33
5.3.3. Scenario 8: Summer Light Post-Project Sensitivity Post-RAS 34
5.3.4. Scenario 9: Summer Peak Post-Project Sensitivity Post-RAS 35
5.4. Constraint Effective Factor Studies 35

Tables

Table 2-1: Thermal Criteria Violations under Category B Conditions for Scenario 1 2
Table 2-2: Thermal Criteria Violations under Category A Conditions for Scenario 2 3
Table 2-3: Thermal Criteria Violations under Category B Conditions for Scenario 2 5
Table 2-4: Thermal Criteria Violations under Category B Conditions for Scenario 6 6
Table 2-5: Thermal Criteria Violations under Category A Conditions for Scenario 7 7
Table 2-6: Thermal Criteria Violations under Category B Conditions for Scenario 7 8
Table 2-7: Thermal Criteria Violations under Category A Conditions for Scenario 11 9
Table 3-1: Thermal Criteria Violations under Category B Conditions for Scenario 3 11
Table 3-2: Thermal Criteria Violations under Category A Conditions for Scenario 4 12
Table 3-3: Thermal Criteria Violations under Category B Conditions for Scenario 4 13
Table 3-4: Thermal Criteria Violations under Category B Conditions for Scenario 8 16
Table 3-5: Thermal Criteria Violations under Category A Conditions for Scenario 9 17
Table 3-6: Thermal Criteria Violations under Category B Conditions for Scenario 9 19
Table 3-7: Thermal Criteria Violations under Category A Conditions for Scenario 13 22
Table 3-8: Transient Stability Study Results under Category B Conditions for Scenario 3 23
Table 4-1: Pre-Project Short-Circuit Current Levels for Scenario 2 28
Table 4-2: Post-Project Short-Circuit Current Levels for Scenario 4 29
Table 4-3: Post-Project Short-Circuit Current Levels for Scenario 5 29
Table 5-1: Pre-Project Mitigation Measures 30
Table 5-2: Post-Project Mitigation Measures 31
Table 5-3: Post-RAS Power Flow Study Results for Scenario 3 33
Table 5-4: Post-RAS Power Flow Study Results for Scenario 4 34
Table 5-5: Post-RAS Power Flow Study Results for Scenario 8 34
Table 5-6: Post-RAS Power Flow Study Results for Scenario 9 35

Attachments

Attachment A1 AESO Engineering Connection Assessment Scope
Attachment A2 Pre-Project Power Flow Diagrams
Attachment A3 Post-Project Power Flow Diagrams
Attachment A4 Post-Project Transient Stability Diagrams
Attachment A5 Dynamic Data and Assumptions
Attachment A6 Post-Mitigation Power Flow Diagrams
Attachment A7 Constraint Effective Factors Table

1. Introduction

This report presents the results of the engineering studies that were completed by Power Grid Specialists Corp. (the Studies Consultant) to assess the impact of the Project (as defined in Attachment A1: AESO Engineering Connection Assessment Scope) on the performance of the Alberta Interconnected Electric System (AIES). The studies were performed in accordance with Attachment A1, which was prepared by the Alberta Electric System Operator (AESO). The following sections describe the results of the studies.

The power system network analysis tool that was used for the studies in this connection assessment was PSS/E version 33.

2. Pre-Project Study Results

This section describes the results of the pre-Project power flow studies.

2.1. Power Flow Studies

Power flow diagrams illustrating the pre-Project power flow studies results for Category A conditions and selected Category B conditions in the Study Area are included in Attachment A2.

2.1.1. Scenario 1: 2024 Summer Light Pre-Project

Category A conditions

No Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions.

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 2-1.

Table 2-1: Thermal Criteria Violations under Category B Conditions for Scenario 1

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow[a] (MVA)	% Loading[b]
161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL - Fort Macleod 15S)	120	132	125.88	104.9
674ST1 or T2 (Borwon 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL)	107	118	112.2	104.86
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	33	150
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.03	136.49
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	582.04	118.78
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.6	102.74
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.09	136.79

Notes: [a] *Power flow (MVA) is current expressed as MVA (i.e., S = $\sqrt{3} \times V_{base} \times I_{actual}$)*

[b] Reported as a percentage of the power flow (in MVA, i.e., S = $\sqrt{3}$ x Vbase x Iactual) relative to the transmission line's Normal Rating (also in MVA), as shown in Attachment A1.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No voltage deviations beyond the limits listed in Table 3-1 of Attachment A1 (hereafter referred to as point of delivery (POD) bus voltage deviations) were observed.

2.1.2. Scenario 2: 2024 Summer Peak Pre-Project

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 2-2.

Table 2-2: Thermal Criteria Violations under Category A Conditions for Scenario 2

Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
	Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
924L (Langdon 102S - Milo 356S)	547.05	656	650.07	118.83
927L (Langdon 102S - Milo 356S)	576	691	652.42	113.27
225L (Glenwood 229S - Spring Coulee 385S)	22	24	26.22	119.2
180L (180AL - Fort Macleod 15S)	120	132	148.67	123.89

Generator curtailment was applied to alleviate these violations prior to conducting Category B analysis. Effective generations were dispatched down to alleviate the Category A violations in 2024 Summer Peak Post Project scenario (Scenario 4) and the same dispatch level was applied to 2024 Summer Peak Pre-project scenario (Scenario 2).

The following table summarizes the curtailments that were applied.

Table 2-3: Generator Curtailments for Scenario 2

Generator	Study Scope Dispatch (MW)	Curtailed Dispatch (MW)	Difference (MW)
P1927 Solar Krafte Brooks	342	171	-171
Black Spring Ridge	180	180	0
Buffalo Plains	279.6	0	-279.6
Travers 1&2	441.8	294.5	-147.3
Spring Coulee	28	21	-7
Raymond	19	19	0
Vulcan P1831	20.9	20.9	0
Claresholm 1&2	126.4	86.3	-40.1
Monarch	22.8	22.8	0
Vulcan P2335	14.3	14.3	0
Chin Chute	9	9	0
Suncor Chin Chute	18	18	0
Lethbridge Taber	7	7	0
Coaldale (COD1)	5	5	0
Taber Solar	51	0	-51
Lethbridge Coaldale	6	6	0
Coaldale Solar	20.9	20.9	0
Total	1591.7	895.7	-696

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 2-4.

Table 2-4: Thermal Criteria Violations under Category B Conditions for Scenario 2

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	107	118	110.36	103.14
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (463AL tap - Fort Macleod 15S)	107	118	111.46	104.17
463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)	725L (Bowron 674S - 725BL tap)	118	130	131.18	111.17
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	172L (Chinook 181S - North Lethbridge 370S)	117	129	119.25	101.93
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	131.26	122.68
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL tap - Fort Macleod 15S)	107	118	132.3	123.65
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	36.83	167.42
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	27.37	109.58
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.77	130.77
935L (Cassils 324S - Milo 356S)	180L (180AL tap - Fort Macleod 15S)	120	132	120.04	100.03
924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	576	691	705.32	122.45
927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	547.05	656	703.58	128.61
940L (North Lethbridge 370S - Picture Butte 120S)	180L (180AL tap - Fort Macleod 15S)	120	132	122.54	102.12
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	558.18	113.91
610L (Fincastle 336S - Taber 83S)	879L (879AL tap - Bowmanton 244S)	85	94	135.58	159.5
172L (Chinook 181S - North Lethbridge 370S)	725L (Bowron 674S - 725BL tap)	118	130	118.6	100.51
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.97	131.69

The EATL contingency resulted in a blown-up case.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No voltage deviations were observed under Category B conditions.

2.1.3. Scenario 6: 2024 Summer Light Pre-Project Sensitivity

Sensitivity study includes projects P2323, P2324, P2325, P2326 and P2511.

Category A conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 2-5.

Table 2-5: Thermal Criteria Violations under Category B Conditions for Scenario 6

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	111.15	103.88
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	33.65	152.96
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.67	139.39
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	582.54	118.89
967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.12	100.52
968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.11	100.52
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	23.24	105.63
161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL tap - Fort Macleod 15S)	120	132	125.68	104.73
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.73	139.69

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No voltage deviations were observed under Category B conditions.

2.1.4. Scenario 7: 2024 Summer Peak Pre-Project Sensitivity

Sensitivity study includes projects P2323, P2324, P2325, P2326 and P2511.

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 2-6.

Table 2-6: Thermal Criteria Violations under Category A Conditions for Scenario 7

Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
	Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
924L (Langdon 102S - Milo 356S)	547.05	656	661.87	120.99
927L (Langdon 102S - Milo 356S)	576	691	664.27	115.33
225L (Glenwood 229S - Spring Coulee 385S)	22	24	27.09	123.15
180L (180AL - Fort Macleod 15S)	120	132	147.31	122.76

Generator curtailment was applied to alleviate these violations prior to conducting Category B analysis. Effective generations were dispatched down to alleviate the Category A violations in 2024 Summer Peak Post Project Sensitivity scenario (Scenario 9) and the same dispatch level was applied to 2024 Summer Peak Pre-project Sensitivity scenario (Scenario 7).

The following table summarizes the curtailments that were applied.

Table 2-7: Generator Curtailments for Scenario 7

Generator	Study Scope Dispatch (MW)	Curtailed Dispatch (MW)	Difference (MW)
P1927 Solar Krafte Brooks	342	171	-171
Black Spring Ridge	180	180	0
Buffalo Plains	279.6	0	-279.6
Travers 1&2	441.8	294.5	-147.3
Spring Coulee	28	21	-7
Raymond	19	19	0
Vulcan P1831	20.9	20.9	0
Claresholm 1&2	126.4	86.3	-40.1
Monarch	22.8	22.8	0
Vulcan P2335	14.3	14.3	0
Chin Chute	9	5.2	-3.8
Suncor Chin Chute	18	10.3	-7.7
Lethbridge Taber	7	4.1	-2.9
Coaldale (COD1)	5	2.9	-2.1
Taber Solar	51	29.2	-21.8
Lethbridge Coaldale	6	3.4	-2.6
Coaldale Solar	20.9	11.9	-9
Total	1591.7	896.8	-694.9

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 2-8.

Table 2-8: Thermal Criteria Violations under Category B Conditions for Scenario 7

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	107	118	110.06	102.86
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (463AL tap - Fort Macleod 15S)	107	118	111.15	103.88
463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)	725L (Bowron 674S - 725BL)	118	130	131.3	111.27
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	172L (Chinook 181S - North Lethbridge 370S)	117	129	128.46	109.79
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	131.01	122.44
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL tap - Fort Macleod 15S)	107	118	132.05	123.41
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	36.58	166.28
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	27.58	110.41
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.51	129.61
935L (Cassils 324S - Milo 356S)	180L (180AL tap - Fort Macleod 15S)	120	132	120.07	100.05
924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	576	691	708.01	122.92
927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	547.05	656	706.26	129.1
940L (North Lethbridge 370S - Picture Butte 120S)	180L (180AL tap – Fort Macleod 15S)	120	132	122.55	102.13
940L (North Lethbridge 370S – Picture Butte 120S)	1005L (Little Bow 991S – Milo 356S)	490	588	558.35	113.95
610L (Fincastle 336S – Taber 83S)	879L (879AL tap – Bowmanton 244S)	85	94	135.58	159.5
172L (Chinook 181S – North Lethbridge 370S)	725L (Bowron 674S – 725BL tap)	118	130	125.51	106.37
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.72	130.53

The EATL contingency resulted in a blown-up case.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No voltage deviations were observed under Category B conditions.

2.1.5. Scenario 10: 2024 Summer Light Pre-Project Sensitivity

Sensitivity study includes projects P2490, P2323, P2324, P2325, P2326 and P2511.

Category A conditions

No Reliability Criteria violations were observed under Category A conditions.

2.1.6. Scenario 11: 2024 Summer Peak Pre-Project Sensitivity

Sensitivity study includes projects P2490, P2323, P2324, P2325, P2326 and P2511.

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 2-9.

Table 2-9: Thermal Criteria Violations under Category A Conditions for Scenario 11

Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
	Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
924L (Langdon 102S - Milo 356S)	547.05	656	674.39	123.28
927L (Langdon 102S - Milo 356S)	576	691	676.84	117.51
225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.2	128.16
172L (Coaldale 254S - 172EL tap)	119.03	131	126.24	106.06
180L (180AL tap - Fort Macleod 15S)	120	132	145.15	120.96

3. Post-Project Study Results

This section describes the results of the post-Project power flow studies and transient stability studies.

As described in Section 2 of Attachment A1, the post-Project studies were performed using Alternative 1 - T-tap 138 kV Connection onto 172L Transmission Line.

3.1. Power Flow Studies

Power flow diagrams illustrating the post-Project power flow study results for Category A conditions and selected Category B conditions in the Study Area are included in Attachment A3.

3.1.1. Scenario 3: 2024 Summer Light Post-Project

Category A conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 3-1.

Table 3-1: Thermal Criteria Violations under Category B Conditions for Scenario 3

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL tap - Fort Macleod 15S)	120	132	125.88	104.9	125.06	104.22	-0.68
674ST1 or T2 (Borwon 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	112.2	104.86	108.86	101.74	-3.12
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	33	150	34.36	156.19	6.19
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.03	136.49	31.37	142.58	6.09
924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.5	93.16	22.03	100.15	6.99
927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.5	93.19	22.04	100.17	6.98
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	582.04	118.78	582.62	118.9	0.12
967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.35	97.07	23.1	105.01	7.94
968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.35	97.06	23.1	105.01	7.95
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.6	102.74	24.06	109.35	6.61
67ST2 (Stirling 67S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.04	95.62	22.26	101.18	5.56
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.09	136.79	31.43	142.87	6.08

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No POD bus voltage deviations were observed.

3.1.2. Scenario 4: 2024 Summer Peak Post-Project

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 3-2.

Table 3-2: Thermal Criteria Violations under Category A Conditions for Scenario 4

Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
			Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
924L (Langdon 102S - Milo 356S)	547.05	656	650.07	118.83	664.24	121.42	2.59
927L (Langdon 102S - Milo 356S)	576	691	652.42	113.27	666.65	115.74	2.47
225L (Glenwood 229S - Spring Coulee 385S)	22	24	26.22	119.2	27.82	126.46	7.26
180L (180AL tap – Fort Macleod 15S)	120	132	148.67	123.89	145.53	121.27	-2.62

Generator curtailment was applied to alleviate these violations prior to conducting Category B analysis. Effective generations were dispatched down to alleviate the Category A violations in 2024 Summer Peak Post Project scenario (Scenario 4) and the same dispatch level was applied to 2024 Summer Peak Pre-project scenario (Scenario 2).

The following table summarizes the curtailments that were applied.

Table 3-3: Generator Curtailments for Scenario 4

Generator	Study Scope Dispatch (MW)	Curtailed Dispatch (MW)	Difference (MW)
P1927 Solar Krafte Brooks	342	171	-171
Black Spring Ridge	180	180	0
Buffalo Plains	279.6	0	-279.6
Travers 1&2	441.8	294.5	-147.3
Spring Coulee	28	21	-7
Raymond	19	19	0
Vulcan P1831	20.9	20.9	0
Claresholm 1&2	126.4	86.3	-40.1
Monarch	22.8	22.8	0
Vulcan P2335	14.3	14.3	0
Chin Chute	9	9	0
Suncor Chin Chute	18	18	0
Lethbridge Taber	7	7	0
Coaldale (COD1)	5	5	0
Taber Solar	51	0	-51
Lethbridge Coaldale	6	6	0
Coaldale Solar	20.9	20.9	0
Total	1591.7	895.7	-696

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 3-4.

Table 3-4: Thermal Criteria Violations under Category B Conditions for Scenario 4

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	107	118	110.36	103.14	107.77	100.72	-2.42

725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (463AL tap – Fort Macleod 15S)	107	118	111.46	104.17	108.9	101.78	-2.39
463L or 463AL (Fort Macleod 15S – Monarch 492S – Chinook 181S)	725L (Bowron 674S – 725BL tap)	118	130	131.18	111.17	128.59	108.97	-2.2
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	172L (Chinook 181S - North Lethbridge 370S)	117	129	119.25	101.93	116.73	99.77	-2.16
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	131.26	122.68	128.68	120.26	-2.42
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL tap - Fort Macleod 15S)	107	118	132.3	123.65	129.64	121.16	-2.49
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	36.83	167.42	38.08	173.08	5.66
618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	24	28	22.94	95.57	24.15	100.64	5.07
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	27.37	109.58	26.01	104.12	-5.46
863L or 891L (Riverbend 618S – Garden City 226S – Magrath 225S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	28.77	130.77	30.12	136.9	6.13
935L (Cassils 324S – Milo 356S)	180L (180AL tap – Fort Macleod 15S)	120	132	120.04	100.03	117.15	97.62	-2.41
924L (Langdon 102S – Milo 356S)	927L (Langdon 102S – Milo 356S)	576	691	705.32	122.45	723.89	125.68	3.23
924L (Langdon 102S – Milo 356S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	21.51	97.78	23.14	105.18	7.4
927L (Langdon 102S – Milo 356S)	924L (Langdon 102S – Milo 356S)	547.05	656	703.58	128.61	722.07	131.99	3.38
927L (Langdon 102S – Milo 356S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	21.51	97.78	23.14	105.18	7.4
940L (North Lethbridge 370S – Picture Butte 120S)	180L (180AL tap - Fort Macleod 15S)	120	132	122.54	102.12	119.12	99.26	-2.86
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	558.18	113.91	558.93	114.07	0.16
967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.69	98.59	23.51	106.88	8.29

968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.69	98.58	23.51	106.87	8.29
610L (Fincastle 336S - Taber 83S)	879L (879AL tap - Bowmanton 244S)	85	94	135.58	159.5	135.57	159.49	-0.01
172L (Chinook 181S - North Lethbridge 370S)	725L (Bowron 674S - 725BL tap)	118	130	118.6	100.51	116.03	98.33	-2.18
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.97	131.69	30.32	137.81	6.12
158ST2 (Vauxhall 158S Transformer T2)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	71.8	60.3	120.86	101.54	41.24
257ST1 (Hull 257S Transformer T1)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	72.3	60.7	120.26	101.03	40.33
618ST1 (Riverbend 618S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	76.6	64.4	120.58	101.3	36.9
770L (Coaldale 254S - North Lethbridge 370S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	112.5	94.5	166.16	139.6	45.1
935L (Cassils 324S – Milo 356S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	76.5	64.3	121.38	101.97	37.67
923L (Milo 356S – Newell 2075S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	75.3	63.2	120.13	100.93	37.73
940L (North Lethbridge 370S – Picture Butte 120S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	79.5	66.8	125.12	105.12	38.32
507L (Taber 83S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	72.3	60.8	120.32	101.08	40.28
763L (Vauxhall 158S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	71.9	60.4	120.93	101.6	41.2

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No POD bus voltage deviations were observed.

3.1.3. Scenario 8: 2024 Summer Light Post-Project Sensitivity

Sensitivity study includes projects P2323, P2324, P2325, P2326 and P2511.

Category A conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 3-5.

Table 3-5: Thermal Criteria Violations under Category B Conditions for Scenario 8

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
158ST2 (Vauxhall 158S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.44	92.93	22.04	100.18	7.25
674ST1 or T2 (Boron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	111.15	103.88	108.61	101.5	-2.38
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	33.65	152.96	35.05	159.3	6.34
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.67	139.39	32.03	145.6	6.21
820L (Coaldale 254S - Chin Chute 315S - Stirling 67S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.94	95.16	22.17	100.79	5.63
924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.17	96.24	22.69	103.13	6.89
927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.18	96.26	22.69	103.15	6.89
940L (North Lethbridge 370S - Picture Butte 120S)	1005L (Little Bow 991S - Milo 356S)	490	588	582.54	118.89	572.58	116.85	-2.04
967L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.12	100.52	23.81	108.23	7.71
968L (North Lethbridge 370S - Windy Flats 138S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	22.11	100.52	23.81	108.23	7.71
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	23.24	105.63	24.66	112.07	6.44
370ST3 (North Lethbridge 370S	225L (Glenwood 229S - Spring	22	24	20.49	93.14	22.3	101.37	8.23

Transformer T3)	Coulee 385S)							
370ST5 (North Lethbridge 370S Transformer T5)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.49	93.14	22.3	101.37	8.23
370ST6 (North Lethbridge 370S Transformer T6)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.48	93.08	22.28	101.28	8.2
161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)	180L (180AL tap - Fort Macleod 15S)	120	132	125.68	104.73	125.73	104.77	0.04
763L (Vauxhall 158S - Hull 257S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	20.52	93.27	22.12	100.53	7.26
67ST2 (Stirling 67S Transformer T2)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.54	97.9	22.75	103.4	5.5
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.73	139.69	32.1	145.9	6.21

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No POD bus voltage deviations were observed.

3.1.4. Scenario 9: 2024 Summer Peak Post-Project Sensitivity

Sensitivity study includes projects P2323, P2324, P2325, P2326 and P2511.

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 3-6.

Table 3-6: Thermal Criteria Violations under Category A Conditions for Scenario 9

Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
			Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
924L (Langdon 102S - Milo 356S)	547.05	656	661.87	120.99	677.74	123.89	2.9
927L (Langdon 102S - Milo 356S)	576	691	664.27	115.33	680.2	118.09	2.77
225L (Glenwood 229S - Spring Coulee 385S)	22	24	27.09	123.15	28.72	130.57	7.42

180L (180AL tap - Fort Macleod 15S)	**120**	**132**	**147.31**	**122.76**	**143.7**	**119.75**	**-3.01**
172L (Lethbridge North 370S – 172FL tap)	**119.03**	**131**	**63.3**	**53.2**	**126.49**	**106.27**	**53.07**

Generator curtailment was applied to alleviate these violations prior to conducting Category B analysis. Effective generations were dispatched down to alleviate the Category A violations in 2024 Summer Peak Post Project Sensitivity scenario (Scenario 9) and the same dispatch level was applied to 2024 Summer Peak Pre-project Sensitivity scenario (Scenario 7).

The following table summarizes the curtailments that were applied.

Table 3-7: Generator Curtailments for Scenario 9

Generator	Study Scope Dispatch (MW)	Curtailed Dispatch (MW)	Difference (MW)
P1927 Solar Krafte Brooks	342	171	-171
Black Spring Ridge	180	180	0
Buffalo Plains	279.6	0	-279.6
Travers 1&2	441.8	294.5	-147.3
Spring Coulee	28	21	-7
Raymond	19	19	0
Vulcan P1831	20.9	20.9	0
Claresholm 1&2	126.4	86.3	-40.1
Monarch	22.8	22.8	0
Vulcan P2335	14.3	14.3	0
Chin Chute	9	5.2	-3.8
Suncor Chin Chute	18	10.3	-7.7
Lethbridge Taber	7	4.1	-2.9
Coaldale (COD1)	5	2.9	-2.1
Taber Solar	51	29.2	-21.8
Lethbridge Coaldale	6	3.4	-2.6
Coaldale Solar	20.9	11.9	-9
Total	1591.7	896.8	-694.9

Category B conditions

Thermal Criteria Violations

Thermal criteria violations were observed under certain Category B conditions as shown in Table 3-8.

Table 3-8: Thermal Criteria Violations under Category B Conditions for Scenario 9

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)	463L (Chinook 181S - 463AL tap)	107	118	110.06	102.86	106.8	99.81	-3.05
725L or 725AL (Coalbanks 111S - Bowron 674S -	463L (463AL tap – Fort Macleod 15S)	107	118	111.15	103.88	107.87	100.82	-3.06

Riverbend 618S)								
463L or 463AL (Fort Macleod 15S – Monarch 492S – Chinook 181S)	725L (Bowron 674S – 725BL tap)	118	130	131.3	111.27	128.47	108.87	-2.4
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	172L (Chinook 181S - North Lethbridge 370S)	117	129	128.46	109.79	124.6	106.5	-3.29
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	131.01	122.44	128.02	119.64	-2.8
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL tap - Fort Macleod 15S)	107	118	132.05	123.41	129.03	120.59	-2.82
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	36.58	166.28	37.96	172.55	6.27
618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	24	28	22.68	94.49	24.15	100.63	6.14
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	27.58	110.41	26.09	104.45	-5.96
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	28.51	129.61	29.9	135.9	6.29
935L (Cassils 324S - Milo 356S)	180L (180AL tap - Fort Macleod 15S)	120	132	120.07	100.05	117.18	97.65	-2.4
924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	576	691	708.01	122.92	727.74	126.34	3.42
924L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.49	97.68	23.08	104.91	7.23
927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	547.05	656	706.26	129.1	725.91	132.7	3.6
927L (Langdon 102S - Milo 356S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	21.49	97.68	23.08	104.91	7.23
940L (North Lethbridge 370S - Picture Butte 120S)	180L (180AL tap – Fort Macleod 15S)	120	132	122.55	102.13	119.21	99.34	-2.79
940L (North Lethbridge 370S – Picture Butte 120S)	1005L (Little Bow 991S – Milo 356S)	490	588	558.35	113.95	559.47	114.18	0.23
967L (North Lethbridge 370S – Windy Flats 138S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	21.68	98.53	23.48	106.72	8.19
968L (North Lethbridge 370S – Windy Flats 138S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	21.68	98.52	23.48	106.71	8.19

610L (Fincastle 336S – Taber 83S)	879L (879AL tap – Bowmanton 244S)	85	94	135.58	159.5	135.54	159.46	-0.04
172L (Chinook 181S – North Lethbridge 370S)	725L (Bowron 674S – 725BL tap)	118	130	125.51	106.37	122.52	103.83	-2.54
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	28.72	130.53	30.1	136.82	6.29
158ST2 (Vauxhall 158S Transformer T2)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	70.7	59.4	124.71	104.77	45.37
257ST1 (Hull 257S Transformer T1)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	71.2	59.8	124.7	104.76	44.96
618ST1 (Riverbend 618S Transformer T1)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	73.5	61.8	123.12	103.43	41.63
863L or 891L (Riverbend 618S – Garden City 226S – Magrath 225S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	70.7	59.4	120.46	101.2	41.8
770L (Coaldale 254S – North Lethbridge 370S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	107.4	90.2	168.04	141.18	50.98
935L (Cassils 324S – Milo 356S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	73.5	61.8	123.39	103.66	41.86
923L (Milo 356S – Newell 2075S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	72.3	60.8	122.16	102.63	41.83
940L (North Lethbridge 370S - Picture Butte 120S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	76.5	64.3	125.97	105.83	41.53
507L (Taber 83S – Hull 257S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	71.3	59.9	124.79	104.84	44.94
763L (Vauxhall 158S - Hull 257S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	70.8	59.5	124.77	104.82	45.32
941L (Montana – Picture Butte 120S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	71	59.6	120.63	101.34	41.74
225ST1 (Magrath 225S Transformer T1)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	69.6	58.5	119.36	100.27	41.77
254ST2 (Coaldale 254S Transformer T2)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	69.7	58.6	119.89	100.72	42.12

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No POD bus voltage deviations were observed.

3.1.5. Scenario 12: 2024 Summer Light Post-Project Sensitivity

Sensitivity study includes projects P2490, P2323, P2324, P2325, P2326 and P2511.

Category A conditions

No Reliability Criteria violations were observed under Category A conditions.

3.1.6. Scenario 13: 2024 Summer Peak Post-Project Sensitivity

Sensitivity study includes projects P2490, P2323, P2324, P2325, P2326 and P2511.

Category A conditions

Thermal criteria violations were observed under Category A conditions as shown in Table 3-9.

Table 3-9: Thermal Criteria Violations under Category A Conditions for Scenario 13

Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
			Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
924L (Langdon 102S – Milo 356S)	547.05	656	674.39	123.28	664.51	121.47	-1.81
927L (Langdon 102S – Milo 356S)	576	691	676.84	117.51	666.92	115.78	-1.72
225L (Glenwood 229S – Spring Coulee 385S)	22	24	28.2	128.16	29.28	133.08	4.91
172L (Coaldale 254S – 172EL tap)	119.03	131	126.24	106.06	122.34	102.78	-3.28
180L (180AL – Fort Macleod 15S)	120	132	145.15	120.96	140.37	116.97	-3.98
172L (Lethbridge North 370S – 172FL tap)	119.03	131	97.90	82.200	152.78	128.36	46.16

3.2. Transient Stability Studies

Transient stability studies were completed for Scenarios 3 and 4 Post-Project, also Scenarios 8 and 9 Sensitivity Post-Project.

The results did not indicate any transient stability concerns, and the system showed acceptable dynamic response to all Category B conditions studied, as shown in Table 3-10, Table 3-11,

Table 3-12 and Table 3-13. The post-Project transient stability plots are provided in Attachment A4. The dynamic data and assumptions of all equipment proposed for the Facility are provided in Attachment A5.

3.2.1. Scenario 3: 2024 Summer Light Post-Project

Table 3-10: Transient Stability Study Results under Category B Conditions for Scenario 3

Category	Line Element	Substation Terminals		Faulted End	Performance
A	Flat Start				All monitored generators – Stable All monitored bus voltages – Acceptable
B	820L	Stirling 67S	Coaldale 254S	67S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	863L	Magrath 225S	Riverbend 618S	225S	All monitored generators – Stable All monitored bus voltages – Acceptable
				618S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L[1]	Taber 83S	Coaldale 254S	83S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Chinook 181S	N. Leth 370S	181S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	770L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	1041L	N. Leth 370S	Travers 554S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				554S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	967L	N. Leth 370S	Wind Flats 138S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable

[1] Fault clearing time for this line was confirmed to be 6 cycles in near end and 7 cycles in far end.

				138S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	940L	N. Leth 370S	Picture Butte 120S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				120S	All monitored generators – Stable All monitored bus voltages – Acceptable

3.2.2. Scenario 4: 2024 Summer Peak Post-Project

Table 3-11: Transient Stability Study Results under Category B Conditions for Scenario 4

Category	Line Element	Substation Terminals		Faulted End	Performance
A	Flat Start				All monitored generators – Stable All monitored bus voltages – Acceptable
B	820L	Stirling 67S	Coaldale 254S	67S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	863L	Magrath 225S	Riverbend 618S	225S	All monitored generators – Stable All monitored bus voltages – Acceptable
				618S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L[2]	Taber 83S	Coaldale 254S	83S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Chinook 181S	N. Leth 370S	181S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	770L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	1041L	N. Leth 370S	Travers 554S	370S	All monitored generators – Stable

[2] Fault clearing time for this line was confirmed to be 6 cycles in near end and 7 cycles in far end.

					All monitored bus voltages – Acceptable
				554S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	967L	N. Leth 370S	Wind Flats 138S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				138S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	940L	N. Leth 370S	Picture Butte 120S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				120S	All monitored generators – Stable All monitored bus voltages – Acceptable

3.2.3. Scenario 8: 2024 Summer Light Sensitivity Post-Project

Table 3-12: Transient Stability Study Results under Category B Conditions for Scenario 8

Category	Line Element	Substation Terminals		Faulted End	Performance
A	Flat Start				All monitored generators – Stable All monitored bus voltages – Acceptable
B	820L	Stirling 67S	Coaldale 254S	67S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	863L	Magrath 225S	Riverbend 618S	225S	All monitored generators – Stable All monitored bus voltages – Acceptable
				618S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L[3]	Taber 83S	Coaldale 254S	83S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Chinook 181S	N. Leth 370S	181S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable

[3] Fault clearing time for this line was confirmed to be 6 cycles in near end and 7 cycles in far end.

B	770L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	1041L	N. Leth 370S	Travers 554S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				554S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	967L	N. Leth 370S	Wind Flats 138S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				138S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	940L	N. Leth 370S	Picture Butte 120S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				120S	All monitored generators – Stable All monitored bus voltages – Acceptable

3.2.4. Scenario 9: 2024 Summer Peak Sensitivity Post-Project

Table 3-13: Transient Stability Study Results under Category B Conditions for Scenario 9

Category	Line Element	Substation Terminals		Faulted End	Performance
A	Flat Start				All monitored generators – Stable All monitored bus voltages – Acceptable
B	820L	Stirling 67S	Coaldale 254S	67S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	863L	Magrath 225S	Riverbend 618S	225S	All monitored generators – Stable All monitored bus voltages – Acceptable
				618S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L[4]	Taber 83S	Coaldale 254S	83S	All monitored generators – Stable All monitored bus voltages – Acceptable
				254S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	172L	Chinook 181S	N. Leth 370S	181S	All monitored generators – Stable

[4] Fault clearing time for this line was confirmed to be 6 cycles in near end and 7 cycles in far end.

					All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	770L	Coaldale 254S	N. Leth 370S	254S	All monitored generators – Stable All monitored bus voltages – Acceptable
				370S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	1041L	N. Leth 370S	Travers 554S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				554S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	967L	N. Leth 370S	Wind Flats 138S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				138S	All monitored generators – Stable All monitored bus voltages – Acceptable
B	940L	N. Leth 370S	Picture Butte 120S	370S	All monitored generators – Stable All monitored bus voltages – Acceptable
				120S	All monitored generators – Stable All monitored bus voltages – Acceptable

4. Short Circuit Studies

4.1. Pre-Project Results

4.1.1. Scenario 2: 2024 Summer Peak Pre-Project

Pre-Project short-circuit current levels are provided in Table 4-1[5].

Table 4-1: Pre-Project Short-Circuit Current Levels for Scenario 2

Substation Name and Number	Base Voltage (kV)	Pre-Fault Voltage (kV)	3-Φ Fault (kA)	Positive Sequence Thevenin Source Impedance (R1+jX1) (pu)	1-Φ Fault (kA)	Zero Sequence Thevenin Source Impedance (R0+jX0) (pu)
North Lethbridge 370S	138	139.7940	14.2	0.00757+j0.03182	11.7	0.00788+j0.05252
	240	246.2640	12.0	0.00455+j0.02220	10.1	0.00642+j0.03447
Coaldale 254S	138	140.3460	9.3	0.01621+j0.04762	6.1	0.02913+j0.12614
Taber 83S	138	142.2642	6.6	0.02887+j0.06638	4.5	0.04333+j0.17023
Stirling 67S	138	142.0020	2.9	0.06293+j0.15153	2.2	0.08297+j0.30976
Chin Chute 315S	138	142.4988	2.9	0.05893+j0.14840	2.3	0.06051+j0.29898

[5] Short-circuit current studies were based on modeling information provided to the AESO by third parties. The authenticity of the modeling information has not been validated. Fault levels could change as a result of system developments, new customer connections, or additional generation in the area. It is recommended that these changes be monitored and fault levels reviewed to ensure that the fault levels are within equipment operating limits. The information provided in this study should not be used as the sole source of information for electrical equipment specifications or for the design of safety-grounding systems.

4.2. Post-Project Results

4.2.1. Scenario 4: 2024 Summer Peak Post-Project

Post-Project short-circuit current levels for Scenario 4 are provided in Table 4-2.

Table 4-2: Post-Project Short-Circuit Current Levels for Scenario 4

Substation Name and Number	Base Voltage (kV)	Pre-Fault Voltage (kV)	3-Φ Fault (kA)	Positive Sequence Thevenin Source Impedance (R1+jX1) (pu)	1-Φ Fault (kA)	Zero Sequence Thevenin Source Impedance (R0+jX0) (pu)
North Lethbridge 370S	138	140.0424	14.5	0.00731+j0.03128	13.8	0.00685+j0.03483
	240	246.1440	12.1	0.00444+j0.02202	11.1	0.00538+j0.02791
Coaldale 254S	138	141.4638	9.5	0.01561+j0.04672	9.0	0.01355+j0.05359
Taber 83S	138	142.7472	6.7	0.02862+j0.06604	4.7	0.03978+j0.15328
Stirling 67S	138	142.6920	2.9	0.06251+j0.15094	2.2	0.07994+j0.29074
Chin Chute 315S	138	143.2164	3.0	0.05848+j0.14772	2.4	0.05843+j0.27661
Elder 1057S	138	141.9882	9.3	0.01559+j0.04835	13.5	0.00002+j0.00017

4.2.2. Scenario 5: 2031 Winter Peak Post-Project

Post-Project short-circuit current levels for Scenario 5 are provided in Table 4-3.

Table 4-3: Post-Project Short-Circuit Current Levels for Scenario 5

Substation Name and Number	Base Voltage (kV)	Pre-Fault Voltage (kV)	3-Φ Fault (kA)	Positive Sequence Thevenin Source Impedance (R1+jX1) (pu)	1-Φ Fault (kA)	Zero Sequence Thevenin Source Impedance (R0+jX0) (pu)
North Lethbridge 370S	138	140.9	14.5	0.00592+j0.02948	13.6	0.00647+j0.03342
	240	246.4	12.8	0.00330+j0.01944	11.5	0.00501+j0.02565
Coaldale 254S	138	141.2	9.1	0.01453+j0.04554	8.6	0.01354+j0.05350
Taber 83S	138	142.2	6.2	0.02798+j0.06566	4.4	0.03961+j0.15129
Stirling 67S	138	141.1	2.7	0.06175+j0.15030	2.1	0.07995+j0.29068
Chin Chute 315S	138	141.9	2.8	0.05768+j0.14687	2.2	0.05843+j0.27657
Elder 1057S	138	141.4	8.9	0.01429+j0.04675	6.1	0.02462+j0.10977

5. Mitigation Measure Development and Evaluation

The Studies Consultant, in consultation with the AESO, developed mitigation measures to address the system performance issues that were identified in the post-Project scenarios. Existing remedial action schemes (RASs) are described in Section 1.2.2 of Attachment A1.

5.1. Pre-Project

Pre-Project mitigation measures are summarized in Table 5-1.

Table 5-1: Pre-Project Mitigation Measures[6]

Mitigation Measure	Location of Observed Violation	Contingency
Existing RAS #36 and RAS #42	225L (Glenwood 229S - Spring Coulee 385S)	618ST1 (Riverbend 618S Transformer T1)
Existing RAS #36 and RAS #42	225L (Stirling 67S - 225AL tap)	618ST1 (Riverbend 618S Transformer T1)
Existing RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	863L or 891L (Riverbend 618S – Garden City 226S – Magrath 225S)
Existing RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	13L50 EATL (Newell 2075S – Heathfield 2029S)
Existing RAS # 126 and RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	225ST1 (Magrath 225S Transformer T1)
Planned RAS #175	924L (Langdon 102S – Milo 356S)	927L (Langdon 102S – Milo 356S)
Planned RAS #175	927L (Langdon 102S – Milo 356S)	924L (Langdon 102S – Milo 356S)
Planned RAS #178	463L (Chinook 181S – 463AL tap)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
Planned RAS #178	463L (463AL tap – Fort Macleod 15S)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
Planned RAS #180	879L (879AL – Bowmanton 244S)	610L (Fincastle 336S – Taber 83S)
Planned RAS 169	172L (Chinook 181S – North Lethbridge 370S)	725L (Bowron 674S – 725BL)
RTOP	180L (180AL tap – Fort Macleod 15S)	161L or 161AL (Enterprise 1070S – Vulcan 255S – Queenstown 504S)

[6] Including sensitivity studies

RTOP	463L (Chinook 181S – 463AL tap)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
RTOP	1005L (Little Bow 991S – Milo 356S)	940L (North Lethbridge 370S – Picture Butte 120S)
RTOP	463L (Chinook 181S – 463AL tap)	725L or 725AL (Coalbanks 111S – Bowron 674S – Riverbend 618S)
RTOP	463L (463AL tap – Fort Macleod 15S)	725L or 725AL (Coalbanks 111S – Bowron 674S – Riverbend 618S)
RTOP	725L (Bowron 674S – 725BL tap)	463L or 463AL (Fort Macleod 15S – Monarch 492S – Chinook 181S)
RTOP	172L (Chinook 181S – North Lethbridge 370S)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
RTOP	180L (180AL tap – Fort Macleod 15S)	935L (Cassils 324S – Milo 356S)
RTOP	180L (180AL tap – Fort Macleod 15S)	940L (North Lethbridge 370S – Picture Butte 120S)
RTOP	725L (Bowron 674S – 725BL tap)	172L (Chinook 181S – North Lethbridge 370S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	967L (North Lethbridge 370S – Windy Flats 138S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	968L (North Lethbridge 370S – Windy Flats 138S)

5.2. Post-Project

Post-Project mitigation measures are summarized in Table 5-2.

Table 5-2: Post-Project Mitigation Measures[7]

Mitigation Measure	Location of Observed Violation	Contingency
Existing RAS #36 and RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	618ST1 (Riverbend 618S Transformer T1)
Existing RAS #36 and RAS #42	225L (Spring Coulee 385S – Magrath 225S)	618ST1 (Riverbend 618S Transformer T1)
Existing RAS #36 and RAS #42	225L (Stirling 67S – 225AL tap)	618ST1 (Riverbend 618S Transformer T1)
Existing RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	863L or 891L (Riverbend 618S – Garden City 226S – Magrath 225S)
Existing RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	13L50 EATL (Newell 2075S – Heathfield 2029S)
Existing RAS # 126 and RAS #42	225L (Glenwood 229S – Spring Coulee 385S)	225ST1 (Magrath 225S Transformer T1)
Planned RAS #175	924L (Langdon 102S – Milo 356S)	927L (Langdon 102S – Milo 356S)
Planned RAS #175	927L (Langdon 102S – Milo 356S)	924L (Langdon 102S – Milo 356S)
Planned RAS	463L (Chinook 181S - 463AL tap)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)

[7] Including sensitivity studies

#178		
Planned RAS #178	463L (463AL - Fort Macleod 15S)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
Planned RAS #180	879L (879AL - Bowmanton 244S)	610L (Fincastle 336S - Taber 83S)
New RAS	172L (North Lethbridge 370S - 172FL tap)	770L (Coaldale 254S - North Lethbridge 370S)
RTOP	180L (180AL tap - Fort Macleod 15S)	161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)
RTOP	463L (Chinook 181S - 463AL tap)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	924L (Langdon 102S - Milo 356S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	927L (Langdon 102S - Milo 356S)
RTOP	1005L (Little Bow 991S - Milo 356S)	940L (North Lethbridge 370S - Picture Butte 120S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	967L (North Lethbridge 370S - Windy Flats 138S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	968L (North Lethbridge 370S - Windy Flats 138S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	67ST2 (Stirling 67S Transformer T2)
RTOP	463L (Chinook 181S - 463AL tap)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
RTOP	463L (463AL tap - Fort Macleod 15S)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
RTOP	725L (Bowron 674S - 725BL tap)	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	158ST2 (Vauxhall 158S Transformer T2)
RTOP	172L (North Lethbridge 370S - 172FL tap)	257ST1 (Hull 257S Transformer T1)
RTOP	172L (North Lethbridge 370S - 172FL tap)	618ST1 (Riverbend 618S Transformer T1)
RTOP	172L (North Lethbridge 370S - 172FL tap)	935L (Cassils 324S - Milo 356S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	923L (Milo 356S - Newell 2075S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	940L (North Lethbridge 370S - Picture Butte 120S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	507L (Taber 83S - Hull 257S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	763L (Vauxhall 158S - Hull 257S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	158ST2 (Vauxhall 158S Transformer T2)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	820L (Coaldale 254S - Chin Chute 315S - Stirling 67S)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	370ST3 (North Lethbridge 370S Transformer T3)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	370ST5 (North Lethbridge 370S Transformer T5)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	370ST6 (North Lethbridge 370S Transformer T6)
RTOP	225L (Glenwood 229S – Spring Coulee 385S)	763L (Vauxhall 158S - Hull 257S)
RTOP	172L (Chinook 181S - North Lethbridge 370S)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
RTOP	725L (Bowron 674S - 725BL tap)	172L (Chinook 181S - North Lethbridge 370S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	941L (Montana - Picture Butte 120S)
RTOP	172L (North Lethbridge 370S - 172FL tap)	225ST1 (Magrath 225S Transformer T1)
RTOP	172L (North Lethbridge 370S - 172FL tap)	254ST2 (Coaldale 254S Transformer T2)

5.3. Evaluation of Mitigation Measures

This section describes the results of the power flow studies that were performed to assess the impact of the Project on the performance of the AIES following the implementation of proposed mitigation measures.

The post-mitigation measures studies were performed under Category B conditions for all post project scenarios using the RASs described in the previous section.

The post-mitigation power flow diagrams for selected Category B conditions are provided in Attachment A6. Post-mitigation power flow diagrams present only those post-Project contingencies that result in thermal criteria violations that require RAS mitigation. Post-Project contingencies that result in thermal criteria violations that can be mitigated by real-time operational practices, or TFO capital maintenance projects were not studied.

5.3.1. Scenario 3: Summer Light Post-Project Post-RAS

Category B Conditions

The thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RAS as shown in Table 5-3.

Table 5-3: Post-RAS Power Flow Study Results for Scenario 3

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Post-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	34.36	156.19	19.4	88
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	31.37	142.58	19.4	88
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	24.06	109.35	16.3	74
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	31.43	142.87	13.4	61

5.3.2. Scenario 4: Summer Peak Post-Project Post-RAS

Category B Conditions

The thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RAS as shown in Table 5-4.

Table 5-4: Post-RAS Power Flow Study Results for Scenario 4

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Post-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL)	107	118	128.68	120.26	93.1	87
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL - Fort Macleod 15S)	107	118	129.64	121.16	94.2	88
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	38.08	173.08	18.9	86
618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	24	28	24.15	100.64	23.8	99
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	26.01	104.12	8.2	33
863L or 891L (Riverbend 618S – Garden City 226S – Magrath 225S)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	30.12	136.9	18.9	86
924L (Langdon 102S – Milo 356S)	927L (Langdon 102S – Milo 356S)	576	691	723.89	125.68	553.0	96
927L (Langdon 102S – Milo 356S)	924L (Langdon 102S – Milo 356S)	547.05	656	722.07	131.99	552.5	101
610L (Fincastle 336S – Taber 83S)	879L (879AL – Bowmanton 244S)	85	94	135.57	159.49	68.9	81
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S – Spring Coulee 385S)	22	24	30.32	137.81	20.9	95
770L (Coaldale 254S – North Lethbridge 370S)	172L (North Lethbridge 370S – 172FL tap)	119.03	131	166.16	139.6	111.9	94

The remaining overload on 924L is below emergency ratings and would be managed by real time operational practices.

5.3.3. Scenario 8: Summer Light Post-Project Sensitivity Post-RAS

Category B Conditions

The thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RAS as shown in Table 5-5.

Table 5-5: Post-RAS Power Flow Study Results for Scenario 8

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Post-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	35.05	159.3	20.0	91
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	32.03	145.6	20.2	92
13L50 (Newell 2075S - Heathfield 2029S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	24.66	112.07	16.9	77
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	32.1	145.9	14.1	64

5.3.4. Scenario 9: Summer Peak Post-Project Sensitivity Post-RAS

Category B Conditions

The thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RAS as shown in Table 5-6.

Table 5-6: Post-RAS Power Flow Study Results for Scenario 9

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Post-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (Chinook 181S - 463AL tap)	107	118	128.02	119.64	92.0	86
674ST1 or T2 (Bowron 674S Transformer T1 or T2)	463L (463AL tap - Fort Macleod 15S)	107	118	129.03	120.59	93.1	87
618ST1 (Riverbend 618S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	37.96	172.55	18.5	84
618ST1 (Riverbend 618S Transformer T1)	225L (Spring Coulee 385S - Magrath 225S)	24	28	24.15	100.63	23.5	98
618ST1 (Riverbend 618S Transformer T1)	225L (Stirling 67S - 225AL tap)	24.98	28	26.09	104.45	8.0	32
863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	29.9	135.9	18.3	83
924L (Langdon 102S - Milo 356S)	927L (Langdon 102S - Milo 356S)	576	691	727.74	126.34	558.7	97
927L (Langdon 102S - Milo 356S)	924L (Langdon 102S - Milo 356S)	547.05	656	725.91	132.7	558.0	102
610L (Fincastle 336S - Taber 83S)	879L (879AL tap - Bowmanton 244S)	85	94	135.54	159.46	68.9	81
225ST1 (Magrath 225S Transformer T1)	225L (Glenwood 229S - Spring Coulee 385S)	22	24	30.1	136.82	20.5	93
770L (Coaldale 254S - North Lethbridge 370S)	172L (North Lethbridge 370S - 172FL tap)	119.03	131	168.04	141.18	105.9	89

The remaining overload on 924L is below emergency ratings and would be managed by real time operational practices.

5.4. Constraint Effective Factor Studies

Constraint effective factor studies were conducted for post-Project scenarios 3, 4, 8, 9, 12 and 13. The constraint effective factors were calculated for all Category B conditions when the loadings of the monitored transmission elements in the Study Area exceeded 100% (i.e., for all of the contingencies that resulted in thermal criteria violations). The results of the constraint effective factor studies are provided in Attachment A7.

Attachment A1

AESO Engineering Connection Assessment Scope

Engineering Connection Assessment: Study Scope

P2466 PR Prominence Solar Facility

PR Development Limited Partnership

Date: October 31, 2022

Version: **Final**

Classification: AESO Protected

Company Name	Name and Credentials	Date	Signature
PGSC (Study Consultant)	Aaron Krush, P.Eng	2022-11-01	
AESO	Peyman Ahmadi, P.Eng	Nov 1, 2022	
Transmission Facility Owner	Michael Harmon, P.Eng.	Nov. 1, 2022	
PR Development LP (Market Participant)	Joel Fridman	Nov 1, 2022	

Contents

1 Introduction 1
1.1 Project Overview 1
1.2 Existing System Overview 2
1.2.1 Study Area 2
1.2.2 Existing Constraints 2
2 Connection Alternative to be Studied 4
2.1 Alternative 1 – T-Tap connection to the existing 138 kV transmission line 172L 4
3 Criteria, Standards and Requirements 6
3.1 AESO Reliability Criteria 6
3.2 ISO Rules and Information Documents 7
4 Scenarios and Assumptions 8
4.1 Scenarios 8
4.2 Assumptions 9
4.2.1 System Project Assumptions 9
4.2.2 Connection Project Assumptions 9
4.2.3 Load Assumptions 10
4.2.4 Generation Assumptions 10
4.2.5 Intertie Flow Assumptions 17
4.2.6 HVDC Power Order Assumptions 18
4.2.7 Transmission Facility Ratings 18
4.2.8 Protection Fault Clearing Times 20
4.2.9 Project Dynamic Data 21
4.2.10 Voltage Profile Assumption 21
5 Study Methodology 23
5.1 Study Case Validation 24
5.2 Power Flow Studies 24
5.2.1 Contingencies to be Studied 25
5.3 Transient Stability Studies 25
5.3.1 Contingencies to be Studied 25
5.4 Short-Circuit Current Level Studies 25
6 Mitigation Measures 26
6.1 Development 26
6.2 Evaluation 26
6.2.1 Post-Mitigation Studies 26
6.2.2 Constraint Effective Factor Studies 26
7 Changes to Study Assumptions 27

Tables

Table 1-1: Project Load and Generation Details 1
Table 3-1: Post-Contingency Voltage Deviation Guidelines for Low Voltage Busses 7
Table 4-1: Connection Study Scenarios 8
Table 4-2: Planned Connection Projects Included in the Study Area 9
Table 4-3: Forecast Load (at AESO South Planning Region Peak) 10
Table 4-4: Existing Generation (excluding Wind and Solar) Dispatch Conditions 11
Table 4-5: Dispatch Conditions for Existing and Under Construction Wind Generation Facilities 11
Table 4-6: Dispatch Conditions for Existing Solar Generation Projects 13
Table 4-7: Dispatch Conditions for Planned Wind Generation Projects 14
Table 4-8: Dispatch Conditions for Planned Solar Generation Projects 15
Table 4-9: Dispatch Conditions for Projects Included in Sensitivity Studies 17
Table 4-10: Intertie Flows for by Scenario 18
Table 4-11: HVDC to Adjacent AC System MVAr Exchange Limits 18
Table 4-12: Thermal Rating Assumptions for Key Transmission Lines in the Study Area 18
Table 4-13: Summary of Key Transformer Ratings in the Study Area 20
Table 4-14: Summary of Key Shunt Elements in the Study Area 20
Table 4-15: Protection Fault Clearing Times 21
Table 5-1: Summary of the Studies to be Performed 23

Figures

Figure 1-1: Transmission System in the Study Area 3
Figure 2-1: Connection Alternative 1 5

Attachments

Attachment A: Transmission Planning Criteria – Basis and Assumptions

1 Introduction

This Study Scope provides an overview of the engineering studies to be completed by Power Grid Specialists Corp. (the Studies Consultant) to assess the impact of the Project (as defined in section 1.1) on the performance of the Alberta interconnected electric system (AIES). Technical criteria, assumptions and methods for performing these engineering studies are provided in this document.

1.1 Project Overview

PR Development LP (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its proposed Prominence Solar (Facility) to the AIES.

The Market Participant's request includes: a request for a new system access service in the area, with a Rate STS, *Supply Transmission Service*, contract capacity of 80 MW and a Rate DTS, *Demand Transmission Service*, contract capacity of 1 MW; and a request for transmission development (collectively, the Project).

The Project in-service date (ISD) used for the purpose of the studies is April 19, 2024.

Load and generation components of the Project are listed in Table 1-1.

Table 1-1: Project Load and Generation Details

Project Component		Description
Load	Existing Rate DTS, *Demand Transmission Service,* contract capacity	No existing contract
	Requested Rate DTS	1 MW
	Type	Station Service
	Motors (number and size)	Not Applicable
	Power factor	Not Applicable
	Future load expansion plans	No
Generation	Generation type	Solar
	Existing Rate STS, *Supply Transmission Service,* contract capacity	No existing contract
	Requested Rate STS	80 MW
	Number and size of generating units	1 x 80MW
	Maximum authorized real power (MARP)	80 MW
	Maximum capability (MC)	80 MW
	Reactive power capability	-26.29 MVAr (0.95 pf absorbing)
		38.75 MVAr (0.9 pf producing)
	Future generation expansion plans	No

Project Component	Description

Note:

MARP and MC are defined in the AESO's *Consolidated Authoritative Document Glossary*, which can be found on the AESO's website.

1.2 Existing System Overview

1.2.1 Study Area

Geographically, the Project is located in the AESO planning area of Lethbridge (Area 54).

The Study Area consists of the AESO planning areas of Stavely (area 49), Vauxhall (Area 52), Lethbridge (area 54) and Glenwood (area 55), including the tie lines connecting these planning areas to the rest of the AIES.

The existing transmission system in the Study Area is shown in Figure 1-1.

1.2.2 Existing Constraints

Existing constraints in the Study Area are managed in accordance with the procedures set out in Section 302.1 of the ISO rules, *Real Time Transmission Constraint Management* (TCM Rule).

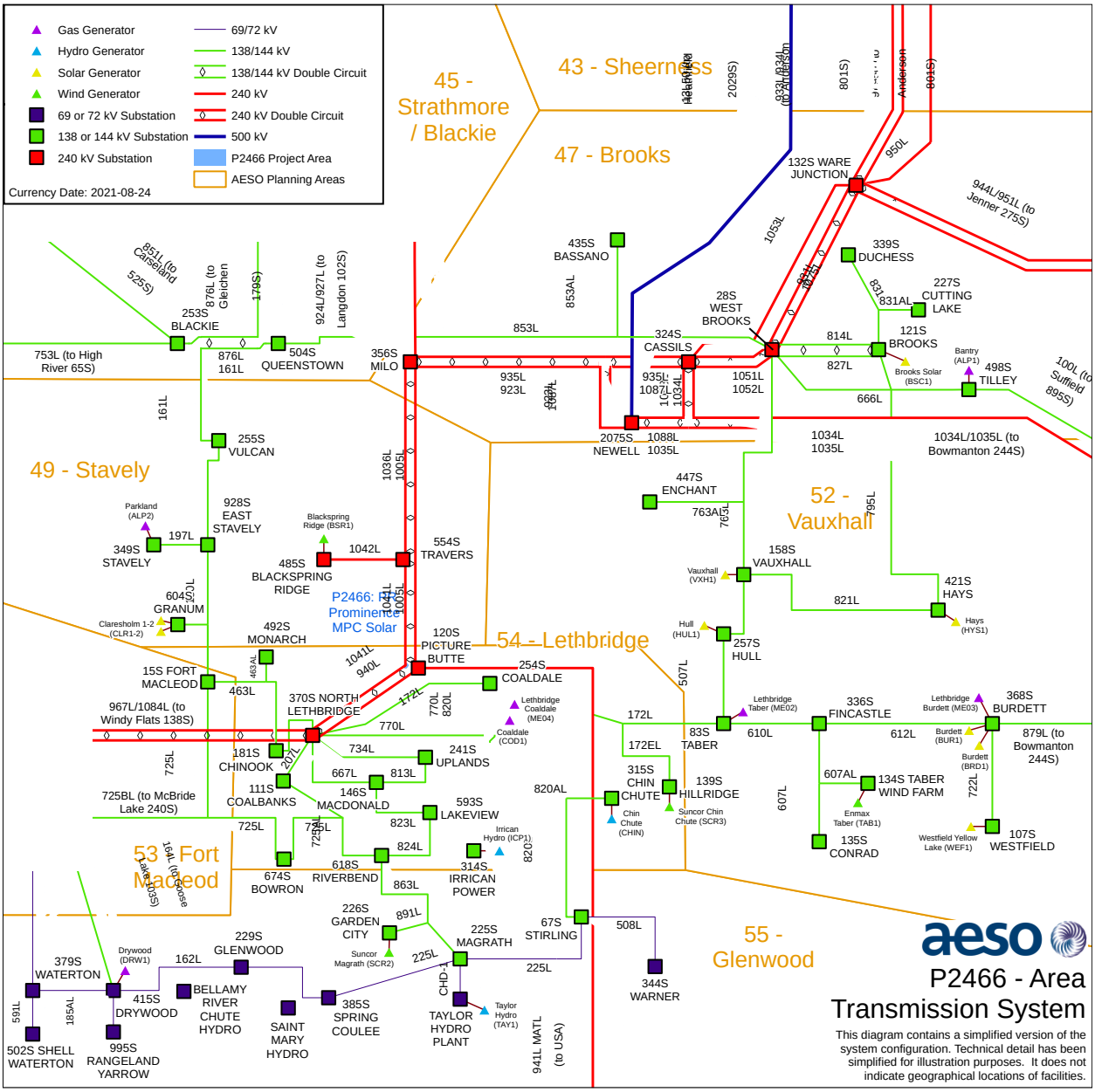
There are a number of constraints in the Study Area that are mitigated by existing remedial action schemes (RASs) and/or other protection schemes.

The following existing RASs and/or other protection schemes are used to manage constraints in the area:

- RAS 36: Garden City 226s WAGF Trip Scheme
- RAS 42: Spring Coulee 385s - 225LW Overload Mitigation Scheme
- RAS 43: Stirling 67s - 508L Load Trip Scheme
- RAS 126: Magrath 225s Generation Trip Scheme
- RAS 136: Direct Transfer Trip to MATL on Loss of 1201L
- RAS 137: MATL Local Detection Scheme
- RAS 167: 820L-254S Overload Mitigation (P1719)
- RAS 168: 172L-83S Overload Mitigation
- RAS 169: 725LW-674S Overload Mitigation
- RAS 175: Milo 356S – 924L/927L Overload Mitigation Scheme
- RAS 178: 172L (370S-181S) Overload Mitigation
- RAS 180: 879L Overload Mitigation Scheme
- RAS 181: 610L Overload Mitigation Scheme
- RAS 1618: Taylor Hydro Special Protection System (SPS)

- RAS 2612: 103S Overvoltage - I-354S IPP Trip

Figure 1-1: Transmission System in the Study Area



P2466 - Area Transmission System

This diagram contains a simplified version of the system configuration. Technical detail has been simplified for illustration purposes. It does not indicate geographical locations of facilities.

2 Connection Alternative to be Studied

The following alternative will be studied:

2.1 Alternative 1 – T-Tap connection to the existing 138 kV transmission line 172L

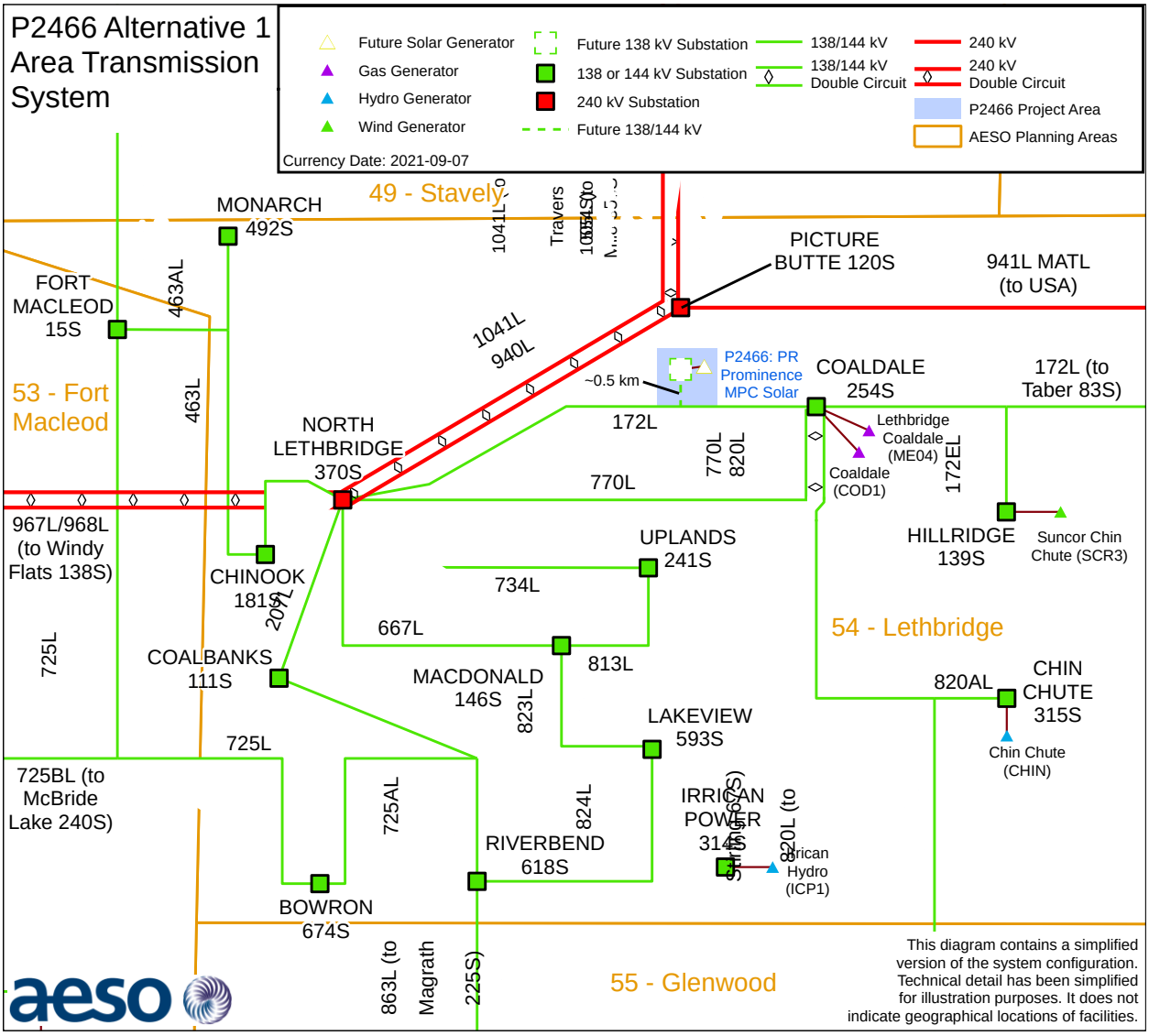
This alternative includes the following developments:

- Add a 138 kV circuit, approximately 0.5 kilometer[1] in length, to connect the collector substation to the existing 138 kV transmission line 172L (between North Lethbridge 370S – Coaldale 254S) using a T-tap connection configuration;
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 2-1.

[1] Exact line length to be determined by the MP.

Figure 2-1: Connection Alternative 1



3 Criteria, Standards and Requirements

3.1 AESO Reliability Criteria

The Transmission Planning (TPL) Standards, which are included in the Alberta Reliability Standards, and *Transmission Planning Criteria – Basis and Assumptions (see Attachment A),* (collectively, the Reliability Criteria) will be applied to evaluate system performance under Category A system conditions (i.e., all elements in-service) and following Category B contingencies (i.e., single element outage), prior to and following the studied alternatives. Below is a summary of Category A and Category B system conditions.

Category A, often referred to as the N-0 condition, represents a normal system with no contingencies and all facilities in service. Under this condition, 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 range, and the system must be stable with no cascading outages.

Category B events, often referred to as an N-1 or N-G-1 with the most critical generator out of service, result in the loss of any single specified system element under specified fault conditions with normal clearing. These elements are a generator, a transmission circuit, a transformer, or a single pole of a DC transmission line. The acceptable impact on the system is the same as Category A. Planned or controlled interruptions of electric supply to radial customers or some local network customers, connected to or supplied by the faulted element or by the affected area, may occur in certain areas without impacting the overall reliability of the interconnected transmission systems. To prepare for the next contingency, system adjustments are permitted, including curtailments of contracted firm (non-recallable reserved) transmission service electric power transfers.

The TPL standards, TPL-001-AB-0, TPL-002-AB1-0, have referenced Applicable Ratings when specifying the required system performance under Category A and Category B events. For the purpose of applying the TPL standards to the studies documented in this report, Applicable Ratings are defined as follows:

- Normal thermal rating of the line's loading limits for each season;
- The highest specified loading limits for transformers;
- For Category A conditions: Voltage range under normal operating condition per AESO Information Document #2010-007RS, *General Operating Practices – Voltage Control* (ID #2010-007RS). For the busses not listed in ID #2010-007RS, Table 2-1 in the *Transmission Planning Criteria – Basis and Assumptions* applies;
- For Category B condition: The extreme voltage range values per Table 2-1 in the *Transmission Planning Criteria – Basis and Assumptions; and*
- Desired post-contingency voltage deviation limits for three defined post-event timeframes as provided in Table 3-1.

Table 3-1: Post-Contingency Voltage Deviation Guidelines for Low Voltage Busses

Parameter and reference point	Time Period		
	Post Transient (up to 30 sec)	Post Auto Control (30 sec to 5 min)	Post Manual Control (Steady State)
Voltage deviation from steady state at point of delivery (POD) low voltage bus.	±10%	±7%	±5%

3.2 ISO Rules and Information Documents

ID #2010-007RS will be used to establish system normal (i.e., pre-contingency) voltage profiles for the Study Area.

The TCM Rule will be followed to set up the study scenarios and assess the impact of the Project. In addition, due regard will be given to the following:

- The AESO's *Connection Study Requirements*;
- Section 502.1 of the ISO rules, *Aggregated Generating Facilities Technical Requirements*;
- Section 502.16 of the ISO rules, *Aggregated Generating Facilities Operating Requirements*;

4 Scenarios and Assumptions

4.1 Scenarios

The following section describes the scenarios to be studied and the assumptions to be used in the studies.

Connection scenarios must be studied as outlined in Table 4-1.

Table 4-1: Connection Study Scenarios

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
Pre-Project					
1	2024 Summer Light (SL)	High Solar (HS)	2024 SL HS Pre-Project	0	0
2	2024 Summer Peak (SP)	High Solar (HS)	2024 SP HS Pre-Project	0	0
Post-Project					
3	2024 Summer Light (SL)	High Solar (HS)	2024 SL HS Post-Project	0	80
4	2024 Summer Peak (SP)	High Solar (HS)	2024 SP HS Post-Project	0	80
5	2031 Winter Peak (WP)	All Study Area Generators In-Service	2031 WP Post-Project	0	80
Pre-Project Sensitivity with P2323, P2324, P2325, P2326 and P2511					
6	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Pre-Project Sensitivity 1	0	0
7	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Pre-Project Sensitivity 1	0	0
Post-Project Sensitivity with P2323, P2324, P2325, P2326 and P2511					
8	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Post-Project Sensitivity 1	0	80
9	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Post-Project Sensitivity 1	0	80

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
Pre-Project Sensitivity with P2490, P2323, P2324, P2325, P2326 and P2511					
10	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Pre-Project Sensitivity 2	0	0
11	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Pre-Project Sensitivity 2	0	0
Post-Project Sensitivity with P2490, P2323, P2324, P2325, P2326 and P2511					
12	2024 Summer Light (SL) Sensitivity	High Solar (HS)	2024 SL HS Post-Project Sensitivity 2	0	80
13	2024 Summer Peak (SP) Sensitivity	High Solar (HS)	2024 SP HS Post-Project Sensitivity 1	0	80

Note:

The 138 kV bus-tie breaker and switch at the Bowmanton 244S substation are assumed to be open for all of the above scenarios.

4.2 Assumptions

4.2.1 System Project Assumptions

The pre-Project and post-Project connection assessment will not include any system transmission projects because there are no planned system transmission developments in the Study Area that are expected to be in service before the scheduled Project ISD.

4.2.2 Connection Project Assumptions

Table 4-2 summarizes the connection projects in the Study Area that should be included in the sensitivity studies.

Table 4-2: Planned Connection Projects Included in the Study Area[2]

AESO Project No.	AESO Project Name	AESO Planning Area No.	Generation (MW)	Load (MW)	Scheduled ISD
P2323	Fortis Taber 83S DER Solar 1	52	16.4	0	Nov 1, 2022
P2324	Fortis Taber 83S DER Solar 2	52	15	0	Nov 1, 2022

[2]This table may change based on the updated connection project list.

AESO Project No.	AESO Project Name	AESO Planning Area No.	Generation (MW)	Load (MW)	Scheduled ISD
P2325	Fortis Taber 83S DER Solar 3	52	13.3	0	Nov 1, 2022
P2326	Fortis Taber 83S DER Solar 4	52	9.2	0	Nov 1, 2022
P2490	TransAlta Tempest MPC Wind	54	100	1	Sep 20, 2024
P2511	COL Chinook 181S DER Solar	54	8.75	0	June 1, 2023

4.2.3 Load Assumptions

The load forecast to be used for the studies is shown in Table 4-3 and is a forecast for the AESO South Planning Region peak based on the AESO 2021 Long-term Outlook (2021 LTO)[3] with modifications to incorporate the latest forecast intelligence. For the post-Project studies, when the Study Area loads are modified to align with the regional load forecast, the active power to reactive power ratio in the base case scenarios shall be maintained.

Table 4-3: Forecast Load (at AESO South Planning Region Peak)

AESO Planning Region Name	Forecast Peak Load by Year/Season (MW)	
	2024 SL	2024 SP
Lethbridge (Area 54)	107	284
South Planning Region[1]	898	1569
AIL without losses	8089	11186

Note:
[1] The South Region comprises the following AESO planning areas: 4, 43 ,44 ,45 ,46 ,47, 48, 49, 52,53 ,54, and 55

IDEV files contain non-motor loads in zones 34, 36, and 351. These loads are not accounted for in the forecasted peak loads shown above and should not be considered when scaling load. The AESO engineer will provide guidance to load scaling procedures as required.

4.2.4 Generation Assumptions

The generation forecast to be used for the studies is based on the 2021 LTO with modifications to incorporate the latest forecast intelligence. The generation assumptions for the studies will assume high solar dispatch condition. Additional studies may be required in the event of changes to the AESO's corporate forecast.

[3] The 2021 LTO is available on the AESO website.

The existing generation (excluding wind and solar) dispatch conditions for the study scenarios are described in Table 4-4.

Table 4-4: Existing Generation (excluding Wind and Solar) Dispatch Conditions

Facility Name	Unit No.	Bus No.	MC (MW)	AESO Planning Area No.	Unit Net Generation[a] (MW) by Scenario	
					2024 SL	2024 SP
Coaldale (COD1)	4	2690	5	54	4	5
Chin Chute (CHIN)	1	407	15	54	10	9
Irrican Hydro (ICP1)	1	450	7	54	7	6
Raymond Reservoir (RYMD)	1	414	21	55	19	19
Taylor Hydro (TAY1)	1	4670	14	55	14	13
Parkland (ALP2)	1	4235	10	49	0	9
Drywood (DRW1)	1, 2	4226	6	55	0	0
Lethbridge Taber (ME02)	2	3272	8	52	0	7
Lethbridge Burdett (ME03)	3	4269	7	52	0	7
Lethbridge Coaldale (ME04)	G5	557690	6	54	0	6

Notes:
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

The wind and solar generation facilities will be dispatched to yield the credible worst-case power flow conditions for the Study Area. Pre-Project dispatch levels for the existing, under-construction and contracted wind and solar generation facilities, as well as planned projects are shown in Table 4-5, Table 4-6, Table 4-7 and Table 4-8.

Table 4-5: Dispatch Conditions for Existing and Under Construction Wind Generation Facilities

Facility Name and Code	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
				SL HS	SP HS
Ardenville Wind (ARD1)	4735, 4740	53	68	13.6	40.8

Fortis Bull Creek Phases 1 and 2 (BUL1 & BUL2)	550003, 550004	37	29	5.8	17.4
Blackspring Ridge (BSR1)	61736, 61737	49	300	60	180
Blue Trail Wind (BTR1)	66328, 67328	53	66	13.2	39.6
Castle River #1 (CR1)	2234, 3234	53	39	7.8	23.4
Castle Rock Ridge 2 (CRR2)	567221	53	30.6	6.12	18.36
Castle Rock Wind Farm (CRR1)	67221	53	77	15.4	46.2
Cowley Ridge (CRE3)	4264	53	20	4	12
Enmax Taber (TAB1)	15343, 16343	52	81	16.2	48.6
Ghost Pine (NEP1)	2621, 2622, 2623, 2624, 2625	42	82	16.4	49.2
Halkirk (HAL1)	66435, 67435	42	150	30	90
Kettles Hill (KHW1)	2402, 3402	53	63	12.6	37.8
McBride Lake Windfarm (AKE1)	2901, 3901, 4901	53	73	14.6	43.8
Old Man River Wind (OWF1)	61543	53	46	9.2	27.6
Rattlesnake Ridge Wind (RTL1)	60873	4	130	26	78
Riverview Wind (RIV1)	69221	53	115	23	69
Soderglen Wind (GWW1)	12358, 13358	53	71	14.2	42.6
Summerview 1 (IEW1)	2338, 3338	53	66	13.2	39.6
Summerview 2 (IEW2)	4339, 5337	53	66	13.2	39.6
Suncor Chin Chute (SCR3)	2389	54	30	6	18
Suncor Magrath (SCR2)	11002	53	30	6	18
Capital Power Whitla Wind Power Facility Phase 1 (WHT1)	60990	4	201.6	40.32	120.96
Capital Power Whitla Wind Power Facility Phase 2 and 3 (WHT2)	61990, 64990	4	151	30.2	90.6
TransAlta Windrise (WRW1)	567031	53	207	41.4	124.2
Suncor Wintering Hills (SCR4)	60789, 60791, 60793, 60846, 60848, 60850	43	88	17.6	52.8

Wheatland Wind (WHE1)	61632,60632	43	120	24	72

Note:
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

Table 4-6: Dispatch Conditions for Existing Solar Generation Projects

Facility Name and Code	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
				SL HS	SP HS
Burdett (BRD1)	2269	52	10.5	7.4	10.0
Burdett (BUR1)	557269	52	20	14.0	19.0
Brooks Solar (BSC1)	553257	47	15	10.5	14.3
Brooks Solar 1 (BRK1)	553256	47	13	9.1	12.4
Brooks Solar 2 (BRK2)	554257	47	14	9.8	13.3
Coaldale Solar (COL1)	554691	54	22	15.4	20.9
Claresholm 1 (CLR1)	60894	49	58	40.6	55.1
Claresholm 2 (CLR2)	61894	49	75	52.5	71.3
Conrad 1 (CRD1)	554291	52	23	16.1	21.9
Conrad 2 (CRD2)	553291	52	18	12.6	17.1
East Strathmore Namaka (NMK1)	553340	45	20	14.0	19.0
Hays (HYS1)	554401	52	24	16.8	22.8
Hull (HUL1)	2401	52	24.5	17.2	23.3
Innisfail Solar (INF1)	557120	39	22	15.4	20.9
Jenner (JER1)	554986	48	21	14.7	20.0
Monarch (MON1)	554400	54	24	16.8	22.8
Strathmore 1 (STR1)	557259	45	18	12.6	17.1
Strathmore 2 (STR2)	558259	45	23	16.1	21.9
Suffield (SUF1)	3270	52	23	16.1	21.9
Travers (TVS1)	560026, 561026, 562026	49	400	280.0	380.0
Vauxhall Solar (VXH1)	4274	52	22	15.4	20.9
Westfield Yellow Lake (WEF1)	557277	52	19	13.3	18.1
Kisikaw-pisim 1&2 (KKP1& KKP2)	995214, 995220	60	14	9.8	13.3

Note:
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

Table 4-7: Dispatch Conditions for Planned Wind Generation Projects

Project Number	Project Name	Planned ISD	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
						SL HS	SP HS
P0693	Wild Rose 2 Wind Farm	15-Aug-2022	3462, 3463	4	192	38.4	115.2
P1250	Wild Run Grizzly Bear Wind	1-Oct-2022	67308	13	120	24.0	72.0
P1533	Joss MPC WAGF	30-Jun-2022	60798, 60799	47	122.4	24.5	73.4
P1567	EDPR Sharp Hills Wind Farm	16-Dec-2022	60831, 60832	42	248.4	49.7	149.0
P1698	Joss Jenner WAGF - Phase 2	30-Jun-2022	61798	47	71.4	14.3	42.8
P1704	Paintearth Wind Power	1-Jul-2023	61418	42	150	30.0	90.0
P1719	Stirling WAGF Project	30-Jun-2023	61630	54	113	22.6	67.8
P1812	Suncor Forty Mile Granlea WAGF	2-May-2022	61994, 62994	4	200	40.0	120.0
P1853	Fortis Buffalo Atlee Cluster 1 WAGF	1-Sep-2022	553260	47	17.25	3.5	10.4
P1892	Fortis Buffalo Atlee Cluster 3 WAGF	1-Sep-2022	552260	47	17.25	3.5	10.4
P1898	Pattern Lanfine North Wind	30-Sep-2022	60996	42	145	29.0	87.0
P1909	TransAlta Garden Plain Wind	30-Jun-2022	565002	42	130	26.0	78.0
P2065	Wild Run Grizzly Bear Wind Phase 2	1-Oct-2022	67308	13	24	4.8	14.4
P2122	EDF Cypress Wind	1-Nov-2022	560003, 561003	4	195.9	39.2	117.5
P2199	Buffalo Atlee Wind Farm 2	1-Sep-2022	557261	47	13.8	2.8	8.3
P2234	Joss Jenner WAGF - Phase 3	30-Jun-2022	61799	47	111.2	22.2	66.7
P2247	Buffalo Plains MPC Wind	17-Apr-2023	560041,	47	466	93.2	279.6

			560042				
P2254	RESC Hilda MPC Wind	7-Oct-2023	567004	48	100	20.0	60.0
P2263	BER Hand Hills MPC Wind	1-Sep-2022	560045	42	145	29.0	87.0
P2412	Fortis Buffalo Atlee Cluster 4 WAGF	1-Sep-2022	990002	47	11	2.2	6.6
P2413	EDF Cypress Wind 2	Aug 31 2022	560003, 561003	4	45.8	9.2	27.5

Note:
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

Table 4-8: Dispatch Conditions for Planned Solar Generation Projects

Project Number	Project Name	Planned ISD	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
						SL HS	SP HS
P1831	Fortis 255S Vulcan Faribault Farms DG PV	1-Sep-2022	4244	49	22	15.4	20.9
P1862	Fortis Spring Coulee 385S Solar DG	15-Oct-2021	553246, 554246	55	29.5	20.7	28.0
P1870	Fortis Stavely 349S DER Solar	24-May-2021	2004	49	16.5	11.6	15.7
P1927	Solar Krafte Brooks	1-Feb-2023	60434, 61434	47	360	252.0	342.0
P1978	ATCO Michichi DER Solar	1-Nov-2022	552448, 553448, 552450	42	75	52.5	71.3
P2059	ATCO Three Hills 770S DER Solar	1-May-2022	552433	42	25	17.5	23.8
P2061	ATCO Michichi Creek 802S DER Solar	1-May-2022	554448	42	25	17.5	23.8

P2194	FortisAlberta East Crossifield 64S DER Solar	1-Apr-2022	994312	42	5.65	4.0	5.4
P2195	FortisAlberta Bassano 435S DER Solar	1-Feb-2023	557399	47	9.25	6.5	8.8
P2249	FortisAlberta Empress 394S DER Solar 1	1-May-2022	558316	48	22.5	15.8	21.4
P2250	FortisAlberta Empress 394S DER Solar 2	1-May-2022	558016	48	16	11.2	15.2
P2300	RESC Enterprise MPC Solar	1-Apr-2022	563070	49	65	45.5	61.8
P2335	FortisAlberta Vulcan 255S DER Solar	1-May-2022	990003	52	15	10.5	14.3
P2337	Dunmore Solar	1-Apr-2023	560044	4	216	151.2	205.2
P2341	Greengate Travers Solar Phase 2	24-Mar-2022	560026, 561026, 562026	49	65	45.5	61.8
P2347	Forty Mile Granela Solar Phase 2	24-Mar-2022	65994	4	220	154.0	209.0
P2362	FortisAlberta Enchant 447S DER Solar	8-Jul-2022	993287	52	23	16.1	21.9
P2363	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	993289	52	17.9	12.5	17.0
P2364	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	994287	52	10	7.0	9.5
P2365	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	994289	52	24	16.8	22.8
P2424	ATCO Oyen 767S DER Solar	1-Dec-2022	88888	42	15	10.5	14.3
P2459	ENMAX Barlow	8-Dec-2022	4590	6	27	18.9	25.7

	Park DER Solar						
P2475	EPC SS-24 DER Solar	22-Dec-2022	4590, 3590	6	37	25.9	35.2

Note:
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

The Facility will be dispatched to 80 MW in all post-Project scenarios. In the sensitivity studies, P2490, P2323, P2324, P2325, P2326 and P2511 will be dispatched to the generation outputs listed in

9 in pre- and post-Project scenarios.

Table 4-9: Dispatch Conditions for Projects Included in Sensitivity Studies

Project Number	Project Name	Planned ISD	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW) 2024 Cases (WP 2023 cases)	
						SL HW	SP HW
P2490	TransAlta Tempest MPC Wind	Sep 20, 2024	567065	54	100	20	60
P2511	COL Chinook DER Solar	June 01, 2023	Generic[4]	54	8.75	6.12	8.32
P2323	Fortis Taber 83S DER Solar 1	Nov 1, 2022	992323	52	16.4	11.48	15.6
P2324	Fortis Taber 83S DER Solar 2	Nov 1, 2022	992324	52	15.0	10.5	14.2
P2325	Fortis Taber 83S DER Solar 3	Nov 1, 2022	992325	52	13.3	9.31	12.6
P2326	Fortis Taber 83S DER Solar 4	Nov 1, 2022	992325	52	9.2	6.44	8.74

4.2.5 Intertie Flow Assumptions

The intertie flow assumptions for the Alberta-British Columbia (AB-BC), Alberta-Saskatchewan (AB-SK), and Alberta-Montana (MATL) interties are shown in Table 4-10. Generation in Area 25 and 40 need to be scaled to maintain the intertie flows as indicated.

[4] Generic generation needs to be added as this project does not have PDUP. This can be connected to bus 3367.

For the 2031 Winter Peak scenario, the intertie flow values should be set to the AESO planning base cases.

Table 4-10: Intertie Flows for by Scenario

Scenario Number	Scenario Name	Import (-) / Export (+) (MW) by Intertie		
		AB-BC	AB-SK	MATL
1, 3, 6, 8	2024 SL HS	-602	0	-300
2, 4, 7, 9	2024 SP HS	-181	0	-300

4.2.6 HVDC Power Order Assumptions

The Western Alberta Transmission Line (WATL) and the Eastern Alberta Transmission Line (EATL) are high-voltage direct current (HVDC) transmission lines. The HVDC power order assumptions for the studies will be set to minimize losses for the pre-Project and post-Project study scenarios.

For the 2031 Winter Peak scenario, the HVDC power order should be as per the AESO base cases and will not be adjusted.

The reactive power limits of the MVAr exchanges between the HVDC terminals (WATL and EATL) and the connected alternating current (AC) transmission systems are shown in Table 4-11. These limits must be maintained when performing the studies.

Table 4-11: HVDC to Adjacent AC System MVAr Exchange Limits

HVDC Facility	North Terminal Reactive Power Limit (MVAr)	South Terminal Reactive Power Limit (MVAr)
EATL	-85 to 75	-35 to 35
WATL	-75 to 75	-35 to 35

4.2.7 Transmission Facility Ratings

The legal owner of transmission facilities (TFO) provided the thermal ratings assumptions for the existing transmission lines in the Study Area. Table 4-12 shows the normal ratings and emergency ratings for the key transmission lines in the Study Area, which will be used to perform the engineering studies.

Table 4-12: Thermal Rating Assumptions for Key Transmission Lines in the Study Area

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)	Emergency Rating (MVA)
			Summer	Summer
185L	Pincher Creek 396S To Waterton 379S	69	41	45
185L	Drywood 415S To Waterton 379S	69	39LTD-L	43LTD-L
162L	Drywood 415S To Glenwood 229S	69	40	44

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)	Emergency Rating (MVA)
			Summer	Summer
225L	Glenwood 229S To Springcoulee 385S	69	22	24
225L	Springcoulee 385S To Magrath 225S	69	24CT	28
225L	Stirling 67S To Magrath 225S	69	25	28
180L	Fort Macleod 15S To East Stavely 928S	138	120	132
180L	Vulcan 255S To East Tavely 928S	138	118	130
161L	Vulcan 255S To Queenstown 504S	138	117	129
164L	Drywood 415S To Goose Lake 103S	138	111	122
610L	Fincastle 336S To Taber 83S	138	85	94
463L	Fort Macleod 15S To Chinook 181S	138	107	118
879L	Burdett 368S To Bowmanton 244S	138	85	94
172L	Taber 83S To Coaldale 254S	138	119	131
507L	Taber 83S To Hull 257S	138	120	132
820L	Stirling 67S To Coaldale 254S	138	120	132
207L	Coalbanks 111S To Lethbridge North 370S	138	120	132
172L	Chinook 181S To Lethbridge North 370S	138	85	94
770L	Coaldale 254S To Lethbridge North 370S	138	120	132
172L	Coaldale 254S To Lethbridge North 370S	138	119	131
734L	Uplands 241S To Lethbridge North 370S	138	167M	184M
667L	Lethbridge North 370S To Macdonald 146S	138	174	191
863L	Magrath 225S To Riverbend 618S	138	120	132
725L	Coalbanks 111S To JCT.725AL	138	122	134
725L	JCT.725AL To Bowron 674S	138	122	134
725L	Fort Macleod 15S – 725BL Tap	138	119	131
725L	Bowron 674S – 725BL Tap	138	118	130
725AL	Riverbend 618S To 725AL	138	120	132
940L	Lethbridge North 370S To Picture Butte 120S	240	481	577
1041L	Lethbridge North 370S To Travers 554S	240	444TD-L	533 TD-L
1005L	Picture Butte 120S To Milo 356S	240	490	588
1036L	Travers 554S To Milo 356S	240	481	577

Note:
“CT” indicates that the transmission line is limited by current transformer.

"M" indicates that the transmission line rating is limited for reasons other than protection equipment, transformer, current transformer, line, ganged switch, circuit breaker, or regulator.

"LTD-L" indicate Long-Term Derate from LiDAR surveys.

"TD-L" indicate Temporary Derate from LiDAR surveys

The TFO provided the details of the substation transformers in the Study Area. The key transformers in the Study Area are shown in Table 4-13.

Table 4-13: Summary of Key Transformer Ratings in the Study Area

Substation Name and Number	Transformer ID	Transformer Voltages (kV)	Transformer Rating (MVA)
North Lethbridge 370S	T3	240/138 kV	193.6/224
	T5	240/138 kV	200
	T6	240/138 kV	200
Drywood 415S	T1	138/69 kV	50
Stirling 67S	T2	138/69 kV	50
Magrath 225S	T1	138/69 kV	50

The TFO provided the details of the shunt elements in the Study Area. The key shunt elements in the Study Area are shown in Table 4-14.

Table 4-14: Summary of Key Shunt Elements in the Study Area

Substation Name and Number	Voltage Class (kV)	Capacitors		Reactors	
		Number of Switched Shunt Blocks	Total at Nominal Voltage (MVAr)	Number of Switched Shunt Blocks	Total at Nominal Voltage (MVAr)
Taber 83S	138	1	24.46	-	-
		1	27.2	-	-
Hays 421S	138	1	22.96	-	-
Burdett 368S	138	1	22.96	-	-
		1	24.46	-	-
Picture Butte 120S	240	2	2 x 50	-	-

4.2.8 Protection Fault Clearing Times

The transient stability studies will be performed using the actual fault clearing times for the selected contingencies, as provided by the TFO and as shown in Table 4-15. Only those contingencies shown in Table 4-15 will be studied for transient stability studies. If the TFO did not specify the fault clearing times

(e.g. for new transmission lines) for a selected contingency, then the studies for that contingency will be performed using the standard fault clearing times that are specified in Table 2-3 of the AESO's *Transmission Planning Criteria – Basis and Assumptions*.

Table 4-15: Protection Fault Clearing Times

Contingency (System Element Lost)	Fault Location	Clearing Times (Cycles)		
		Near End	T-Tapped End	Far End
Fault Clearing Times for Alt 1				
820L Coaldale 254S to Irrican Power Tap to Stirling 67S	Coaldale 254S	9	-	60
	Stirling 67S	9	-	60
863L Magrath 225S to 891L Tap to Riverbend 618S	Magrath 225S	9	-	60
	Riverbend 618S	9	-	60
172L Coaldale 254S to Chin Chute Tap to Taber 83S	Coaldale 254S	9	-	60
	Taber 83S	9	-	60
172L Coaldale 254S to N Lethbridge 370S	Coaldale 254S	9	-	60
	N Lethbridge 370S	9	-	60
172L N Lethbridge 370S to Chinook 181S	N Lethbridge 370S	9	-	30
	Chinook 181S	9	-	30
770L Coaldale 254S to N Lethbridge 370S	Coaldale 254S	9	-	30
	N Lethbridge 370S	9	-	30
1041L Travers 554S to N Lethbridge 370S	Travers 554S	5	-	6
	N Lethbridge 370S	5	-	6
967L N Lethbridge 370S to Windy Flats 138S	N Lethbridge 370S	5	-	6
	Windy Flats 138S	5	-	6
940L Picture Butte 120S to N Lethbridge 370S	Picture Butte 120S	5	-	6
	N Lethbridge 370S	5	-	6

4.2.9 Project Dynamic Data

Dynamic data for the Project will be based on the Stage 1 Project Data Update Package (PDUP-1).

4.2.10 Voltage Profile Assumption

ID #2010-007RS will be used to establish system normal (i.e., pre-contingency) voltage profiles for key area busses prior to commencing any studies. Table 2-1 of the *Transmission Planning Criteria – Basis and*

Assumptions applies for the busses not included in ID #2010-007RS. These voltages will be used to set the voltage profile for the study base cases prior to the power flow studies.

5 Study Methodology

The studies to be performed for this connection assessment are identified in Table 5-1.

Table 5-1: Summary of the Studies to be Performed

Scenario No. and Name		Power Flow		Voltage Stability		Transient Stability		Motor Starting		Short Circuit
		Category		Category		Category		Category		Category A
		A	B	A	B	A	B	A	B	
Pre-Project										
1	2024 SL HS Pre-project	X	X			X*	X*			
2	2024 SP HS Pre-project	X	X			X*	X*			X
Post-Project										
3	2024 SL HS Post-project	X	X			X*	X*			
4	2024 SP HS Post-project	X	X			X*	X*			X
5	2031 WP Post-project									X
Pre-Project Sensitivity with P2323, P2324, P2325, P2326 and P2511										
6	2024 SL HS Pre-project Sensitivity 1	X	X			X*	X*			
7	2024 SP HS Pre-project Sensitivity 1	X	X			X*	X*			
Post-Project Sensitivity with P2323, P2324, P2325, P2326 and P2511										
8	2024 SL HS Post-project Sensitivity 1	X	X			X	X			
9	2024 SP HS Post-project Sensitivity 1	X	X			X	X			
Pre-Project Sensitivity with P2490, P2323, P2324, P2325, P2326 and P2511										
10	2024 SL HS Pre-project Sensitivity 2	X								
11	2024 SP HS Pre-project Sensitivity 2	X								
Post-Project Sensitivity with P2490, P2323, P2324, P2325, P2326 and P2511										
12	2024 SL HS Post-project Sensitivity 2	X								
13	2024 SP HS Post-project Sensitivity 2	X								

Notes:

*Only required if post-Project studies show potential transient stability issues.

For the engineering studies, all transmission facilities 69 kV and above, within the Study Area and the transmission lines connecting these planning areas to neighboring planning areas will be studied and monitored to assess the impact of the Project on the performance of the AIES, including any violations of the Reliability Criteria (as defined in Section 3.1).

5.1 Study Case Validation

The study will be conducted on the AIES system model using the AESO's planning base cases. The seasonal light/peak scenarios will be studied as required. The base cases will be modified by the AESO to include the corresponding load and generation forecast information. The resulting cases, or seed cases, along with the project IDEVs, will be provided by the AESO to the Studies Consultant. These cases are provided in PSS/E v34 and/or v33 format. Upon request, the AESO can provide RAW and SEQ files. Software used by the Studies Consultant must be able to read and write these file types. Manual adjustments may be required to ensure full alignment with the details outlined in this Study Scope, as described in the process outlined below. The AESO will provide guidance to the Studies Consultant with regard to the setup of the study cases should any questions arise.

The expected process for the creation of acceptable study cases is as follows:

1. The AESO provides seed cases and the appropriate incremental IDEVs to use and any other applicable information required to the Studies Consultant.
2. The Studies Consultant applies the identified IDEVs to the seed cases to create the study cases. The Studies Consultant verifies and makes adjustments as required to ensure the study cases represent the assumptions outlined within the Study Scope.
3. Upon creating the study cases, all the study cases are forwarded to the AESO for approval.
4. The Studies Consultant proceeds with the required engineering studies only after the study cases are approved by the AESO.

5.2 Power Flow Studies

Power flow studies will be performed to identify thermal and voltage criteria violations as per the Reliability Criteria, and any deviations from the limits listed in Table 3-1.

For information purposes, the Studies Consultant must also provide, as a separate file, a list of any transmission elements where the thermal loading exceeds 95% of the element's normal rating under Category A and Category B conditions.

For the Category B power flow studies, the transformer taps and switched shunt reactive compensating devices such as shunt capacitors and reactors will be locked and continuous shunt devices will be enabled.

Voltage deviations at point-of-delivery (POD) low voltage busses will also be assessed for both the pre-Project and post-Project networks by first locking all tap changers and area shunt reactive compensating devices to identify any post-transient voltage deviations above 10%. Second, tap changers will be allowed to move while shunt reactive compensating devices remained locked to determine if any voltage deviations above 7% would occur in the area. Third, all the taps and shunt reactive compensating devices will be allowed to adjust, and voltage deviations above 5% will be reported.

The scenarios to be studied are shown in Table 5-1.

5.2.1 Contingencies to be Studied

Power flow studies will be performed for the Category A and all Category B in the Study Area.

5.3 Transient Stability Studies

The Genesee generating unit 3 in Wabamun (Area 40) will be used as the reference for the studies.

The report presenting the results of the transient stability studies must provide response plots for several variables, including rotor angle, and active and reactive power output for the study area generation units. The results report must also provide the 500 kV, 240 kV and 138 kV bus voltage levels for substations near the point of connection. Other busses will be monitored and will be reported as determined by the results. The results report must also provide the key branch active and reactive power flow surrounding the Facility.

Transient stability studies will be performed for the post-Project scenarios as shown in Table 5-1. If any transient stability issues are observed, transient stability analysis will be performed for the corresponding pre-Project scenarios.

5.3.1 Contingencies to be Studied

Transient stability studies will be performed for the contingencies shown in Table 4-15.

5.4 Short-Circuit Current Level Studies

A maximum fault level must be provided for the substations in the vicinity of the Project assuming normal system operation with all transmission elements in service and generation dispatched. Three-phase faults and single line-to-ground faults will be simulated. Polar coordinates and per-unit values will be used for reporting the results.

2023 SP Pre and Post and 2031 WP Post scenarios will be used for the short-circuit studies.

Estimated maximum three-phase faults and single line-to-ground short-circuit current levels will be reported for the following substations high voltage buses (138 kV and/or 240 kV):

- North Lethbridge 370S (both 138kV and 240kV)
- Coaldale 254S
- Taber 83S
- Stirling 67S
- Chin Chute 315S
- Hillridge 139S
- P2466 collector substation (including in post-Project studies only)

Further sensitivity studies, in consultation with the TFO, may be required if the primary short-circuit analysis indicates a potential to exceed or approach the existing fault rating of the transmission facilities.

The scenarios to be studied are as shown in Table 5-1.

6 Mitigation Measures

6.1 Development

Mitigation measures may be required if the post-Project study results identify system performance issues. Mitigation measures for the Project may involve modifying or adding real-time operational practices and/or remedial action schemes (RASs).

The Studies Consultant must notify the AESO of any system performance issues in a timely manner, following which the AESO Studies Engineer may instruct the Studies Consultant as follows:

- Develop tables showing the constraint effective factors[5] for generation or load based on thermal criteria violations that are observed.
- Collaborate with the AESO to propose changes, if any, to the connection alternatives that could remove the requirement for a RAS.
- Collaborate with the AESO to study modifications to existing and/or planned RASs, proposed by the AESO, to ensure the coordination of existing protection schemes with the addition of any proposed protection schemes.
- Collaborate with the AESO to identify and study new RASs, if any, that may be required to ensure system reliability is maintained after connecting the Project to the AIES.

The AESO Studies Engineer will work closely with the Studies Consultant and guide the development and/or modifications of the proposed mitigation measures to ensure system reliability, security and compliance with AESO ID #2018-018T, *Provision of System Access Service and the Connection Process*.

6.2 Evaluation

6.2.1 Post-Mitigation Studies

Studies to evaluate the effectiveness of mitigation measures, if required, will be performed in accordance with the technical criteria, assumptions, and methods provided in this Study Scope and in accordance with further instructions from the AESO.

6.2.2 Constraint Effective Factor Studies

Constraint effective factor analysis are used to determine the generator- and load- constraint effective factors and to identify the most effective generators or loads to manage the thermal criteria violations, if any, that are observed under Category B conditions.

[5] Constraint effective factor studies are performed to determine the generator- and load- constraint effective factors. Constraint effective factors are used to estimate the ability of generators and loads to manage transmission constraints. A generator's or load's constraint effective factor is defined as the change in power flow over a specific transmission line following a change in the generator's energy production or in the load's energy consumption. The greater the constraint effective factor, the more effective a generator or load can be in managing a thermal criteria violation on the specific transmission line.

7 Changes to Study Assumptions

This study will utilize the AESO's planning base cases, which are based on the AESO's current corporate forecast (2021 LTO) with modifications to incorporate the latest forecast intelligence. Sensitivity studies or restudy may be required in the event of revisions to the AESO's corporate forecast, forecast intelligence, or other study assumptions. Additional engineering studies may also be required to assess new connection alternatives, changes to project ISD, or delays in proposed system developments. Any additional or revised study requirements shall be captured in a signed Study Scope Amendment document.

Attachment A: Transmission Planning Criteria – Basis and Assumptions

Transmission Planning Criteria – Basis and Assumptions

Date: July 9, 2019

Version: V1.2

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1. Introduction

This document presents the reliability standards, criteria, and assumptions to be used as the basis for planning the Alberta Transmission System. The criteria, standards and assumptions identified in this document supersede those previously established.

2. Transmission Reliability Standards and Criteria[1]

The AESO applies the following Alberta Reliability Standards to ensure that the transmission system is planned to meet applicable performance requirements under a defined set of system conditions and contingencies. A brief description of each of these standards is given below:

1. **TPL-001-AB-0: System Performance Under Normal Conditions**

   Category A represents a normal system condition with all elements in service (N-0). All equipment must be within its applicable rating, voltages must be within their applicable ratings and the system must be stable with no cascading outages. Under Category A, electric supply to load cannot be interrupted and generating units cannot be removed from service.

2. **TPL-002-AB1-0: System Performance Following Loss of a Single BES Element**

   Category B events result in the loss of any single element (N-1) under specified fault conditions with normal clearing. The specified elements are a generating unit, a transmission circuit, a transformer or a single pole of a direct current transmission line. The acceptable impact on the system is the same as Category A with the exception that radial customers or some local network customers, including loads or generating units, are allowed to be disconnected from the system if they are connected through the faulted element. The loss of opportunity load or opportunity interchanges is allowed. No cascading can occur.

3. **TPL-003-AB-0: System Performance Following Loss of Two or More BES Elements**

   Category C events result in the loss of two or more bulk electric system elements (sequential, N-1-1 or concurrent, N-2) under specified fault conditions and include both normal and delayed fault clearing. All of the system limits for Category A and B events apply with the exception that planned and controlled loss of firm load, firm transfers and/or generation is acceptable provided there is no cascading.

4. **TPL-004-AB-0: System Performance Following Extreme BES Events**

   Category D represents a wide variety of extreme, rare and unpredictable events, which may result in the loss of load and generation in widespread areas. The system may not be able to reach a new stable steady state, which means a blackout is a possible outcome. The AESO needs to evaluate these events, at its discretion, for risks and consequences prior to creating mitigation plans.

5. **FAC-014-AB1-2: Establishing and Communicating System Operating Limits**

   The AESO is required to establish system operating limits where a contingency is not mitigated through construction of transmission facilities

[1] A complete description of the *Alberta Reliability Standards* can be found on the AESO's website: https://www.aeso.ca/rules-standards-and-tariff/alberta-reliability-standards/

2.1 Thermal Loading Criteria

The AESO Thermal Loading Criteria require that the continuous thermal rating of any transmission element is not exceeded under normal and post-contingency operating conditions. Thermal limits are assumed to be 100% of the respective normal summer and winter ratings. Emergency limits are not considered in the planning evaluations.

2.2 Voltage Range and Voltage Stability Criteria

The normal minimum and maximum voltage limits as specified in the following table are used to identify Category A system voltage violations, while the extreme minimum and maximum limits are used to identify Category B and C system violations. Table 2-1 presents the acceptable steady state and contingency state voltage ranges for the AIES. Table 2-2 provides voltage stability criteria used to test the system performance.

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

Nominal Voltage	Extreme Minimum	Normal Minimum	Normal Maximum	Extreme Maximum
500	475	500	525	550
240	216	234	252	264
260 (Northeast & Northwest)*	234	247	266	275
144	130	137	151	155
138	124	135	145	150
72	65	68.5	75.5	79
69	62	65.5	72.5	76

Table 2-2: Voltage Stability Criteria

Performance Level	Disturbance (1)(2)(3)(4) Initiated by: Fault of No Fault DC Disturbance	MW Margin (P-V method) (5)(6)(7)	MVAr Margin (V-Q method) (6)(7)
A	Any element such as: One Generator One Circuit One Transformer One Reactive Power Source One DC Monopole	≥5%	Worst Case Scenario(8)
B	Bus Section	≥5%	50% of Margin Requirement in Level A
C	Any combination of two elements such as: A Line and a Generator A Line and a Reactive Power Source Two Generators Two Circuits Two Transformers Two Reactive Power Sources DC Bipole	≥2.5%	50% of Margin Requirement in Level A
D	Any combination of three or more elements such as: Three or More Circuits on ROW Entire Substation Entire Plant Including Switchyard	> 0	> 0

2.3 Transient Stability Analysis Assumptions

Standard fault clearing times as shown in Table 2-3 are used for the new facilities or when the actual clearing times are not available for the existing facilities. Double line-to-ground faults are applied for the Category C5 events with normal clearing times. Single line-to-ground faults are applied for Category C6 to C9 events with delayed clearing times as depicted in Table 2-4 and Table 2-5.

Table 2-3: Fault Clearing Times

Nominal (kV)	Near End (Cycles)	Far End (Cycles)
500	4	5
240	5	6
144/138 with telecommunications	6	8
144/138 without telecommunications	6	30

Table 2-4: Stuck Breaker Clearing Times for Lines

Voltage (kV)	Fault Clearing Times (Cycles)		
	Near End	Far End	2nd Ckt (C5 and C7 only)
138/144	15	24	24
240	12	6	14
500	9	5	11

Table 2-5: Stuck Breaker Clearing Times for Transformers

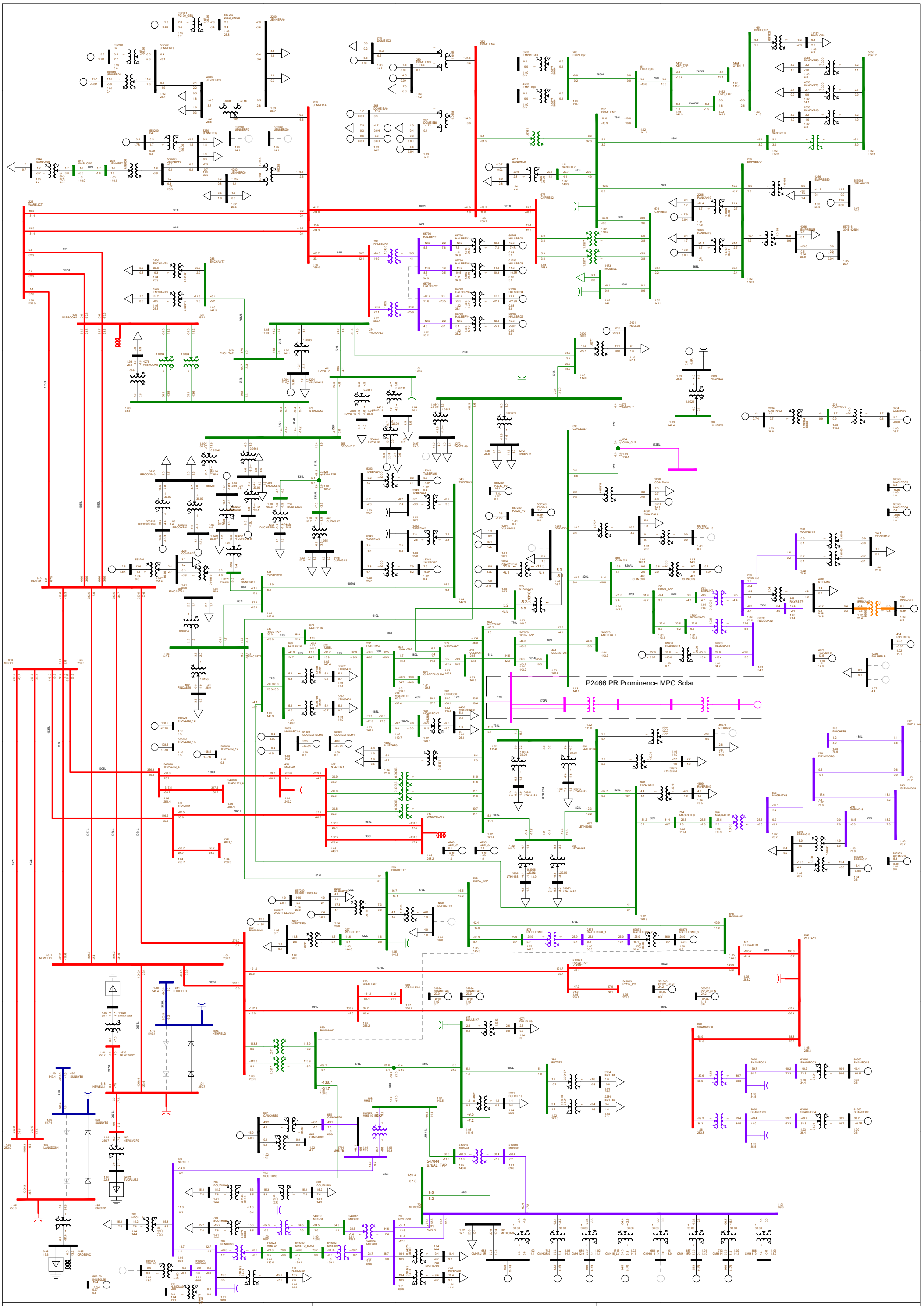
Voltage (kV)	Fault Location	Fault Clearing Times (Cycles)		
		High Side	Low Side	2nd Ckt (breaker fail)
240/138	240 kV side	12	6	14
	138 kV side	5	15	24
500/240	500 kV side	9	5	11
	240 kV side	4	12	14

Attachment A2

Pre-Project Power Flow Diagrams

Table A2-1: List of 2024 Summer Light Pre-Project Load Flow Diagrams

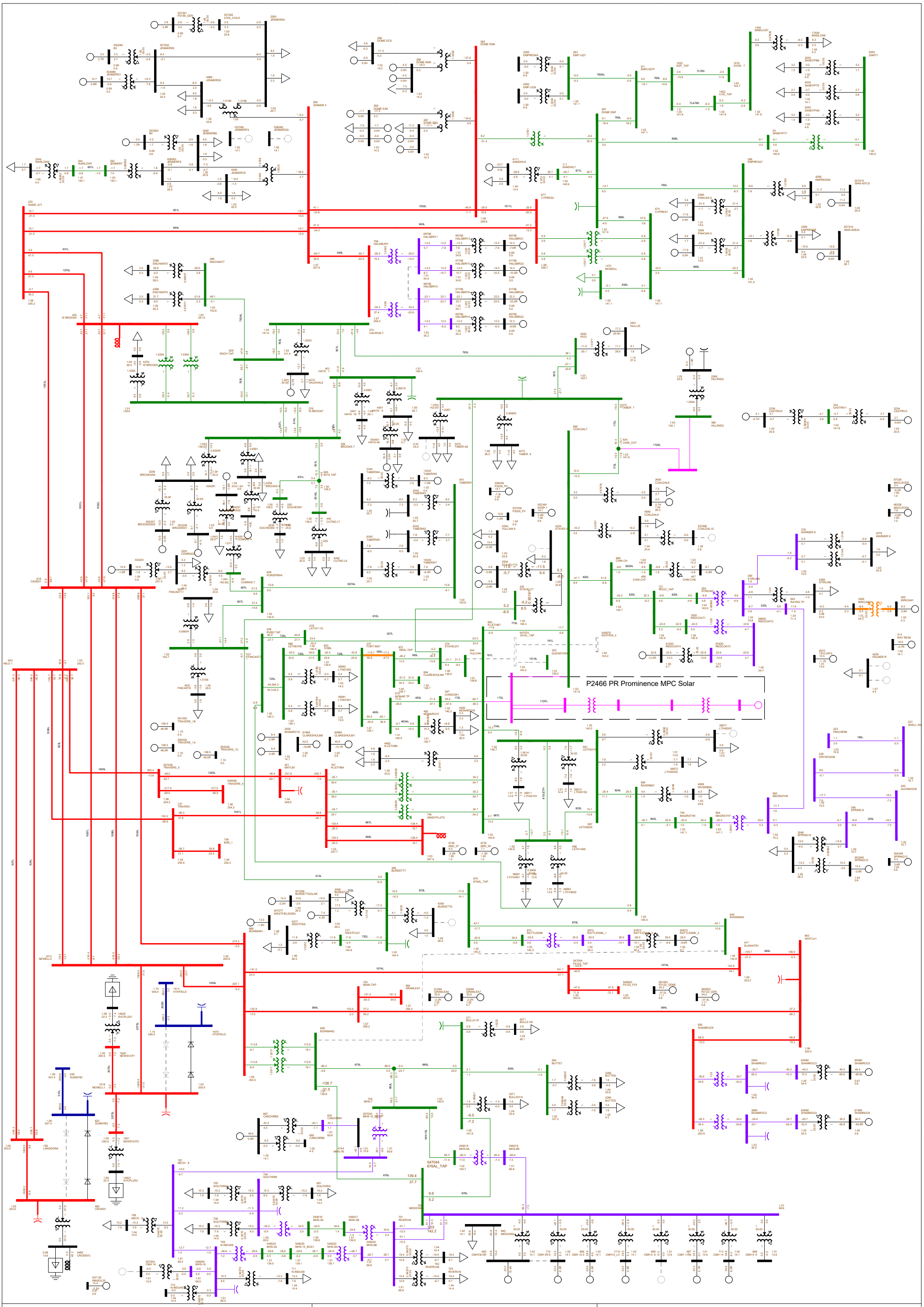
Figure	Category	Contingency
A2-1 SL Pre - 1	A (N-0)	System Normal
A2-1 SL Pre - 2	B (N-1)	161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)
A2-1 SL Pre - 3	B (N-1)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
A2-1 SL Pre- 4	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A2-1 SL Pre - 5	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A2-1 SL Pre- 6	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A2-1 SL Pre- 7	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A2-1 SL Pre- 8	B (N-1)	225ST1 (Magrath 225S Transformer T1)



2024SL SC1 PRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:20

A 2-1 SL Pre - 1

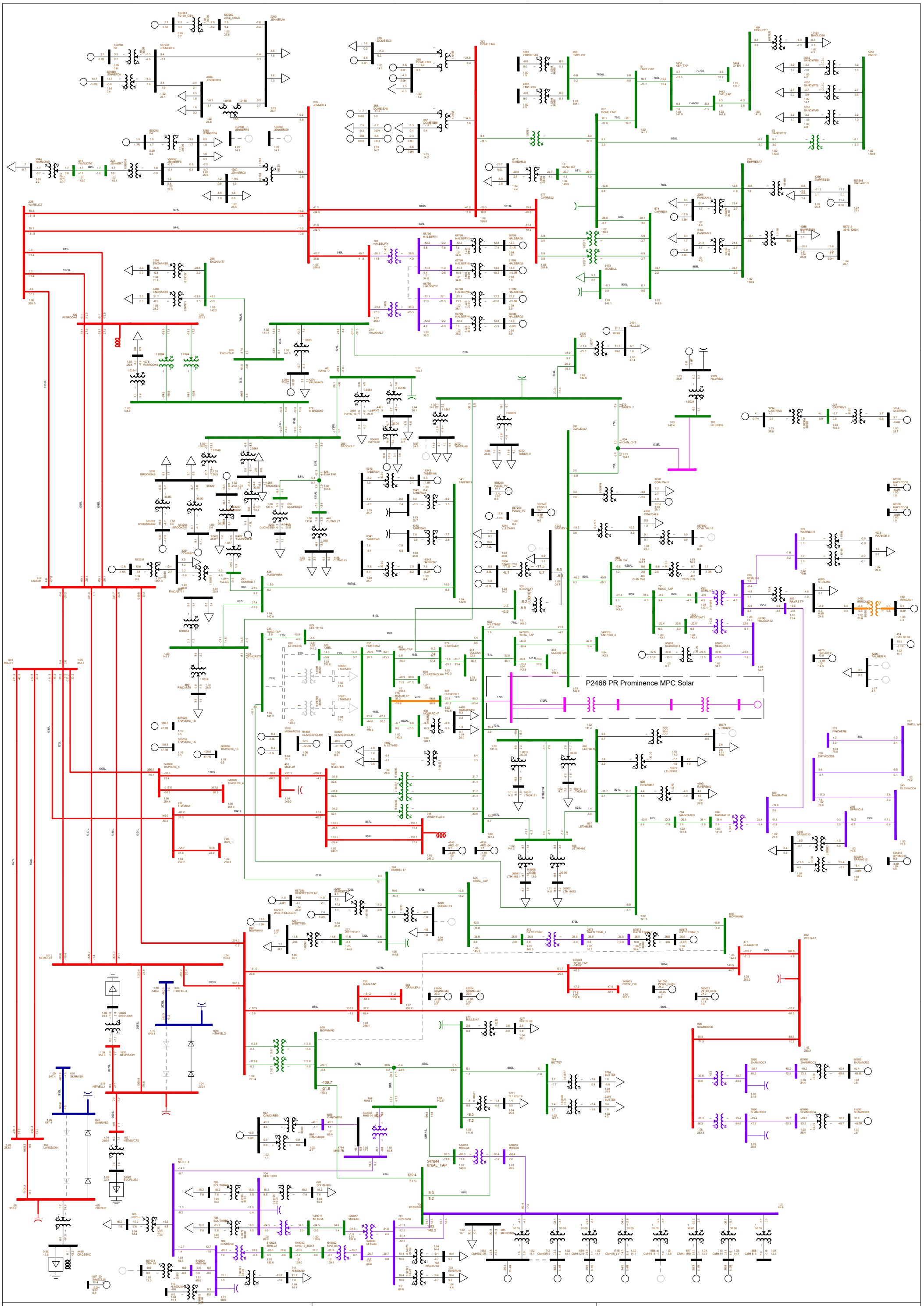
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC1 PRE
161L OR 161AL CONTINGENCY
WED, JUL 05 2023 11:21

A 2-1 SL Pre - 2

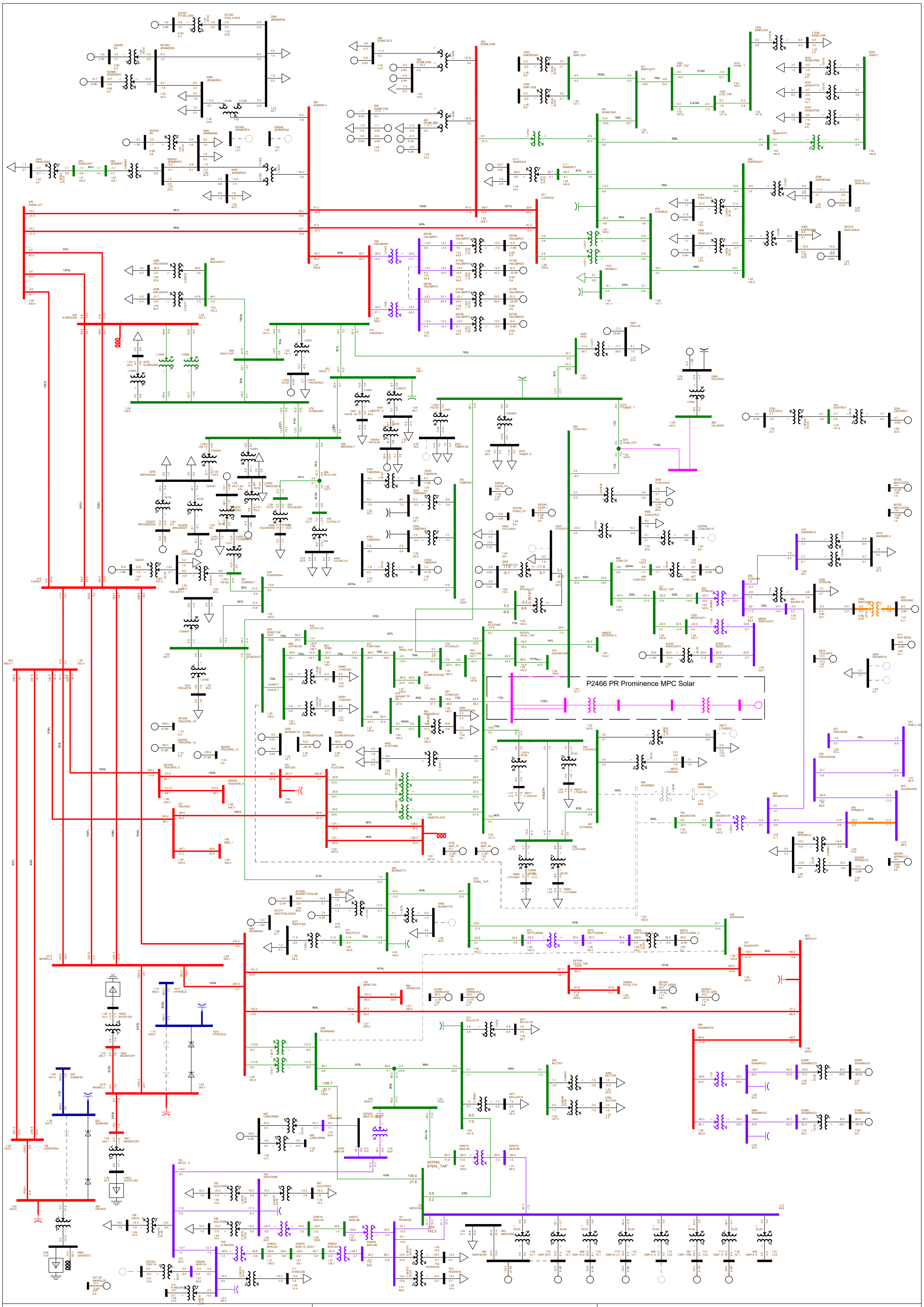
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC1 PRE
BOWRON 674ST1 OR T2 CONTINGENCY
WED, JUL 05 2023 11:21

A 2-1 SL Pre - 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC1 PRE
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 11:21

A 2-1 SL Pre - 4

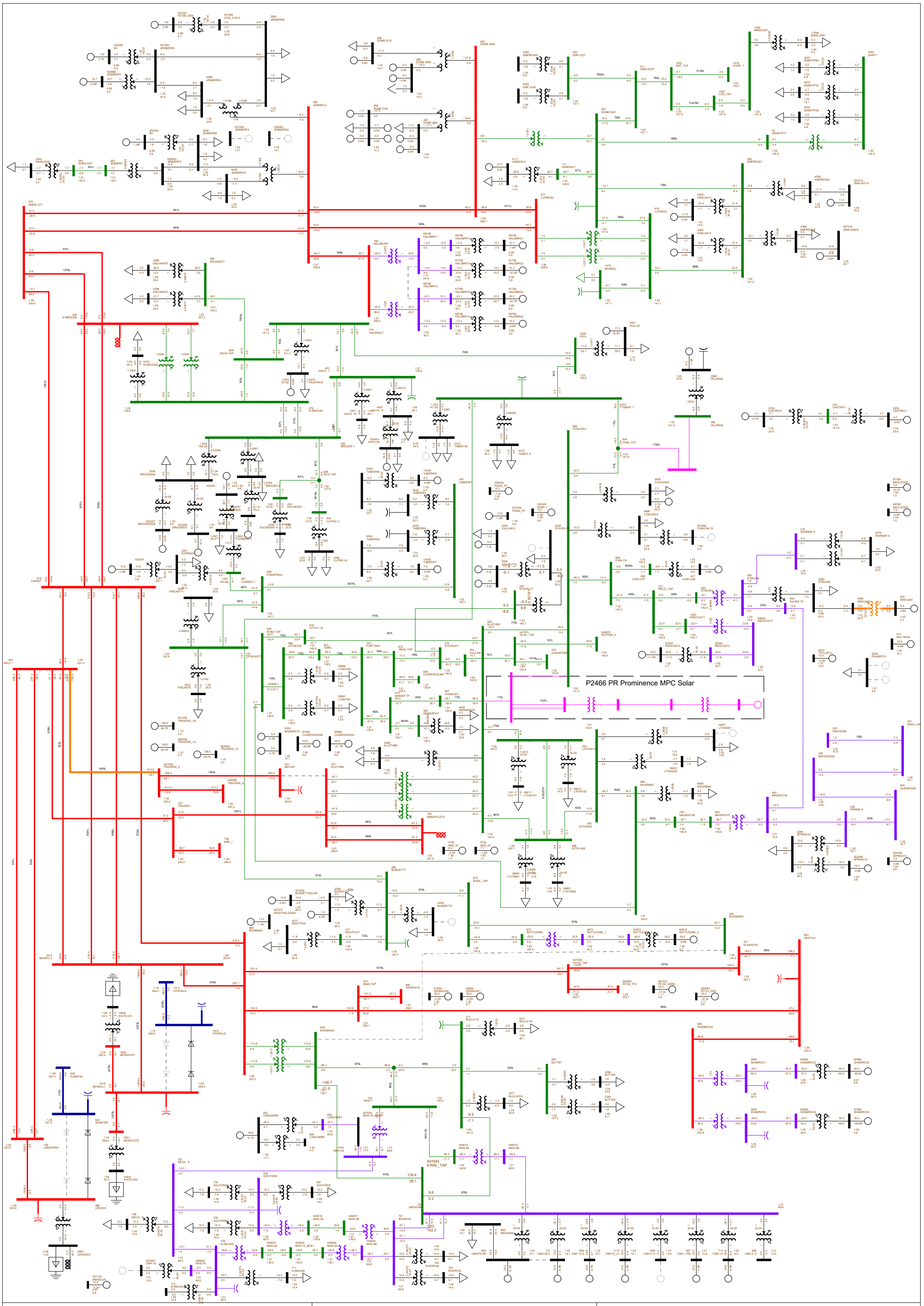
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC1 PRE
86SL CONTINGENCY
WED, JUL 05 2023 11:21

A 2-1 SL Pre - 5

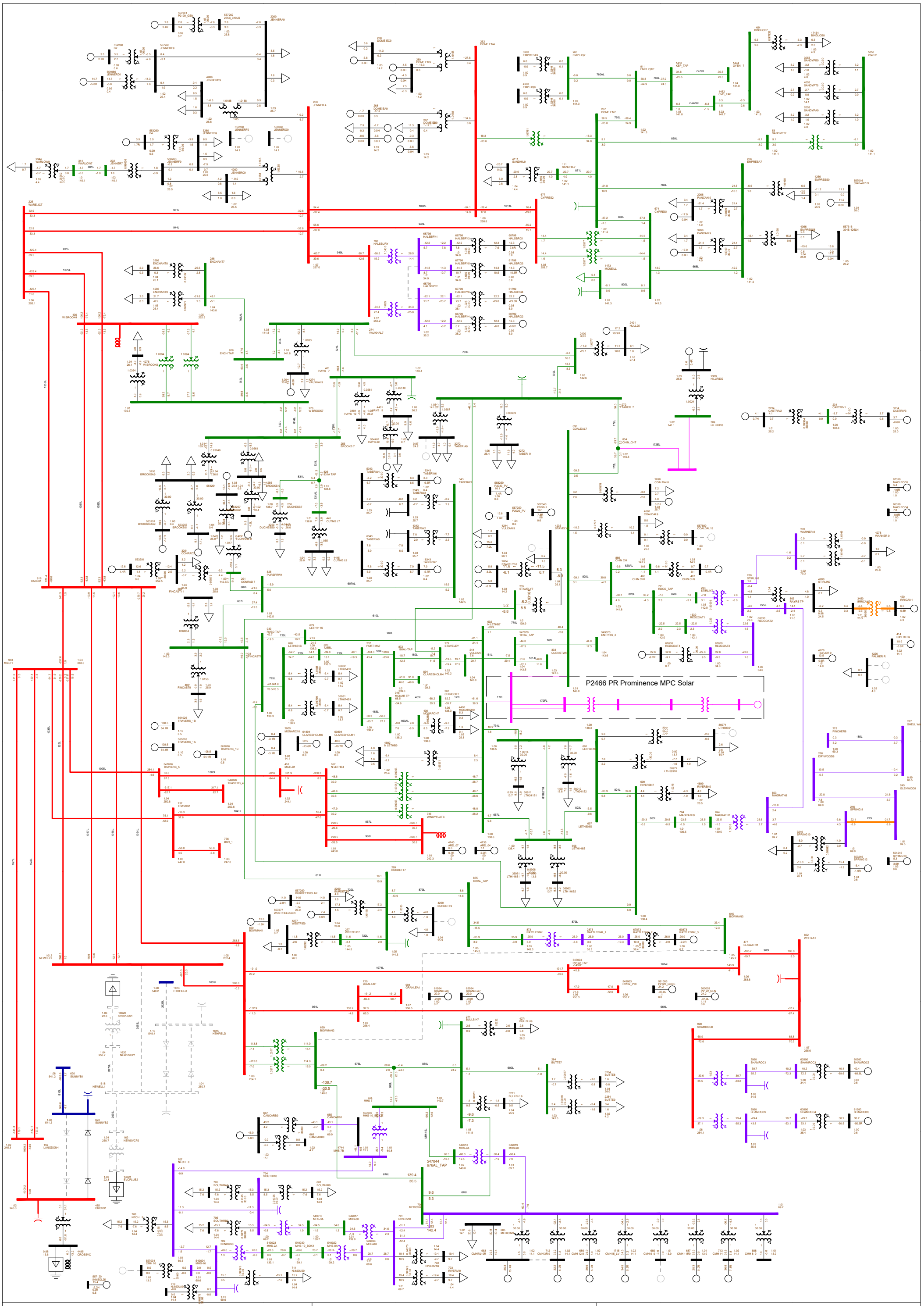
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC1 PRE
94/L CONTINGENCY
WED, JUL 05 2023 11:21

A 2-1 SL Pre - 6

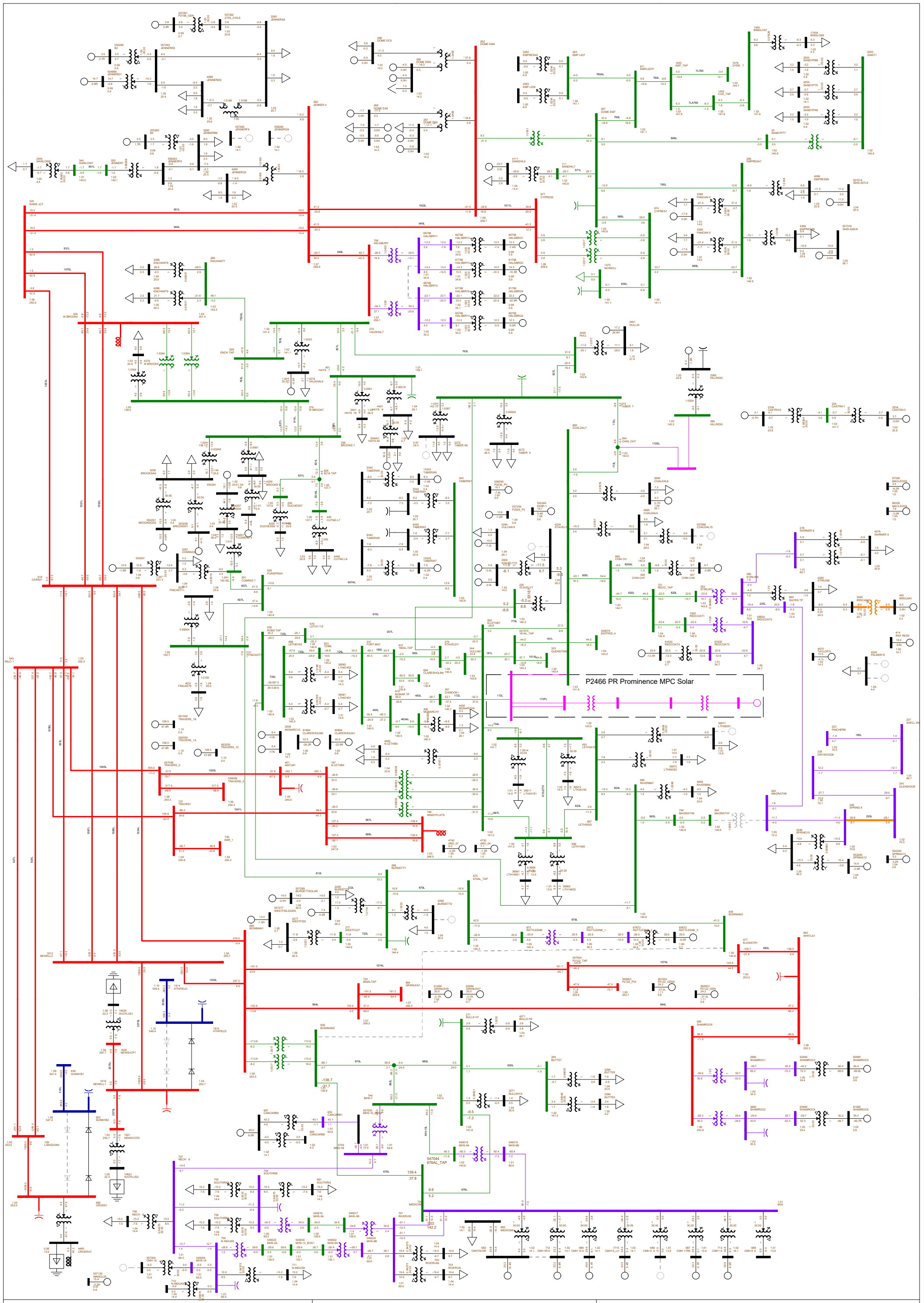
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



202ASL SC1 PRE
EATL CONTINGENCY
WED, JUL 05 2023 11:22

A 2-1 SL Pre - 7

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



202ASL SC1 PRE
MAGRATH 22SST1 CONTINGENCY
WED, JUL 05 2023 11:22

A 2-1 SL Pre - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A2-2: List of 2024 Summer Peak Pre-Project Load Flow Diagrams

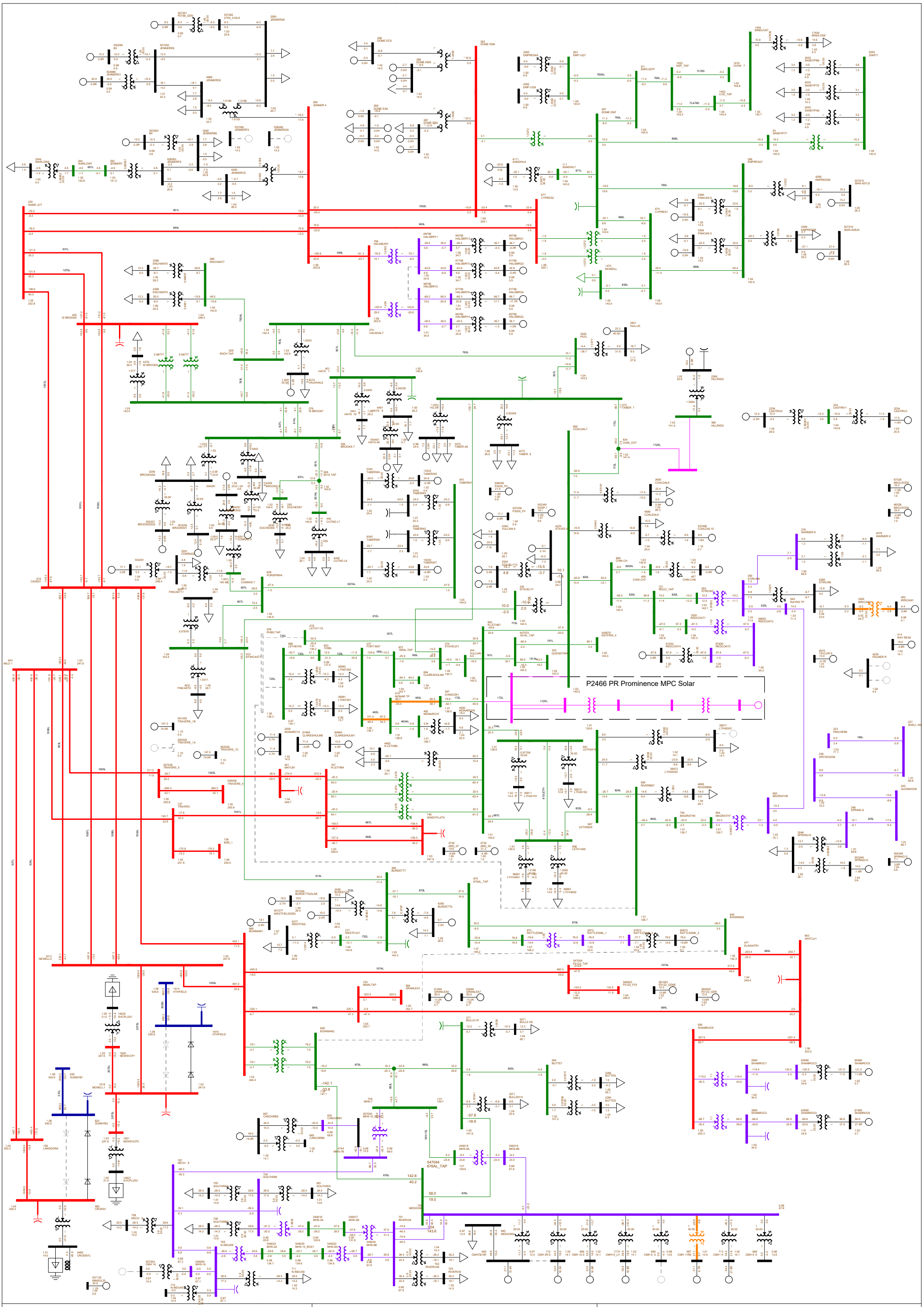
Figure	Category	Contingency
A2-2 SP Pre - 1	A (N-0)	System Normal
A2-2 SP Pre - 2	B (N-1)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
A2-2 SP Pre - 3	B (N-1)	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)
A2-2 SP Pre- 4	B (N-1)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
A2-2 SP Pre - 5	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A2-2 SP Pre- 6	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A2-2 SP Pre- 7	B (N-1)	935L (Cassils 324S - Milo 356S)
A2-2 SP Pre- 8	B (N-1)	924L (Langdon 102S - Milo 356S)
A2-2 SP Pre- 9	B (N-1)	927L (Langdon 102S - Milo 356S)
A2-2 SP Pre- 10	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A2-2 SP Pre- 11	B (N-1)	610L (Fincastle 336S - Taber 83S)
A2-2 SP Pre- 12	B (N-1)	172L (Chinook 181S - North Lethbridge 370S)
A2-2 SP Pre- 13	B (N-1)	225ST1 (Magrath 225S Transformer T1)

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:22

A 2-2 SP Pre - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC2 PRE
725L OR 725AL CONTINGENCY
WED, JUL 05 2023 11:22

A 2-2 SP Pre - 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
463L OR 463AL CONTINGENCY
WED, JUL 05 2023 11:23

A 2-2 SP Pre - 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

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2024SP SC2 PRE
BOWRON 674ST1 OR T2 CONTINGENCY
WED, JUL 05 2023 11:23

A 2-2 SP Pre - 4

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
RIVERBEND 618ST1 CONTINGENCY
WED, JUL 05 2023 11:23

A 2-2 SP Pre - 5

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
86SL CONTINGENCY
WED, JUL 05 2023 11:23

A 2-2 SP Pre - 6

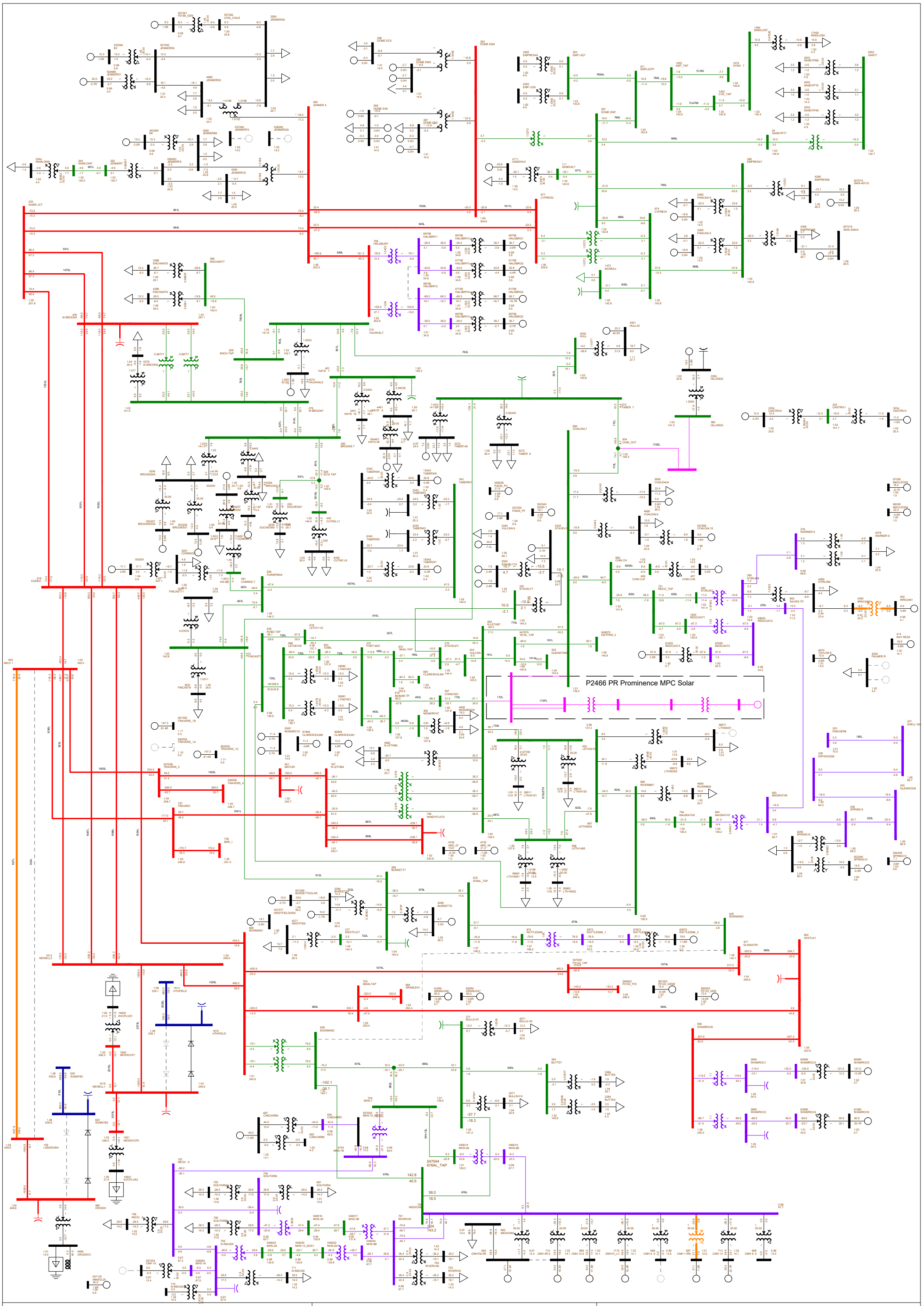
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
93SL CONTINGENCY
WED, JUL 05 2023 11:24

A 2-2 SP Pre - 7

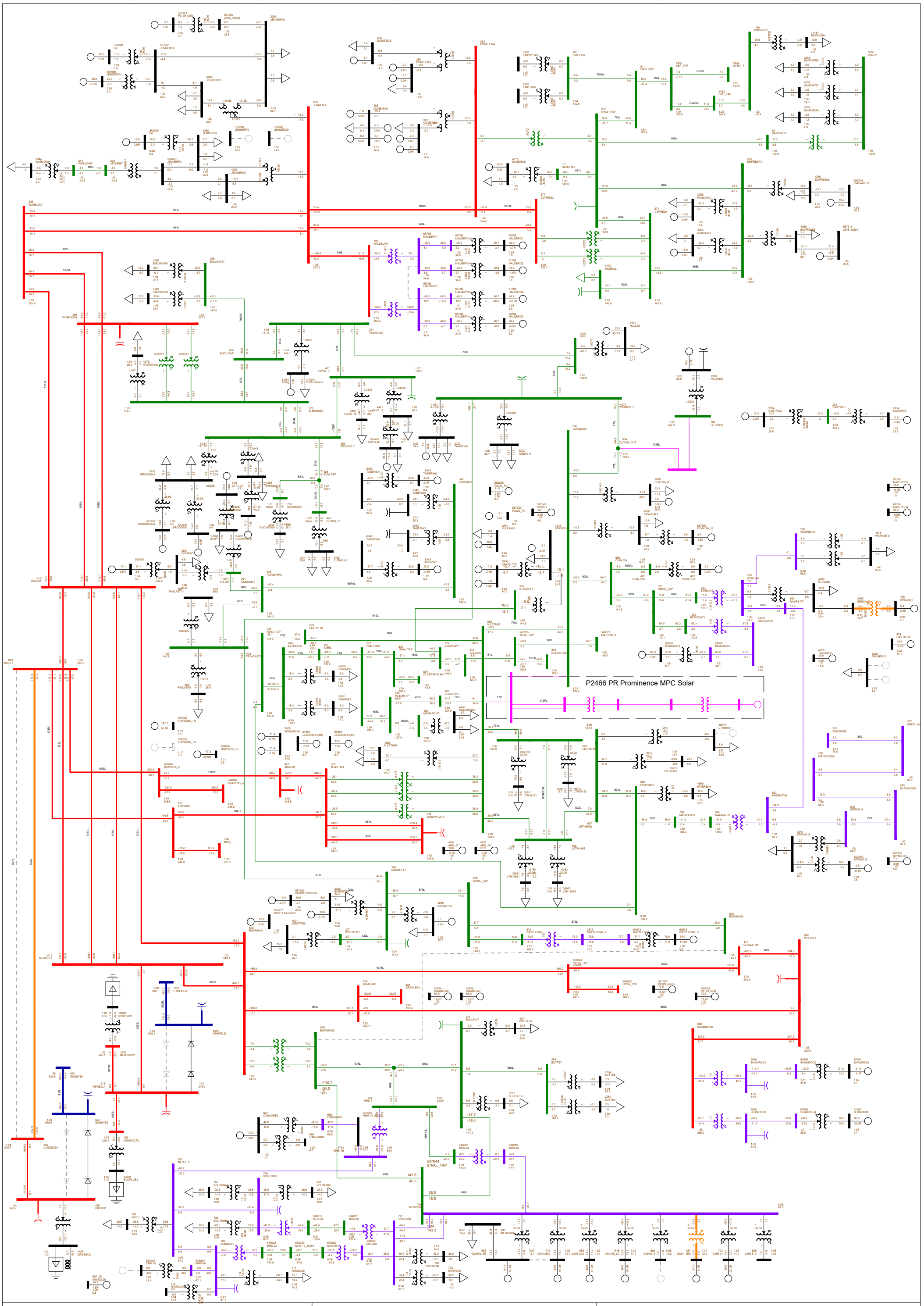
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC2 PRE
924L CONTINGENCY
WED, JUL 05 2023 11:24

A 2-2 SP Pre - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC2 PRE
92TL CONTINGENCY
WED, JUL 05 2023 11:24

A 2-2 SP Pre - 9

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
94L CONTINGENCY
WED, JUL 05 2023 11:24

A 2-2 SP Pre - 10

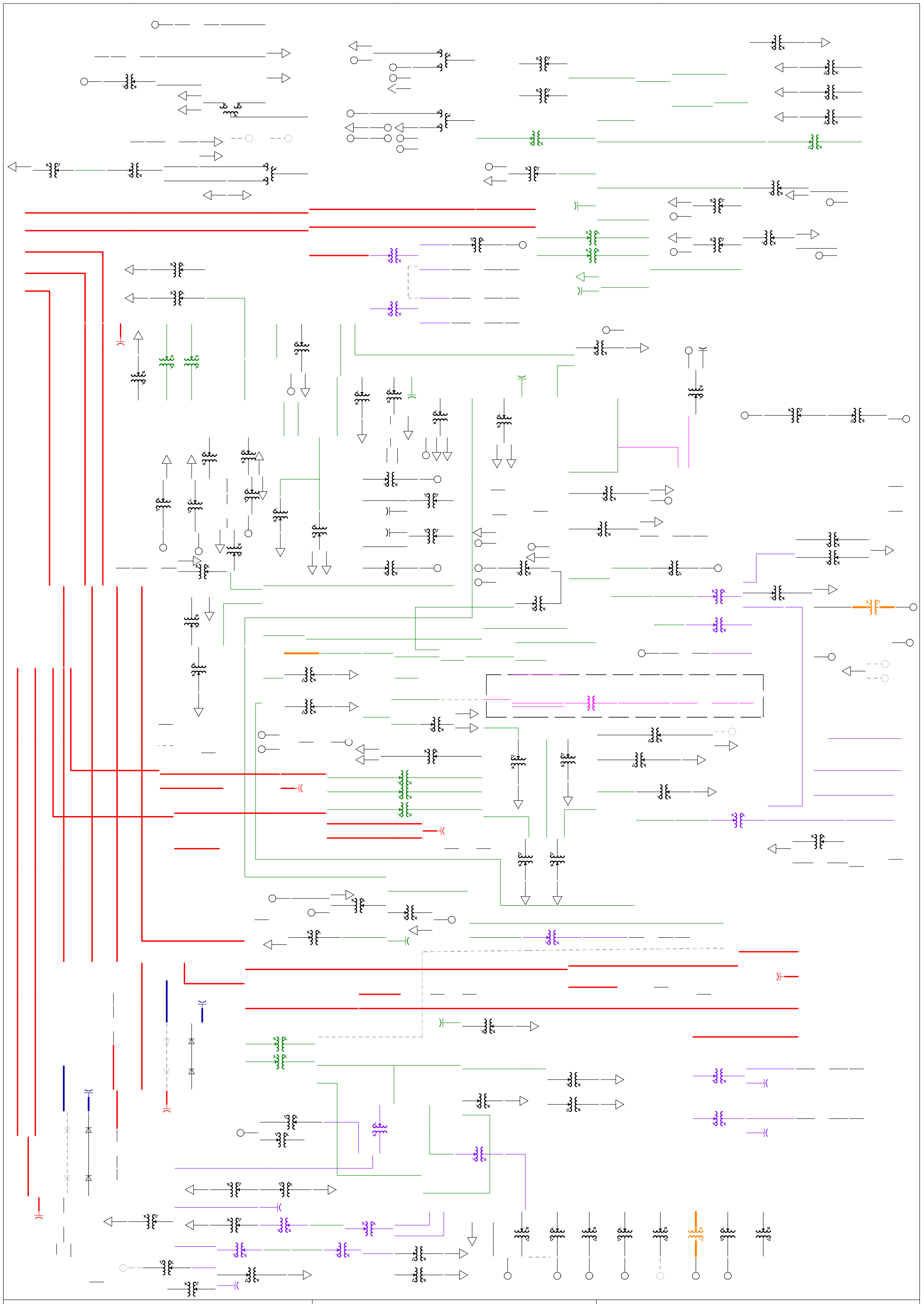
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC2 PRE
61L CONTINGENCY
WED, JUL 05 2023 11:25

A 2-2 SP Pre - 11

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



A 2-2 SP Pre - 12

P2466 PR Prominence MPC Solar

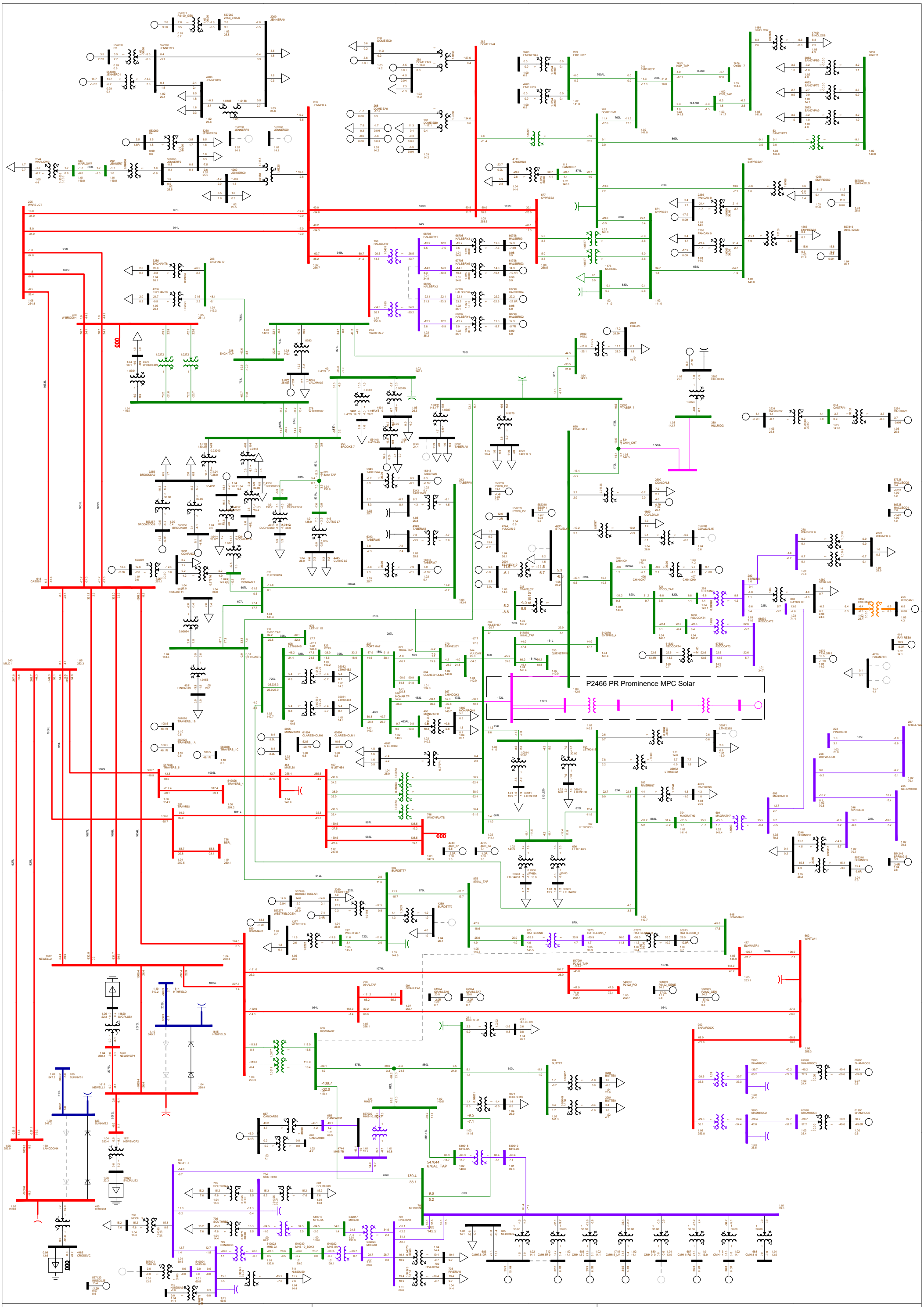
202ASP SC2 PRE
MAGRATH 25ST1 CONTINGENCY
WED, JUL 05 2023 11:25

A 2-2 SP Pre - 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A2-3: List of 2024 Summer Light Sensitivity Pre-Project Load Flow Diagrams

Figure	Category	Contingency
A2-3 SL Pre - 1	A (N-0)	System Normal
A2-3 SL Pre - 2	B (N-1)	161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)
A2-3 SL Pre - 3	B (N-1)	674ST1 or T2 (Boron 674S Transformer T1 or T2)
A2-3 SL Pre- 4	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A2-3 SL Pre - 5	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A2-3 SL Pre- 6	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A2-3 SL Pre- 7	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A2-3 SL Pre- 8	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A2-3 SL Pre- 9	B (N-1)	967L (North Lethbridge 370S - Windy Flats 138S)
A2-3 SL Pre- 10	B (N-1)	968L (North Lethbridge 370S - Windy Flats 138S)



2024SL SC6 SENSPRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 12:05

A 2-3 SL Pre - 1

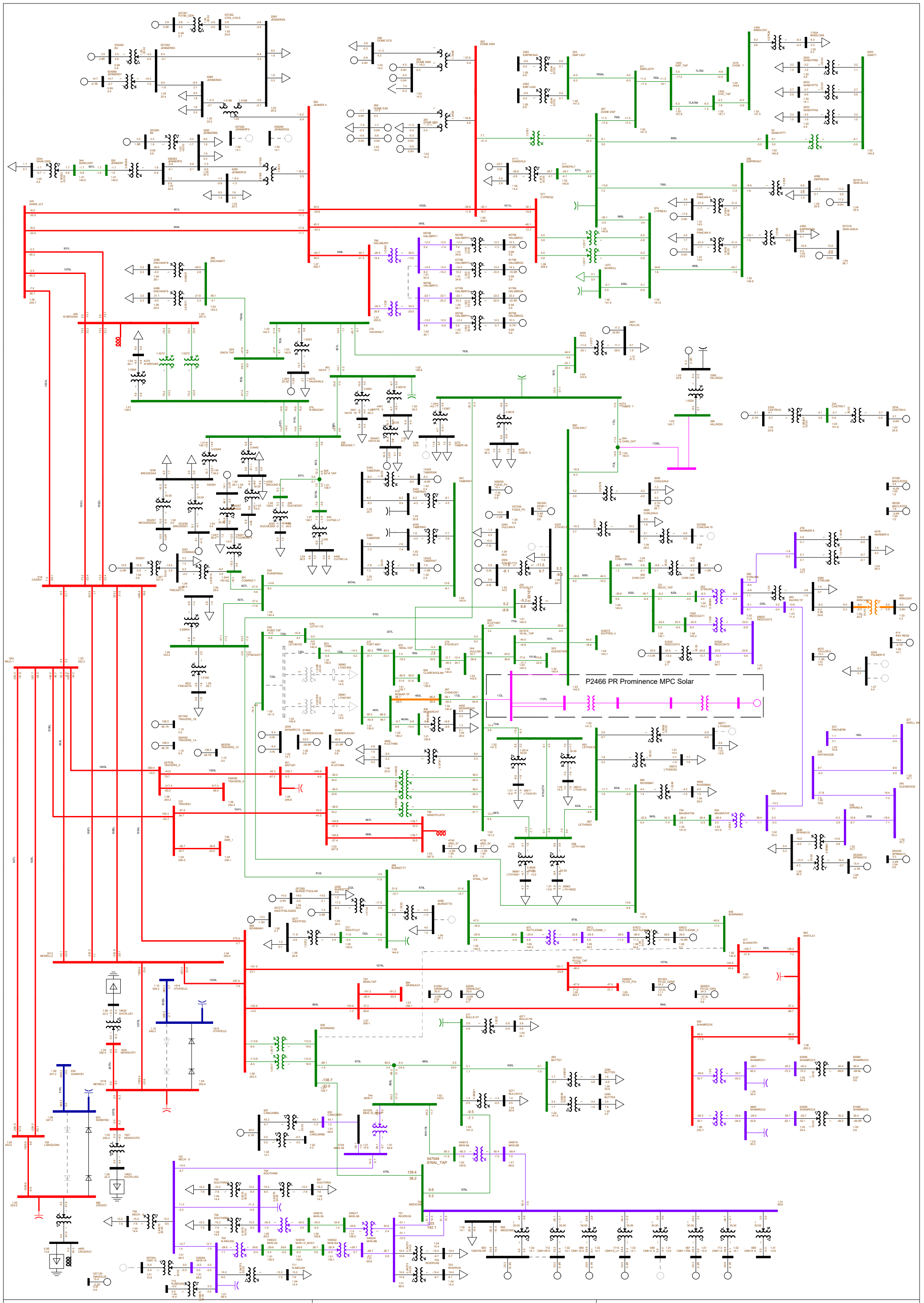
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPRE
16 SL OR 16 AL CONTINGENCY
WED, JUL 05 2023 12:06

A 2-3 SL Pre - 2

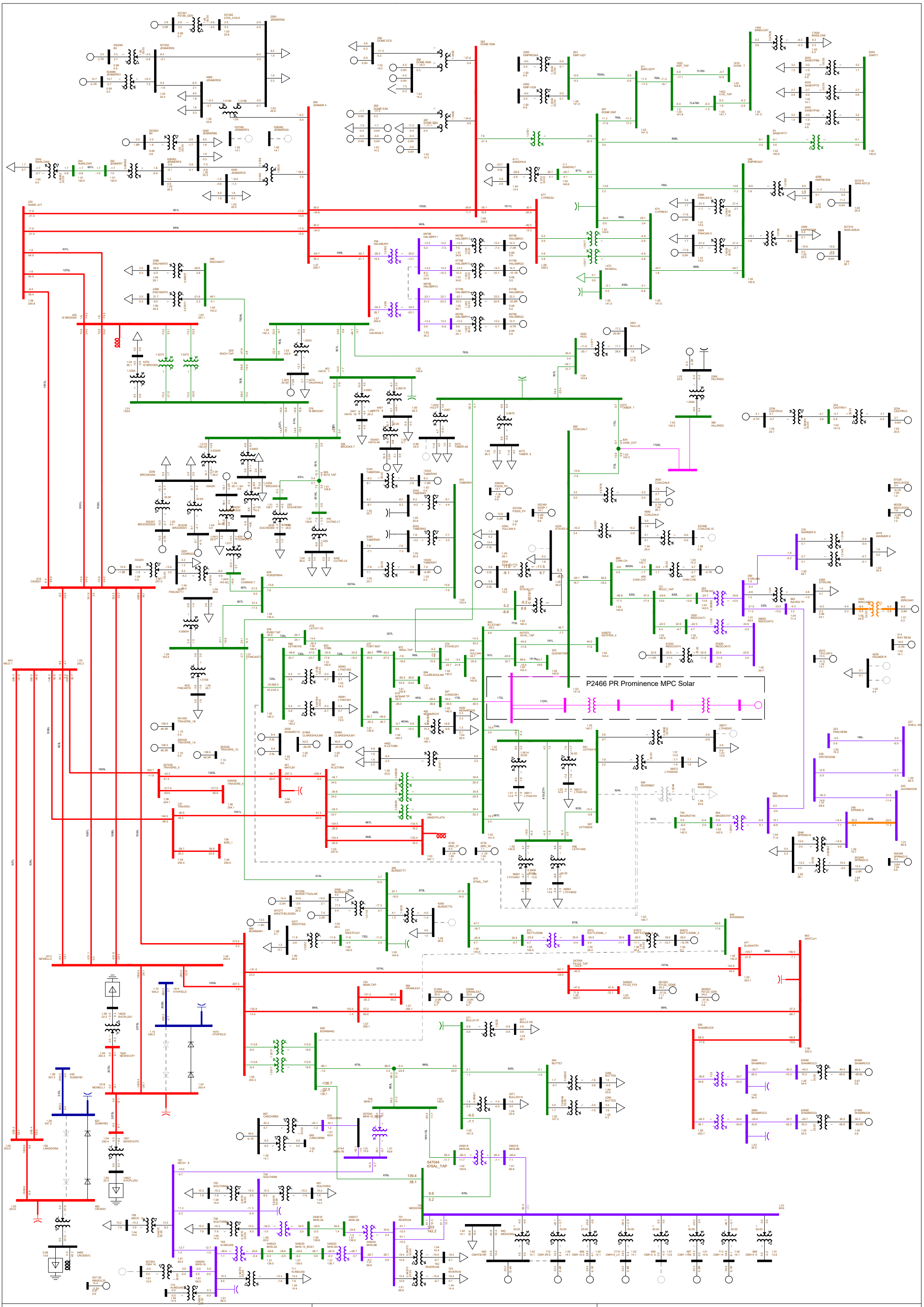
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC6 SENSPRE
BOWRON 67ASTT OR T2 CONTINGENCY
WED, JUL 05 2023 12:06

A 2-3 SL Pre - 3

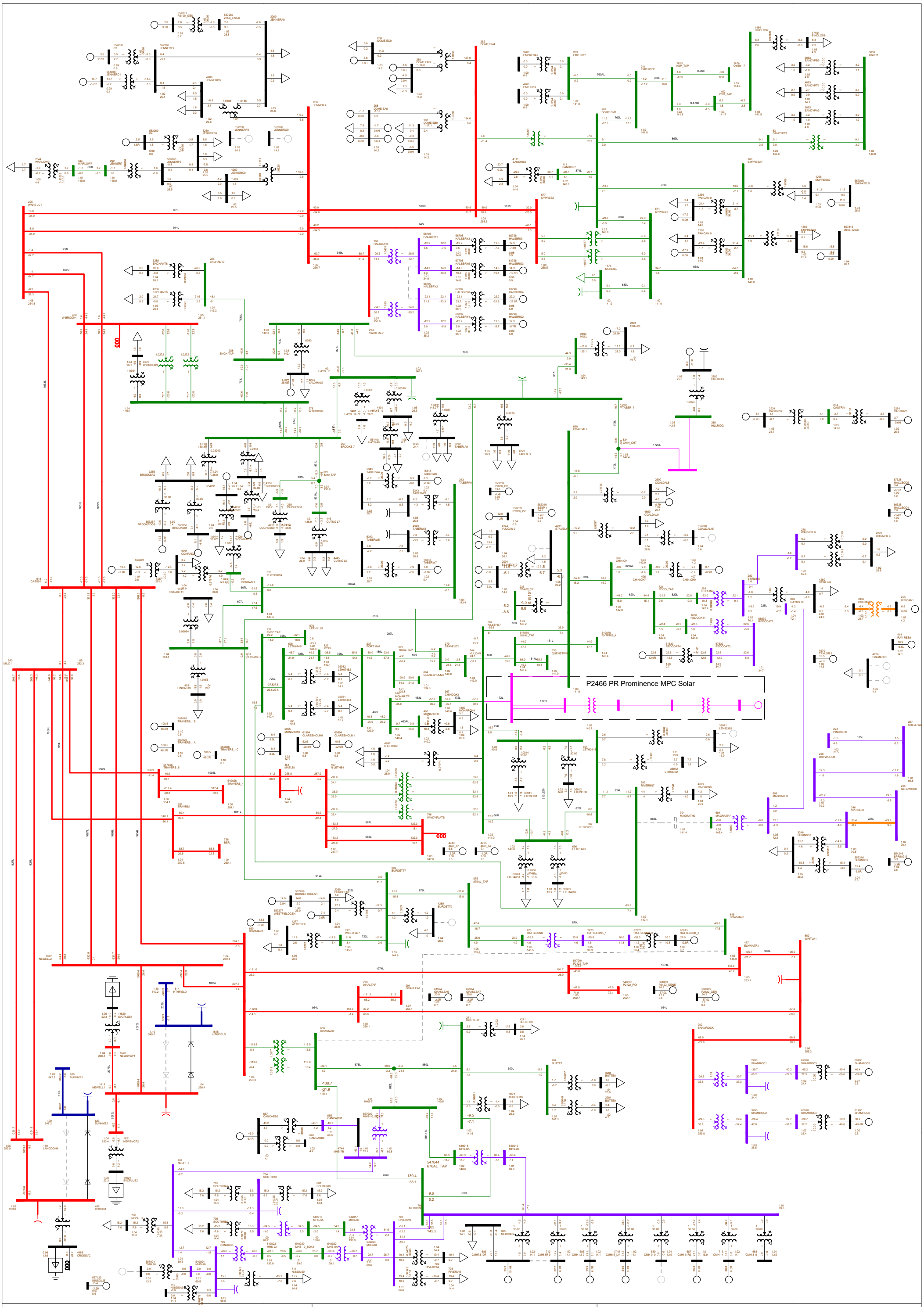
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC6 SENSPRE
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 12:06

A 2-3 SL Pre - 4

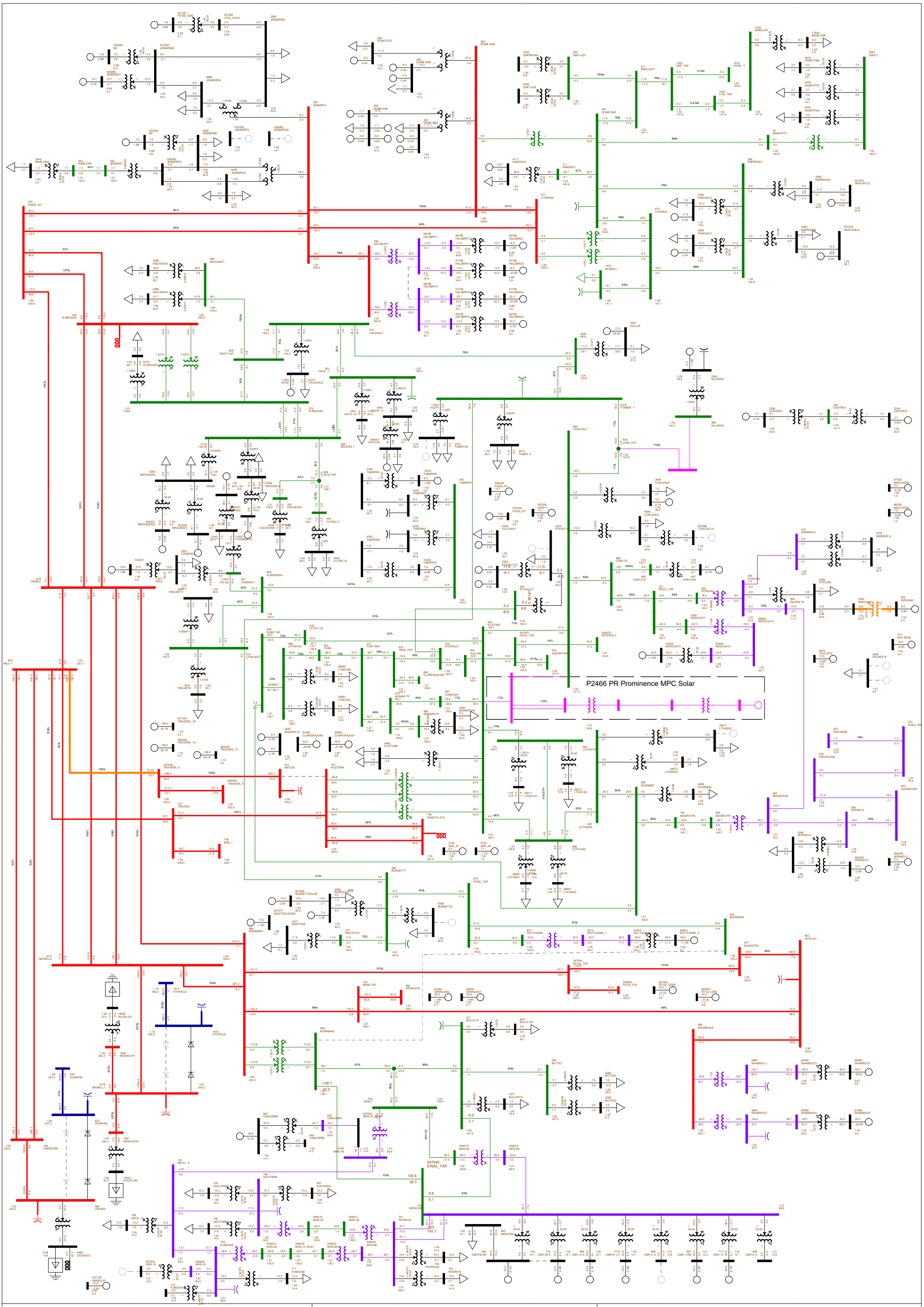
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPRE
86SL CONTINGENCY
WED, JUL 05 2023 12:06

A 2-3 SL Pre - 5

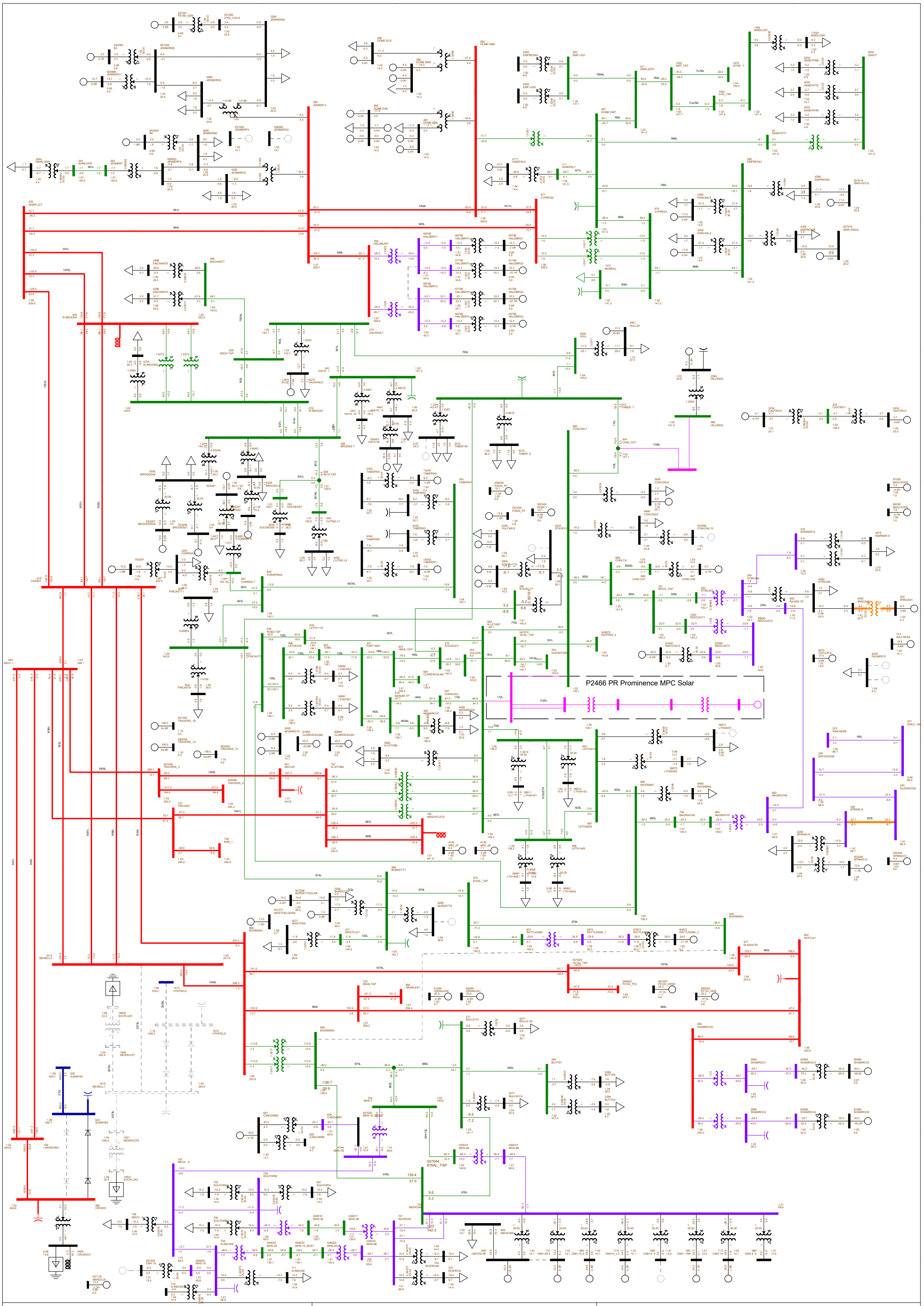
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPRE
94/L CONTINGENCY
WED, JUL 05 2023 12:07

A 2-3 SL Pre - 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC6 SENSPRE
EATL CONTINGENCY
WED, JUL 05 2023 12:07

A 2-3 SL Pre - 7

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

202ASL SC6 SENSPRE
MAGRATH 22SST1 CONTINGENCY
WED, JUL 05 2023 12:07

A 2-3 SL Pre - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

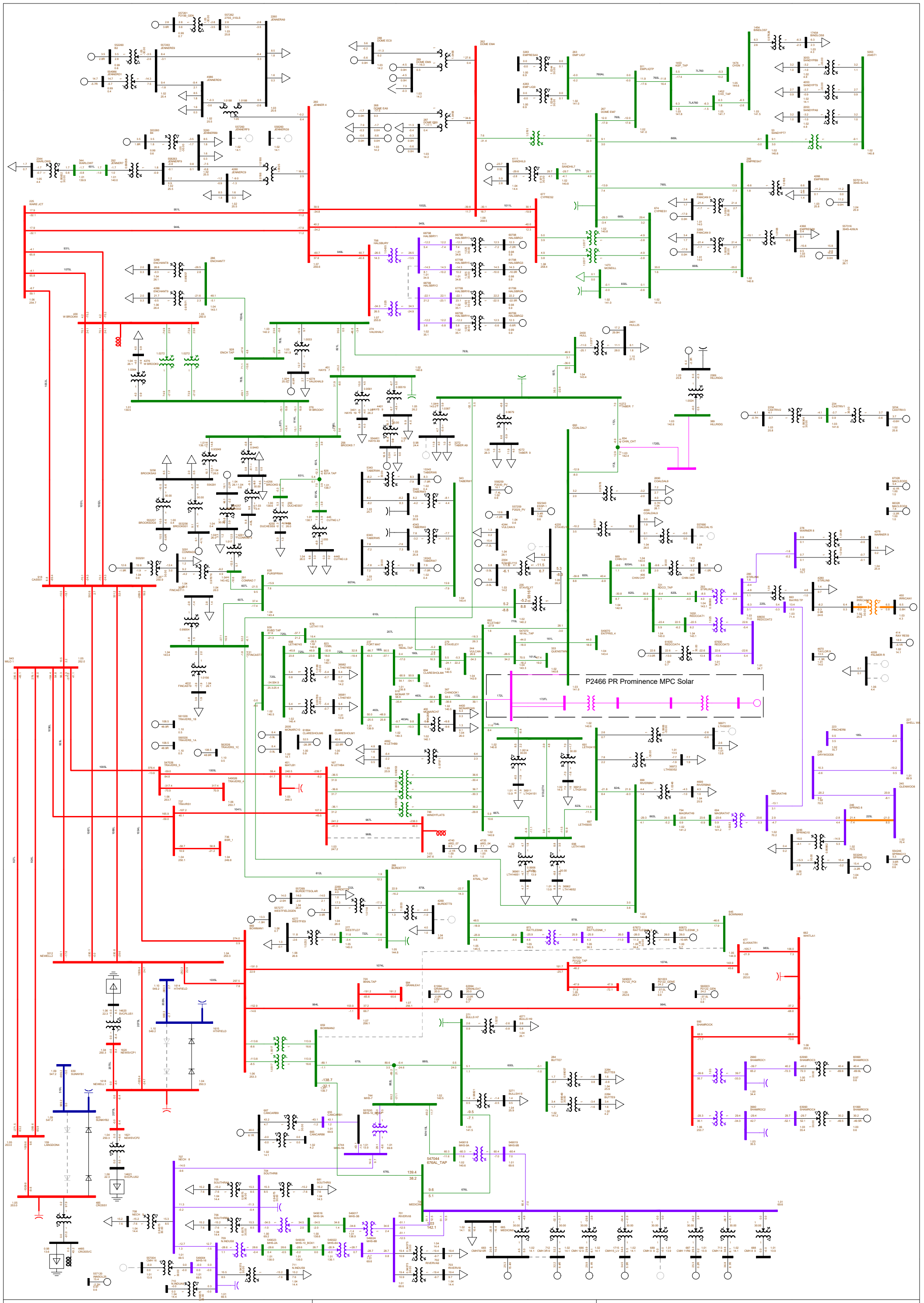
2024SL SC8 SENSPRE
WED, JUL 05 2023 12:07

98.7L CONTINGENCY

A 2-3 SL Pre - 9

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A

kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPRE
968L CONTINGENCY
WED, JUL 05 2023 12:08

A 2-3 SL Pre - 10

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A2-4: List of 2024 Summer Peak Sensitivity Pre-Project Load Flow Diagrams

Figure	Category	Contingency
A2-4 SP Pre - 1	A (N-0)	System Normal
A2-4 SP Pre - 2	B (N-1)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
A2-4 SP Pre - 3	B (N-1)	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)
A2-4 SP Pre- 4	B (N-1)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
A2-4 SP Pre - 5	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A2-4 SP Pre- 6	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A2-4 SP Pre- 7	B (N-1)	935L (Cassils 324S - Milo 356S)
A2-4 SP Pre- 8	B (N-1)	924L (Langdon 102S - Milo 356S)
A2-4 SP Pre- 9	B (N-1)	927L (Langdon 102S - Milo 356S)
A2-4 SP Pre- 10	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A2-4 SP Pre- 11	B (N-1)	610L (Fincastle 336S - Taber 83S)
A2-4 SP Pre- 12	B (N-1)	172L (Chinook 181S - North Lethbridge 370S)
A2-4 SP Pre- 13	B (N-1)	225ST1 (Magrath 225S Transformer T1)

P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:47

A 2-4 SP Pre - 1

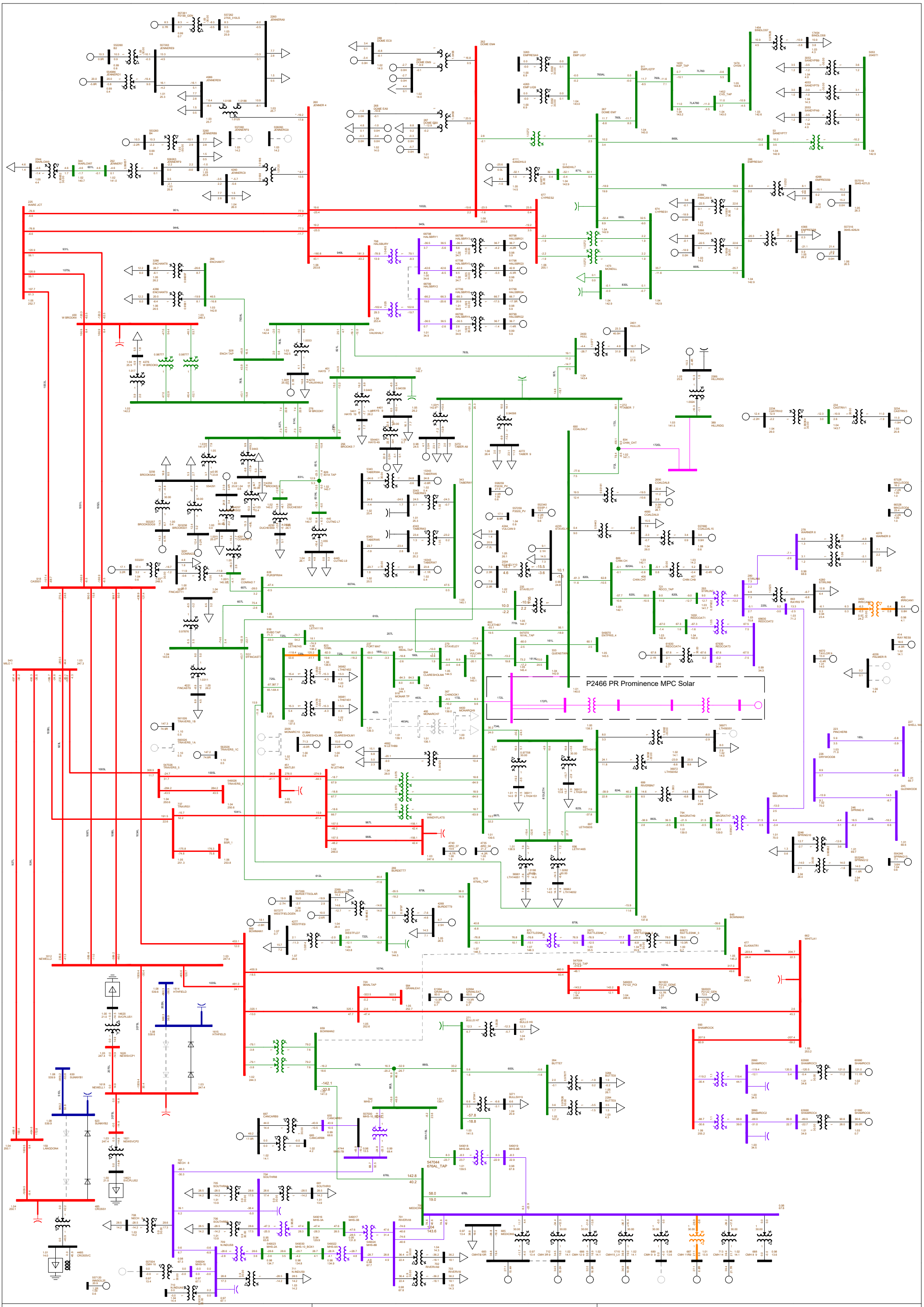
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
72SL OR 72SAL CONTINGENCY
WED, JUL 05 2023 11:47

A 2-4 SP Pre - 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC7 SEN/PSRE
463L OR 463AL CONTINGENCY
WED, JUL 05 2023 11:48

A 2-4 SP Pre - 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

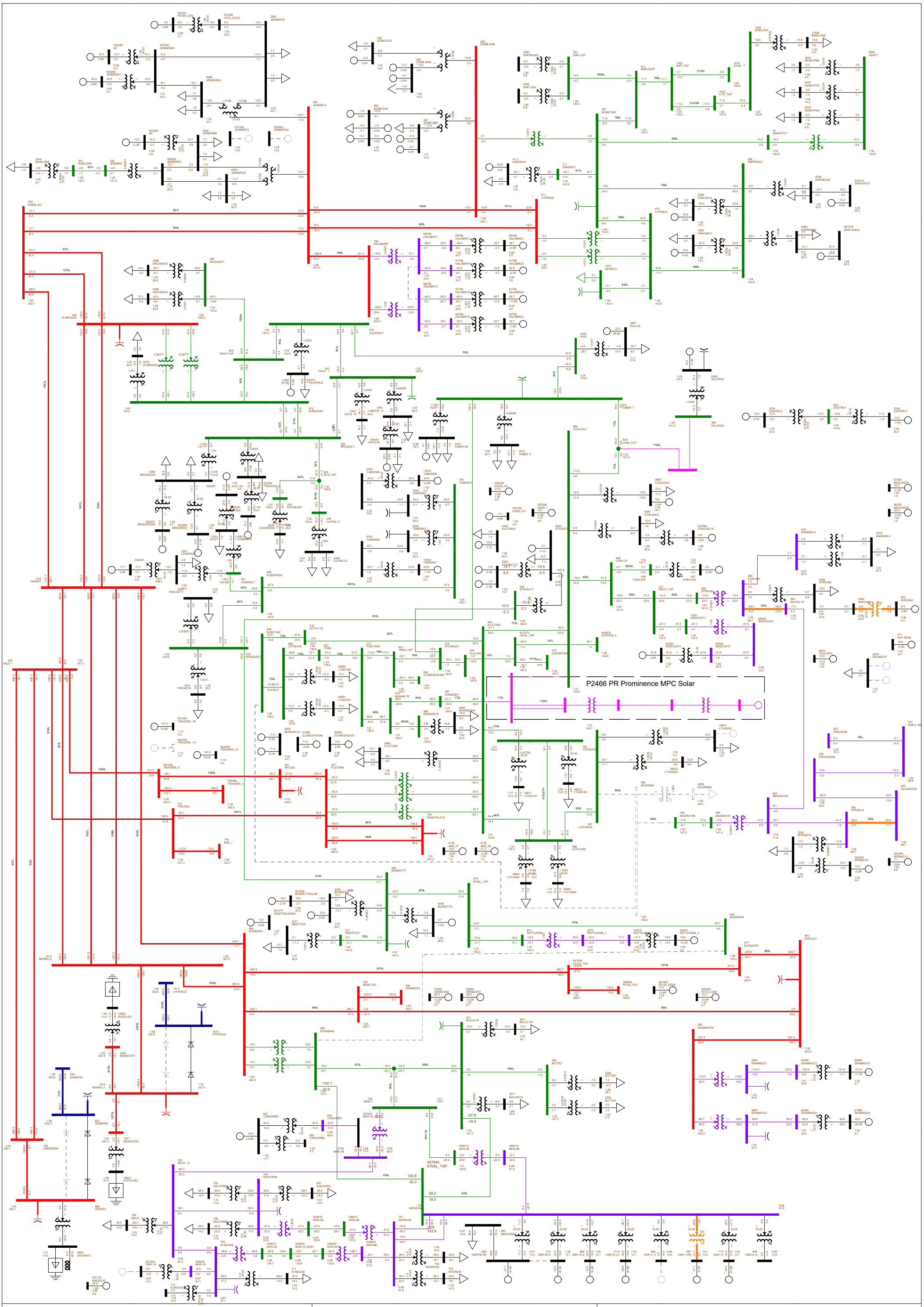
P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
BOWRON 674ST1 OR T2 CONTINGENCY
WED, JUL 05 2023 11:48

A 2-4 SP Pre - 4

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A

kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC7 SEN/PSRE
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 11:48

A 2-4 SP Pre - 5

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
BASL CONTINGENCY
WED, JUL 05 2023 11:48

A 2-4 SP Pre - 6

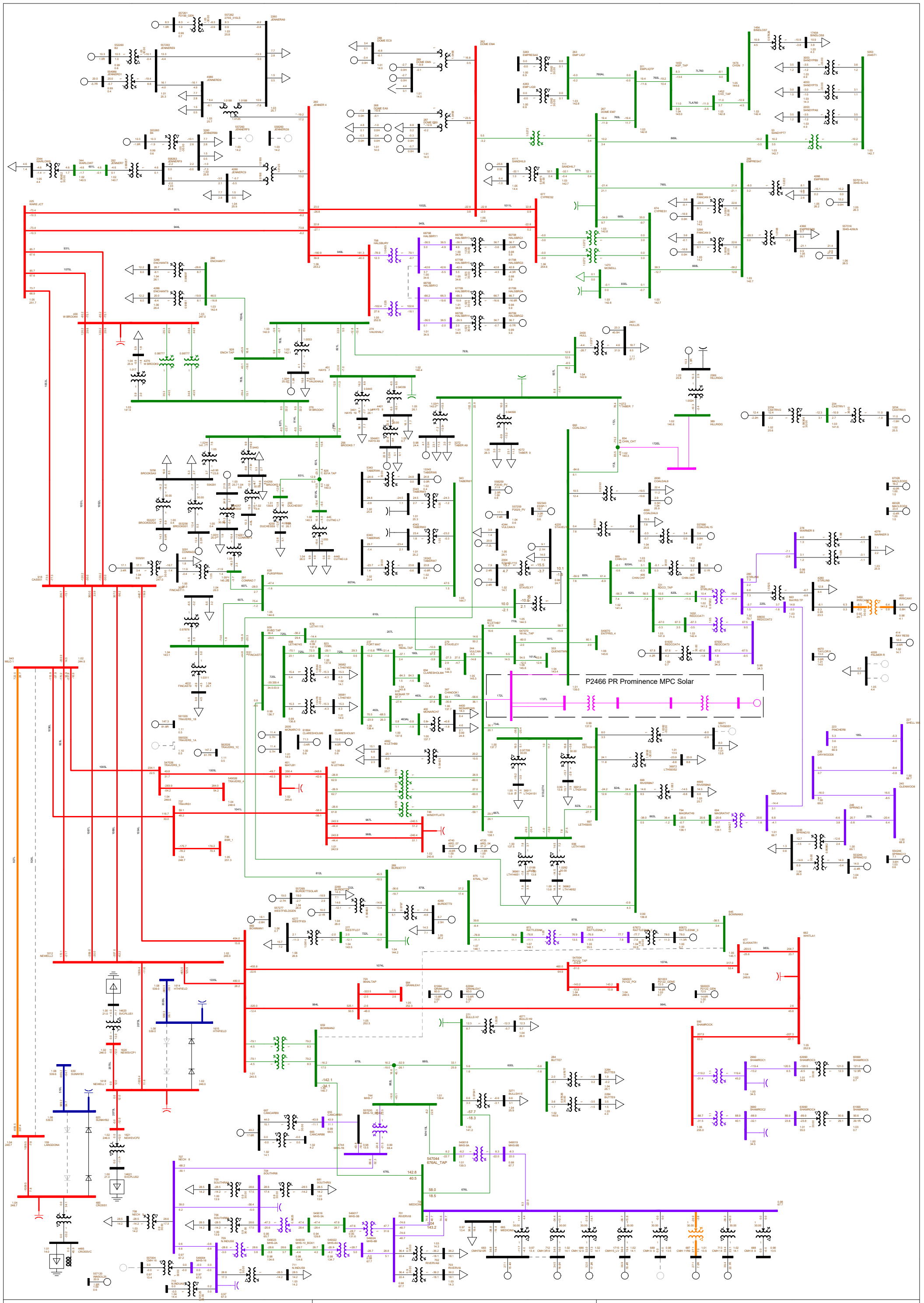
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
93SL CONTINGENCY
WED, JUL 05 2023 11:49

A 2-4 SP Pre - 7

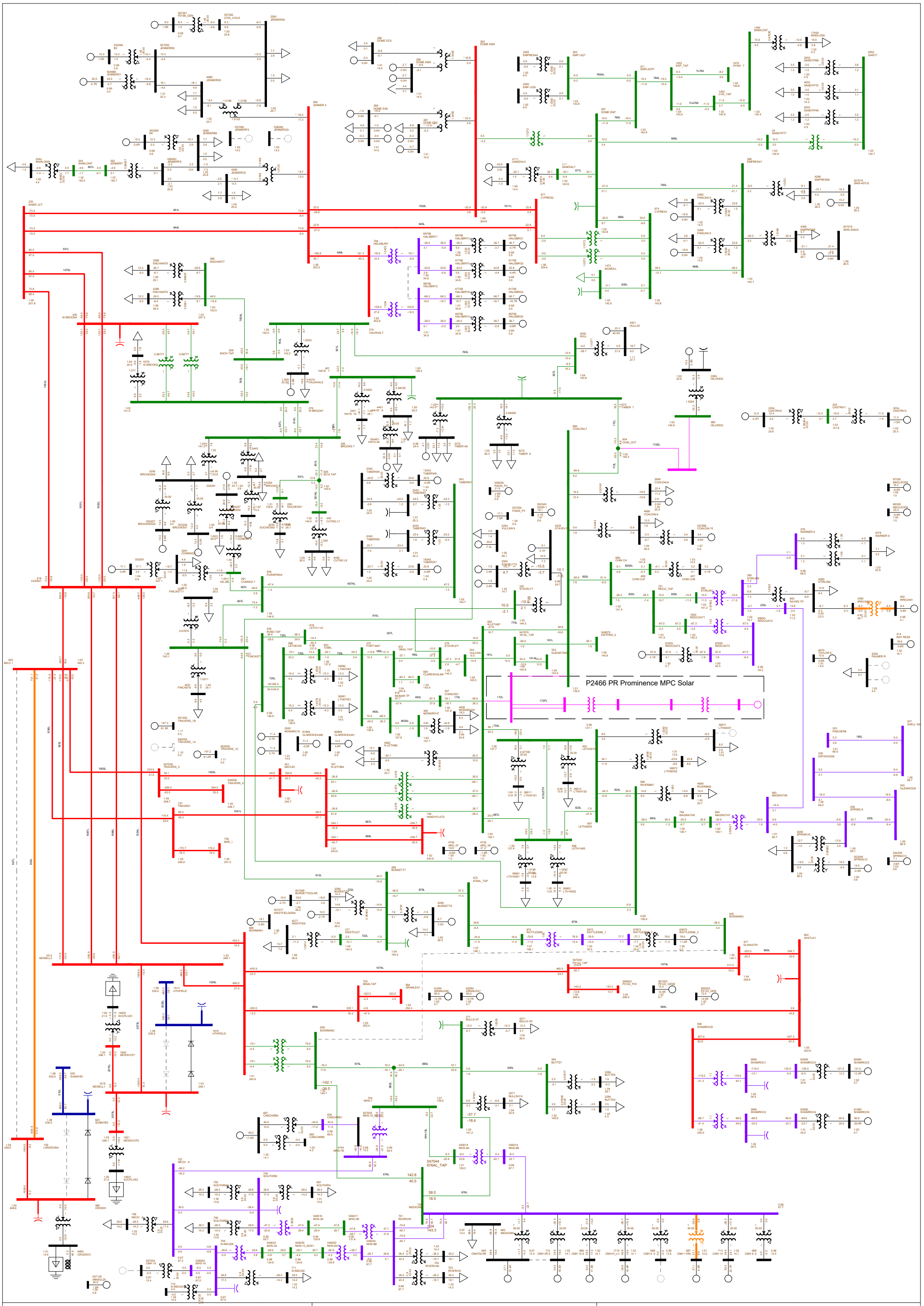
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC7 SEN/PSRE
924L CONTINGENCY
WED, JUL 05 2023 11:49

A 2-4 SP Pre - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC7 SEN/PSRE
927L CONTINGENCY
WED, JUL 05 2023 11:49

A 2-4 SP Pre - 9

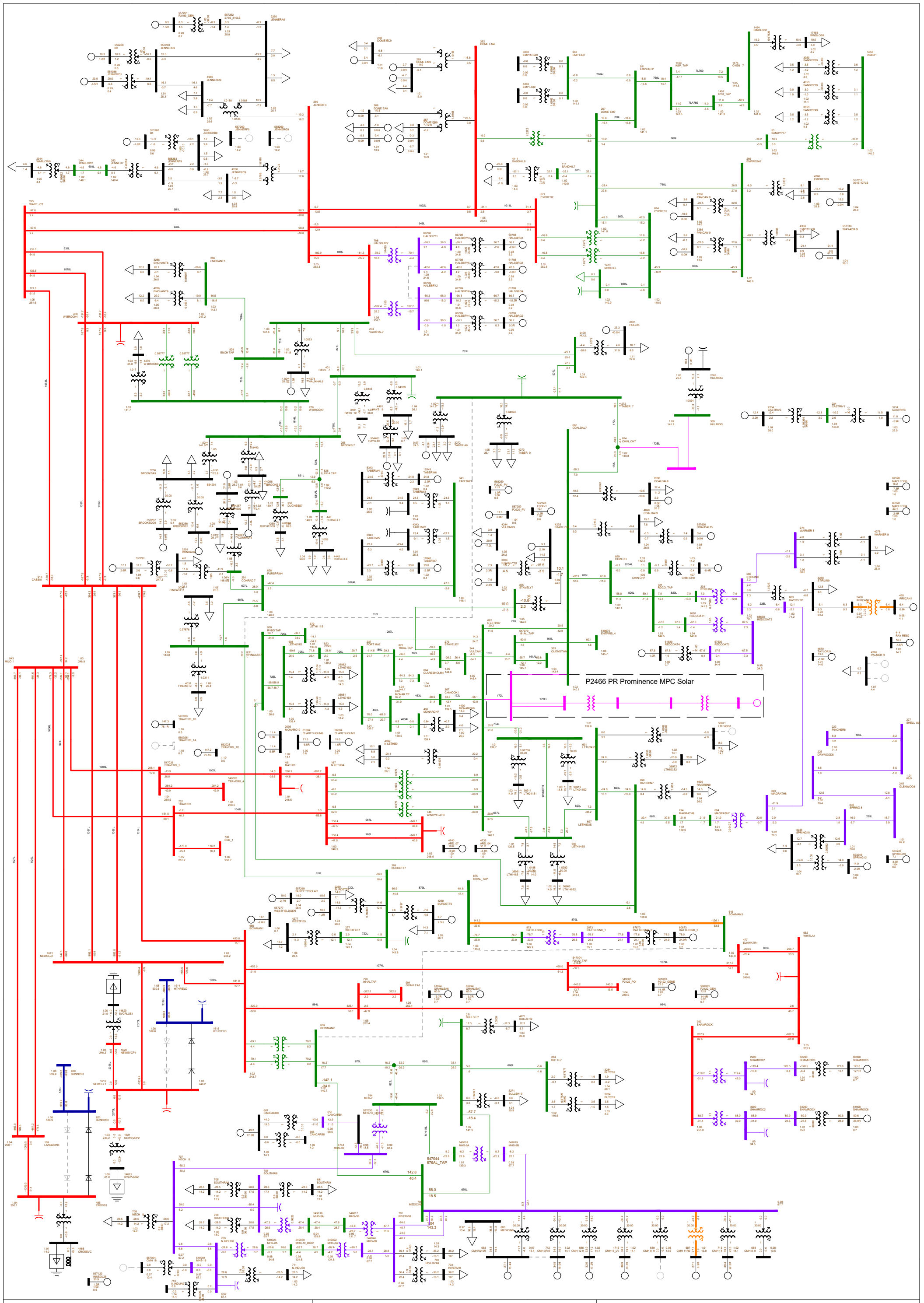
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC7 SEN/PSRE
94L CONTINGENCY
WED, JUL 05 2023 11:49

A 2-4 SP Pre - 10

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC7 SENPSRE
61L CONTINGENCY
WED, JUL 05 2023 11:50

A 2-4 SP Pre - 11

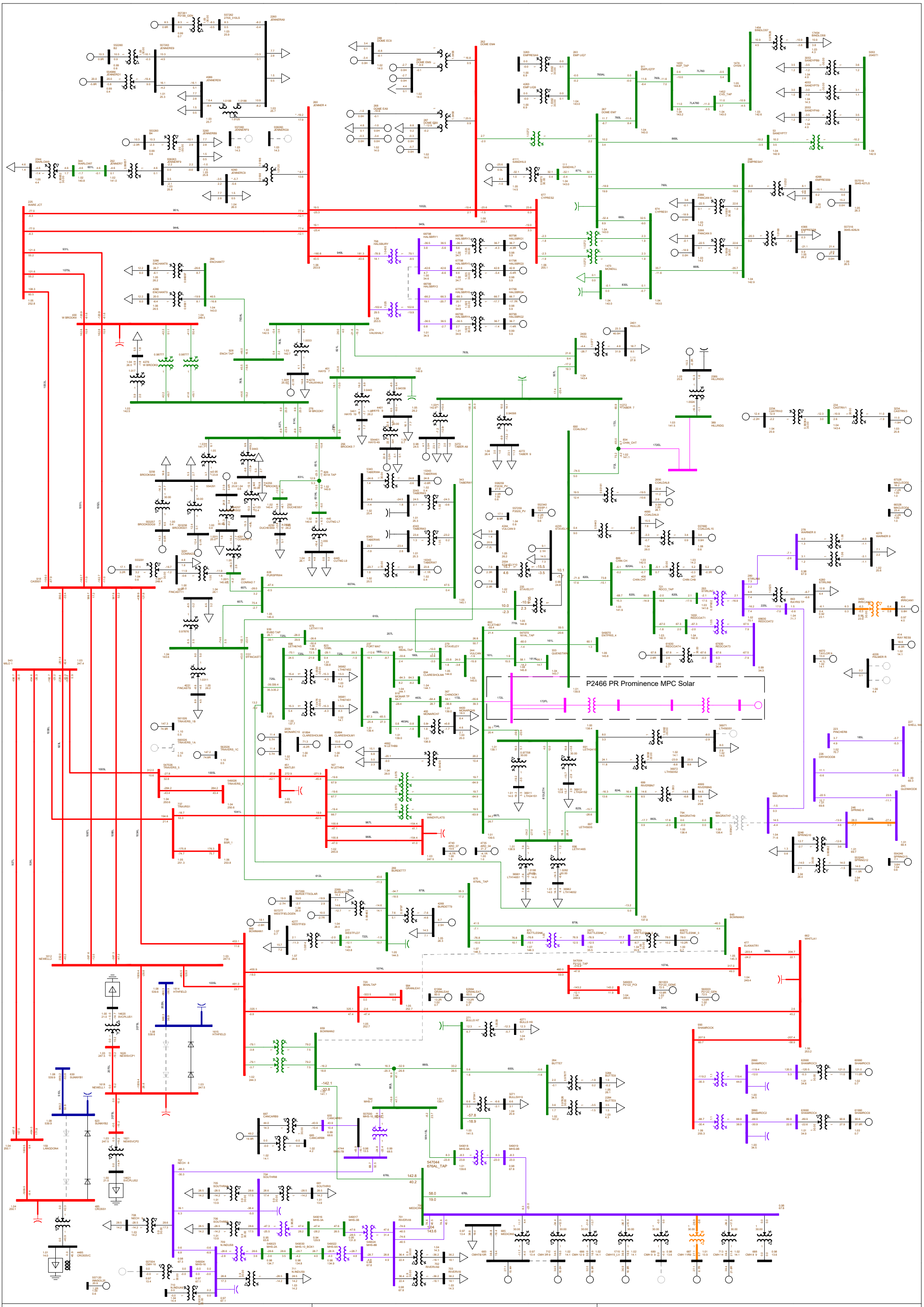
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC7 SENPSRE
172L CONTINGENCY
WED, JUL 05 2023 11:50

A 2-4 SP Pre - 12

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



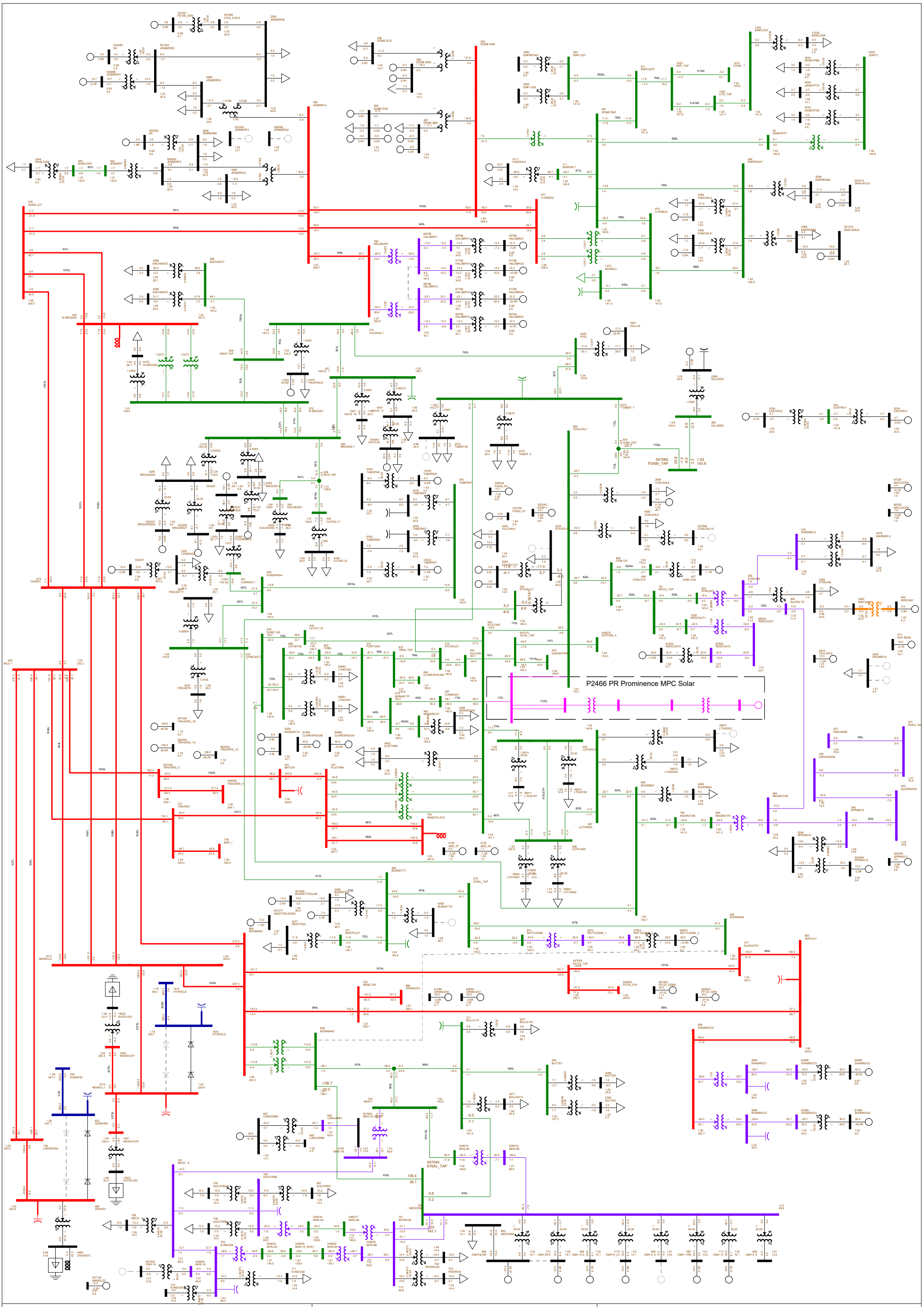
202ASP SC7 SENPSRE
MAGRATH 25ST1 CONTINGENCY
WED, JUL 05 2023 11:50

A 2-4 SP Pre - 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A2-5: List of 2024 Summer Light Sensitivity2 Pre-Project Load Flow Diagrams

Figure	Category	Contingency
A2-5 SL Pre - 1	A (N-0)	System Normal



2024SL SC10 SENSPRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 12:02

A 2-5 SL Pre - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A2-6: List of 2024 Summer Peak Sensitivity2 Pre-Project Load Flow Diagrams

Figure	Category	Contingency
A2-6 SP Pre - 1	A (N-0)	System Normal

P2466 PR Prominence MPC Solar

2024SP SC11 SENSPRE
N-0, SYSTEM NORMAL
WED, JUL 05 2023 12:03

A 2-6 SP Pre - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A3

Post-Project Power Flow Diagrams

Table A3-1: List of 2023 Summer Light Post-Project Load Flow Diagrams

Figure	Category	Contingency
A3-1 SL Post- 1	A (N-0)	System Normal
A3-1 SL Post- 2	B (N-1)	161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)
A3-1 SL Post- 3	B (N-1)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
A3-1 SL Post- 4	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A3-1 SL Post- 5	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A3-1 SL Post- 6	B (N-1)	924L (Langdon 102S - Milo 356S)
A3-1 SL Post- 7	B (N-1)	927L (Langdon 102S - Milo 356S)
A3-1 SL Post- 8	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A3-1 SL Post- 9	B (N-1)	967L (North Lethbridge 370S - Windy Flats 138S)
A3-1 SL Post- 10	B (N-1)	968L (North Lethbridge 370S - Windy Flats 138S)
A3-1 SL Post- 11	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A3-1 SL Post- 12	B (N-1)	67ST2 (Stirling 67S Transformer T2)
A3-1 SL Post- 13	B (N-1)	225ST1 (Magrath 225S Transformer T1)

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2024SL SC3 POST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:25

A 3-1 SL Post - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

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2024SL SC3 POST
16:SL OR:16:AL CONTINGENCY
WED, JUL 05 2023 11:26

A 3-1 SL Post - 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
BOWRON 674ST1 OR T2 CONTINGENCY
WED, JUL 05 2023 11:26

A 3-1 SL Post - 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 11:26

A 3-1 SL Post - 4

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A

kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
86SL CONTINGENCY
WED, JUL 05 2023 11:26

A 3-1 SL Post - 5

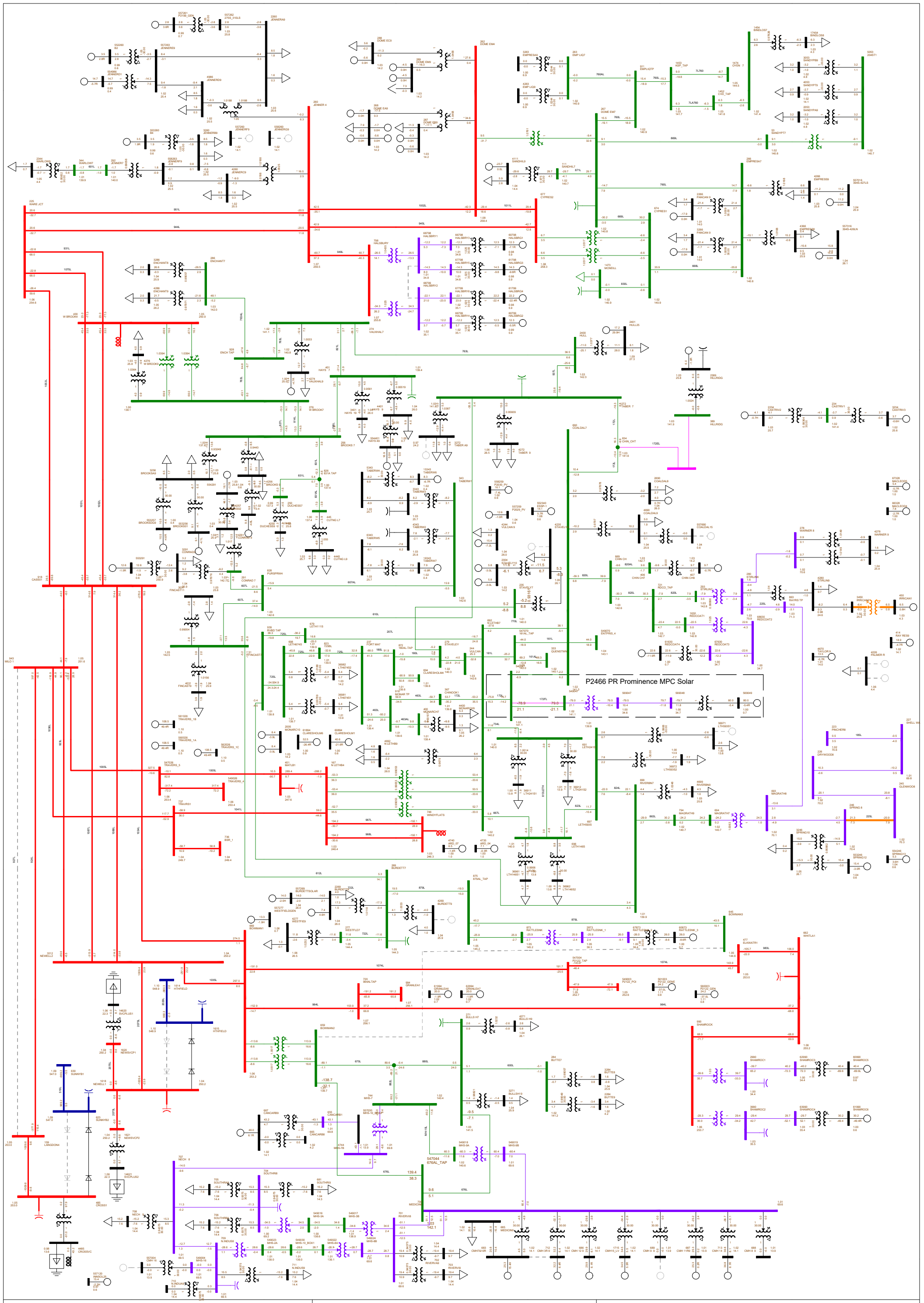
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
924L CONTINGENCY
WED, JUL 05 2023 11:27

A 3-1 SL Post - 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC3 POST
927L CONTINGENCY
WED, JUL 05 2023 11:27

A 3-1 SL Post - 7

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
94SL CONTINGENCY
WED, JUL 05 2023 11:27

A 3-1 SL Post - 8

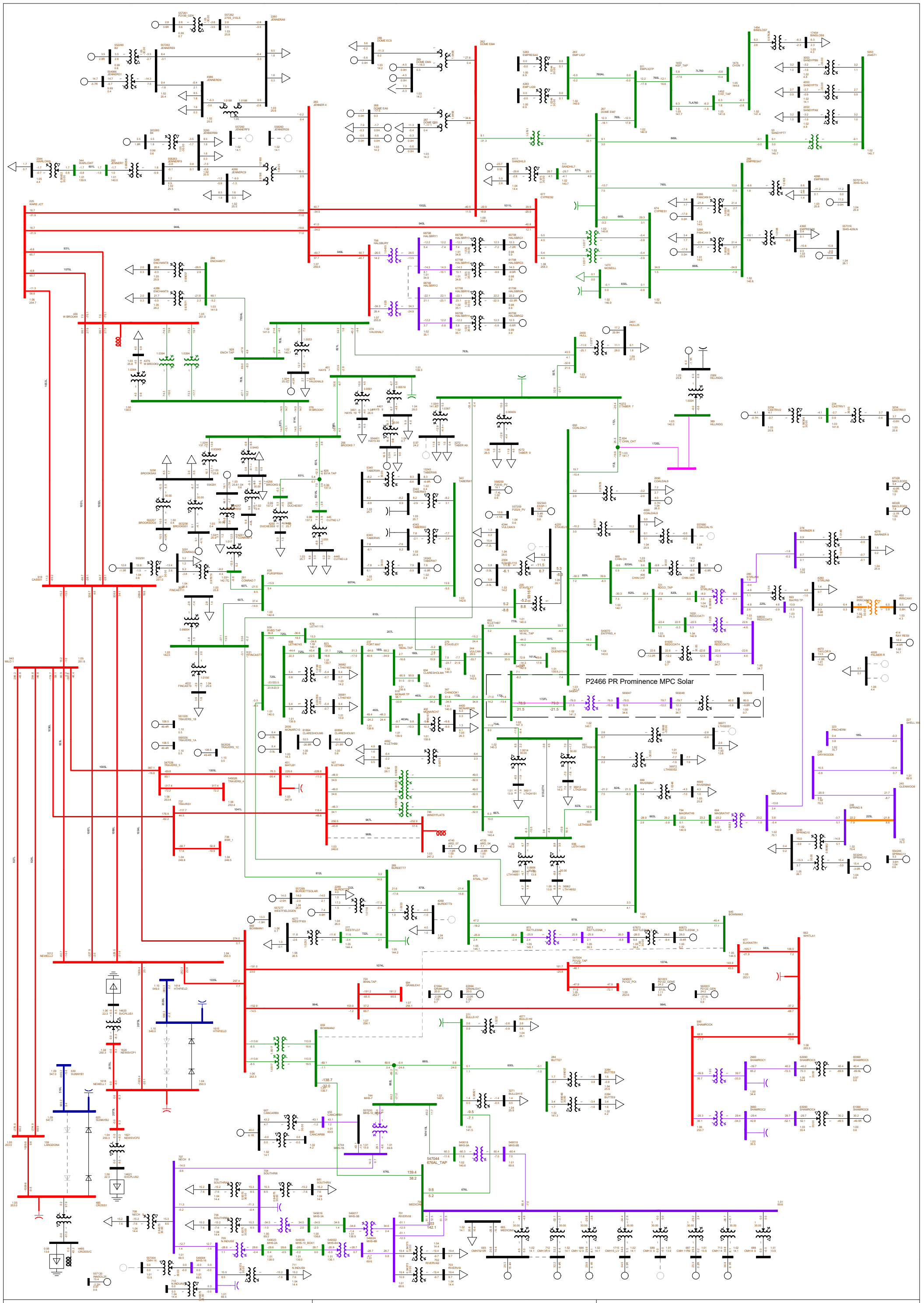
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
96TL CONTINGENCY
WED, JUL 05 2023 11:28

A 3-1 SL Post - 9

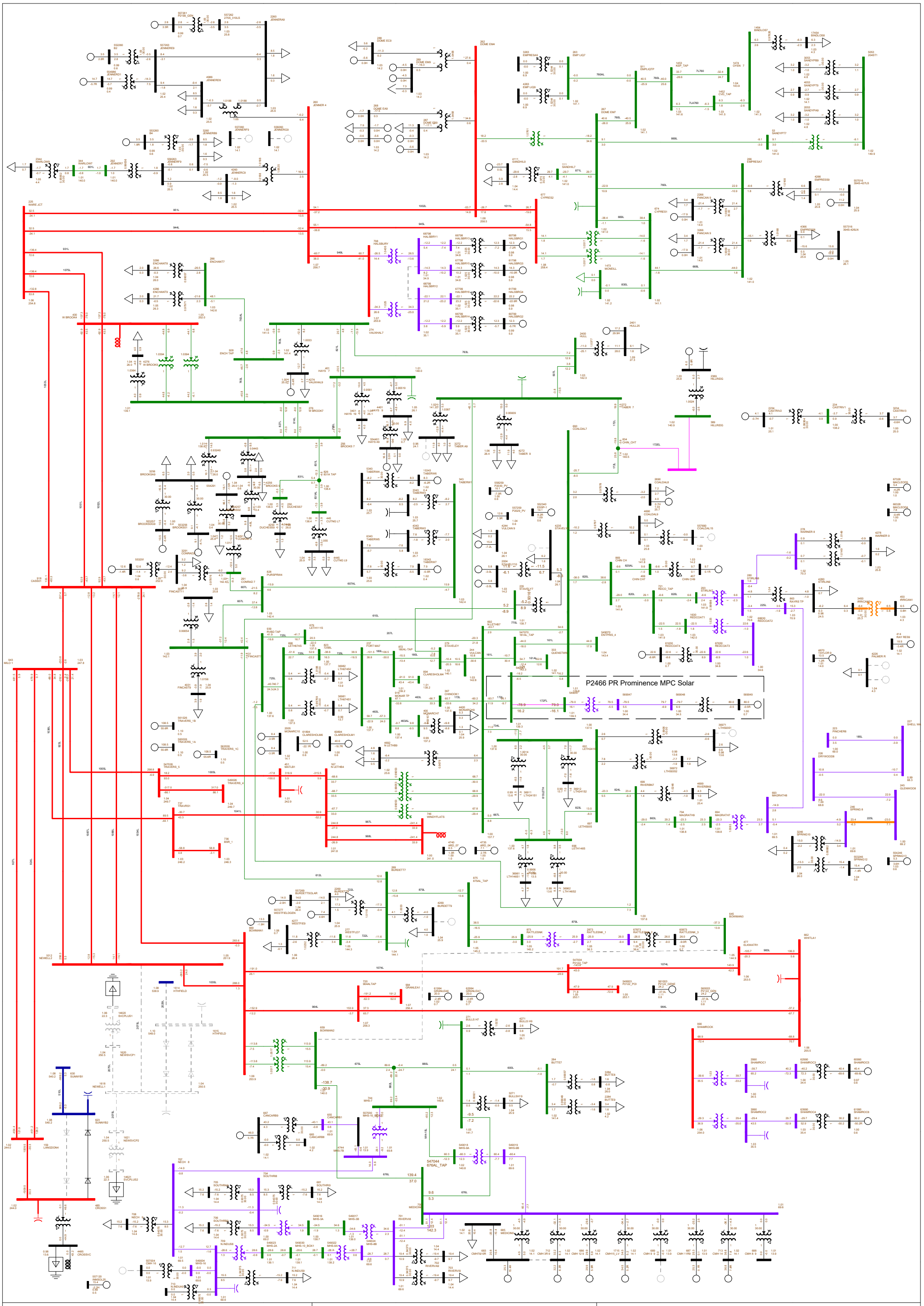
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC3 POST
968L CONTINGENCY
WED, JUL 05 2023 11:28

A 3-1 SL Post - 10

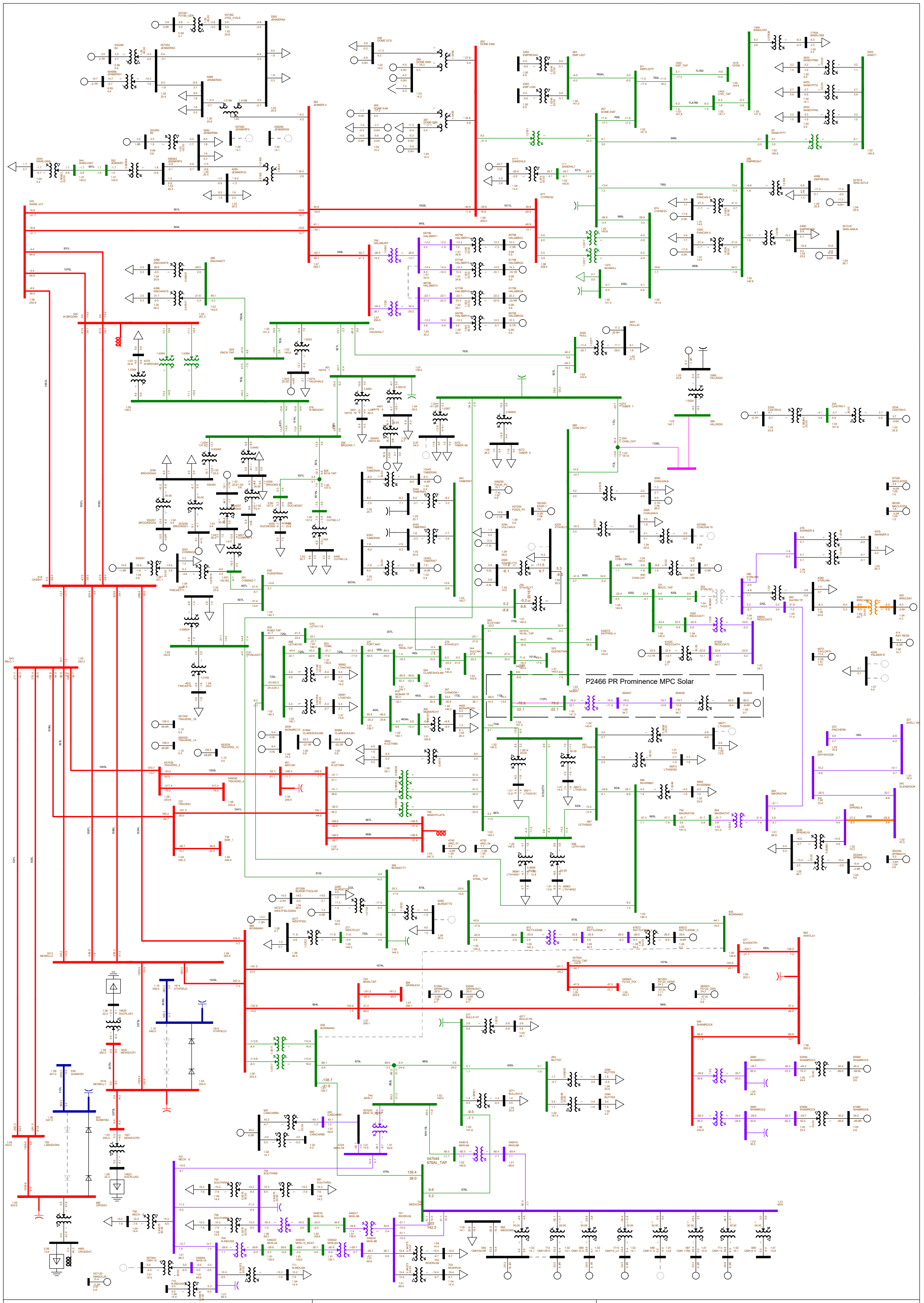
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



202ASL SC3 POST
EATL CONTINGENCY
WED, JUL 05 2023 11:28

A 3-1 SL Post - 11

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC3 POST
67ST2 CONTINGENCY
WED, JUL 05 2023 11:28

A 3-1 SL Post - 12

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
MAGRATH 22SST1 CONTINGENCY
WED, JUL 05 2023 11:29

A 3-1 SL Post - 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A3-2: List of 2024 Summer Peak Post-Project Load Flow Diagrams

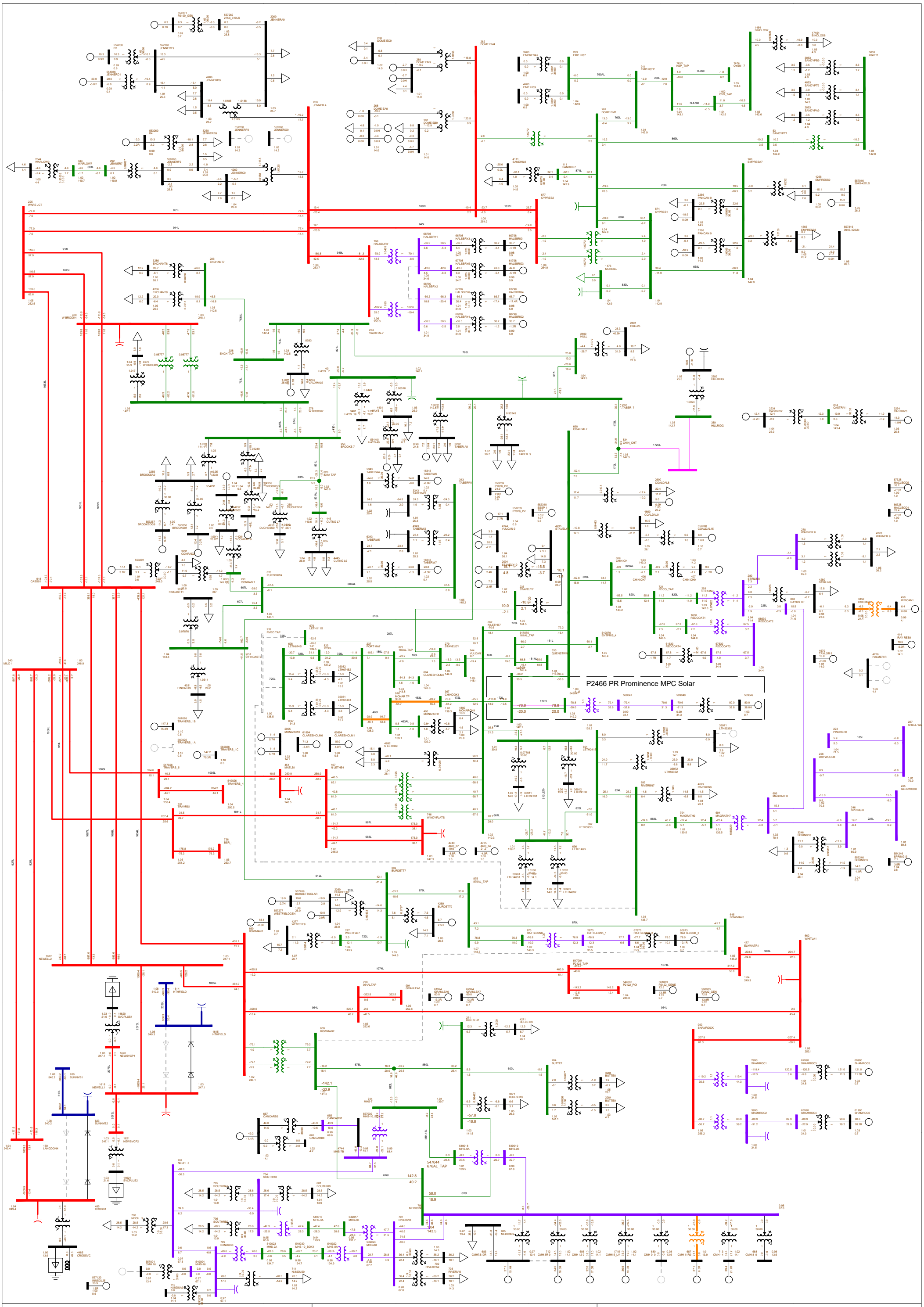
Figure	Category	Contingency
A3-2 SP Post- 1	A (N-0)	System Normal
A3-2 SP Post- 2	B (N-1)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
A3-2 SP Post- 3	B (N-1)	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)
A3-2 SP Post- 4	B (N-1)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
A3-2 SP Post- 5	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A3-2 SP Post- 6	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A3-2 SP Post- 7	B (N-1)	935L (Cassils 324S - Milo 356S)
A3-2 SP Post- 8	B (N-1)	924L (Langdon 102S - Milo 356S)
A3-2 SP Post- 9	B (N-1)	927L (Langdon 102S - Milo 356S)
A3-2 SP Post- 10	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A3-2 SP Post- 11	B (N-1)	967L (North Lethbridge 370S - Windy Flats 138S)
A3-2 SP Post- 12	B (N-1)	968L (North Lethbridge 370S - Windy Flats 138S)
A3-2 SP Post- 13	B (N-1)	610L (Fincastle 336S - Taber 83S)
A3-2 SP Post- 14	B (N-1)	172L (Chinook 181S - North Lethbridge 370S)
A3-2 SP Post- 15	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A3-2 SP Post- 16	B (N-1)	158ST2 (Vauxhall 158S Transformer T2)
A3-2 SP Post- 17	B (N-1)	257ST1 (Hull 257S Transformer T1)
A3-2 SP Post- 18	B (N-1)	770L (Coaldale 254S - North Lethbridge 370S)
A3-2 SP Post- 19	B (N-1)	923L (Milo 356S - Newell 2075S)
A3-2 SP Post- 20	B (N-1)	507L (Taber 83S - Hull 257S)
A3-2 SP Post- 21	B (N-1)	763L (Vauxhall 158S - Hull 257S)

P2466 PR Prominence MPC Solar

2024SP SC4 POST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:29

A 3-2 SP Post - 1

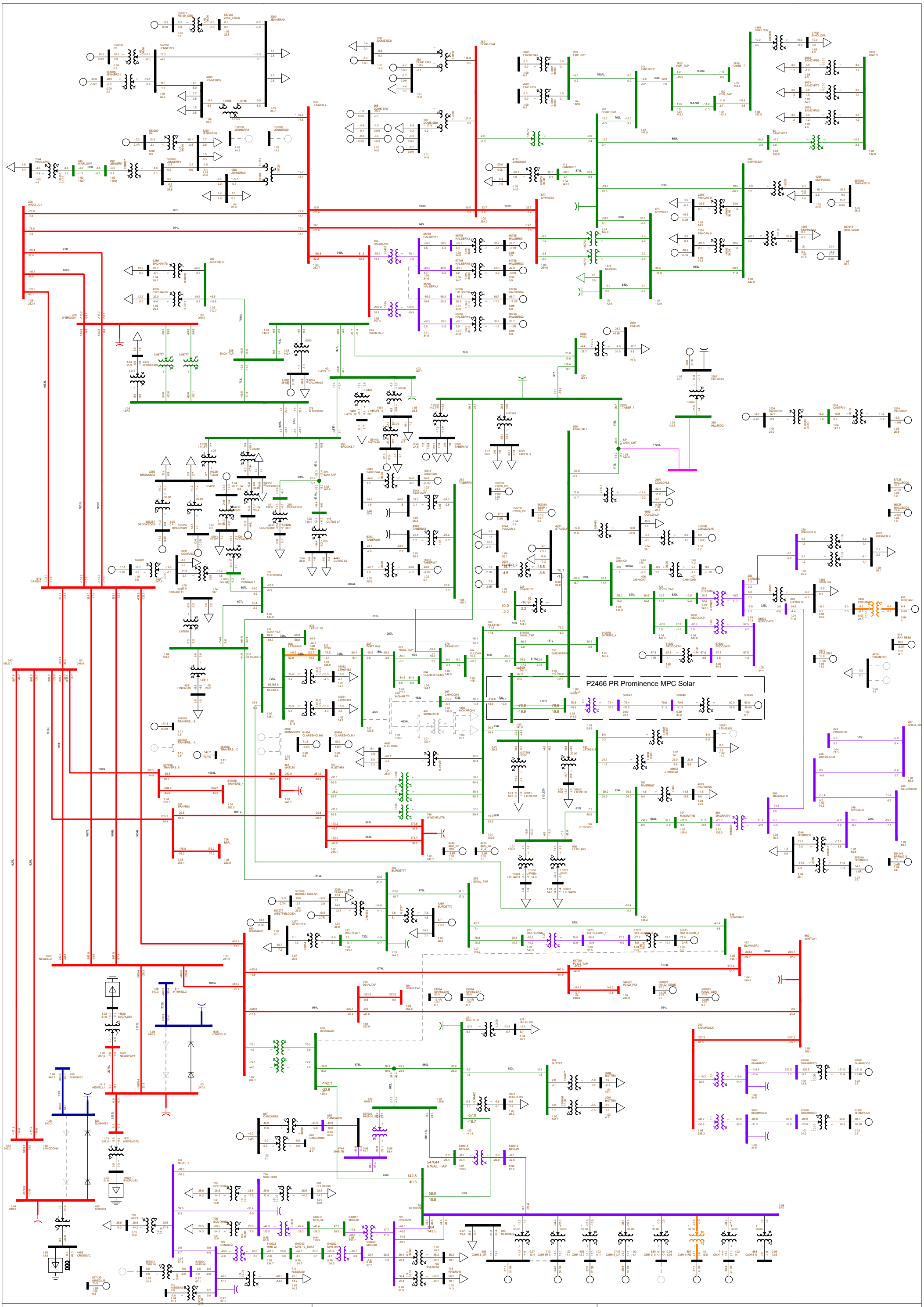
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC4 POST
72SL OR 72SAL CONTINGENCY
WED, JUL 05 2023 11:29

A 3-2 SP Post - 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC4 POST
4&3L OR 4&3AL CONTINGENCY
WED, JUL 05 2023 11:29

A 3-2 SP Post - 3

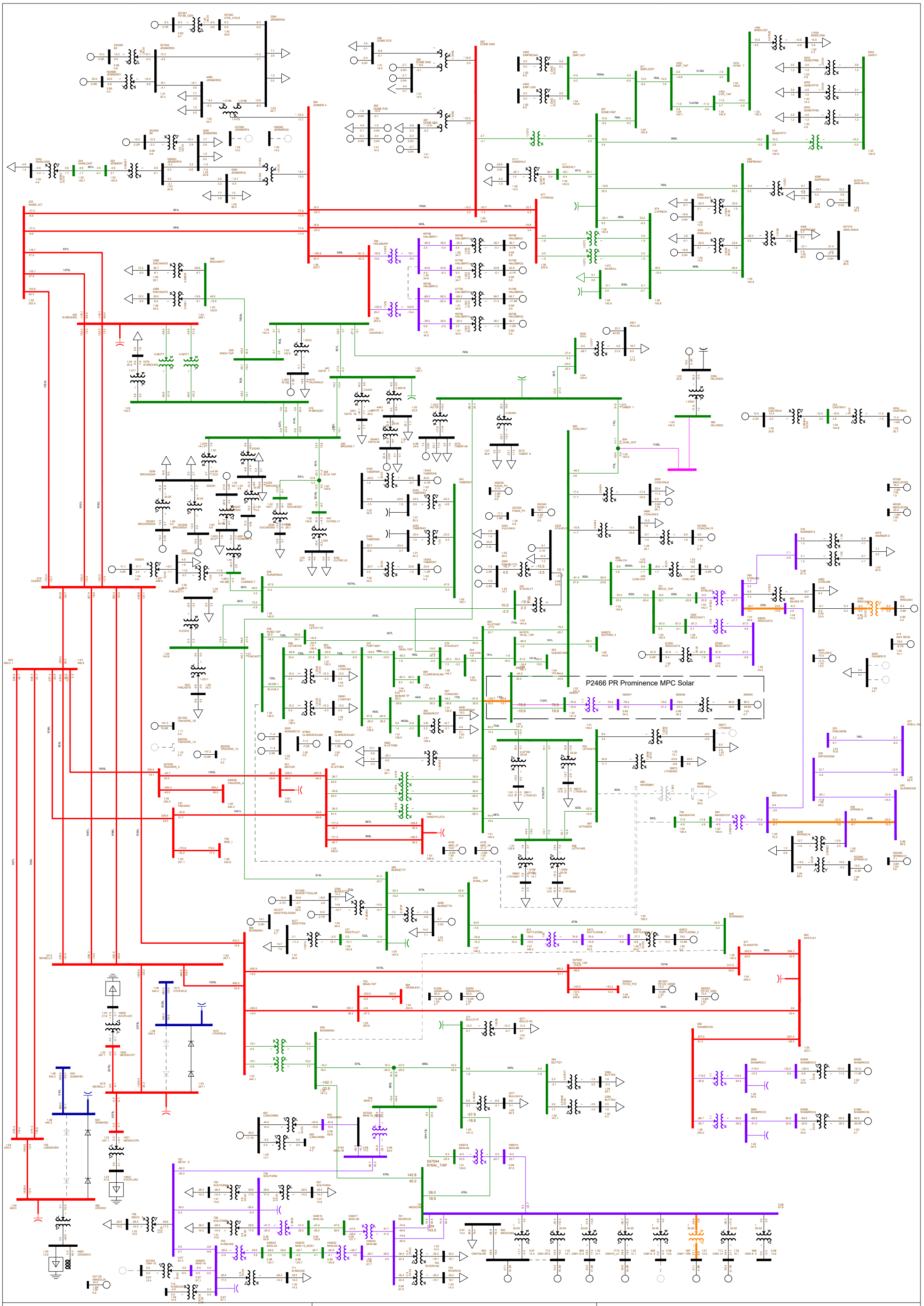
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
BOWRON 674ST 1 OR T2 CONTINGENCY
WED, JUL 05 2023 11:30

A 3-2 SP Post - 4

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC4 POST
RIVERBEND 618ST1 CONTINGENCY
WED, JUL 05 2023 11:30

A 3-2 SP Post - 5

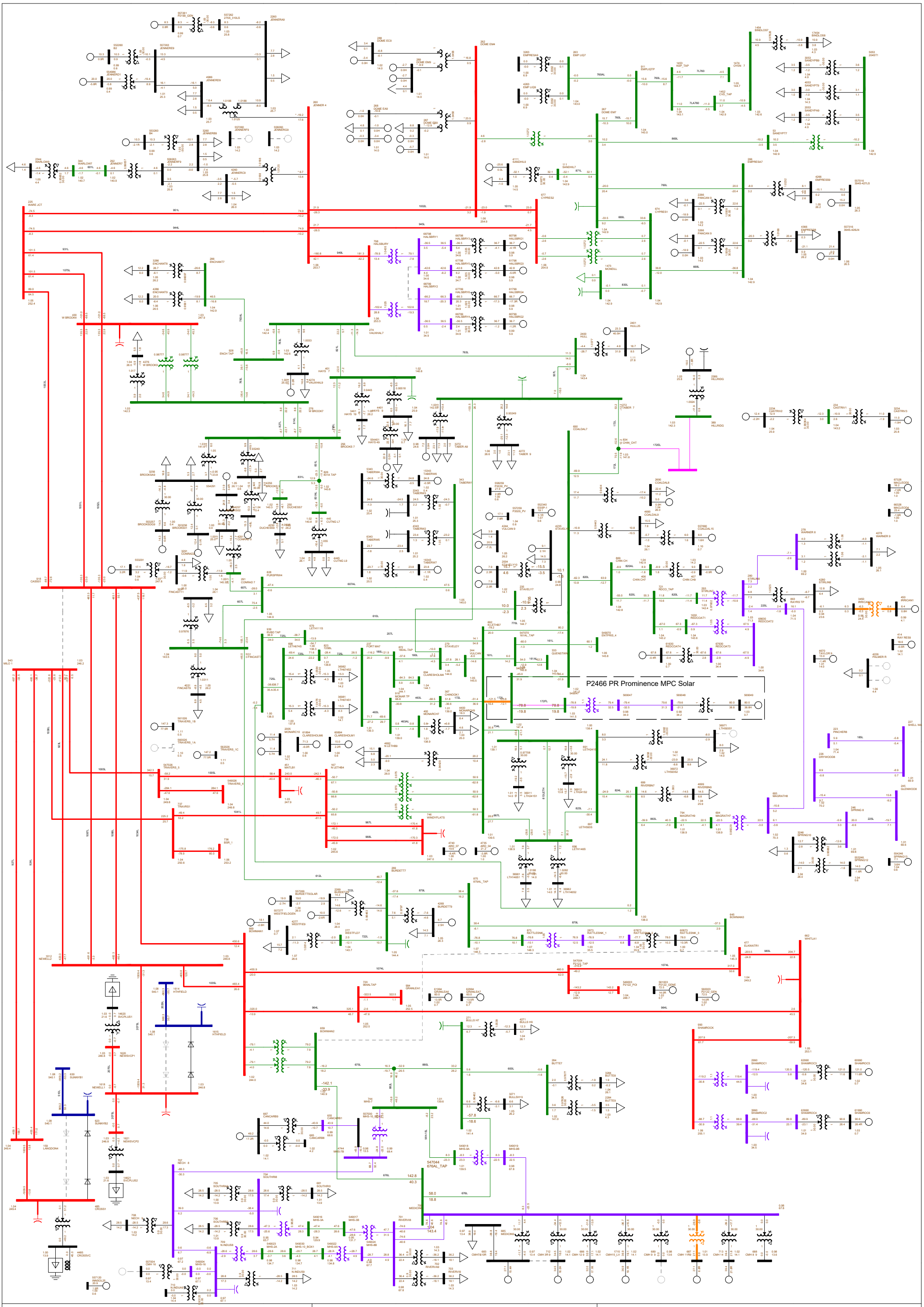
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
86SL CONTINGENCY
WED, JUL 05 2023 11:30

A 3-2 SP Post - 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC4 POST
93SL CONTINGENCY
WED, JUL 05 2023 11:31

A 3-2 SP Post - 7

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
924L CONTINGENCY
WED, JUL 05 2023 11:31

A 3-2 SP Post - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
927L CONTINGENCY
WED, JUL 05 2023 11:31

A 3-2 SP Post - 9

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
94L CONTINGENCY
WED, JUL 05 2023 11:31

A 3-2 SP Post - 10

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
96TL CONTINGENCY
WED, JUL 05 2023 11:32

A 3-2 SP Post - 11

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
968L CONTINGENCY
WED, JUL 05 2023 11:32

A 3-2 SP Post - 12

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
61QL CONTINGENCY
WED, JUL 05 2023 11:32

A 3-2 SP Post - 13

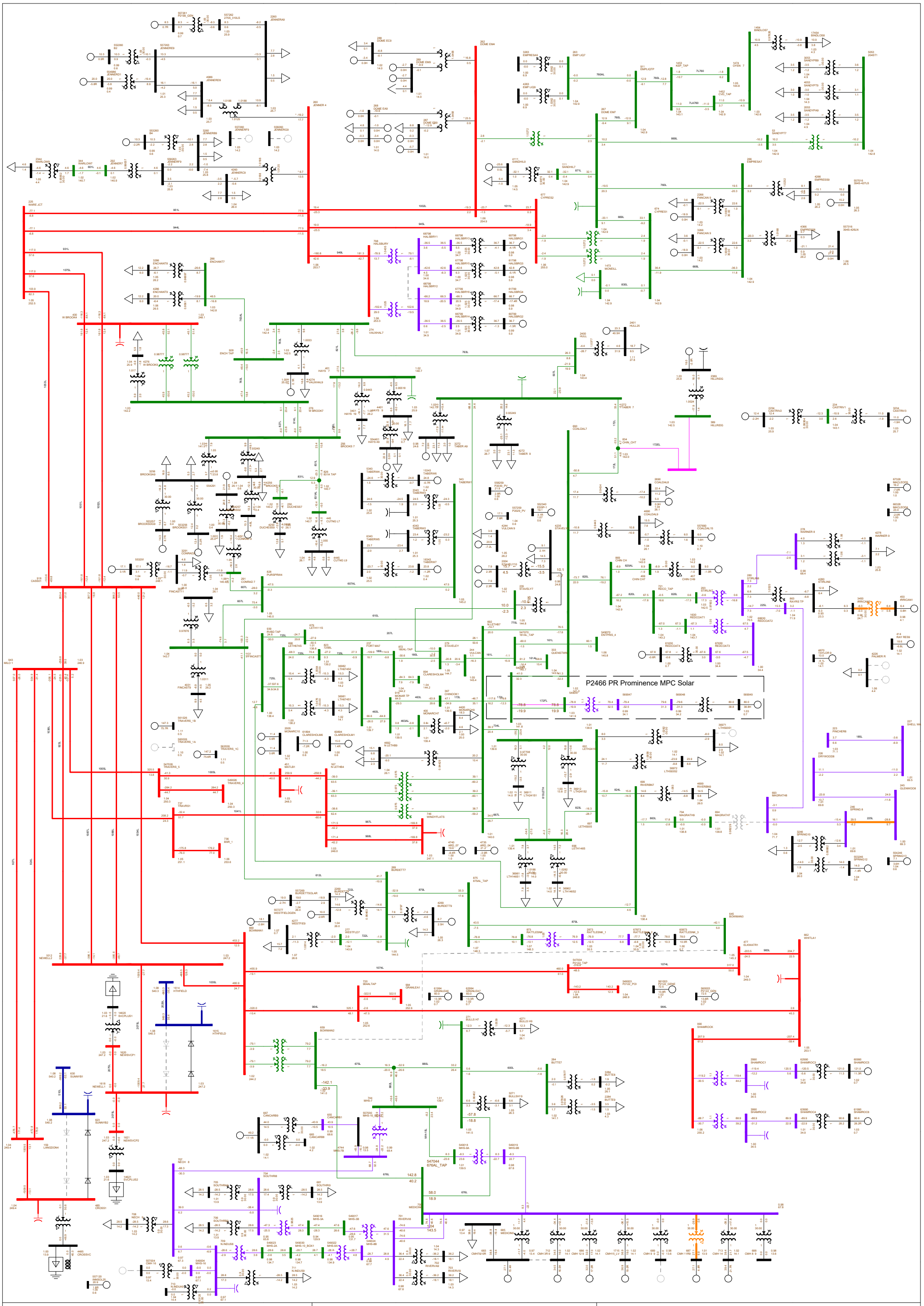
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
172L CONTINGENCY
WED, JUL 05 2023 11:33

A 3-2 SP Post - 14

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



202ASP SC4 POST
MAGRATH 25ST1 CONTINGENCY
WED, JUL 05 2023 11:33

A 3-2 SP Post - 15

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
158S T2 CONTINGENCY
WED, JUL 05 2023 11:33

A 3-2 SP Post - 16

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
25TB T1 CONTINGENCY
WED, JUL 05 2023 11:33

A 3-2 SP Post - 17

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
77/L CONTINGENCY
WED, JUL 05 2023 11:34

A 3-2 SP Post - 18

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A

kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
923L CONTINGENCY
WED, JUL 05 2023 11:34

A 3-2 SP Post - 19

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
SOL CONTINGENCY
WED, JUL 05 2023 11:34

A 3-2 SP Post - 20

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

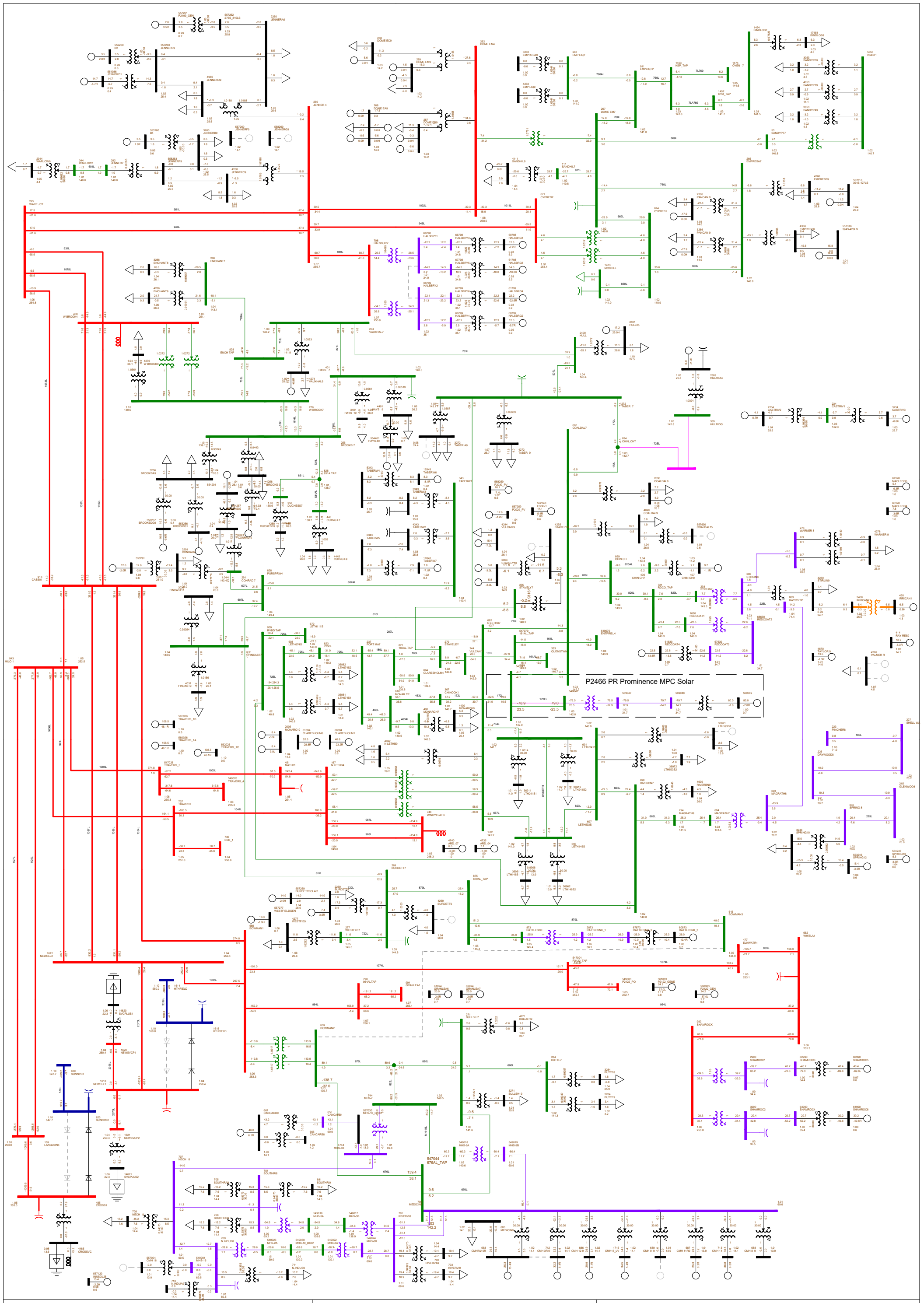
2024SP SC4 POST
763L CONTINGENCY
WED, JUL 05 2023 11:35

A 3-2 SP Post - 21

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A3-3: List of 2024 Summer Light Sensitivity Post-Project Load Flow Diagrams

Figure	Category	Contingency
A3-3 SL Post- 1	A (N-0)	System Normal
A3-3 SL Post- 2	B (N-1)	158ST2 (Vauxhall 158S Transformer T2)
A3-3 SL Post- 3	B (N-1)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
A3-3 SL Post- 4	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A3-3 SL Post- 5	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A3-3 SL Post- 6	B (N-1)	820L (Coaldale 254S - Chin Chute 315S - Stirling 67S)
A3-3 SL Post- 7	B (N-1)	924L (Langdon 102S - Milo 356S)
A3-3 SL Post- 8	B (N-1)	927L (Langdon 102S - Milo 356S)
A3-3 SL Post- 9	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A3-3 SL Post- 10	B (N-1)	967L (North Lethbridge 370S - Windy Flats 138S)
A3-3 SL Post- 11	B (N-1)	968L (North Lethbridge 370S - Windy Flats 138S)
A3-3 SL Post- 12	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A3-3 SL Post- 13	B (N-1)	370ST3 (North Lethbridge 370S Transformer T3)
A3-3 SL Post- 14	B (N-1)	370ST5 (North Lethbridge 370S Transformer T5)
A3-3 SL Post- 15	B (N-1)	370ST6 (North Lethbridge 370S Transformer T6)
A3-3 SL Post- 16	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A3-3 SL Post- 17	B (N-1)	161L or 161AL (Enterprise 1070S - Vulcan 255S - Queenstown 504S)
A3-3 SL Post- 18	B (N-1)	67ST2 (Stirling 67S Transformer T2)
A3-3 SL Post- 19	B (N-1)	763L (Vauxhall 158S - Hull 257S)



2024SL SC8 SENSPOST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:50

A 3-3 SL Post- 1

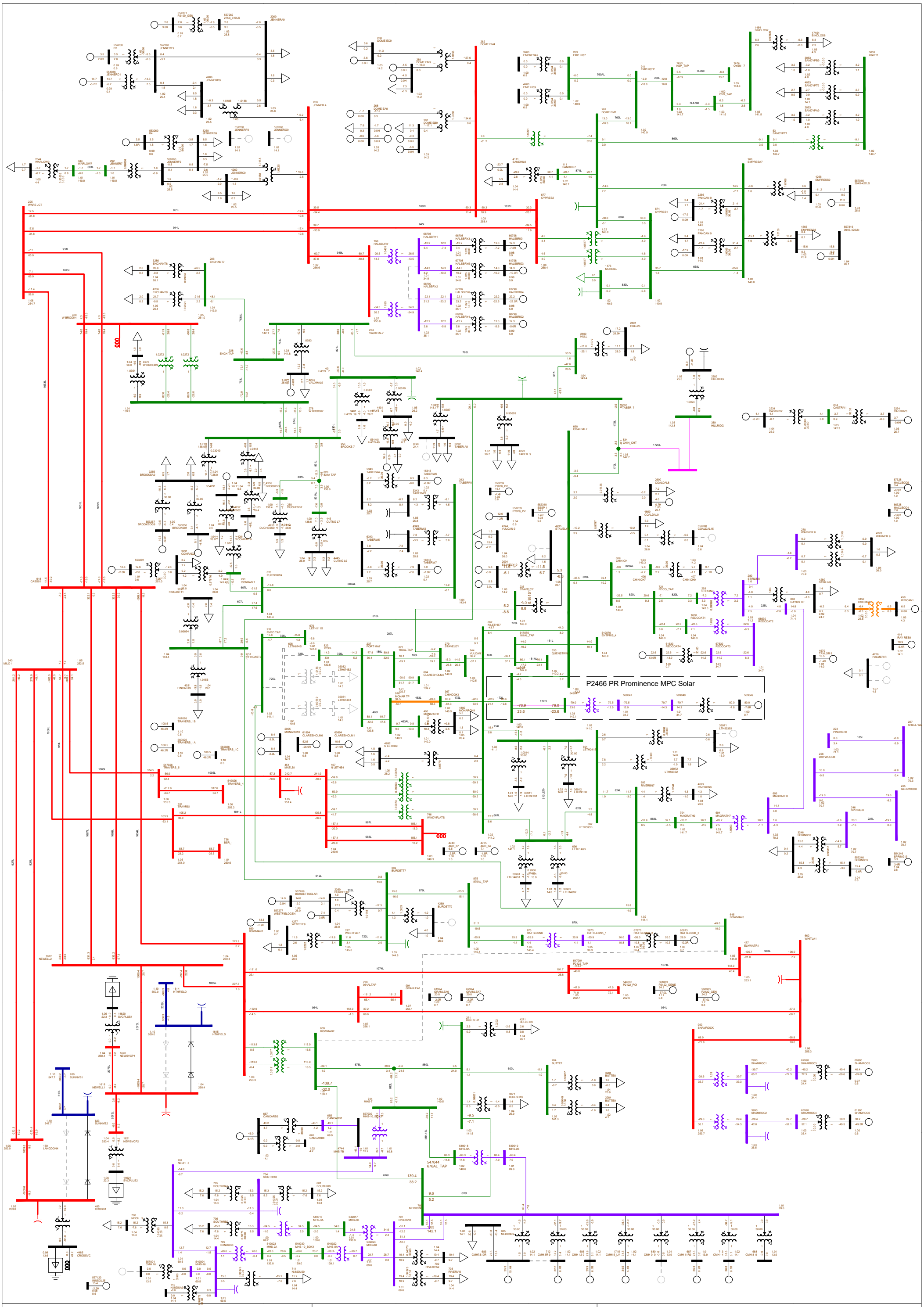
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
158S TRANSFORMER T1 CONTINGENCY
WED, JUL 05 2023 11:51

A 3-3 SL Post- 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
BOWRON 67ASTI OR TJ CONTINGENCY
WED, JUL 05 2023 11:51

A 3-3 SL Post- 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 11:51

A 3-3 SL Post- 4

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
86SL CONTINGENCY
WED, JUL 05 2023 11:51

A 3-3 SL Post- 5

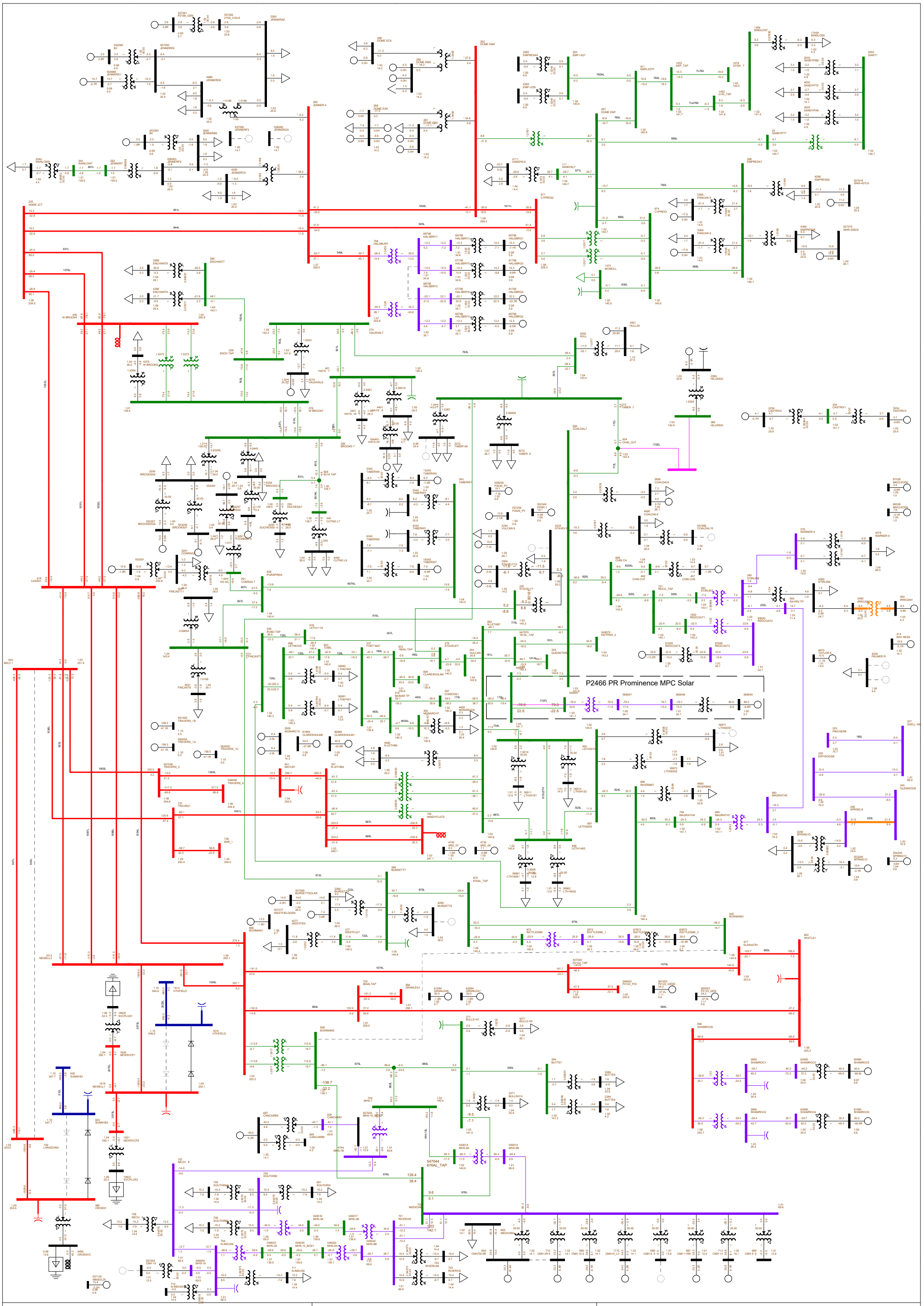
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
820L CONTINGENCY
WED, JUL 05 2023 11:52

A 3-3 SL Post- 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
924L CONTINGENCY
WED, JUL 05 2023 11:52

A 3-3 SL Post- 7

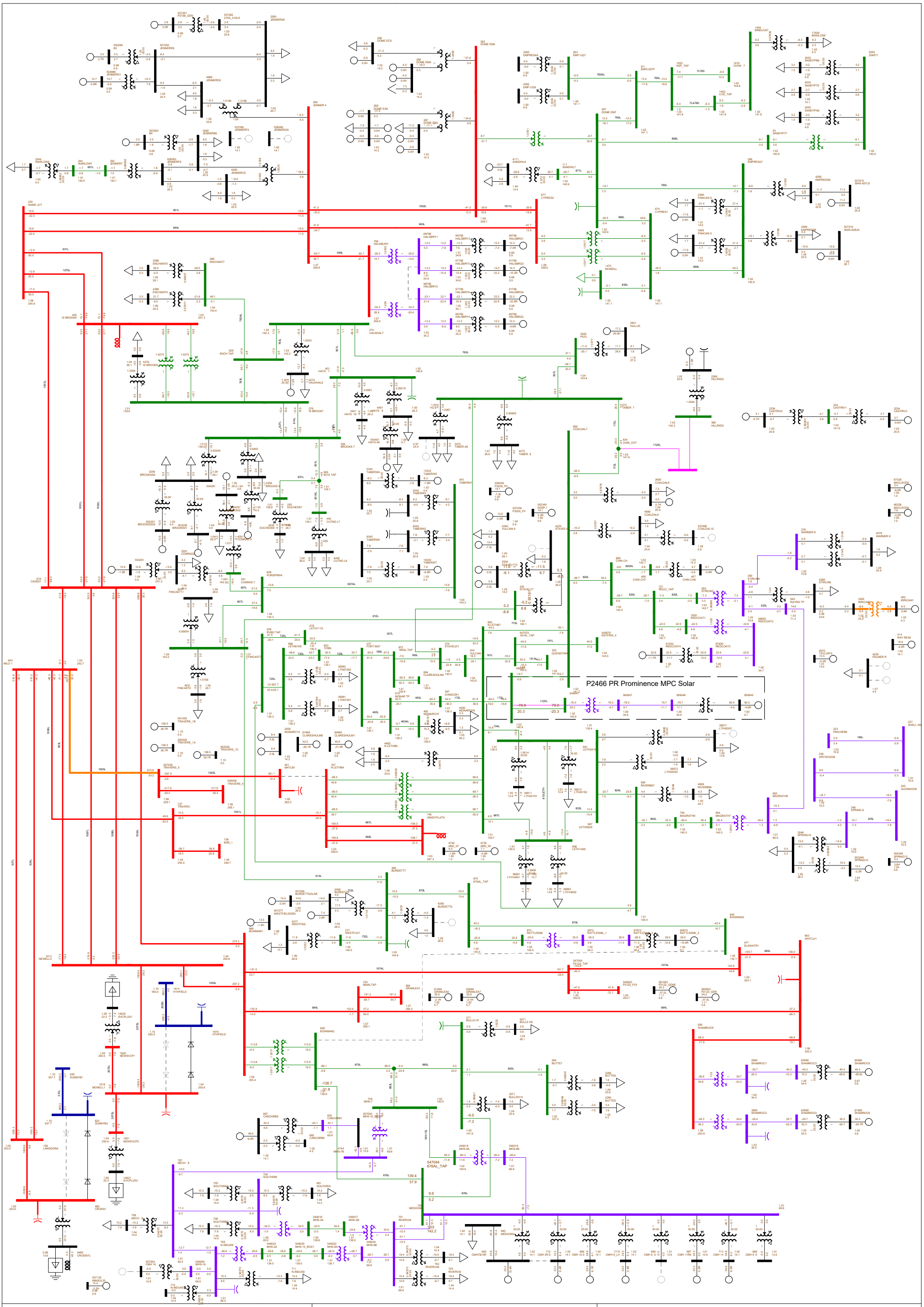
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

A 3-3 SL Post- 8

2024SL SC8 SENSPOST
92TL CONTINGENCY
WED, JUL 05 2023 11:52

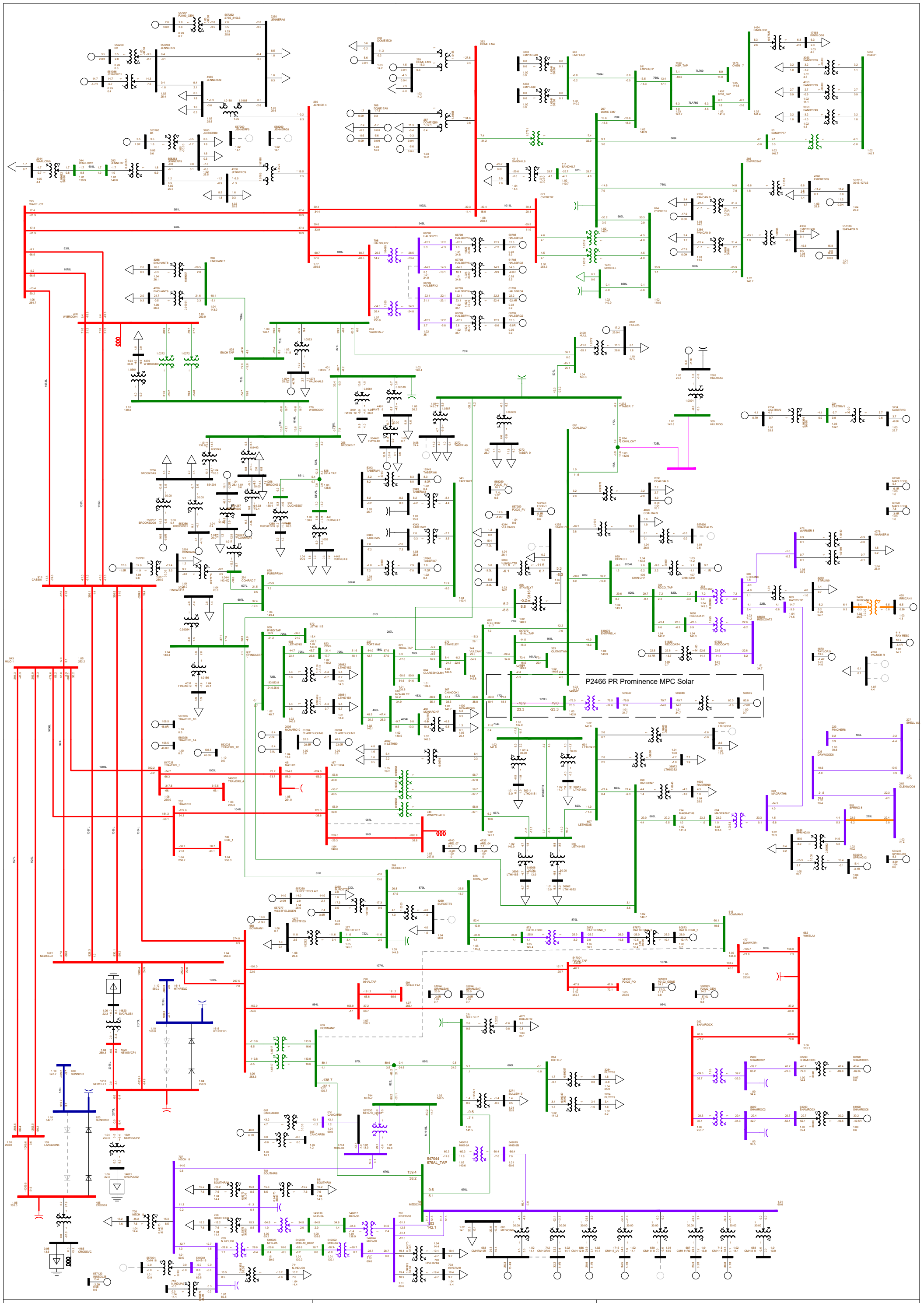
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
94SL CONTINGENCY
WED, JUL 05 2023 11:52

A 3-3 SL Post- 9

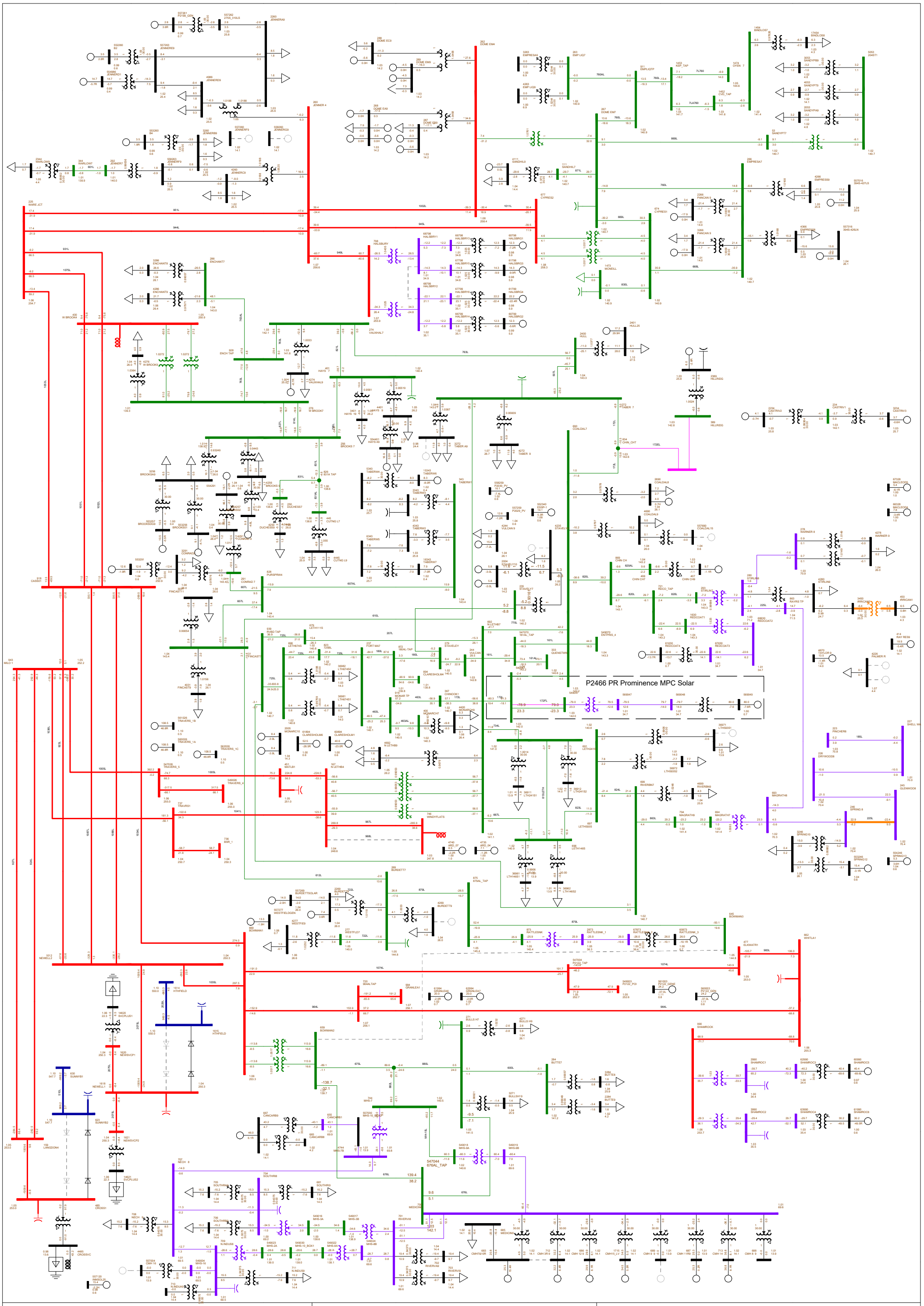
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
96.5L CONTINGENCY
WED, JUL 05 2023 11:53

A 3-3 SL Post- 10

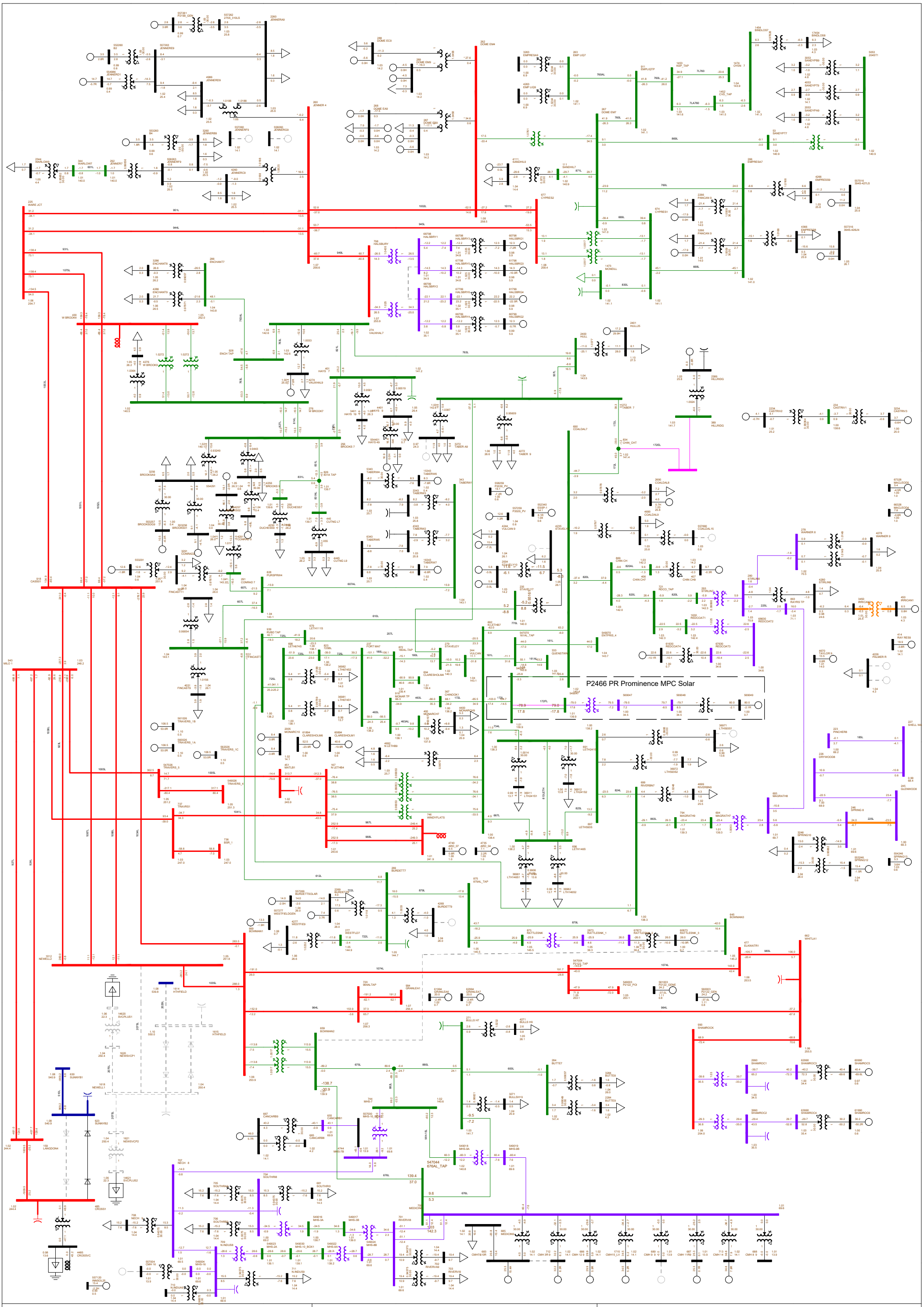
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
968L CONTINGENCY
WED, JUL 05 2023 11:53

A 3-3 SL Post- 11

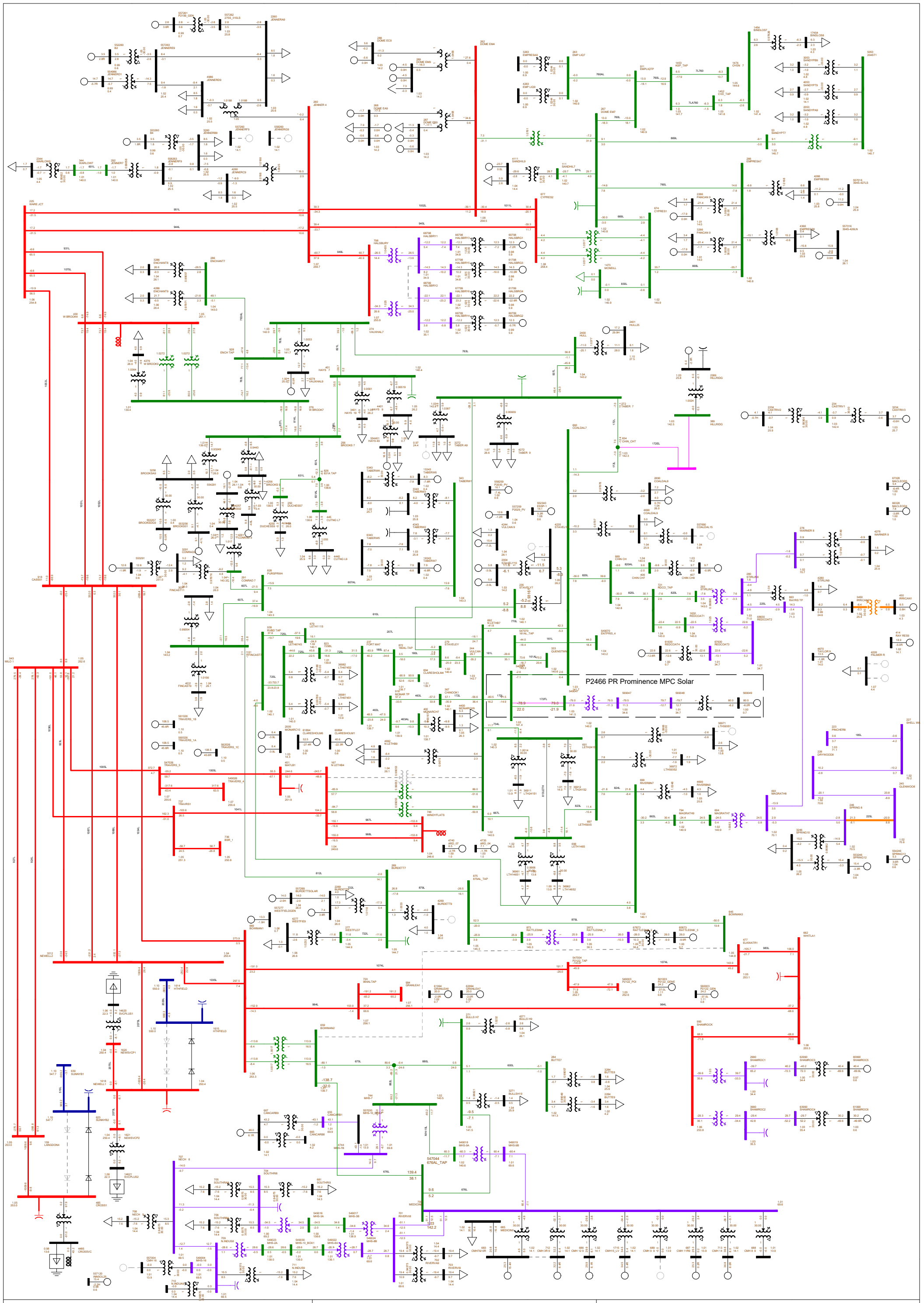
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
EATL CONTINGENCY
WED, JUL 05 2023 11:53

A 3-3 SL Post- 12

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
370B T3 CONTINGENCY
WED, JUL 05 2023 11:53

A 3-3 SL Post- 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
370B TS CONTINGENCY
WED, JUL 05 2023 11:54

A 3-3 SL Post- 14

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 SENSPOST
370B TE CONTINGENCY
WED, JUL 05 2023 11:54

A 3-3 SL Post- 15

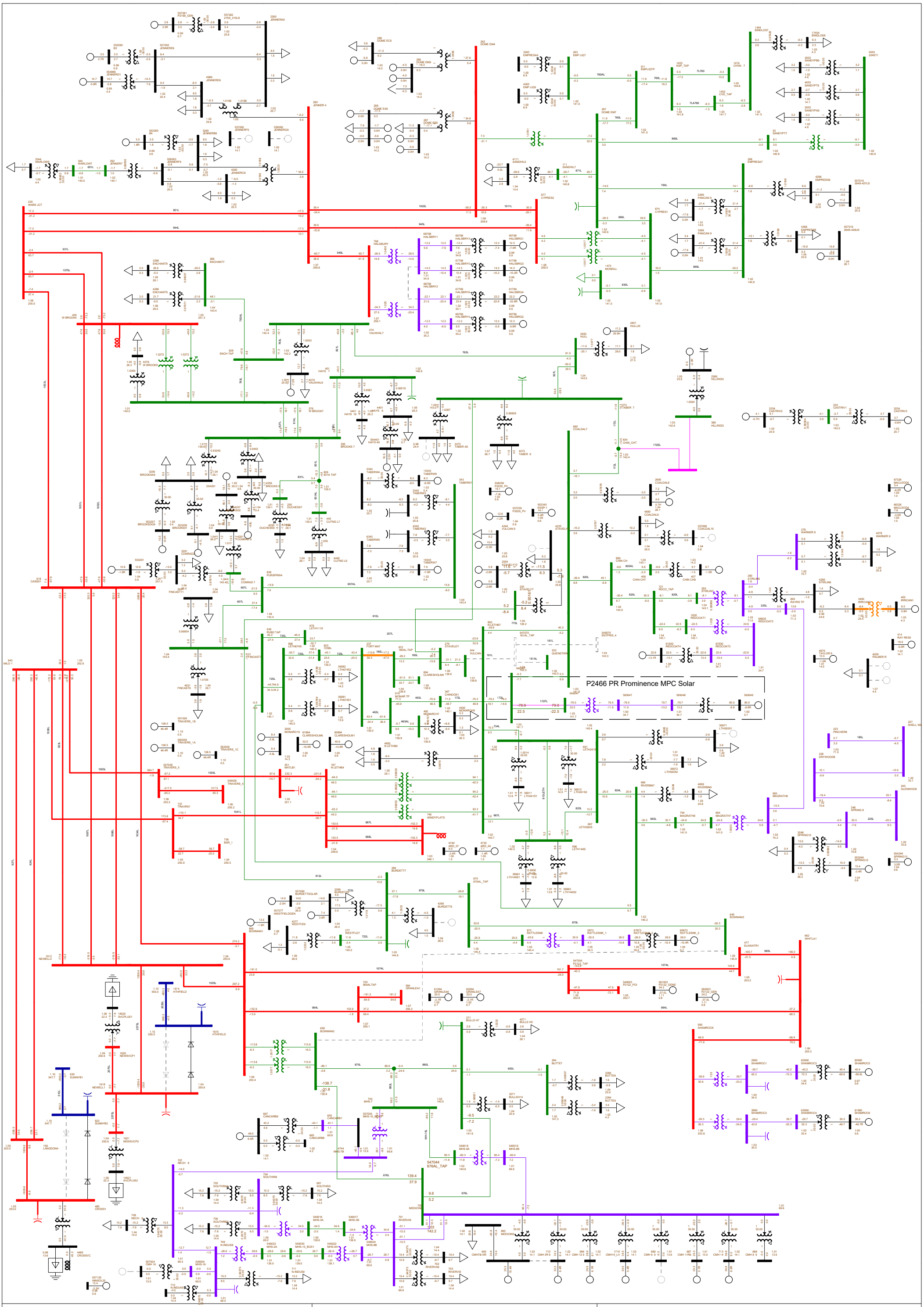
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

202ASL SC8 SENSPOST
MAGRATH 22SST1 CONTINGENCY
WED, JUL 05 2023 11:54

A 3-3 SL Post- 16

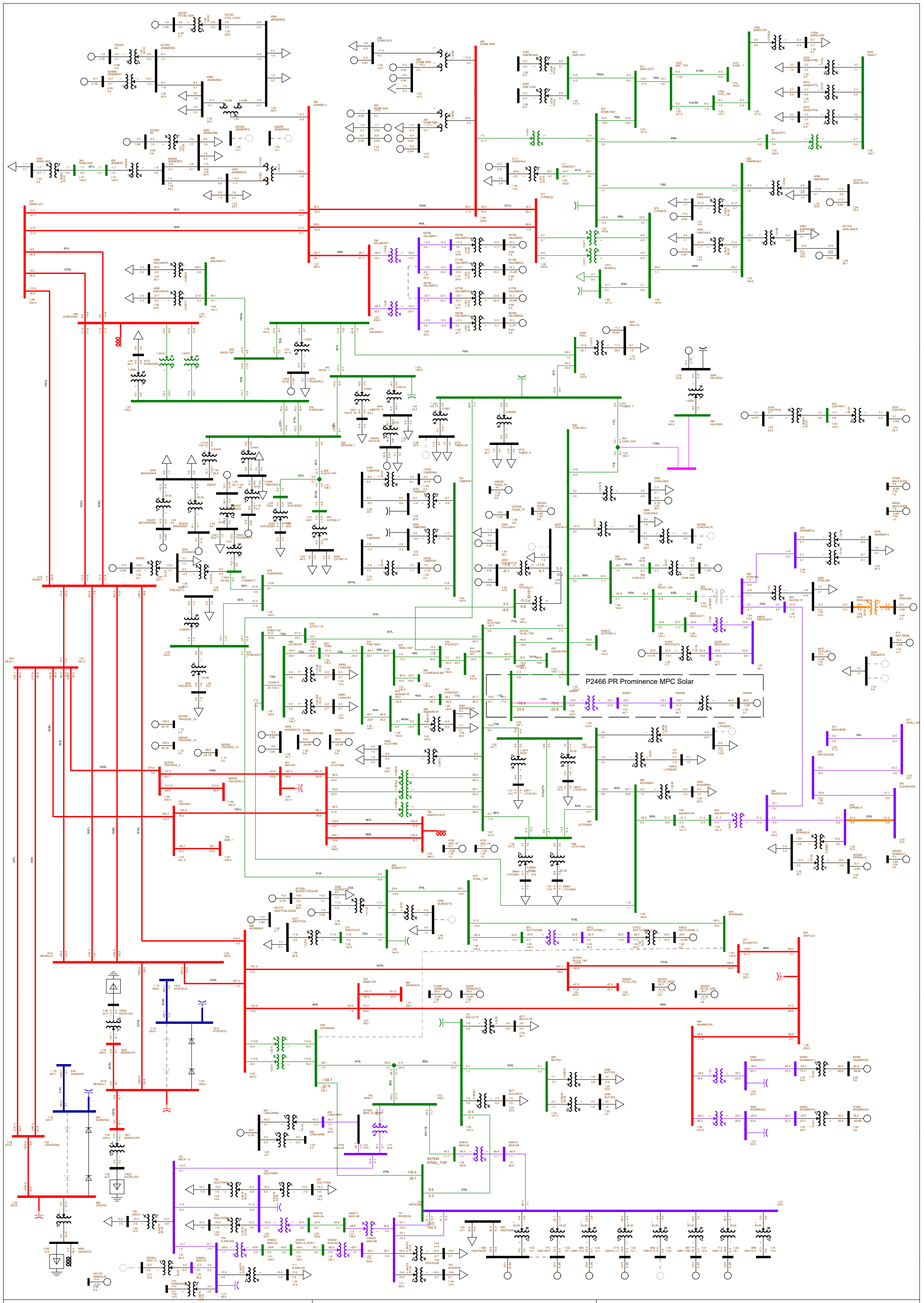
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
161L OR 161AL CONTINGENCY
WED, JUL 05 2023 11:54

A 3-3 SL Post- 17

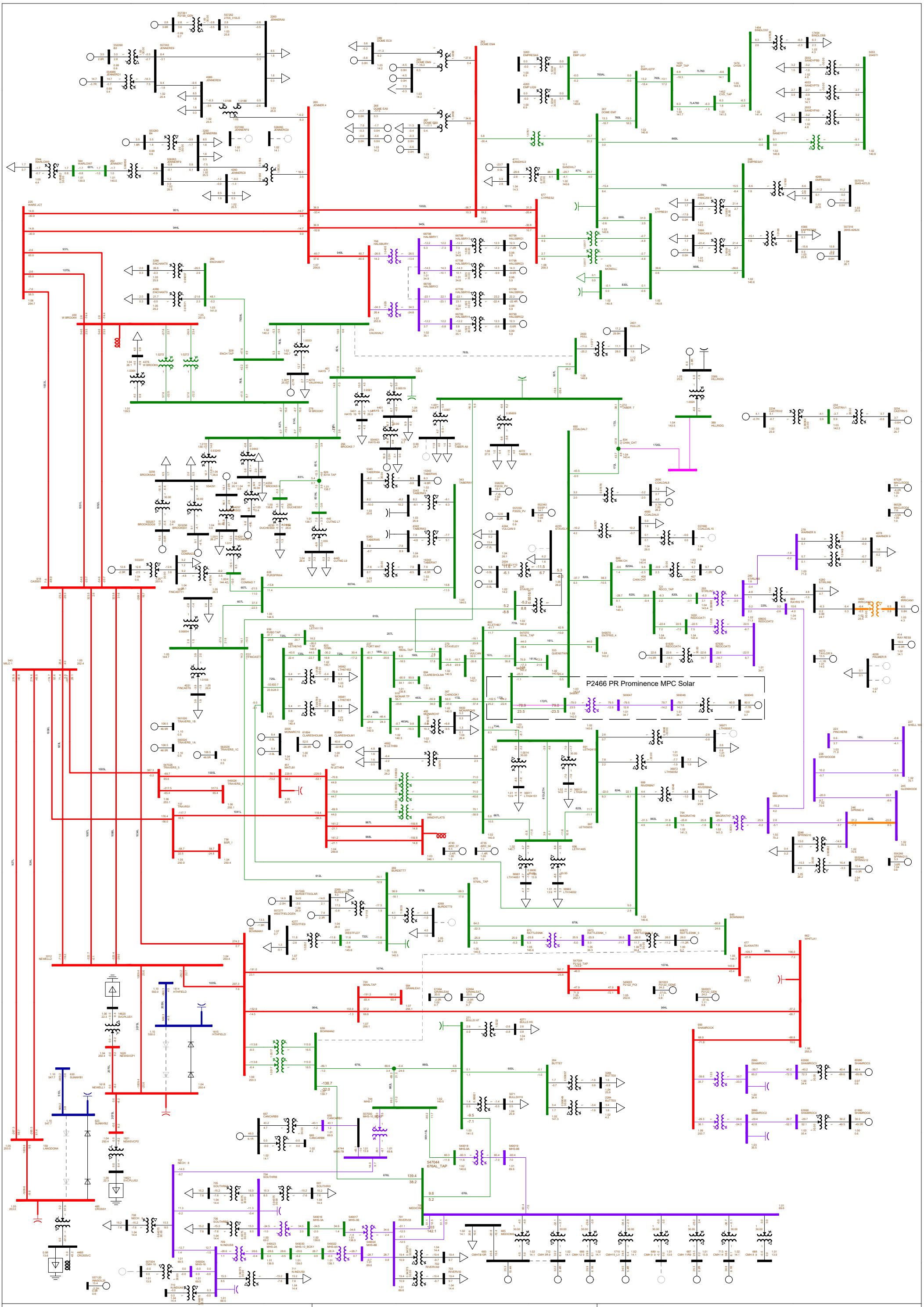
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 SENSPOST
67ST2 CONTINGENCY
WED, JUL 05 2023 11:55

A 3-3 SL Post- 18

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



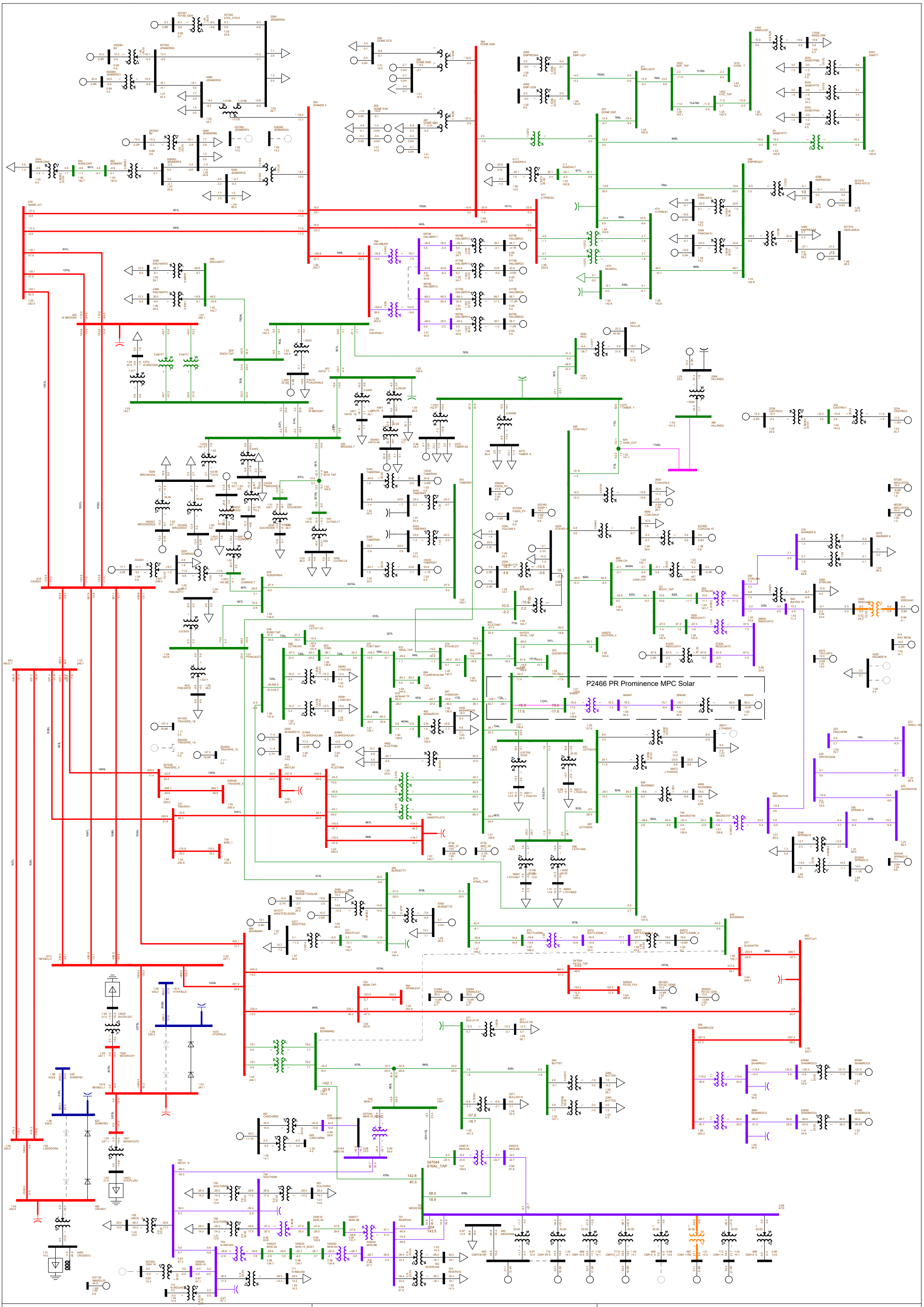
2024SL SC8 SENSPOST
763L CONTINGENCY
WED, JUL 05 2023 11:55

A 3-3 SL Post- 19

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A3-4: List of 2024 Summer Peak Sensitivity Post-Project Load Flow Diagrams

Figure	Category	Contingency
A3-4 SP Post- 1	A (N-0)	System Normal
A3-4 SP Post- 2	B (N-1)	725L or 725AL (Coalbanks 111S - Bowron 674S - Riverbend 618S)
A3-4 SP Post- 3	B (N-1)	463L or 463AL (Fort Macleod 15S - Monarch 492S - Chinook 181S)
A3-4 SP Post- 4	B (N-1)	674ST1 or T2 (Bowron 674S Transformer T1 or T2)
A3-4 SP Post- 5	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A3-4 SP Post- 6	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A3-4 SP Post- 7	B (N-1)	935L (Cassils 324S - Milo 356S)
A3-4 SP Post- 8	B (N-1)	924L (Langdon 102S - Milo 356S)
A3-4 SP Post- 9	B (N-1)	927L (Langdon 102S - Milo 356S)
A3-4 SP Post- 10	B (N-1)	940L (North Lethbridge 370S - Picture Butte 120S)
A3-4 SP Post- 11	B (N-1)	967L (North Lethbridge 370S - Windy Flats 138S)
A3-4 SP Post- 12	B (N-1)	968L (North Lethbridge 370S - Windy Flats 138S)
A3-4 SP Post- 13	B (N-1)	610L (Fincastle 336S - Taber 83S)
A3-4 SP Post- 14	B (N-1)	172L (Chinook 181S - North Lethbridge 370S)
A3-4 SP Post- 15	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A3-4 SP Post- 16	B (N-1)	158ST2 (Vauxhall 158S Transformer T2)
A3-4 SP Post- 17	B (N-1)	257ST1 (Hull 257S Transformer T1)
A3-4 SP Post- 18	B (N-1)	770L (Coaldale 254S - North Lethbridge 370S)
A3-4 SP Post- 19	B (N-1)	923L (Milo 356S - Newell 2075S)
A3-4 SP Post- 20	B (N-1)	507L (Taber 83S - Hull 257S)
A3-4 SP Post- 21	B (N-1)	763L (Vauxhall 158S - Hull 257S)
A3-4 SP Post- 22	B (N-1)	941L (Montana - Picture Butte 120S)
A3-4 SP Post- 23	B (N-1)	254ST2 (Coaldale 254S Transformer T2)


P2466 PR Prominence MPC Solar
A 3-4 SP Post- 1
2024SP SC9 SENSPOST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 11:55
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
72SL OR 72SAL CONTINGENCY
WED, JUL 05 2023 11:56

A 3-4 SP Post- 2

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
463L OR 463AL CONTINGENCY
WED, JUL 05 2023 11:56

A 3-4 SP Post- 3

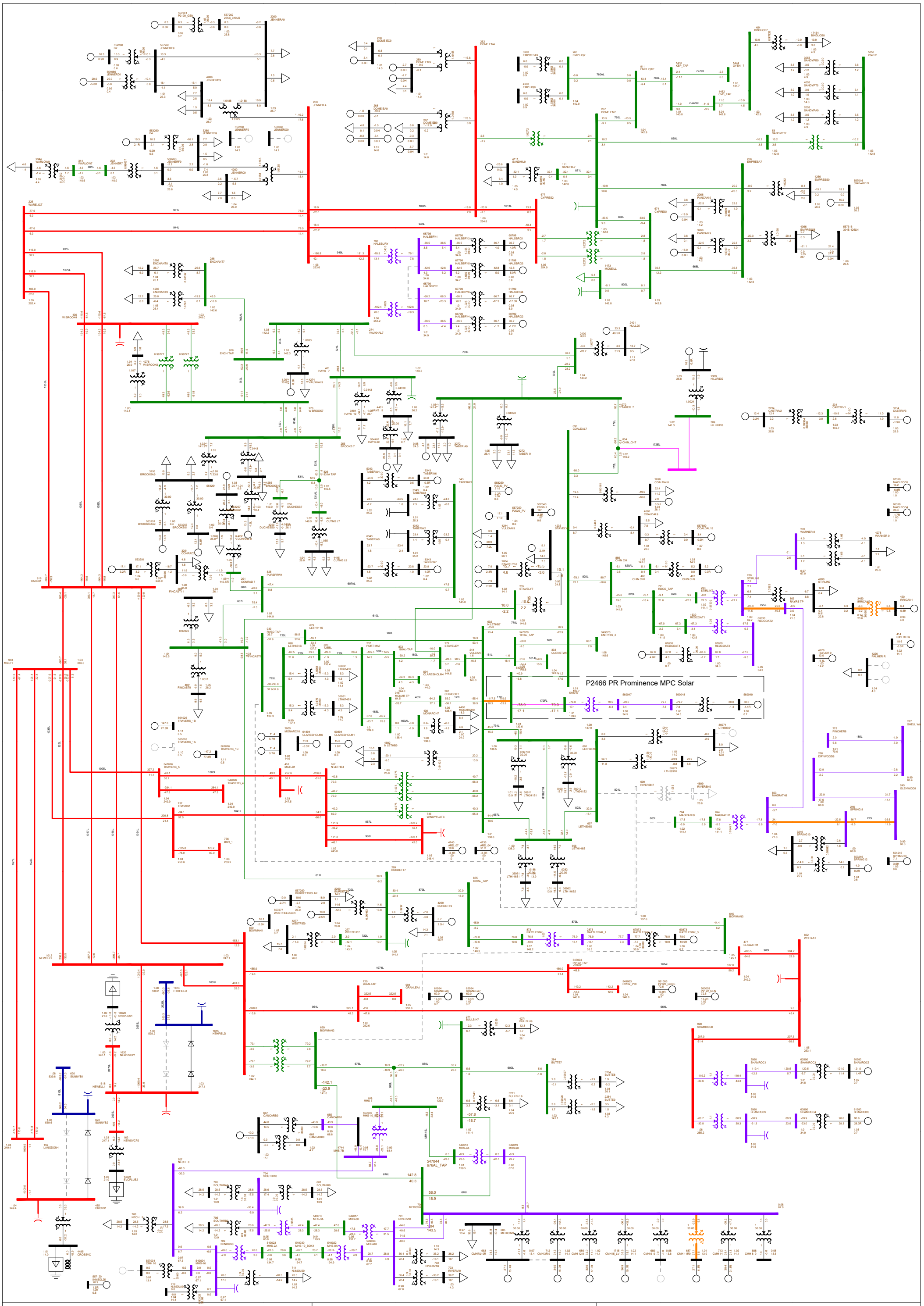
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
BOWRON 67ASTI OR TJ CONTINGENCY
WED, JUL 05 2023 11:56

A 3-4 SP Post- 4

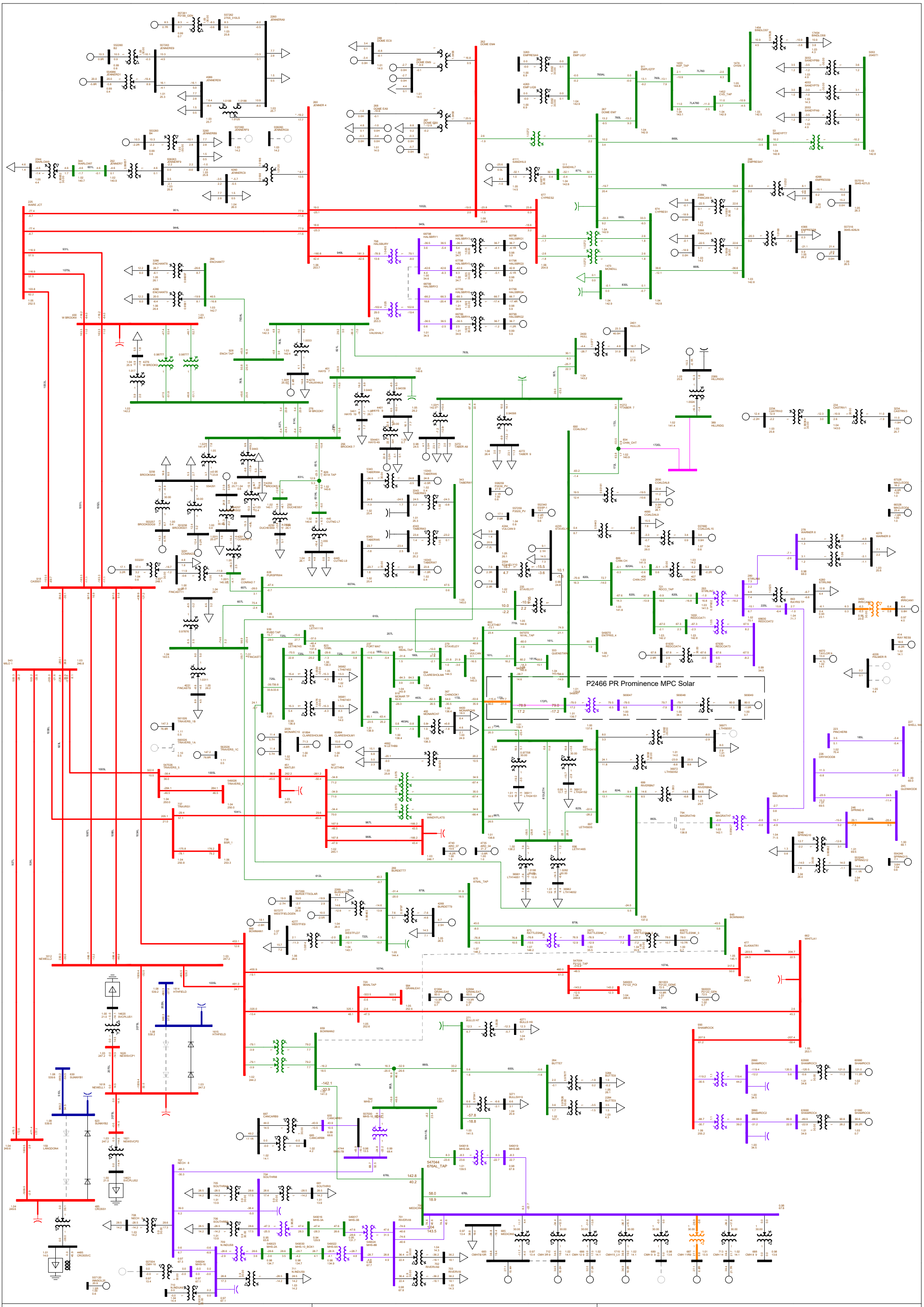
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
RIVERBEND 61BST1 CONTINGENCY
WED, JUL 05 2023 11:56

A 3-4 SP Post- 5

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
86SL CONTINGENCY
WED, JUL 05 2023 11:57

A 3-4 SP Post- 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
930L CONTINGENCY
WED, JUL 05 2023 11:57

A 3-4 SP Post- 7

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
924L CONTINGENCY
WED, JUL 05 2023 11:57

A 3-4 SP Post- 8

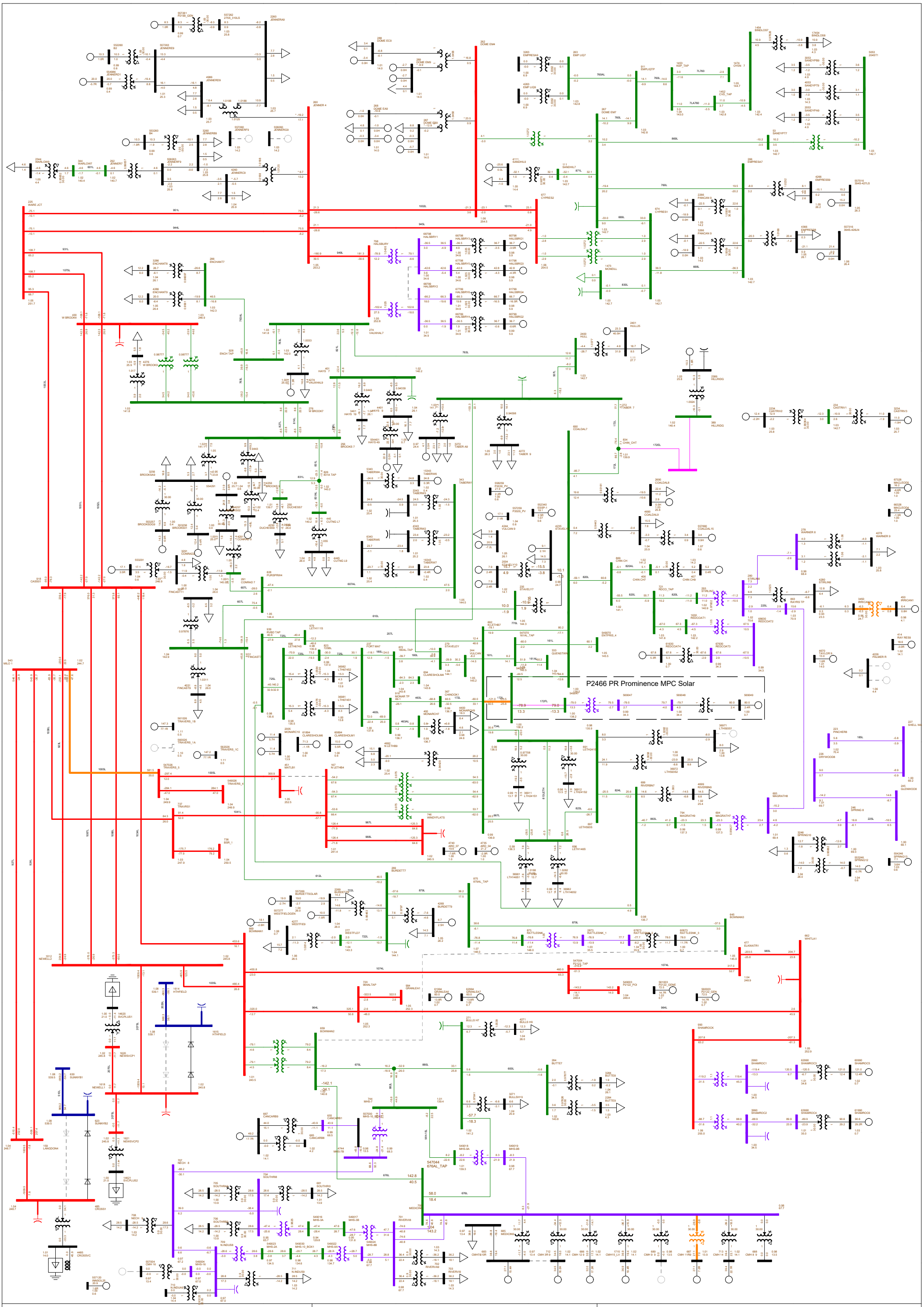
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
927L CONTINGENCY
WED, JUL 05 2023 11:57

A 3-4 SP Post- 9

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
94SL CONTINGENCY
WED, JUL 05 2023 11:58

A 3-4 SP Post- 10

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
96TL CONTINGENCY
WED, JUL 05 2023 11:58

A 3-4 SP Post- 11

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
968L CONTINGENCY
WED, JUL 05 2023 11:58

A 3-4 SP Post- 12

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
61QL CONTINGENCY
WED, JUL 05 2023 11:59

A 3-4 SP Post- 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
172L CONTINGENCY
WED, JUL 05 2023 11:59

A 3-4 SP Post- 14

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

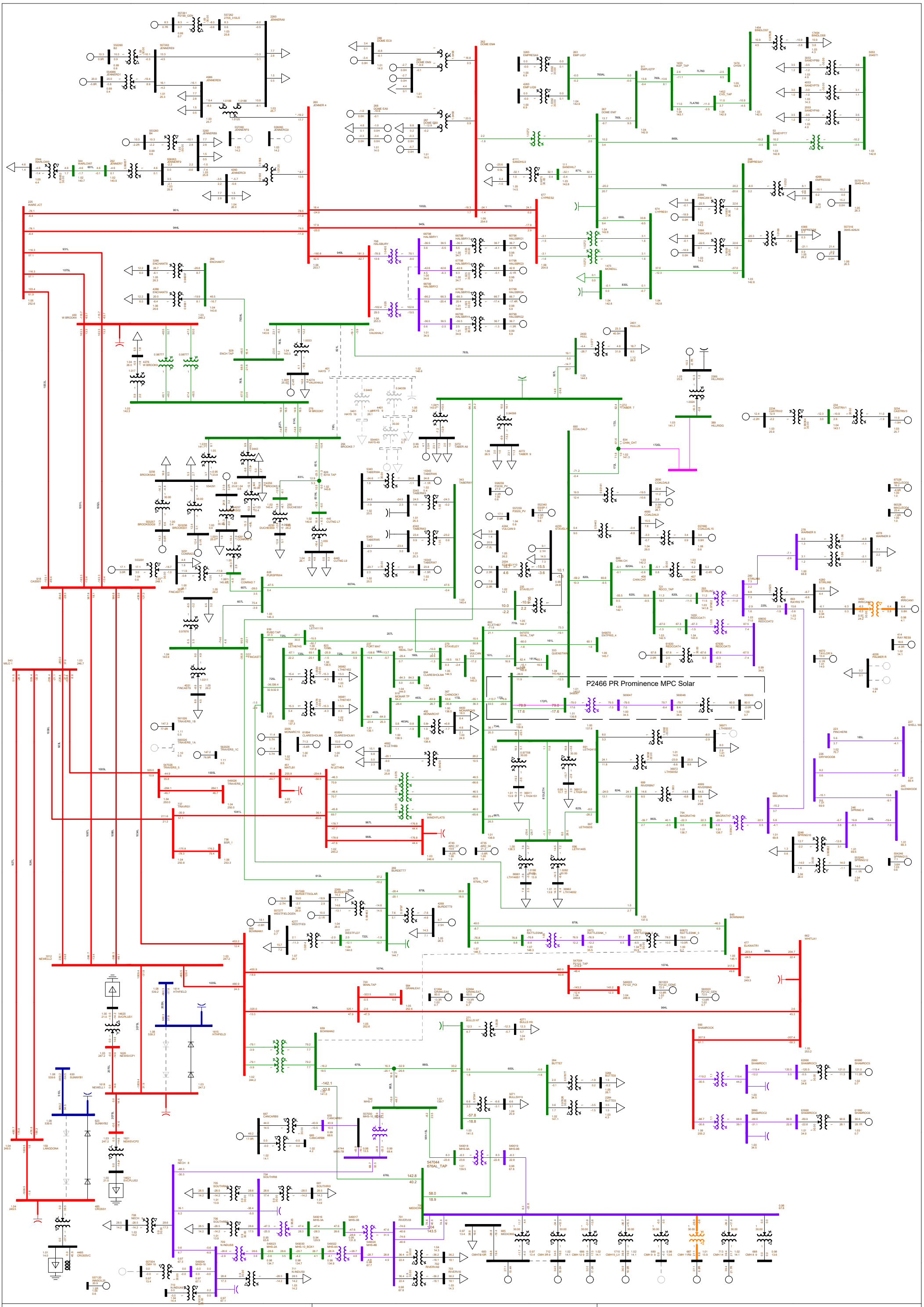
P2466 PR Prominence MPC Solar

202ASP SC9 SENSPOST
MAGRATH 25SIT1 CONTINGENCY
WED, JUL 05 2023 11:59

A 3-4 SP Post- 15

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A

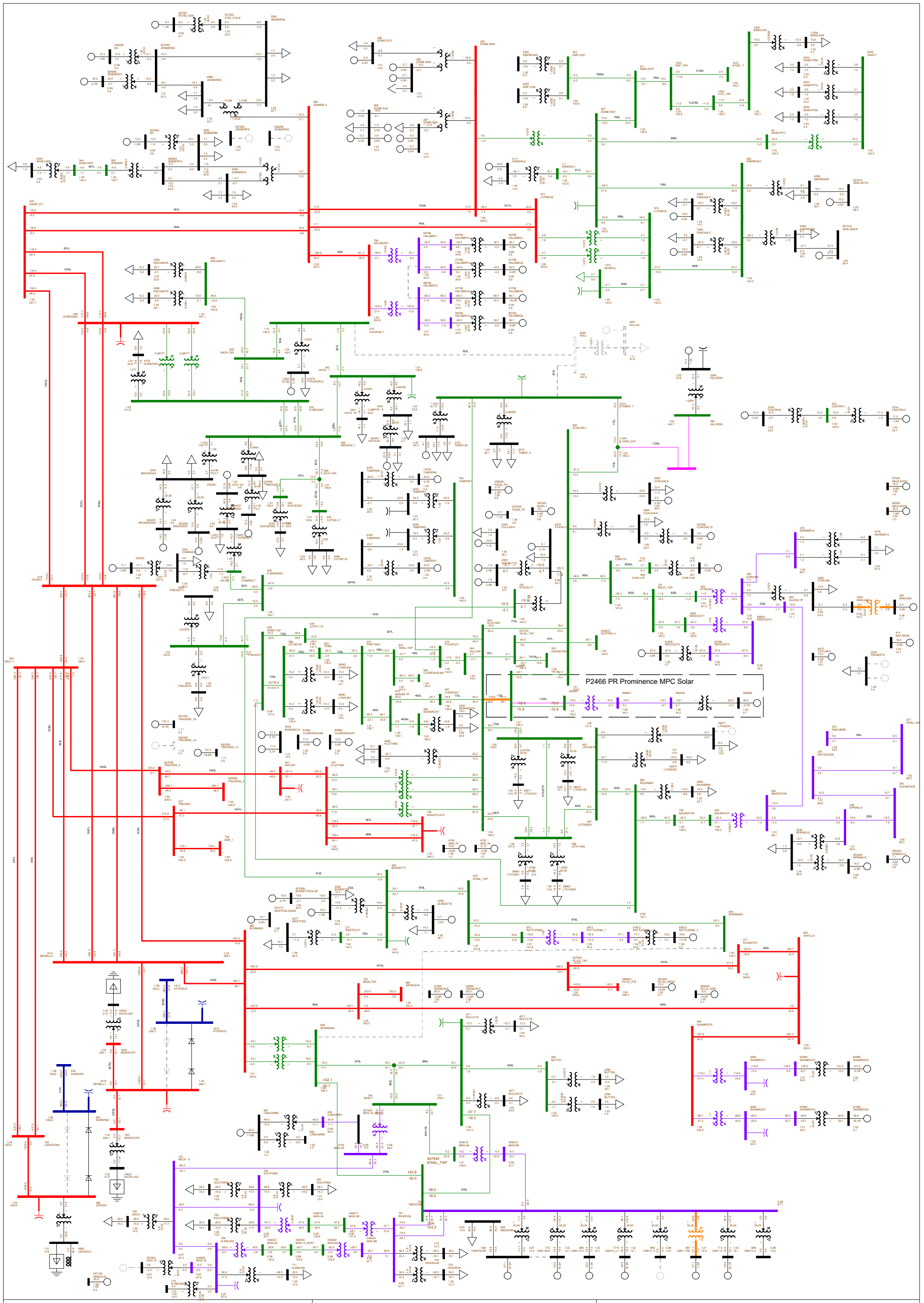
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
158S T2 CONTINGENCY
WED, JUL 05 2023 11:59

A 3-4 SP Post- 16

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
2STB T1 CONTINGENCY
WED, JUL 05 2023 12:00

A 3-4 SP Post- 17

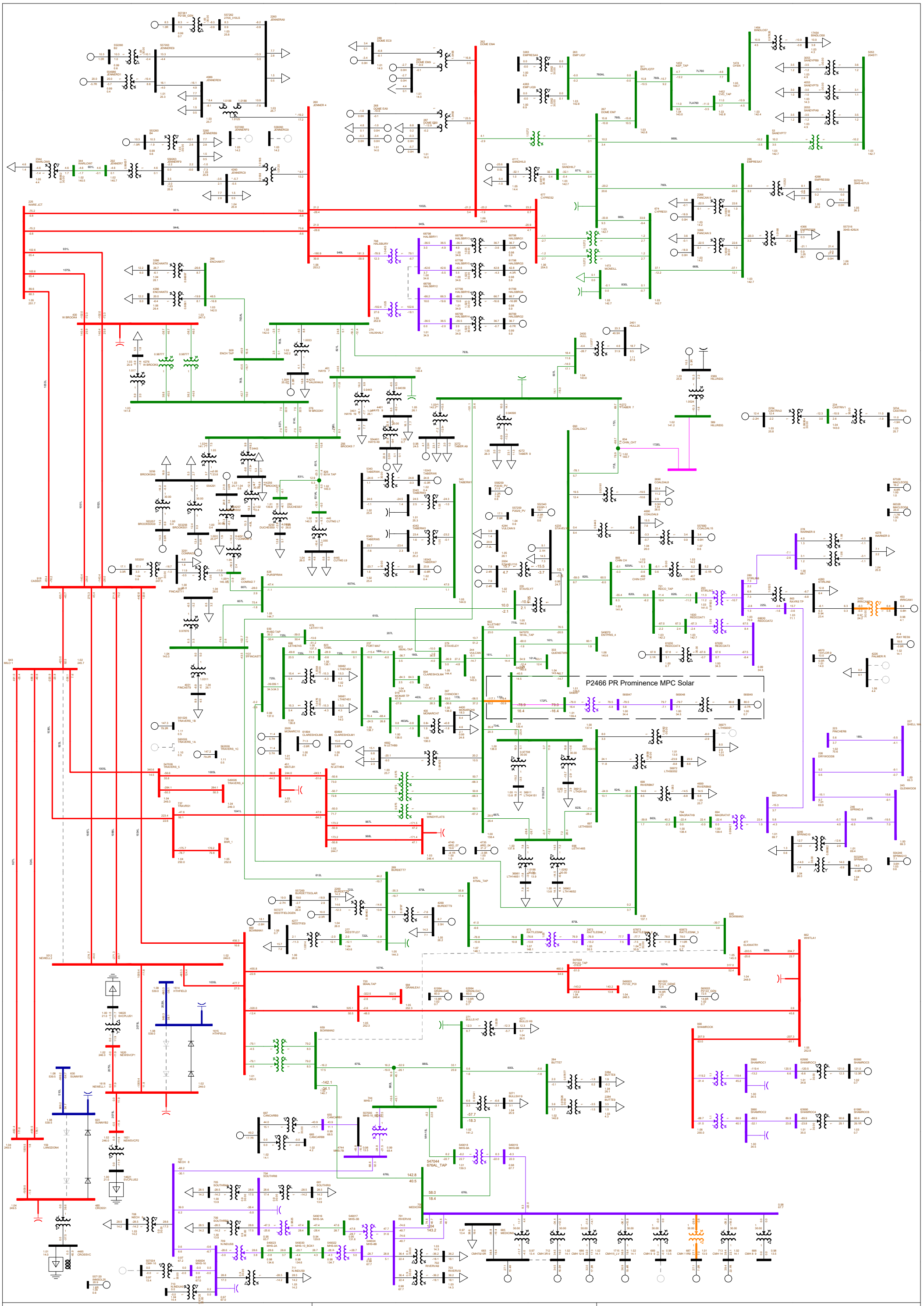
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
77L CONTINGENCY
WED, JUL 05 2023 12:00

A 3-4 SP Post- 18

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC9 SENSPOST
923L CONTINGENCY
WED, JUL 05 2023 12:00

A 3-4 SP Post- 19

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
SOL CONTINGENCY
WED, JUL 05 2023 12:01

A 3-4 SP Post- 20

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
763L CONTINGENCY
WED, JUL 05 2023 12:01

A 3-4 SP Post- 21

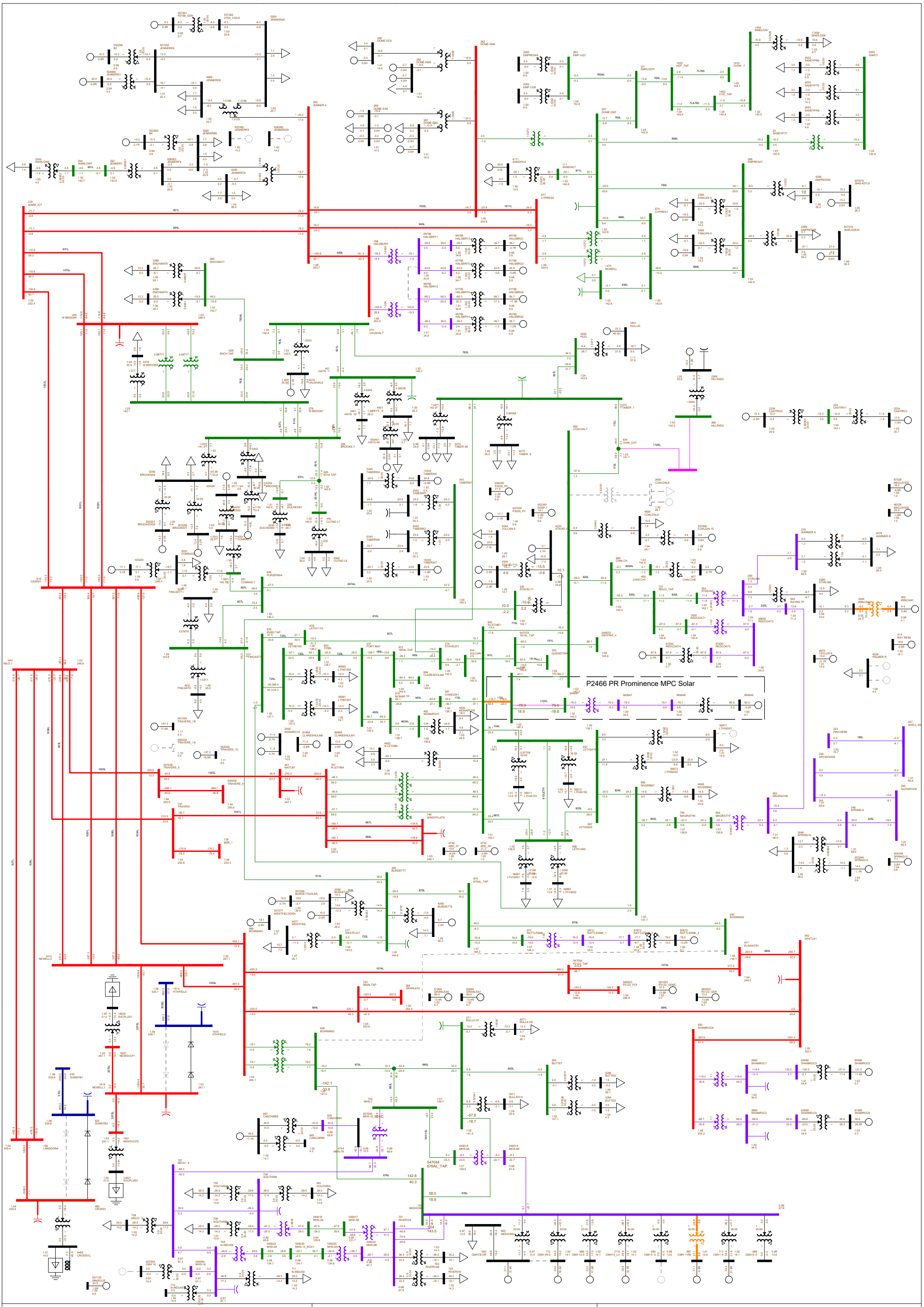
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 SENSPOST
94 IL CONTINGENCY
WED, JUL 05 2023 12:01

A 3-4 SP Post- 22

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



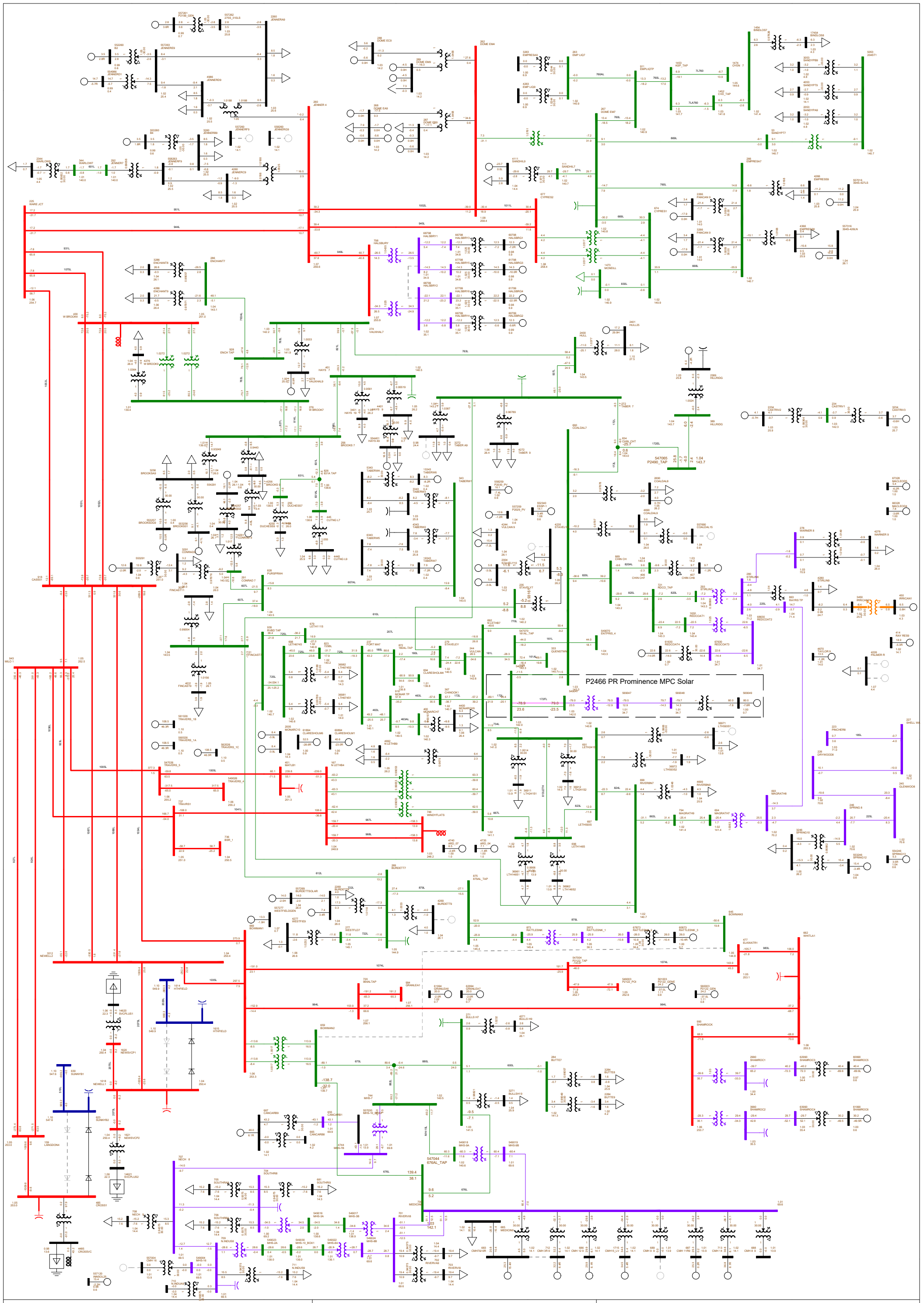
2024SP SC9 SENSPOST
254B T2 CONTINGENCY
WED, JUL 05 2023 12:02

A 3-4 SP Post- 23

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A3-5: List of 2024 Summer Light Sensitivity2 Post-Project Load Flow Diagrams

Figure	Category	Contingency
A3-5 SL Post- 1	A (N-0)	System Normal



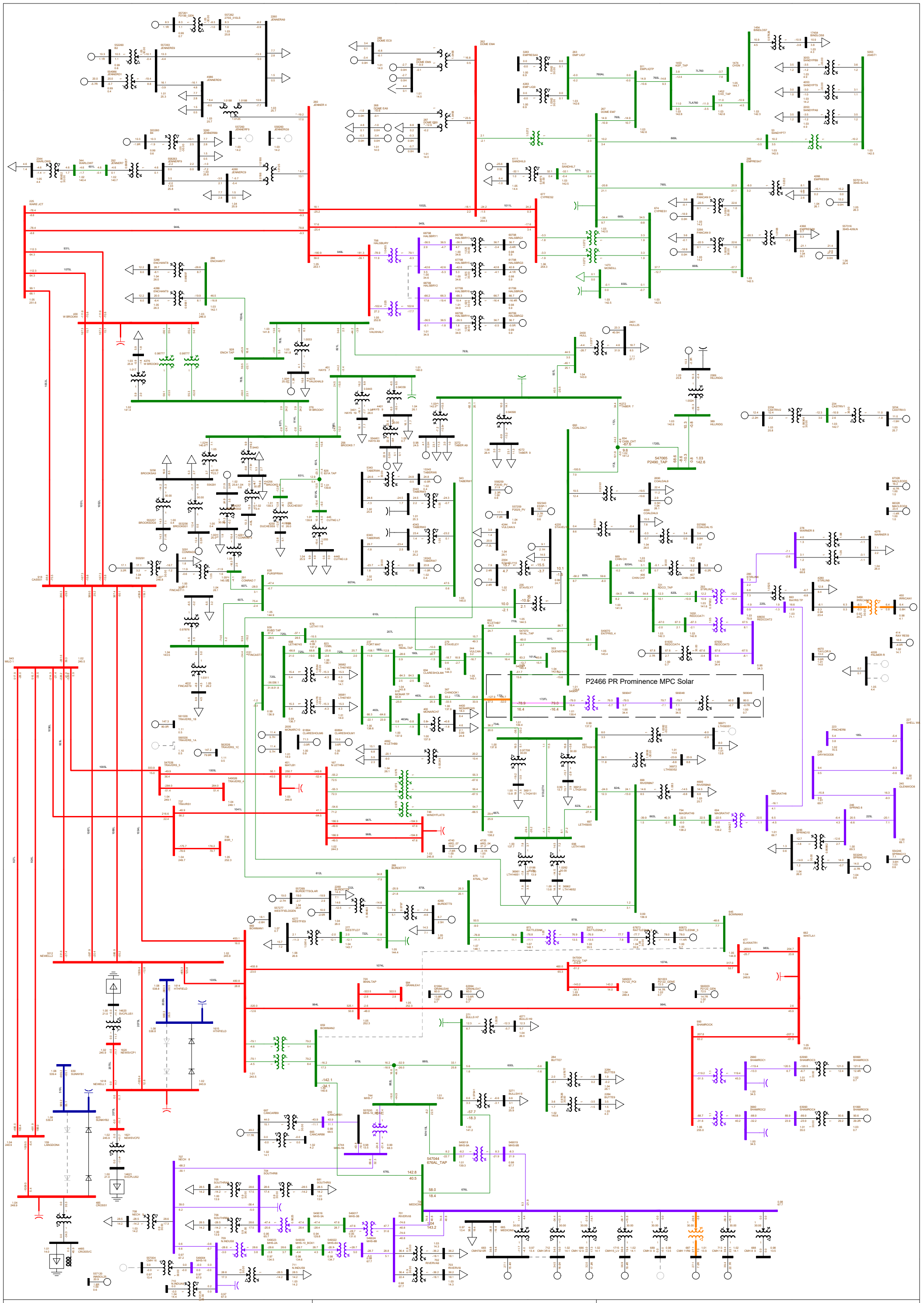
2024SL SC12 SENSPOST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 12:03

A 3-5 SL Post - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Table A3-6: List of 2024 Summer Peak Sensitivity2 Post-Project Load Flow Diagrams

Figure	Category	Contingency
A3-6 SP Post- 1	A (N-0)	System Normal



2024SP SC13 SENSPOST
N-0, SYSTEM NORMAL
WED, JUL 05 2023 12:04

A 3-6 SP Post - 1

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A4

Post-Project Transient Stability Diagrams

Scenario 3

Summer Light Post Project

Transient Response Plot Key

Table Summer Light Post Project Figure Reference:

Scenario	Plots	Figure #
Summer Light Post Project	Power Plots	B-SC3-POST-1 to B-SC3-POST-19
	Var Plots	C-SC3-POST-1 to C-SC3-POST-19
	Bus Voltage Plots	D-SC3-POST-1 to D-SC3-POST-19
	Branchflow MW Plots	E-SC3-POST-1 to E-SC3-POST-19
	Branchflow MVar Plots	F-SC3-POST-1 to F-SC3-POST-19

Table Summer Light Post Project Figures:

Category	Line Element	Substation Terminals		Faulted End	Figure Reference
A	n/a	Flat Start		n/a	B-SC3-POST-1 C-SC3-POST-1 D-SC3-POST-1 E-SC3-POST-1 F-SC3-POST-1
B	820L	Stirling 67S	Coaldale 254S	67S	B-SC3-POST-2 C-SC3-POST-2 D-SC3-POST-2 E-SC3-POST-2 F-SC3-POST-2
				254S	B-SC3-POST-3 C-SC3-POST-3 D-SC3-POST-3 E-SC3-POST-3 F-SC3-POST-3
B	863L	Magrath 225S	Riverbend 618S	225S	B-SC3-POST-4 C-SC3-POST-4 D-SC3-POST-4 E-SC3-POST-4 F-SC3-POST-4
				618S	B-SC3-POST-5 C-SC3-POST-5 D-SC3-POST-5 E-SC3-POST-5 F-SC3-POST-5
B	172L	Taber 83S	Coaldale 254S	83S	B-SC3-POST-6 C-SC3-POST-6 D-SC3-POST-6 E-SC3-POST-6 F-SC3-POST-6
				254S	B-SC3-POST-7 C-SC3-POST-7 D-SC3-POST-7 E-SC3-POST-7 F-SC3-POST-7
B	172L	Coaldale 254S	N. Leth 370S	254S	B-SC3-POST-8 C-SC3-POST-8 D-SC3-POST-8 E-SC3-POST-8 F-SC3-POST-8
				370S	B-SC3-POST-9 C-SC3-POST-9 D-SC3-POST-9 E-SC3-POST-9 F-SC3-POST-9
B	172L	Chinook 181S	N. Leth 370S	181S	B-SC3-POST-10 C-SC3-POST-10

					D-SC3-POST-10 E-SC3-POST-10 F-SC3-POST-10
				370S	B-SC3-POST-11 C-SC3-POST-11 D-SC3-POST-11 E-SC3-POST-11 F-SC3-POST-11
B	770L	Coaldale 254S	N. Leth 370S	254S	B-SC3-POST-12 C-SC3-POST-12 D-SC3-POST-12 E-SC3-POST-12 F-SC3-POST-12
				370S	B-SC3-POST-13 C-SC3-POST-13 D-SC3-POST-13 E-SC3-POST-13 F-SC3-POST-13
B	1041L	N. Leth 370S	Travers 554S	370S	B-SC3-POST-14 C-SC3-POST-14 D-SC3-POST-14 E-SC3-POST-14 F-SC3-POST-14
				554S	B-SC3-POST-15 C-SC3-POST-15 D-SC3-POST-15 E-SC3-POST-15 F-SC3-POST-15
B	967L	N. Leth 370S	Wind Flats 138S	370S	B-SC3-POST-16 C-SC3-POST-16 D-SC3-POST-16 E-SC3-POST-16 F-SC3-POST-16
				138S	B-SC3-POST-17 C-SC3-POST-17 D-SC3-POST-17 E-SC3-POST-17 F-SC3-POST-17
B	940L	N. Leth 370S	Picture Butte 120S	370S	B-SC3-POST-18 C-SC3-POST-18 D-SC3-POST-18 E-SC3-POST-18 F-SC3-POST-18
				120S	B-SC3-POST-19 C-SC3-POST-19 D-SC3-POST-19 E-SC3-POST-19 F-SC3-POST-19

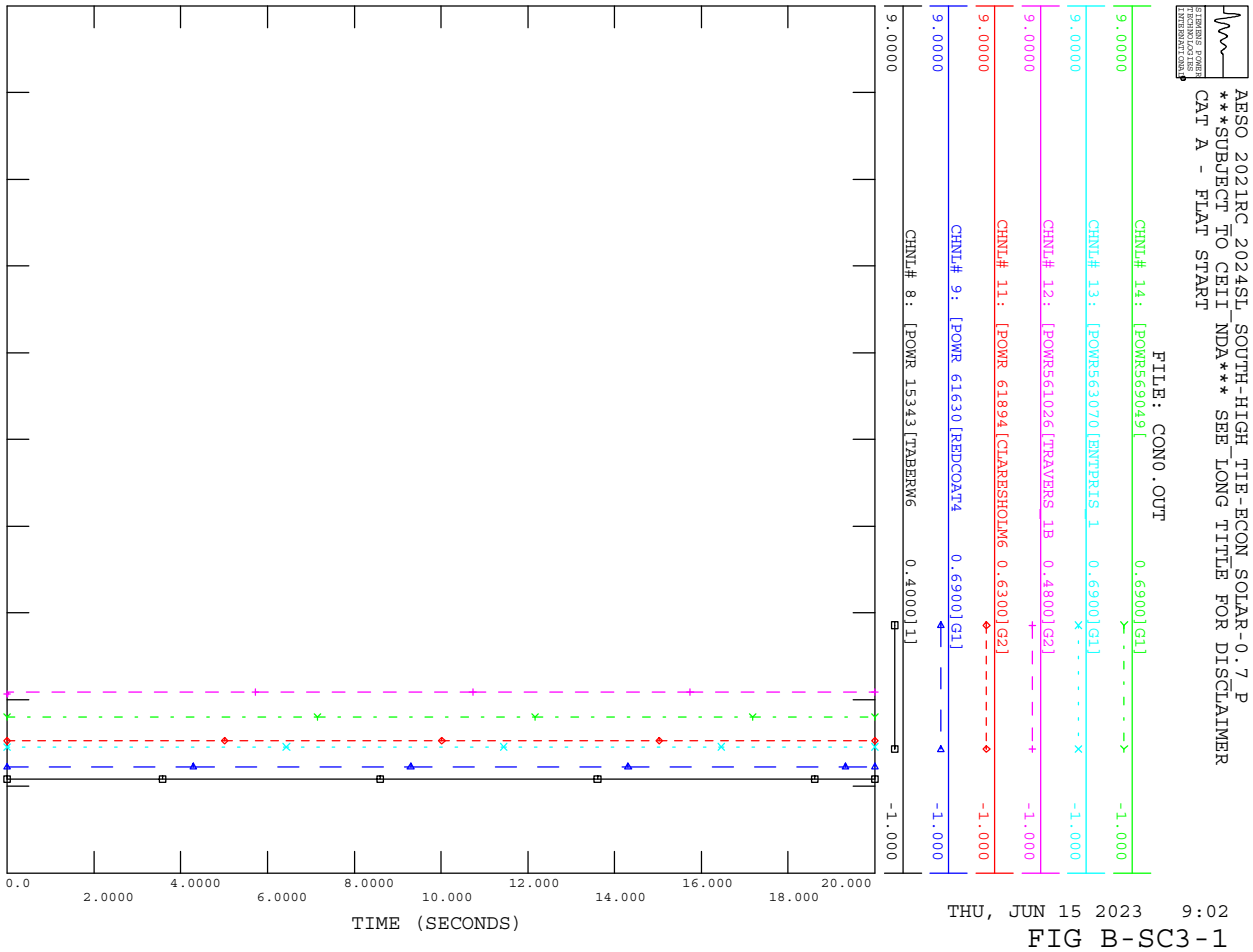


FIG B-SC3-1

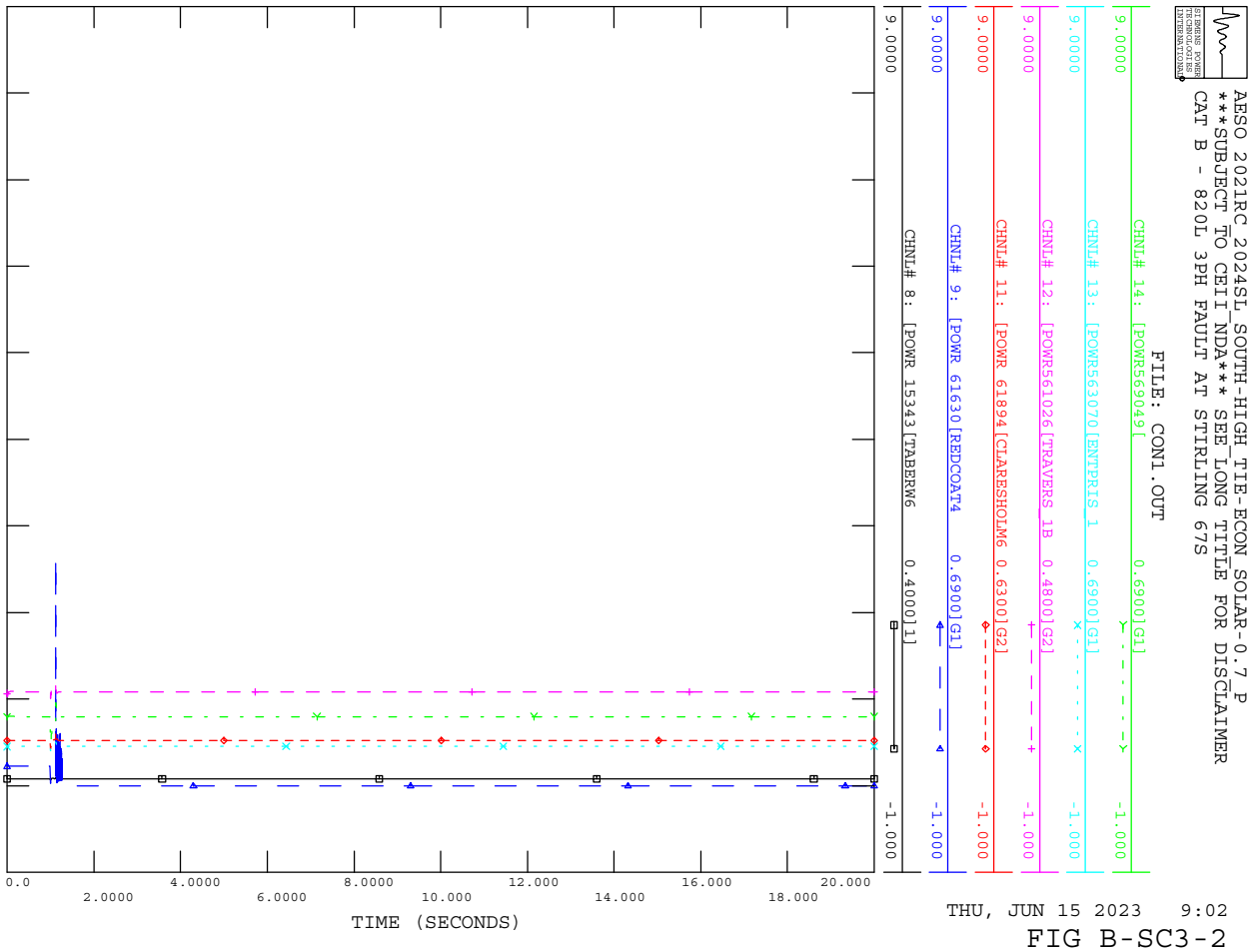


FIG B-SC3-2

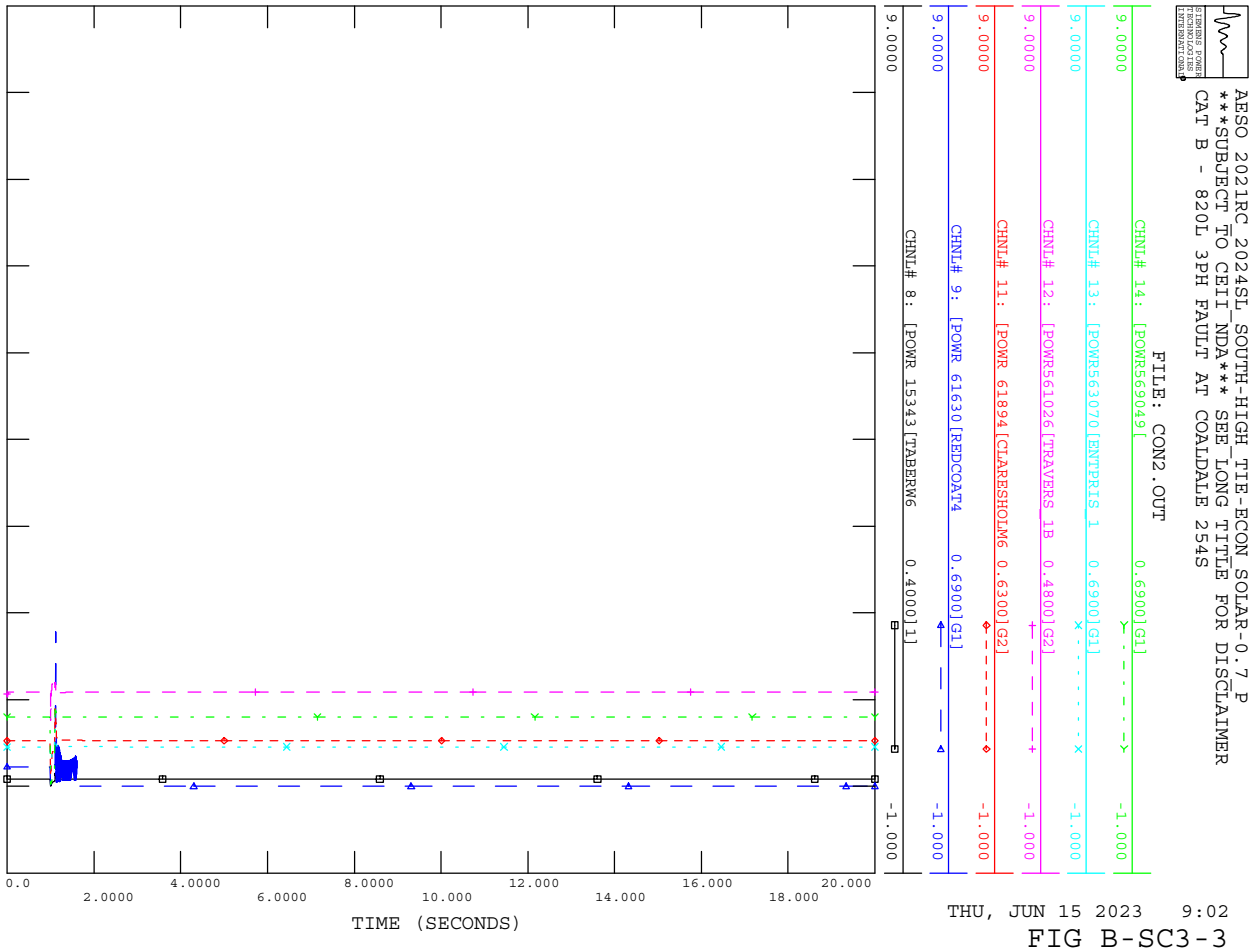


FIG B-SC3-3

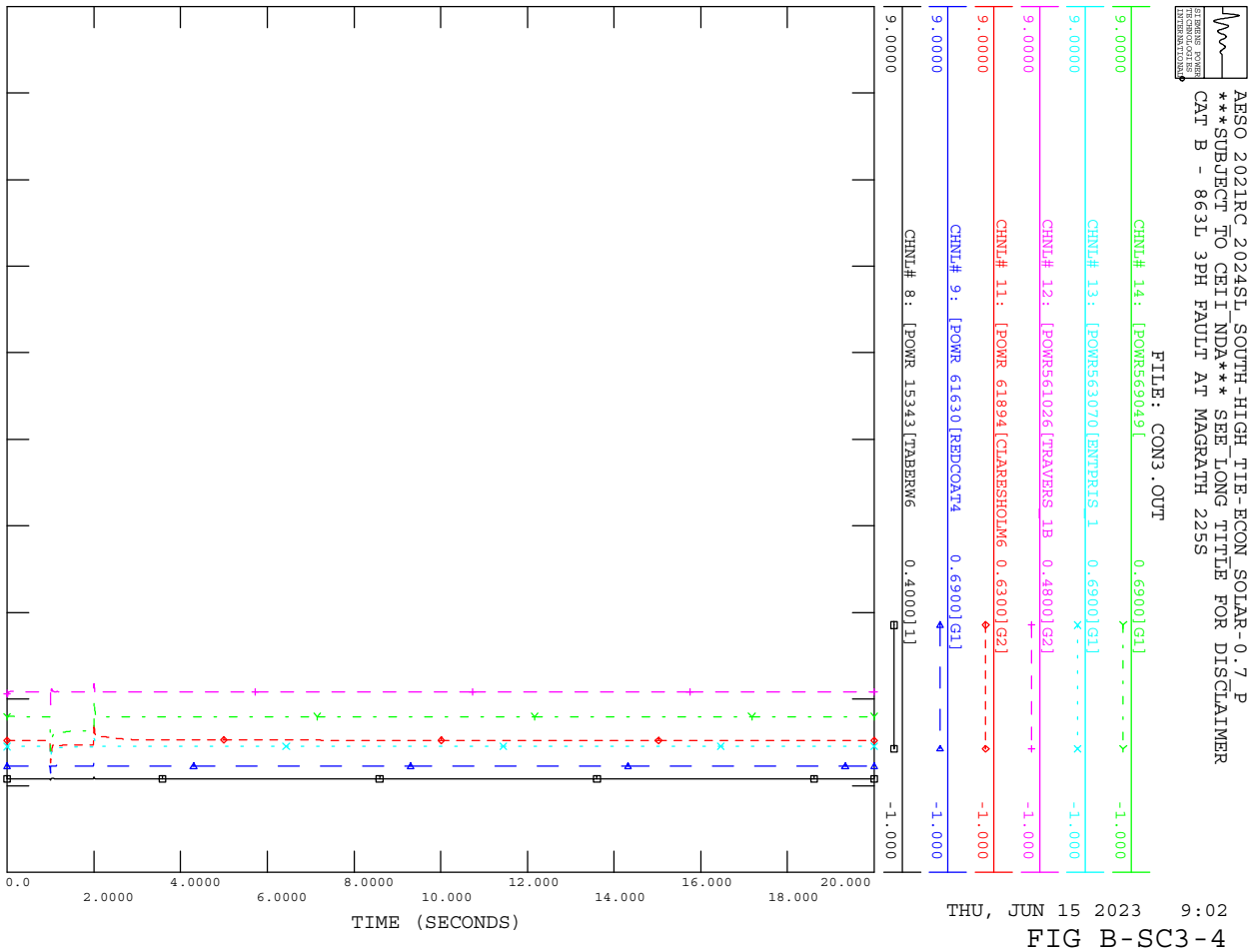


FIG B-SC3-4

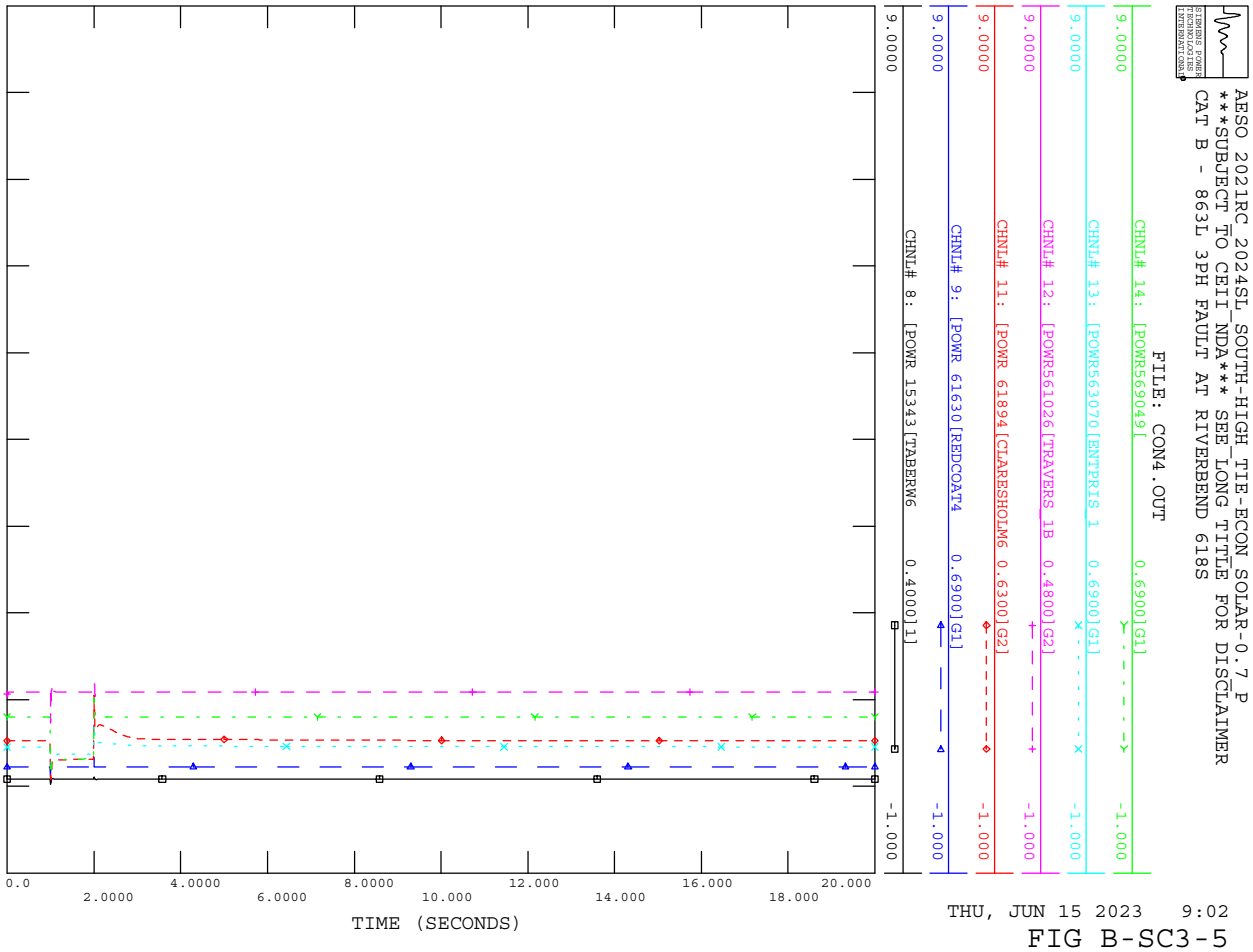


FIG B-SC3-5

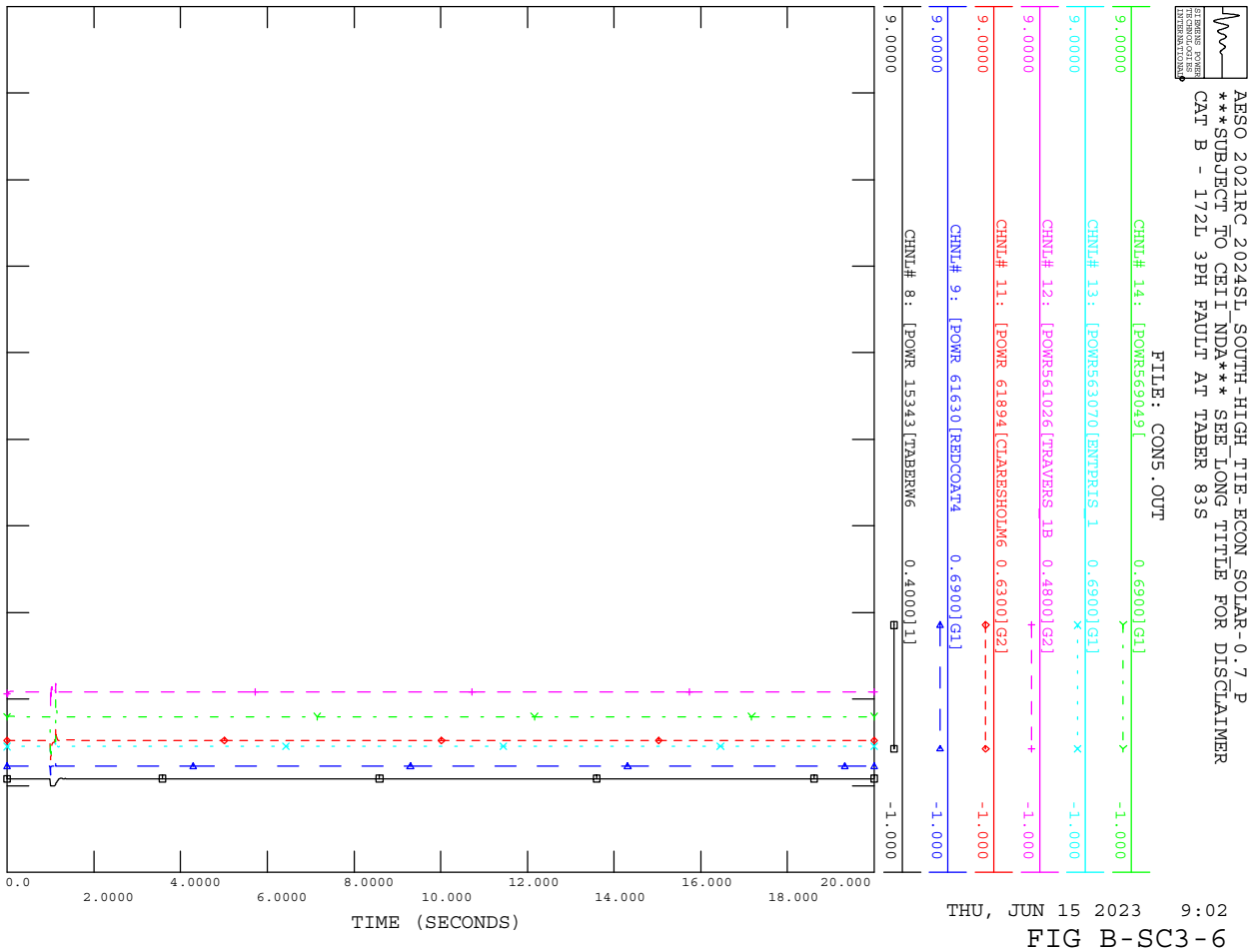


FIG B-SC3-6

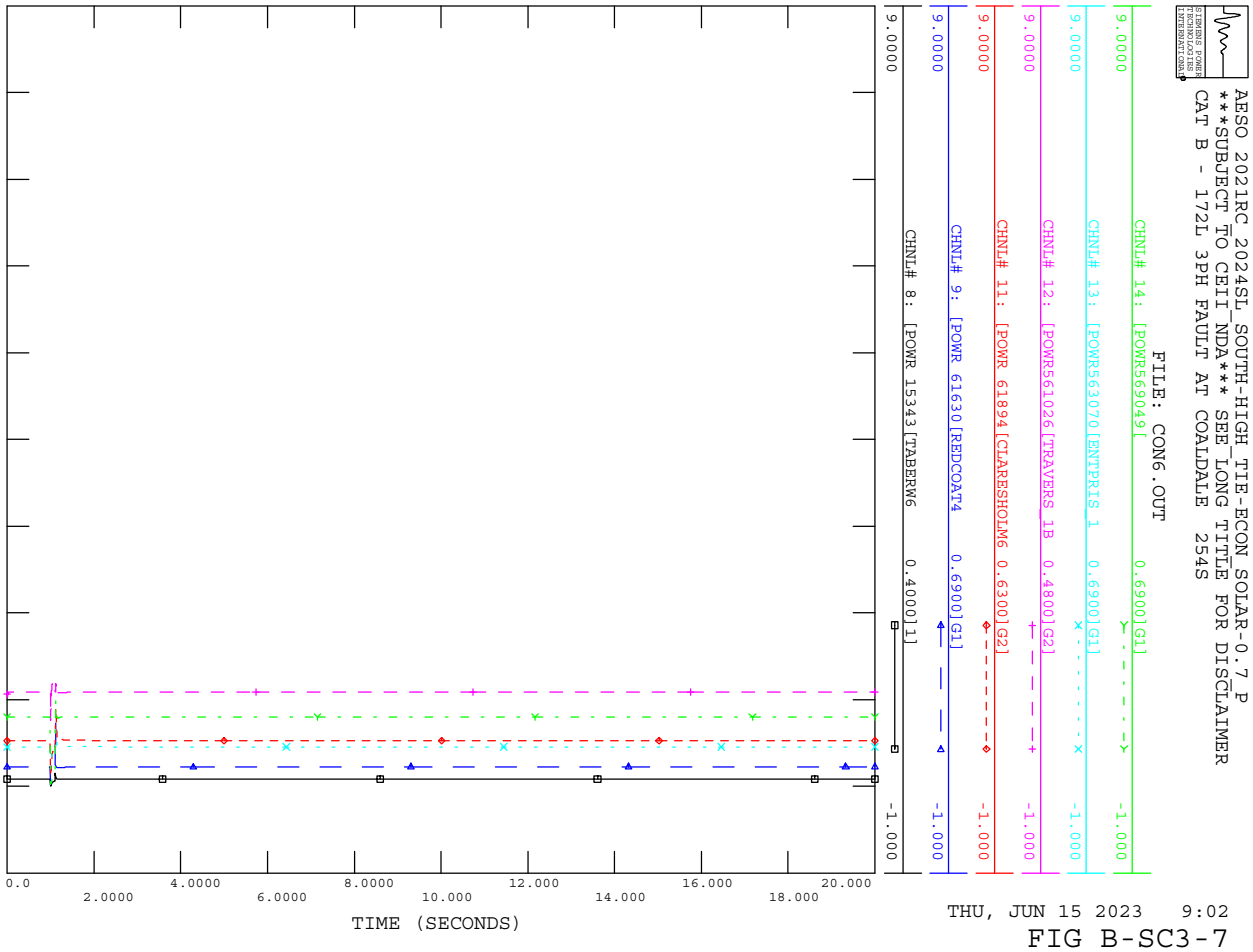


FIG B-SC3-7

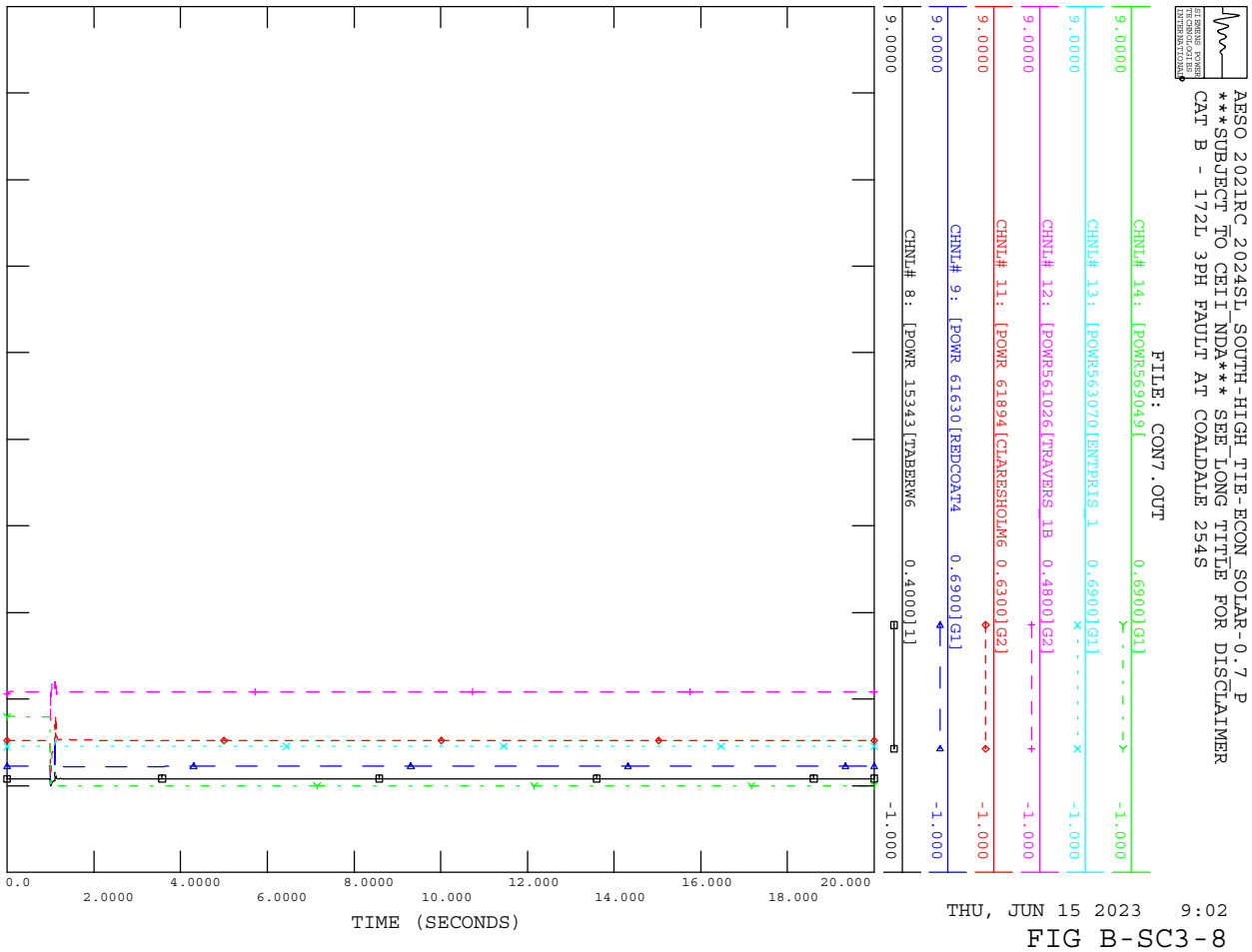


FIG B-SC3-8

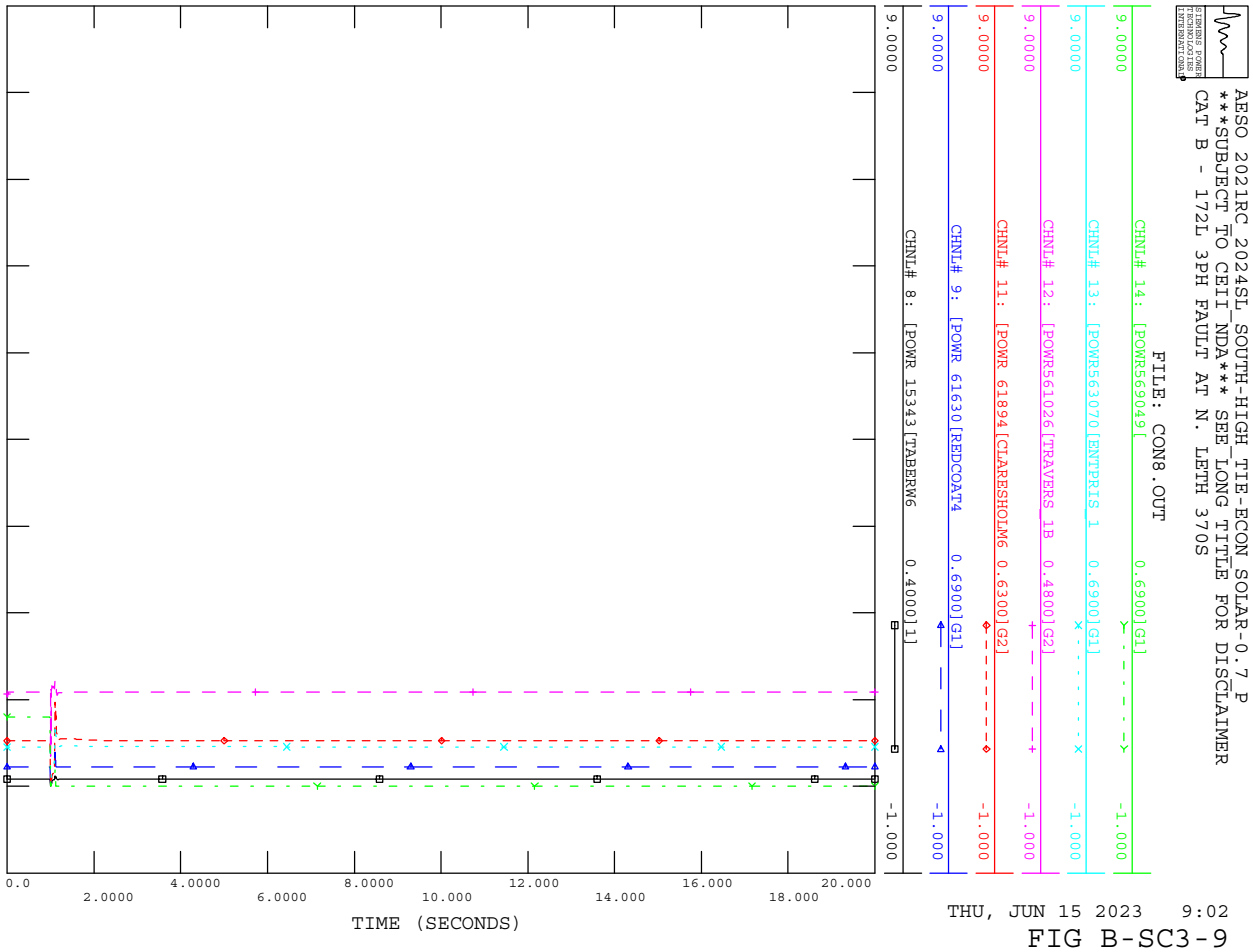


FIG B-SC3-9

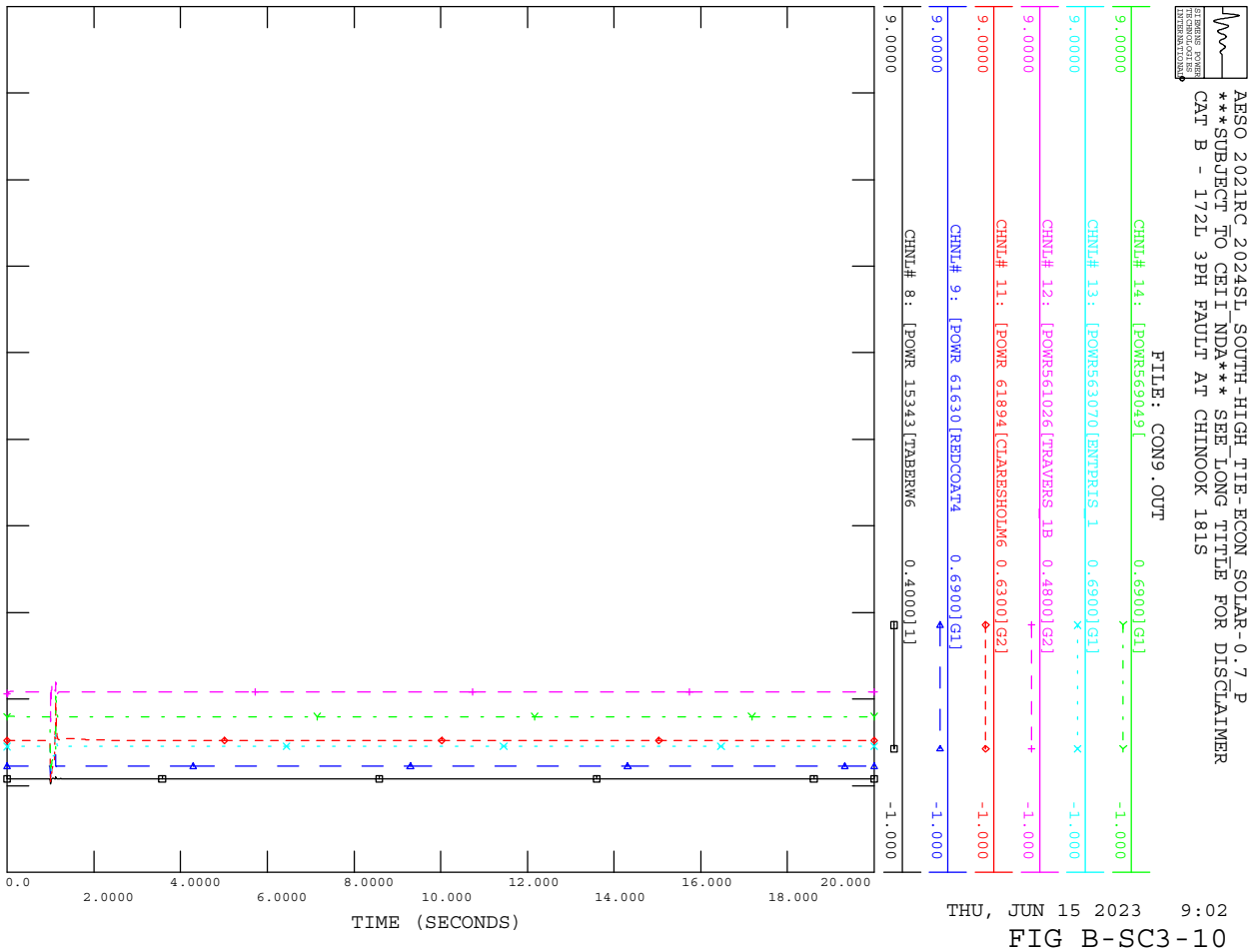
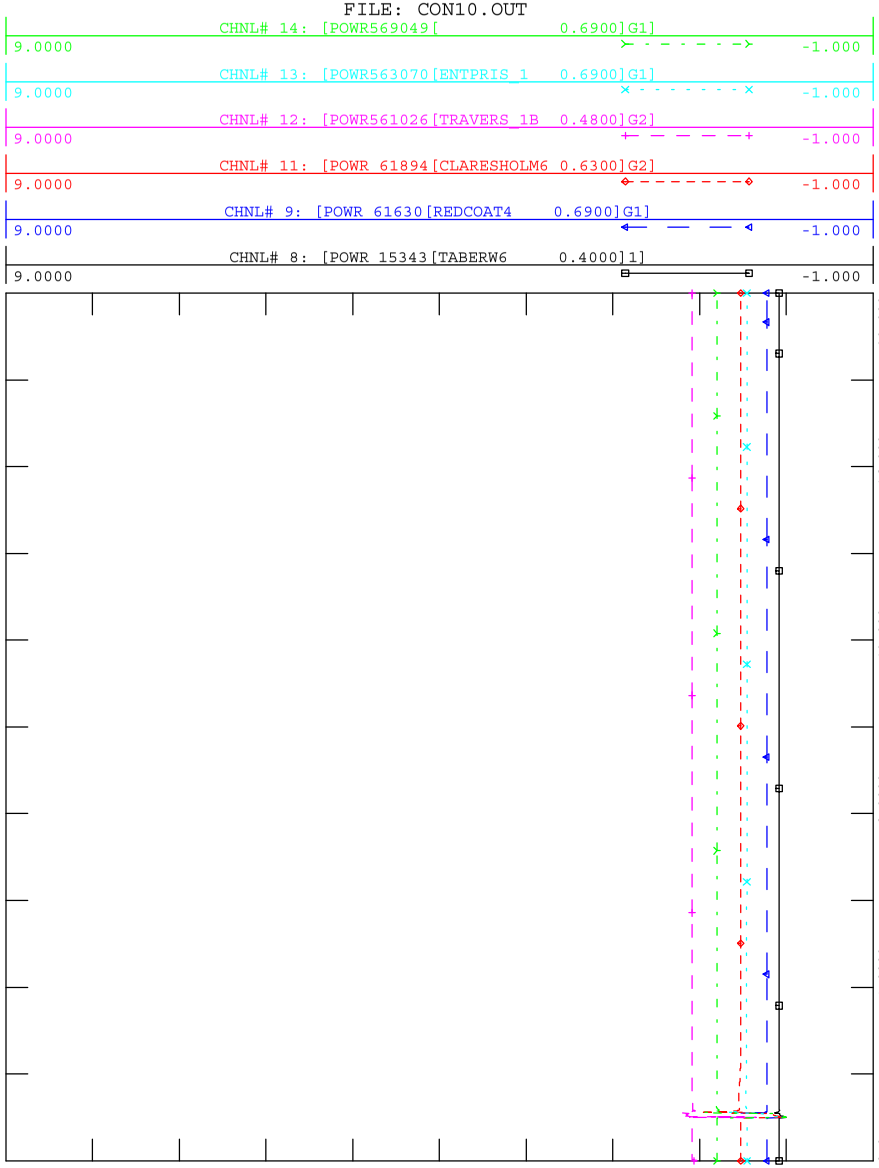


FIG B-SC3-10

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

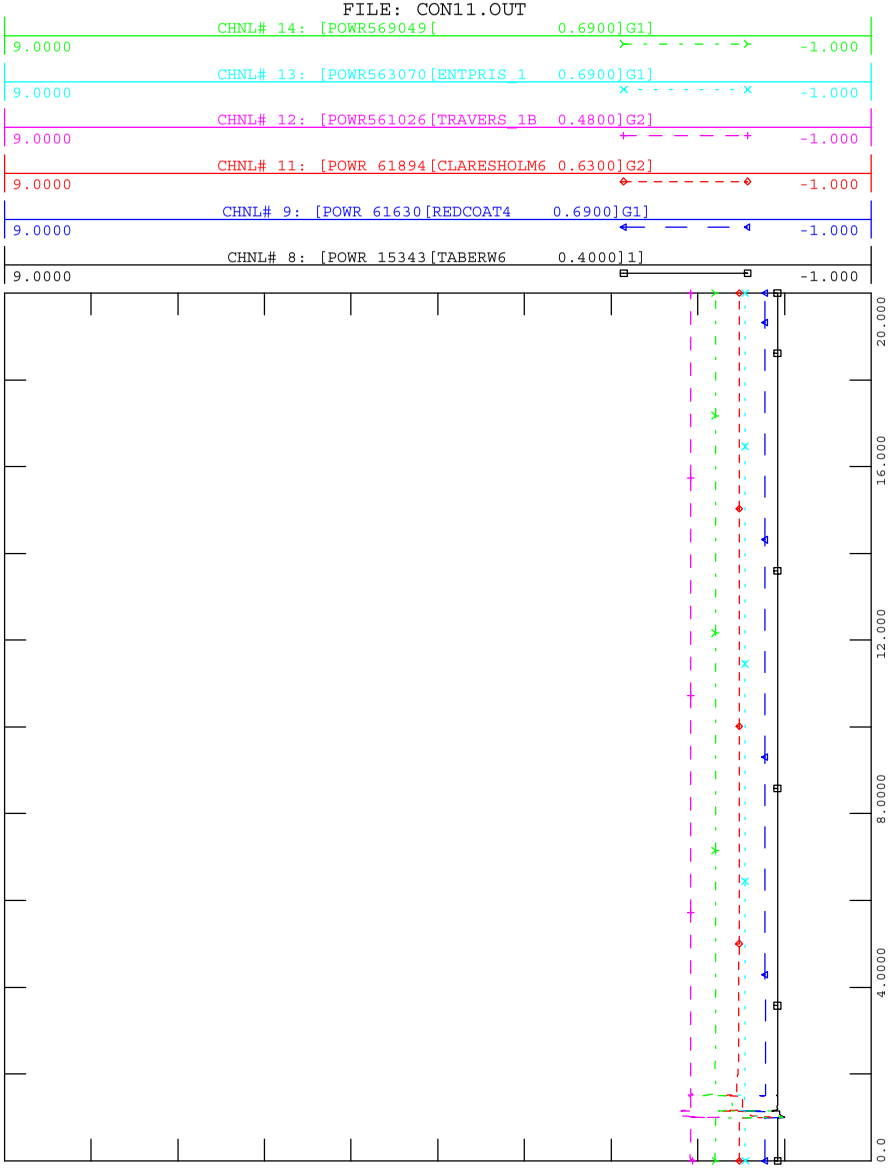
FILE: CON10.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-11

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

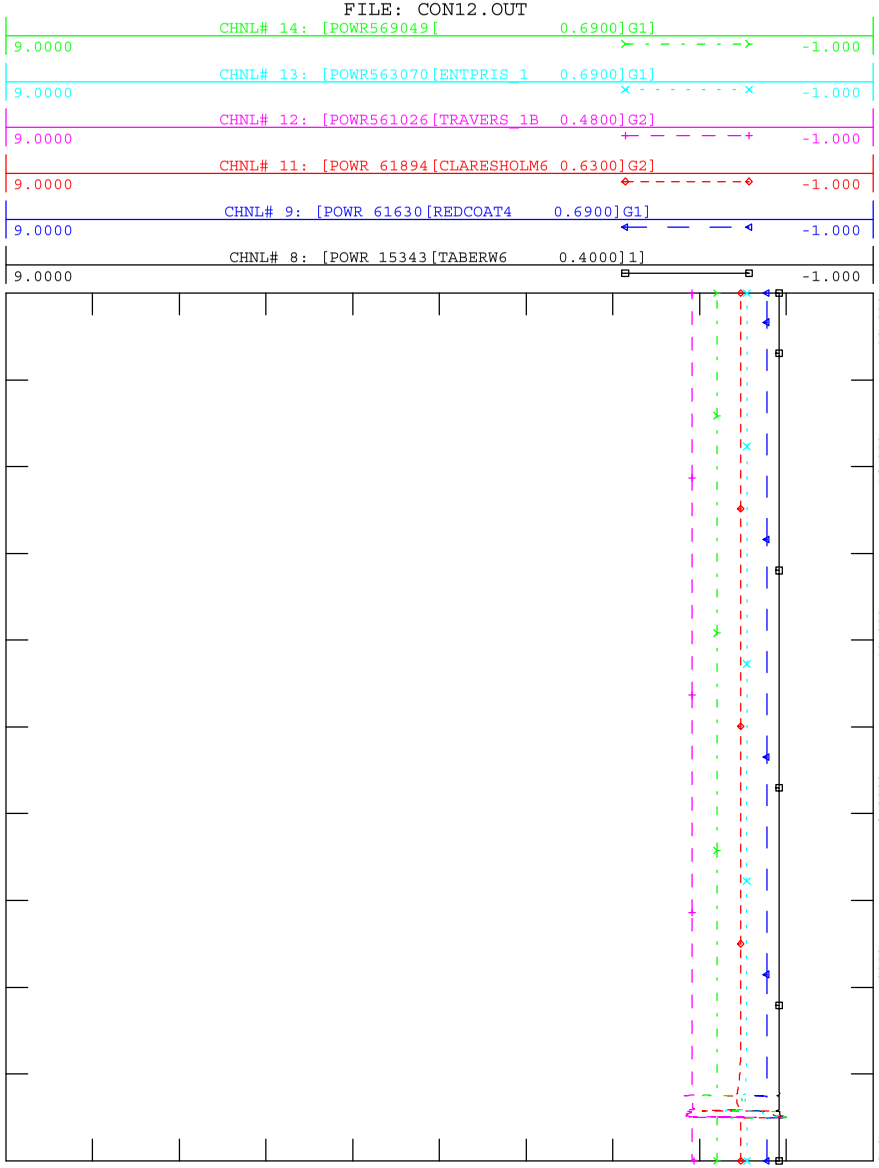
FILE: CON11.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-12

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

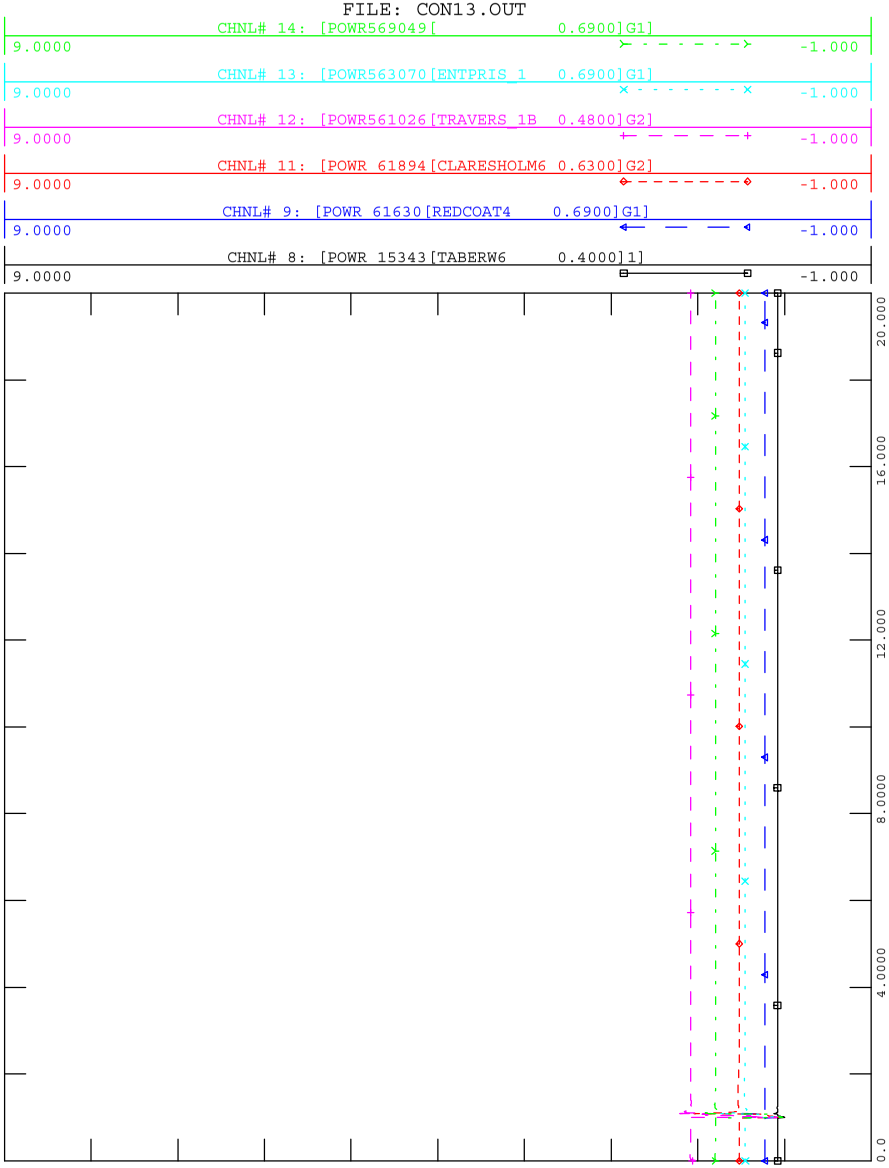
FILE: CON12.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-13

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

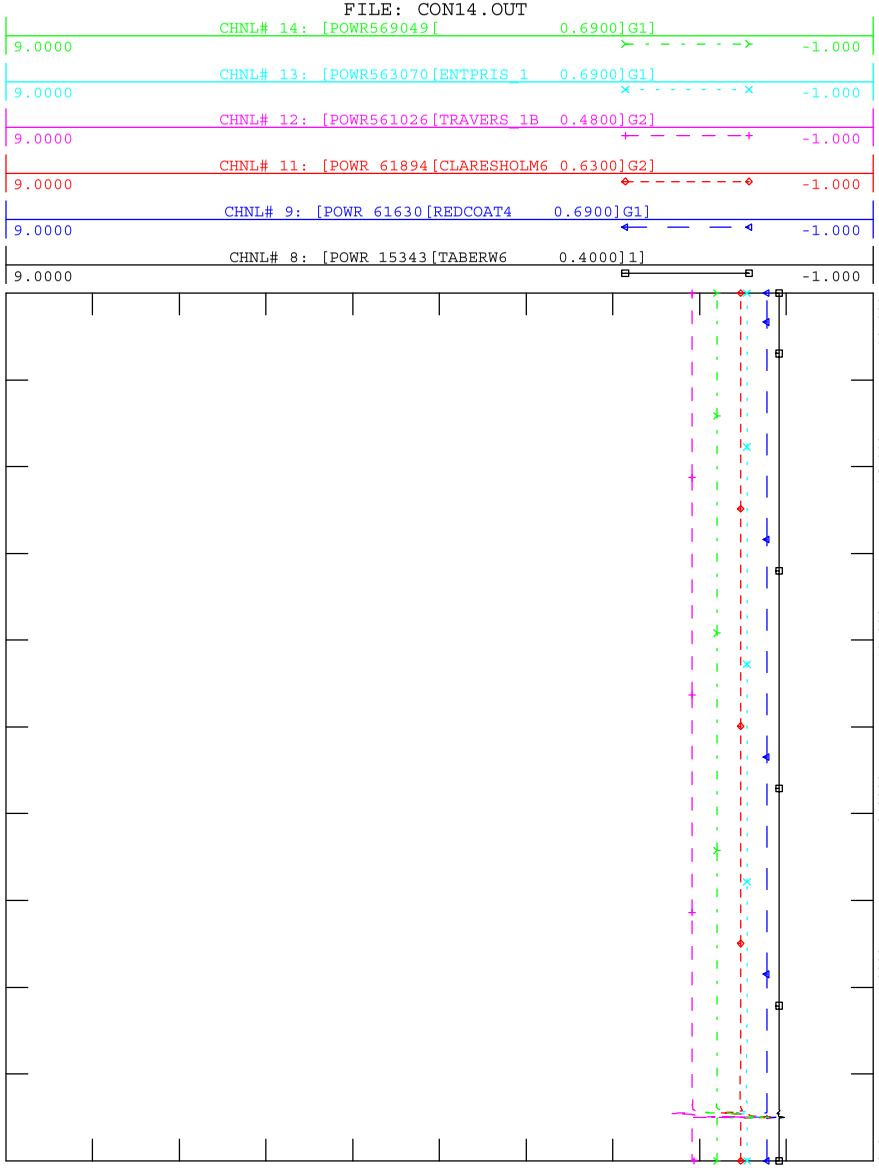
FILE: CON13.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-14

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

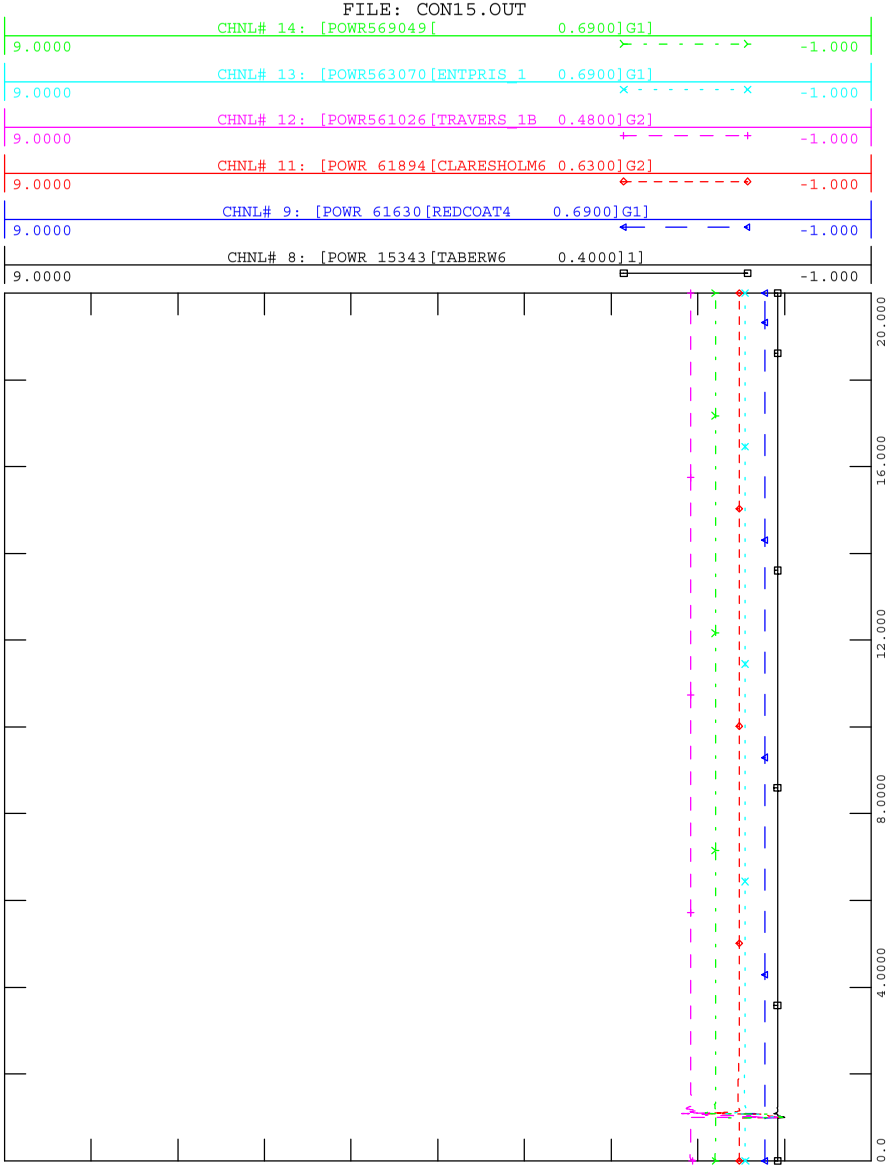
FILE: CON14.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-15

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

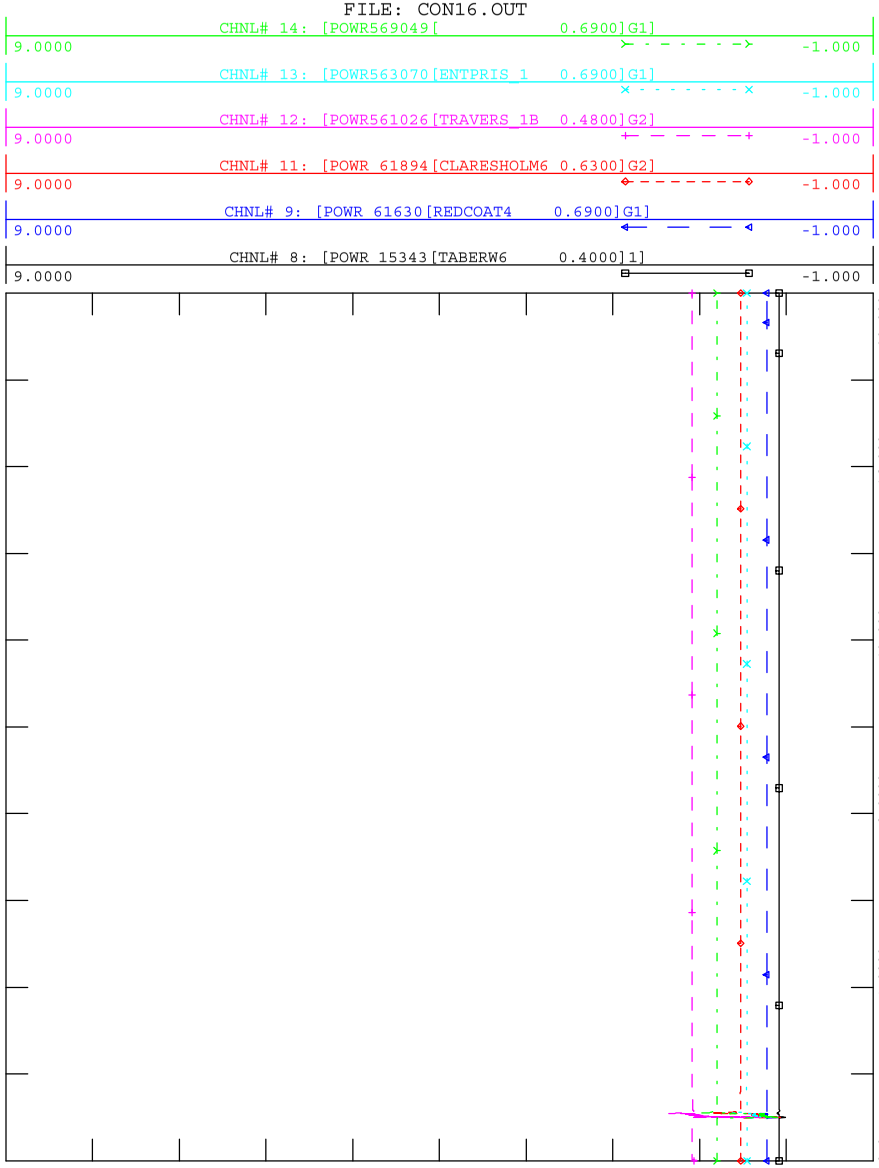
FILE: CON15.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-16

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT WIND FLATS 138S

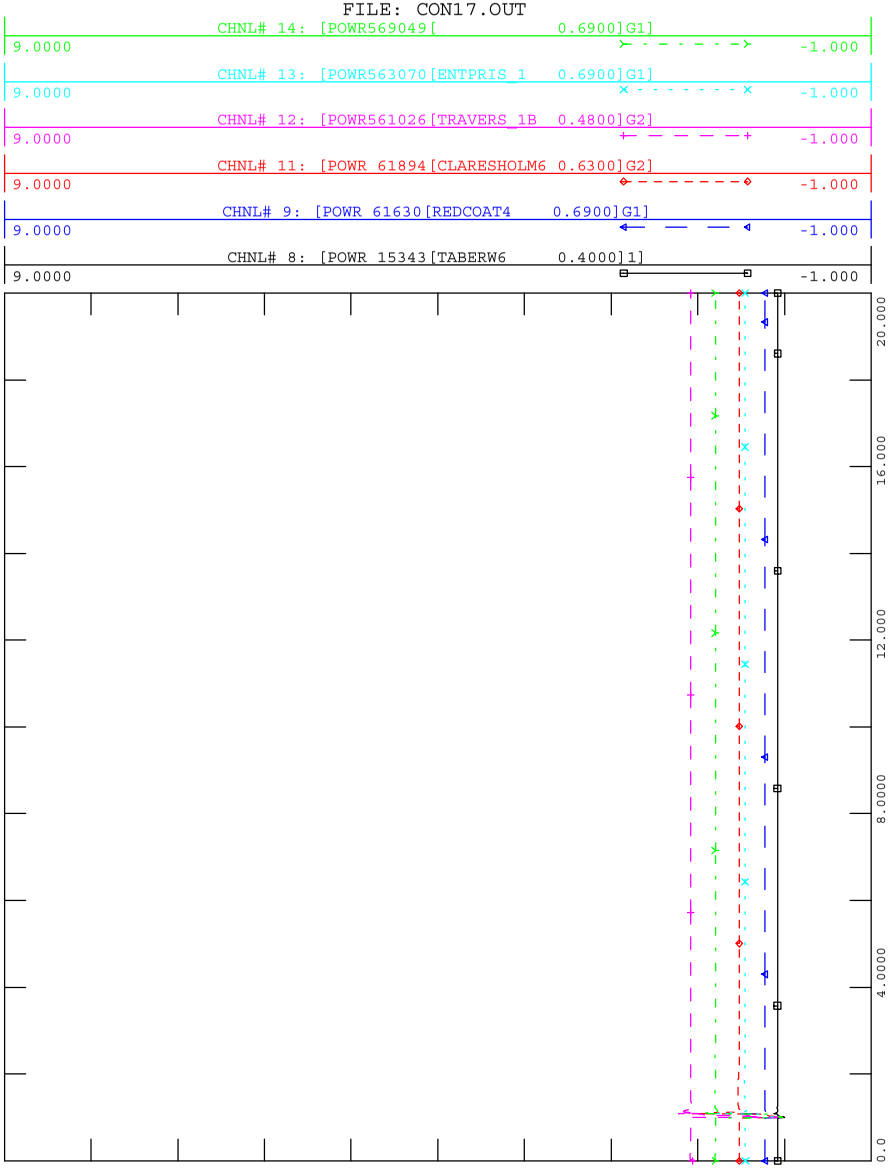
FILE: CON16.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-17

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT N. LETH 370S

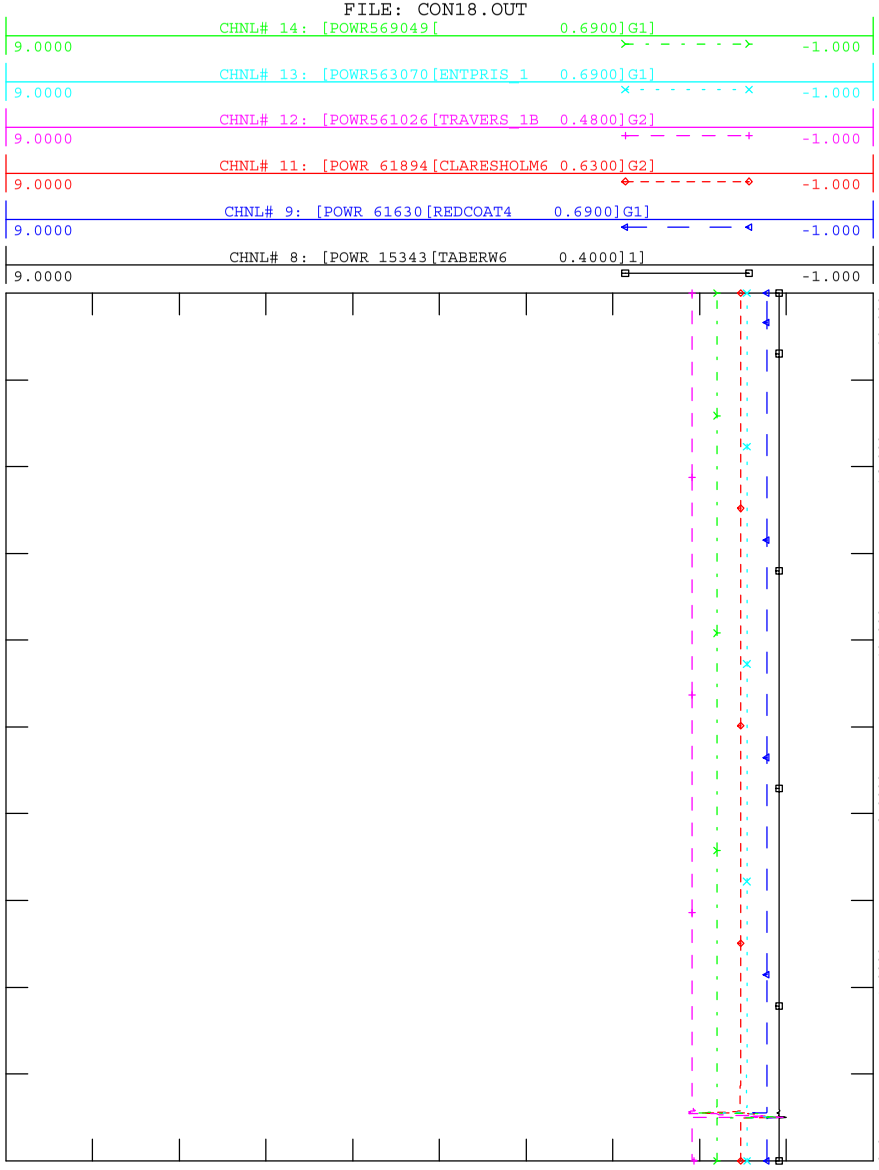
FILE: CON17.OUT



THU, JUN 15 2023 9:02
FIG B-SC3-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



THU, JUN 15 2023 9:02

FIG B-SC3-19

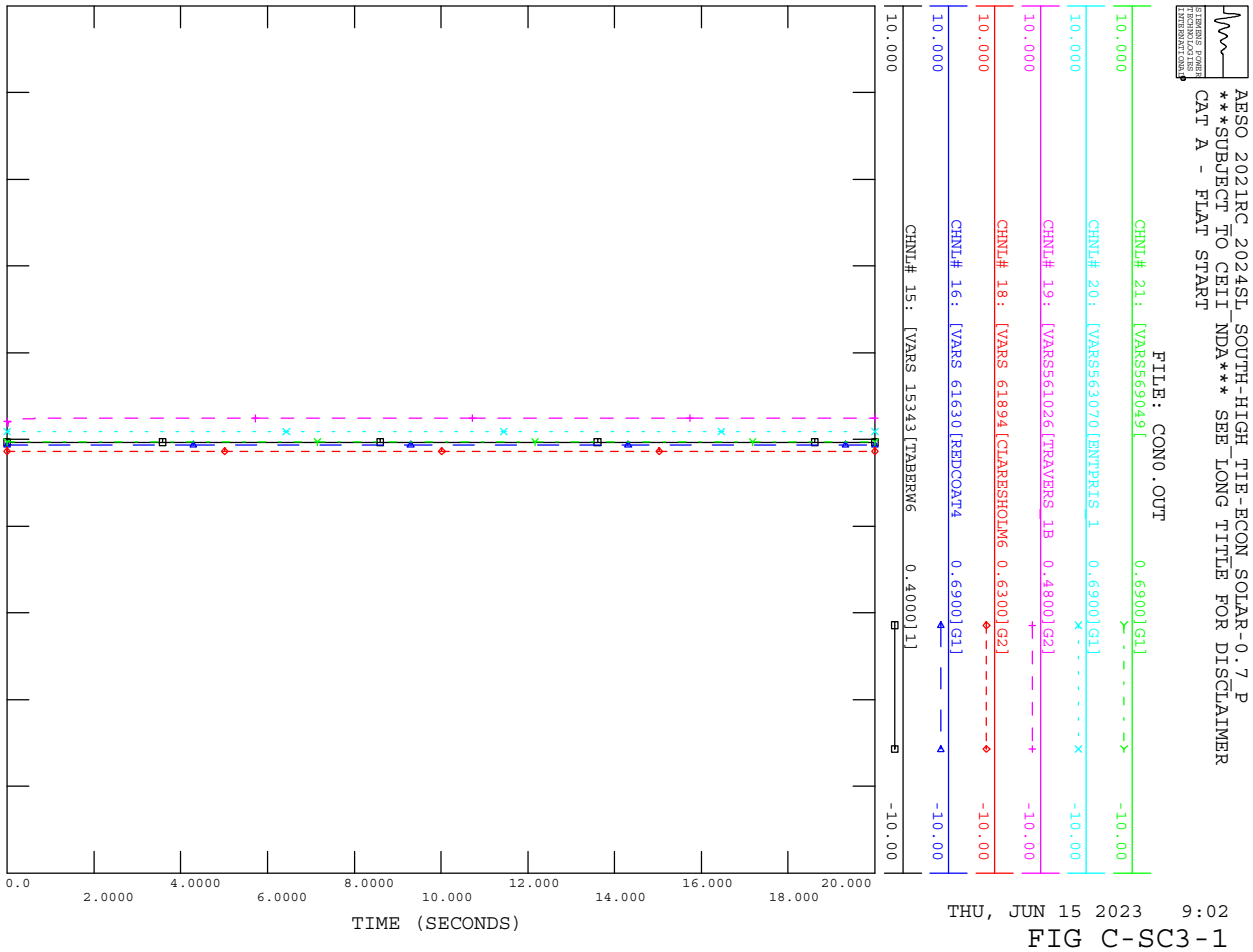


FIG C-SC3-1

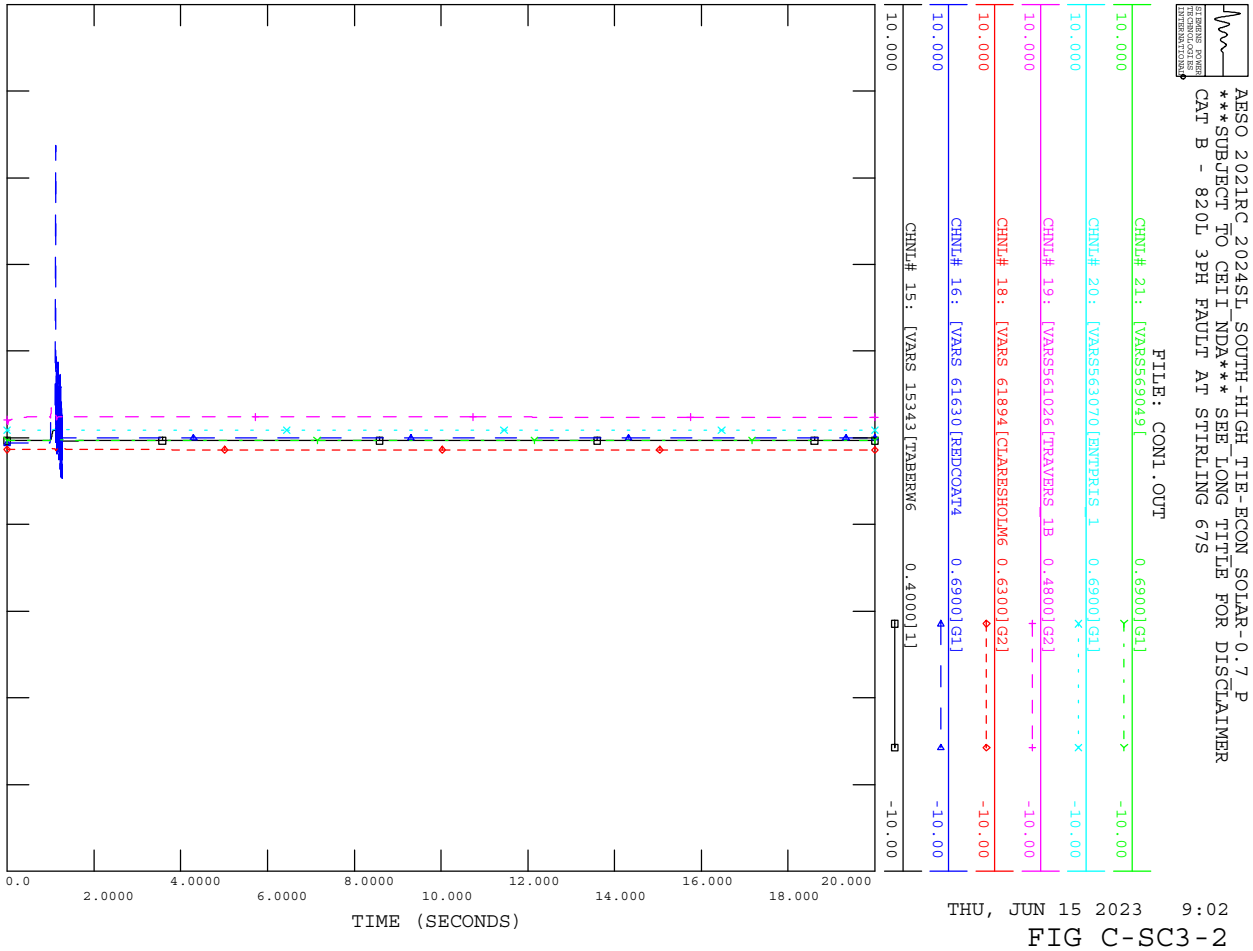


FIG C-SC3-2

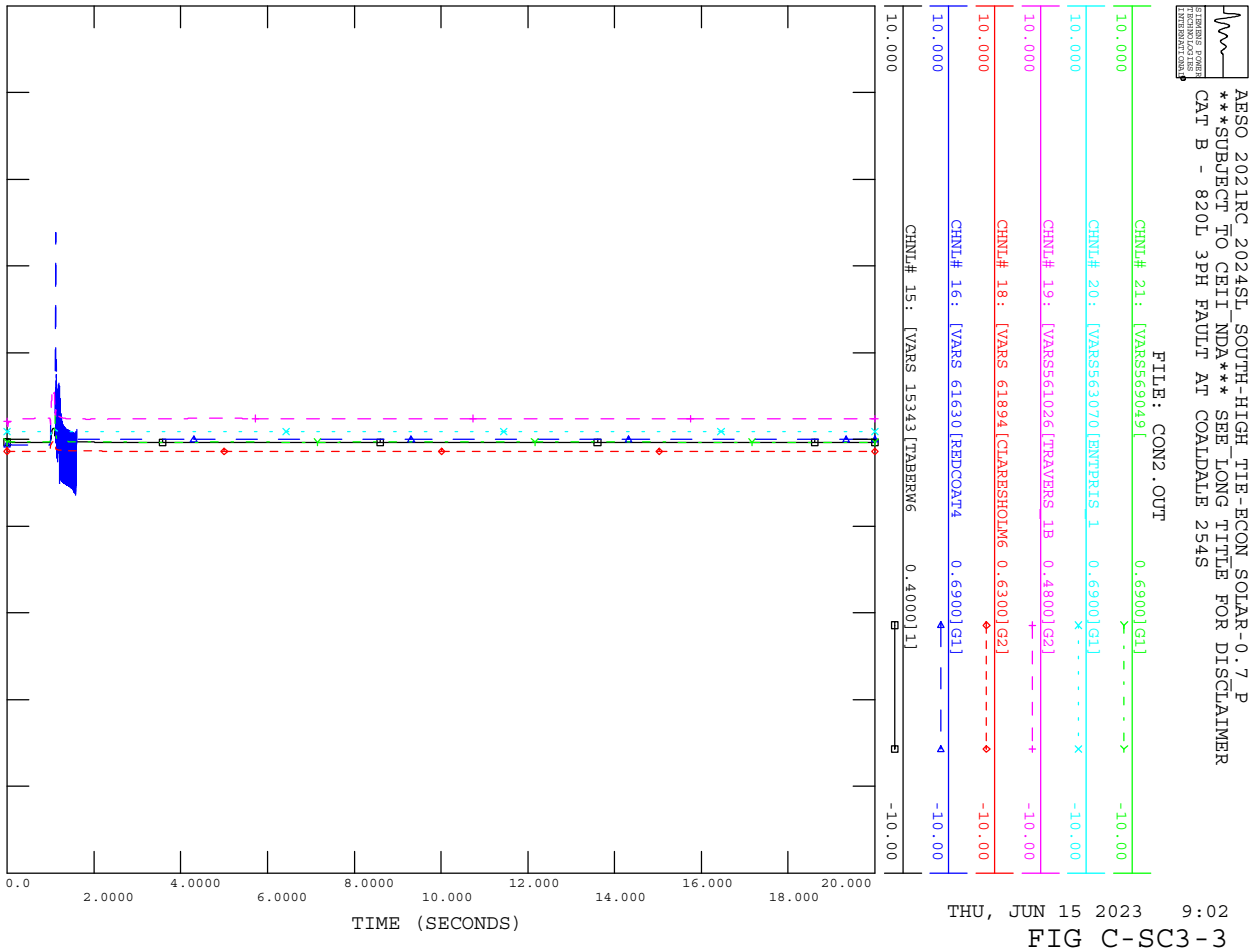


FIG C-SC3-3

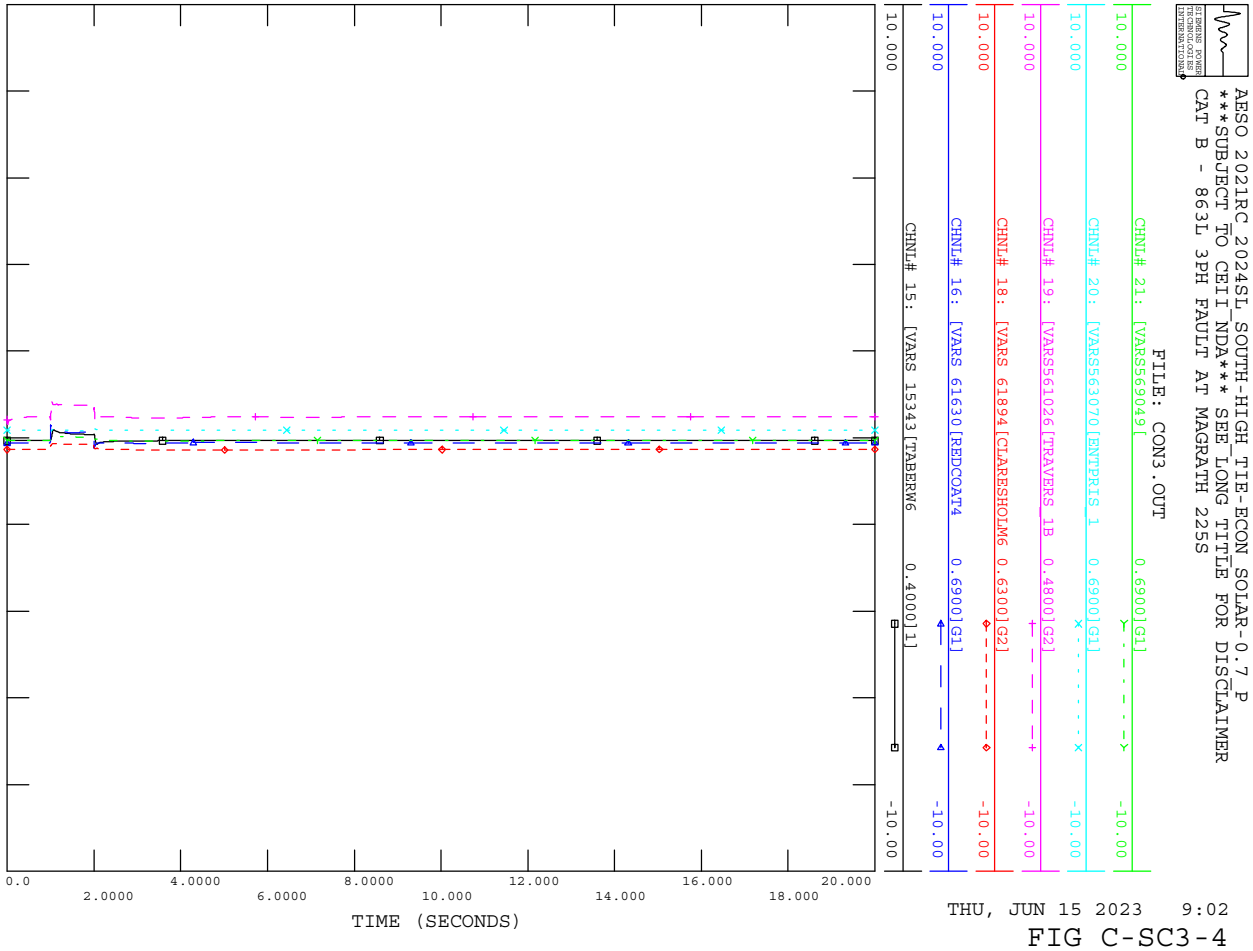


FIG C-SC3-4

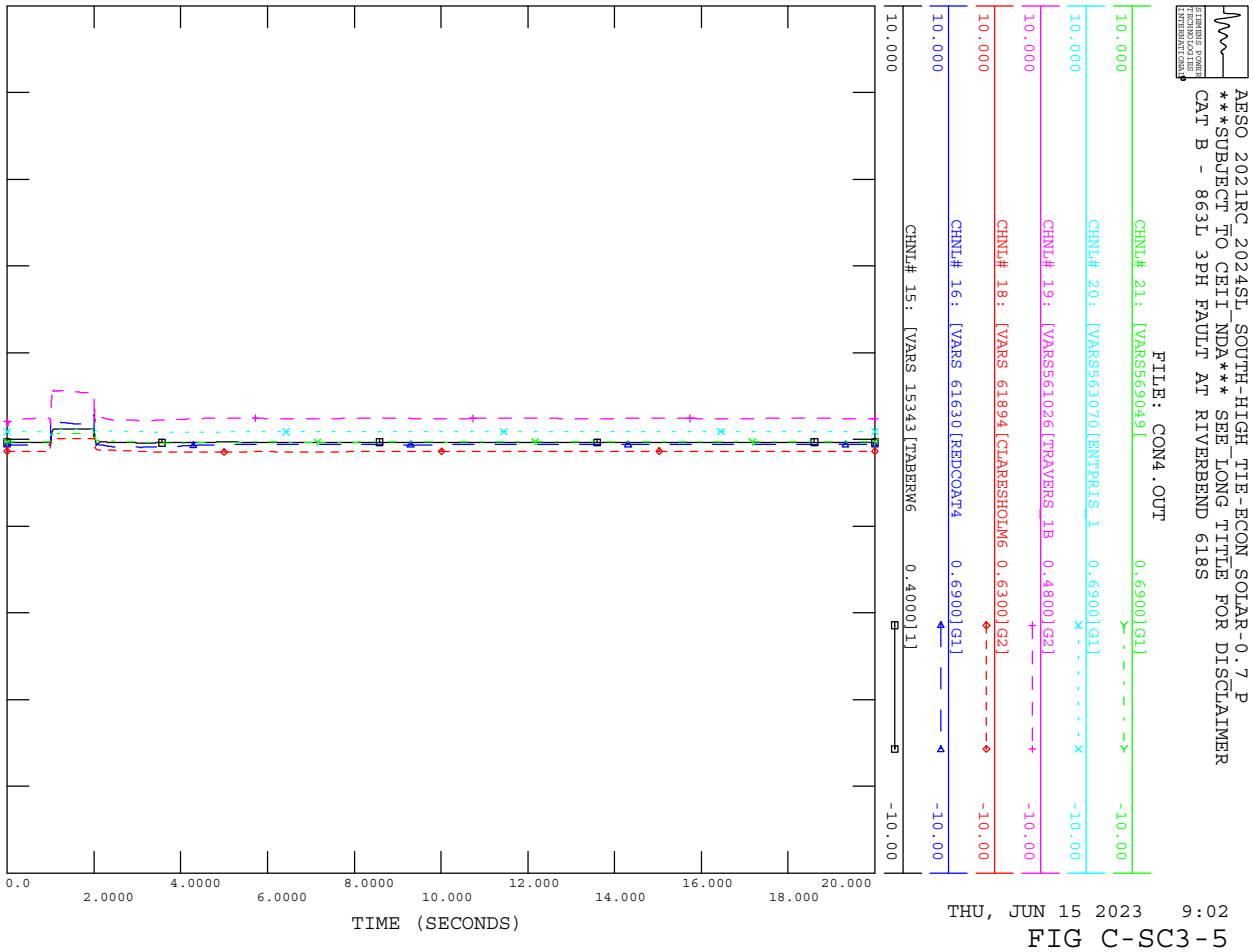


FIG C-SC3-5

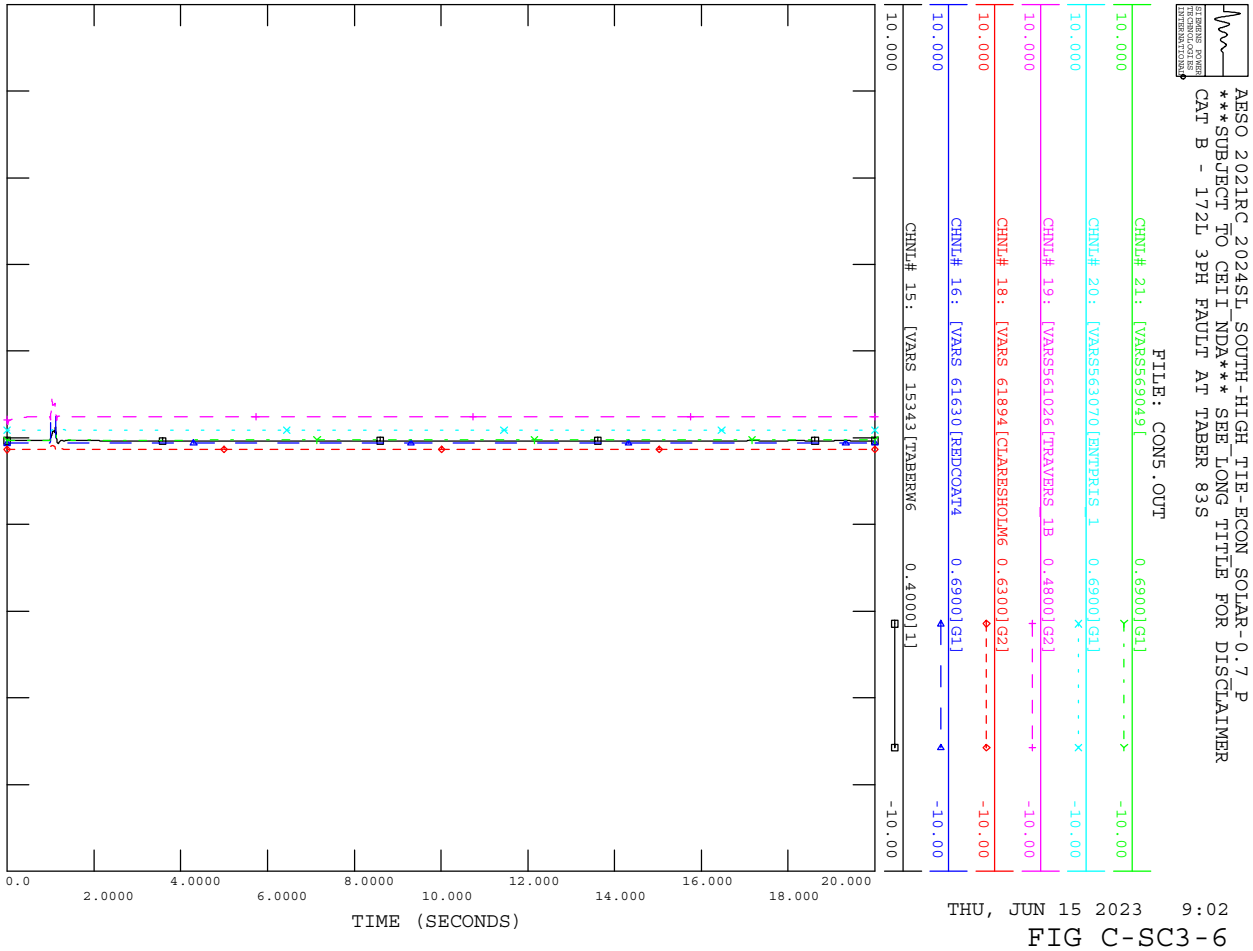


FIG C-SC3-6

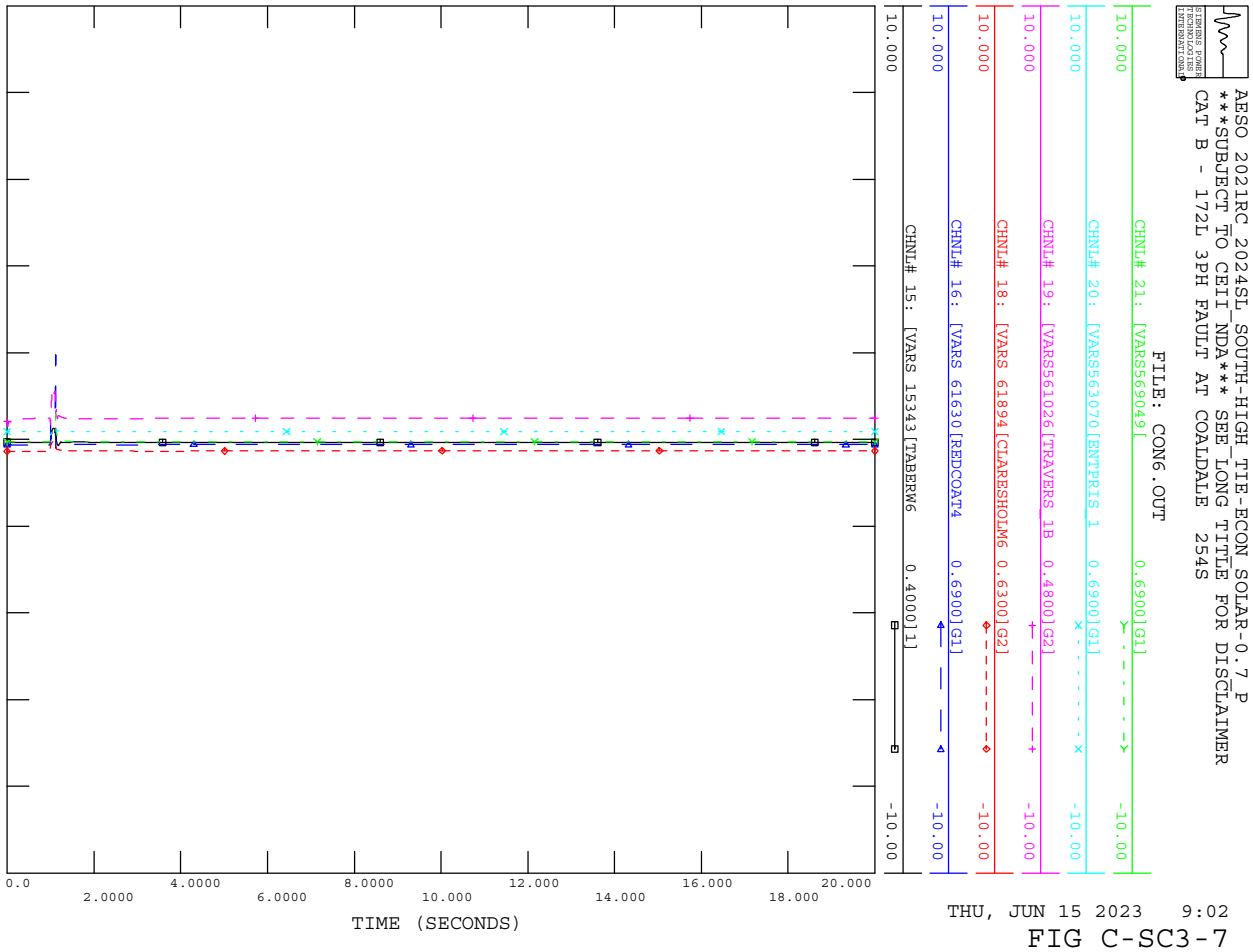


FIG C-SC3-7

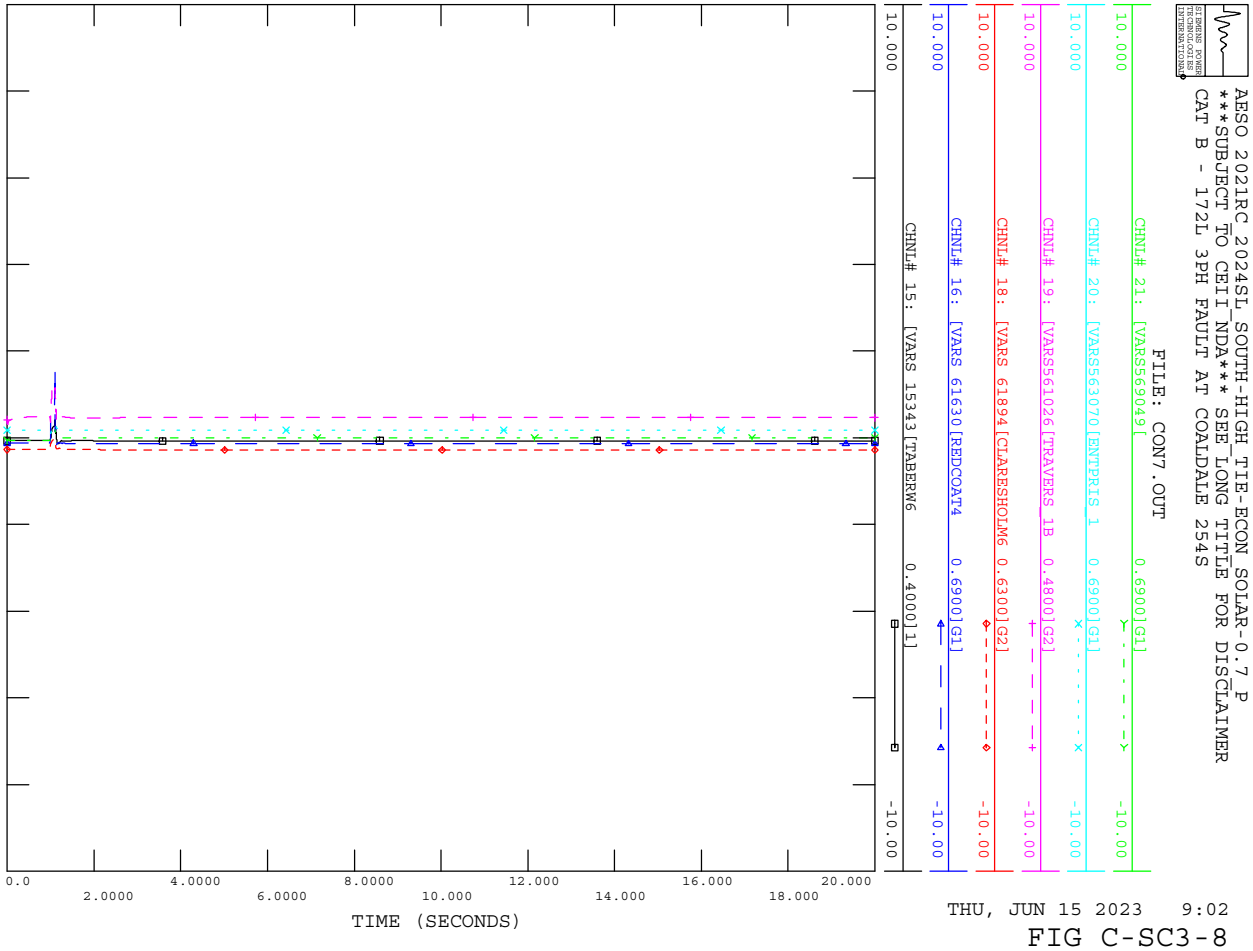
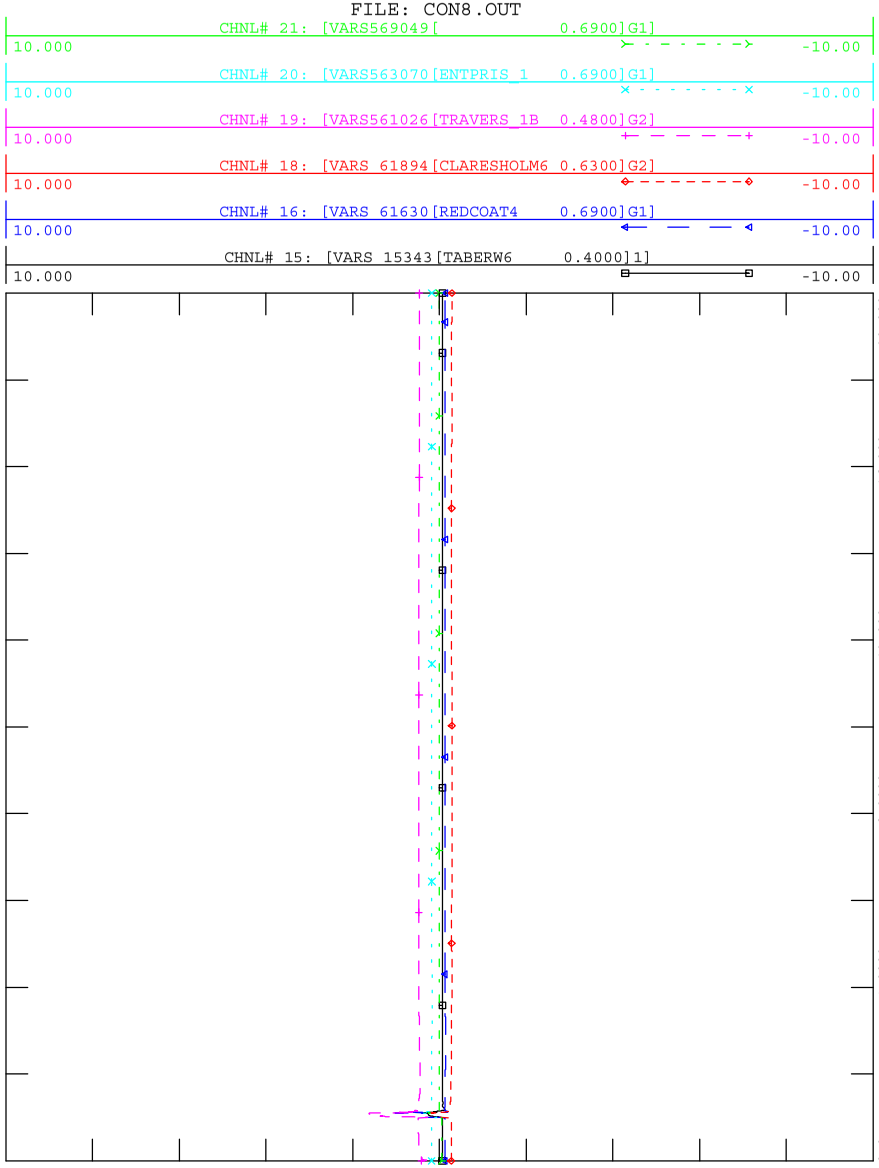


FIG C-SC3-8

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

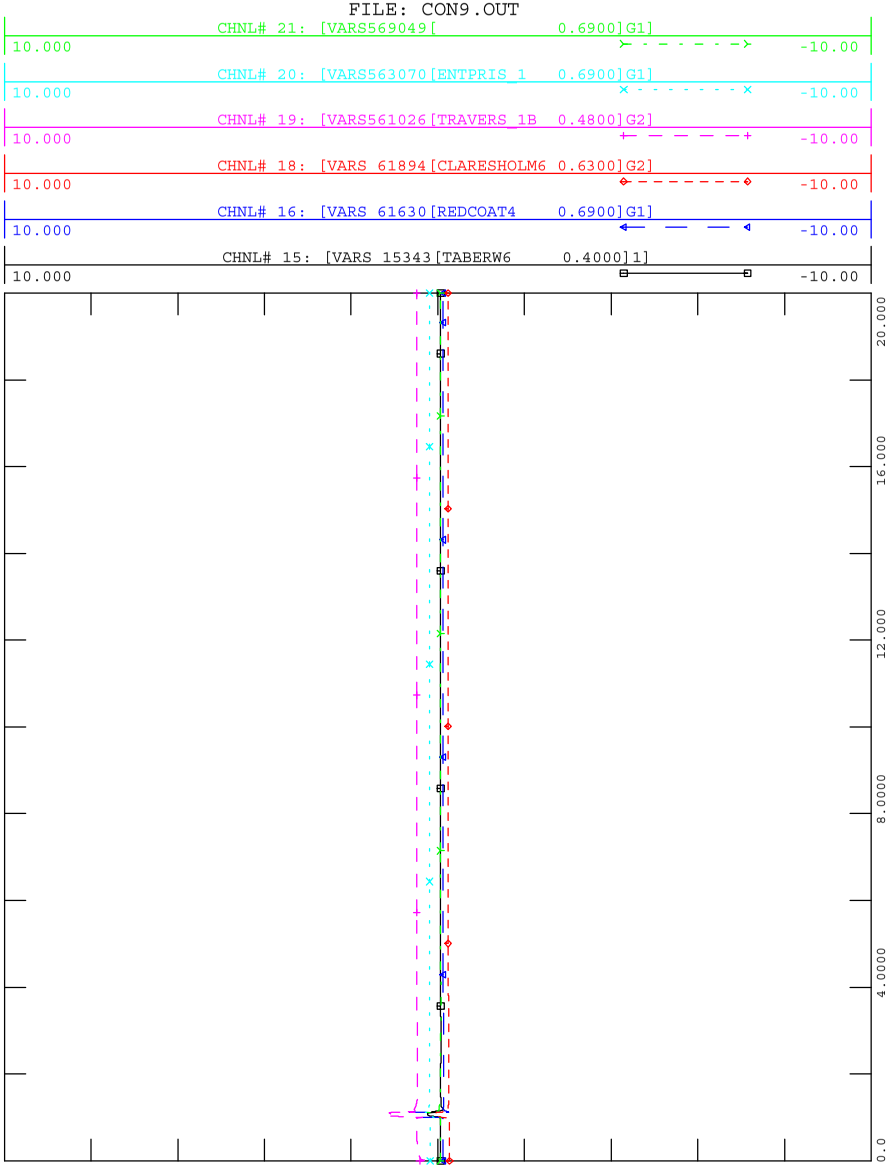
FILE: CON8.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-9

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT CHINOOK 181S

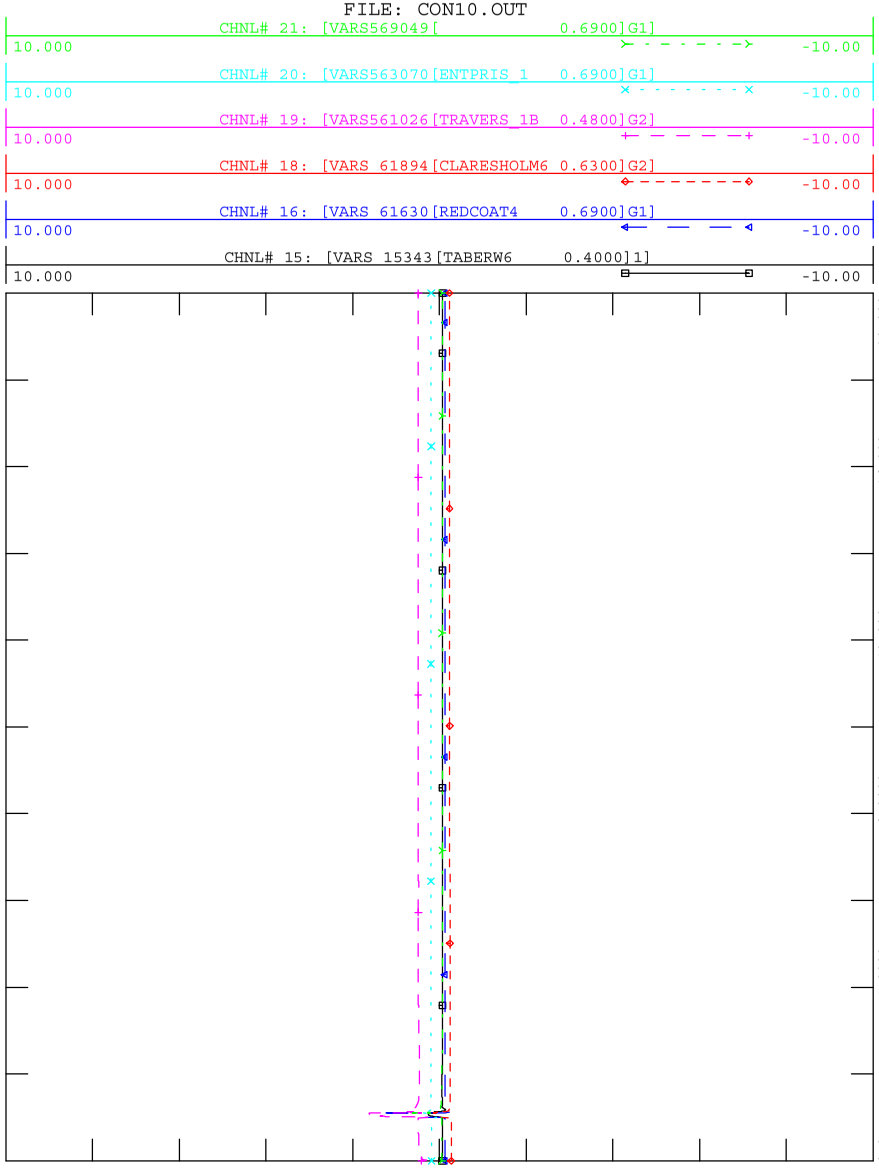
FILE: CON9.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-10

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

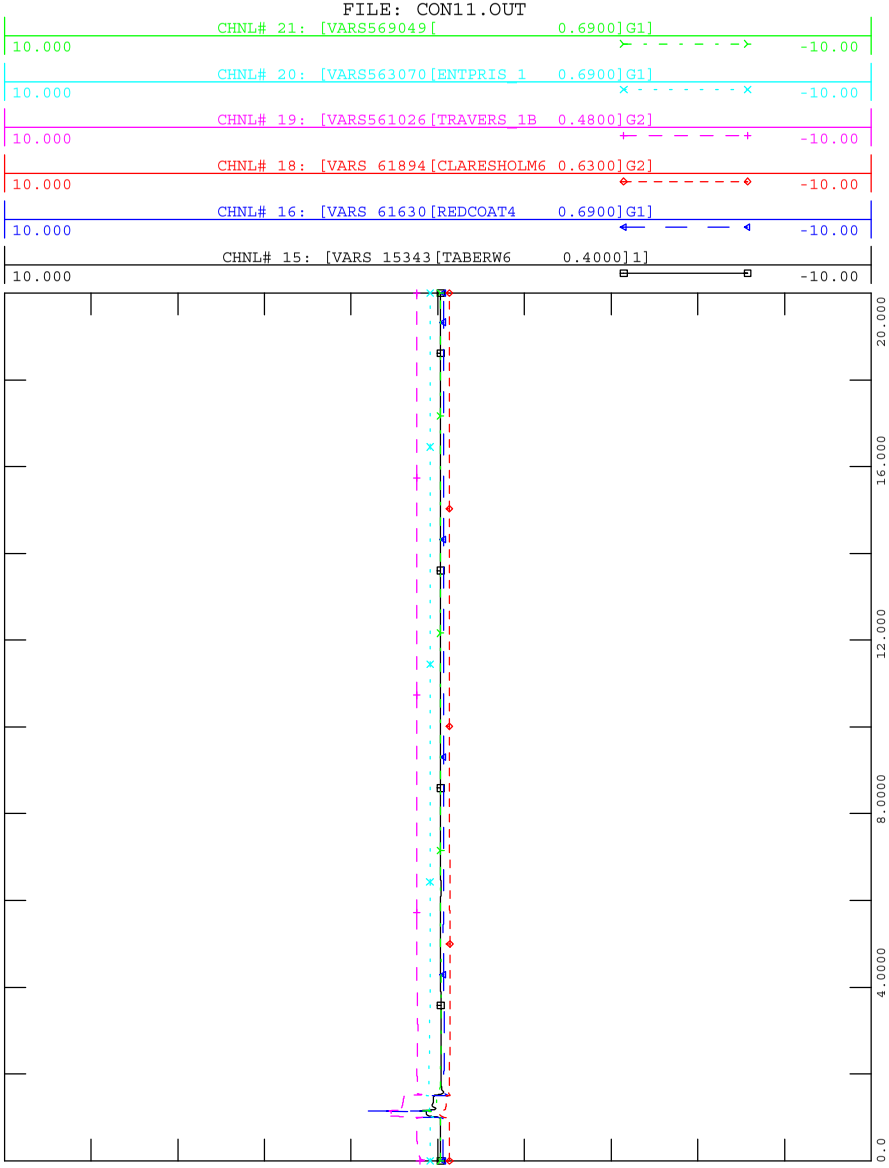
FILE: CON10.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-11

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

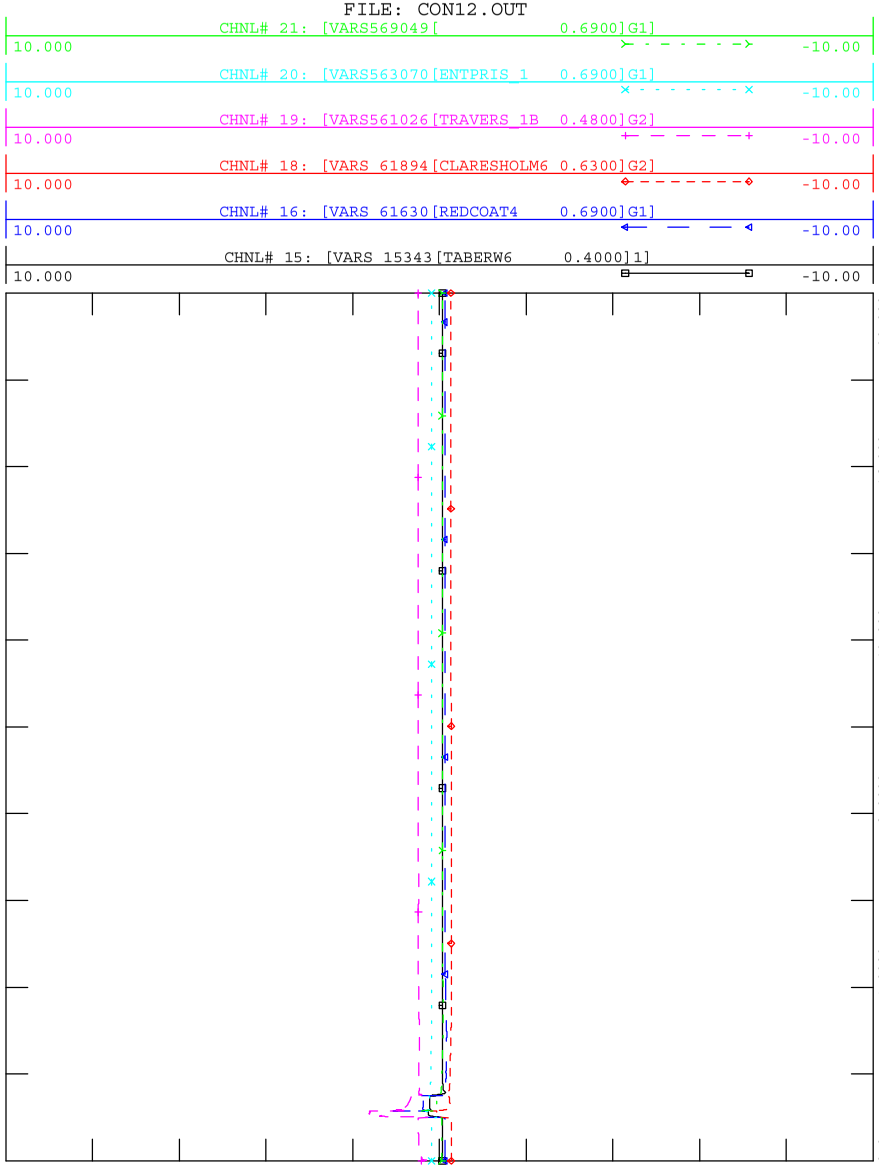
FILE: CON11.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-12

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

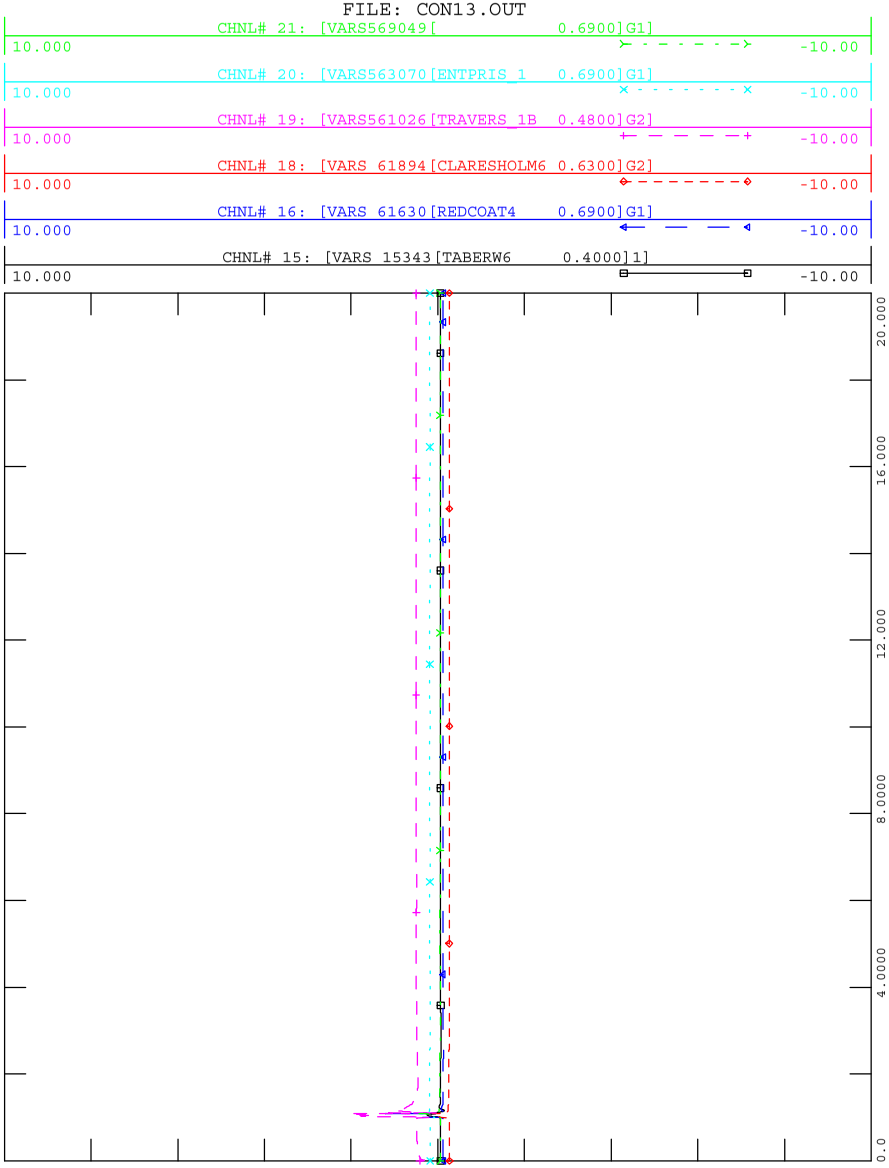
FILE: CON12.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-13

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

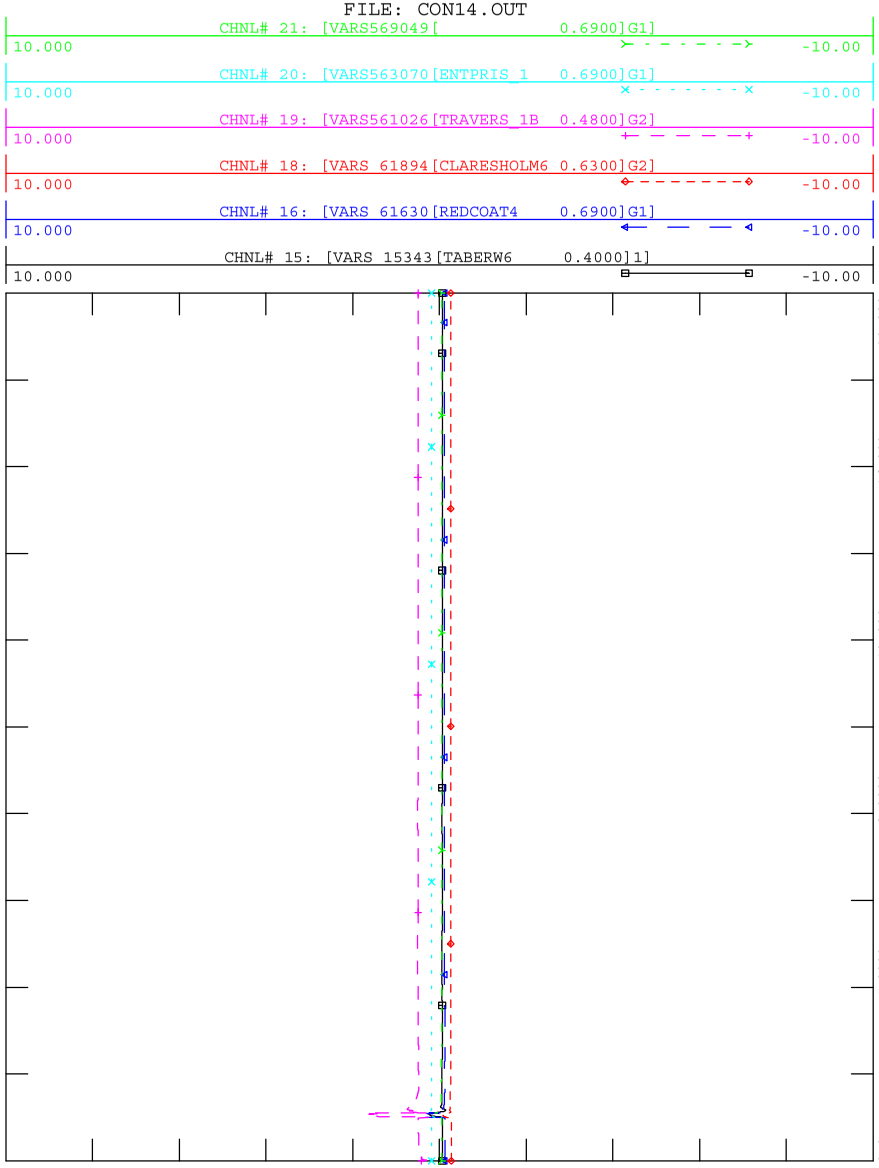
FILE: CON13.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-14

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

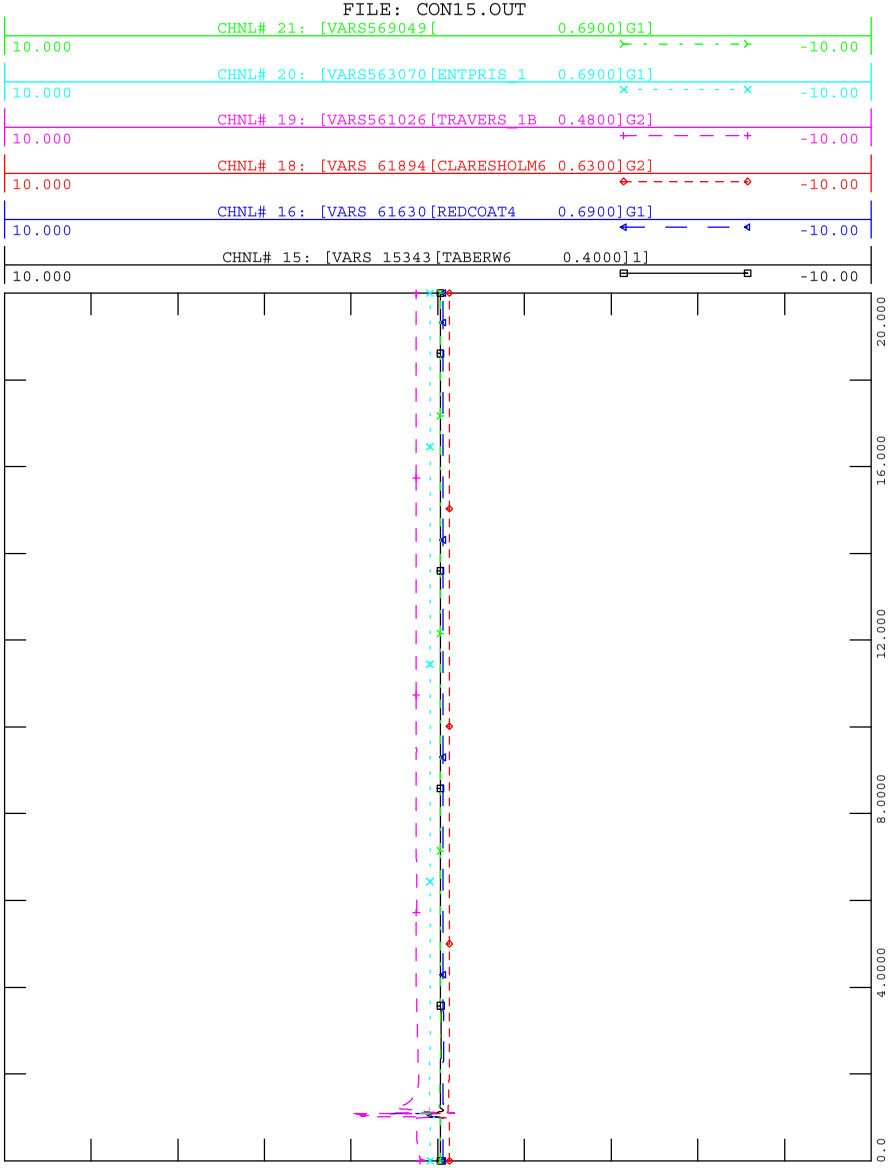
FILE: CON14.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-15

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

FILE: CON15.OUT



THU, JUN 15 2023 9:02
FIG C-SC3-16

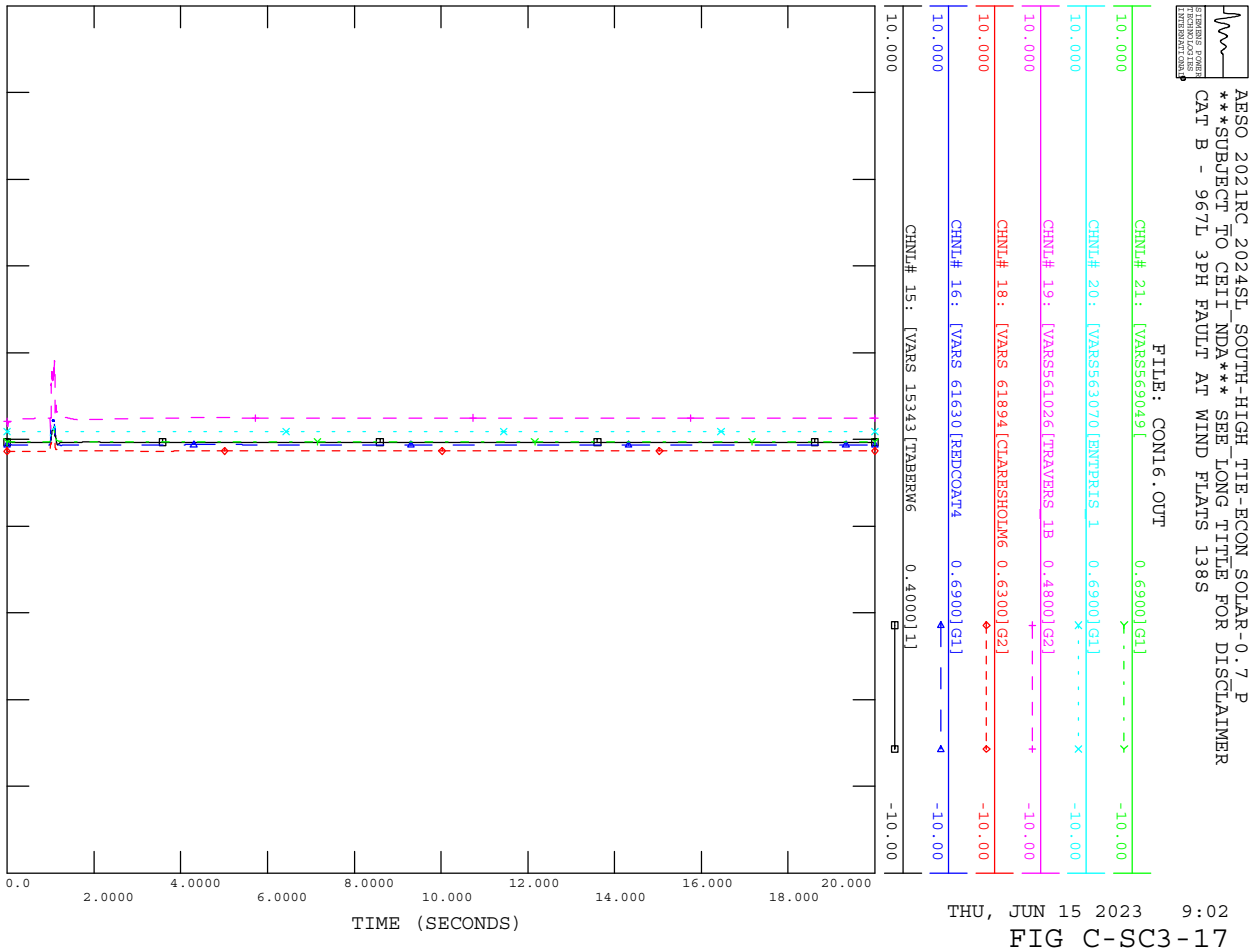


FIG C-SC3-17

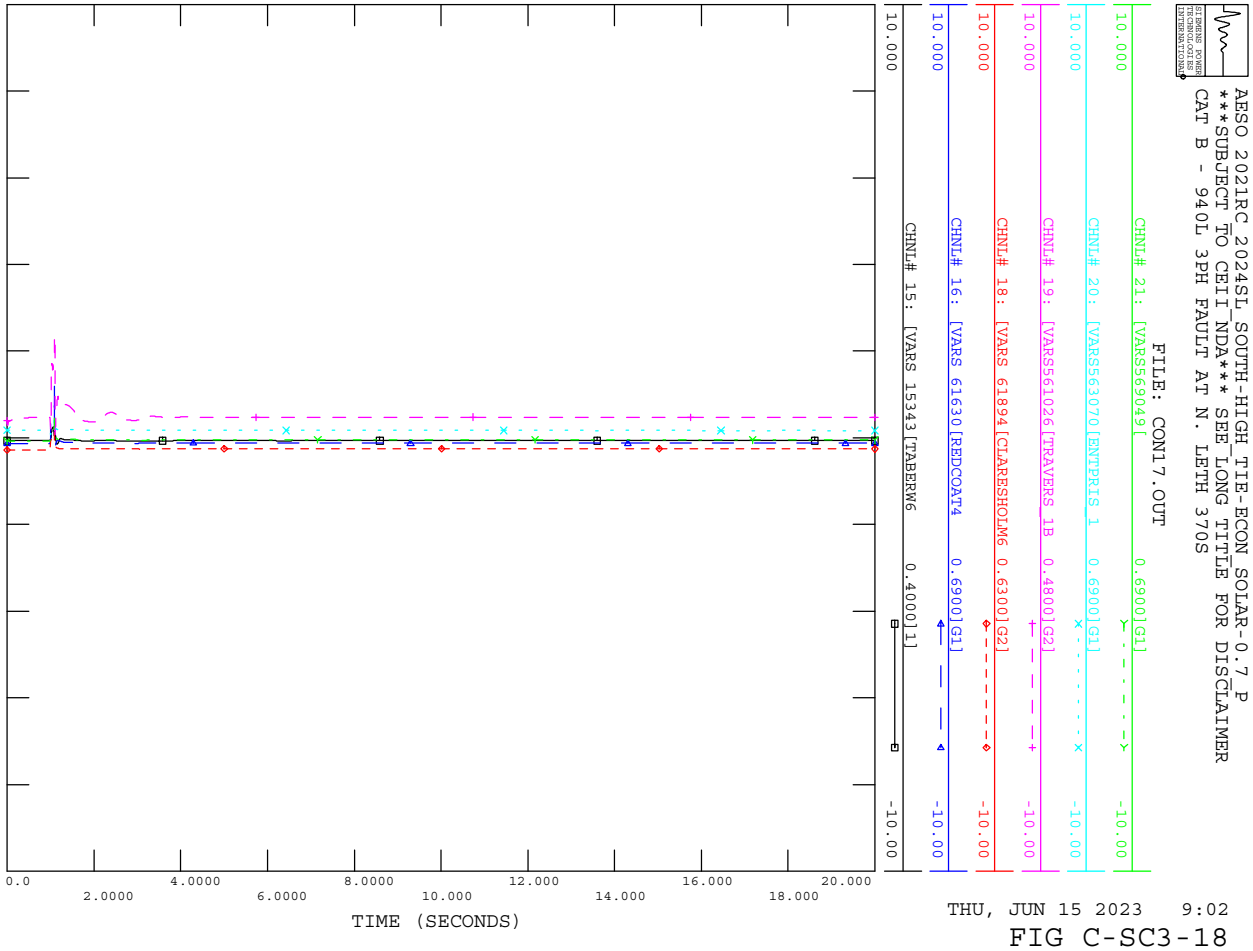
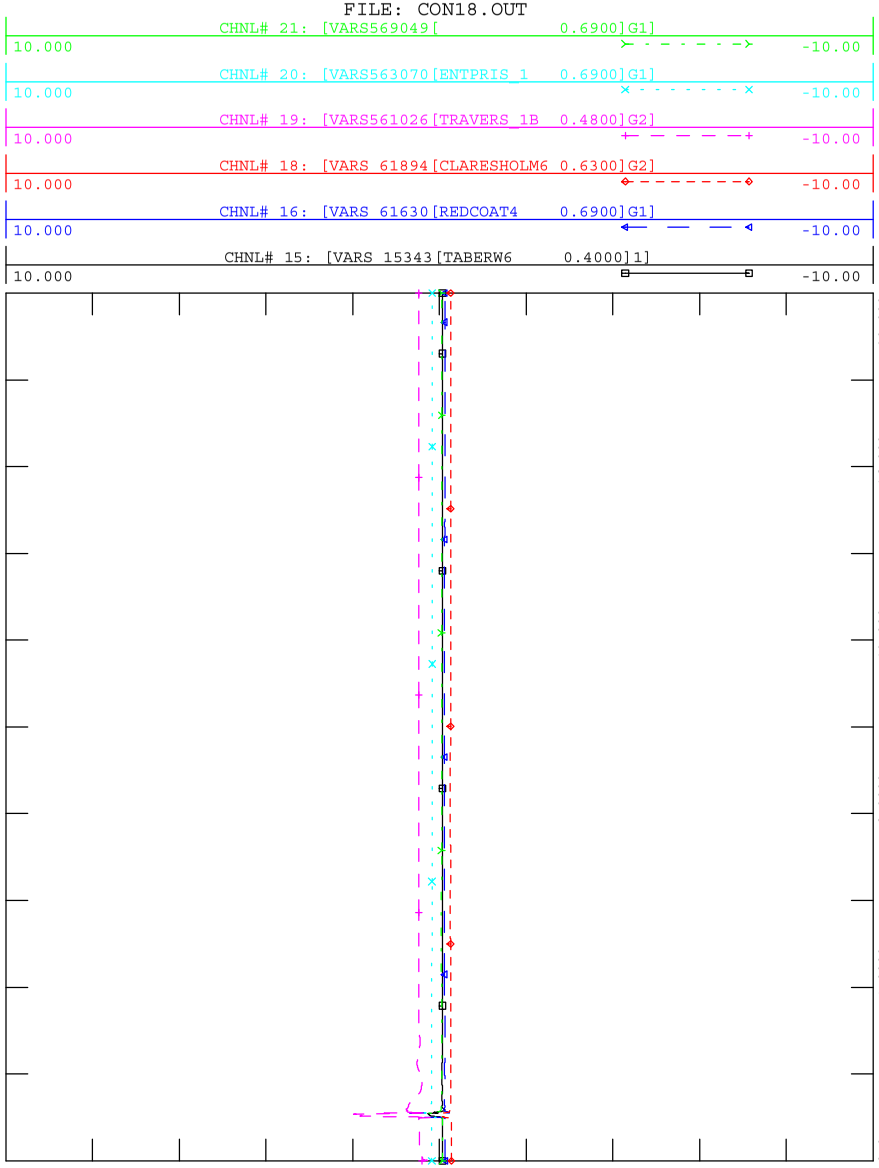


FIG C-SC3-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



THU, JUN 15 2023 9:02

FIG C-SC3-19

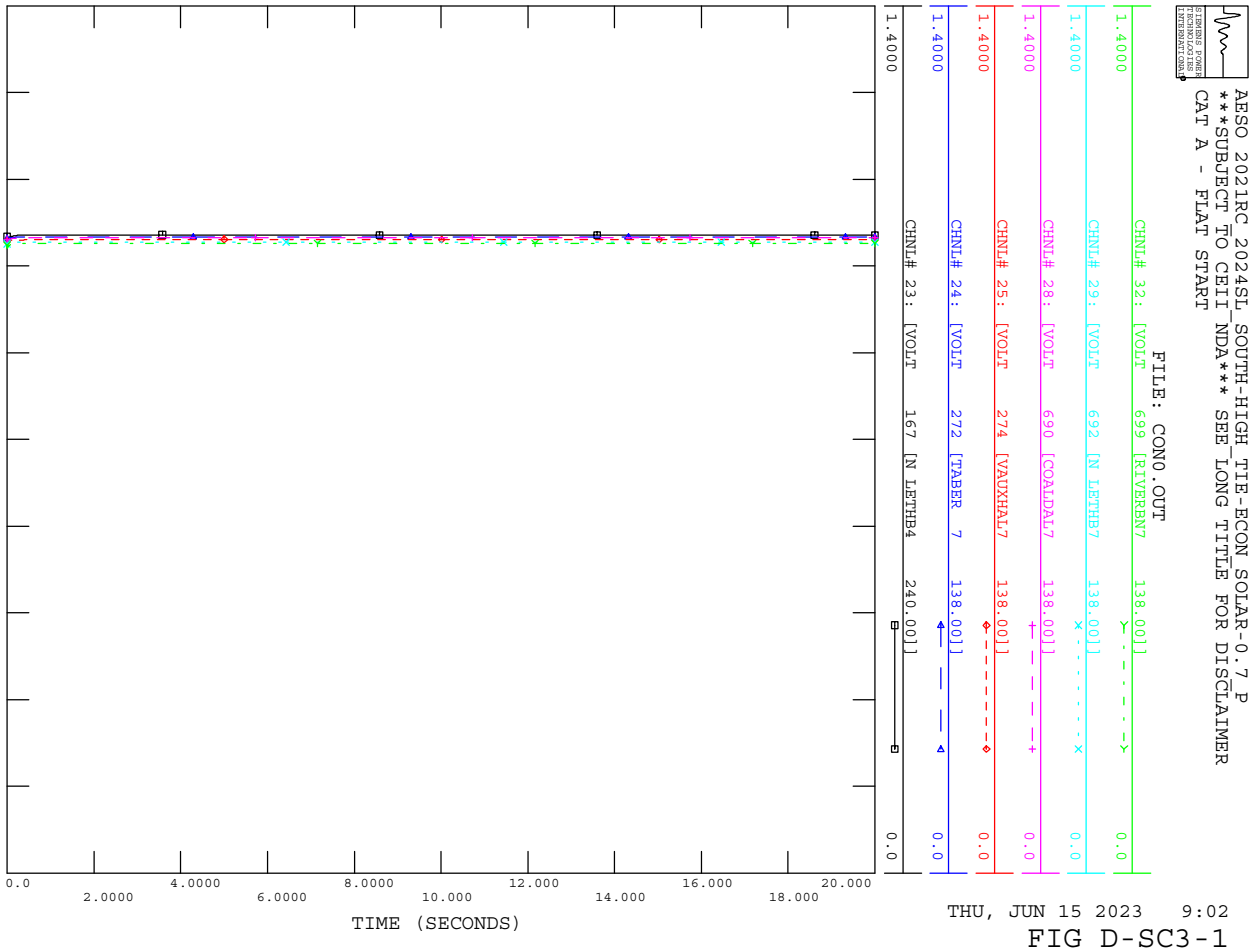


FIG D-SC3-1

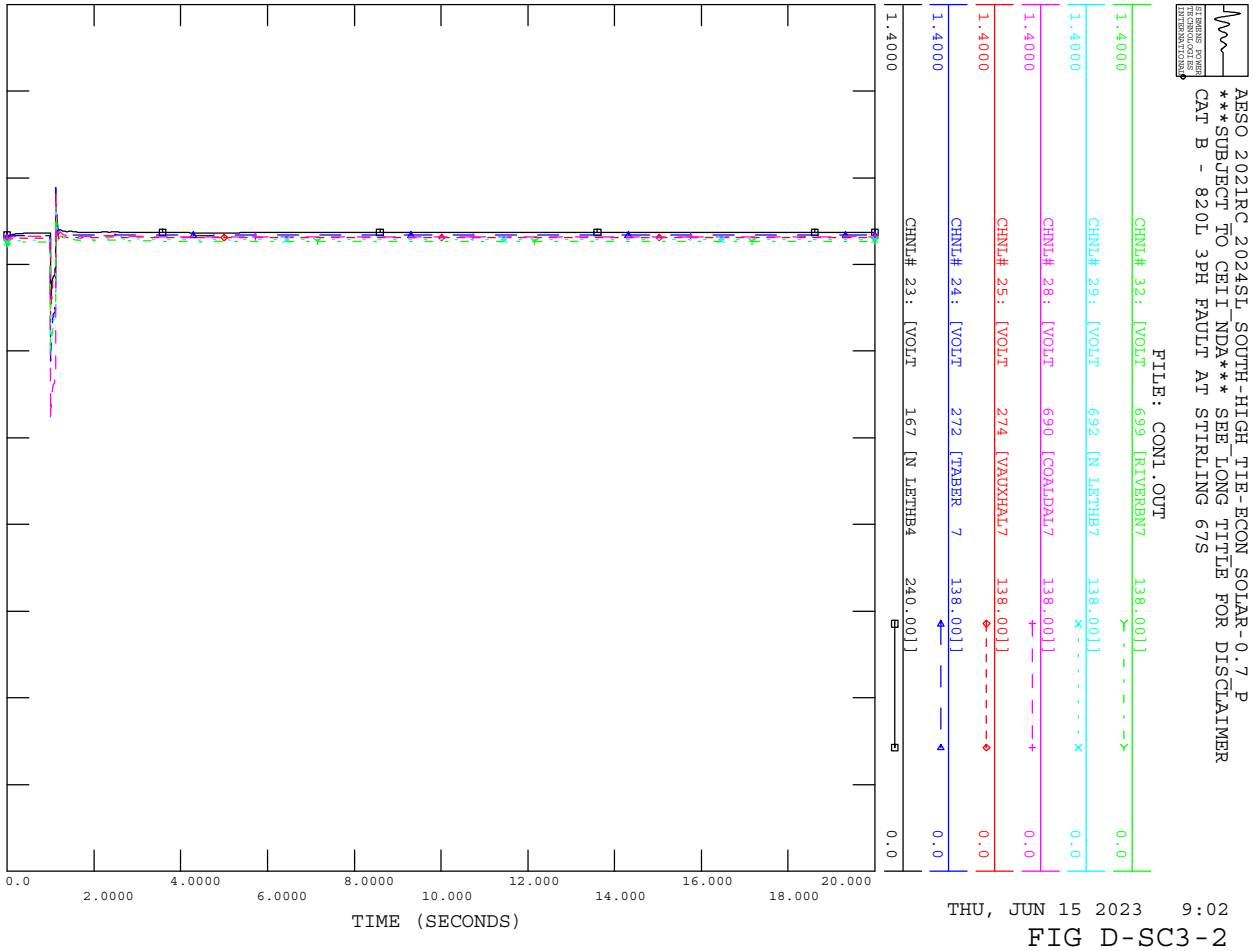


FIG D-SC3-2

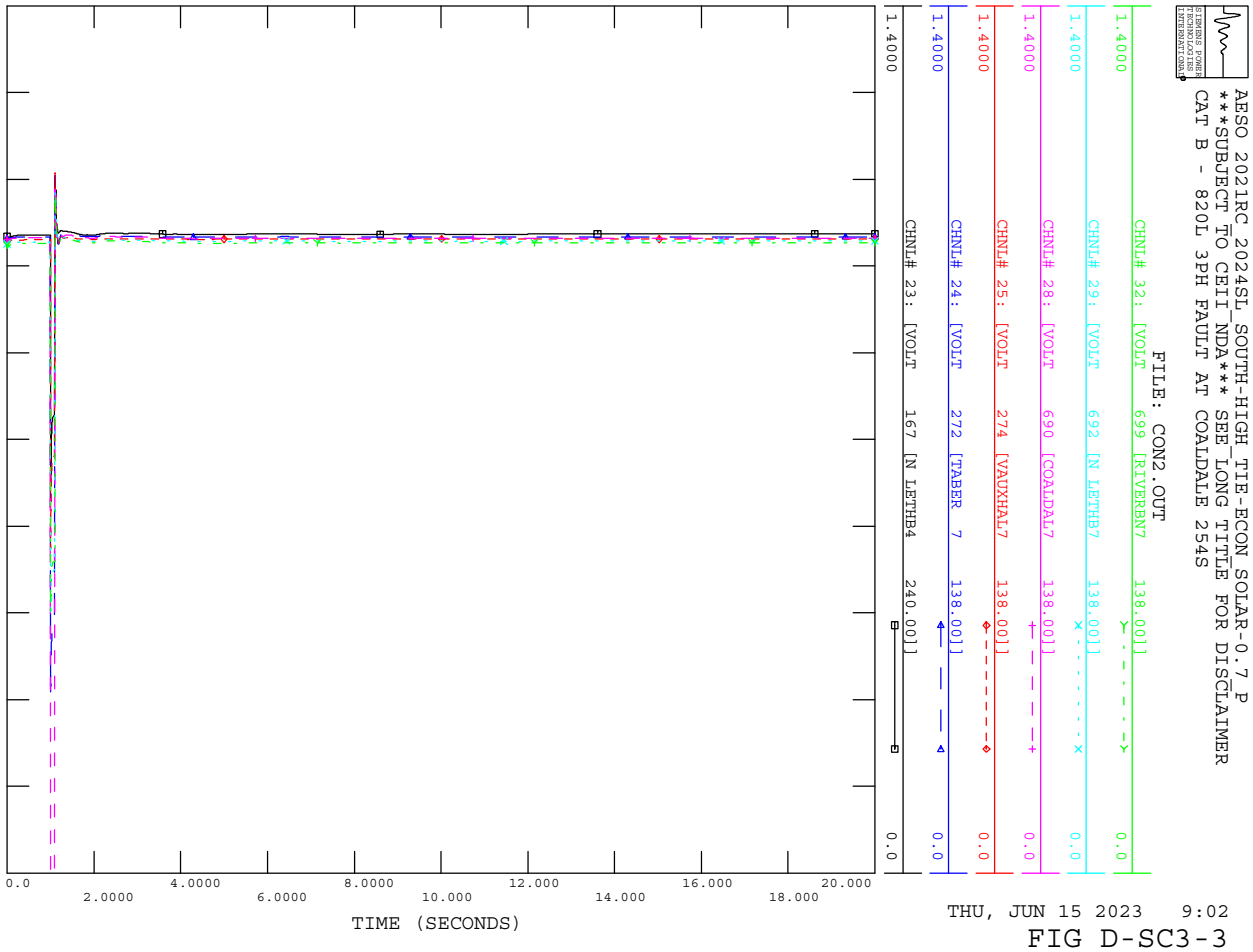


FIG D-SC3-3

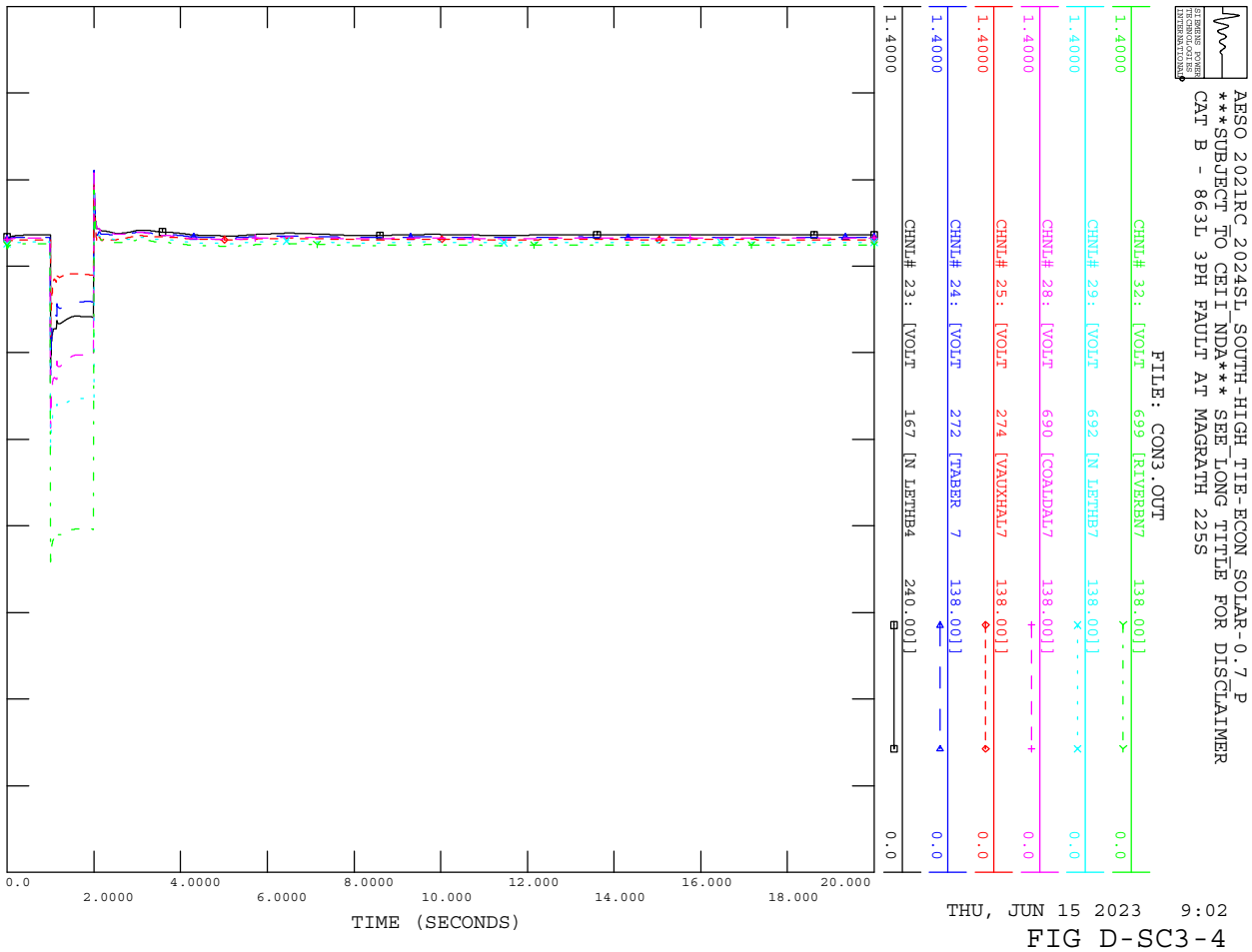
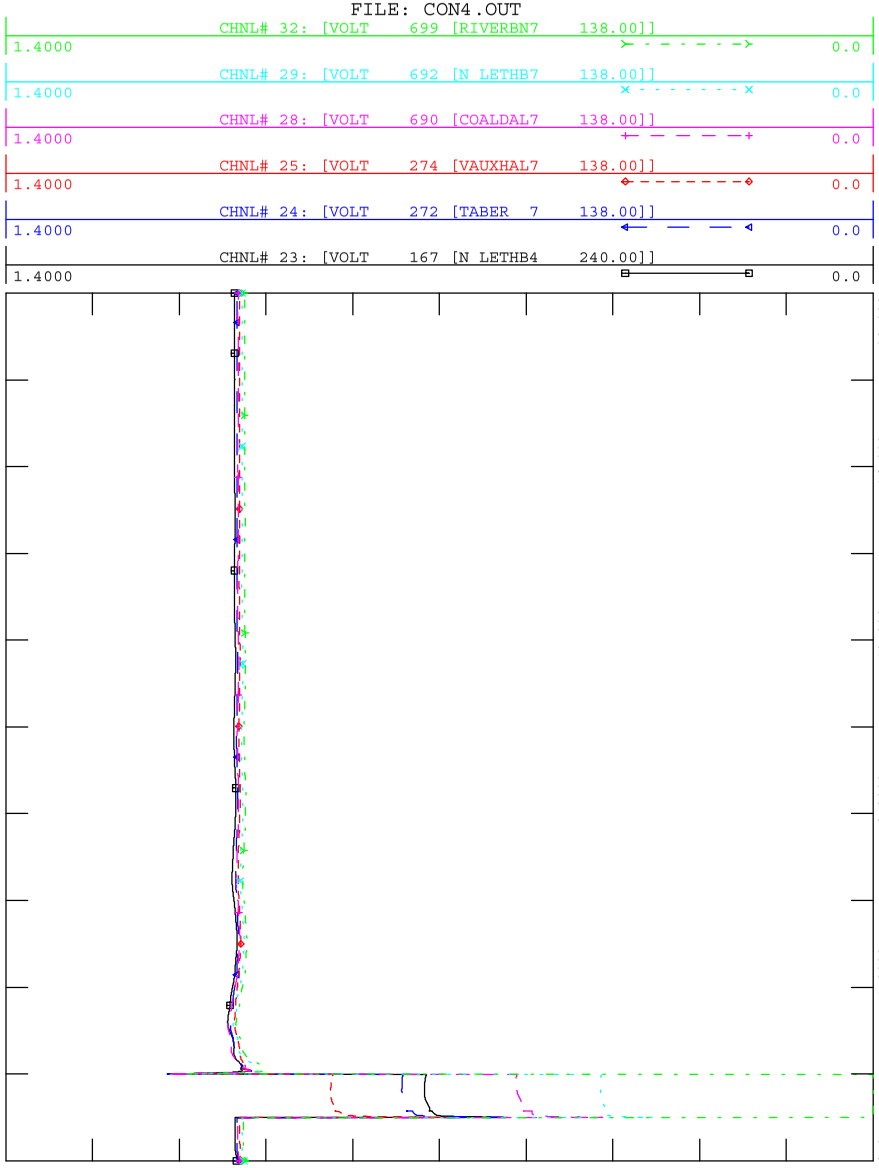


FIG D-SC3-4

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT RIVERBEND 618S

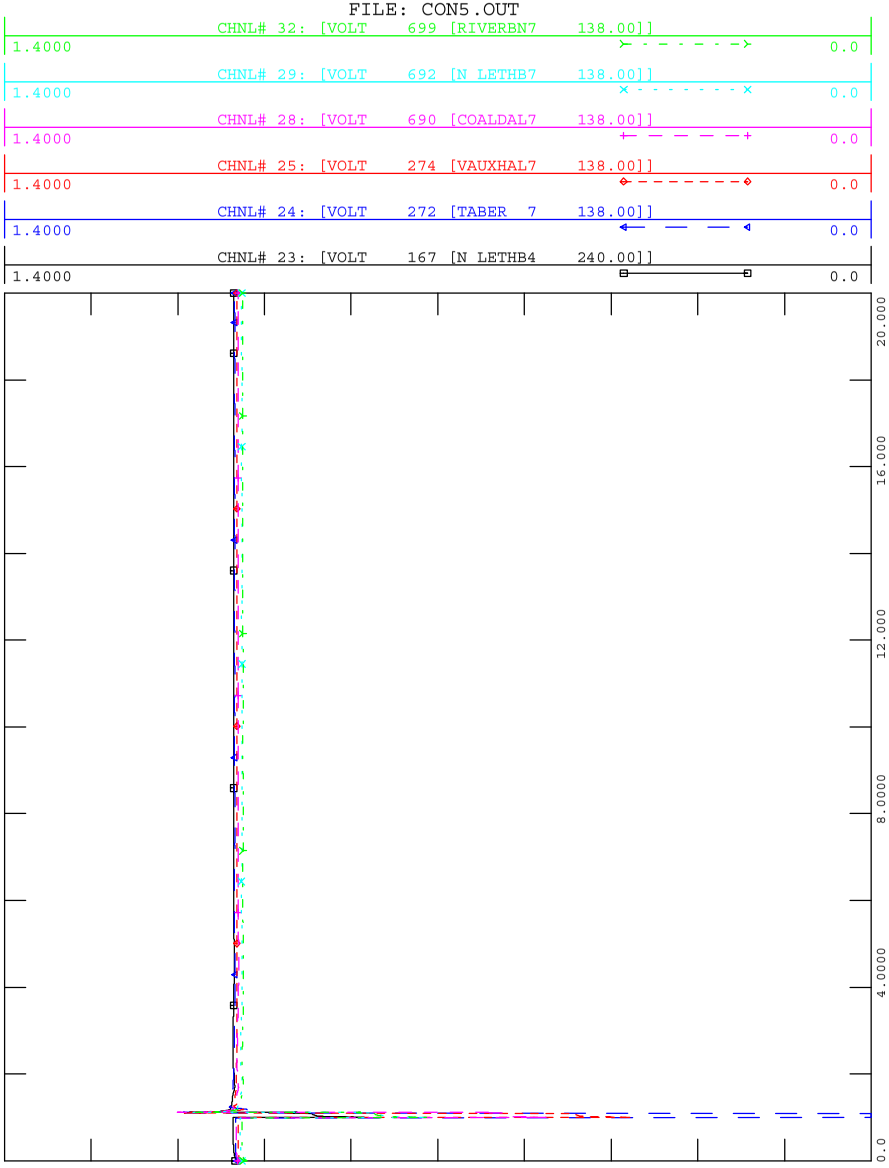
FILE: CON4.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-5

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT TABER 83S

FILE: CON5.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-6

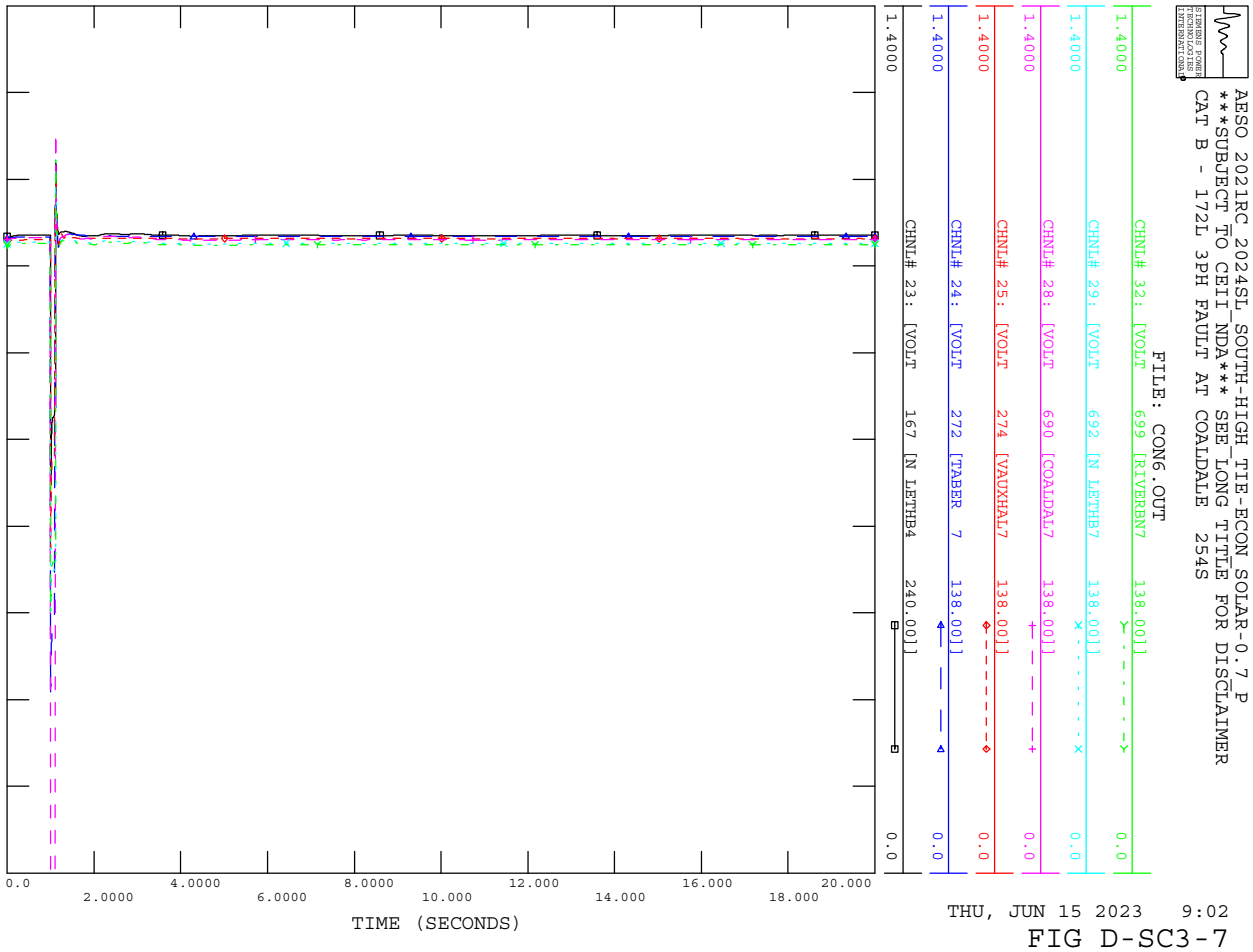


FIG D-SC3-7

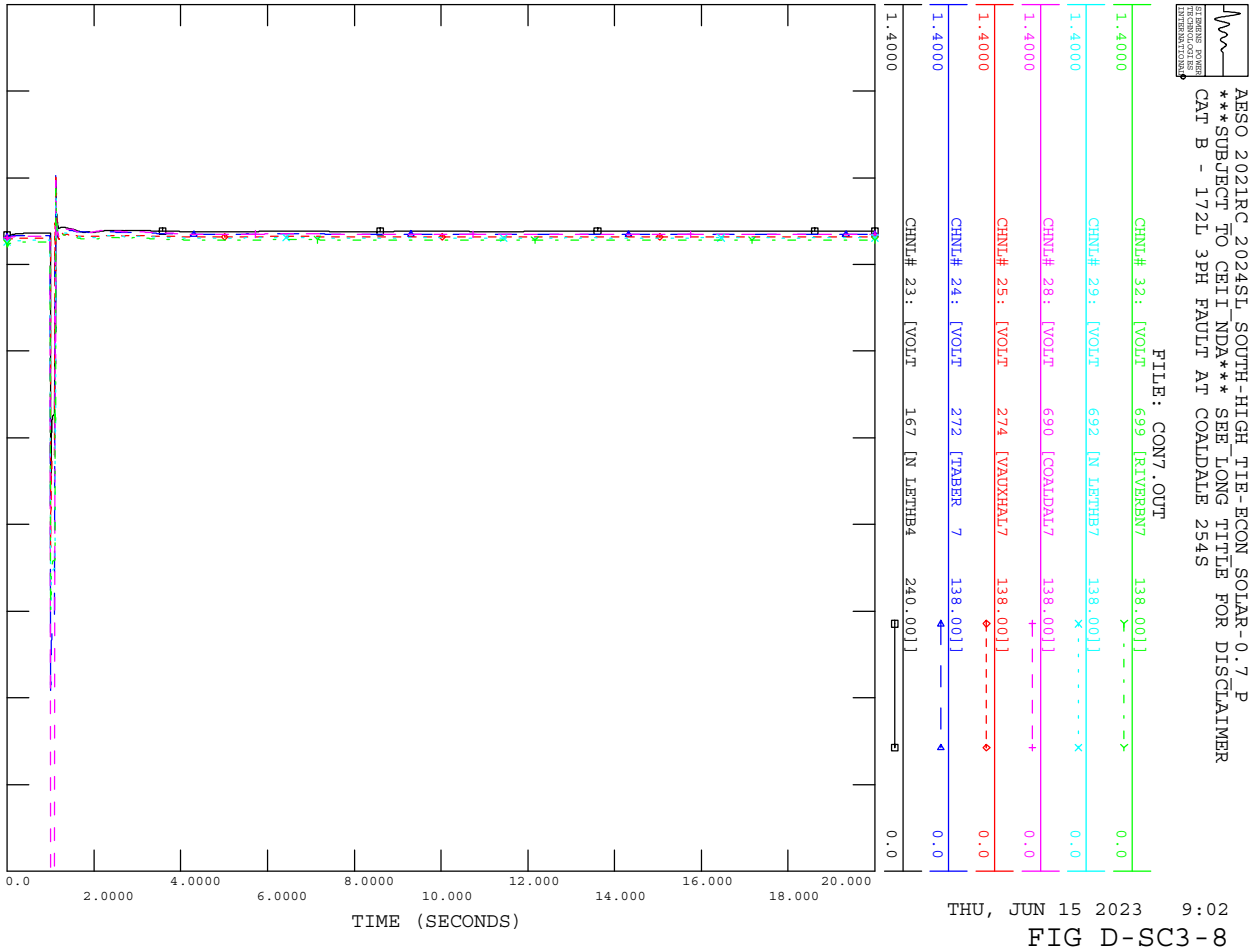
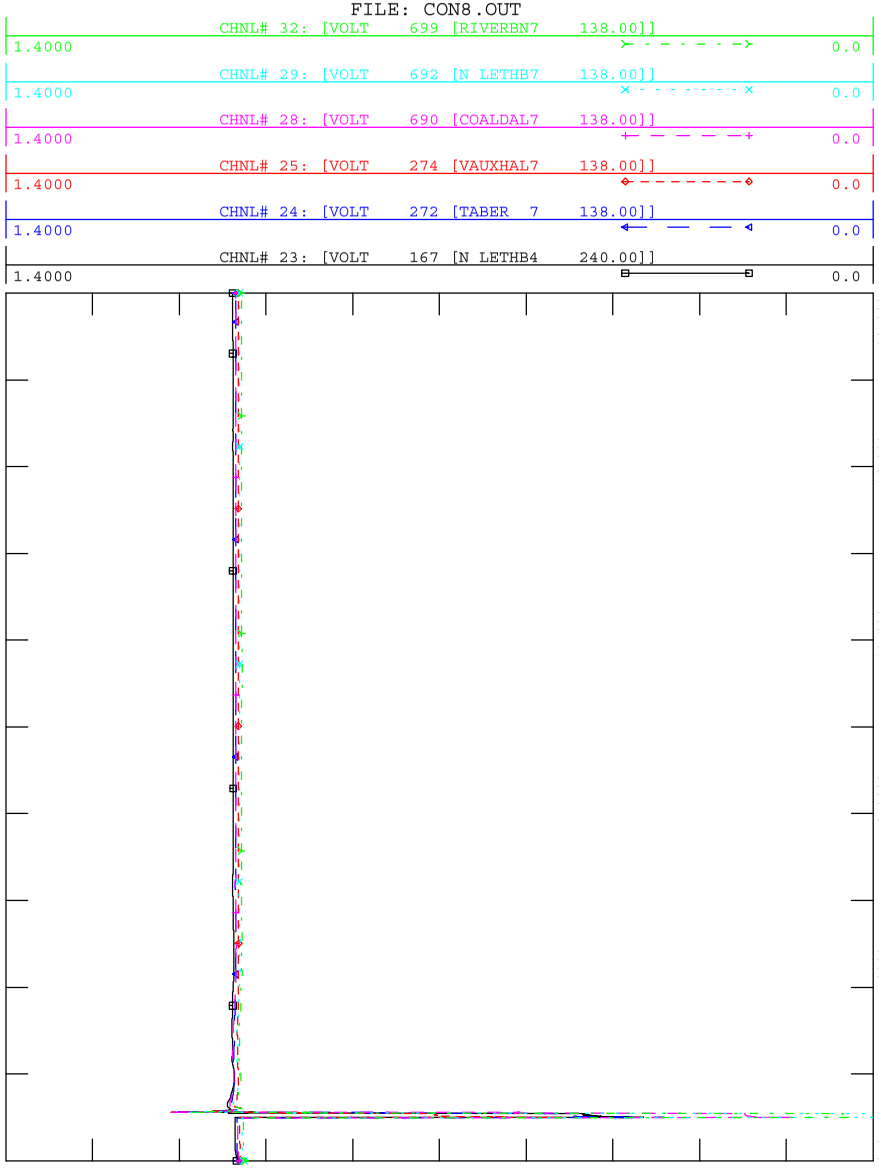


FIG D-SC3-8

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

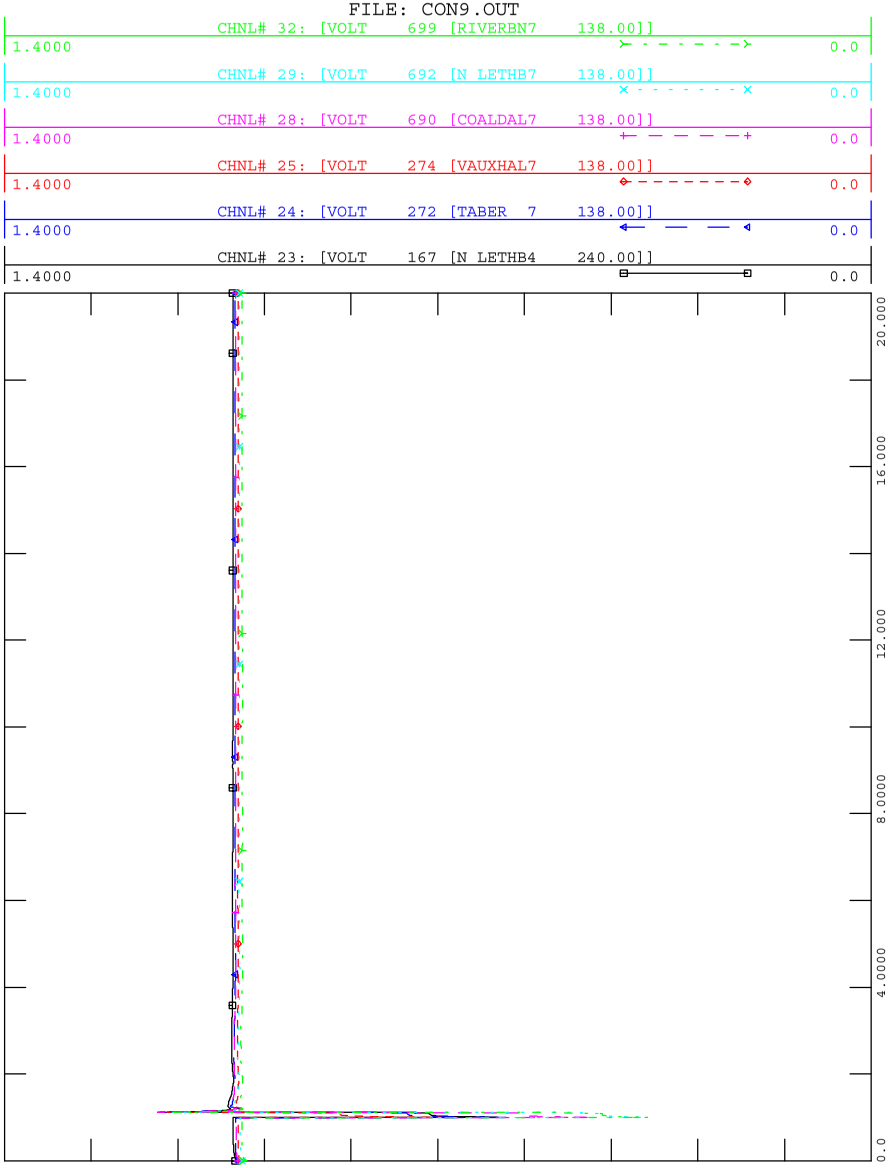
FILE: CON8.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-9

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT CHINOOK 181S

FILE: CON9.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-10

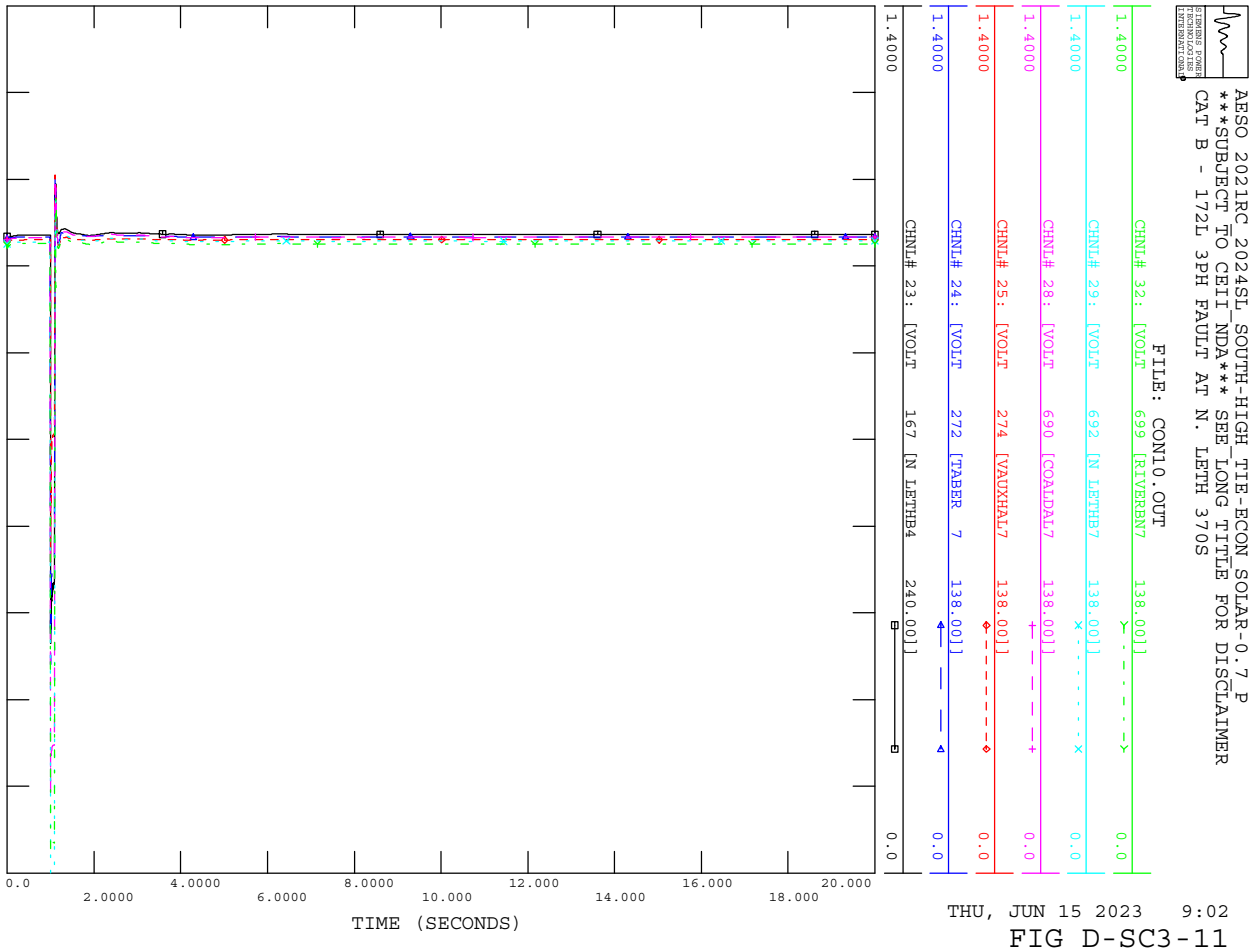


FIG D-SC3-11

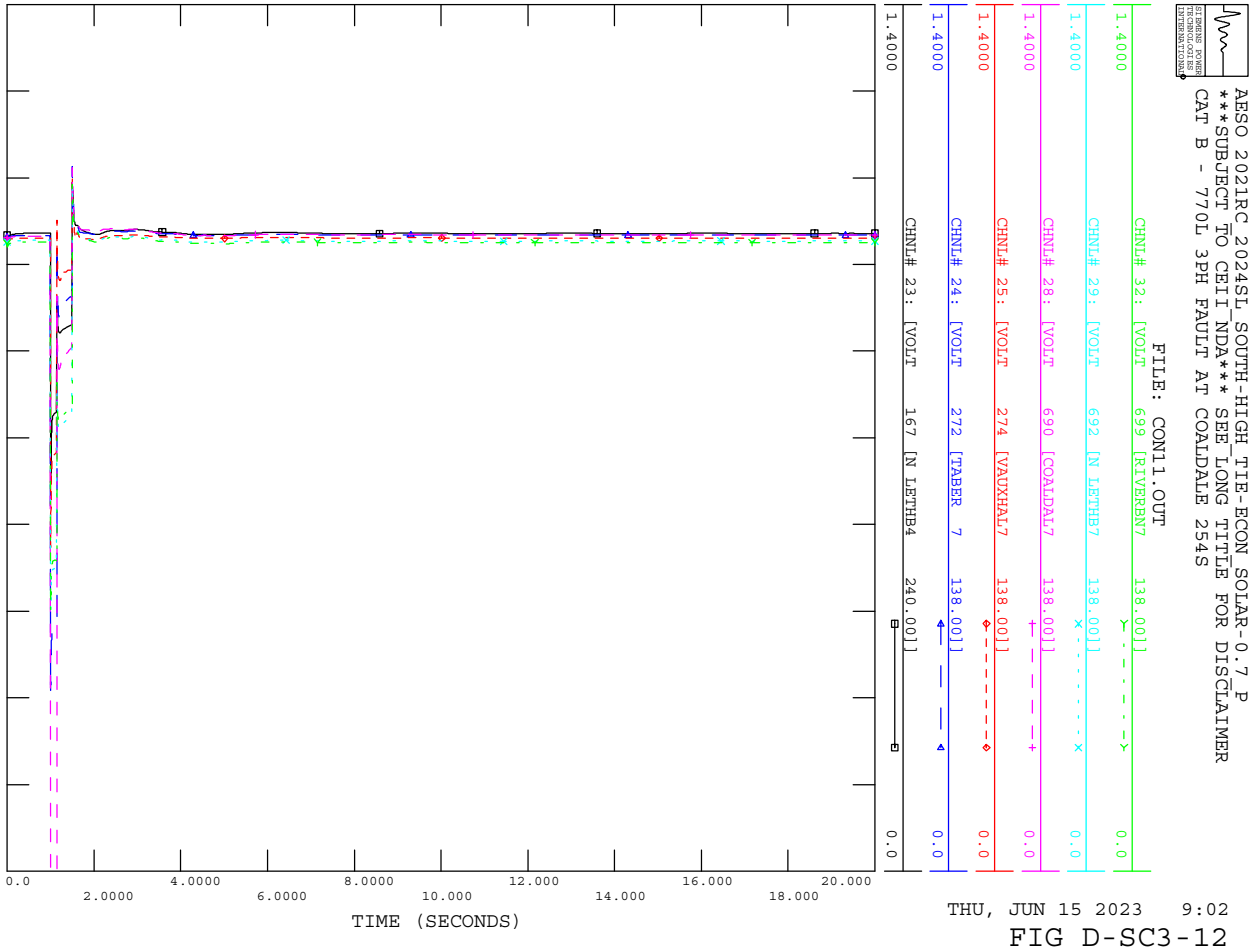


FIG D-SC3-12

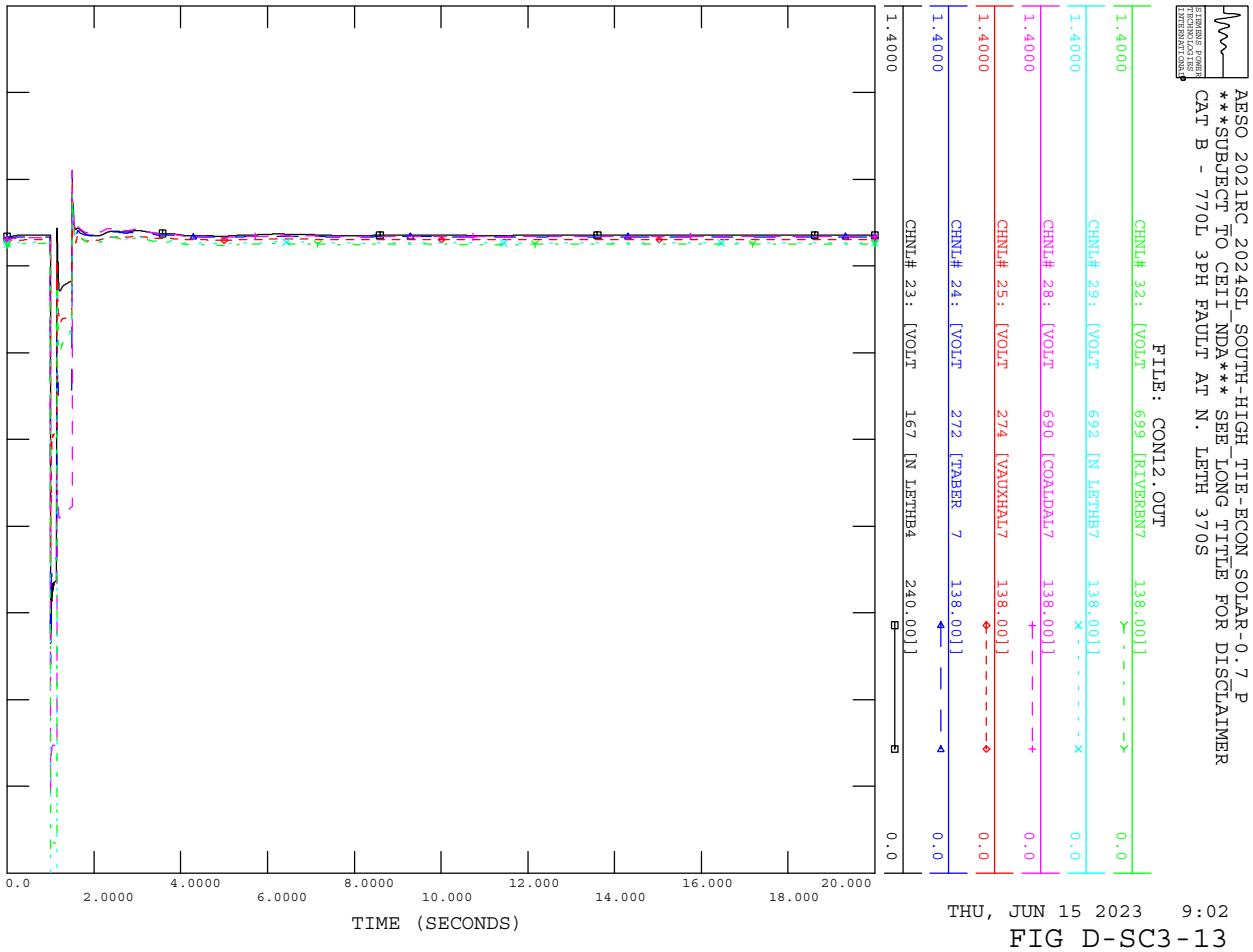


FIG D-SC3-13

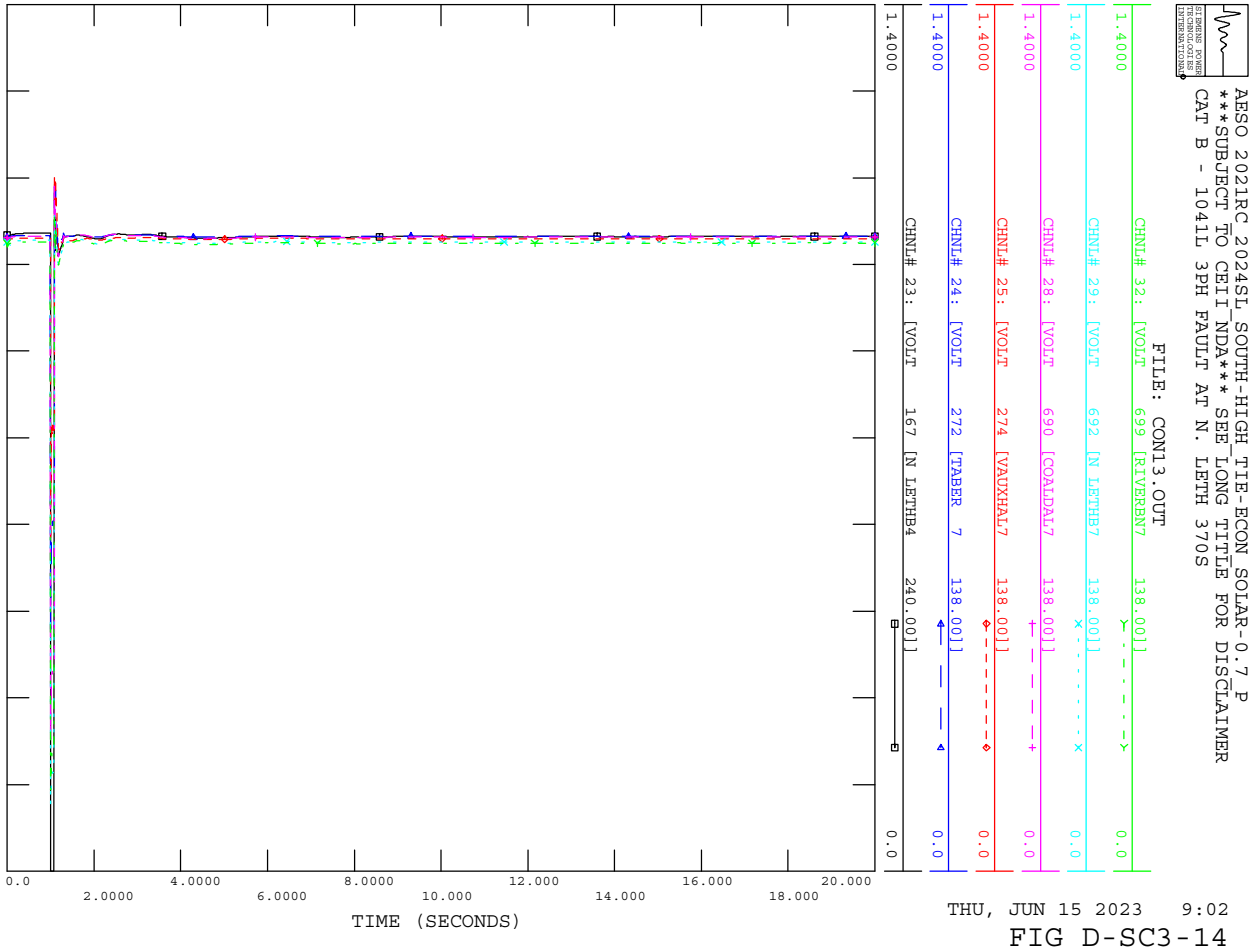
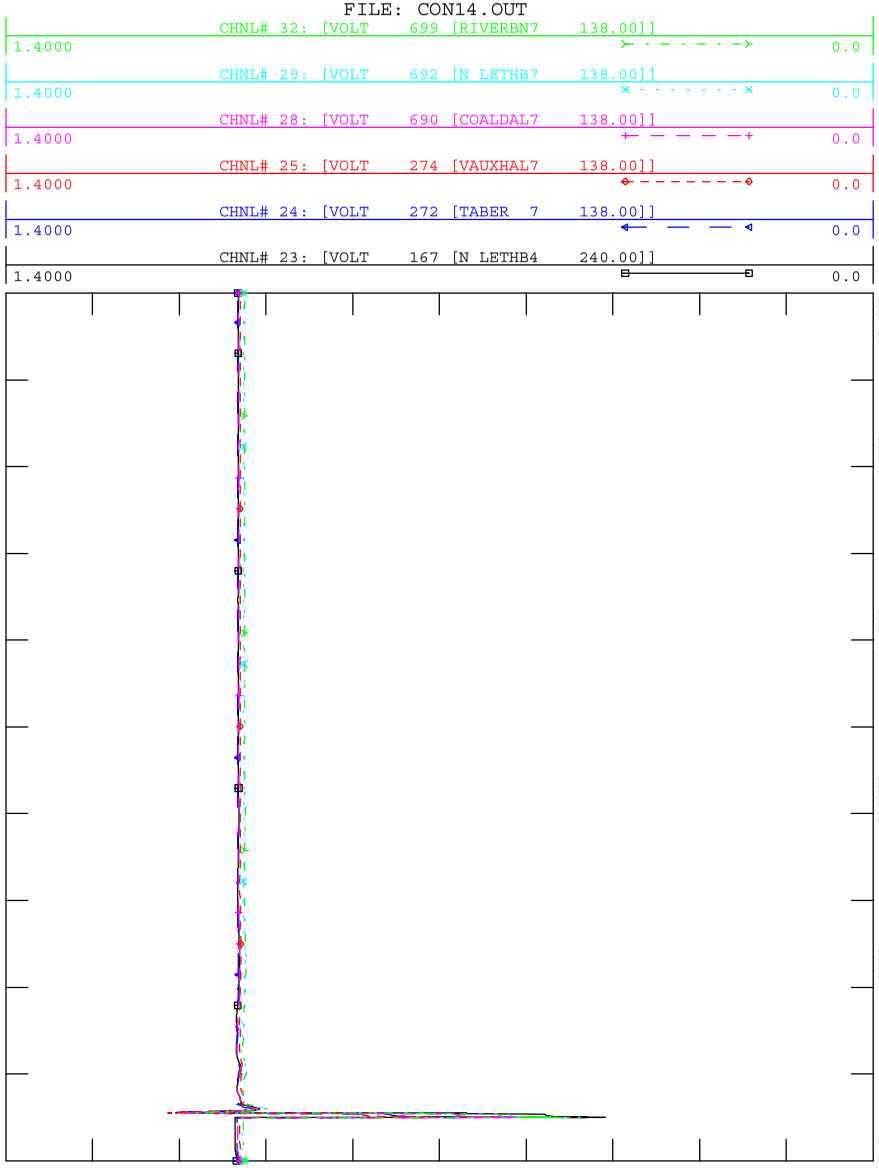


FIG D-SC3-14

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

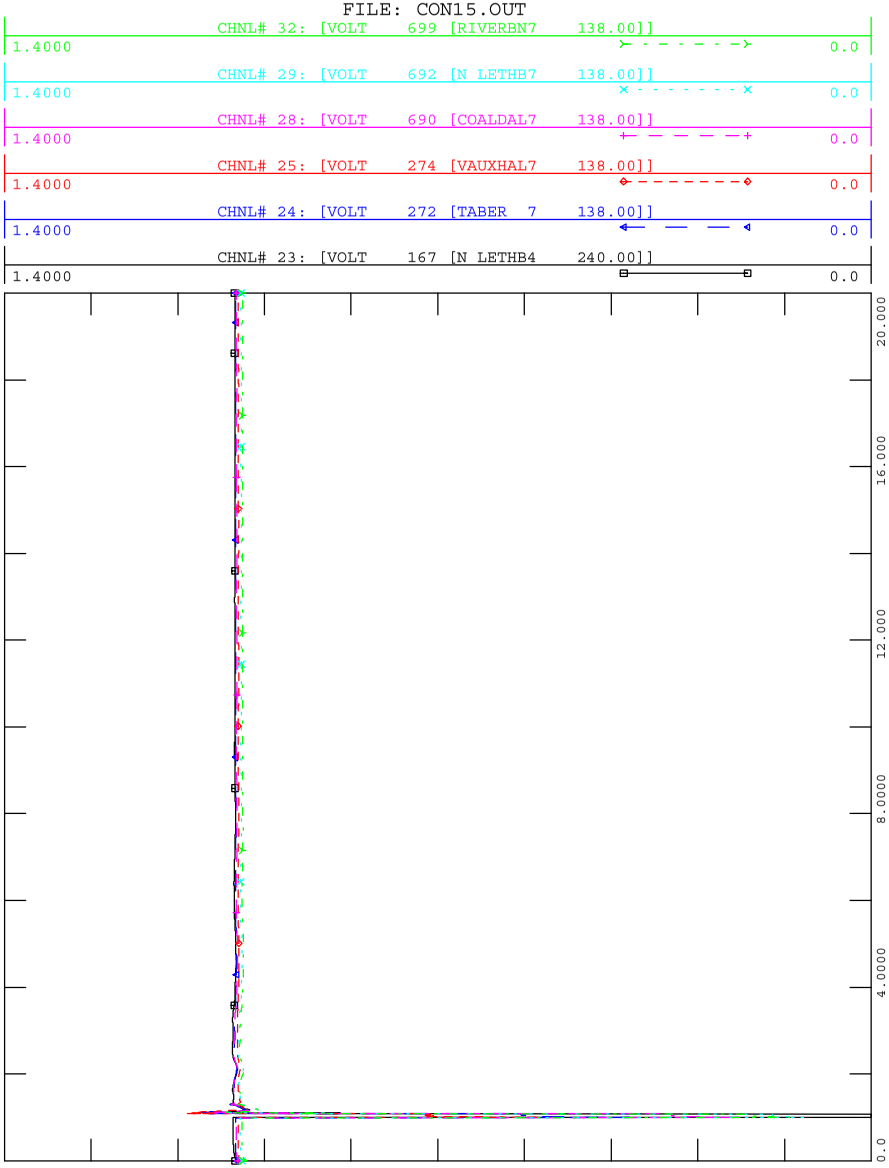
FILE: CON14.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-15

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

FILE: CON15.OUT



THU, JUN 15 2023 9:02
FIG D-SC3-16

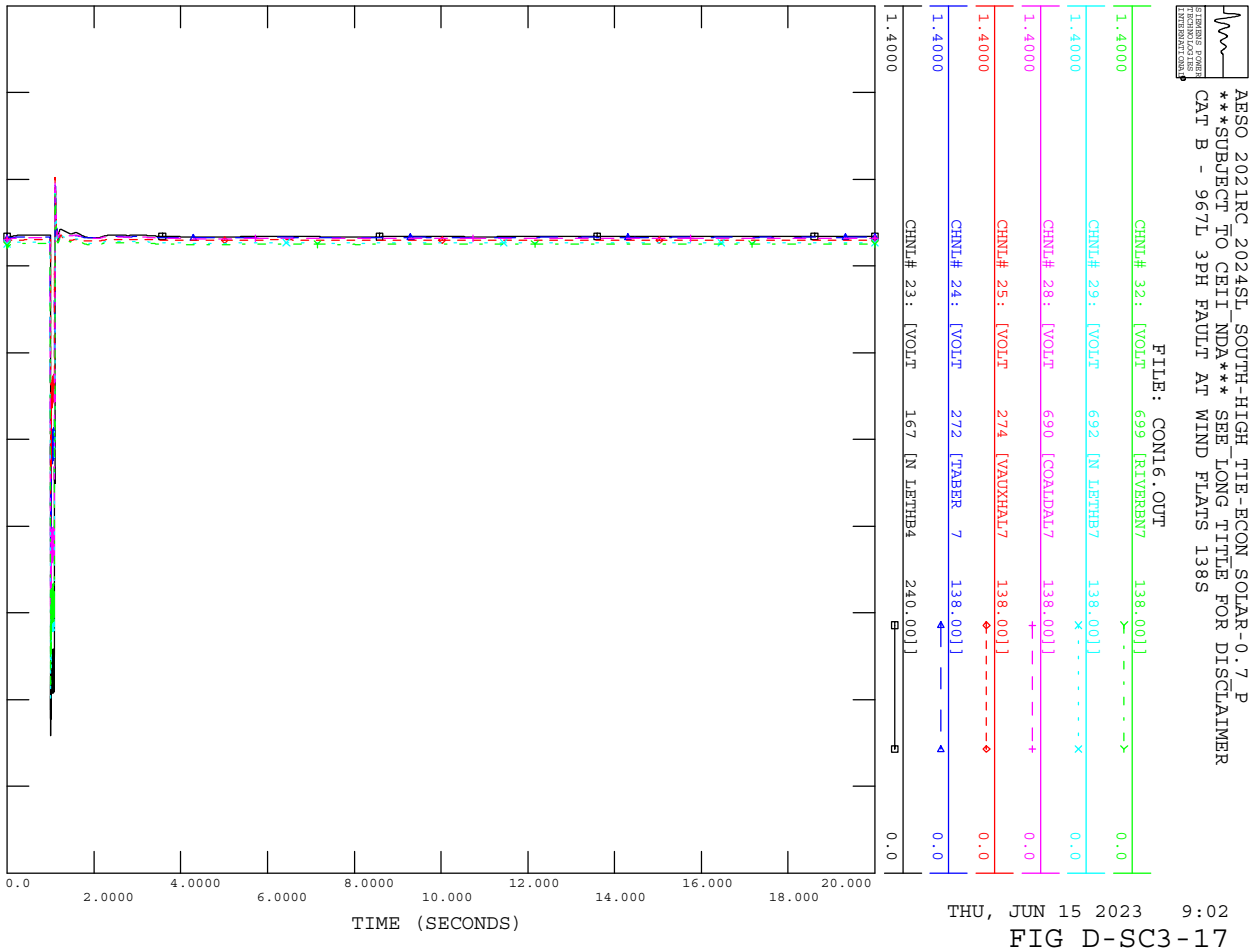


FIG D-SC3-17

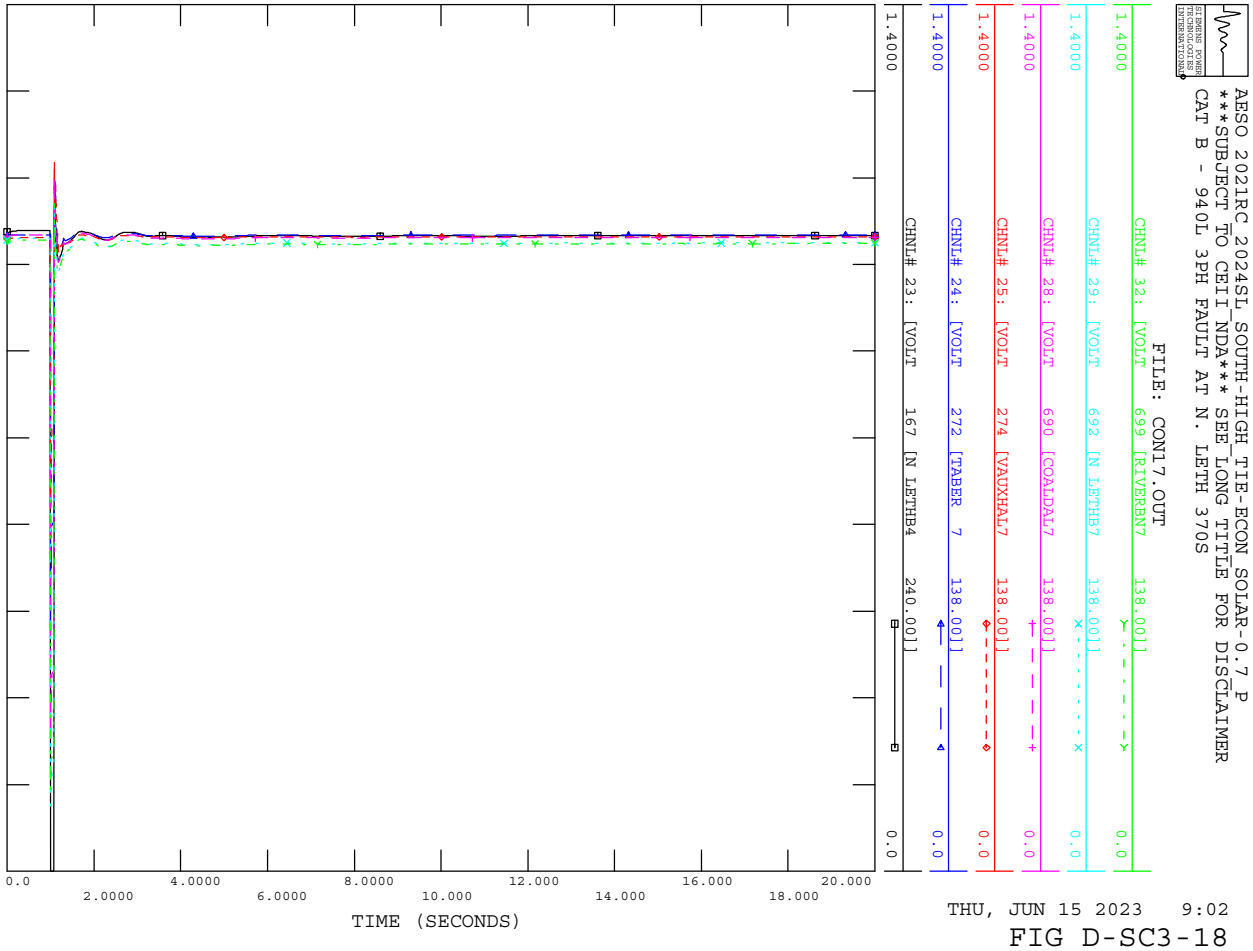


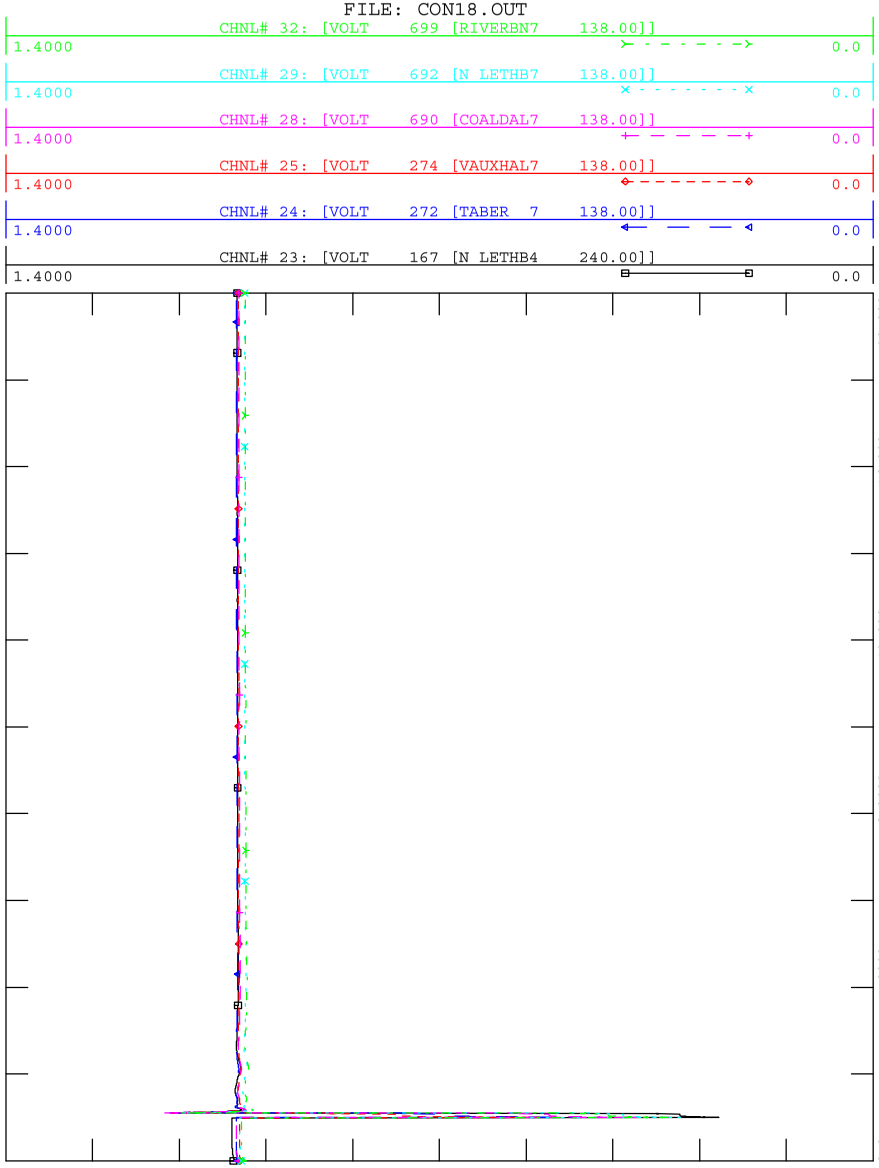
FIG D-SC3-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

THU, JUN 15 2023 9:02

FIG D-SC3-19



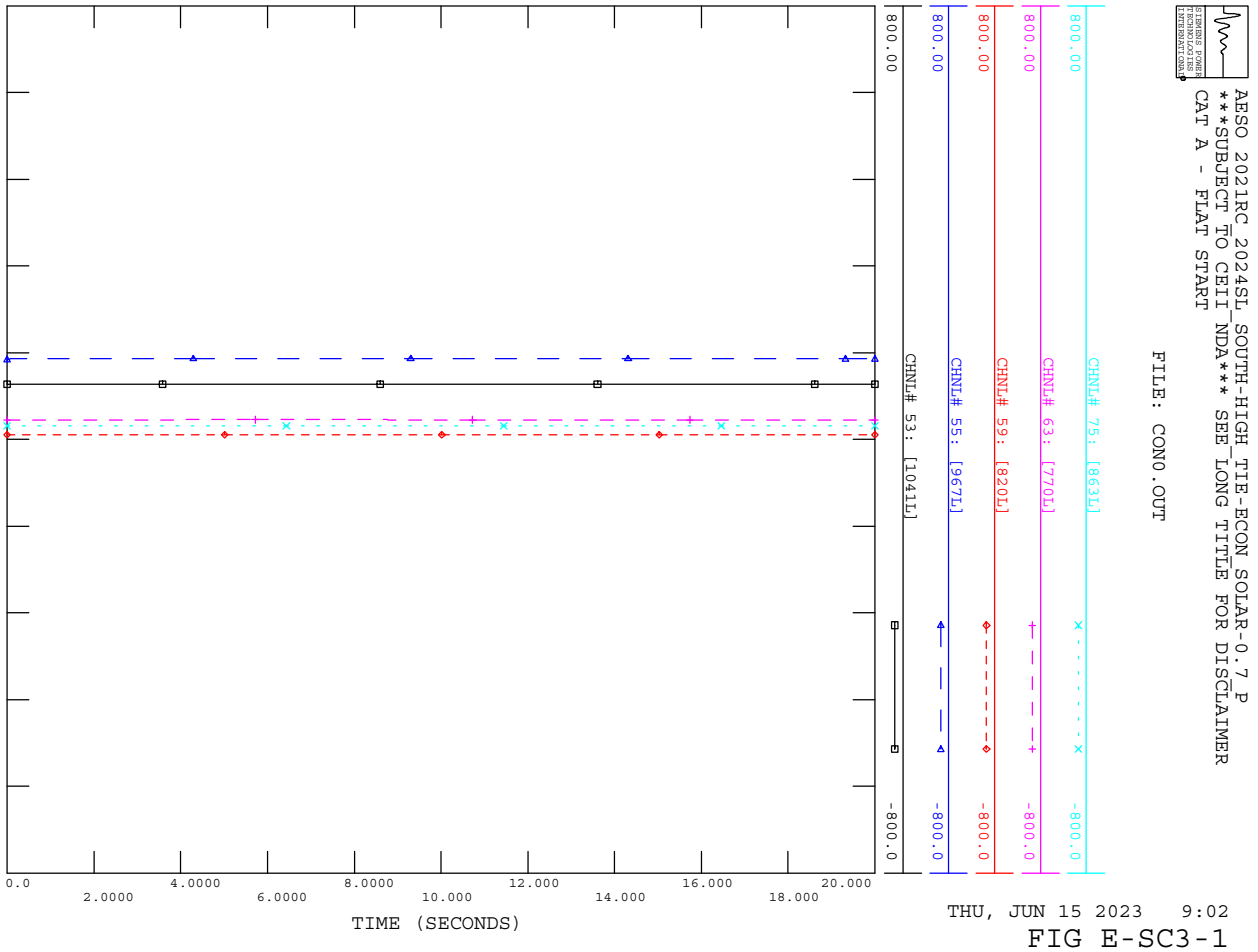


FIG E-SC3-1

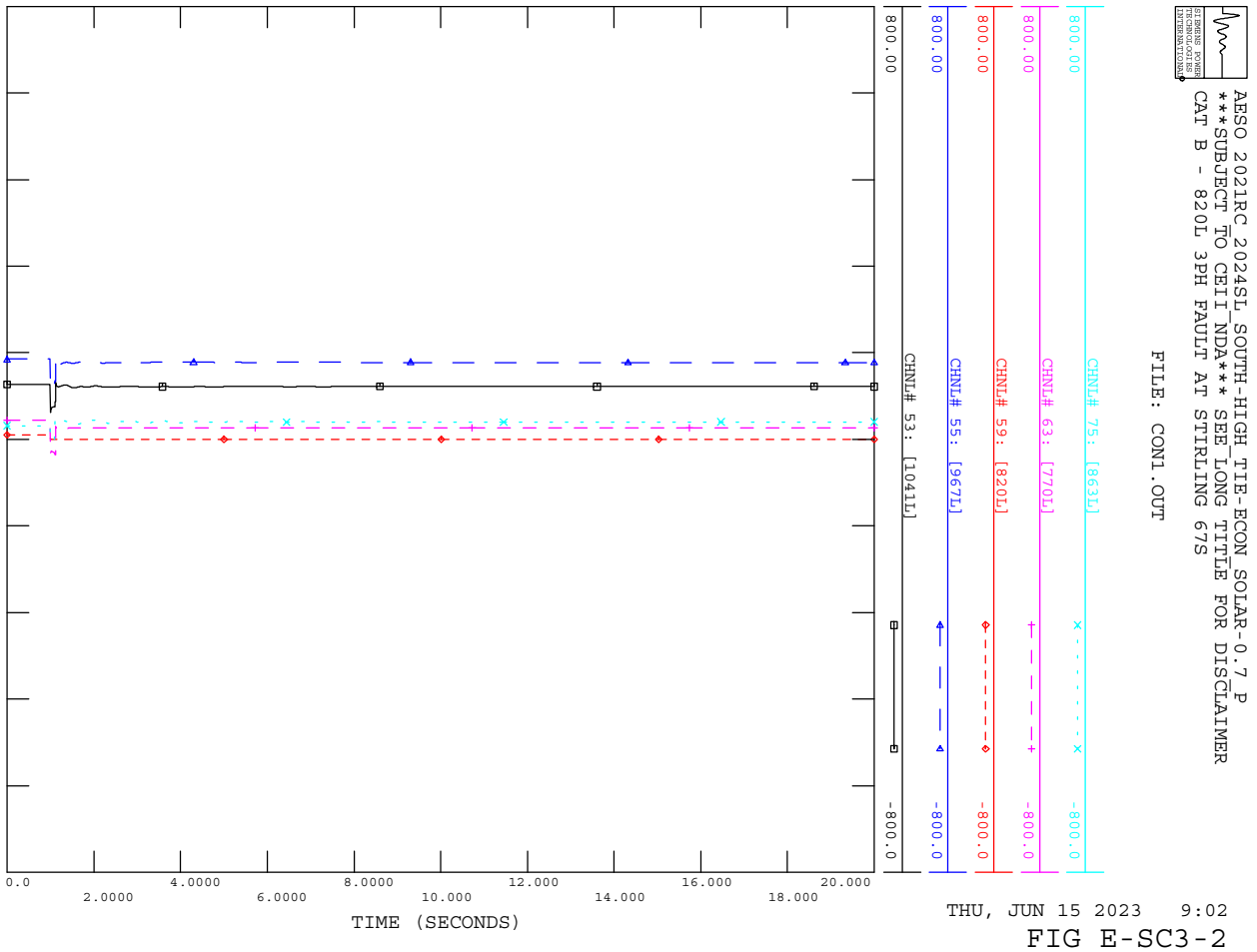


FIG E-SC3-2

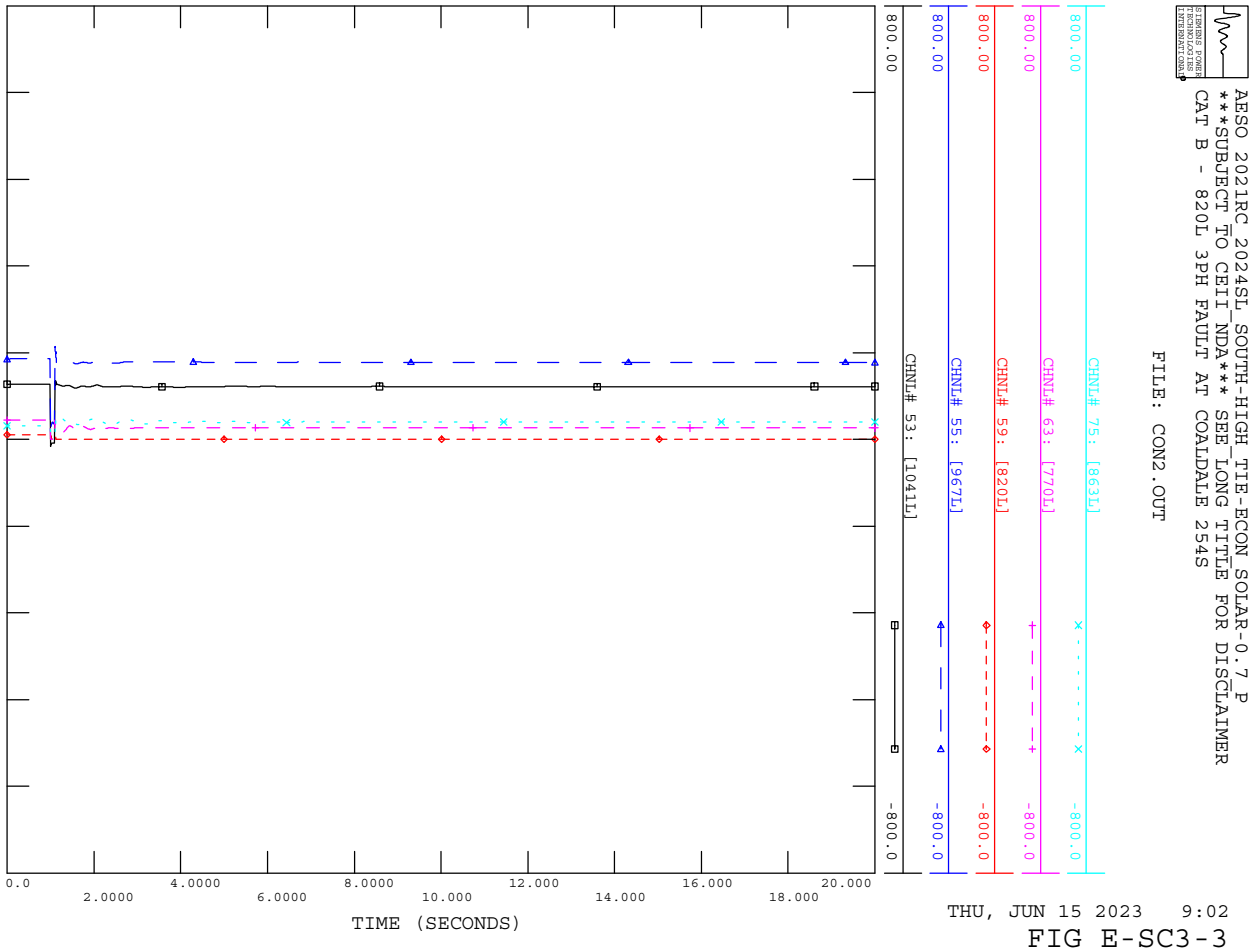


FIG E-SC3-3

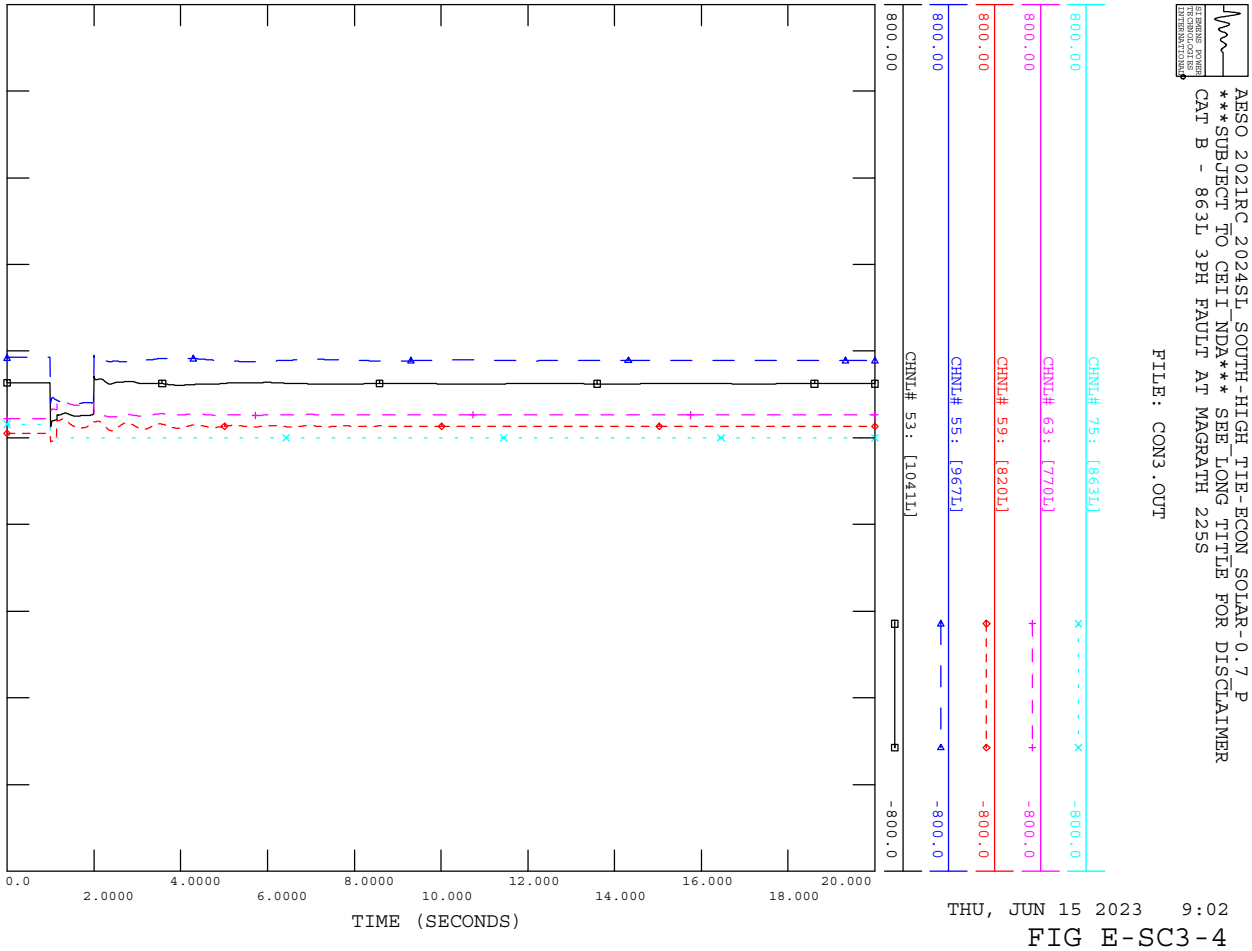


FIG E-SC3-4

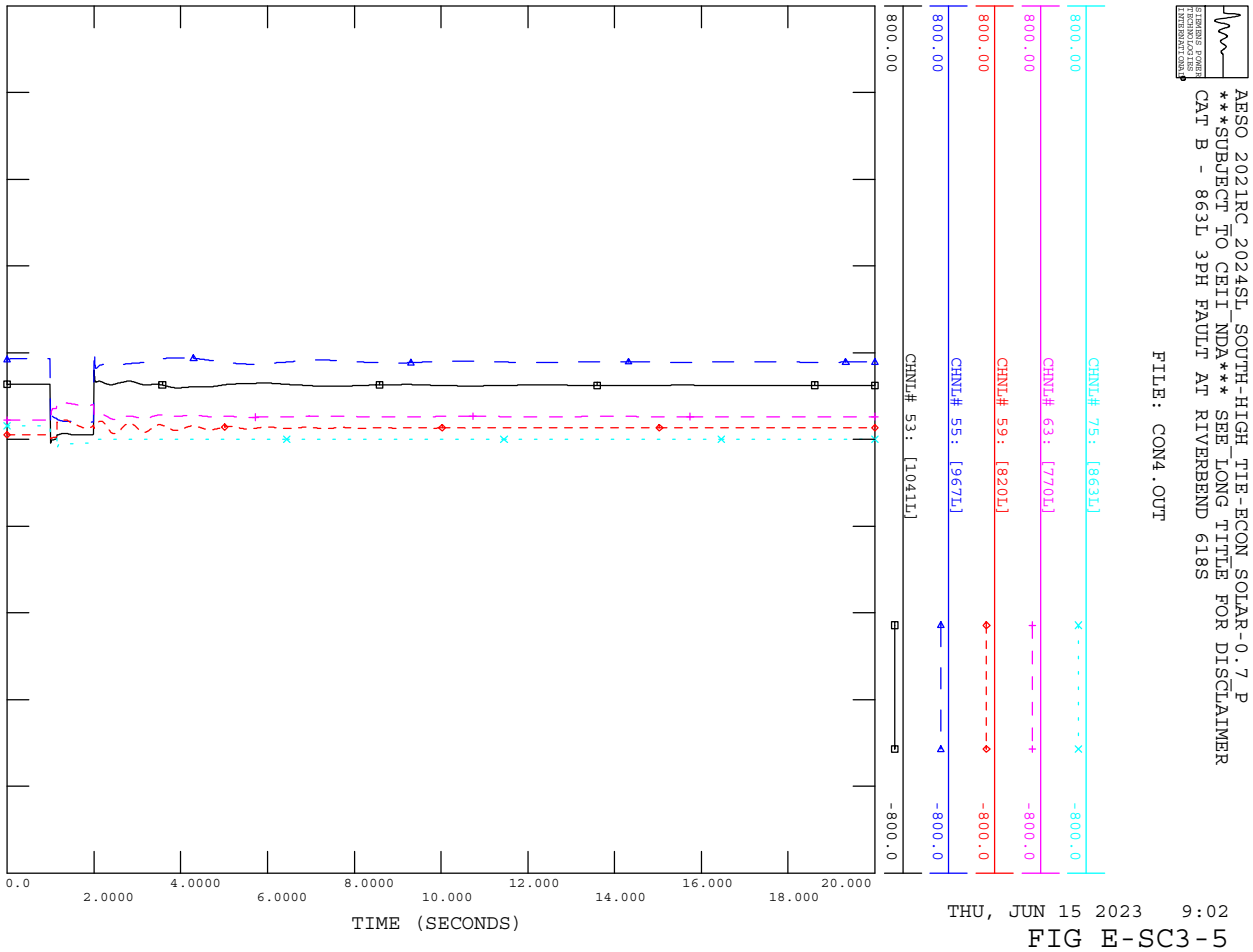


FIG E-SC3-5

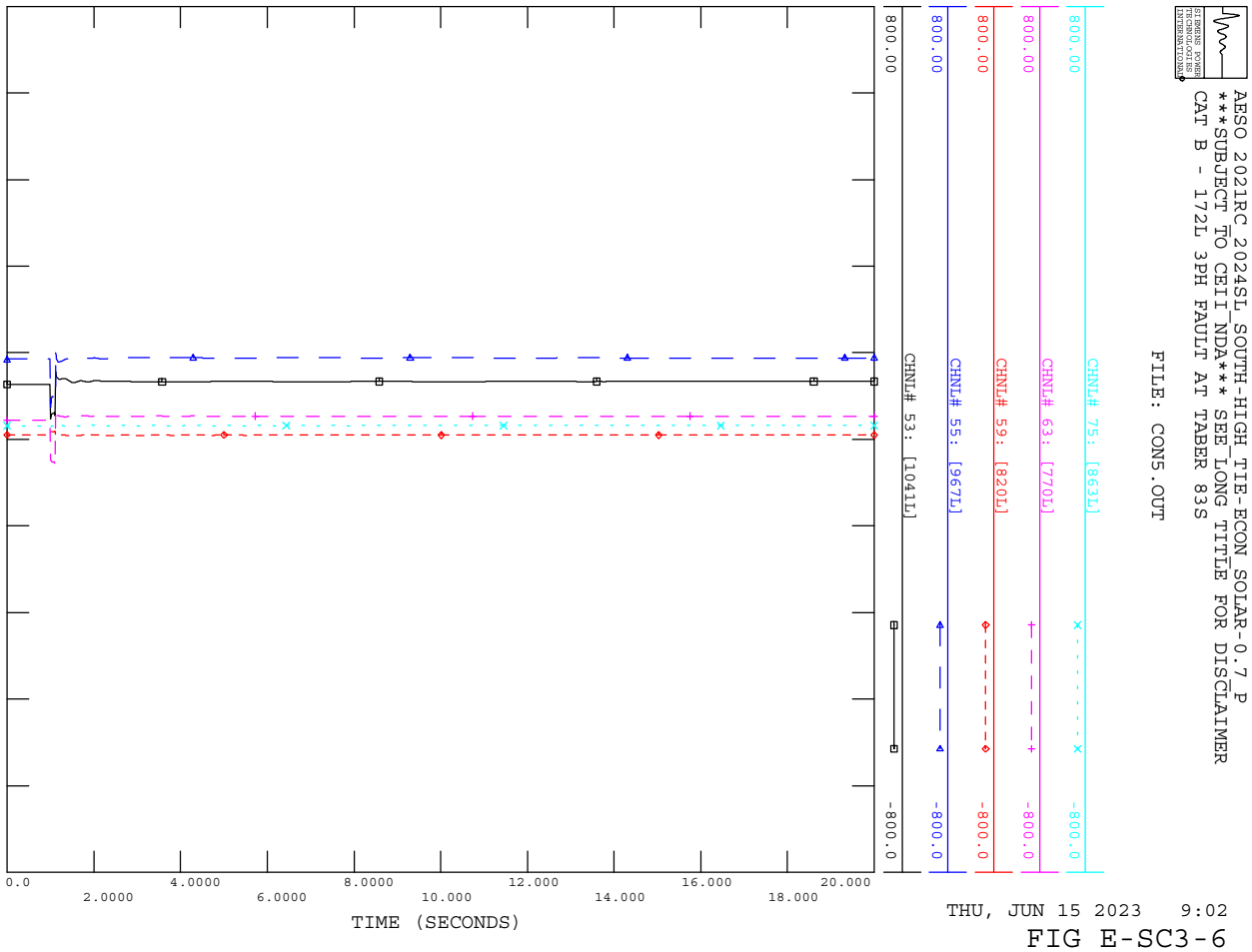


FIG E-SC3-6

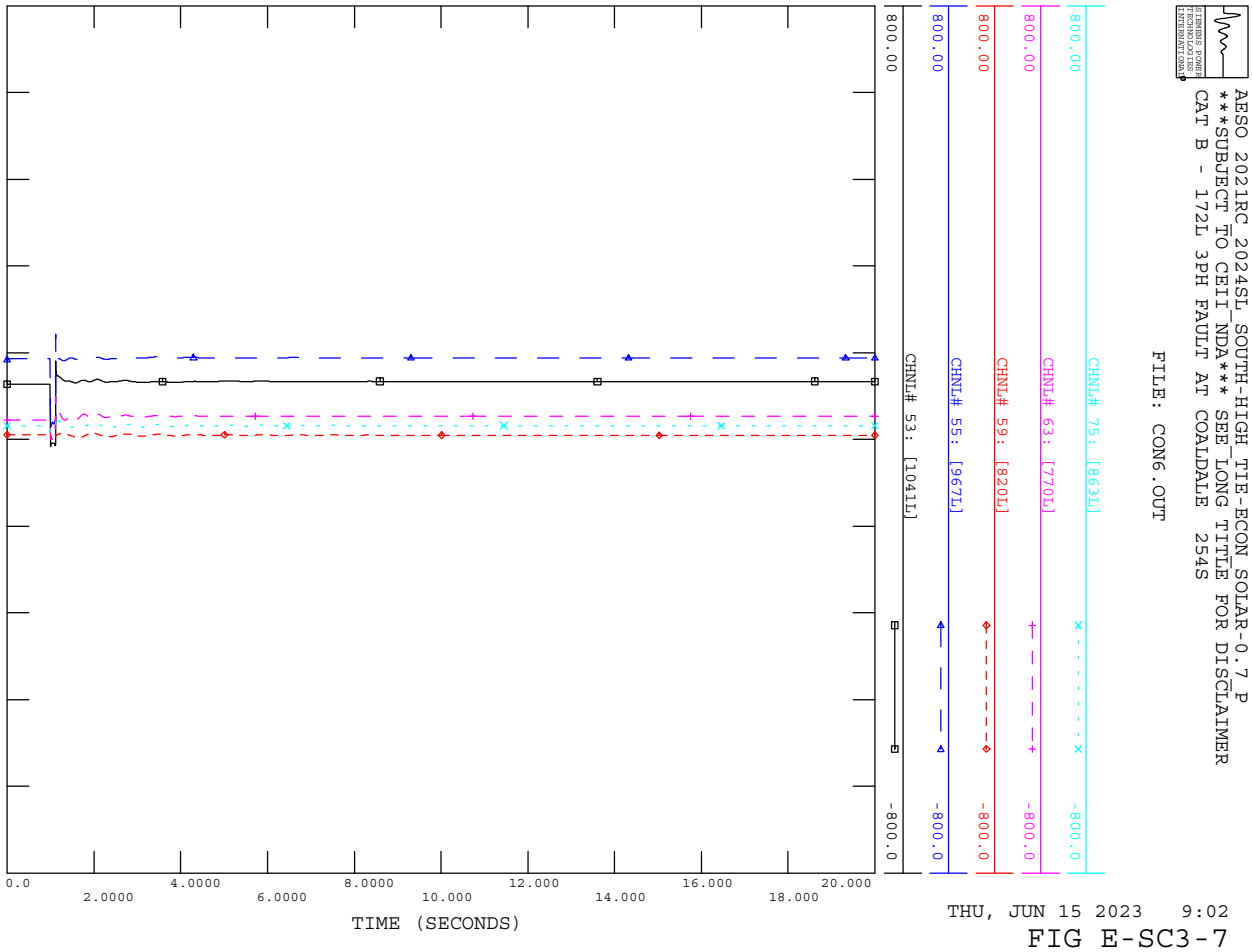


FIG E-SC3-7

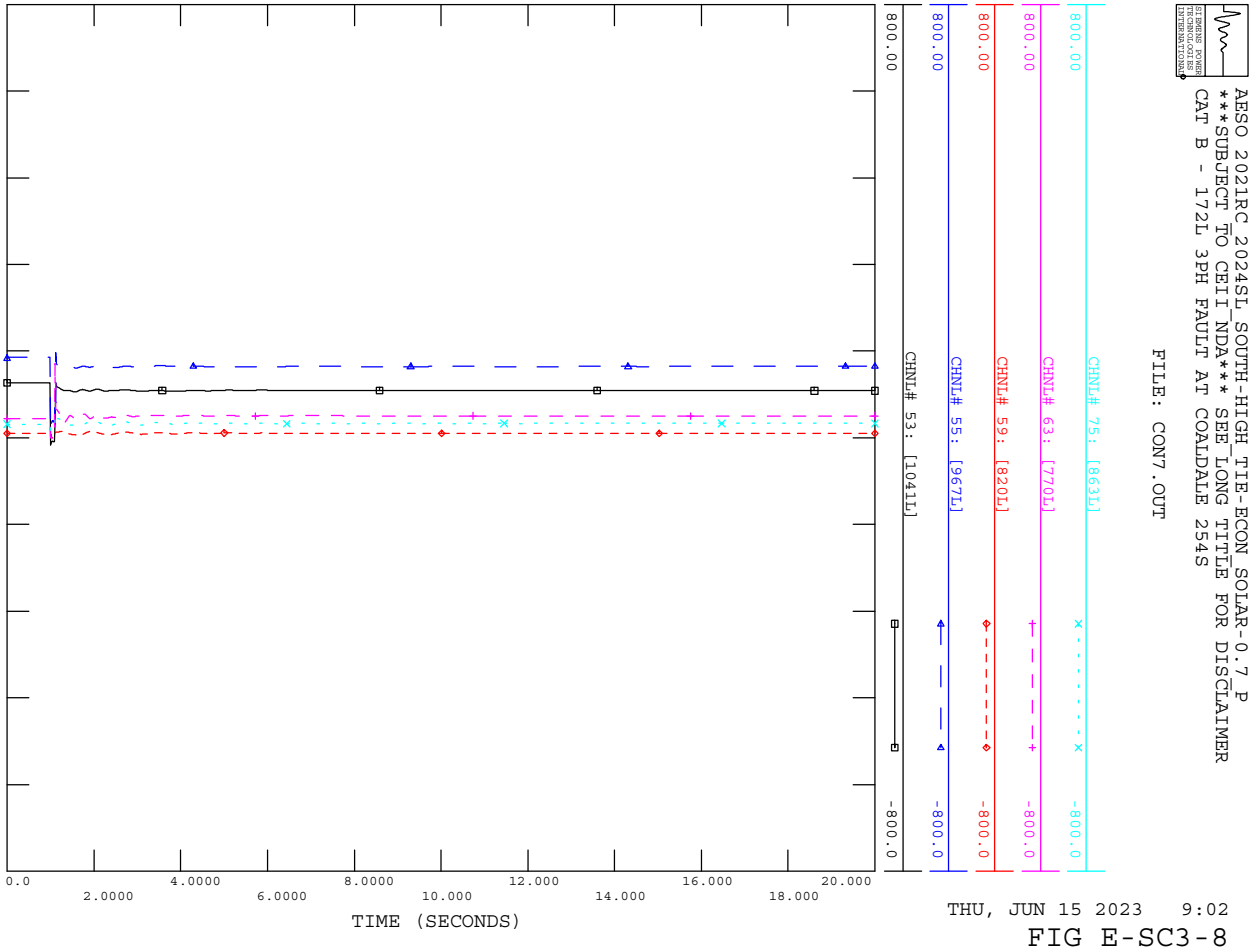


FIG E-SC3-8

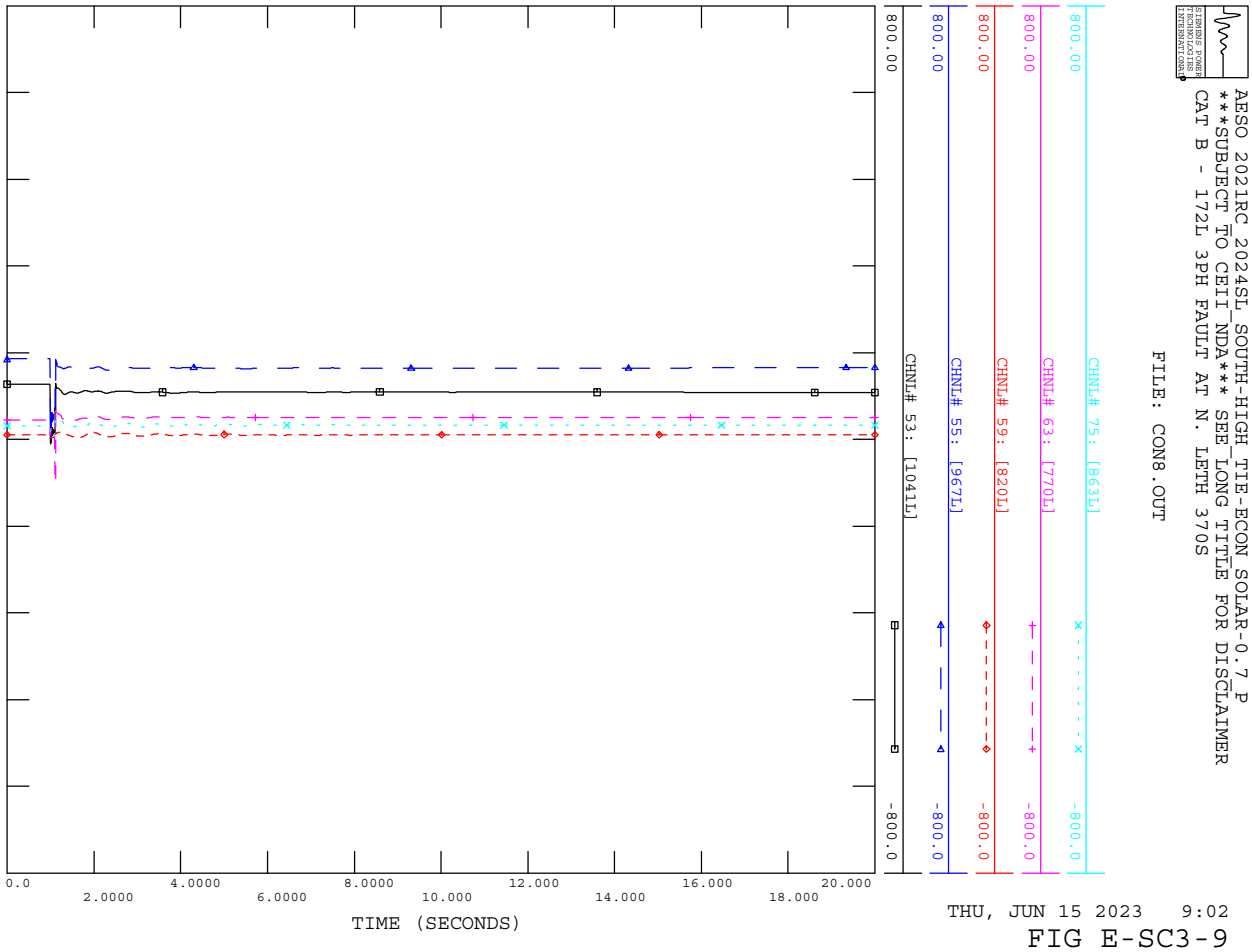


FIG E-SC3-9

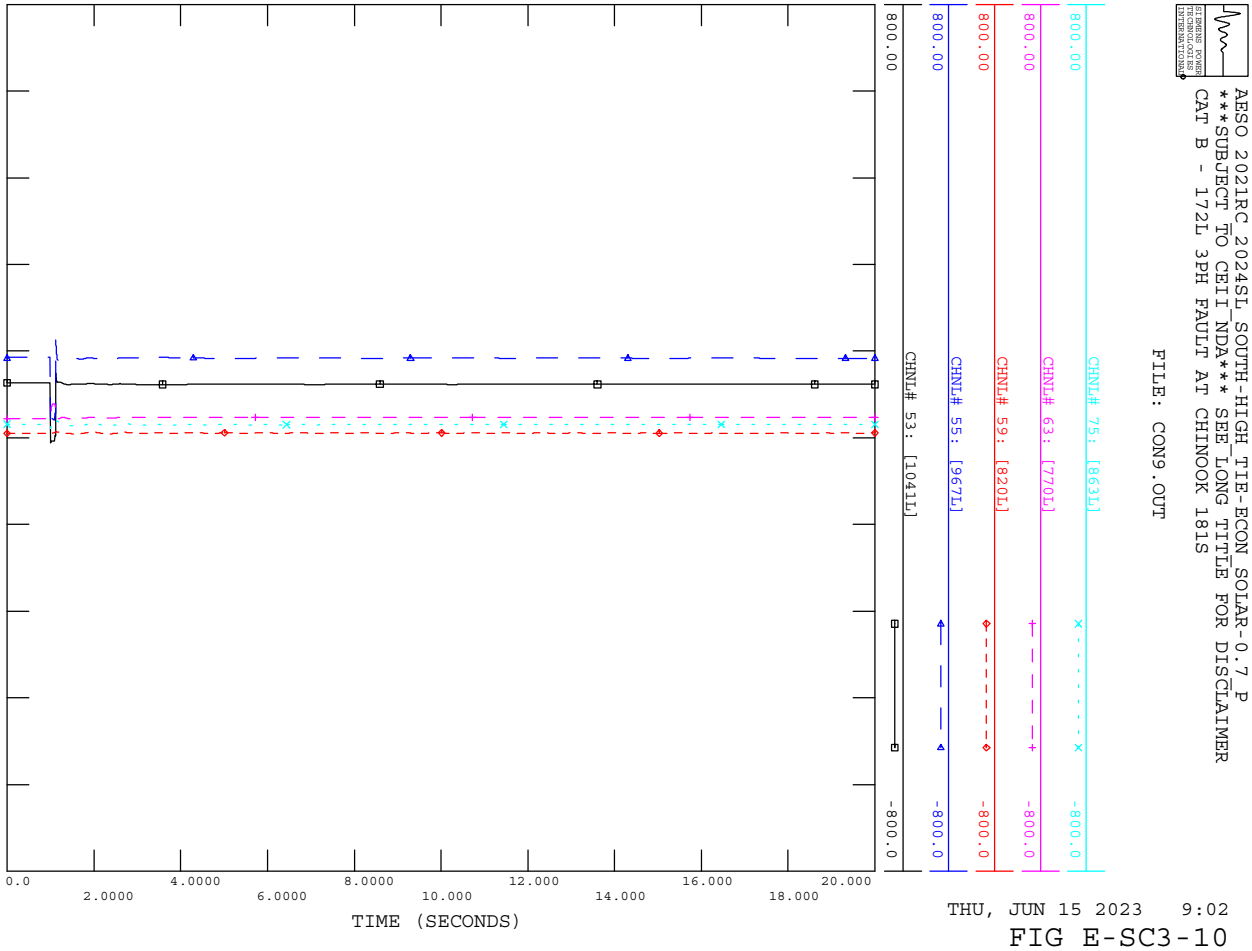


FIG E-SC3-10

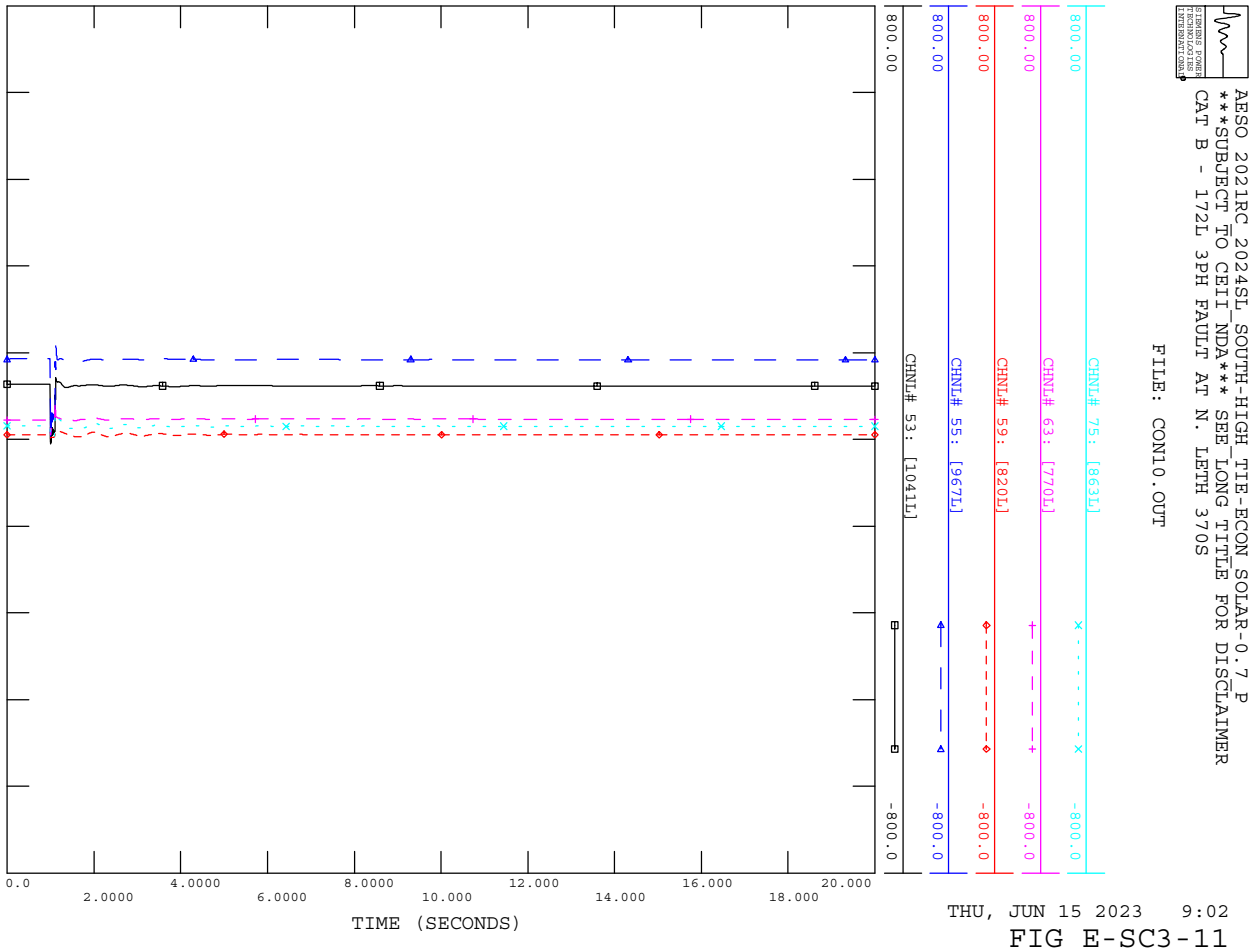


FIG E-SC3-11

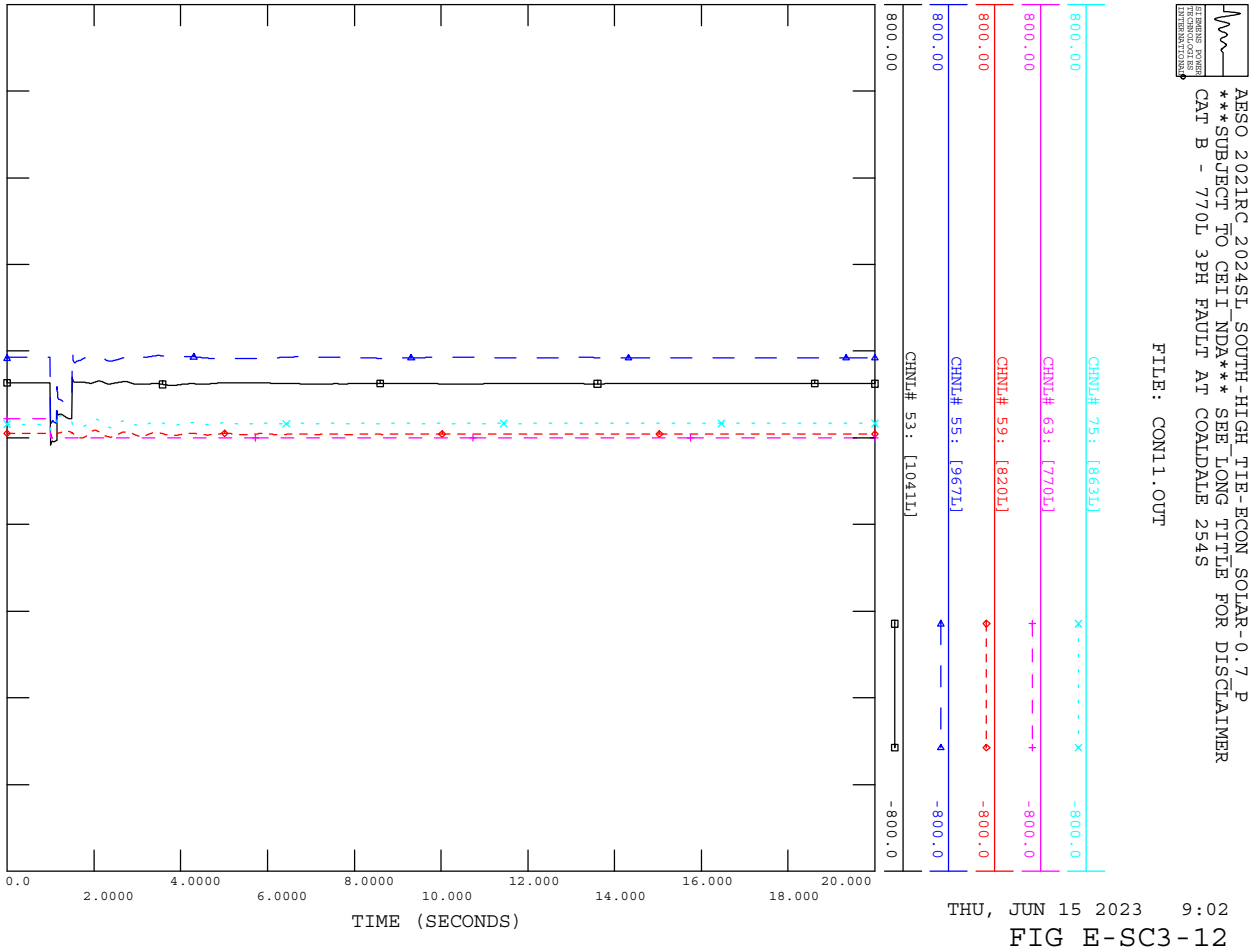


FIG E-SC3-12

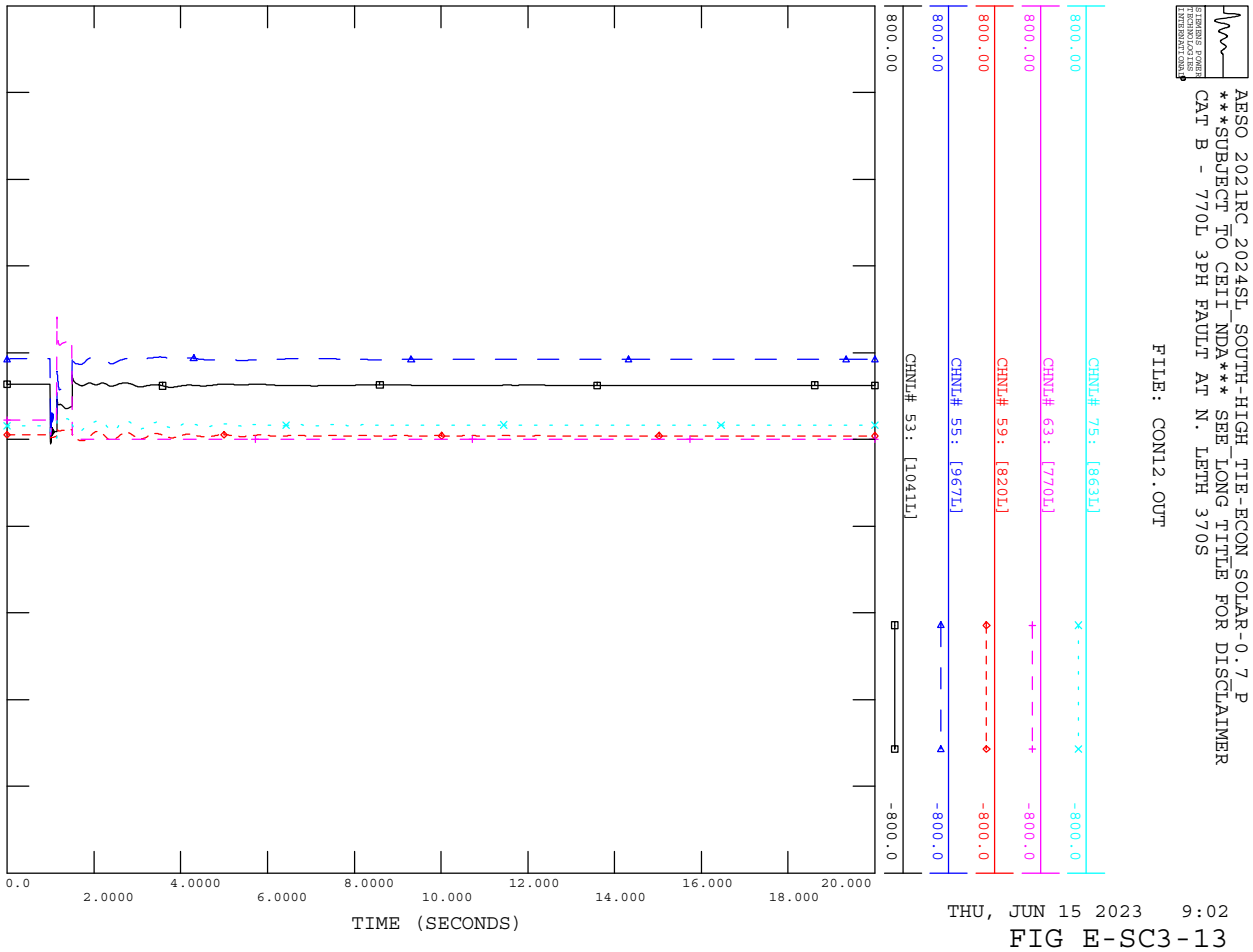


FIG E-SC3-13

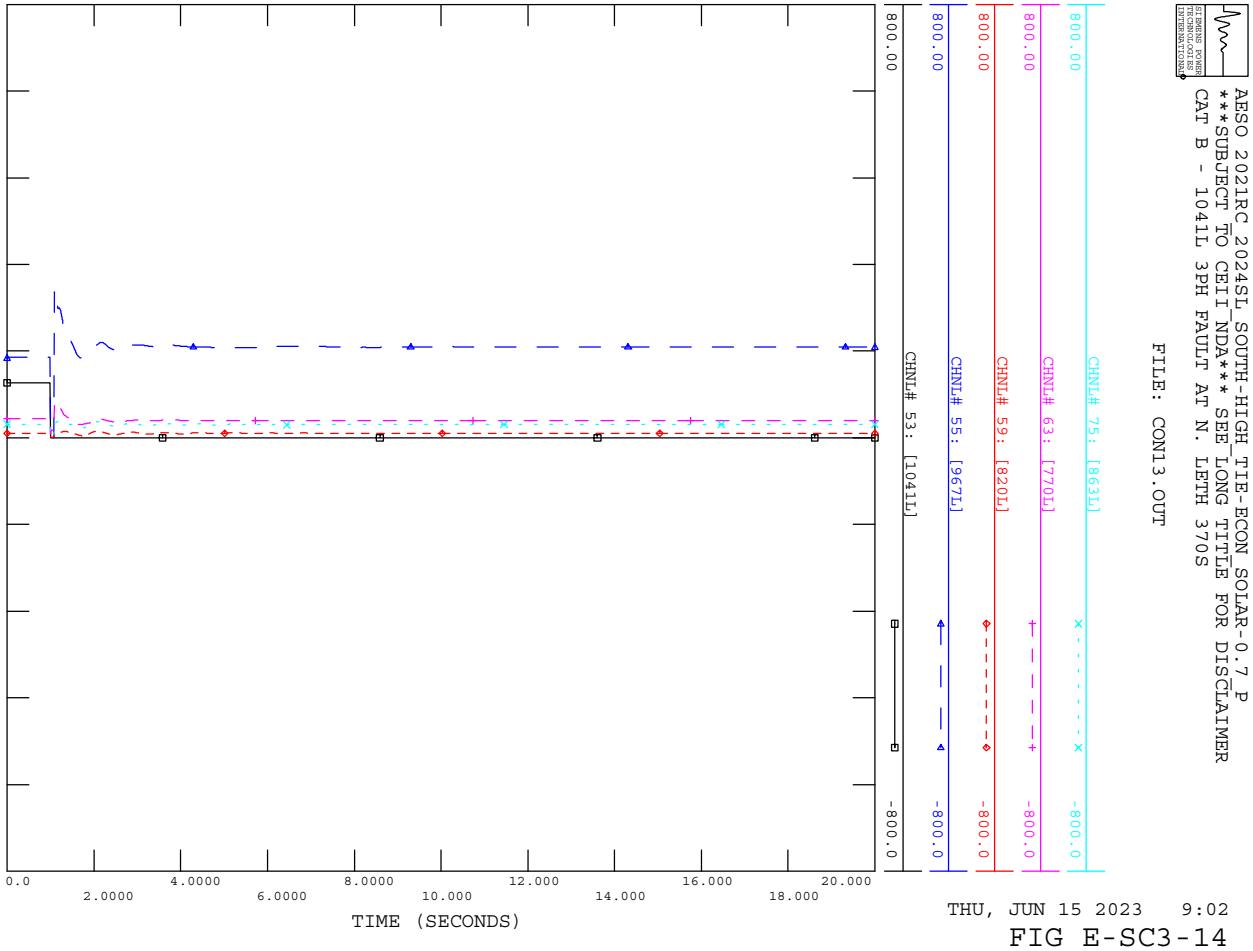


FIG E-SC3-14

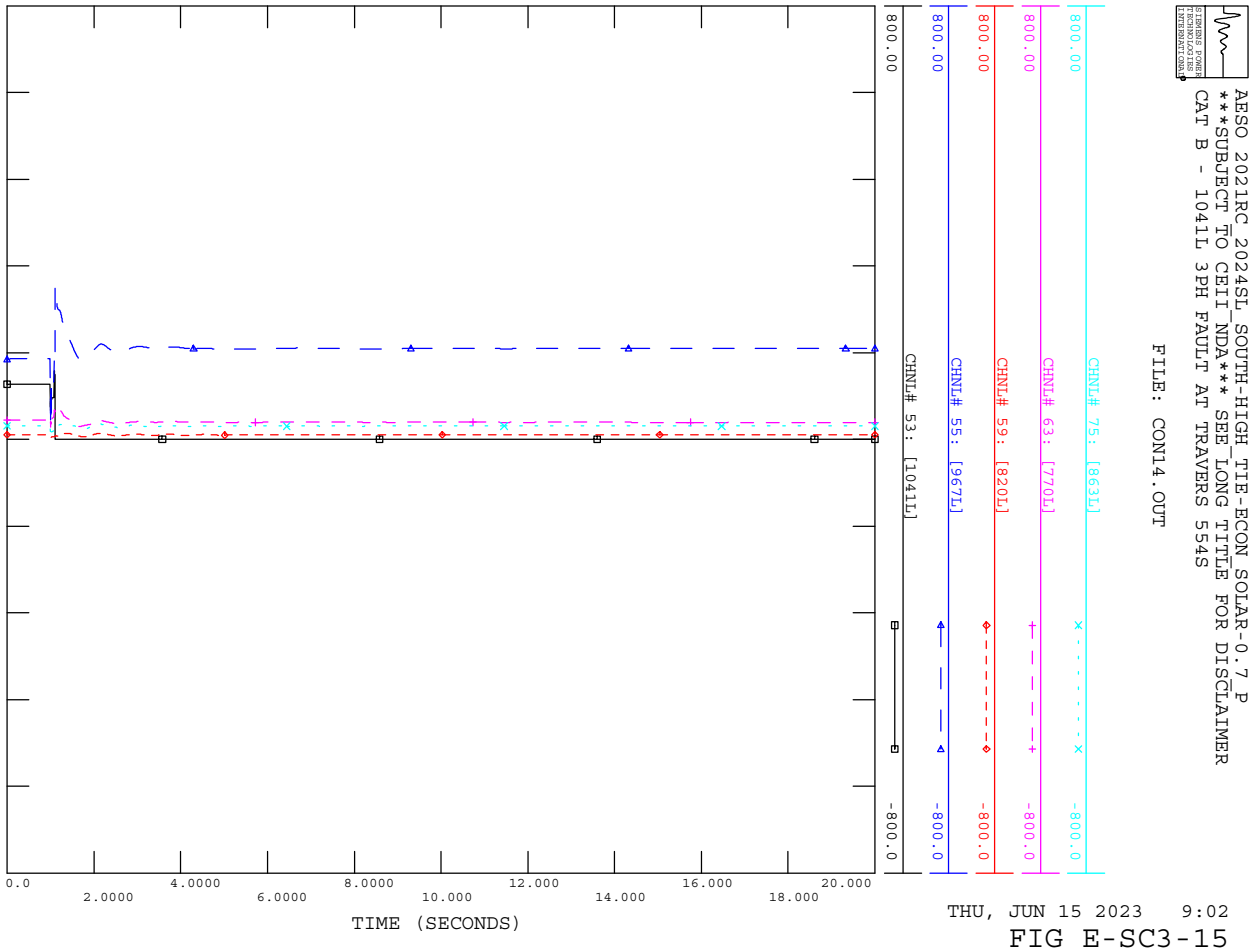


FIG E-SC3-15

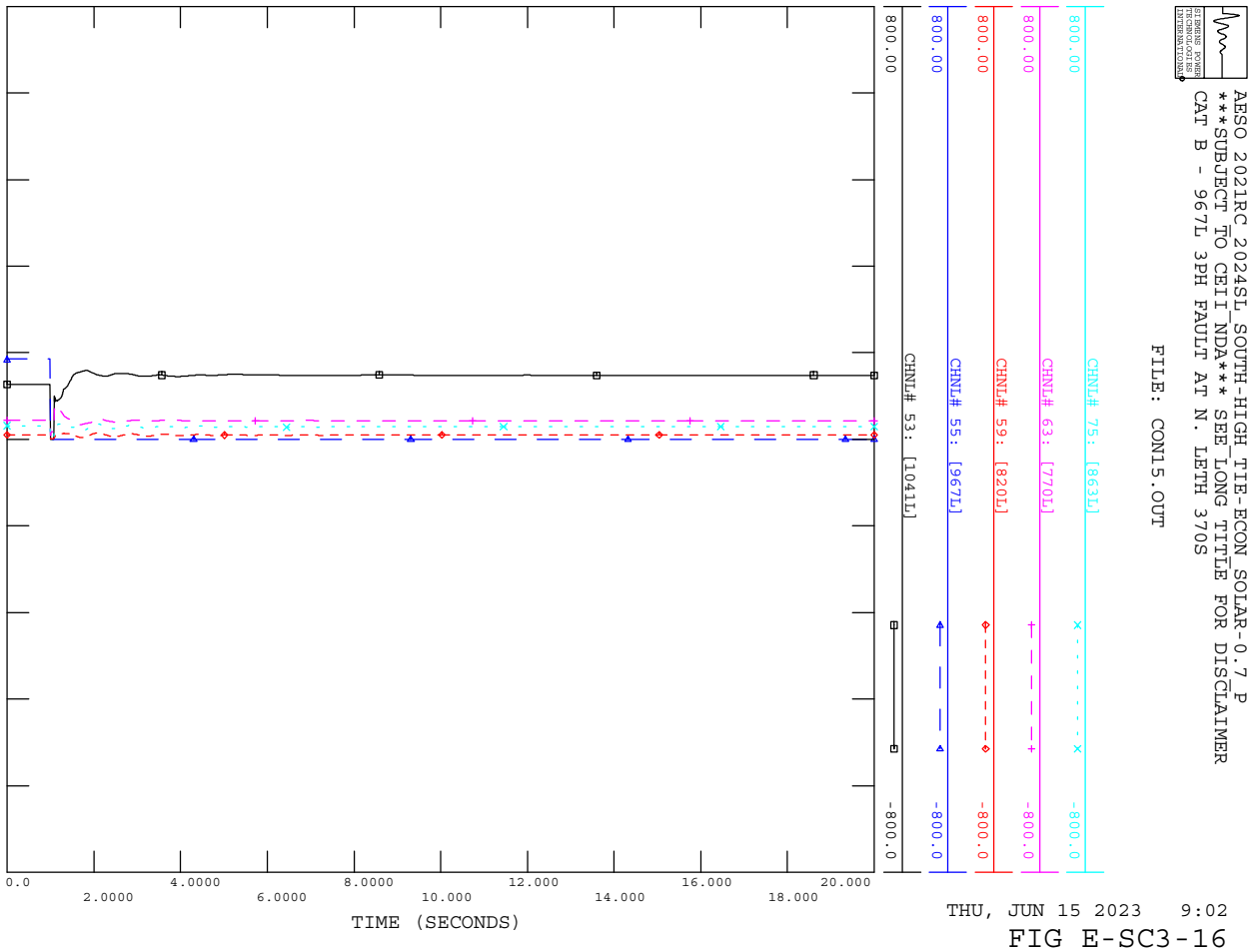


FIG E-SC3-16

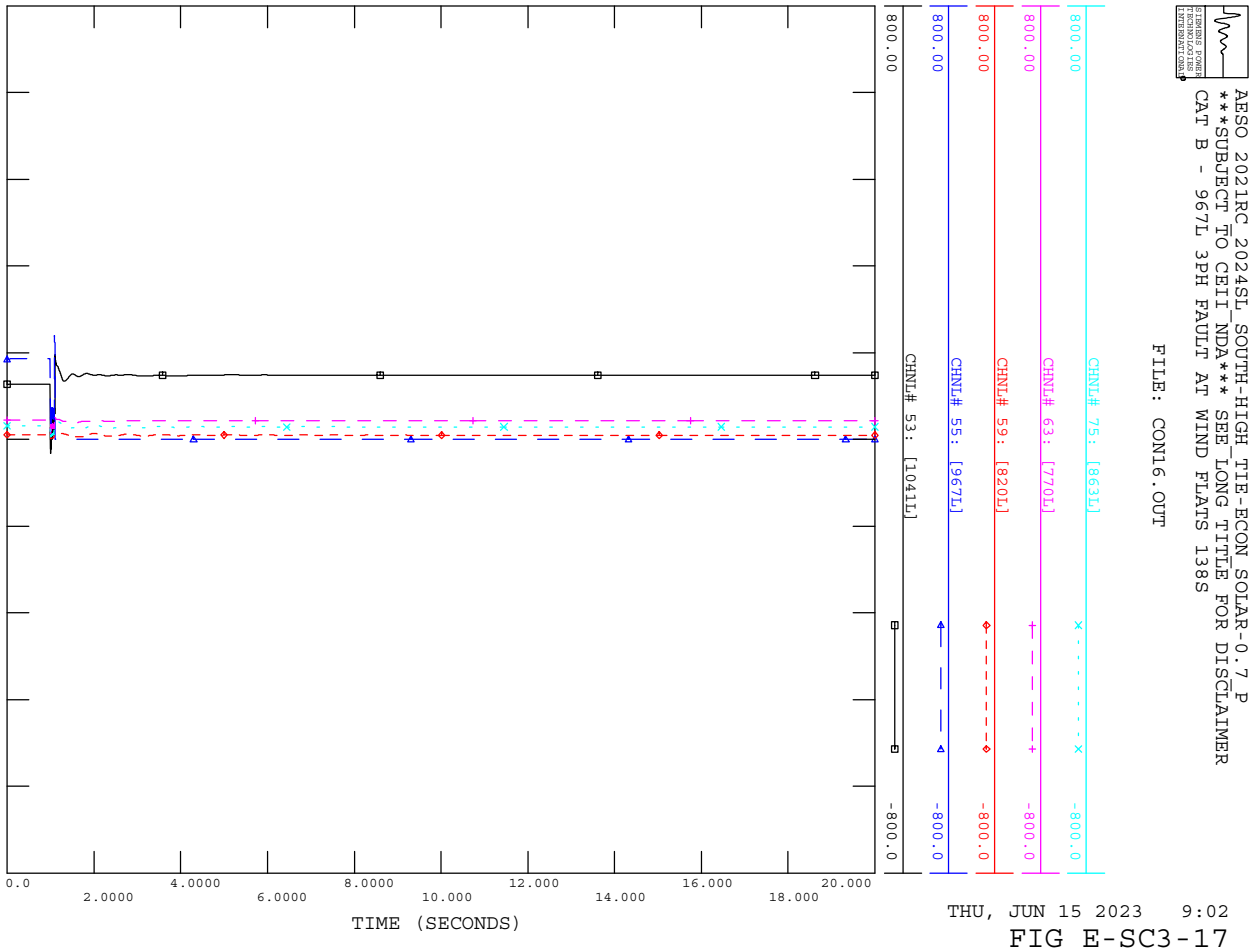


FIG E-SC3-17

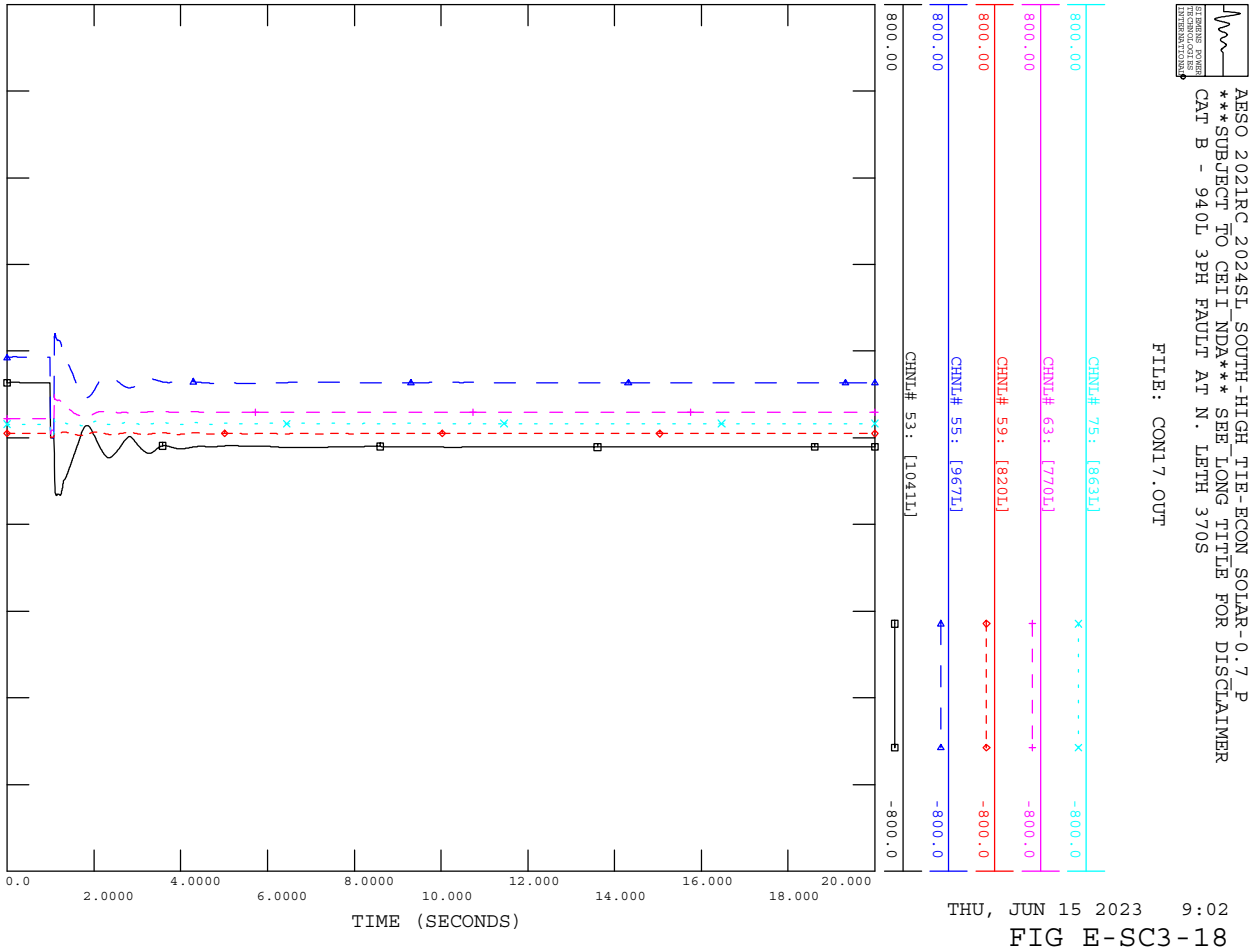


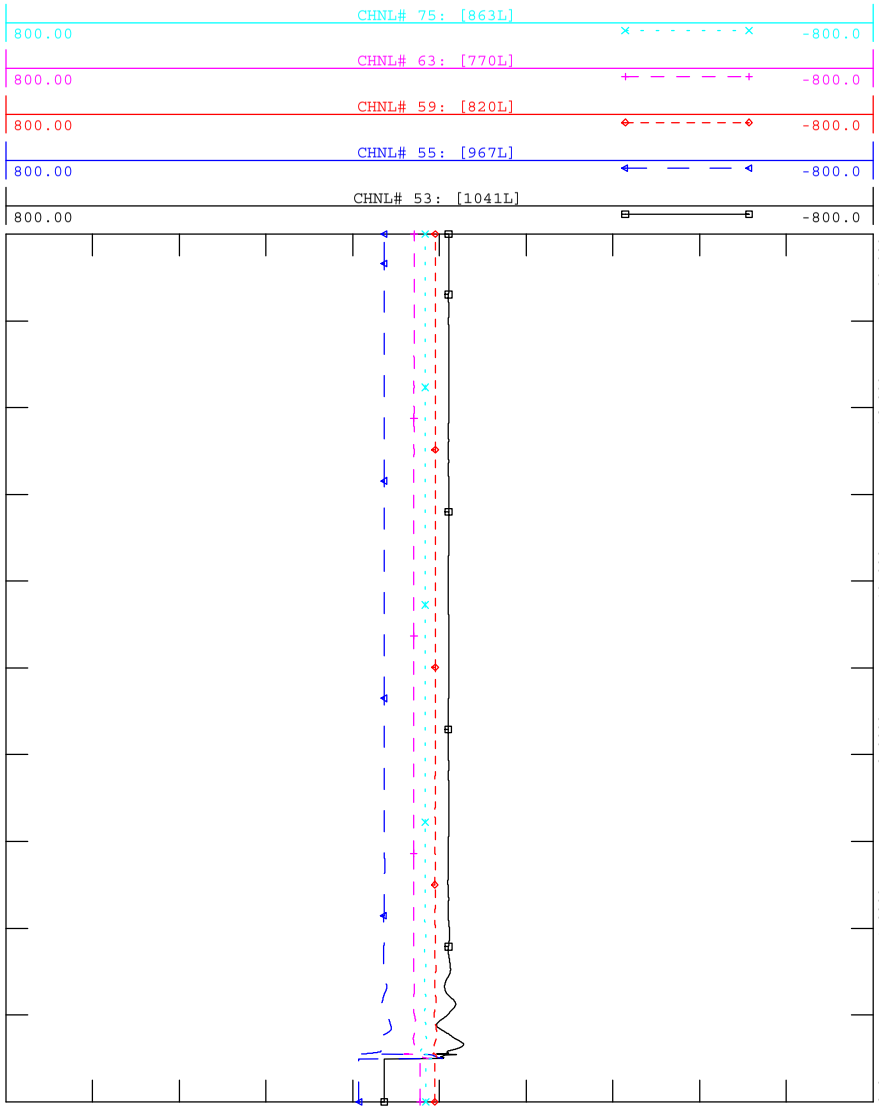
FIG E-SC3-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

THU, JUN 15 2023 9:02

FIG E-SC3-19



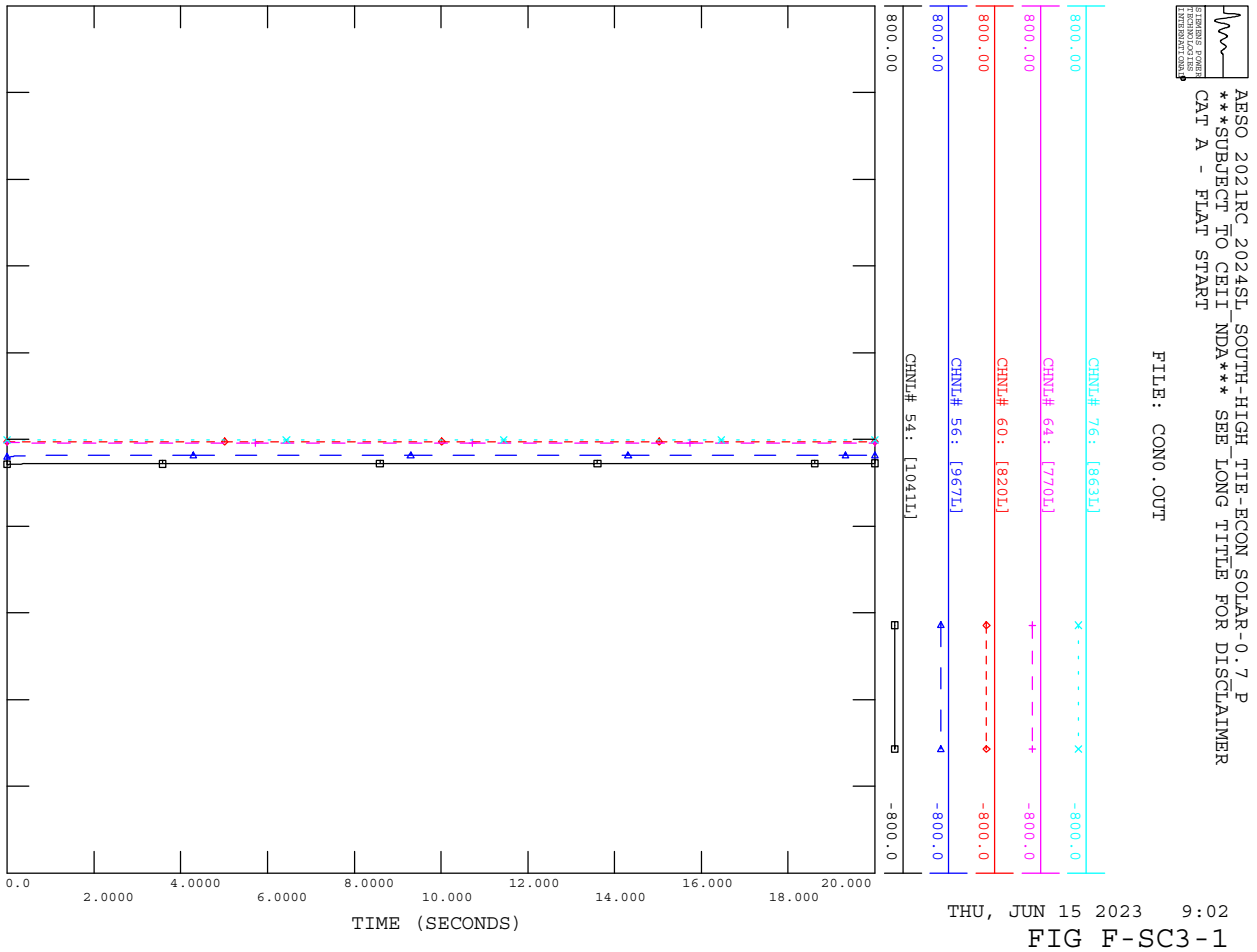


FIG F-SC3-1

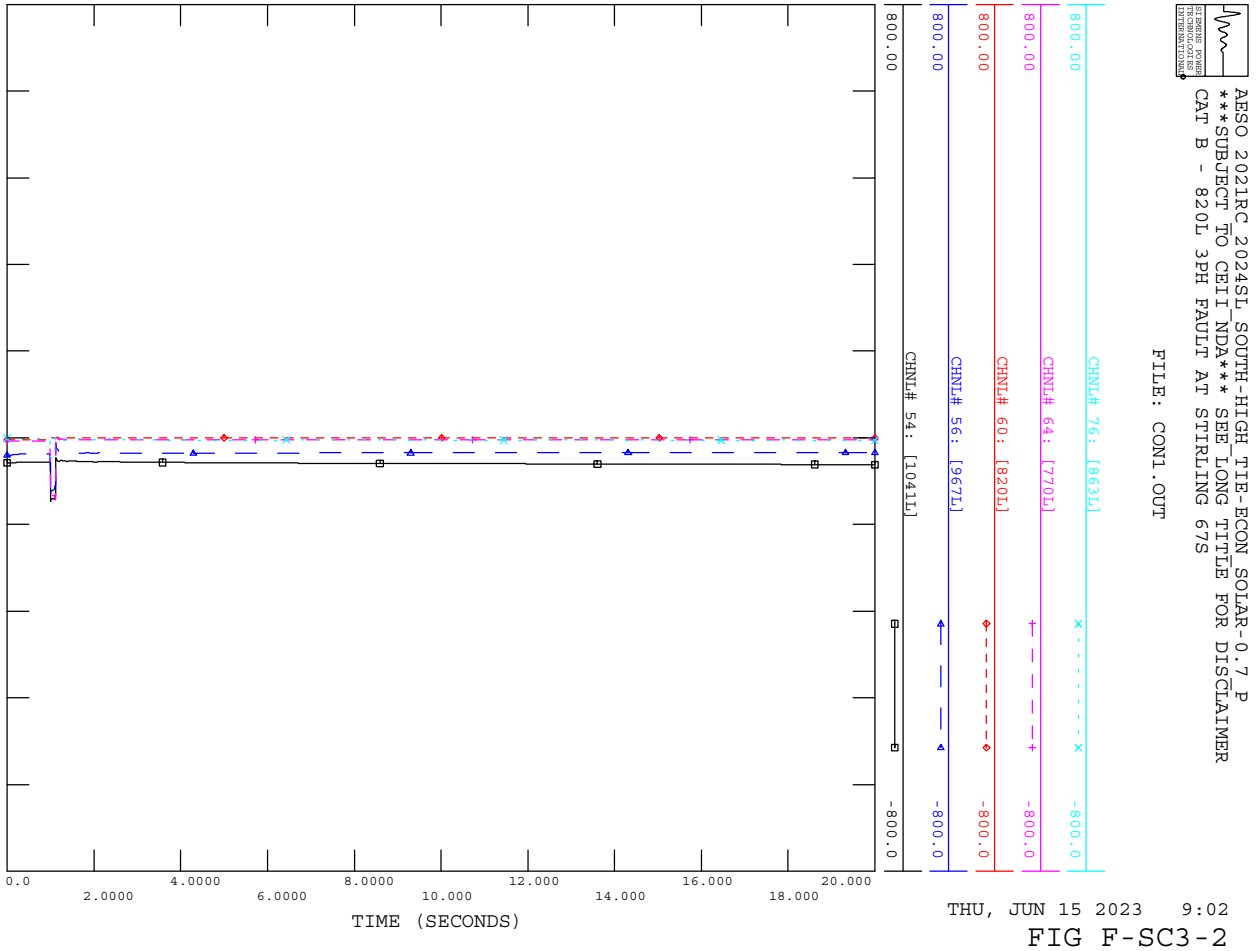


FIG F-SC3-2

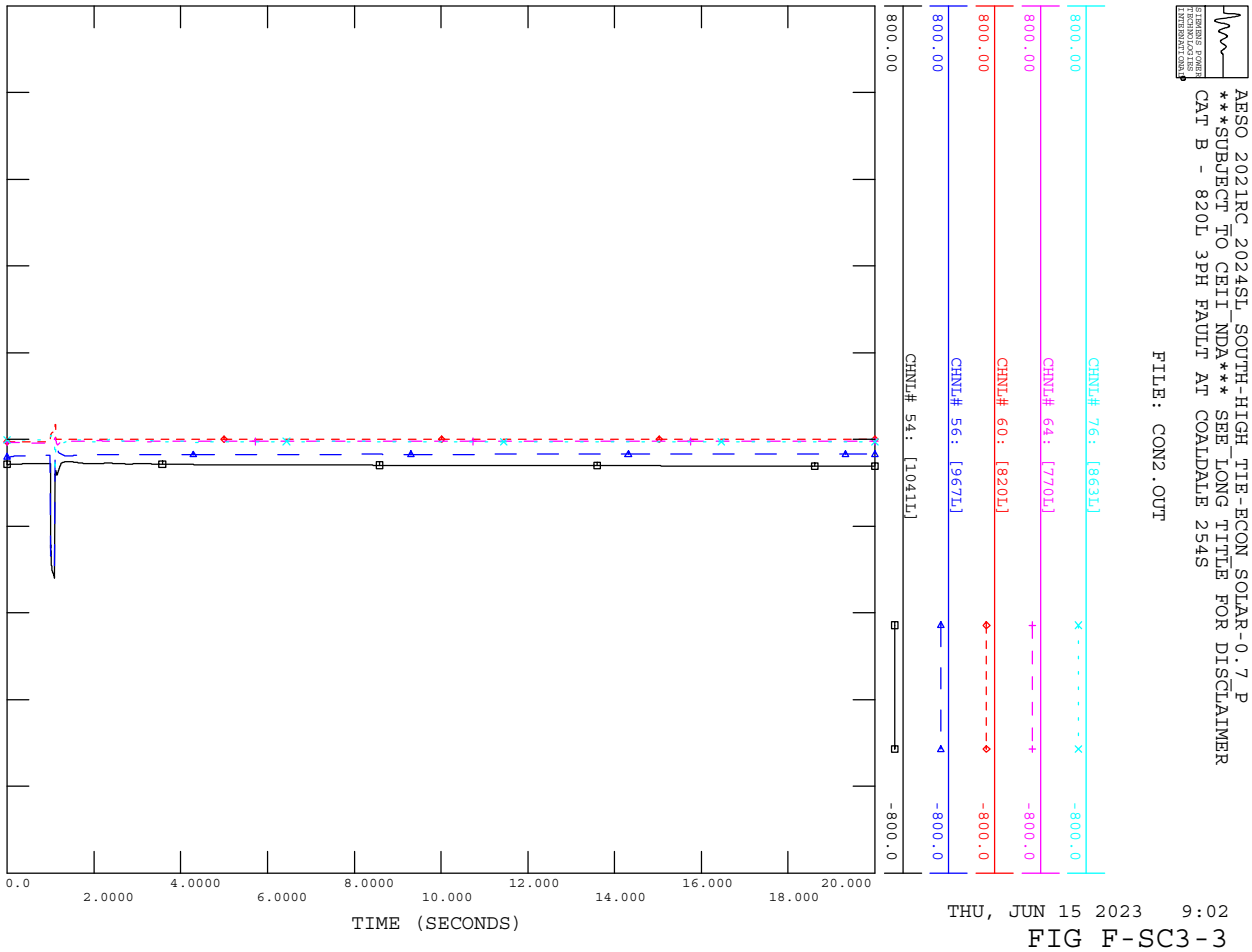


FIG F-SC3-3

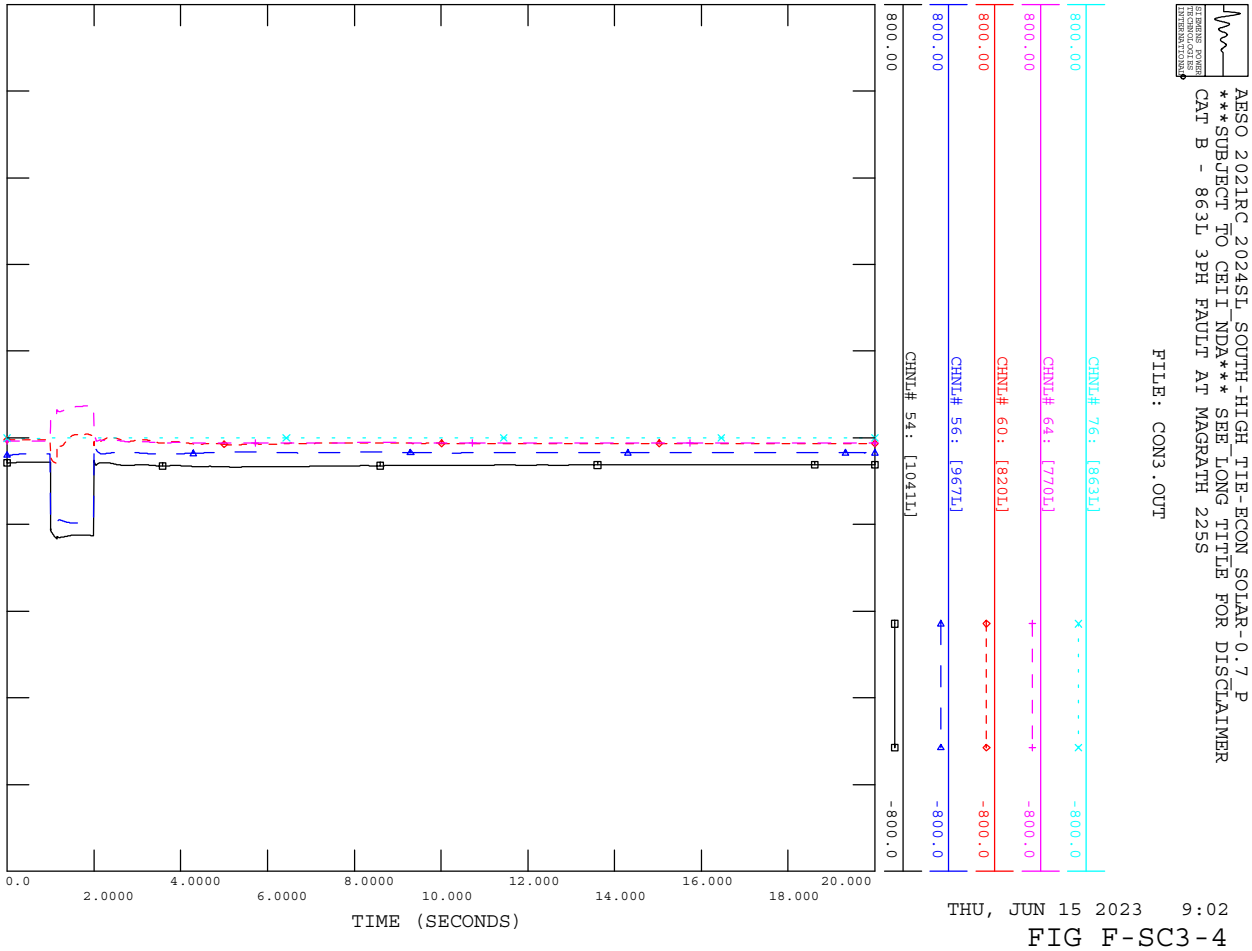


FIG F-SC3-4

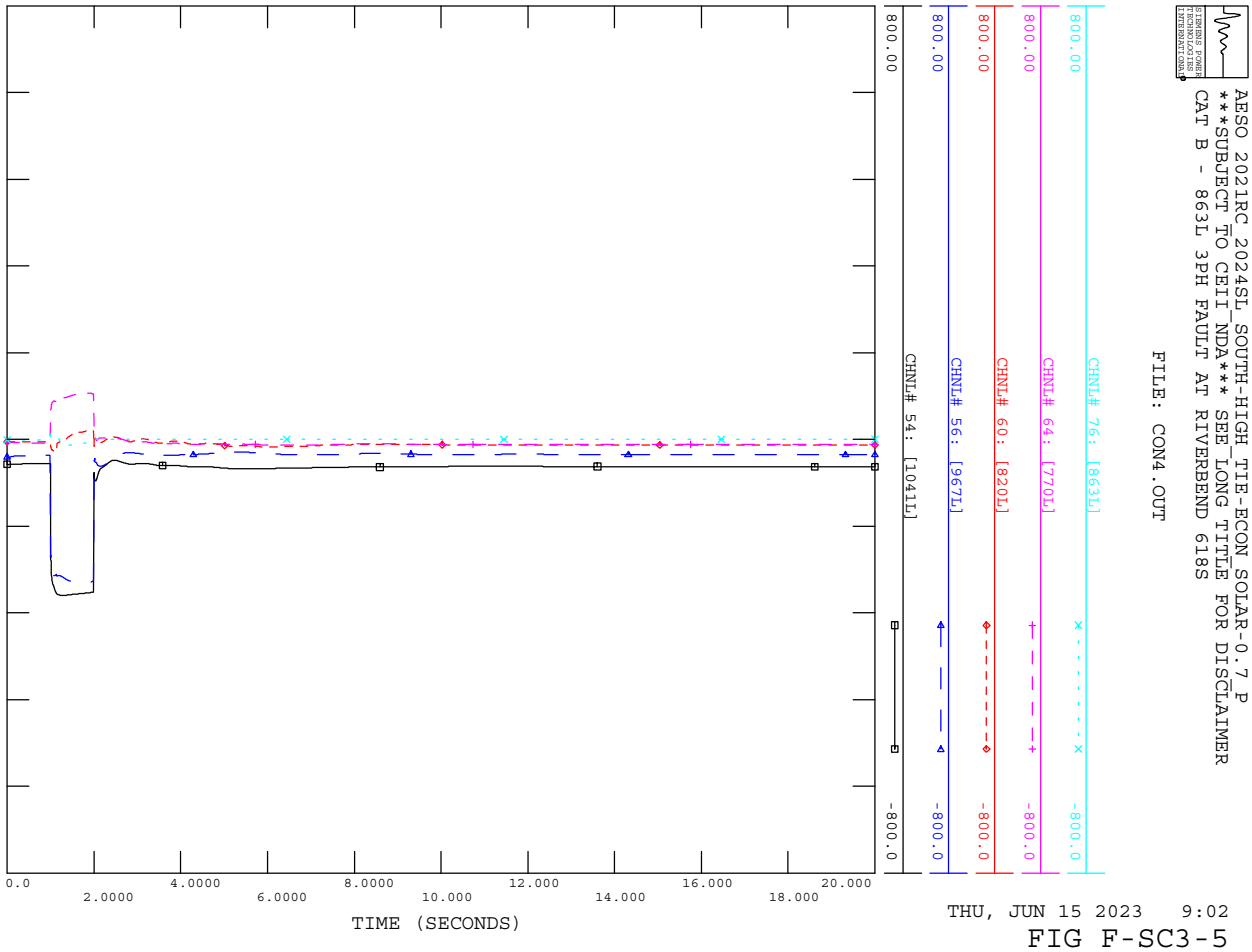


FIG F-SC3-5

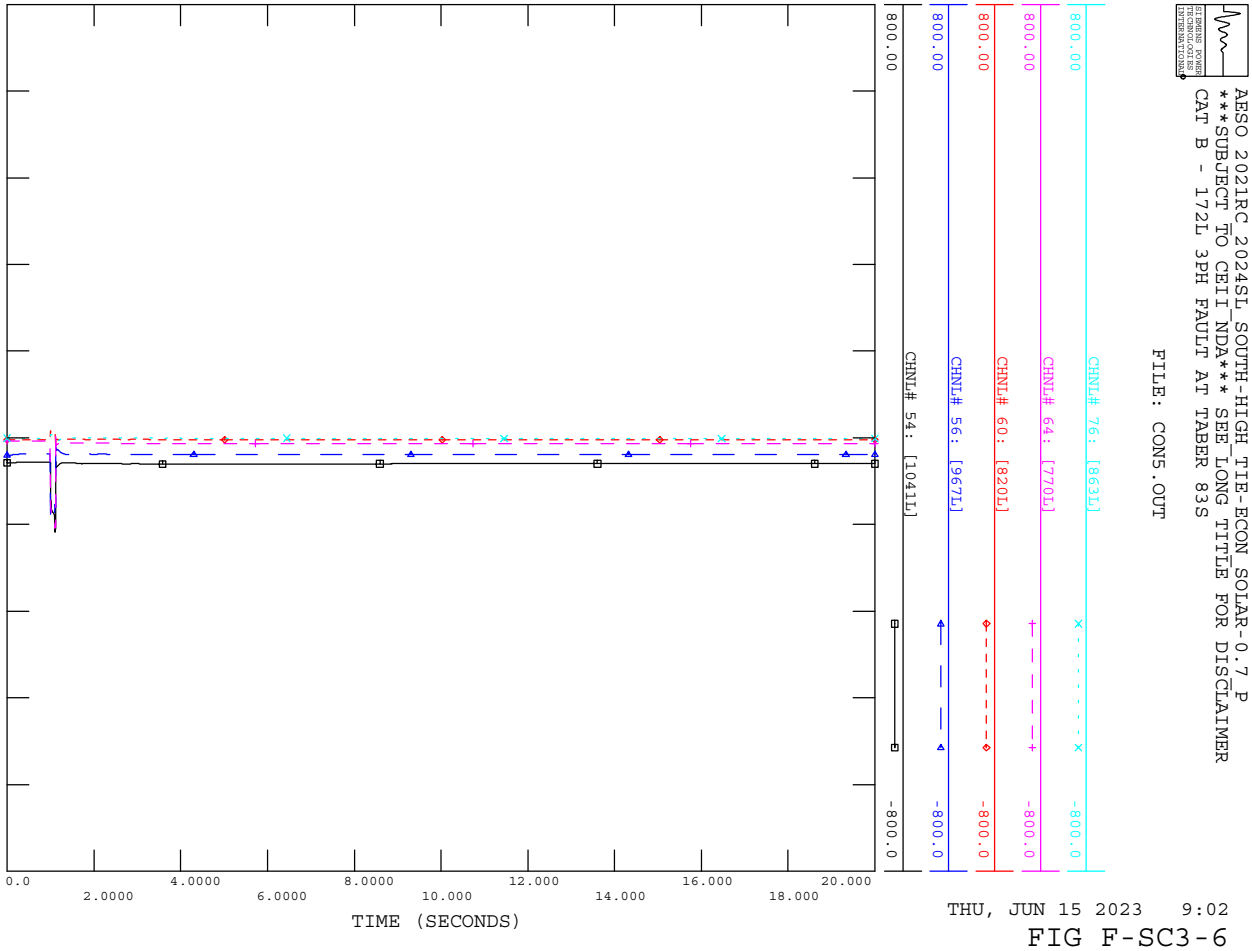


FIG F-SC3-6

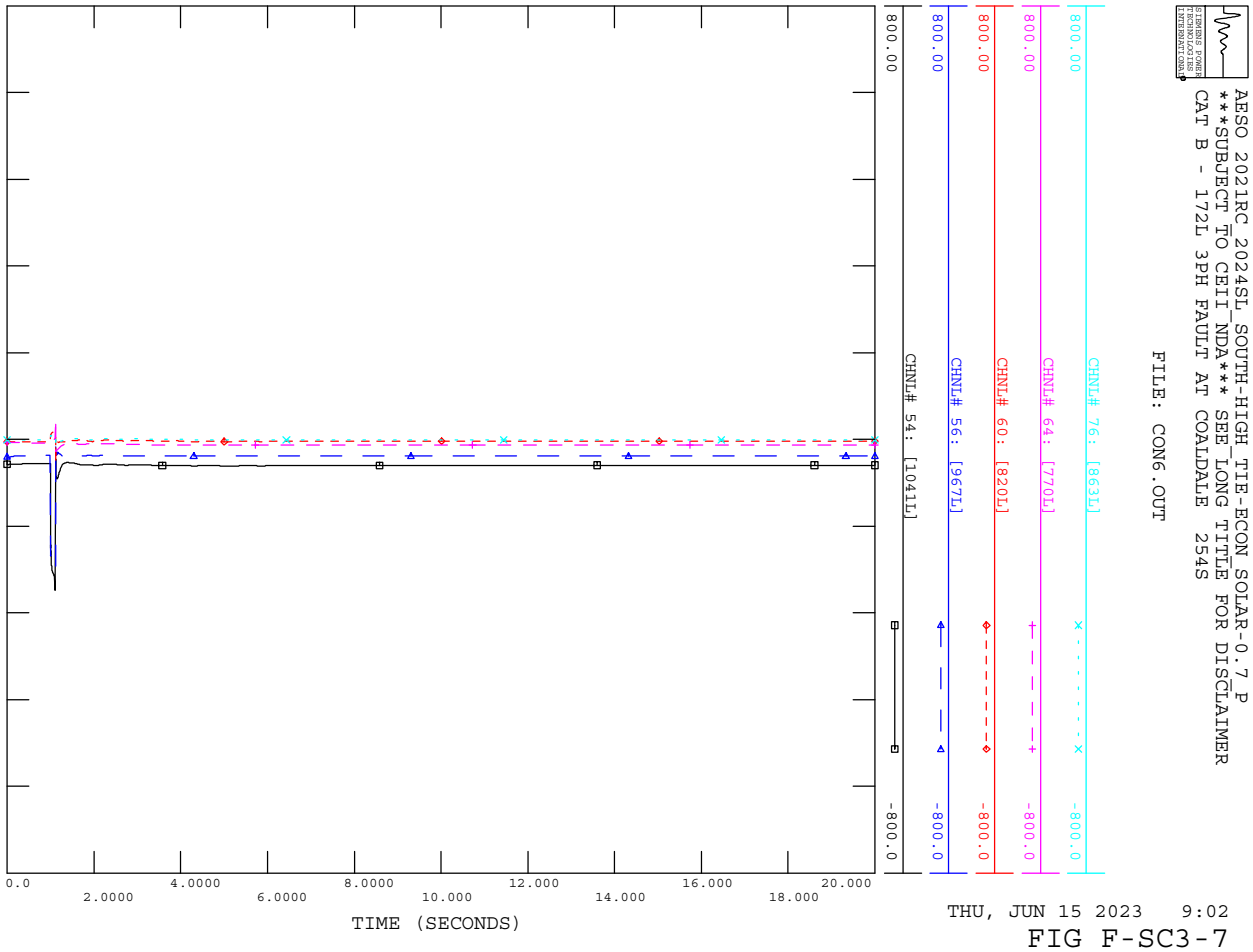


FIG F-SC3-7

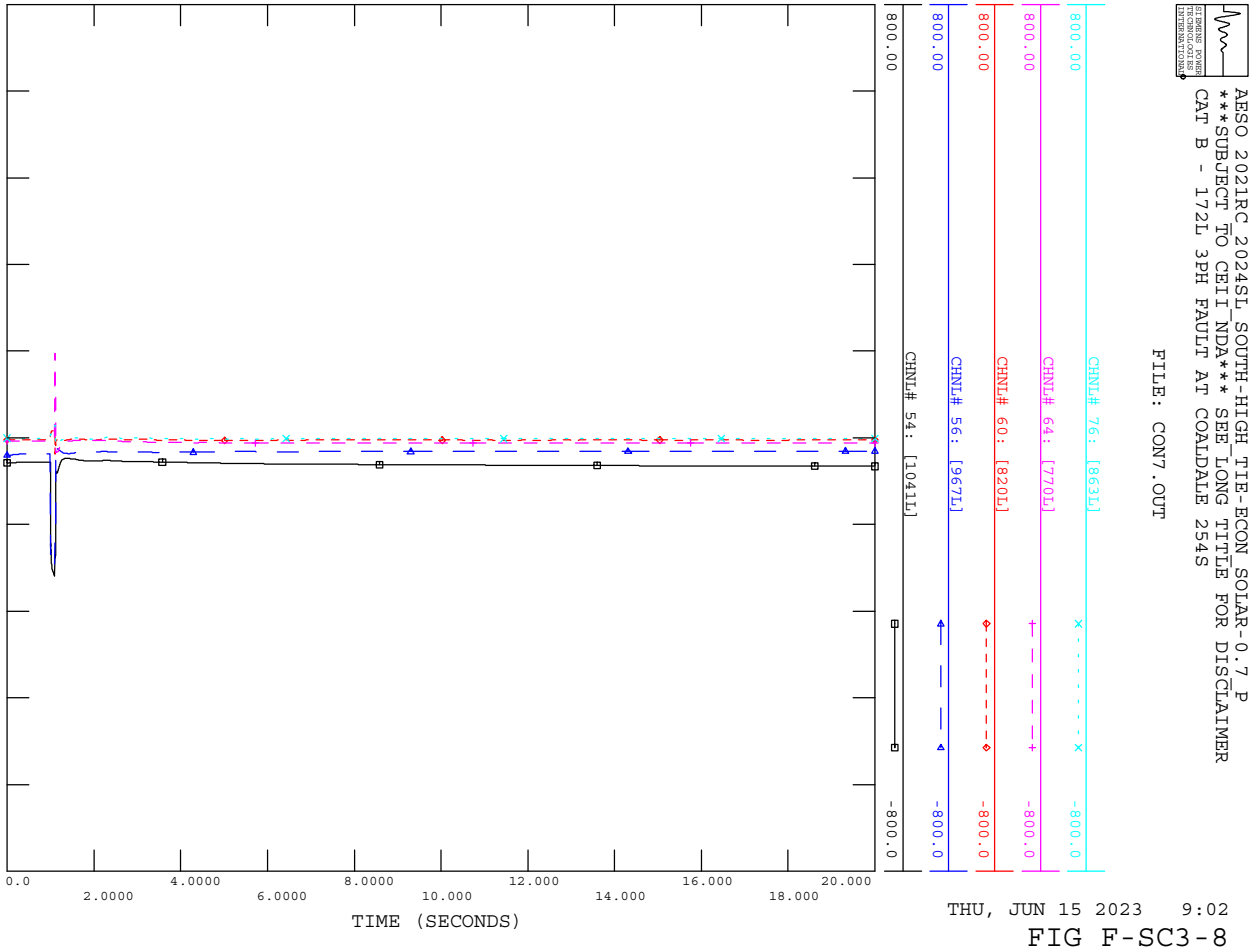


FIG F-SC3-8

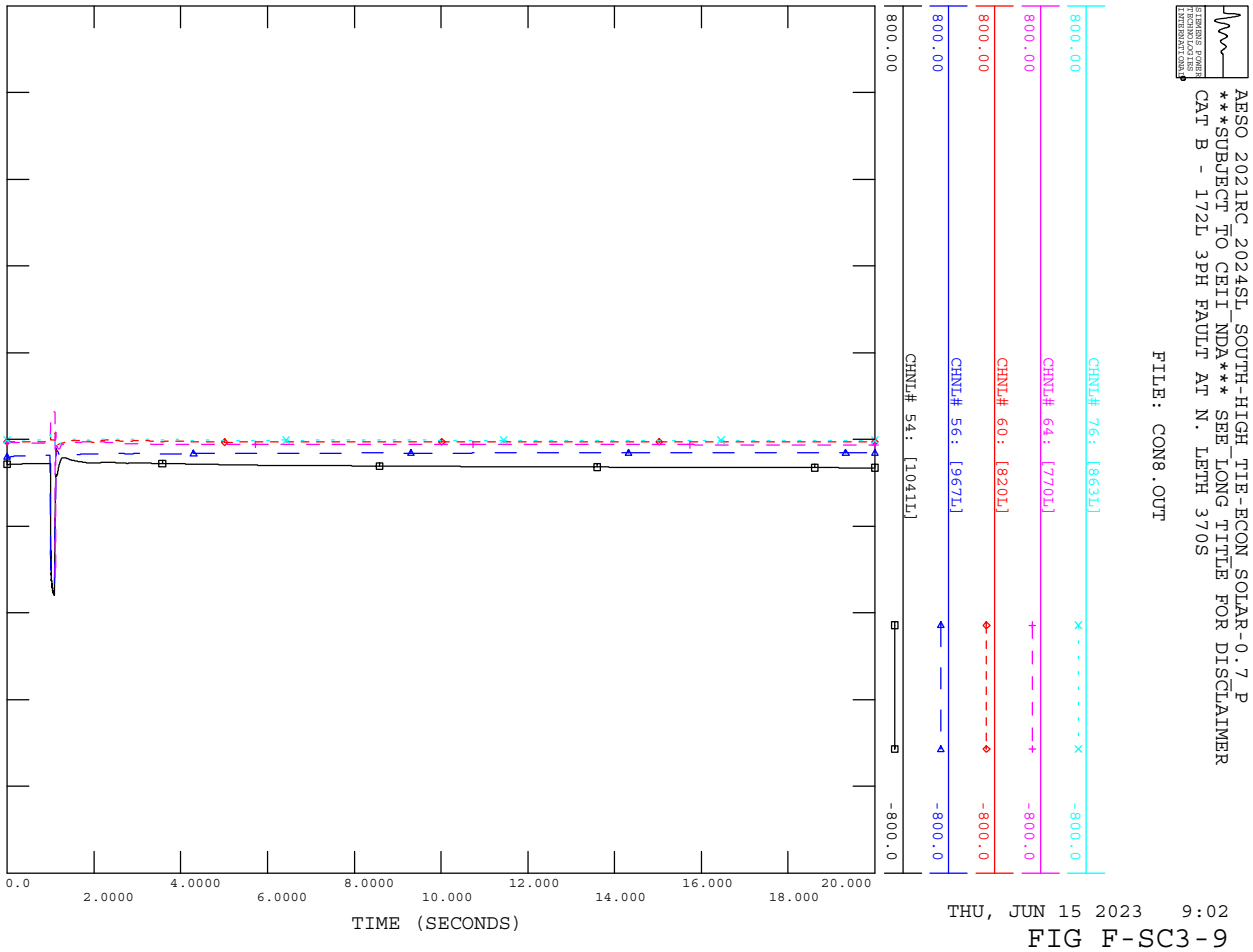


FIG F-SC3-9

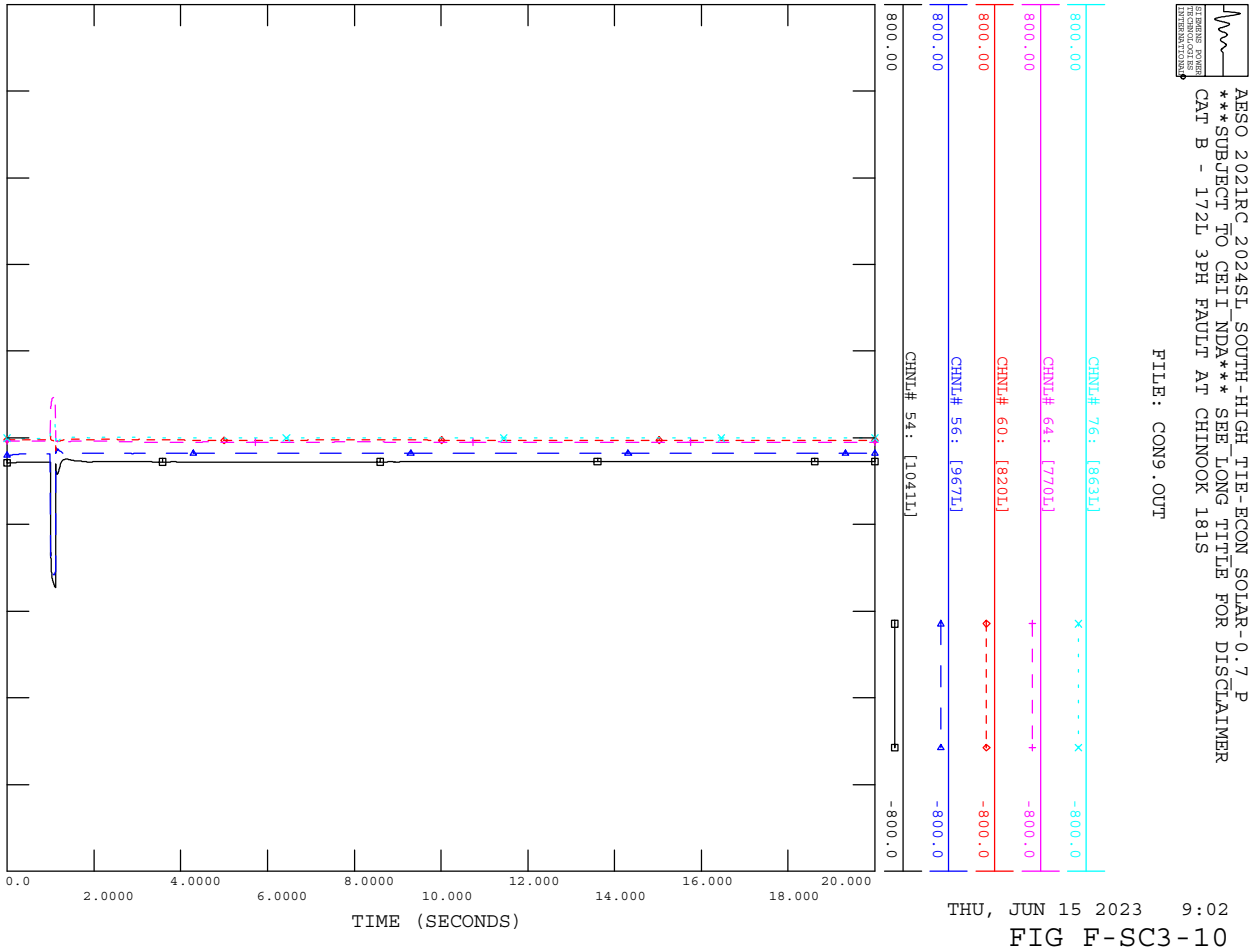


FIG F-SC3-10

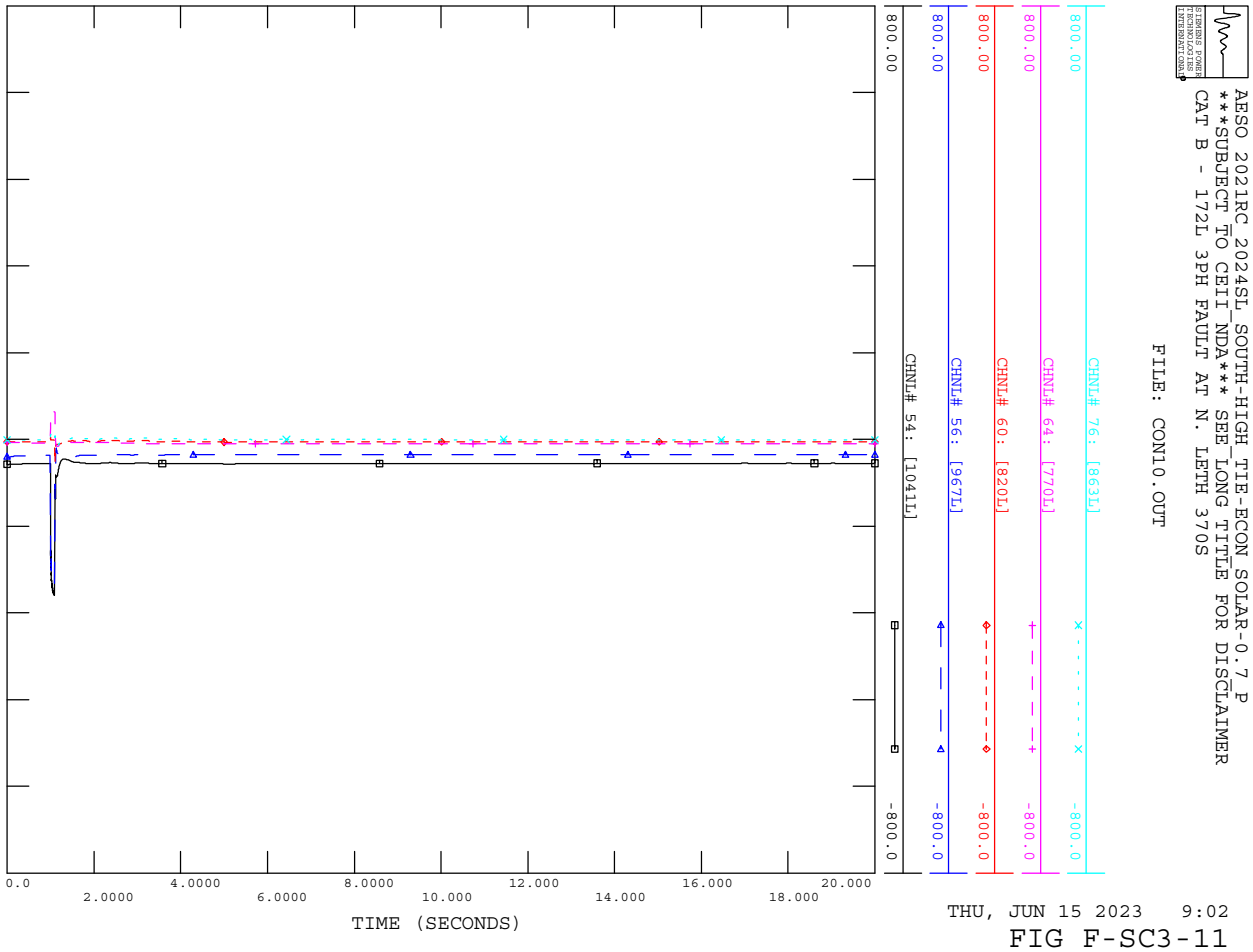


FIG F-SC3-11

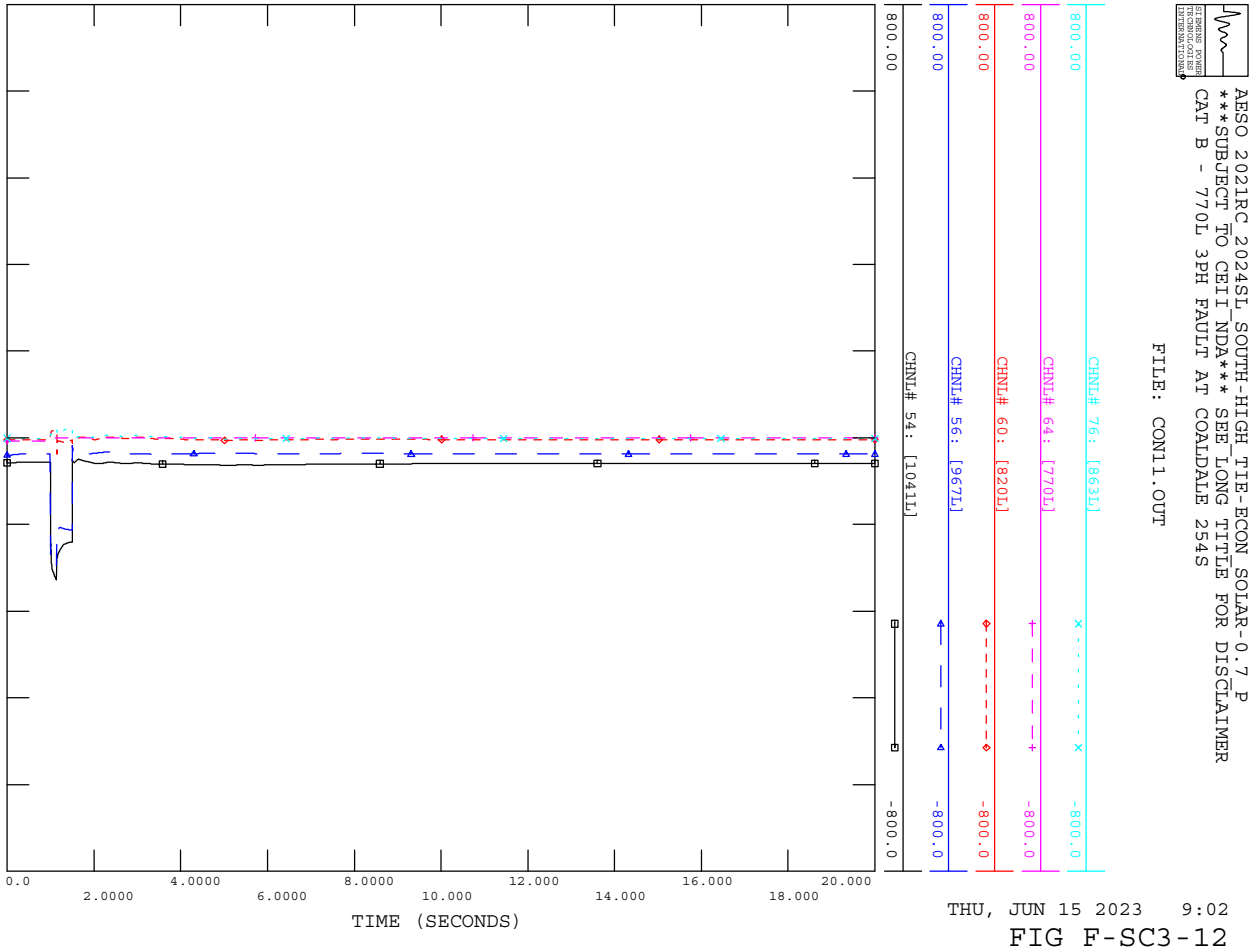


FIG F-SC3-12

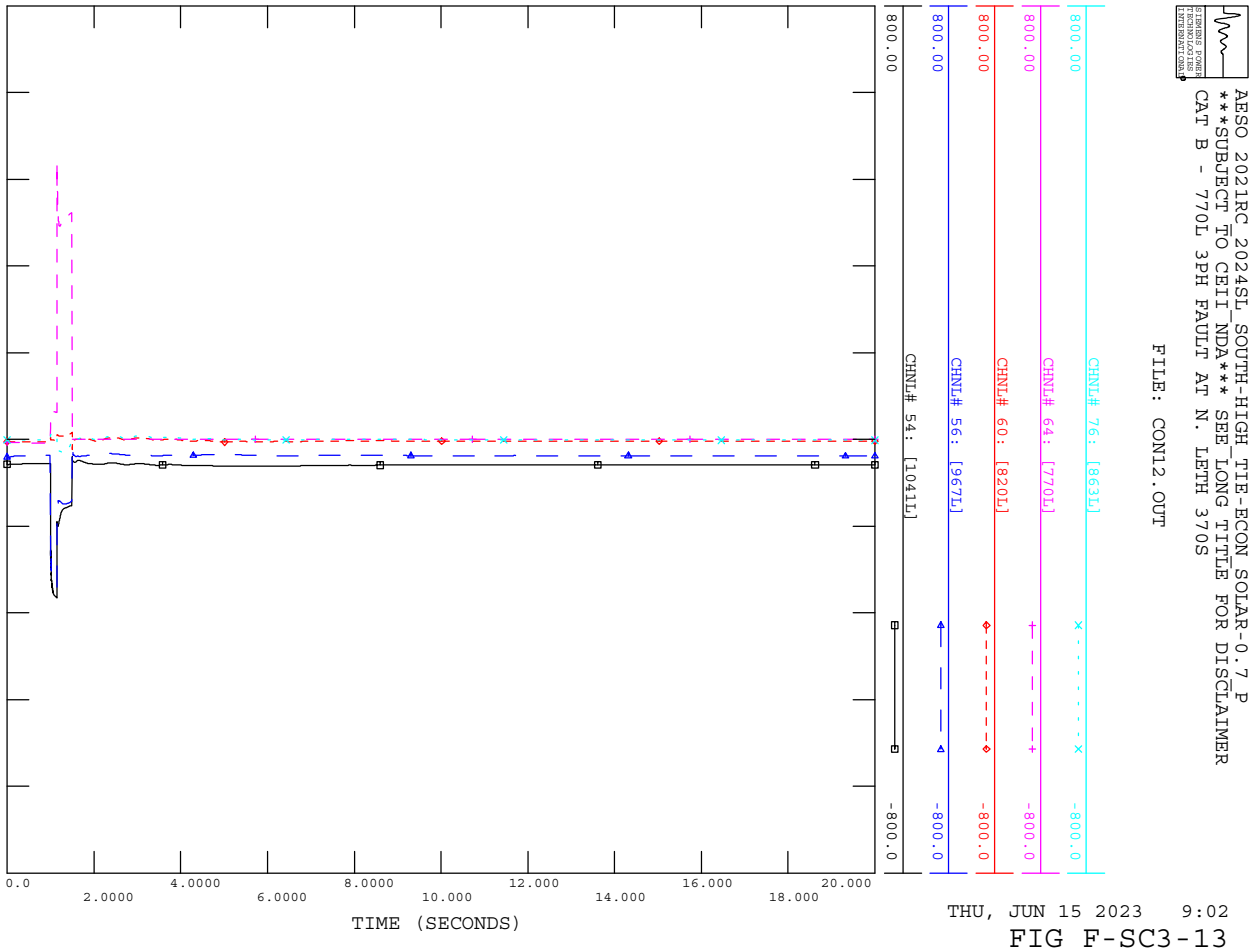


FIG F-SC3-13

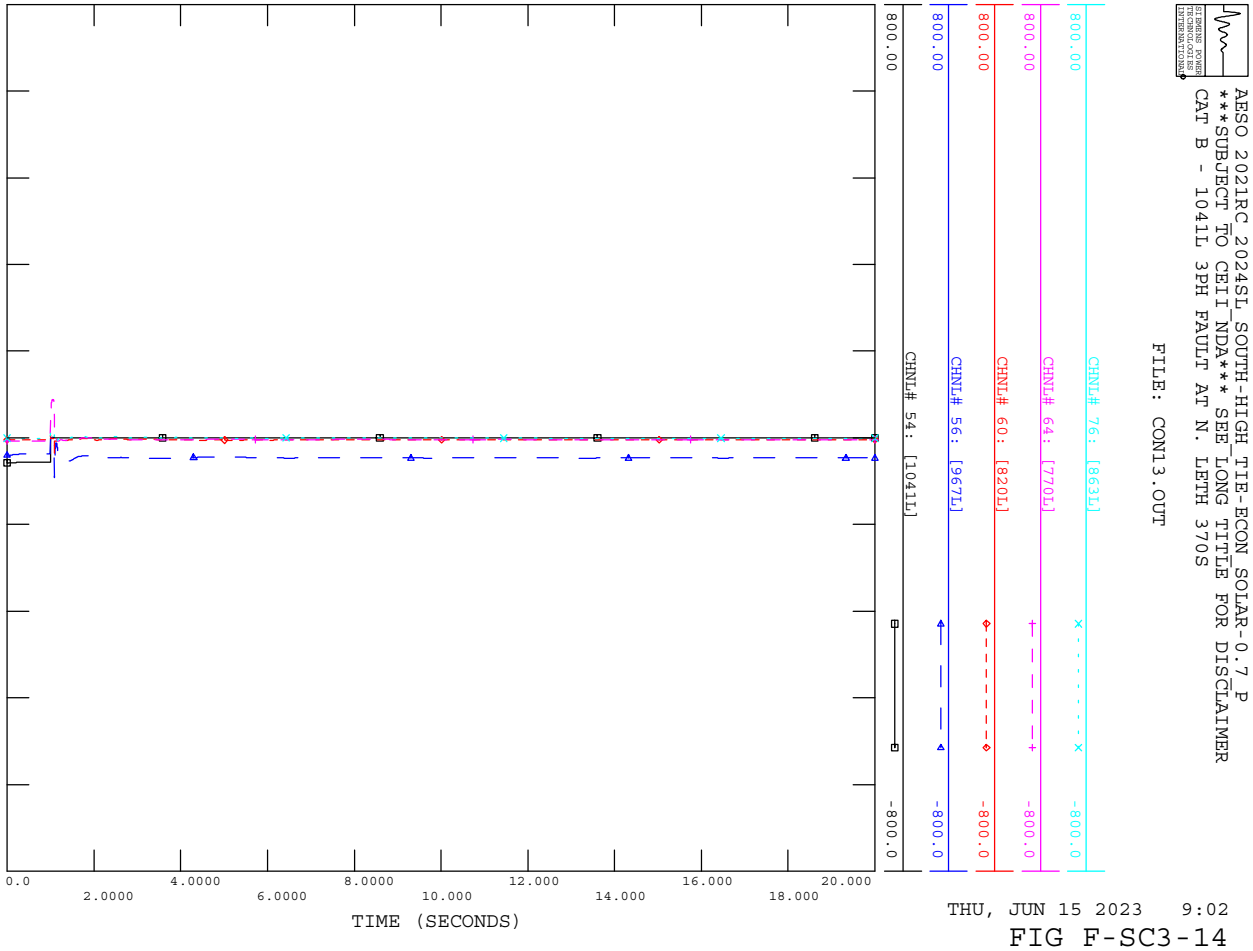


FIG F-SC3-14

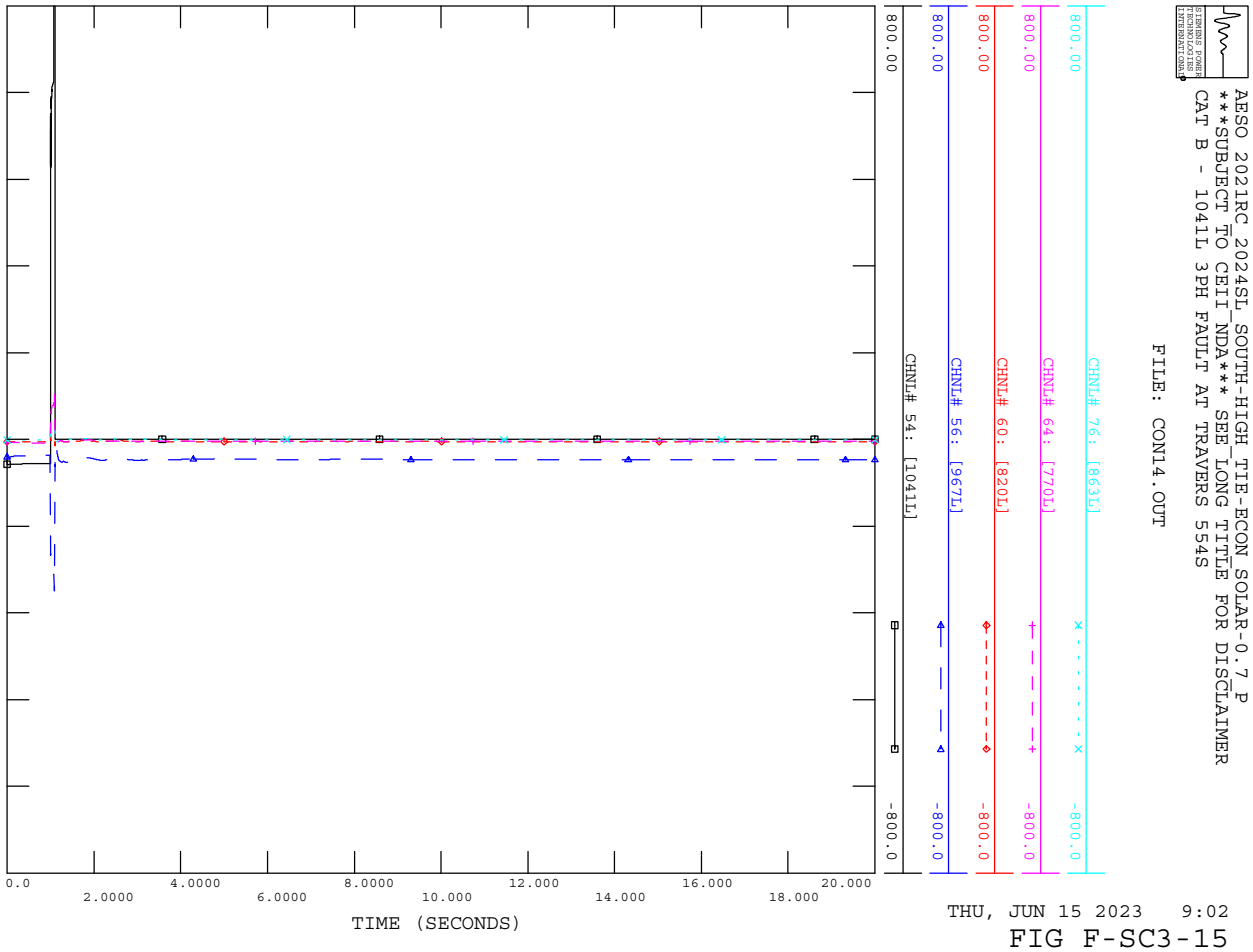


FIG F-SC3-15

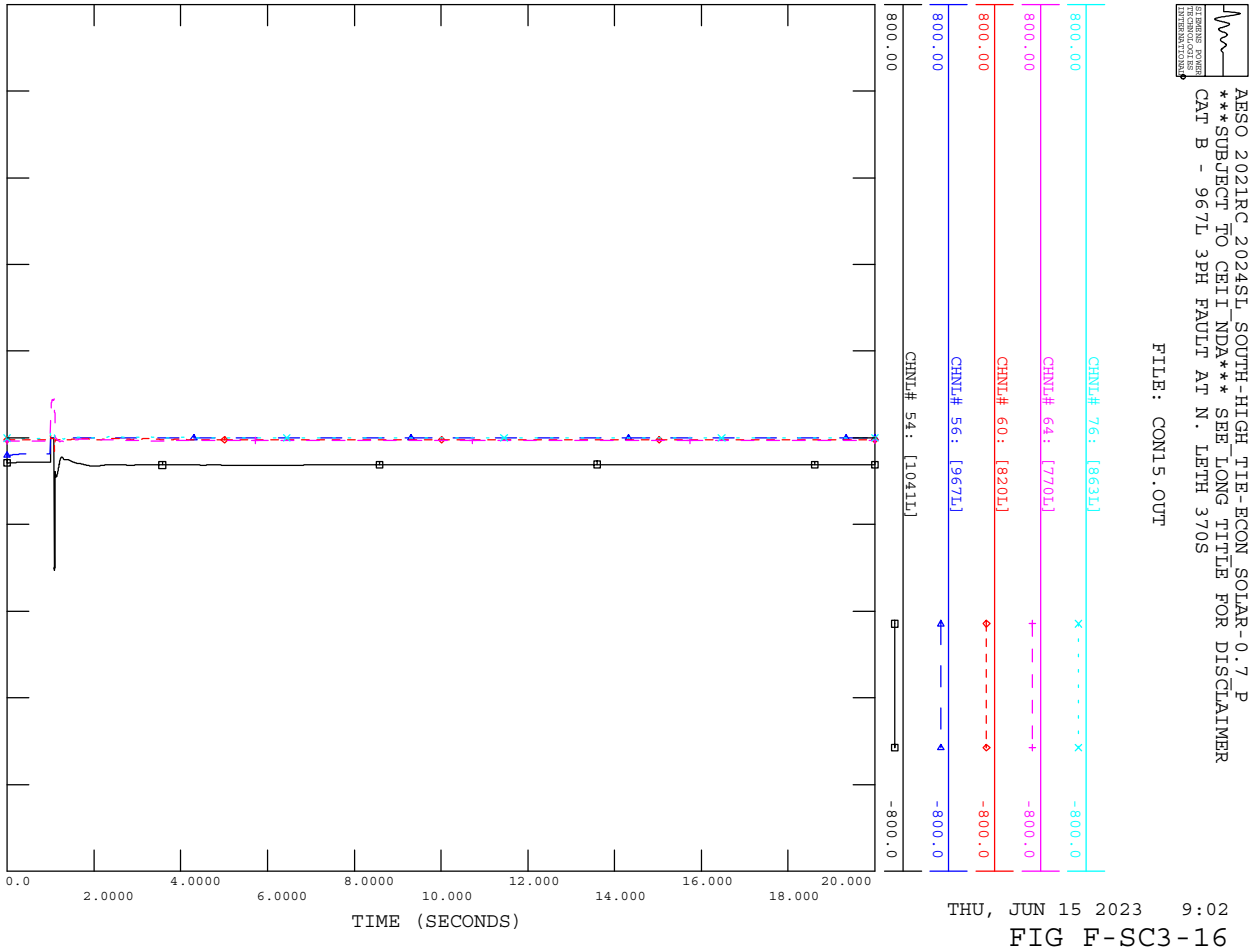


FIG F-SC3-16

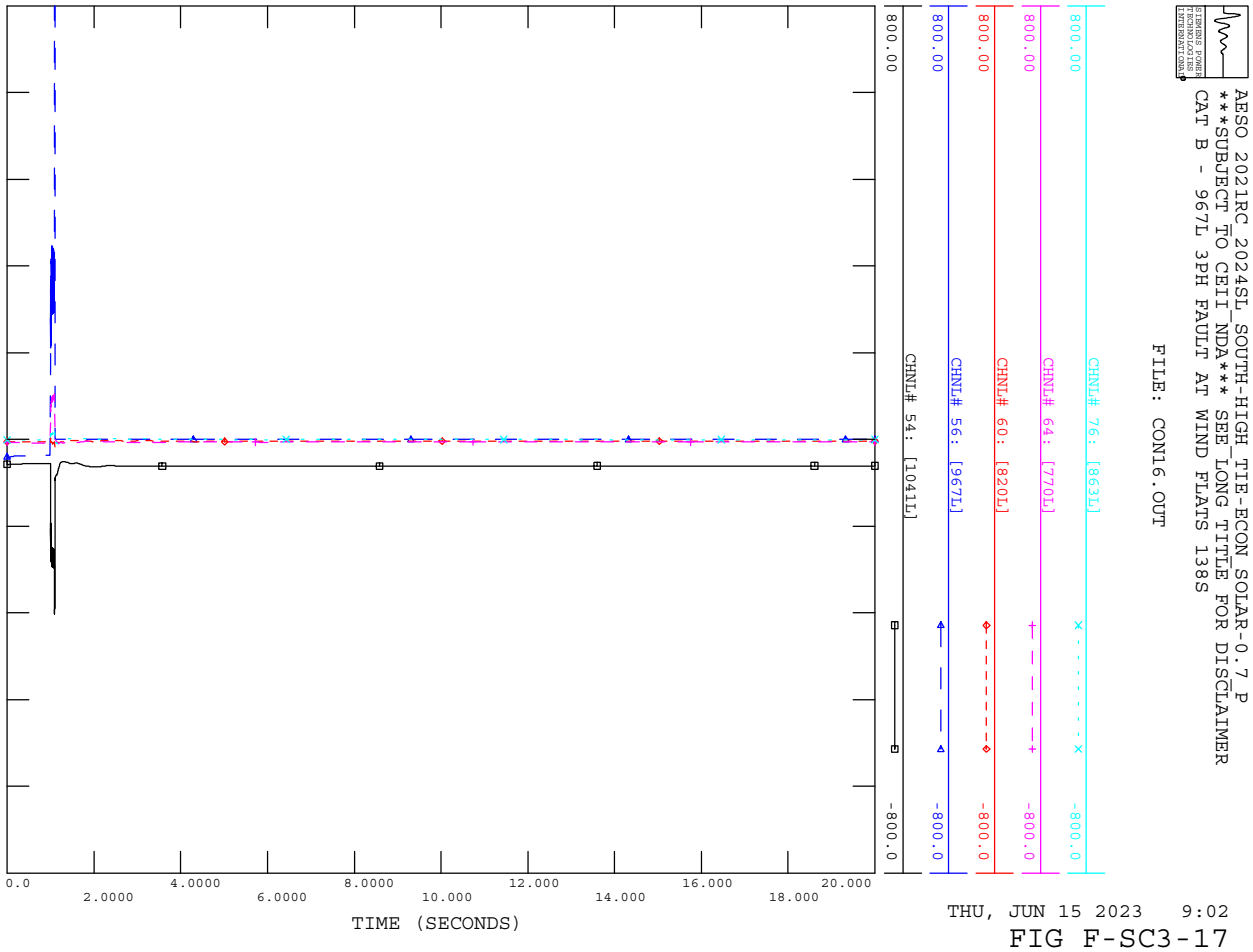


FIG F-SC3-17

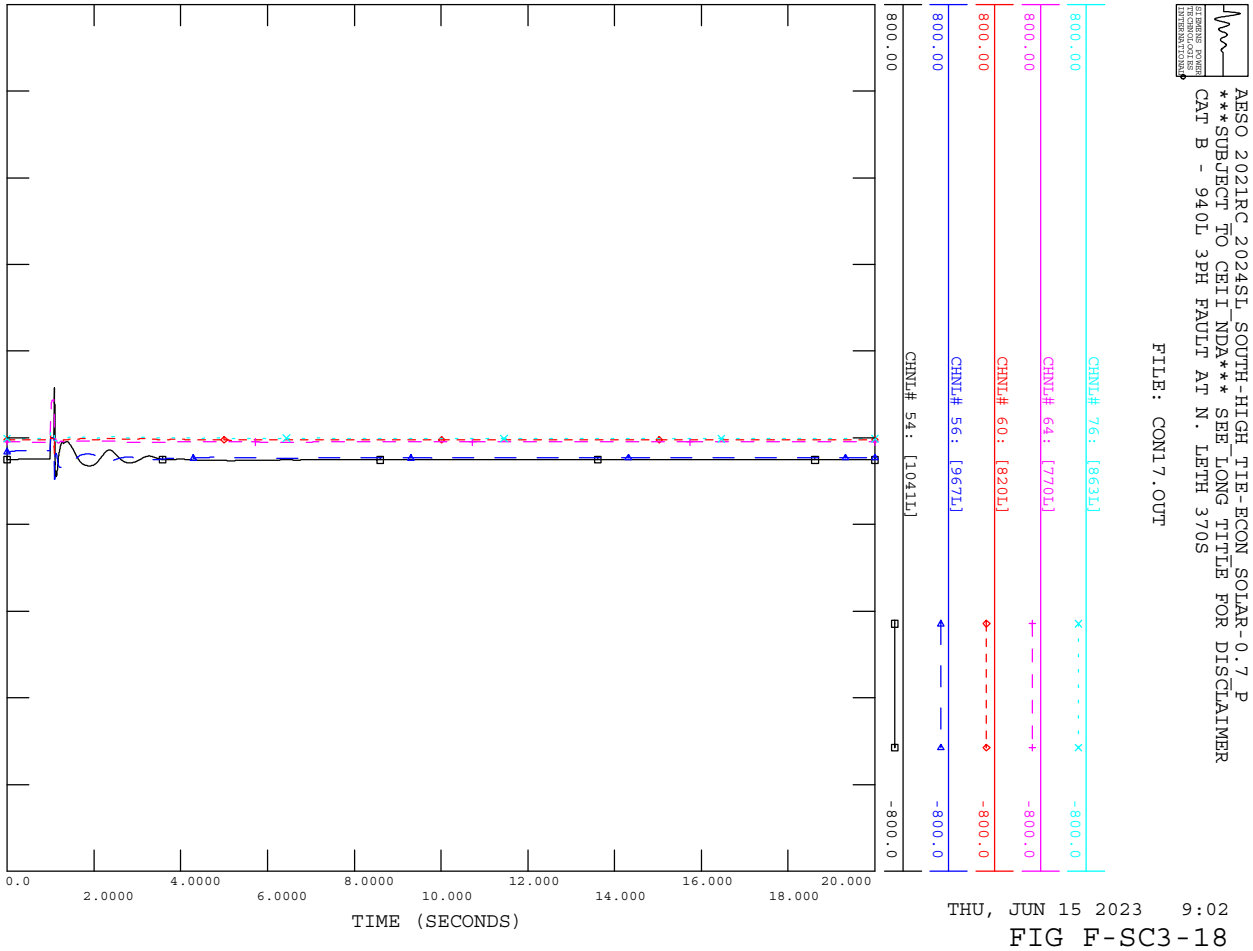


FIG F-SC3-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
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CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

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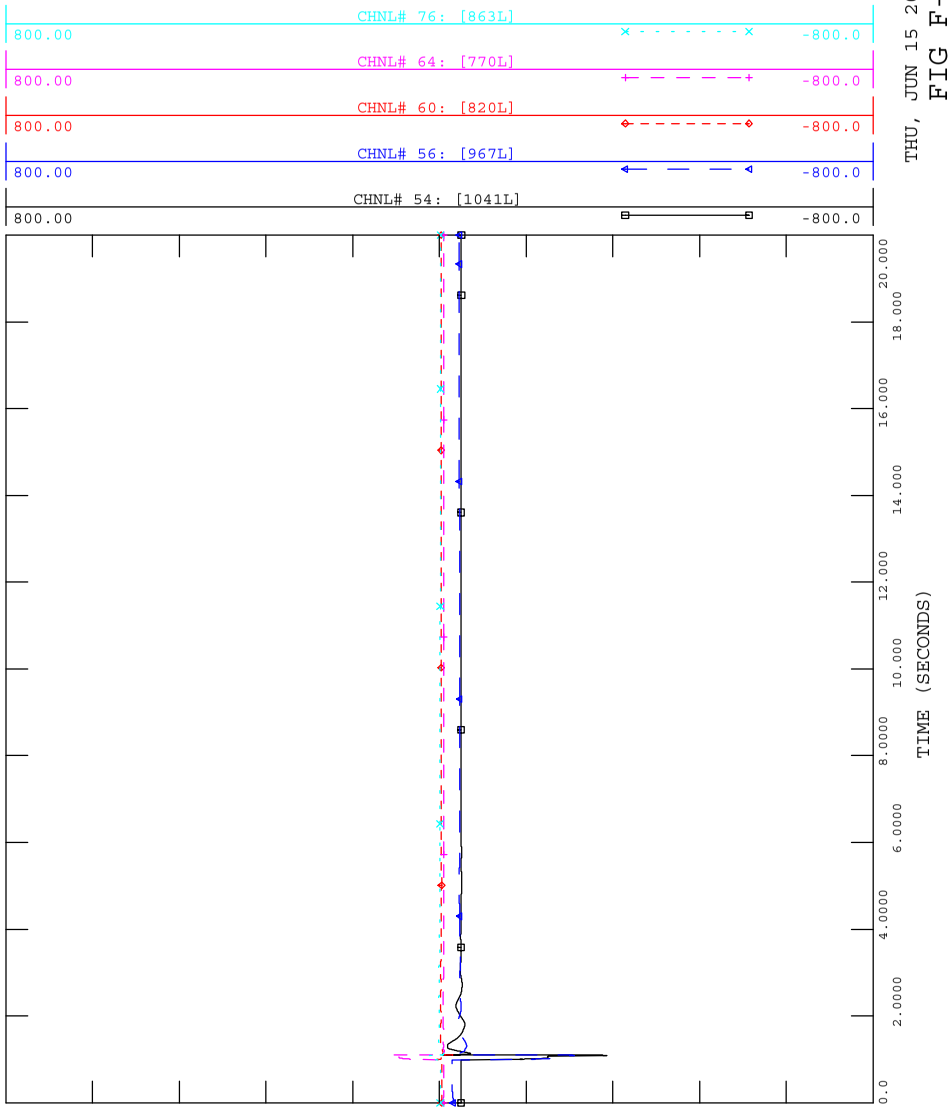
FIG F-SC3-19



Scenario 4

Summer Peak Post Project

Transient Response Plot Key

Table Summer Peak Post Project Figure Reference:

Scenario	Plots	Figure #
Summer Peak Post Project	Power Plots	B-SC4-POST-1 to B-SC4-POST-19
	Var Plots	C-SC4-POST-1 to C-SC4-POST-19
	Bus Voltage Plots	D-SC4-POST-1 to D-SC4-POST-19
	Branchflow MW Plots	E-SC4-POST-1 to E-SC4-POST-19
	Branchflow MVar Plots	F-SC4-POST-1 to F-SC4-POST-19

Table Summer Peak Post Project Figures:

Category	Line Element	Substation Terminals		Faulted End	Figure Reference
A	n/a	Flat Start		n/a	B-SC4-POST-1 C-SC4-POST-1 D-SC4-POST-1 E-SC4-POST-1 F-SC4-POST-1
B	820L	Stirling 67S	Coaldale 254S	67S	B-SC4-POST-2 C-SC4-POST-2 D-SC4-POST-2 E-SC4-POST-2 F-SC4-POST-2
				254S	B-SC4-POST-3 C-SC4-POST-3 D-SC4-POST-3 E-SC4-POST-3 F-SC4-POST-3
B	863L	Magrath 225S	Riverbend 618S	225S	B-SC4-POST-4 C-SC4-POST-4 D-SC4-POST-4 E-SC4-POST-4 F-SC4-POST-4
				618S	B-SC4-POST-5 C-SC4-POST-5 D-SC4-POST-5 E-SC4-POST-5 F-SC4-POST-5
B	172L	Taber 83S	Coaldale 254S	83S	B-SC4-POST-6 C-SC4-POST-6 D-SC4-POST-6 E-SC4-POST-6 F-SC4-POST-6
				254S	B-SC4-POST-7 C-SC4-POST-7 D-SC4-POST-7 E-SC4-POST-7 F-SC4-POST-7
B	172L	Coaldale 254S	N. Leth 370S	254S	B-SC4-POST-8 C-SC4-POST-8 D-SC4-POST-8 E-SC4-POST-8 F-SC4-POST-8
				370S	B-SC4-POST-9 C-SC4-POST-9 D-SC4-POST-9 E-SC4-POST-9 F-SC4-POST-9
B	172L	Chinook 181S	N. Leth 370S	181S	B-SC4-POST-10 C-SC4-POST-10 D-SC4-POST-10

					E-SC4-POST-10 F-SC4-POST-10
				370S	B-SC4-POST-11 C-SC4-POST-11 D-SC4-POST-11 E-SC4-POST-11 F-SC4-POST-11
B	770L	Coaldale 254S	N. Leth 370S	254S	B-SC4-POST-12 C-SC4-POST-12 D-SC4-POST-12 E-SC4-POST-12 F-SC4-POST-12
				370S	B-SC4-POST-13 C-SC4-POST-13 D-SC4-POST-13 E-SC4-POST-13 F-SC4-POST-13
B	1041L	N. Leth 370S	Travers 554S	370S	B-SC4-POST-14 C-SC4-POST-14 D-SC4-POST-14 E-SC4-POST-14 F-SC4-POST-14
				554S	B-SC4-POST-15 C-SC4-POST-15 D-SC4-POST-15 E-SC4-POST-15 F-SC4-POST-15
B	967L	N. Leth 370S	Wind Flats 138S	370S	B-SC4-POST-16 C-SC4-POST-16 D-SC4-POST-16 E-SC4-POST-16 F-SC4-POST-16
				138S	B-SC4-POST-17 C-SC4-POST-17 D-SC4-POST-17 E-SC4-POST-17 F-SC4-POST-17
B	940L	N. Leth 370S	Picture Butte 120S	370S	B-SC4-POST-18 C-SC4-POST-18 D-SC4-POST-18 E-SC4-POST-18 F-SC4-POST-18
				120S	B-SC4-POST-19 C-SC4-POST-19 D-SC4-POST-19 E-SC4-POST-19 F-SC4-POST-19

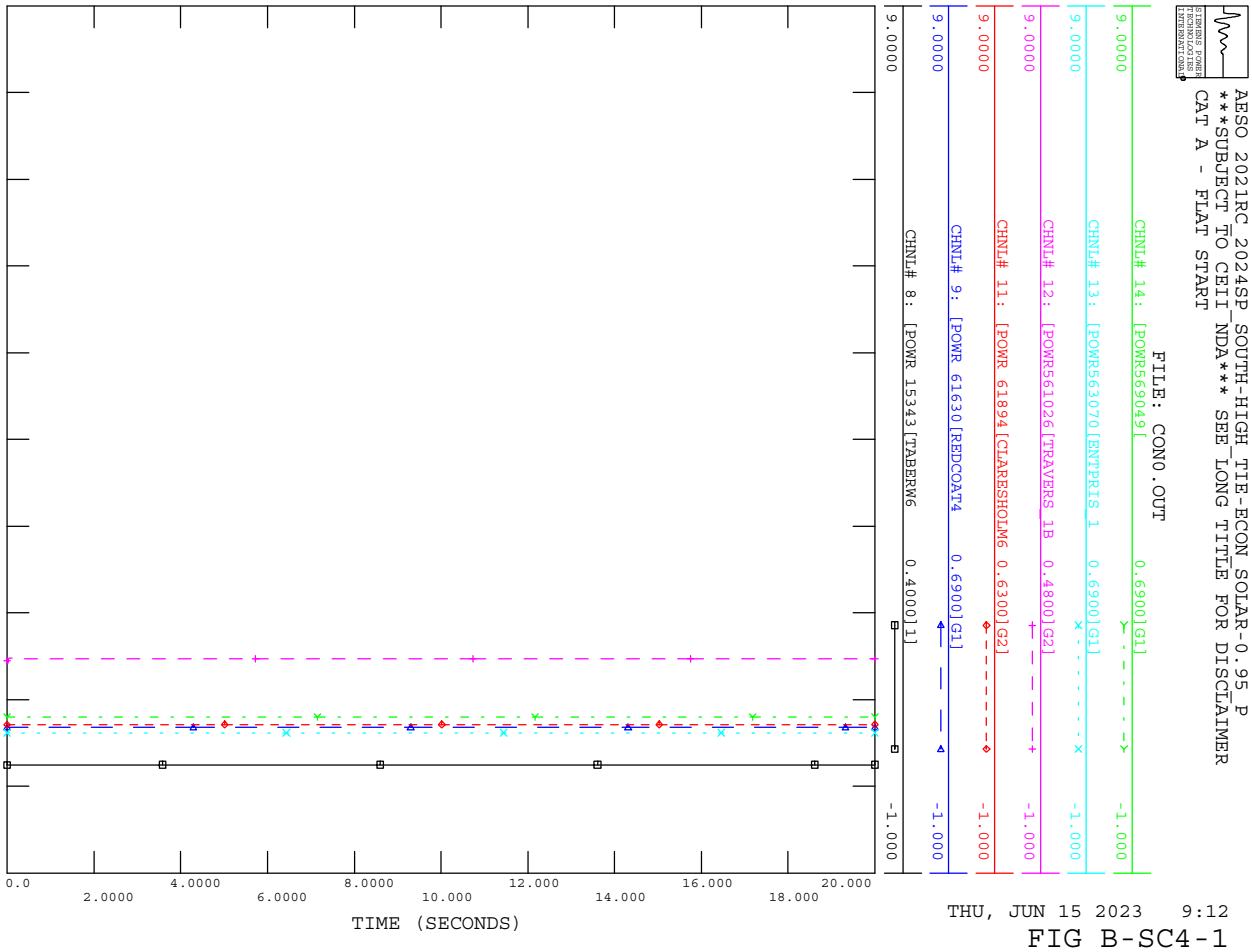


FIG B-SC4-1

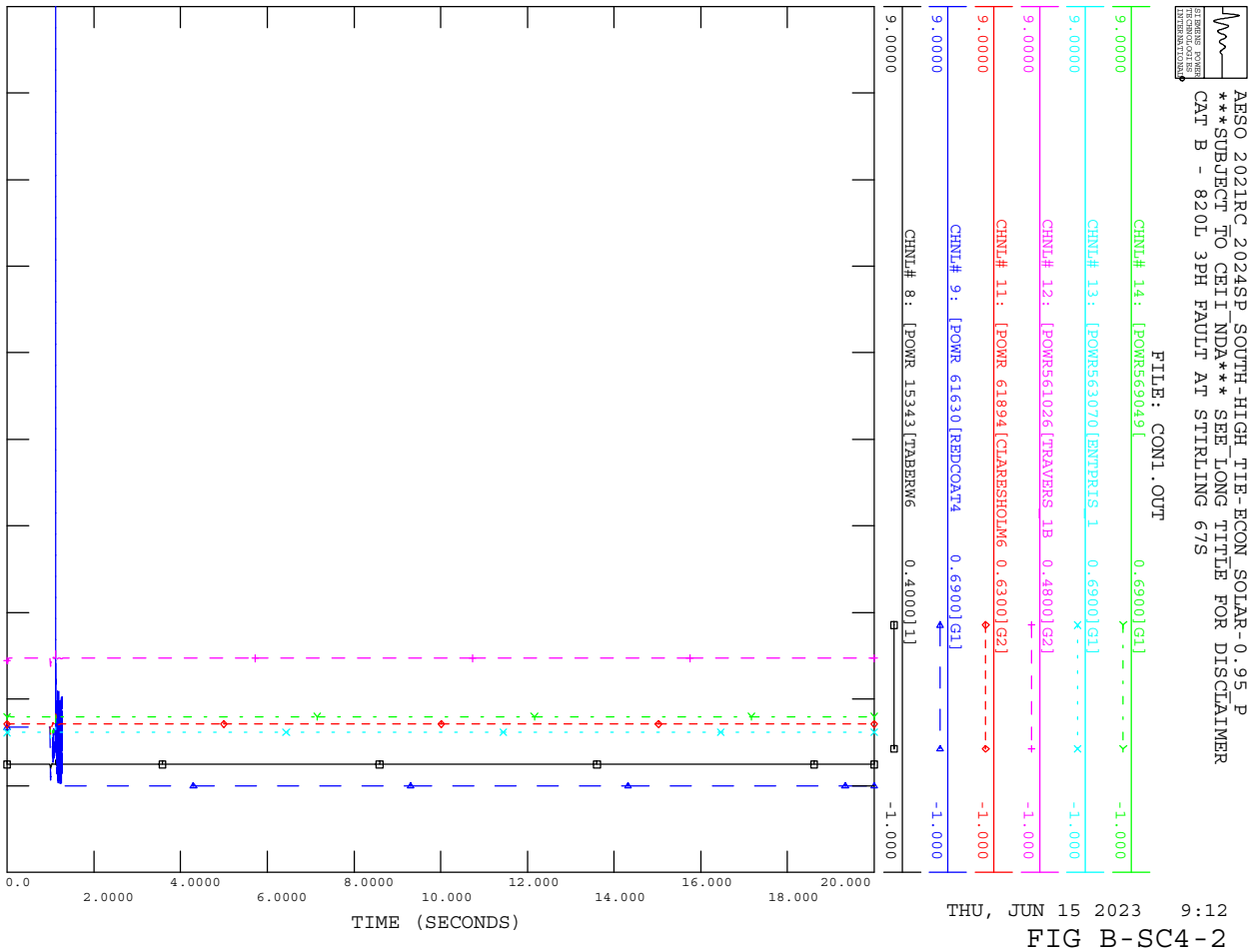


FIG B-SC4-2

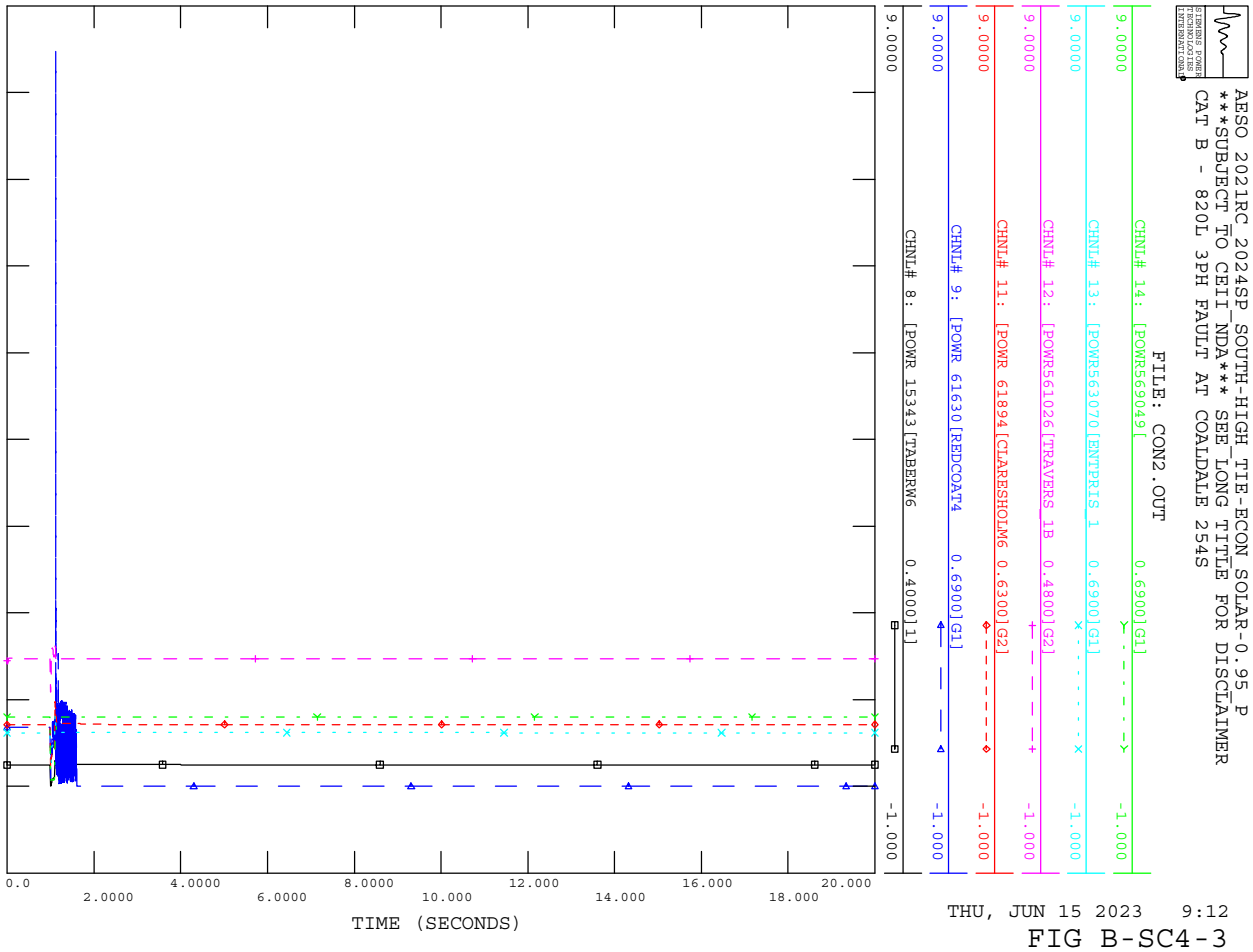


FIG B-SC4-3

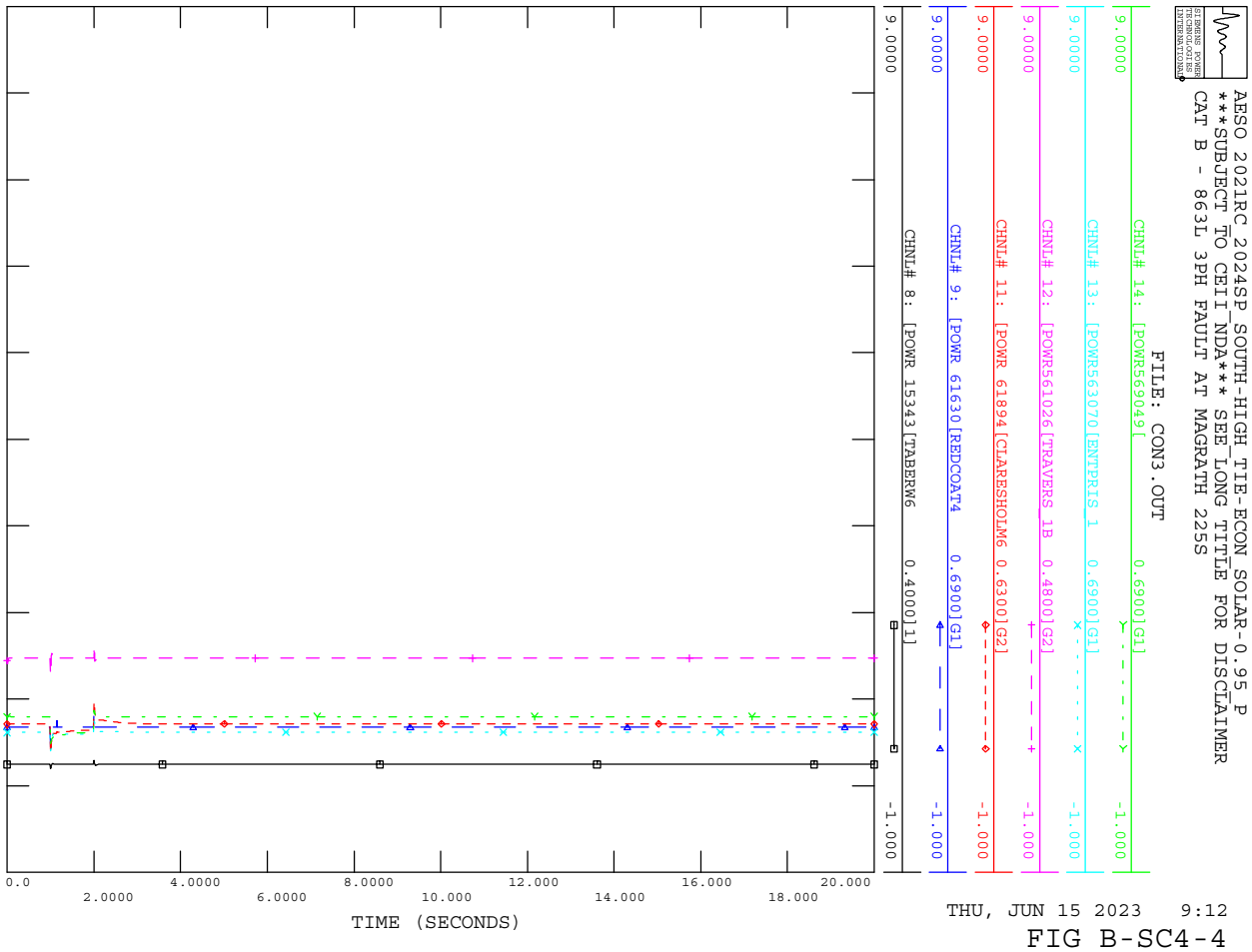


FIG B-SC4-4

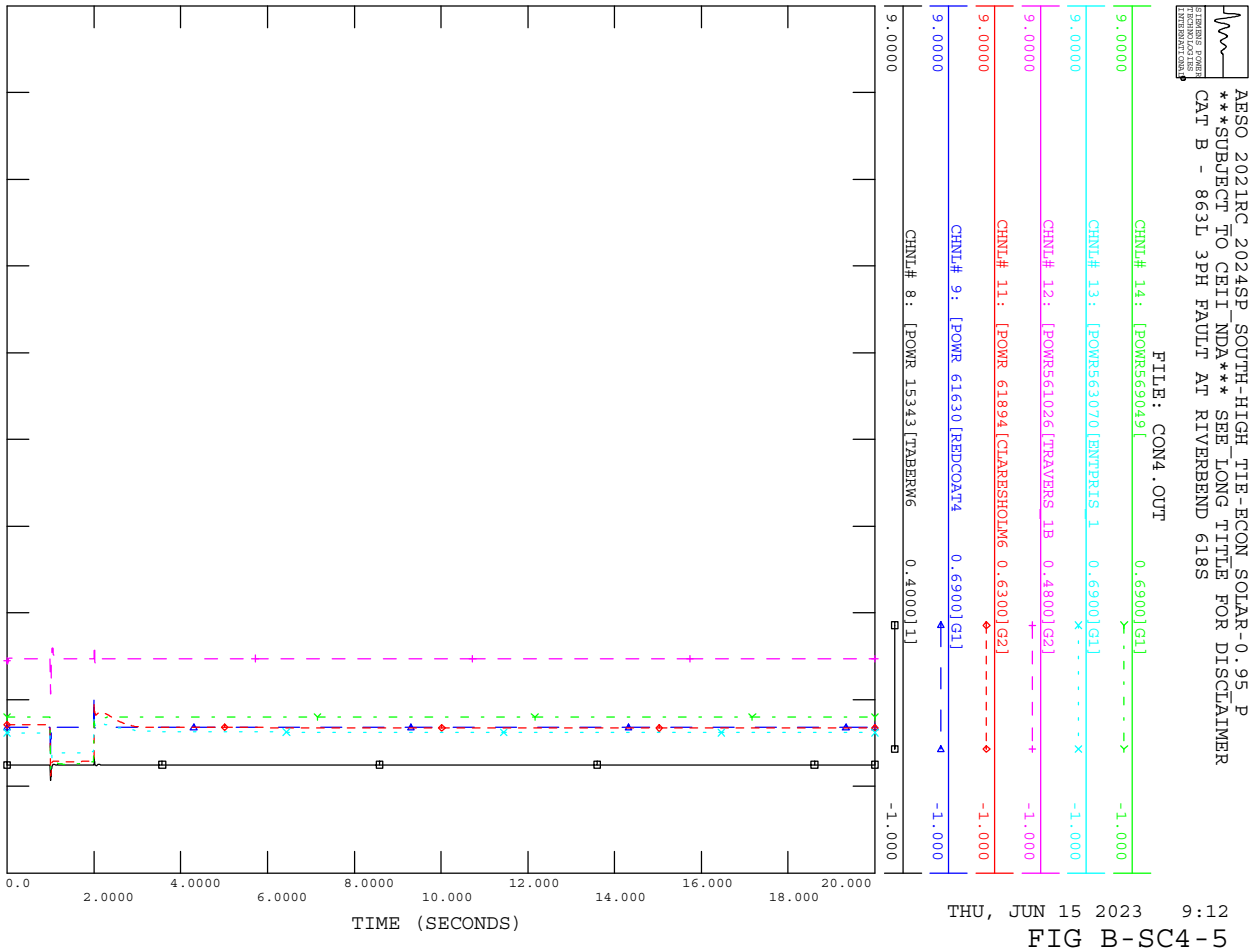


FIG B-SC4-5

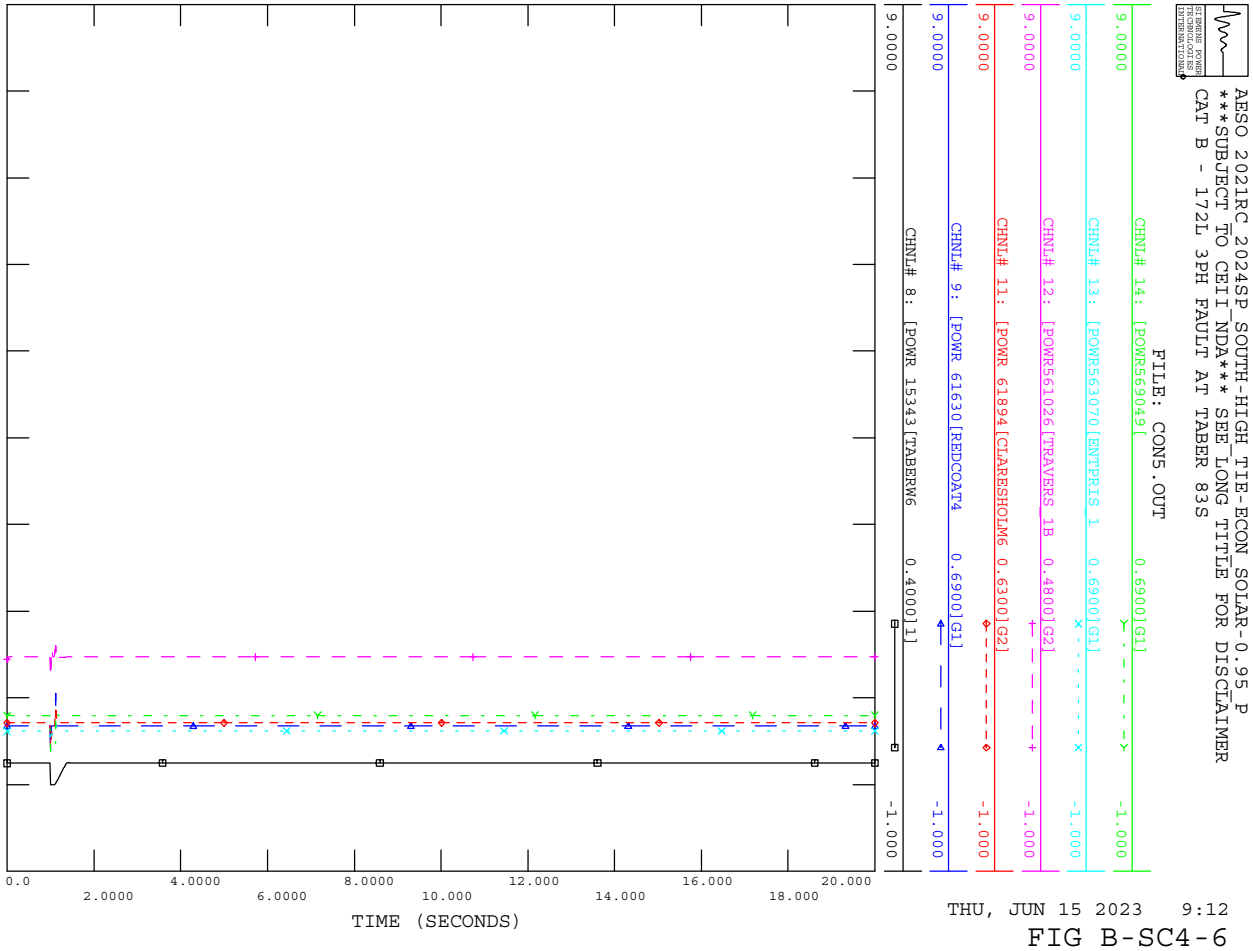


FIG B-SC4-6

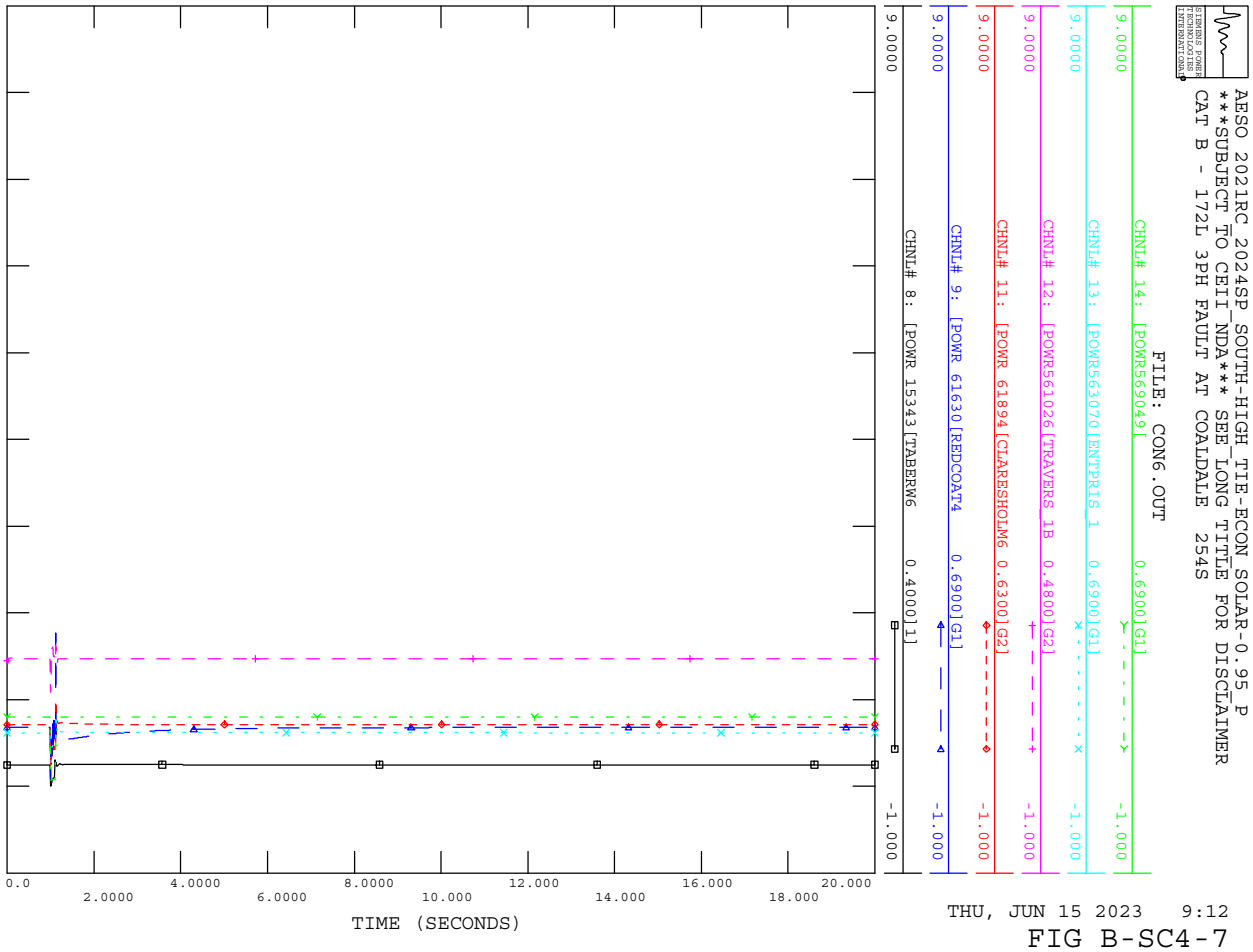


FIG B-SC4-7

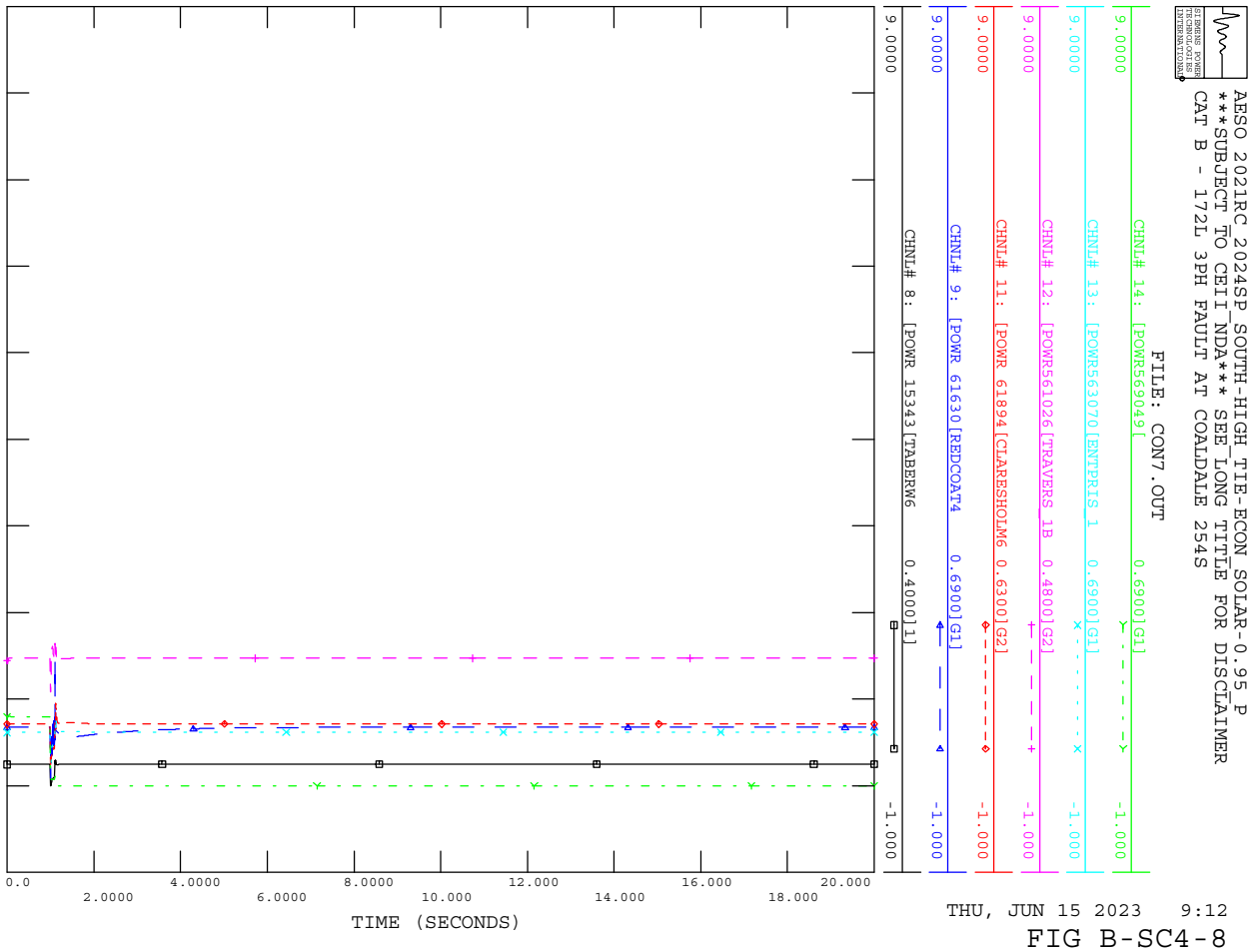


FIG B-SC4-8

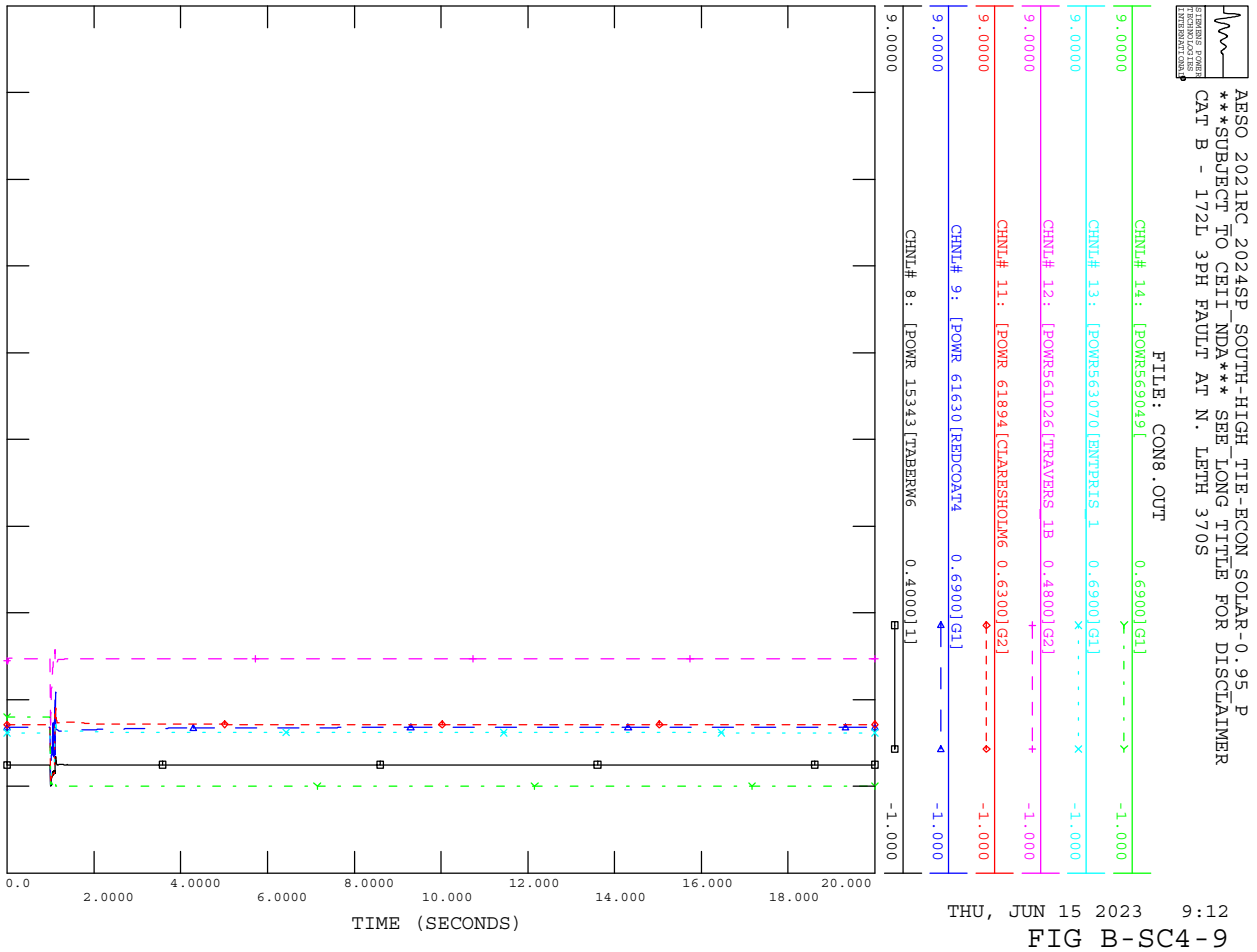


FIG B-SC4-9

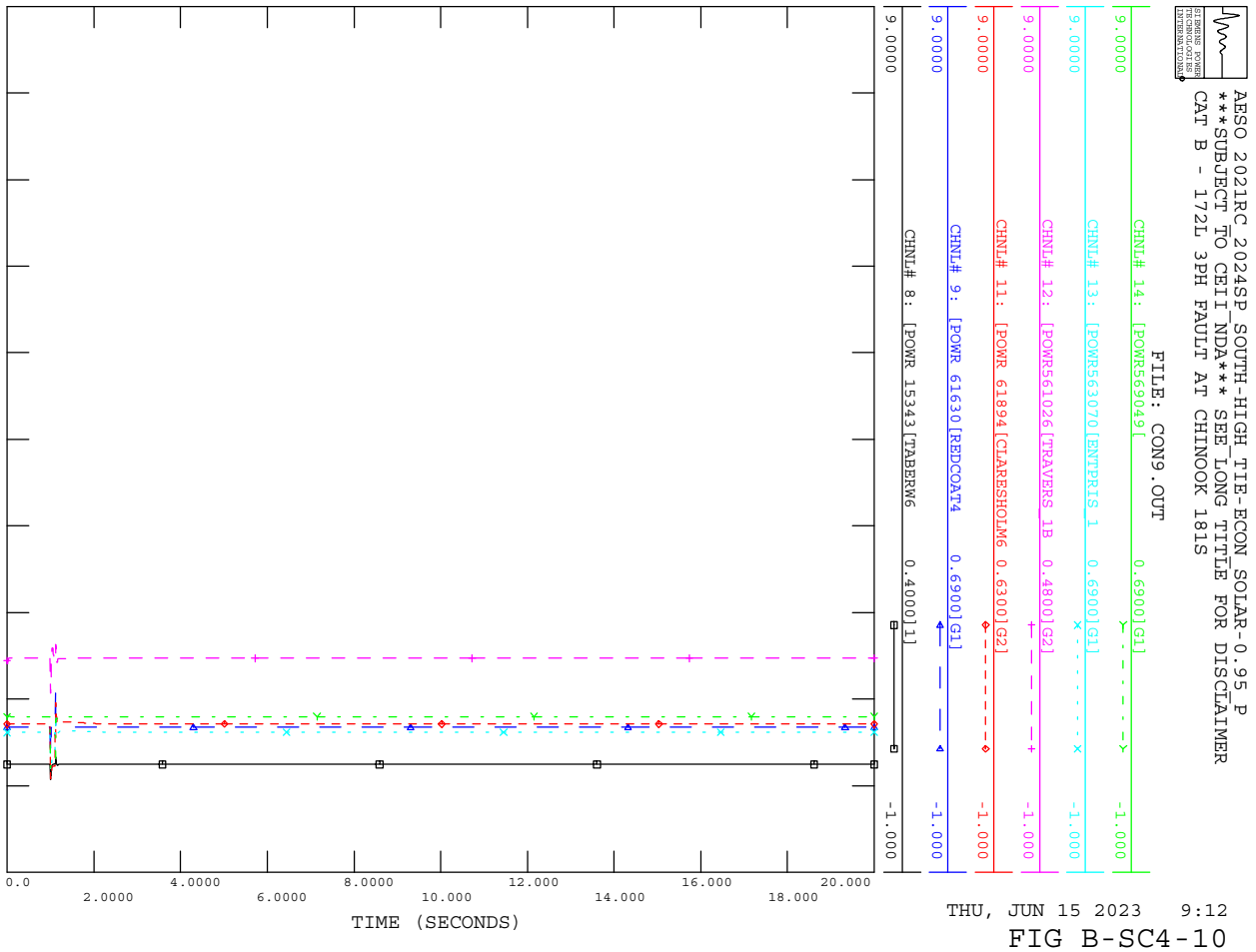


FIG B-SC4-10

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
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CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

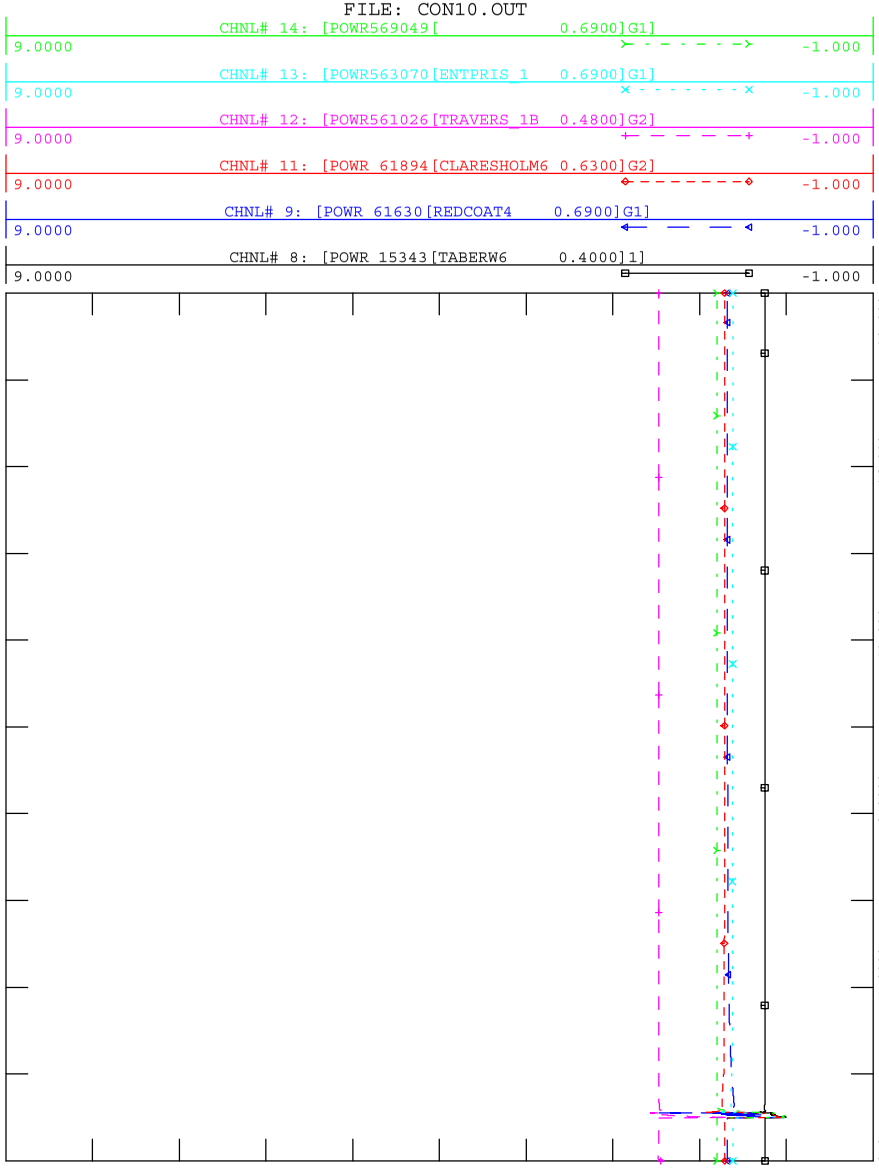

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FIG B-SC4-11

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT

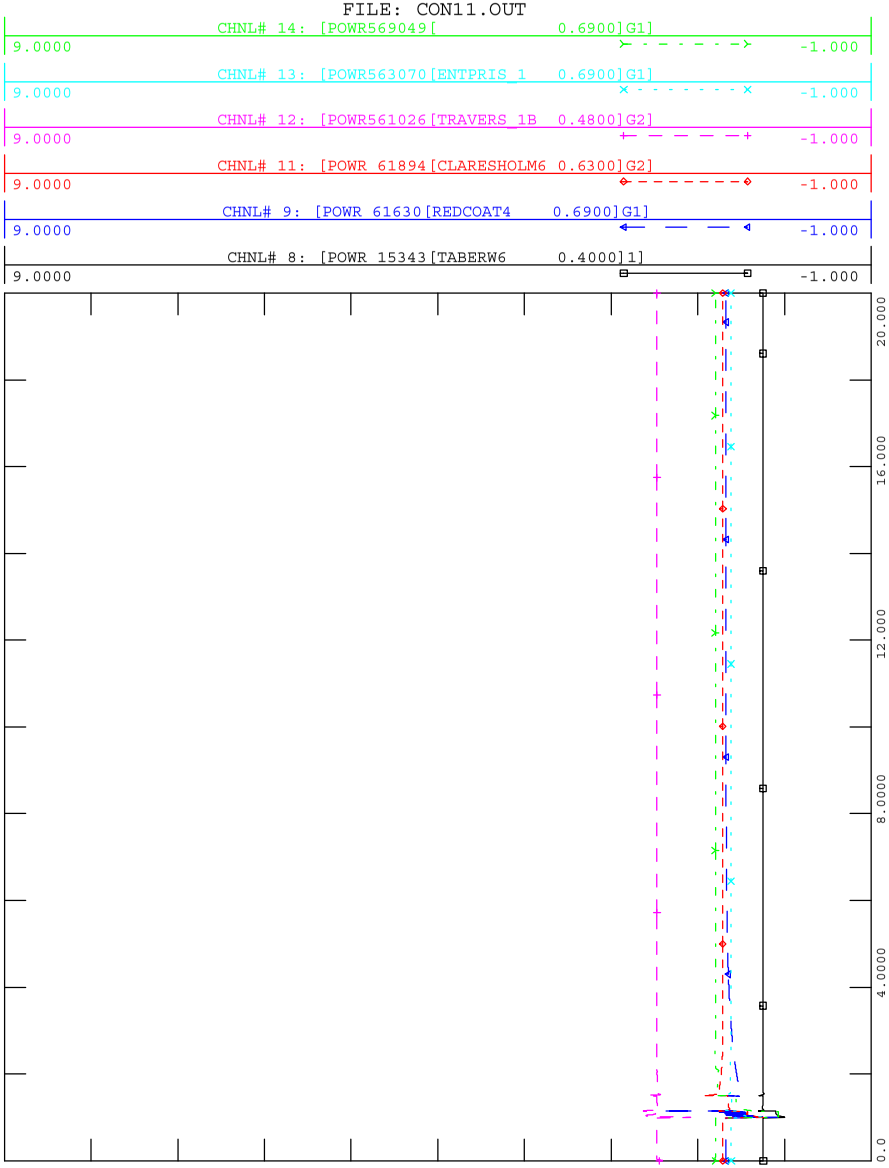

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FIG B-SC4-12

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

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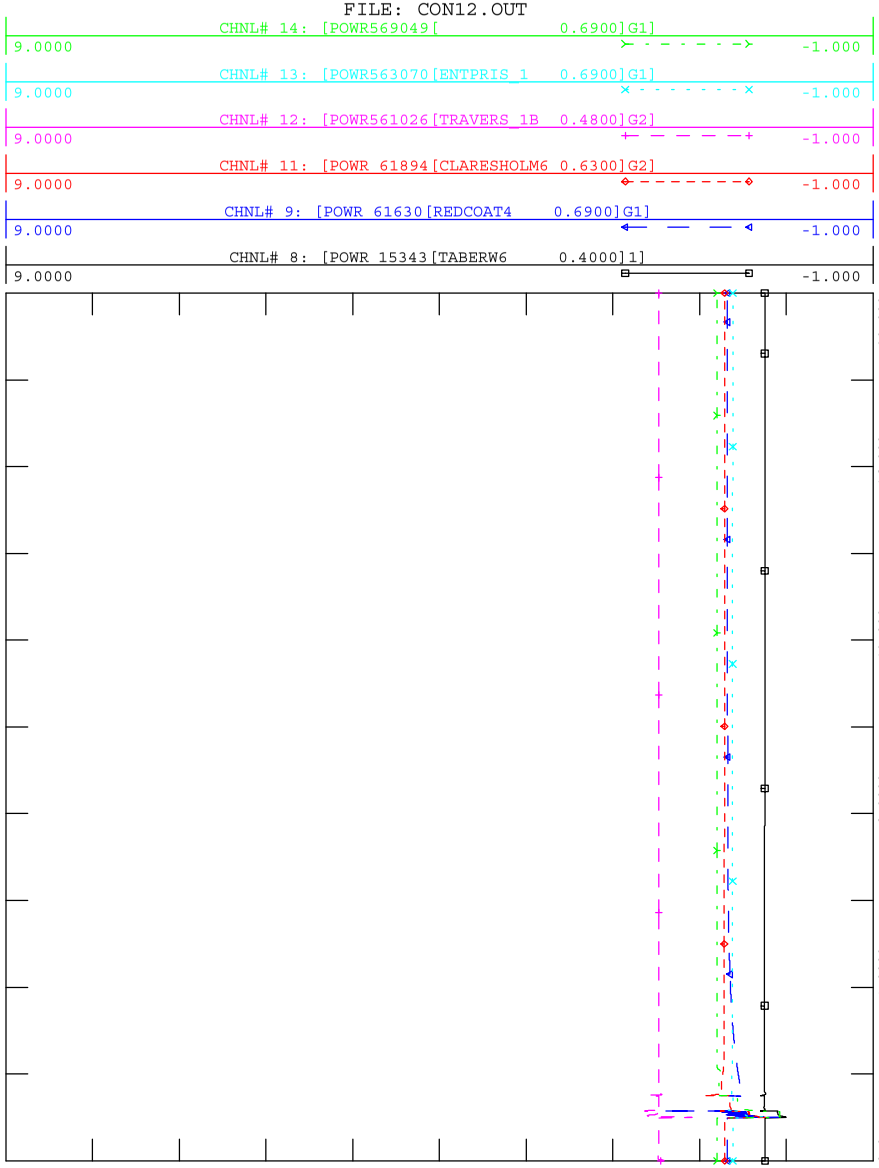

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FIG B-SC4-13

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

FILE: CON13.OUT

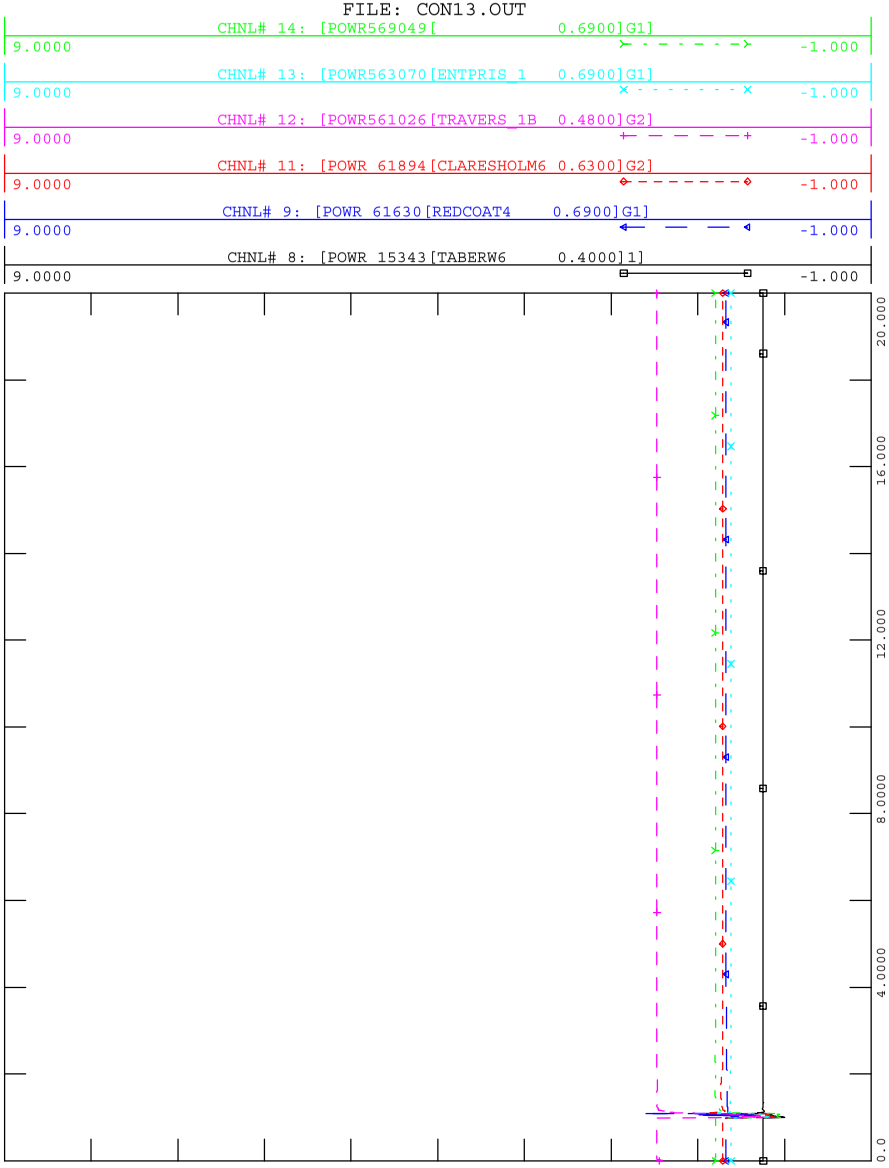

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FIG B-SC4-14

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
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CAT B - 1041L 3PH FAULT AT TRAVERS 554S

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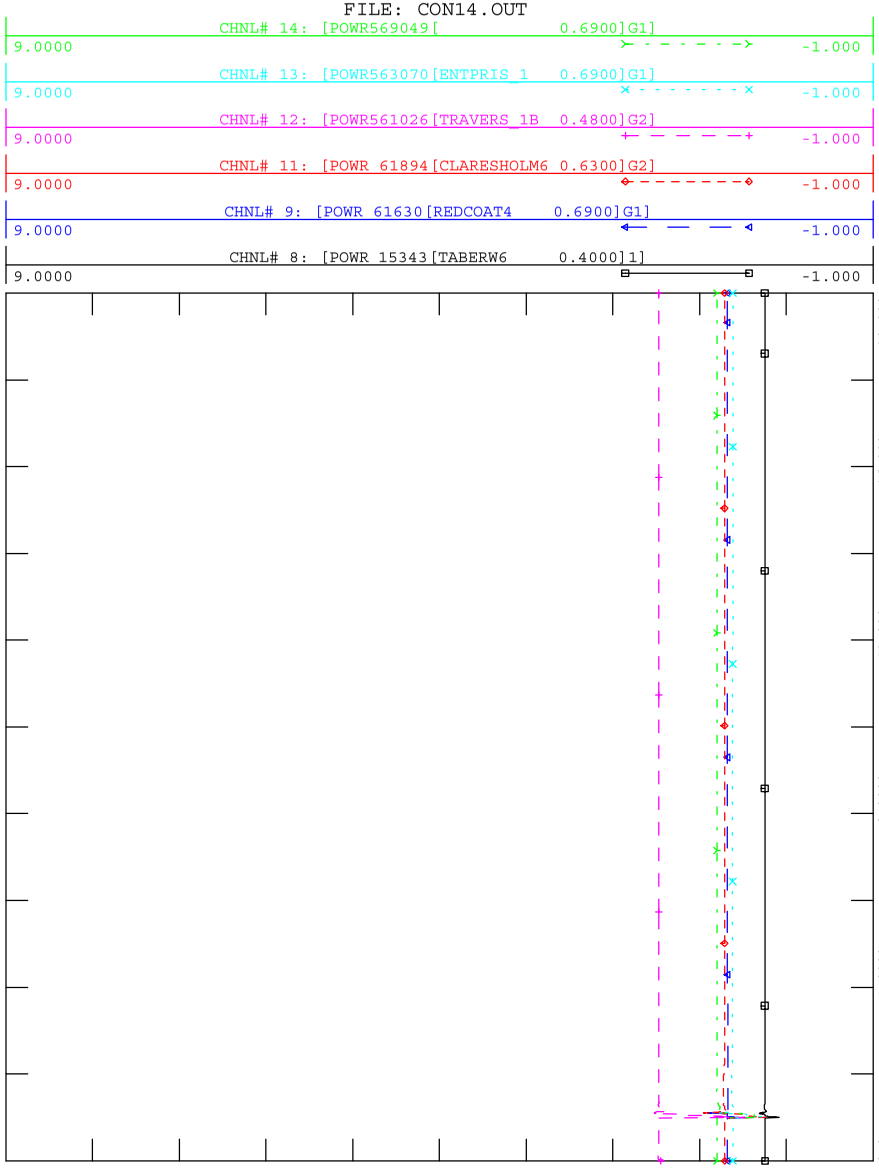

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FIG B-SC4-15

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

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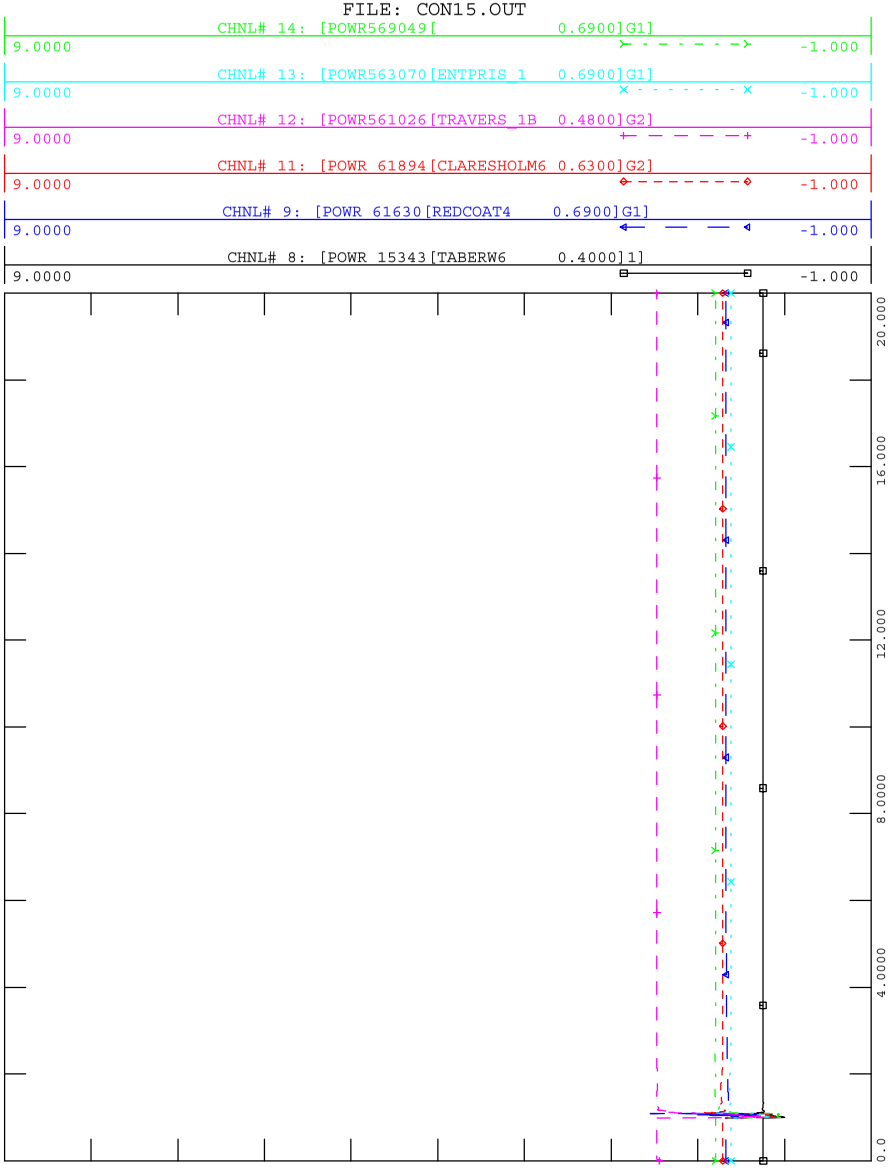

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FIG B-SC4-16

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT WIND FLATS 138S

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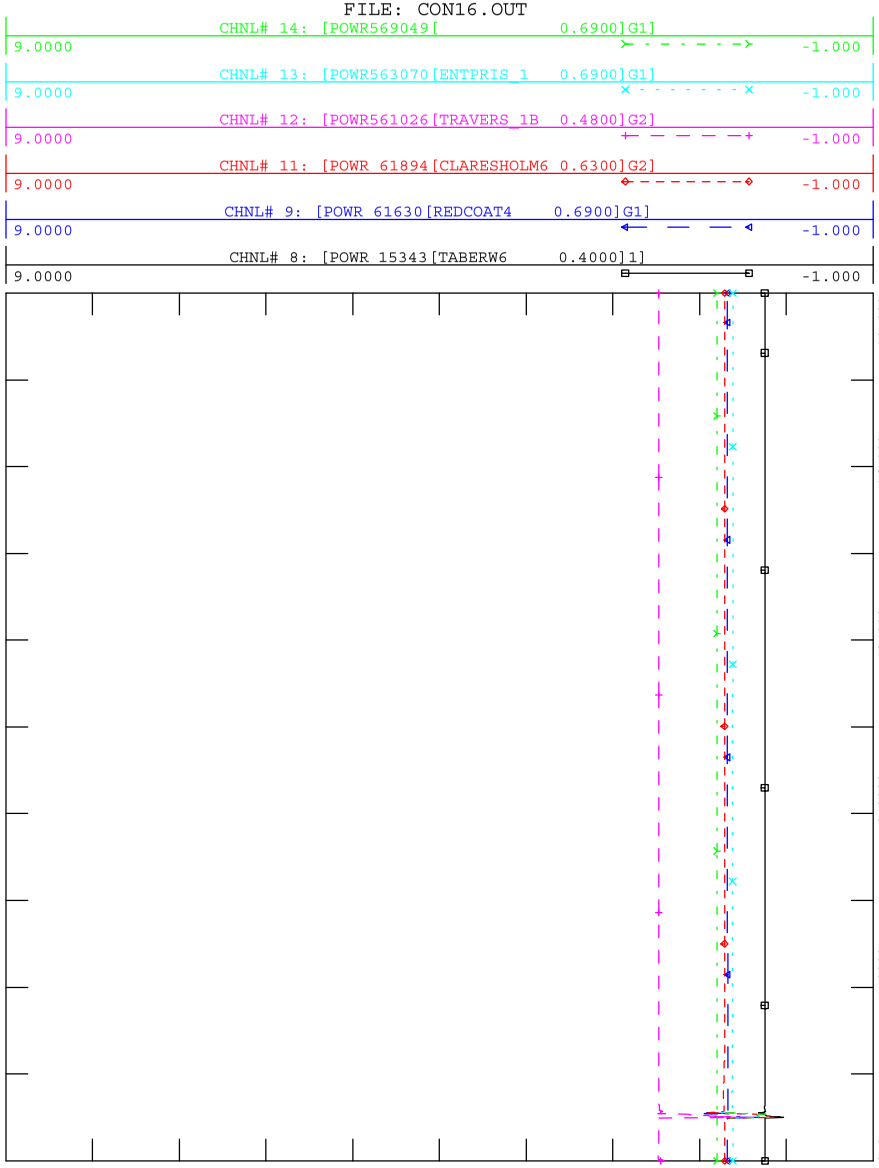

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FIG B-SC4-17

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT N. LETH 370S

FILE: CON17.OUT

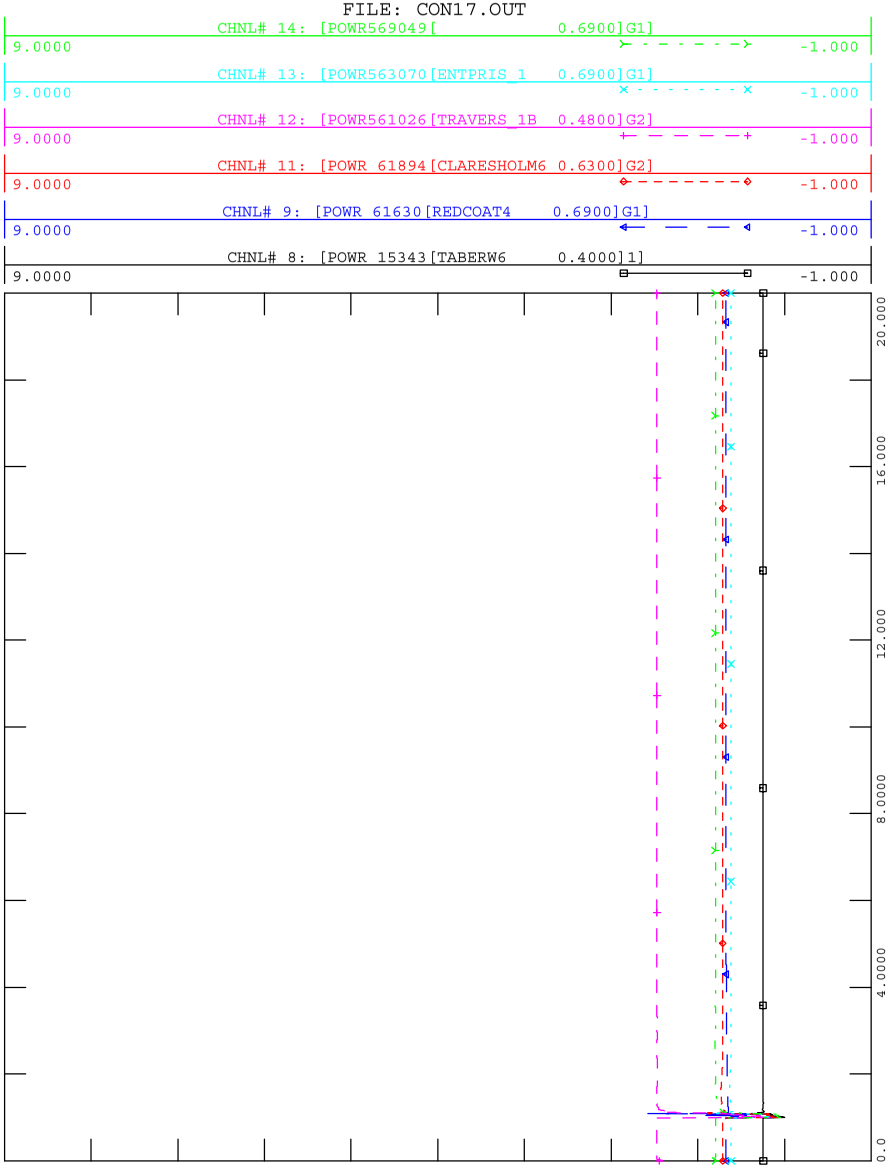

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FIG B-SC4-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

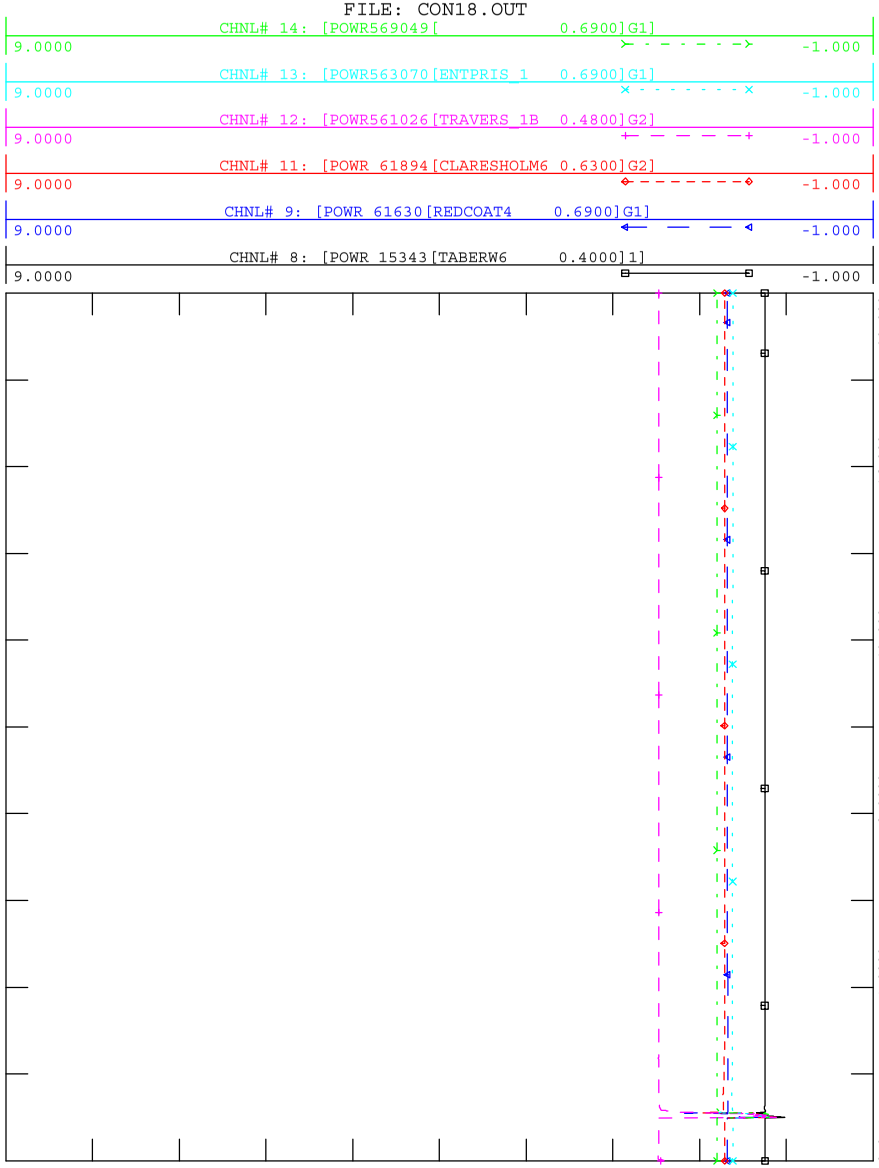

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FIG B-SC4-19

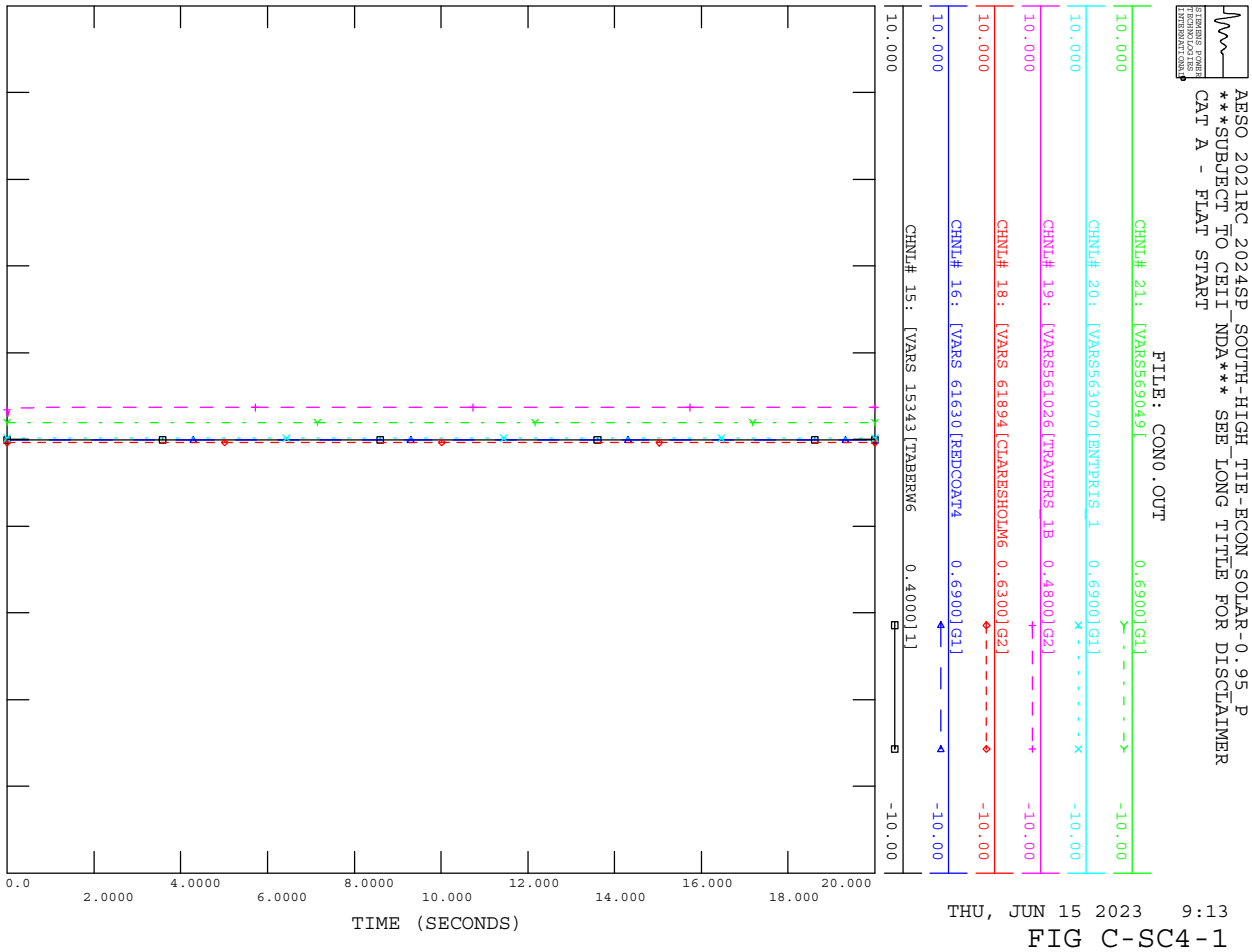

FIG C-SC4-1

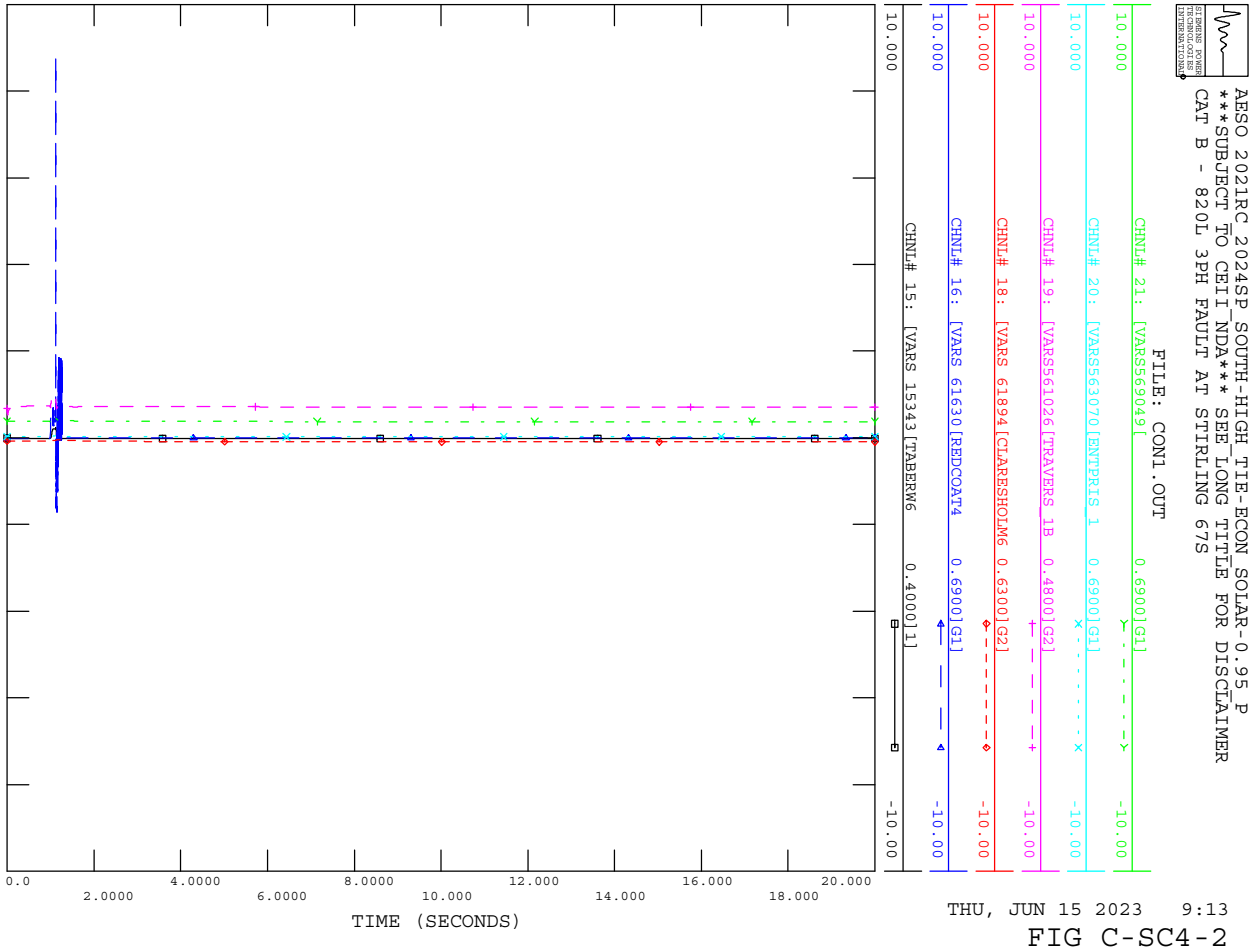

FIG C-SC4-2

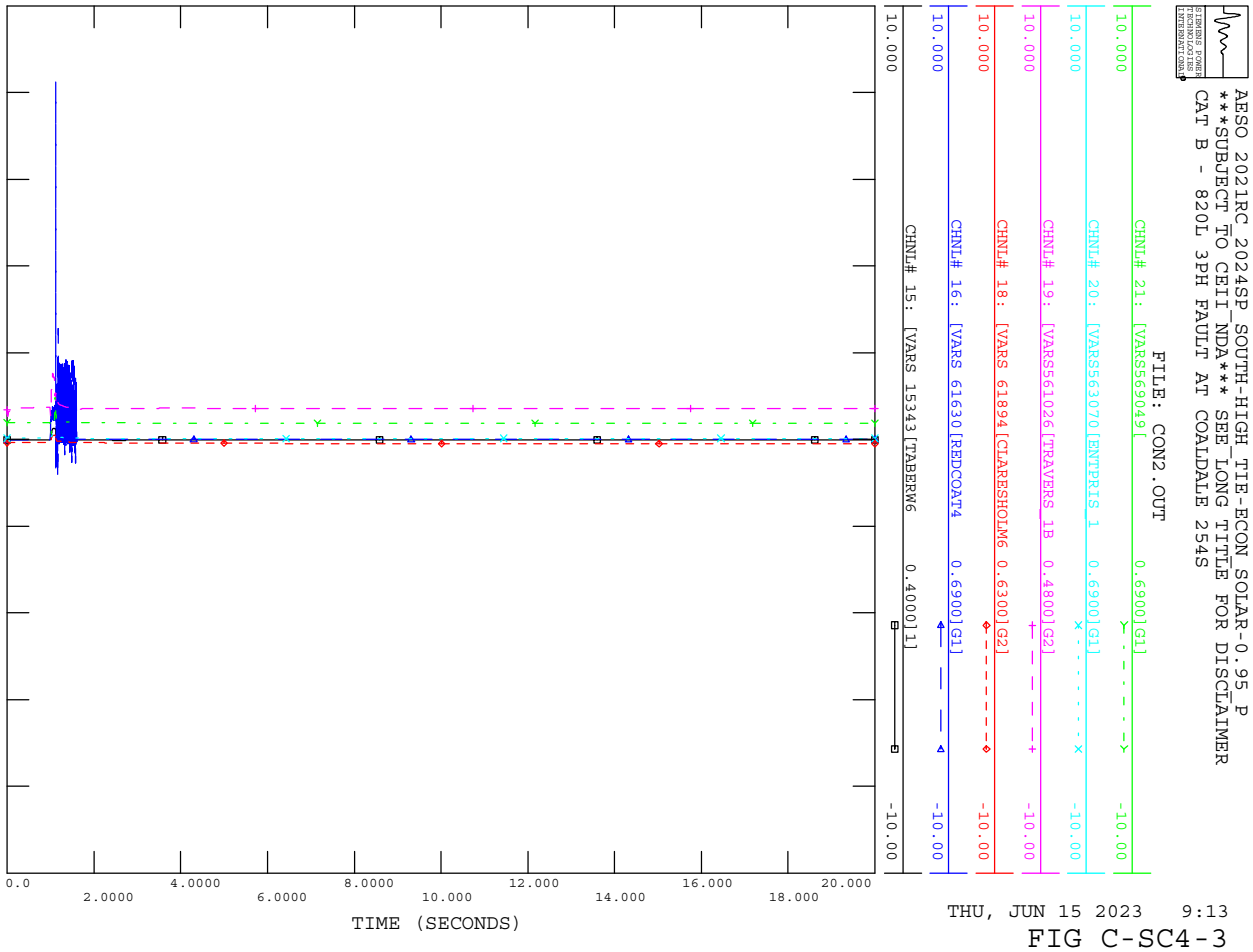

FIG C-SC4-3

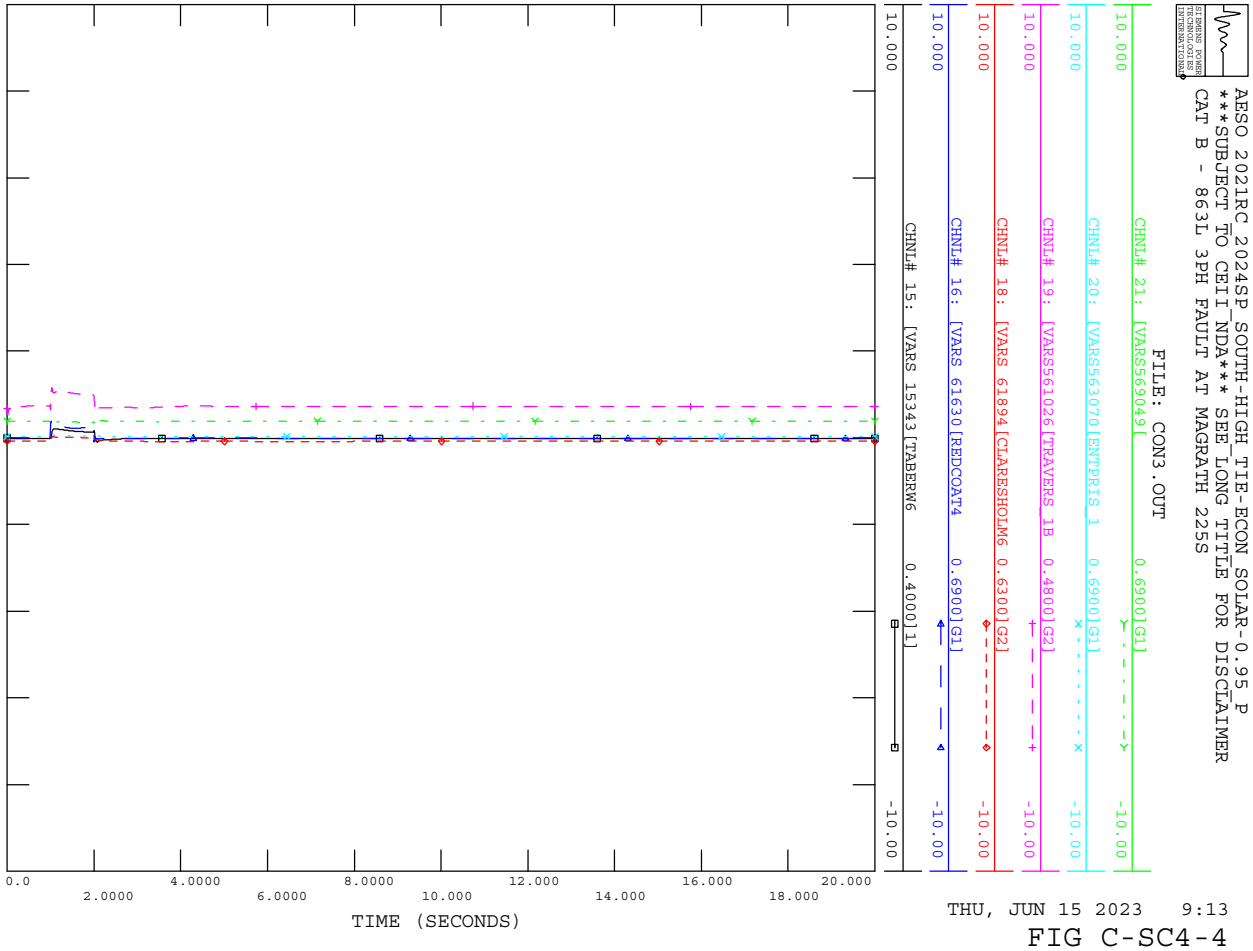

FIG C-SC4-4

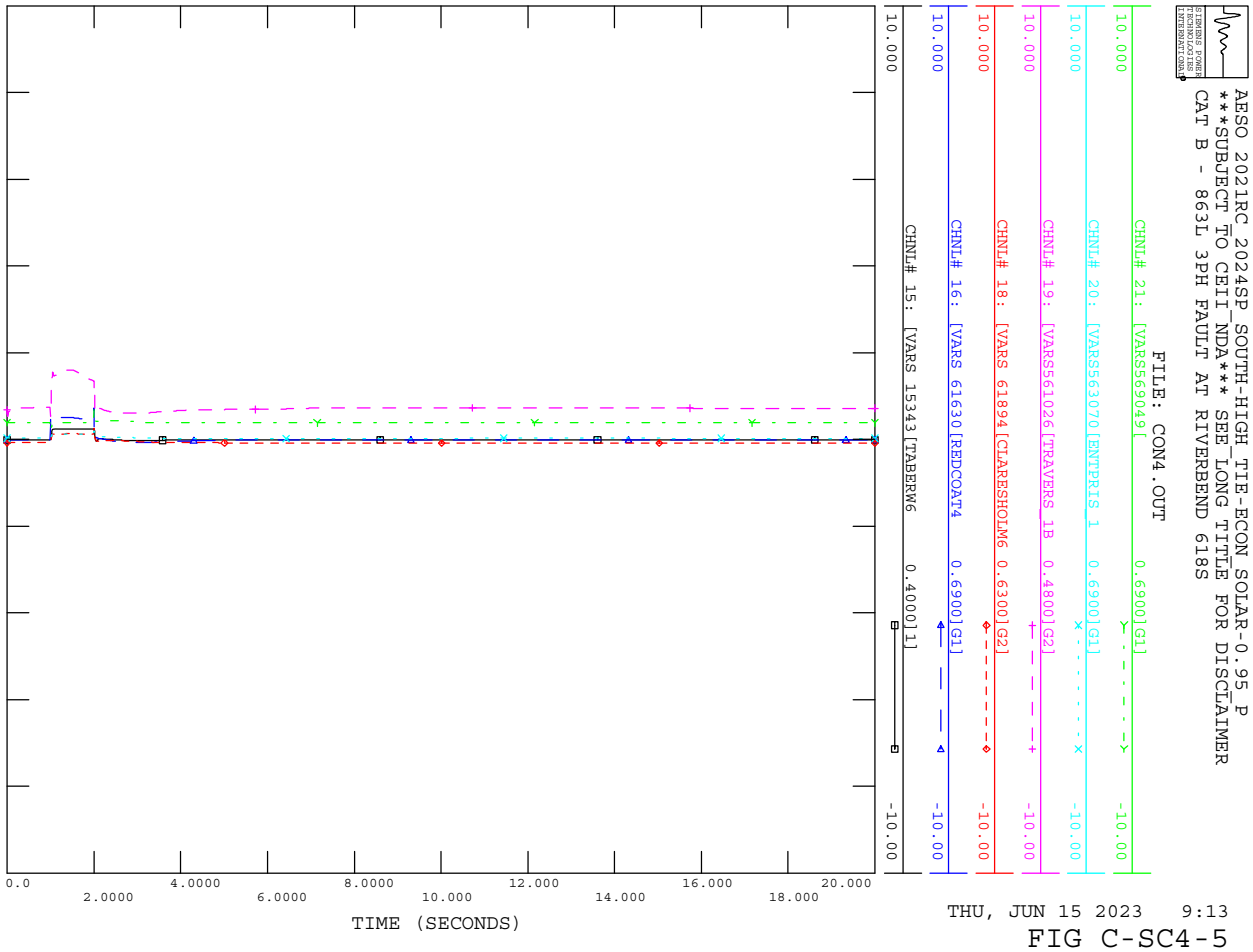

FIG C-SC4-5

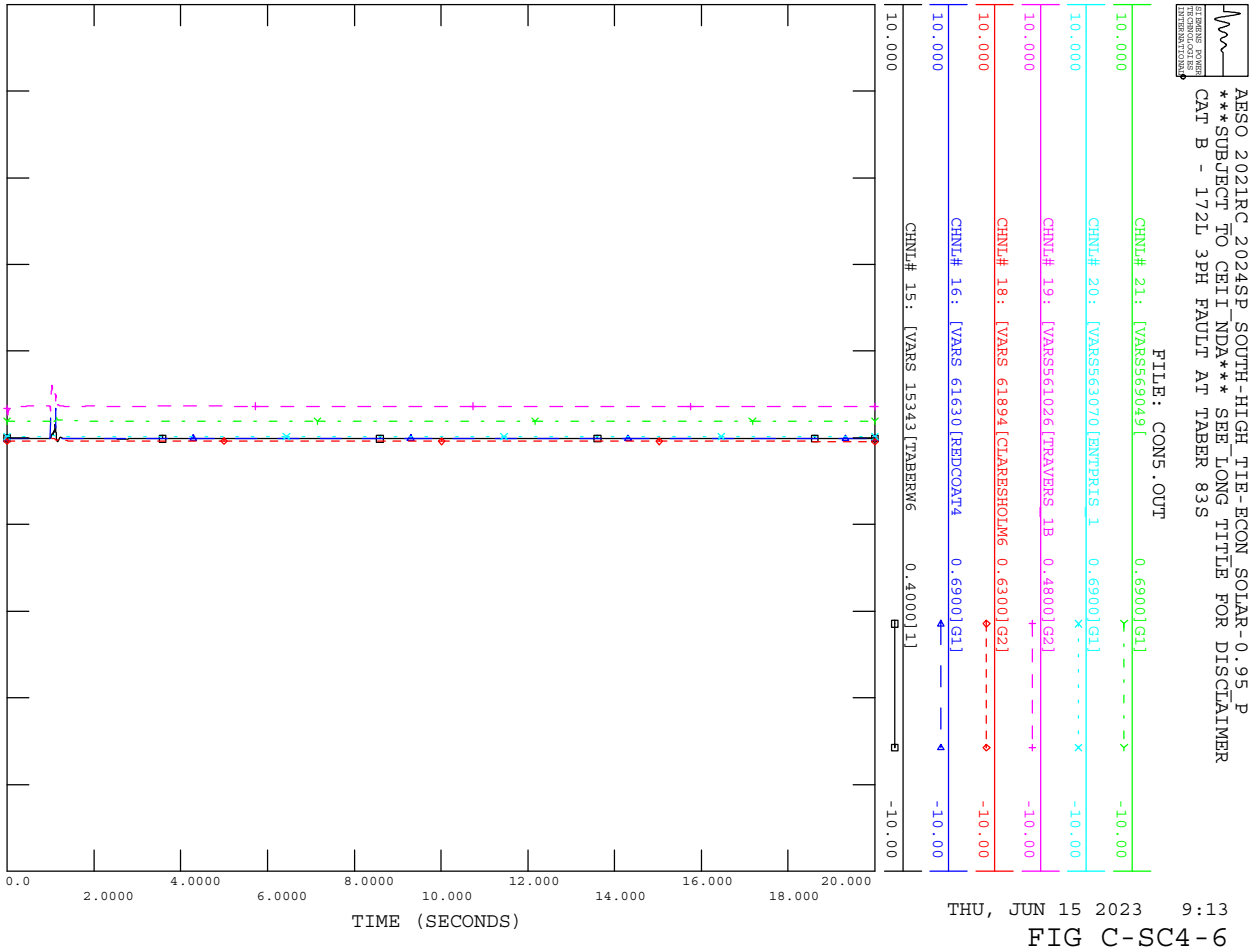

FIG C-SC4-6

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
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CAT B - 172L 3PH FAULT AT COALDALE 254S

FILE: CON6.OUT

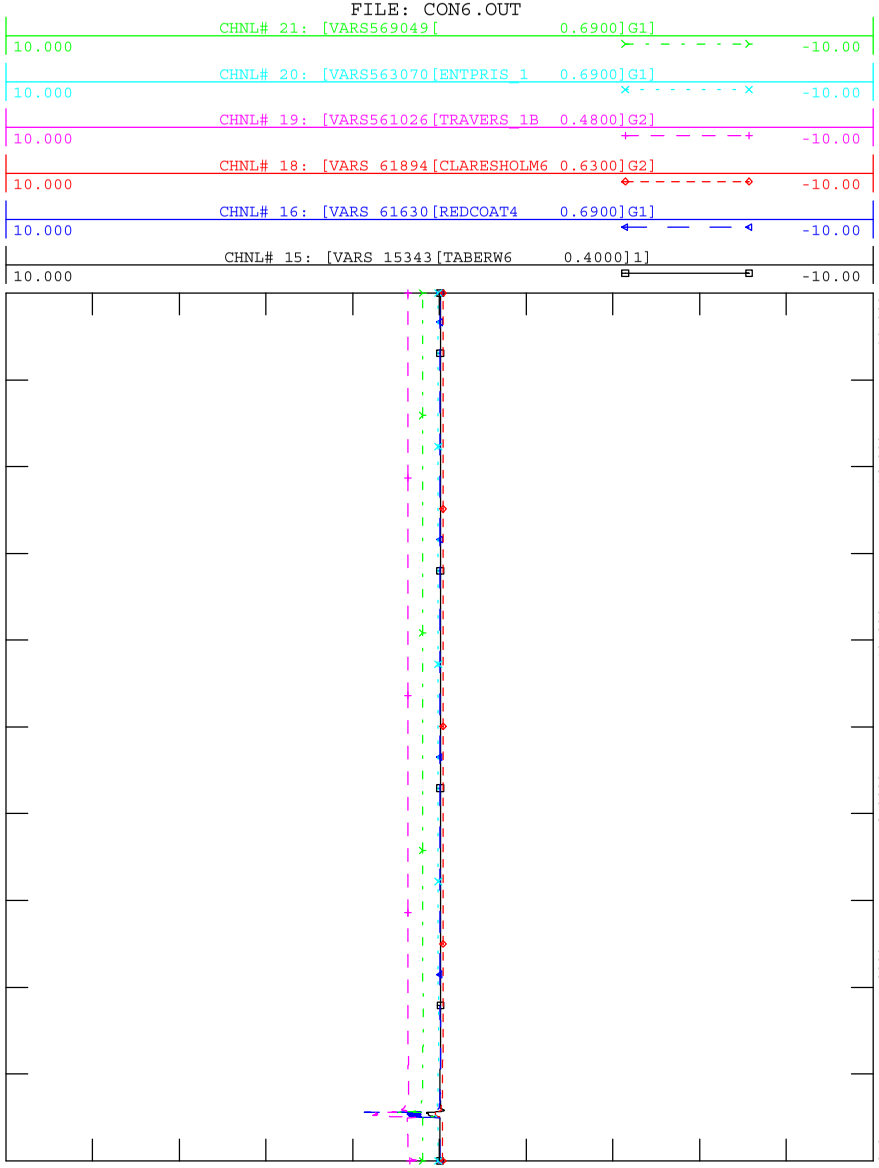

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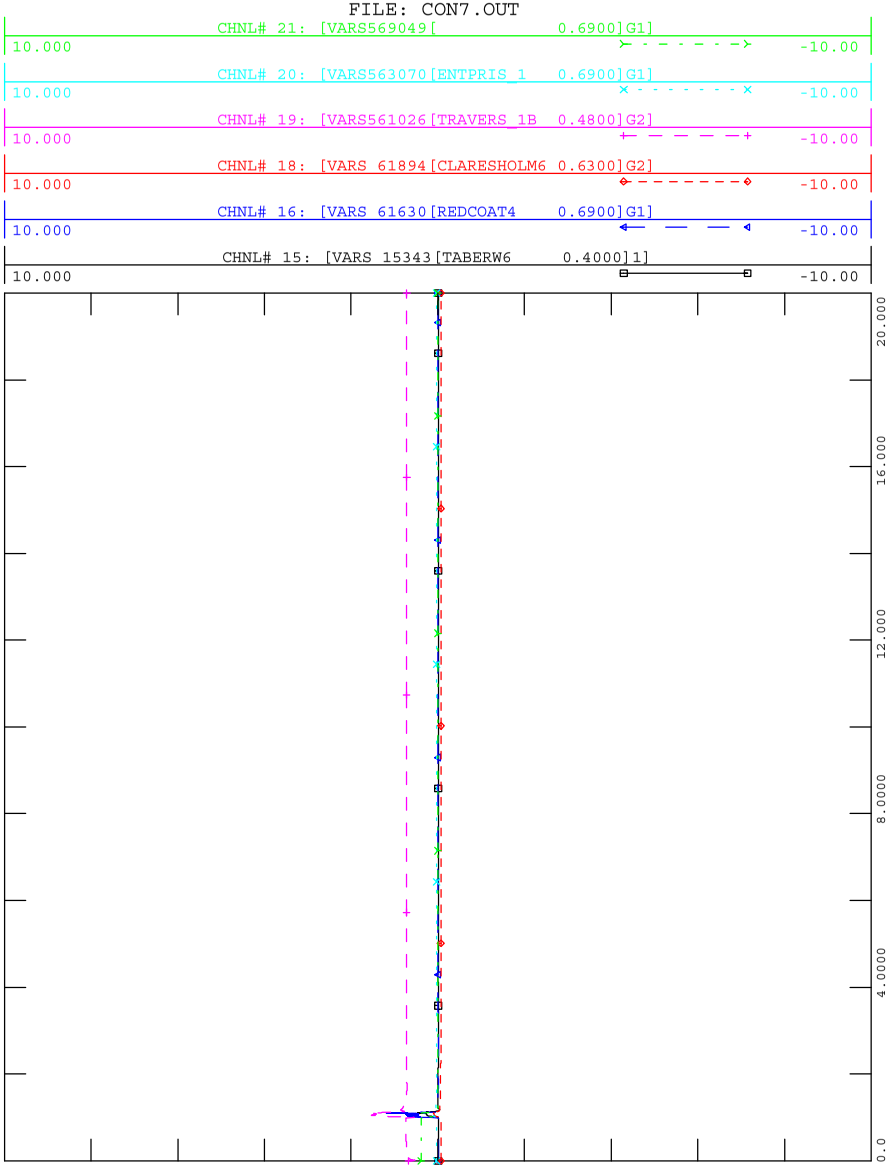
FIG C-SC4-7

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT COALDALE 254S

FILE: CON7.OUT

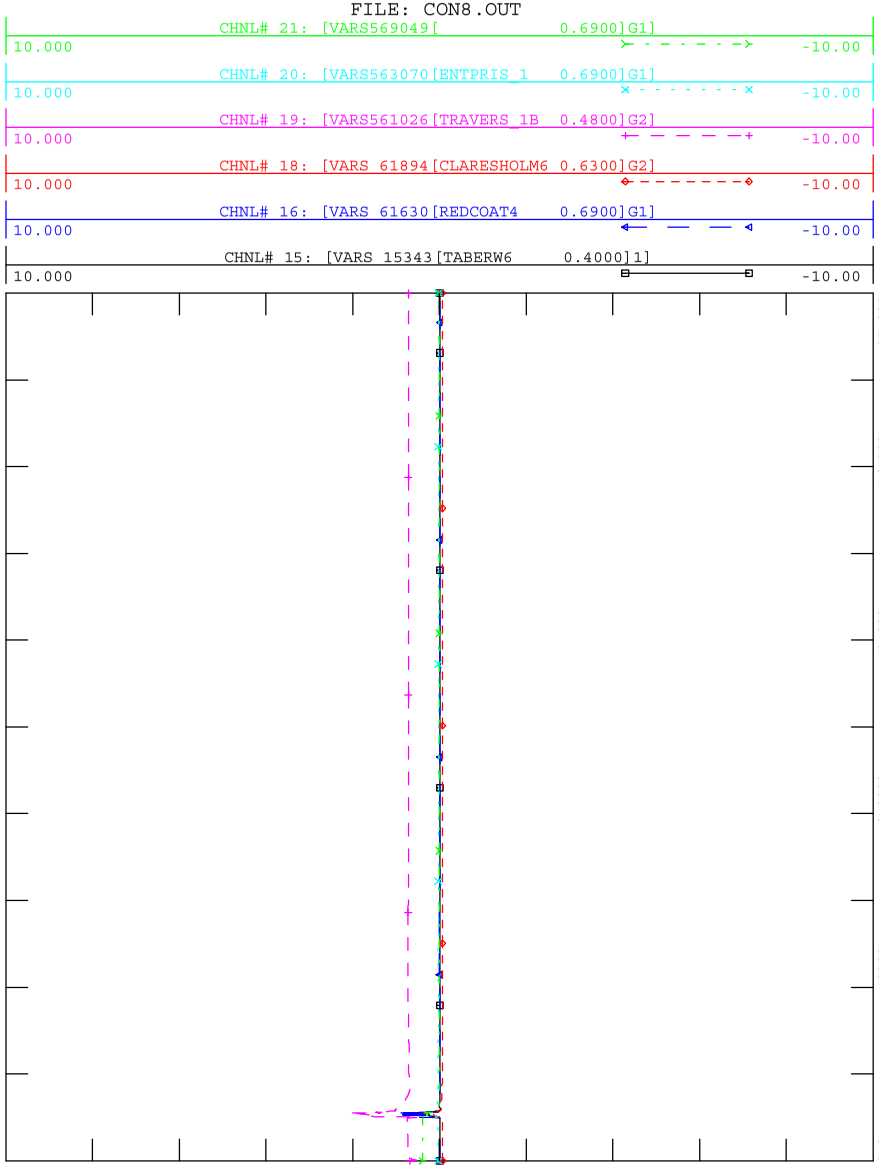


THU, JUN 15 2023 9:13

FIG C-SC4-8

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

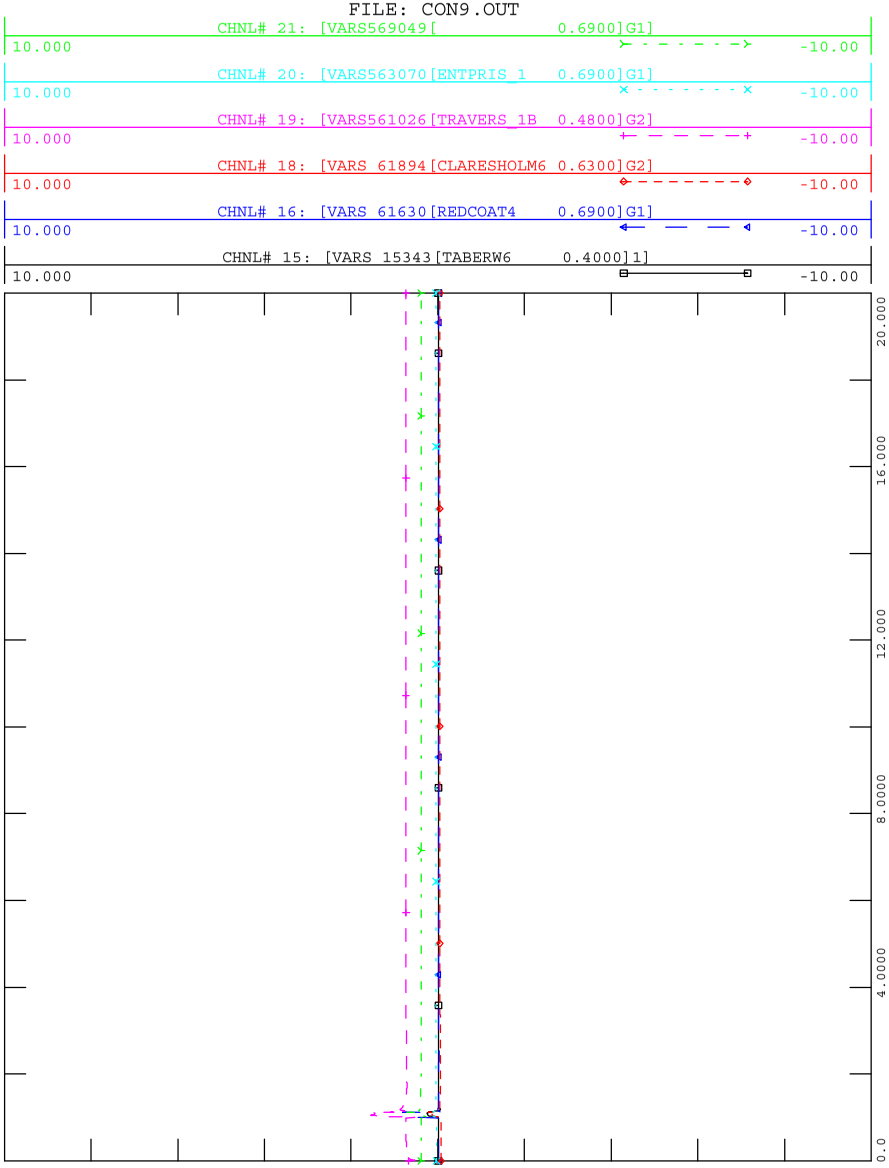
FILE: CON8.OUT



THU, JUN 15 2023 9:13
FIG C-SC4-9

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT CHINOOK 181S

FILE: CON9.OUT



THU, JUN 15 2023 9:13
FIG C-SC4-10

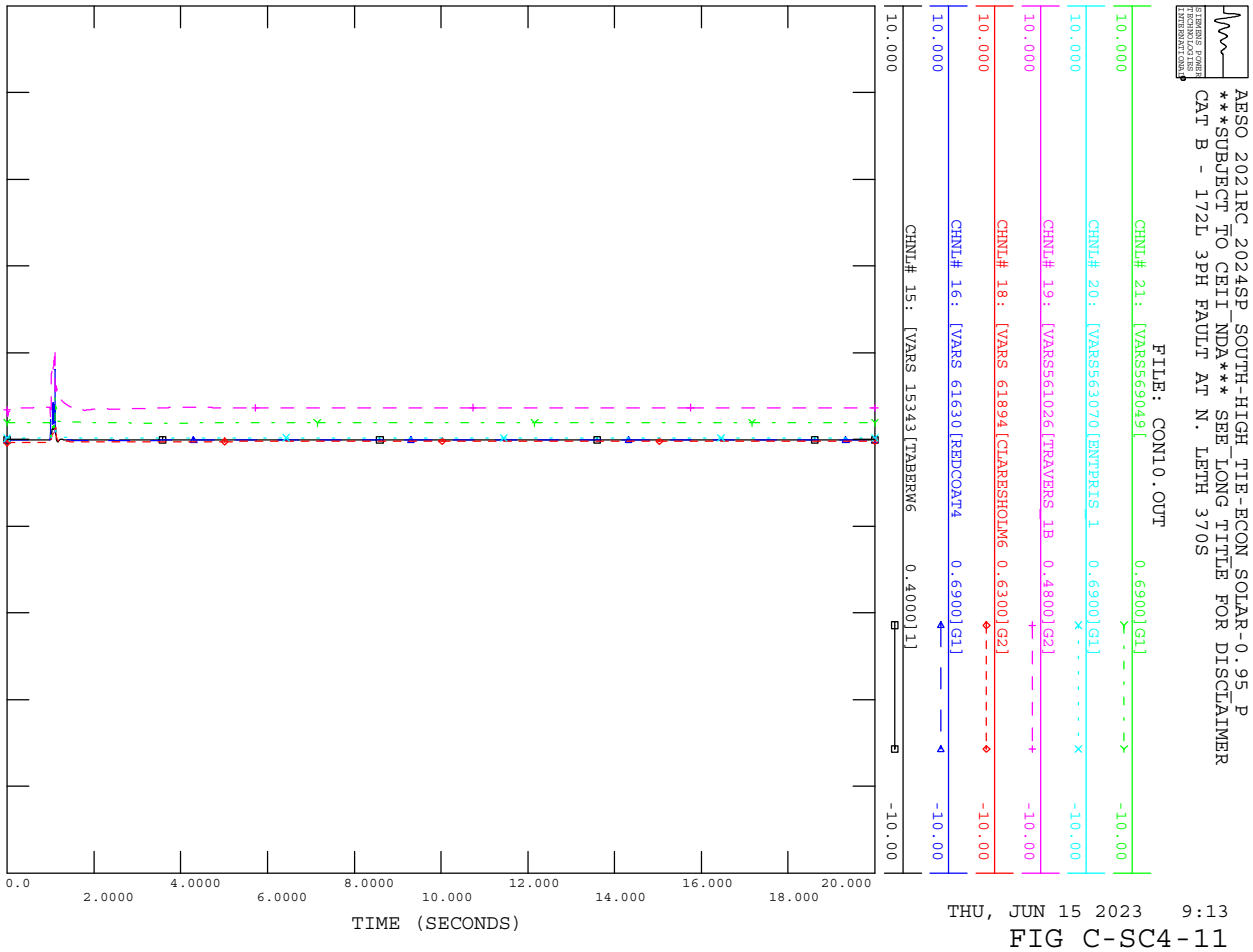


FIG C-SC4-11

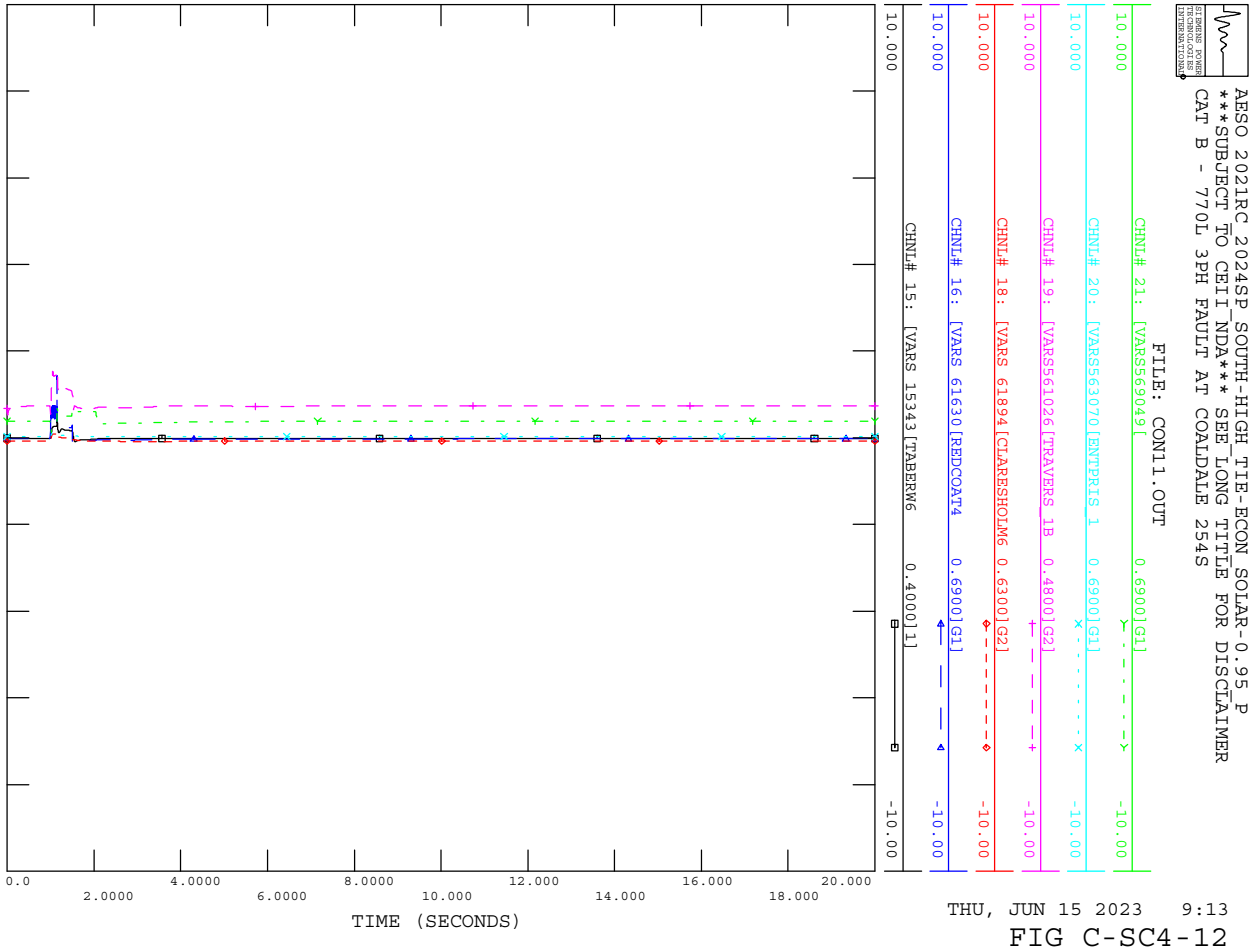
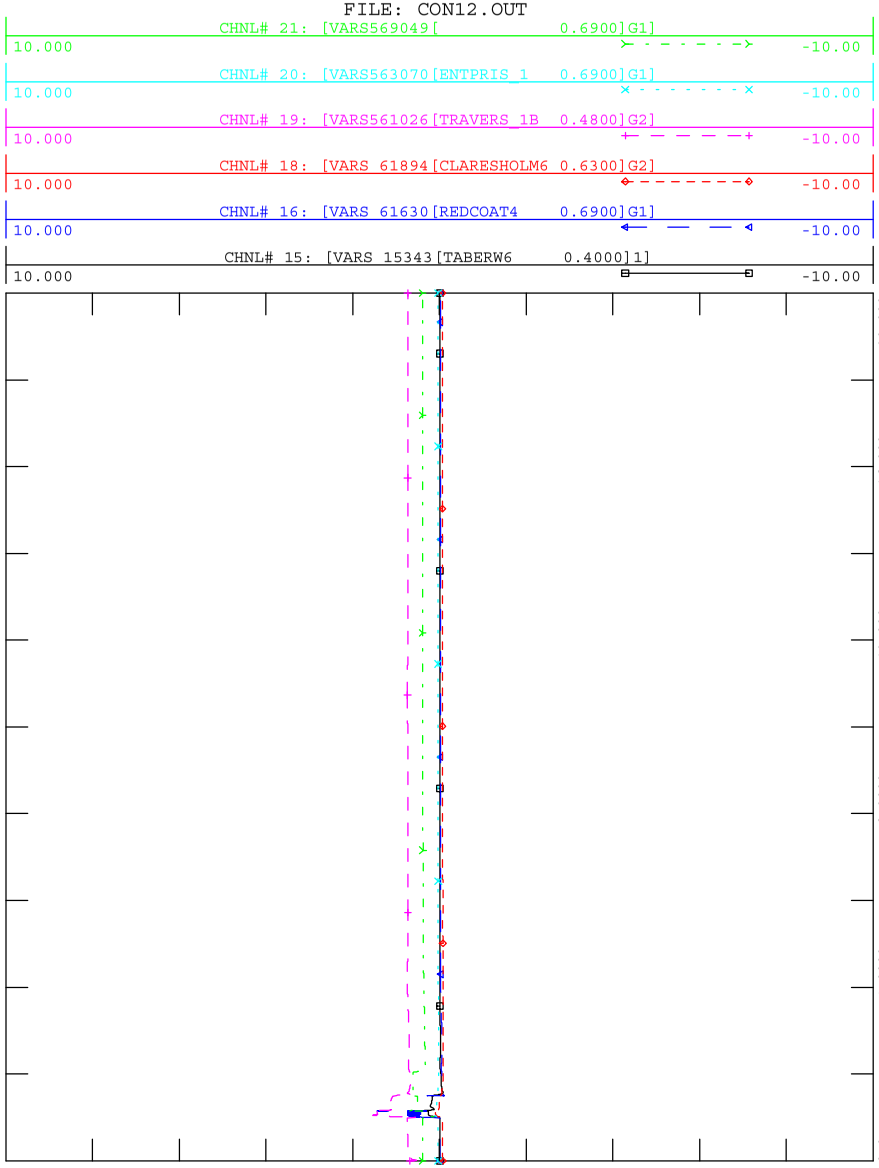


FIG C-SC4-12

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

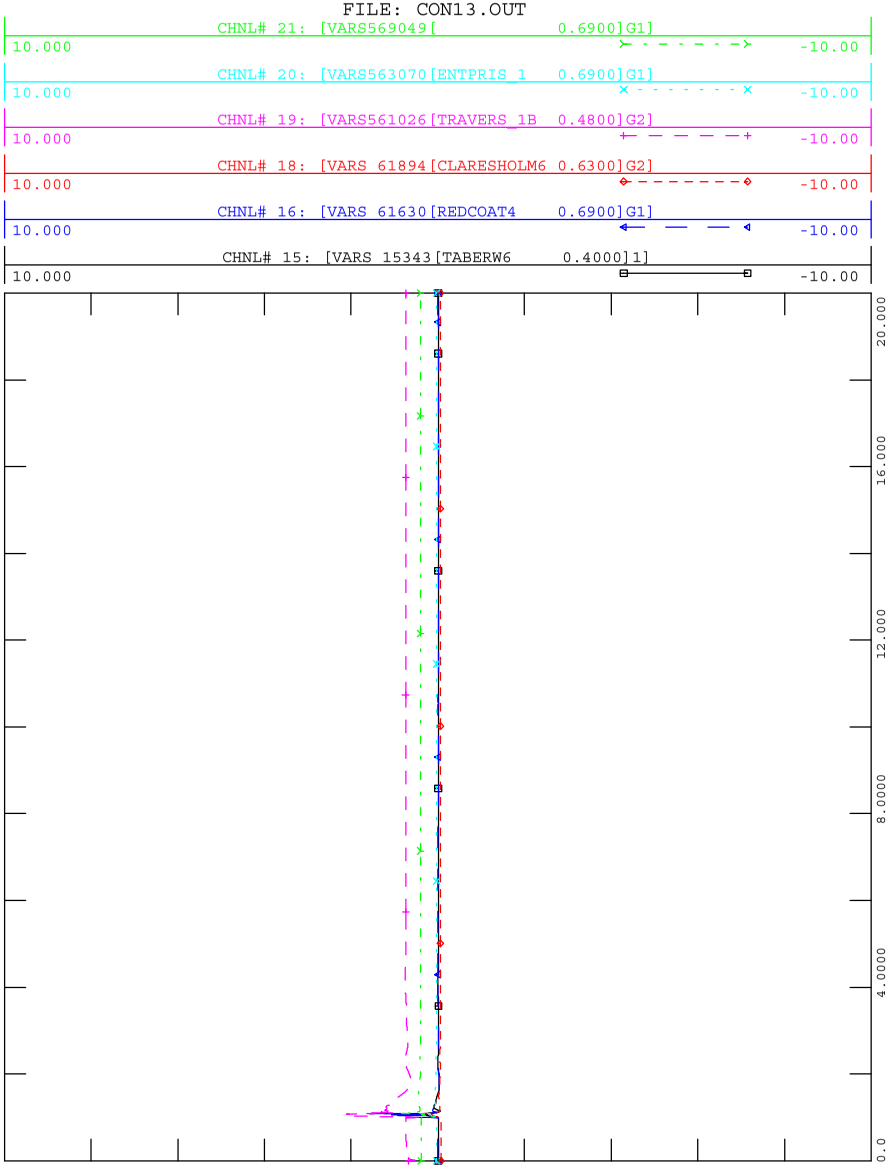
FILE: CON12.OUT



THU, JUN 15 2023 9:13
FIG C-SC4-13

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

FILE: CON13.OUT



THU, JUN 15 2023 9:13
FIG C-SC4-14

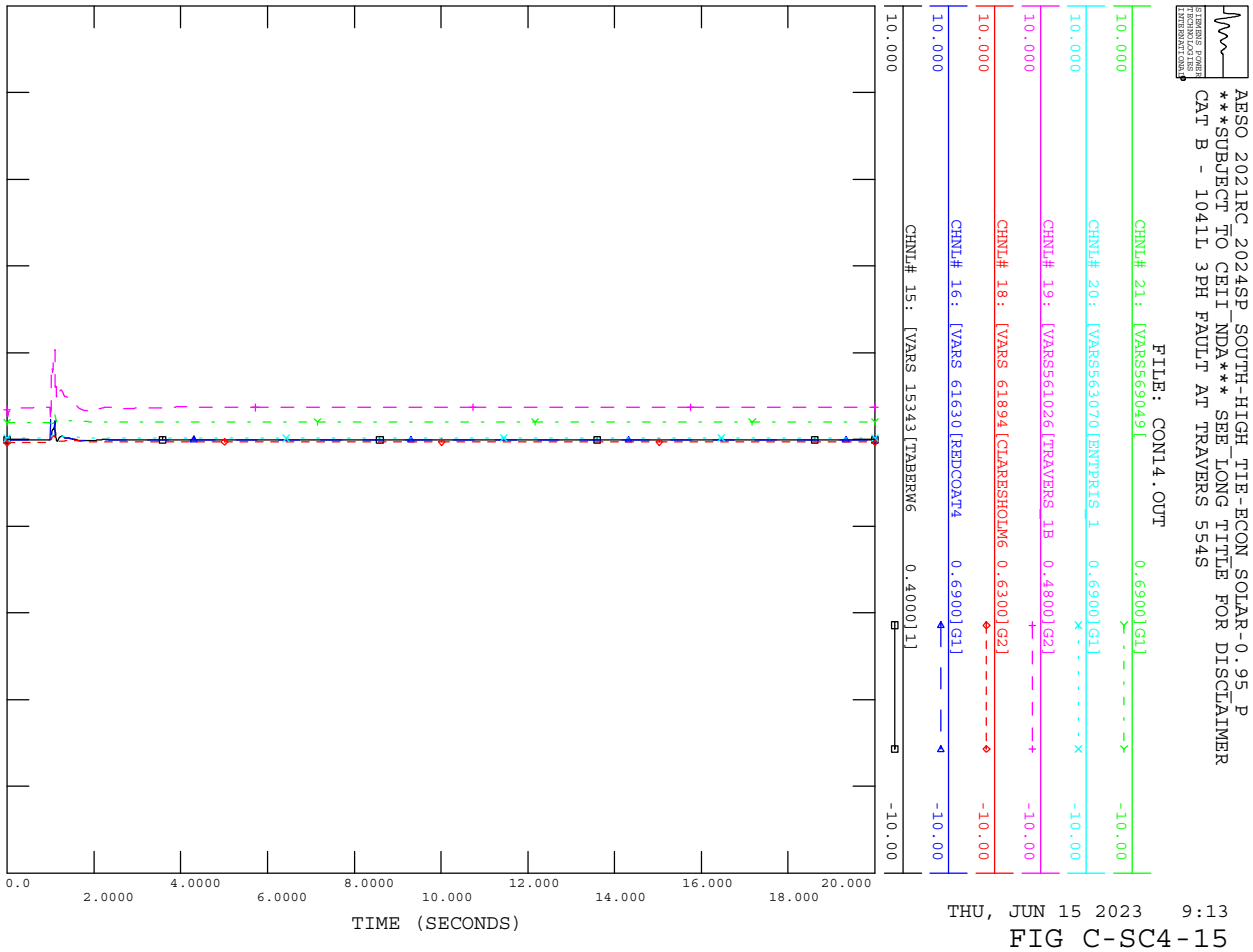


FIG C-SC4-15

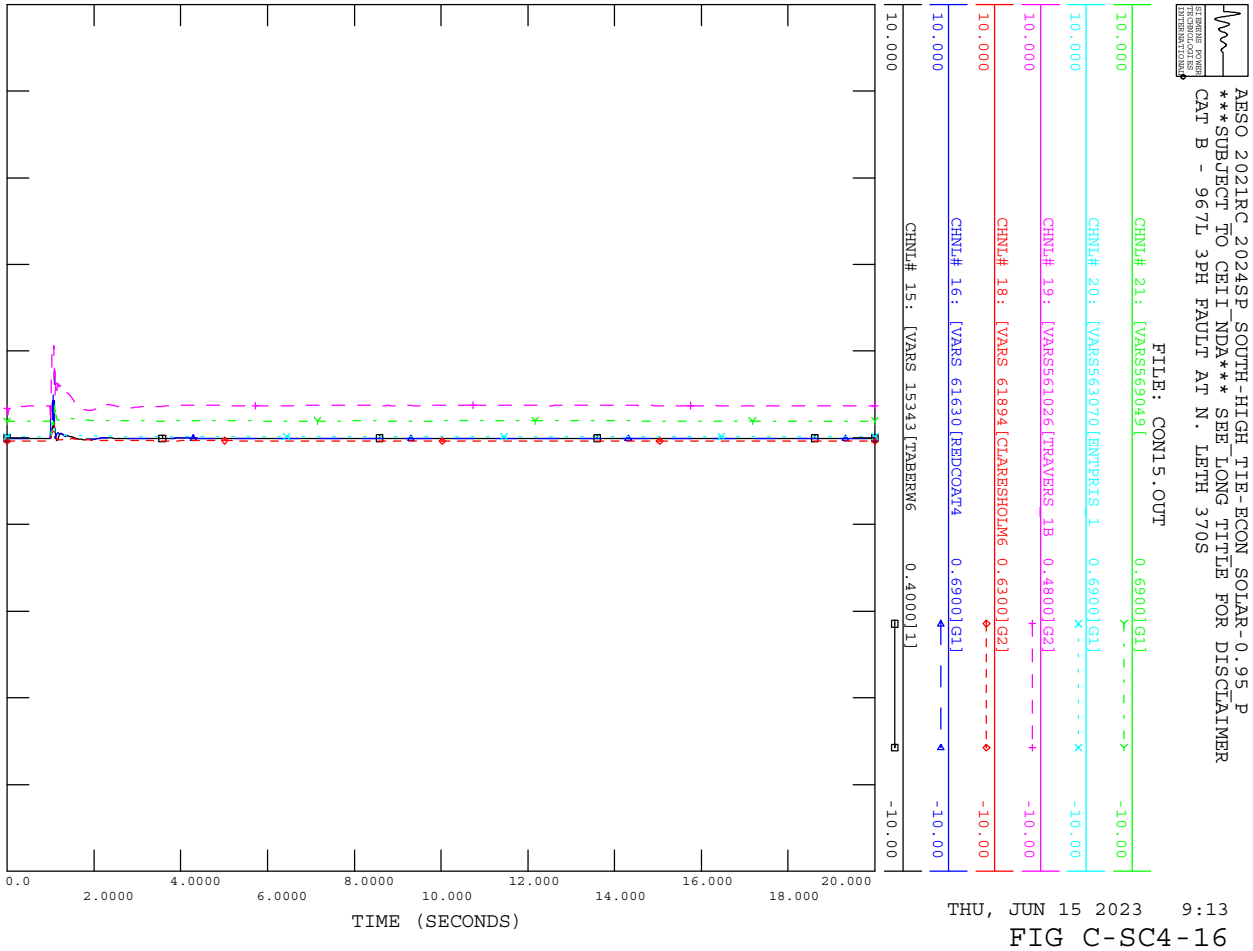
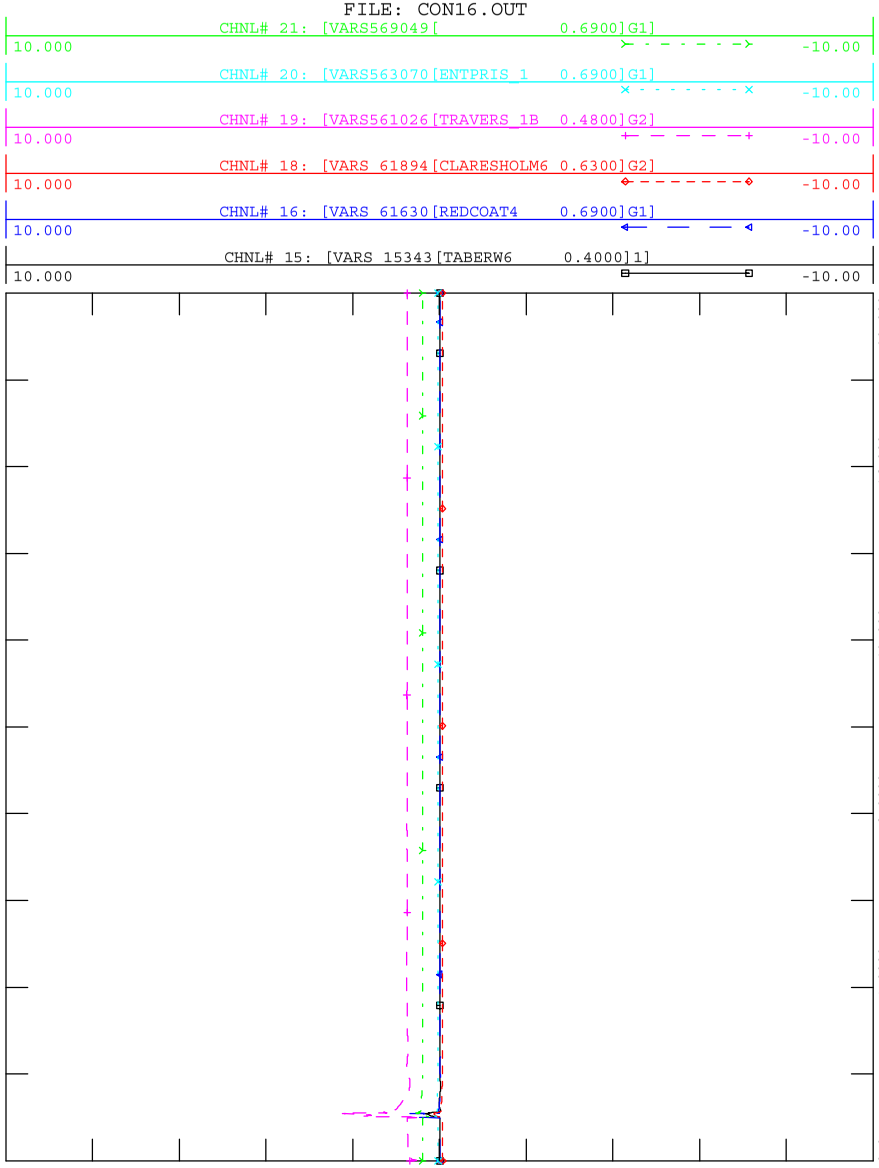


FIG C-SC4-16

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT WIND FLATS 138S

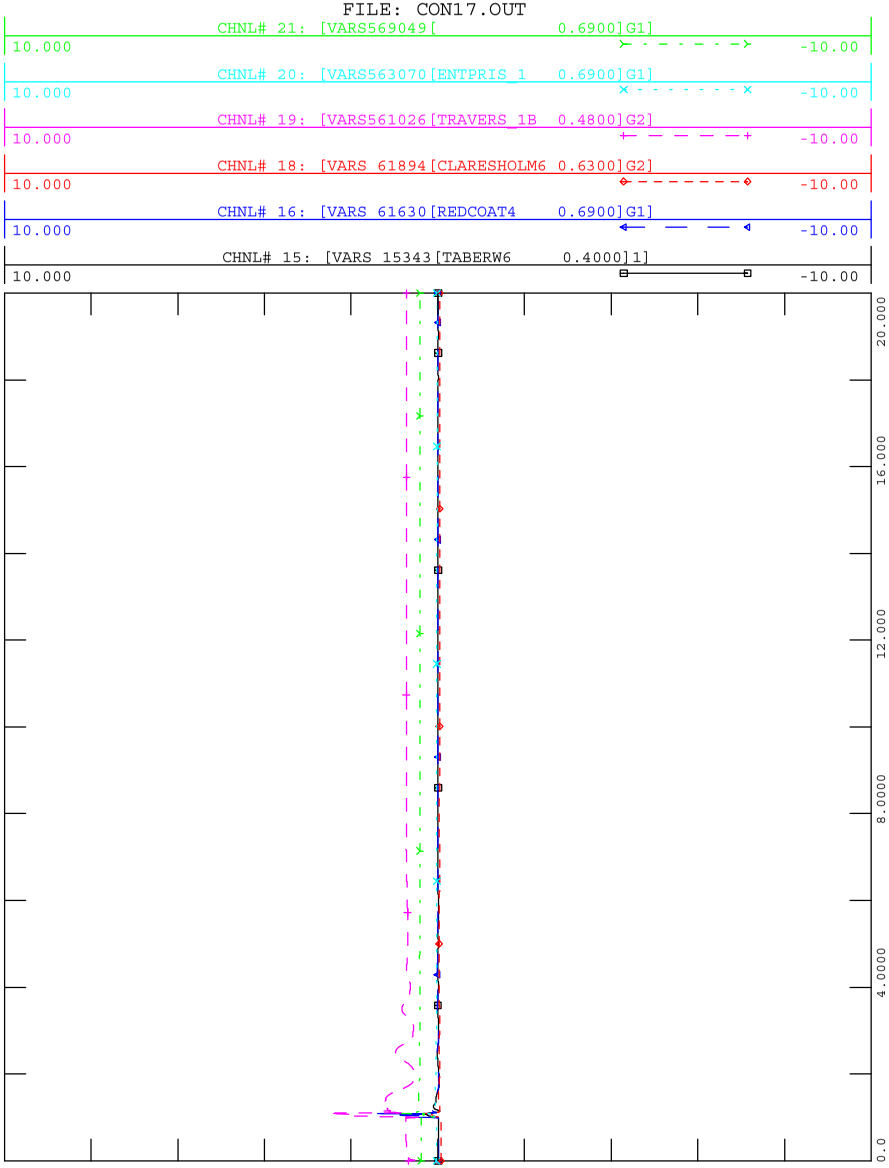
FILE: CON16.OUT



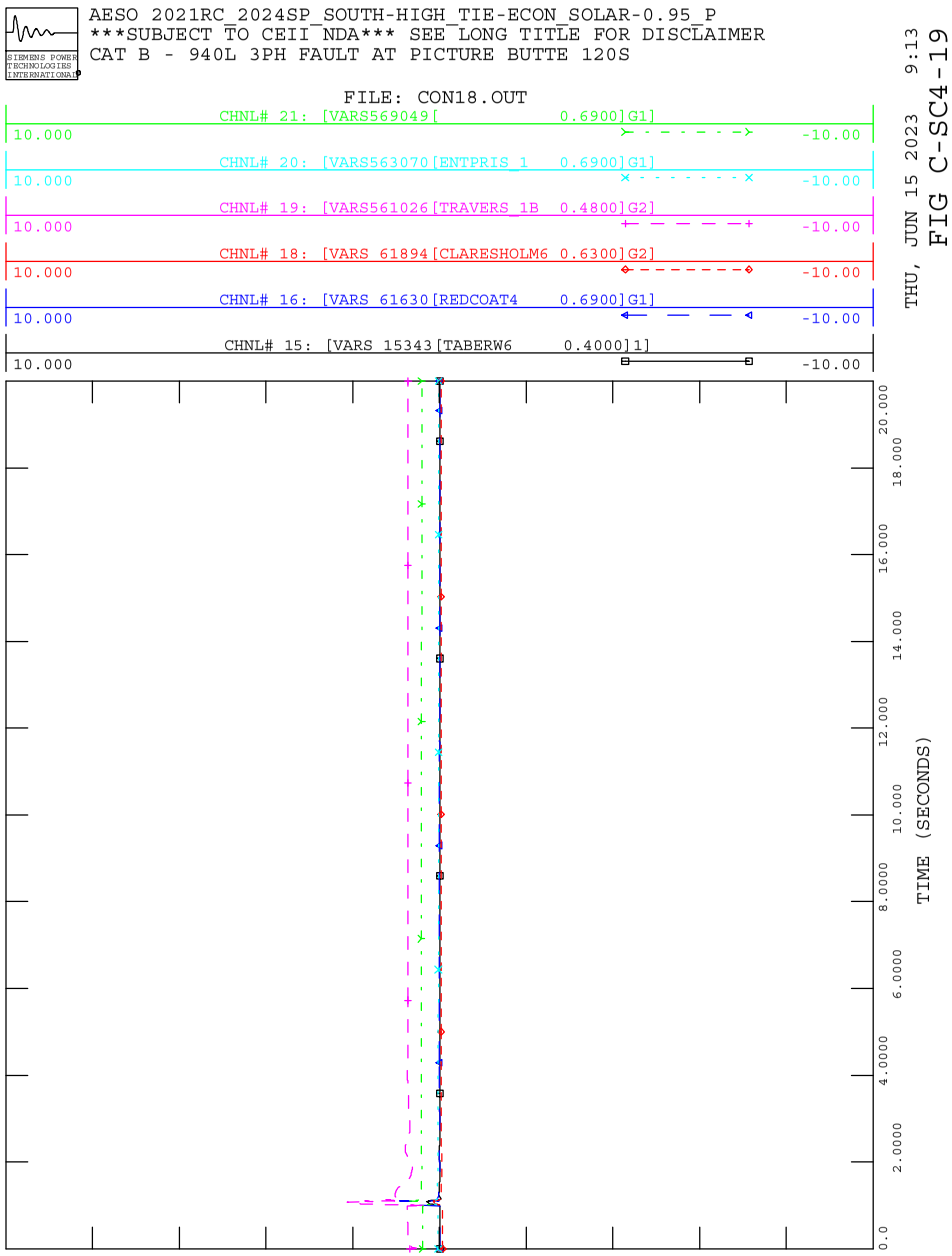
THU, JUN 15 2023 9:13
FIG C-SC4-17

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT N. LETH 370S

FILE: CON17.OUT



THU, JUN 15 2023 9:13
FIG C-SC4-18


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S
FILE: CON18.OUT
CHNL# 21: [VARS569049[0.6900]G1]
10.000
-10.00
CHNL# 20: [VARS563070[ENTPRIS_1 0.6900]G1]
10.000
-10.00
CHNL# 19: [VARS561026[TRAVERS_1B 0.4800]G2]
10.000
-10.00
CHNL# 18: [VARS 61894[CLARESHOLM6 0.6300]G2]
10.000
-10.00
CHNL# 16: [VARS 61630[REDCOAT4 0.6900]G1]
10.000
-10.00
CHNL# 15: [VARS 15343[TABERW6 0.4000]1]
10.000
-10.00
20.000
18.000
16.000
14.000
12.000
10.000
8.0000
6.0000
4.0000
2.0000
0.0
TIME (SECONDS)
THU, JUN 15 2023 9:13
FIG C-SC4-19

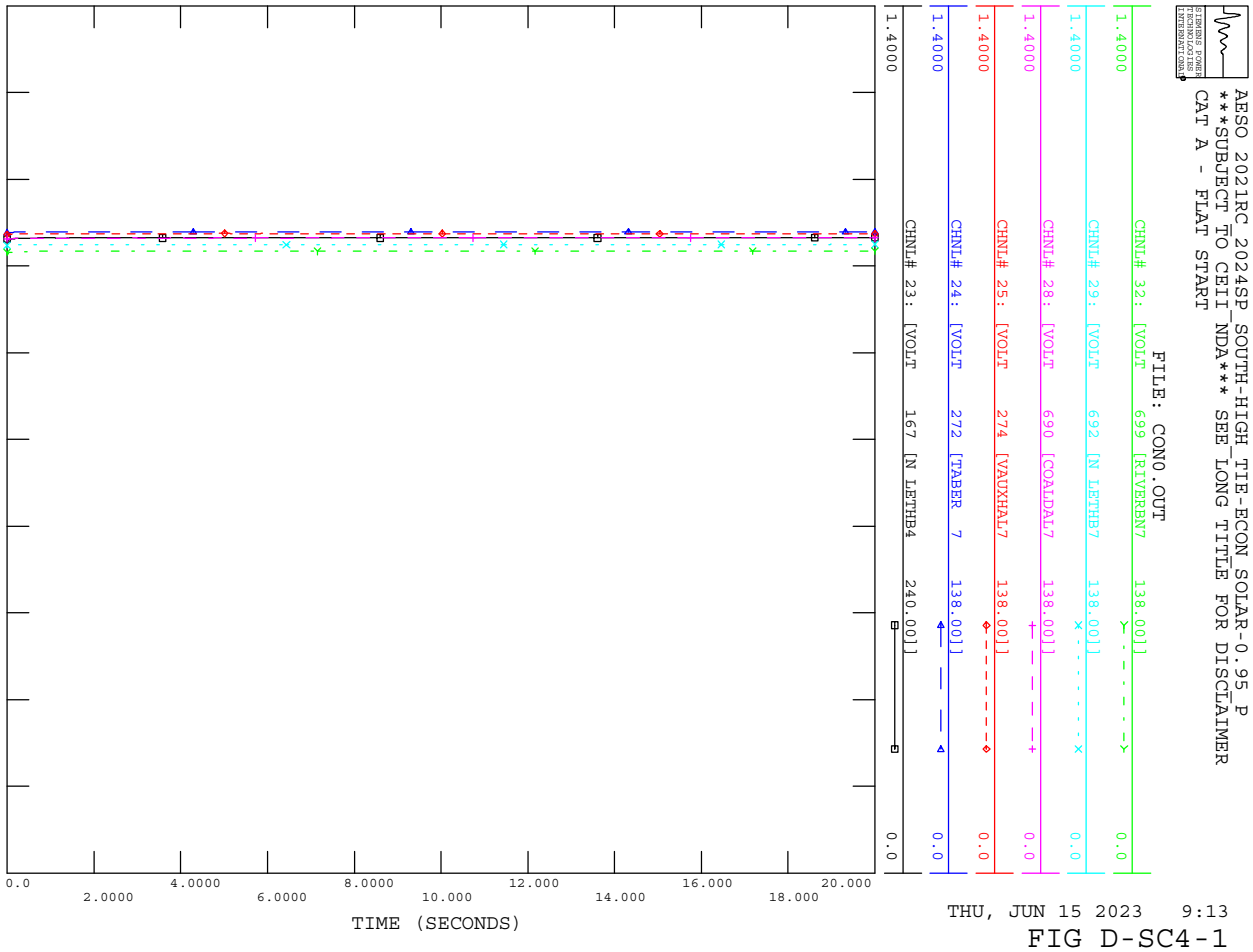


FIG D-SC4-1

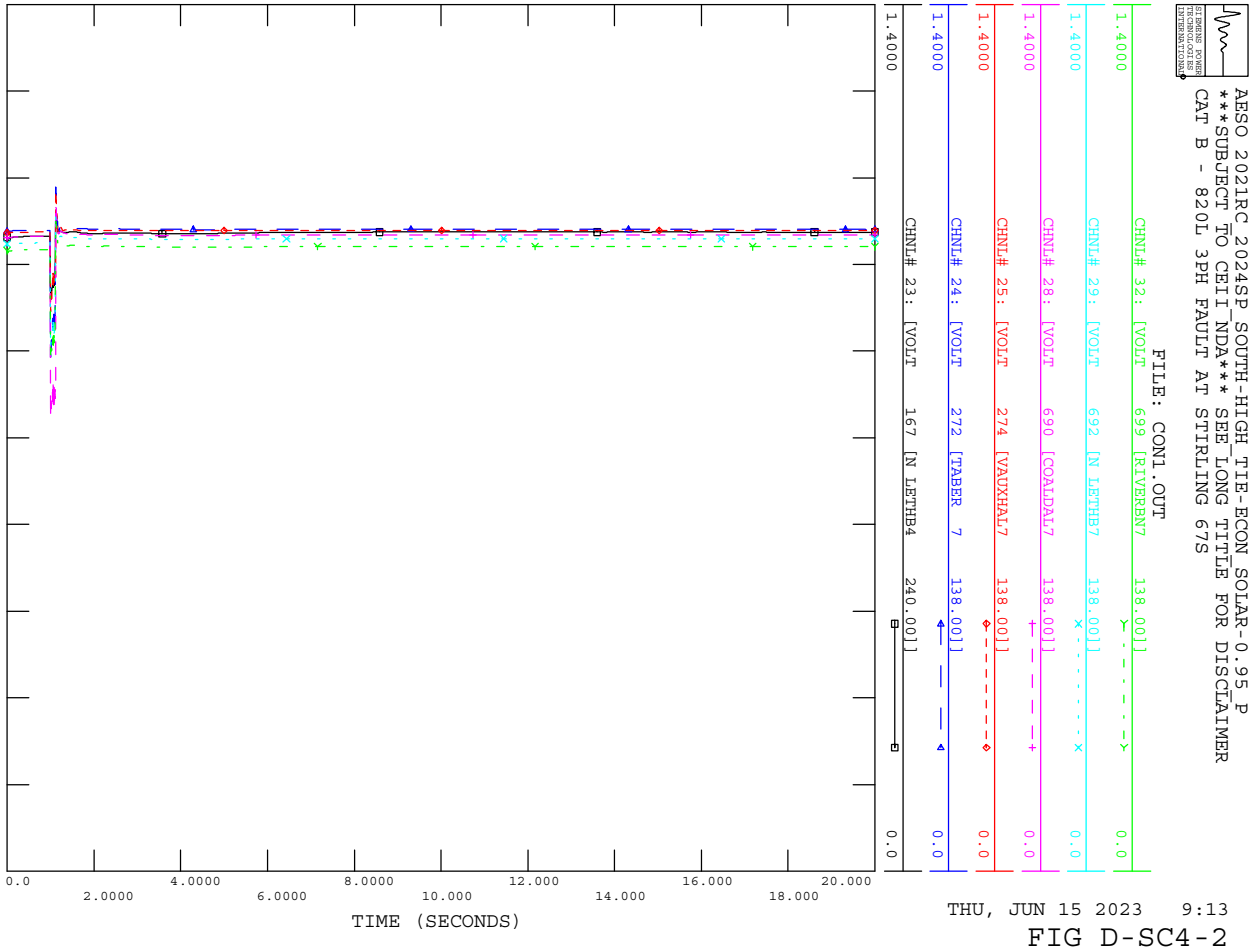


FIG D-SC4-2

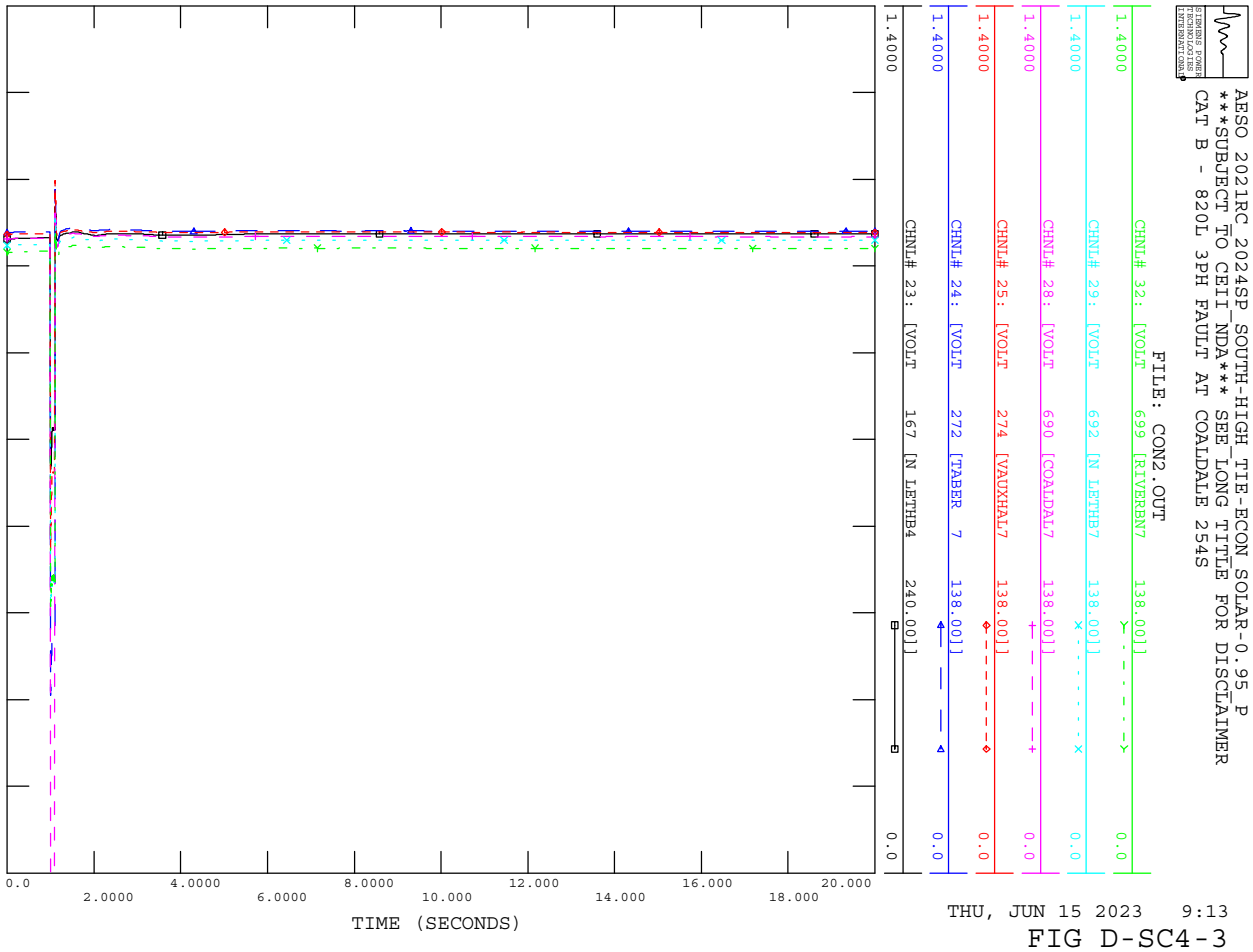


FIG D-SC4-3

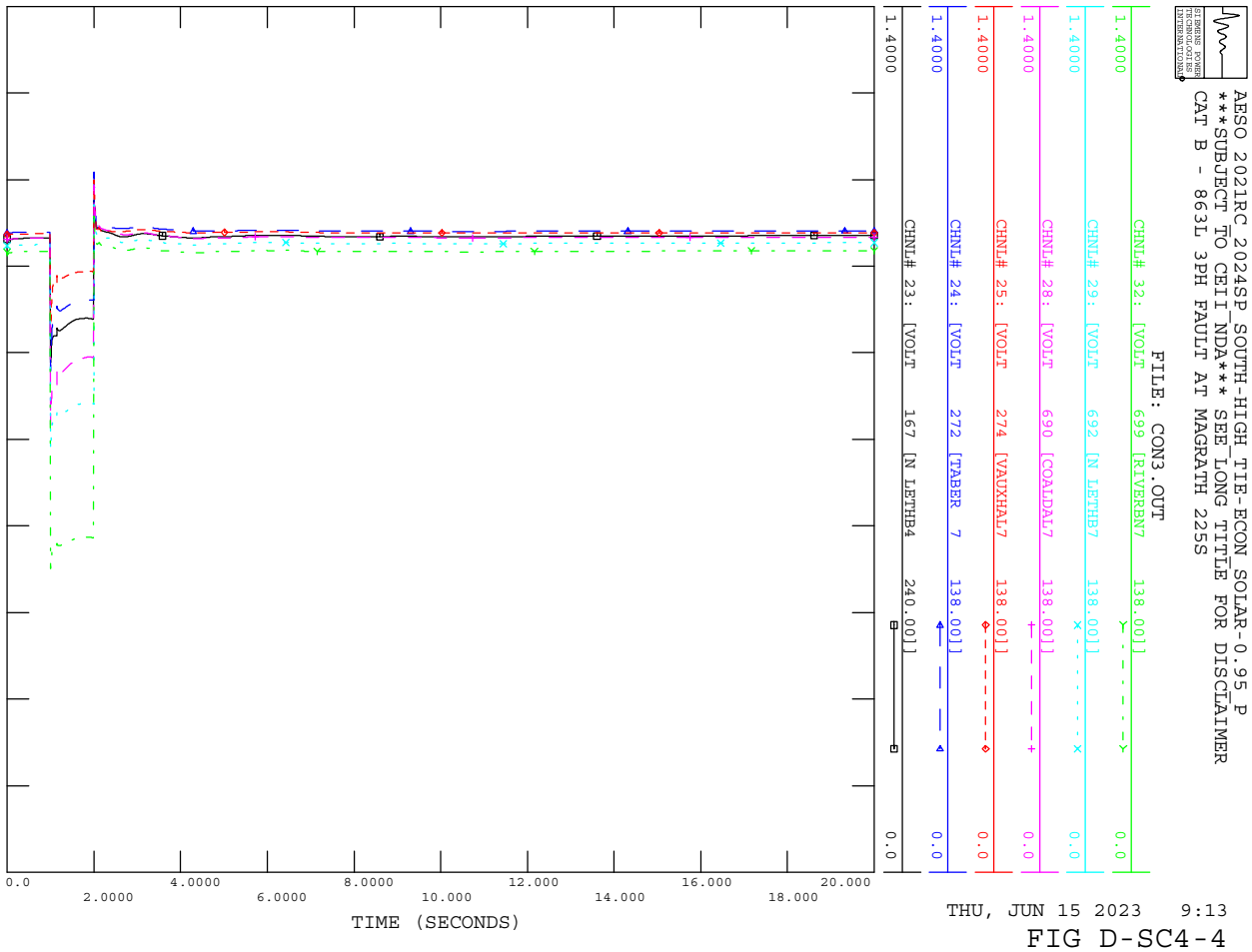
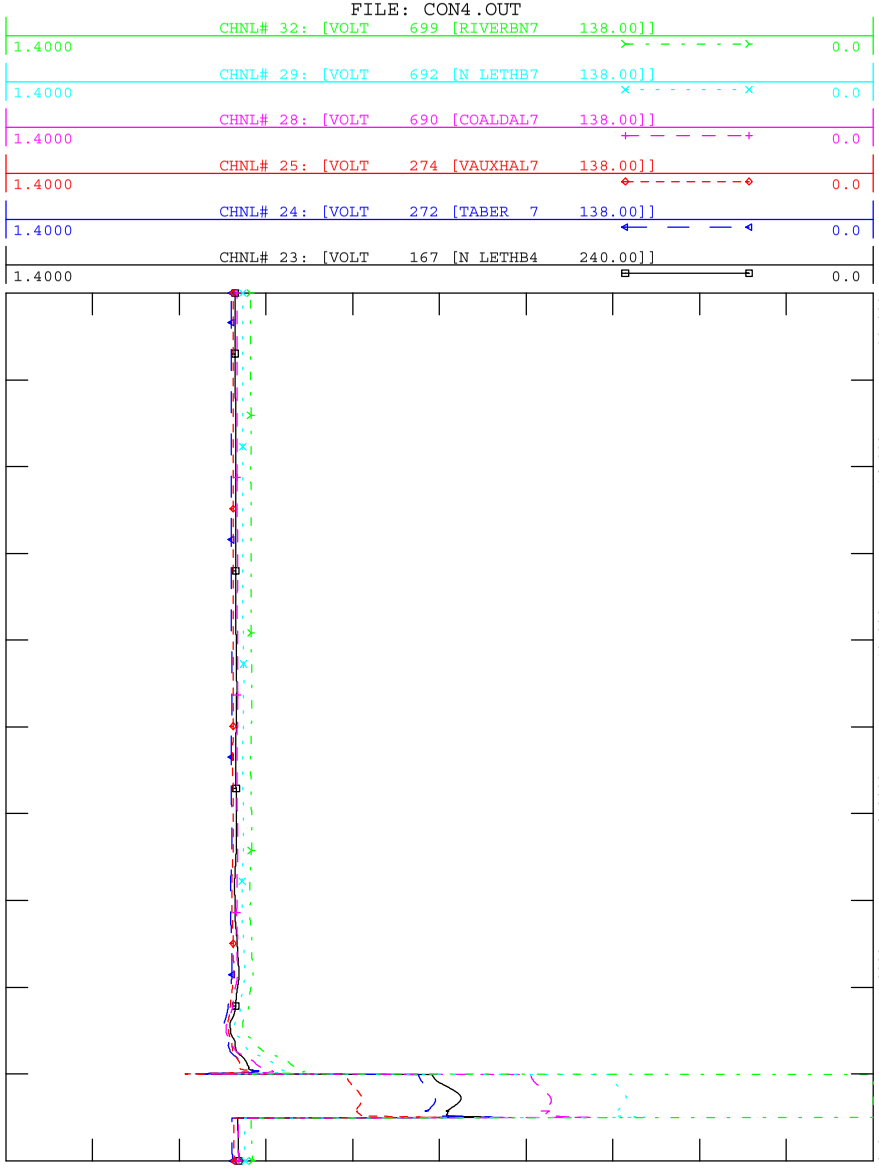


FIG D-SC4-4

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT RIVERBEND 618S

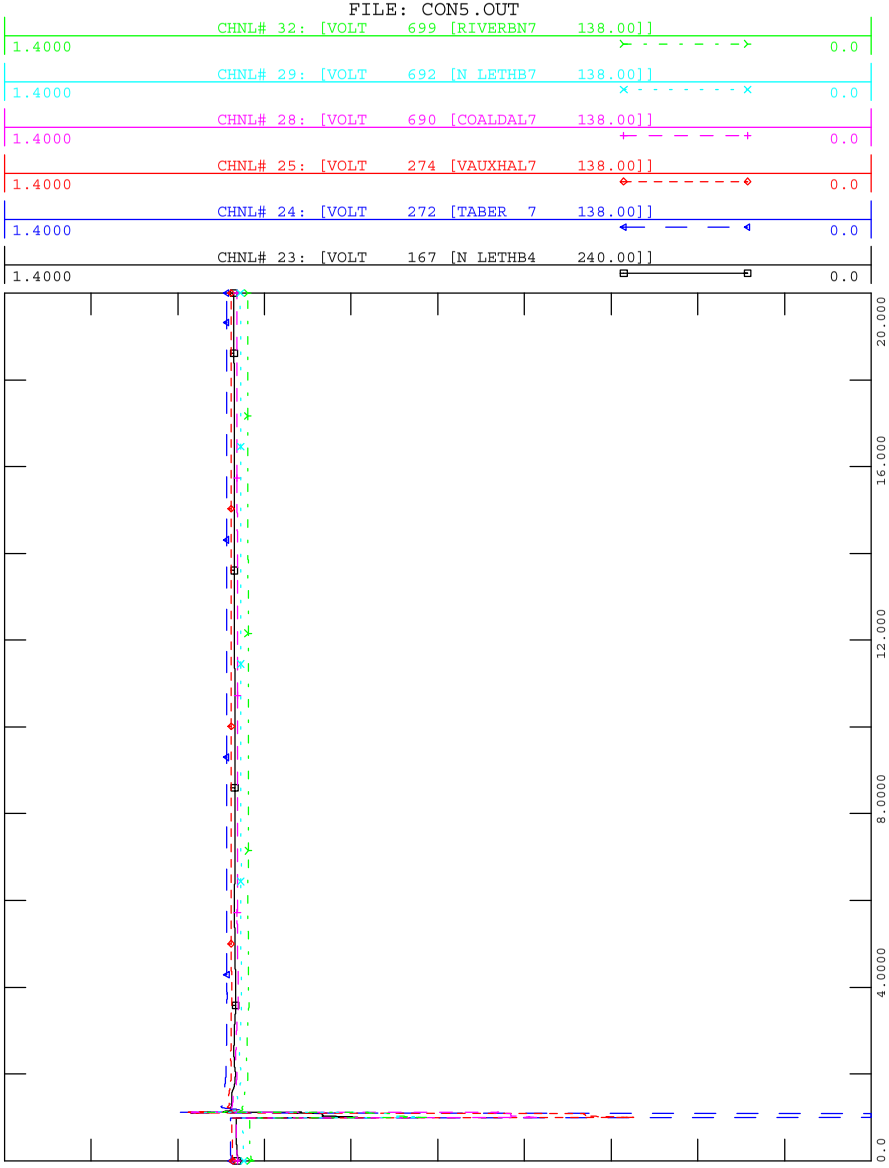
FILE: CON4.OUT



THU, JUN 15 2023 9:13
FIG D-SC4-5

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT TABER 83S

FILE: CON5.OUT



THU, JUN 15 2023 9:13
FIG D-SC4-6

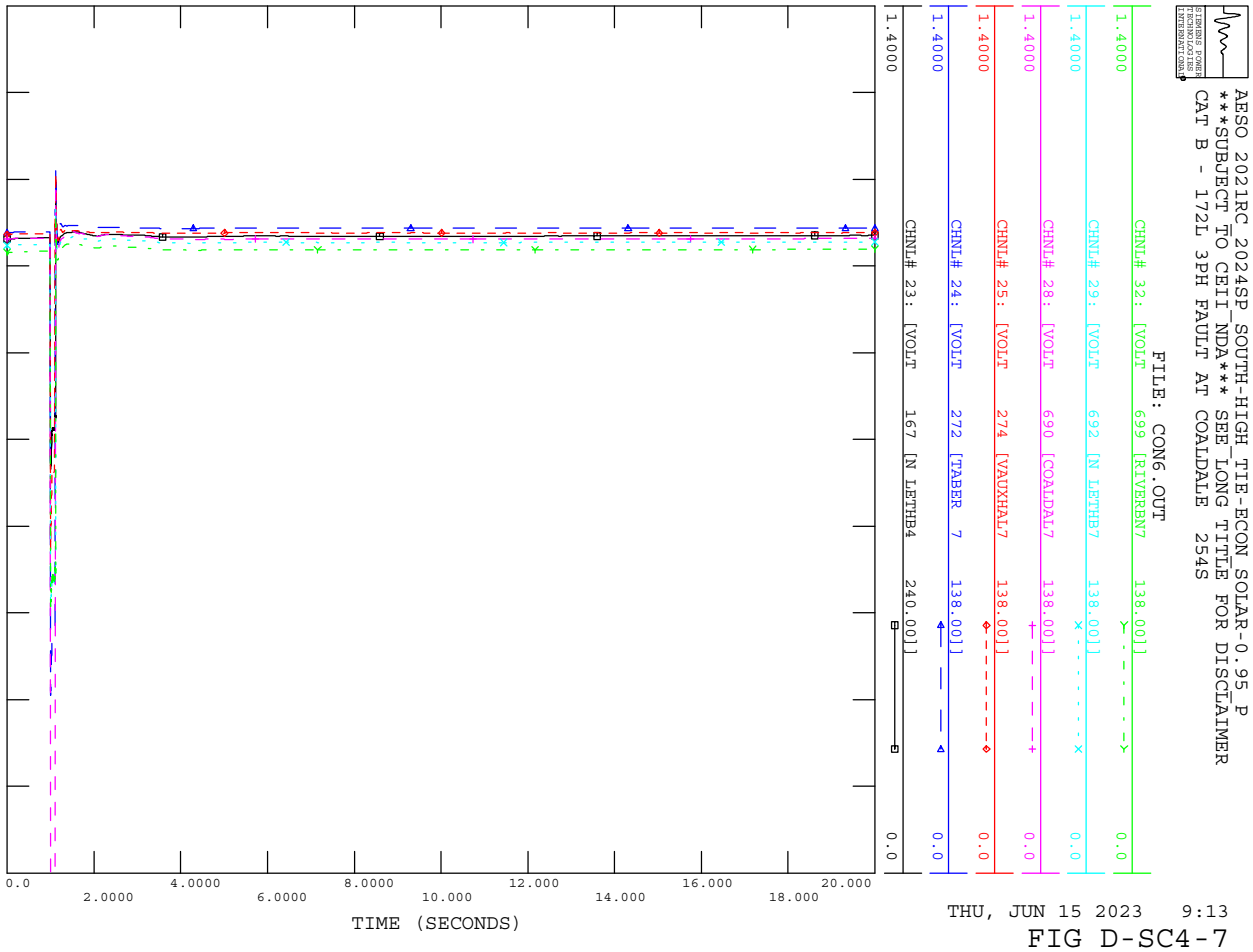


FIG D-SC4-7

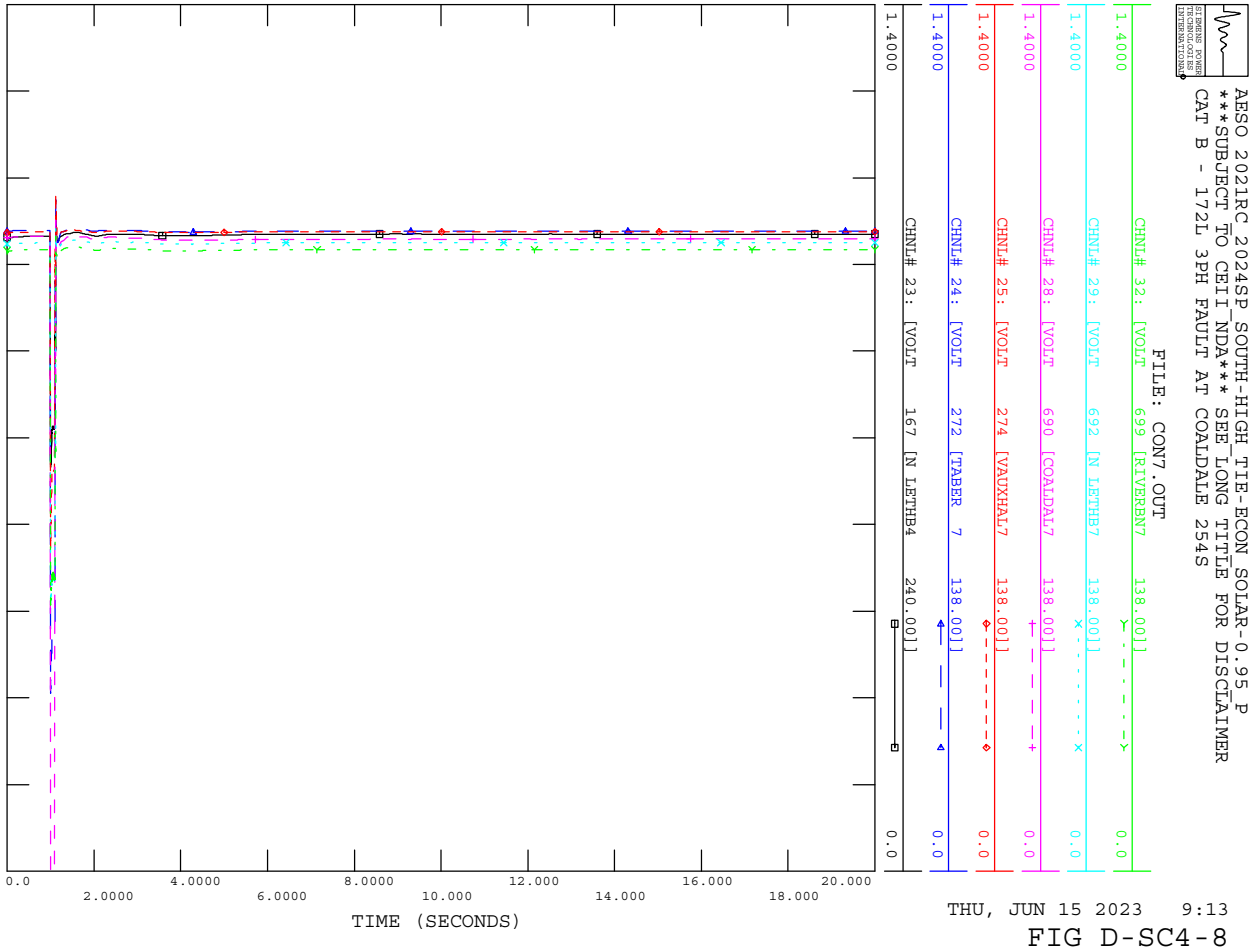


FIG D-SC4-8

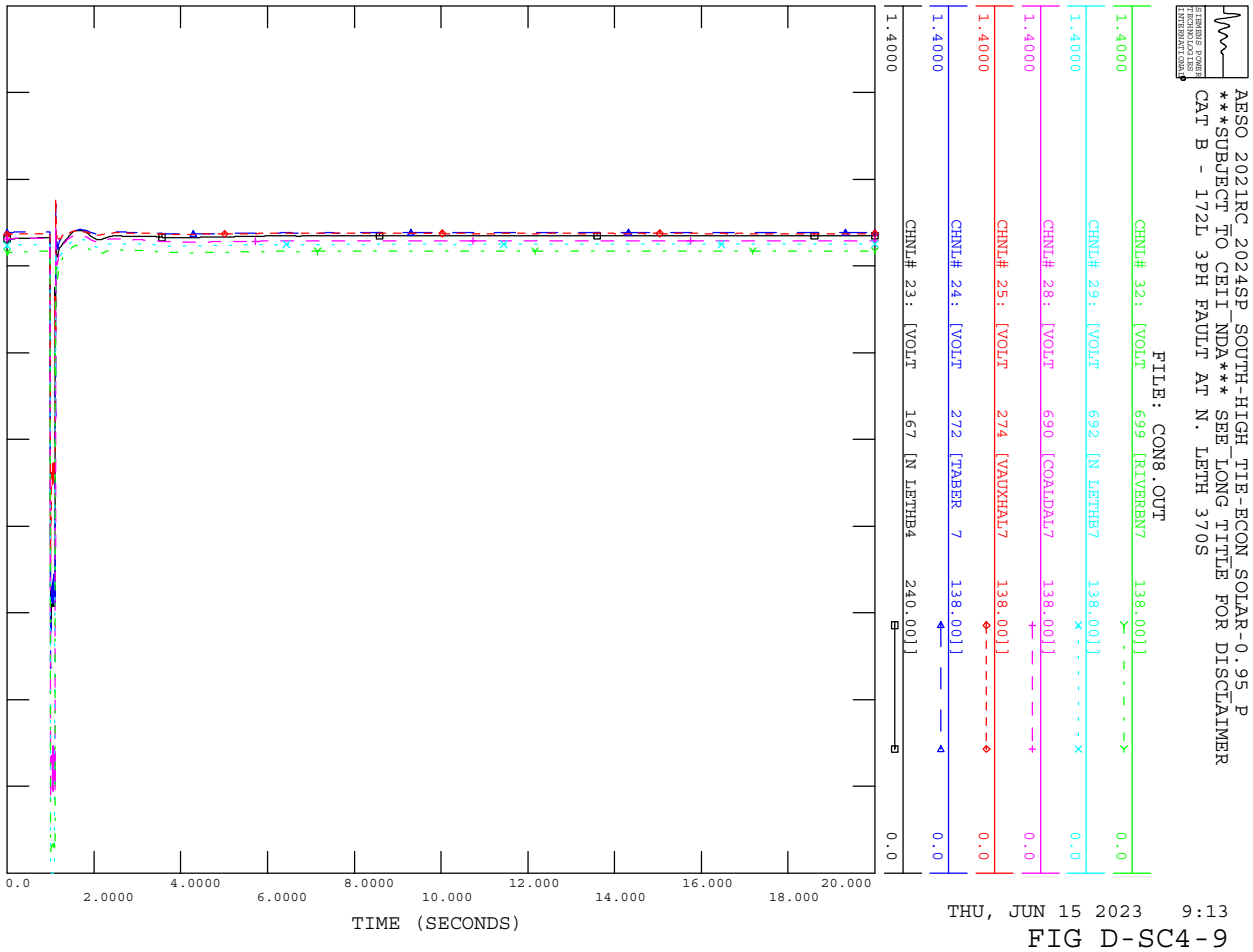


FIG D-SC4-9

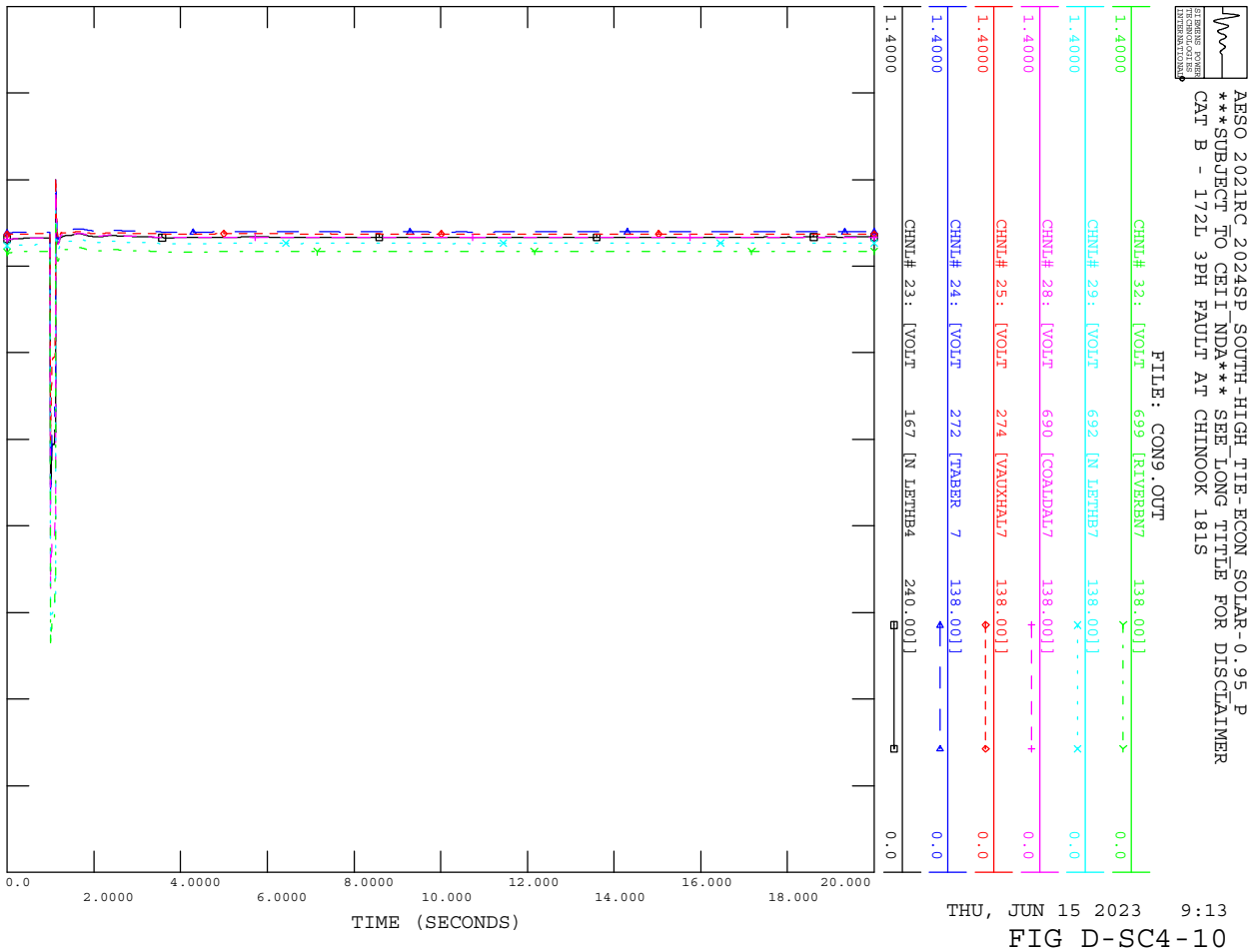
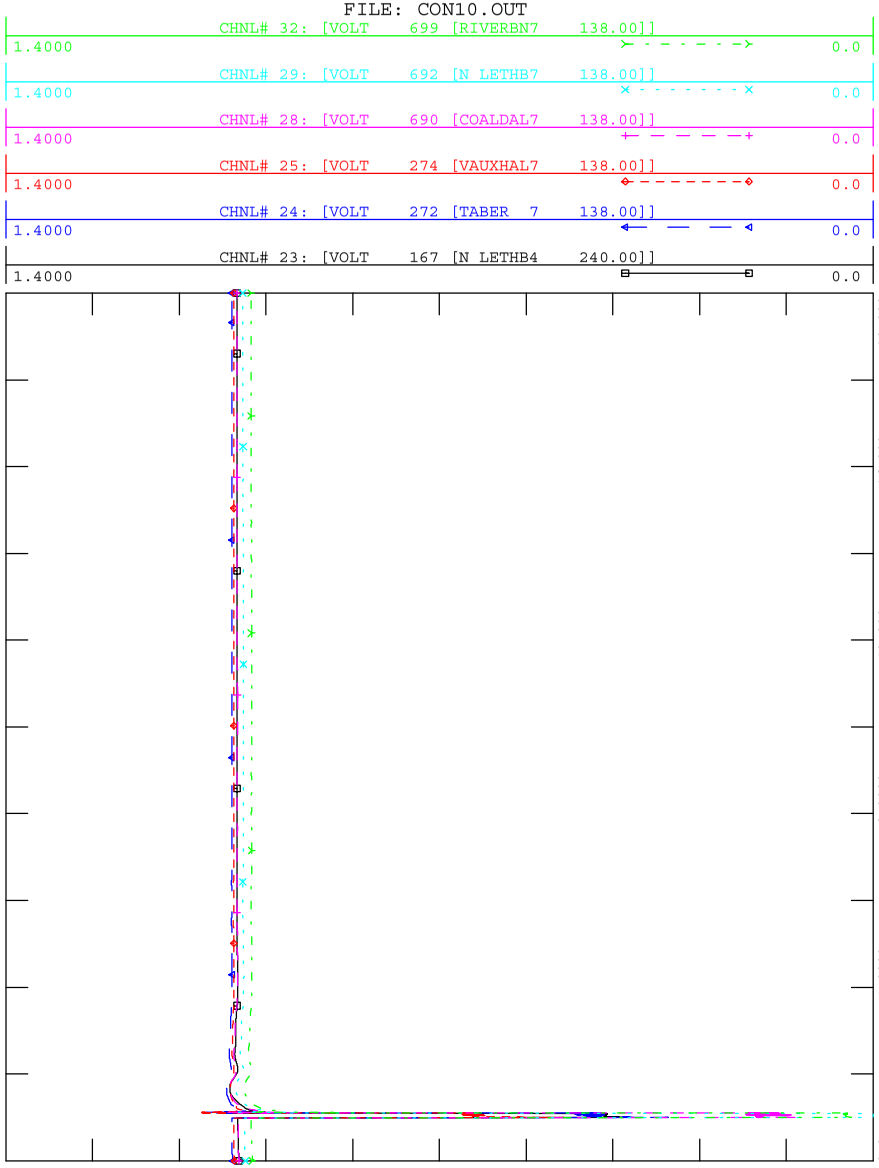


FIG D-SC4-10

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

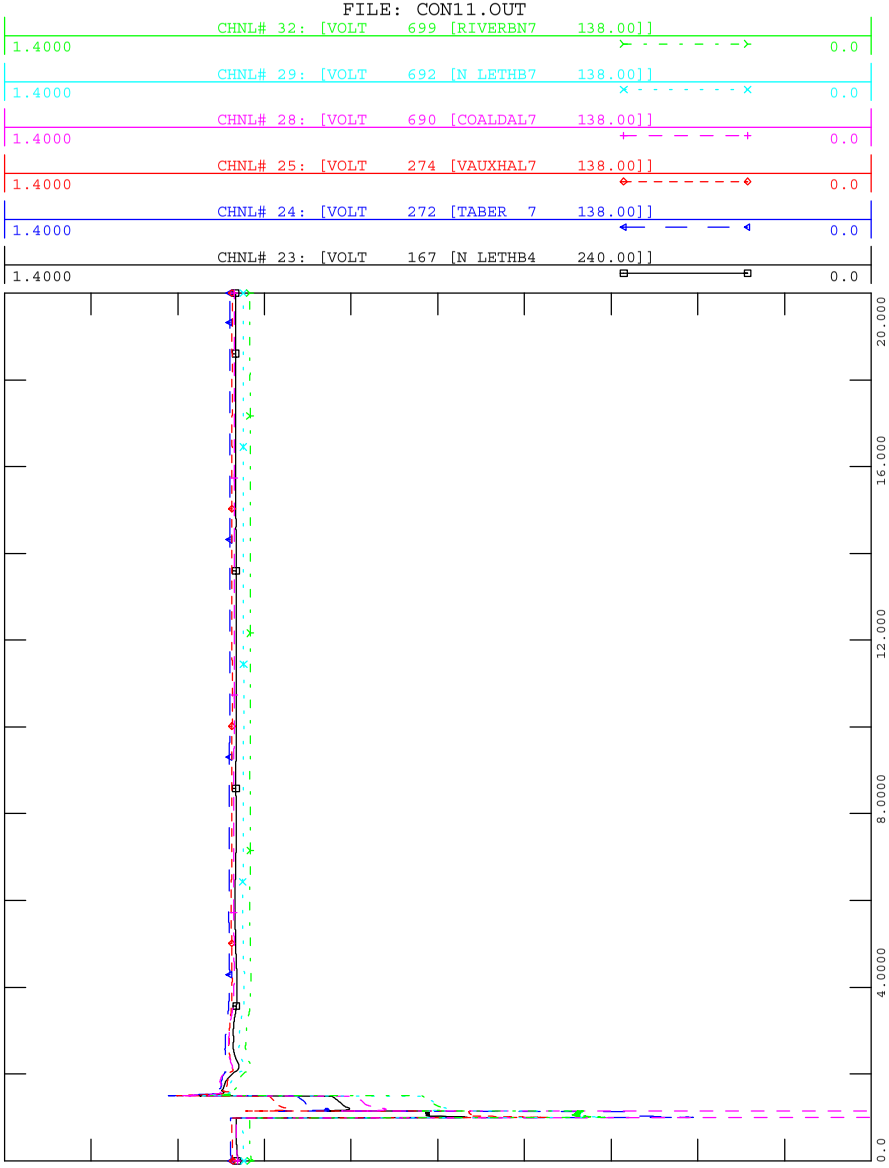


THU, JUN 15 2023 9:13

FIG D-SC4-11

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT



THU, JUN 15 2023 9:13

FIG D-SC4-12

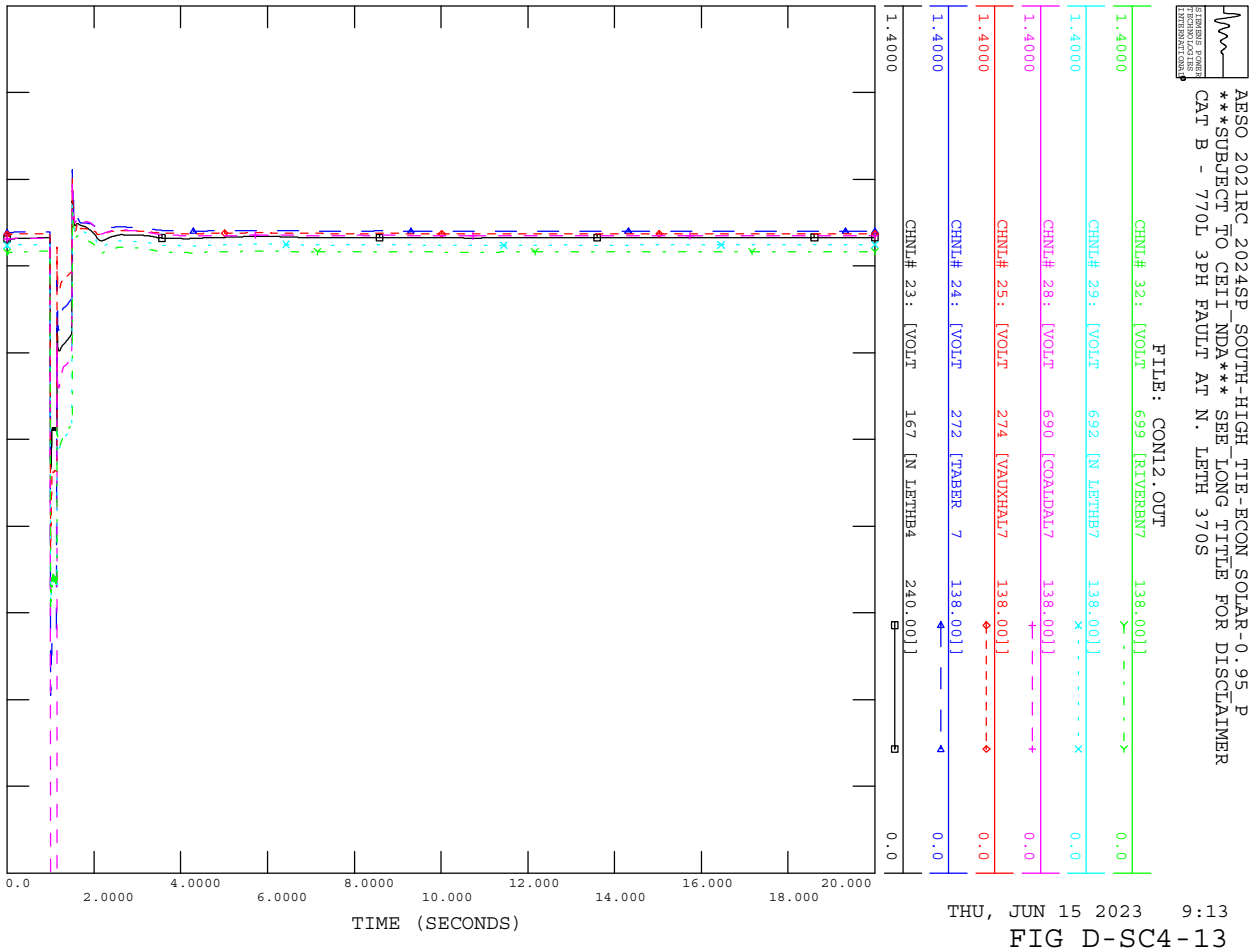


FIG D-SC4-13

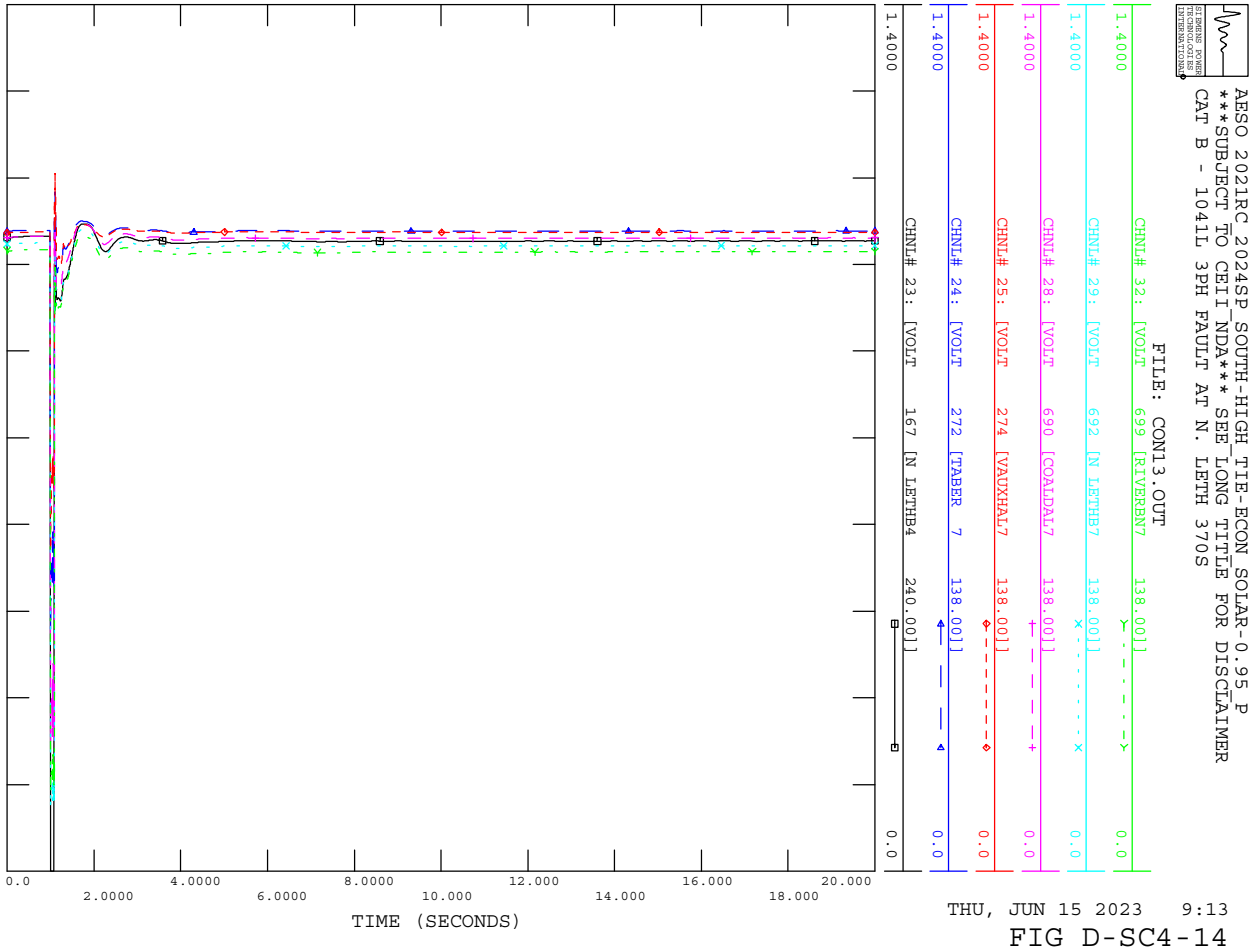


FIG D-SC4-14

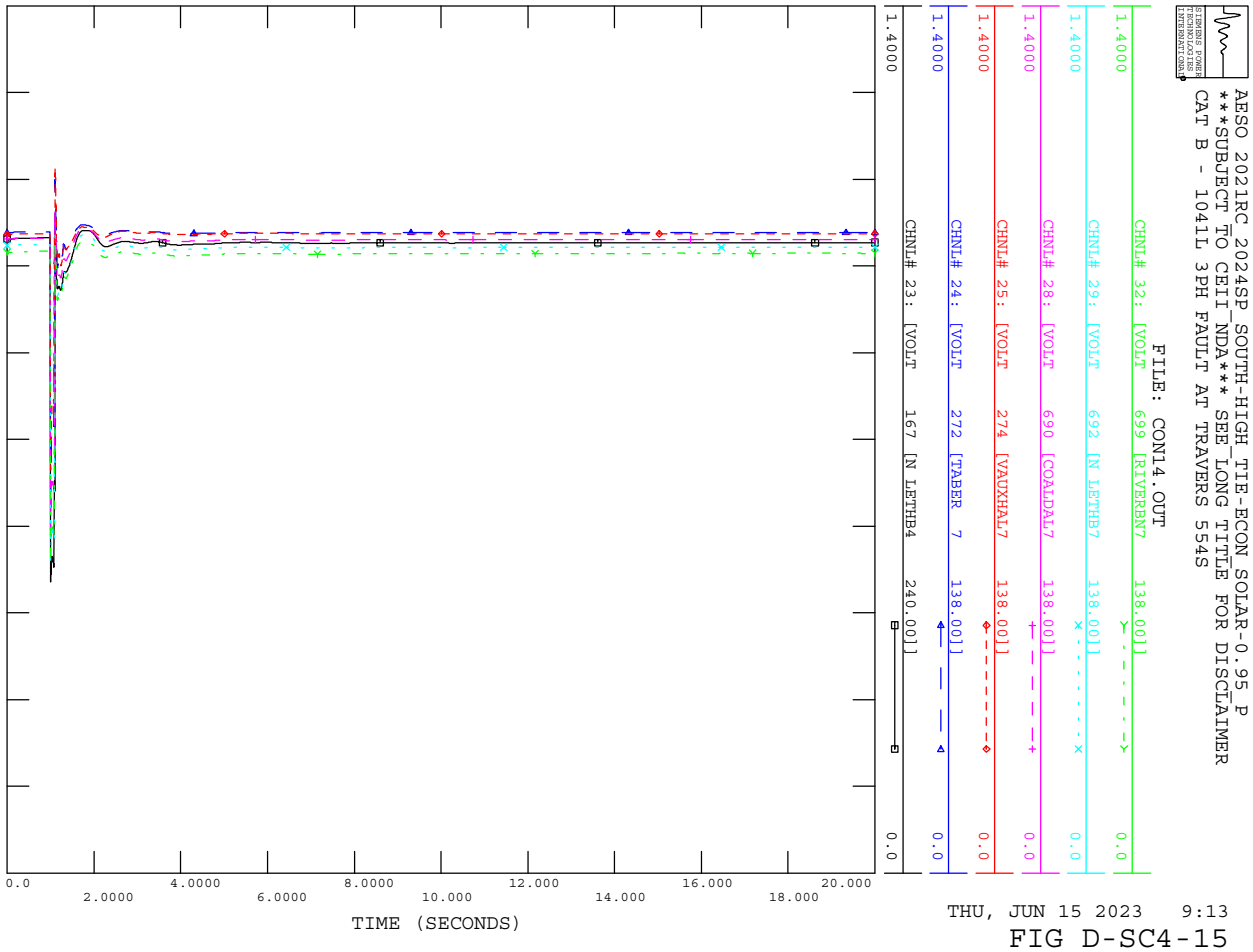


FIG D-SC4-15

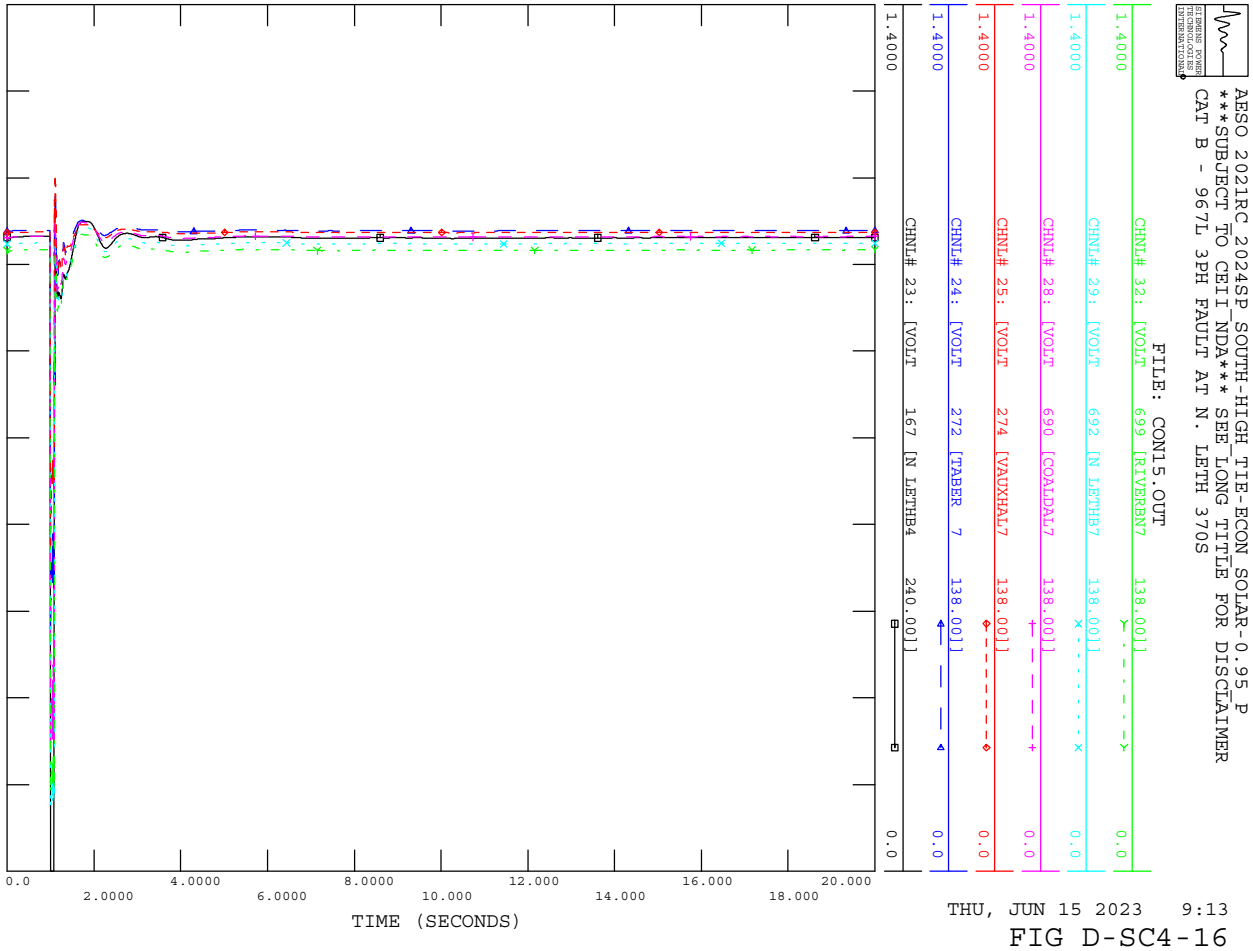


FIG D-SC4-16

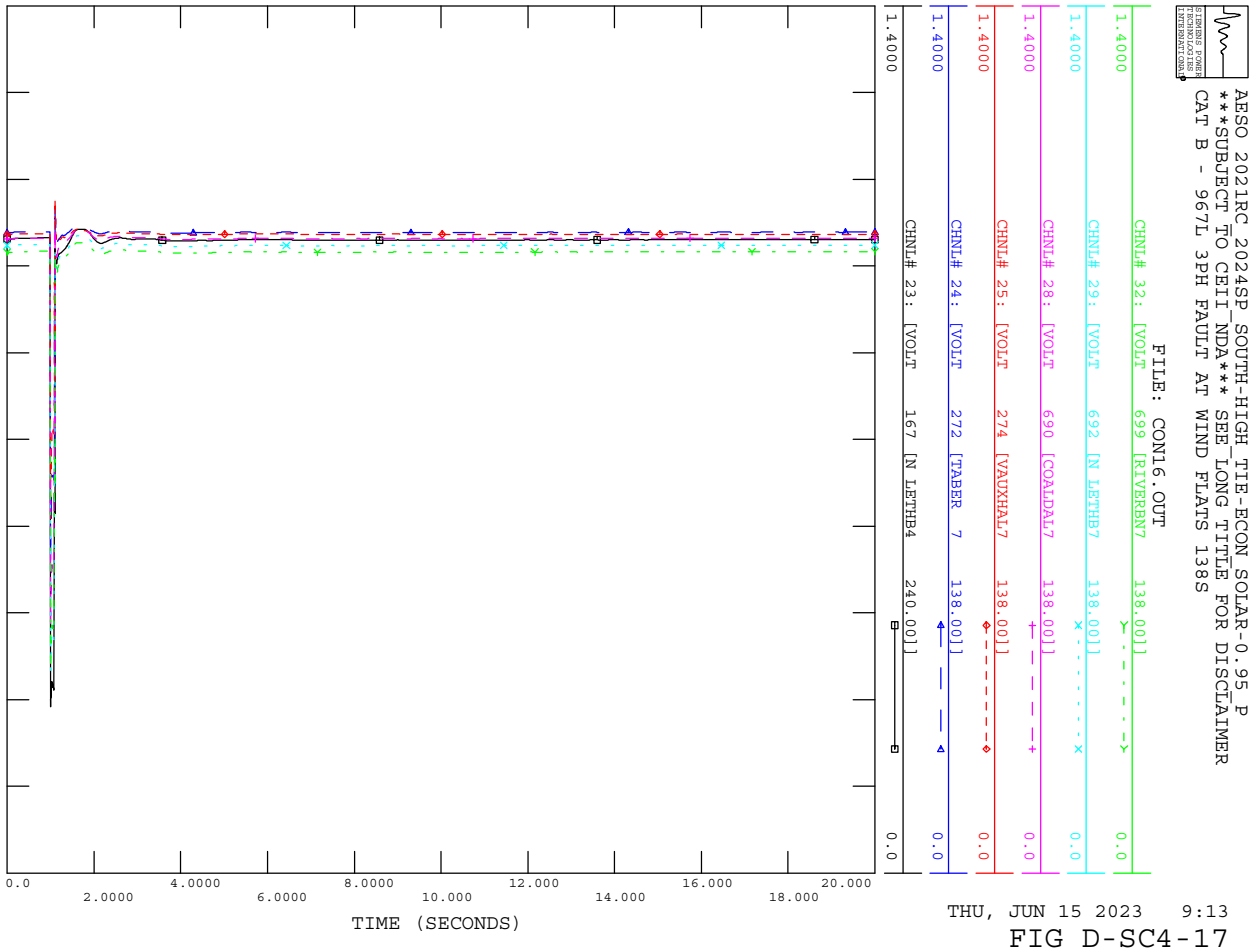


FIG D-SC4-17

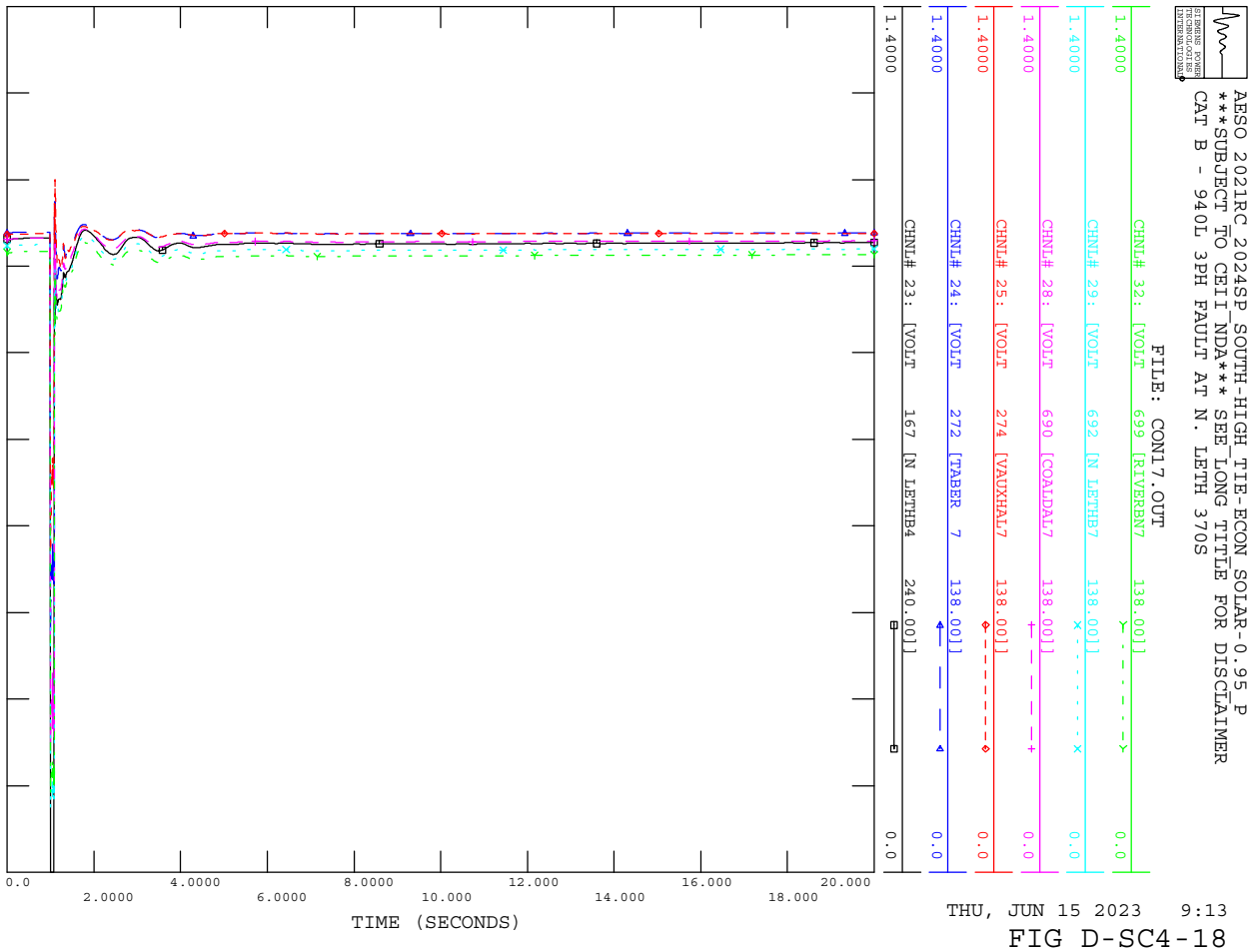


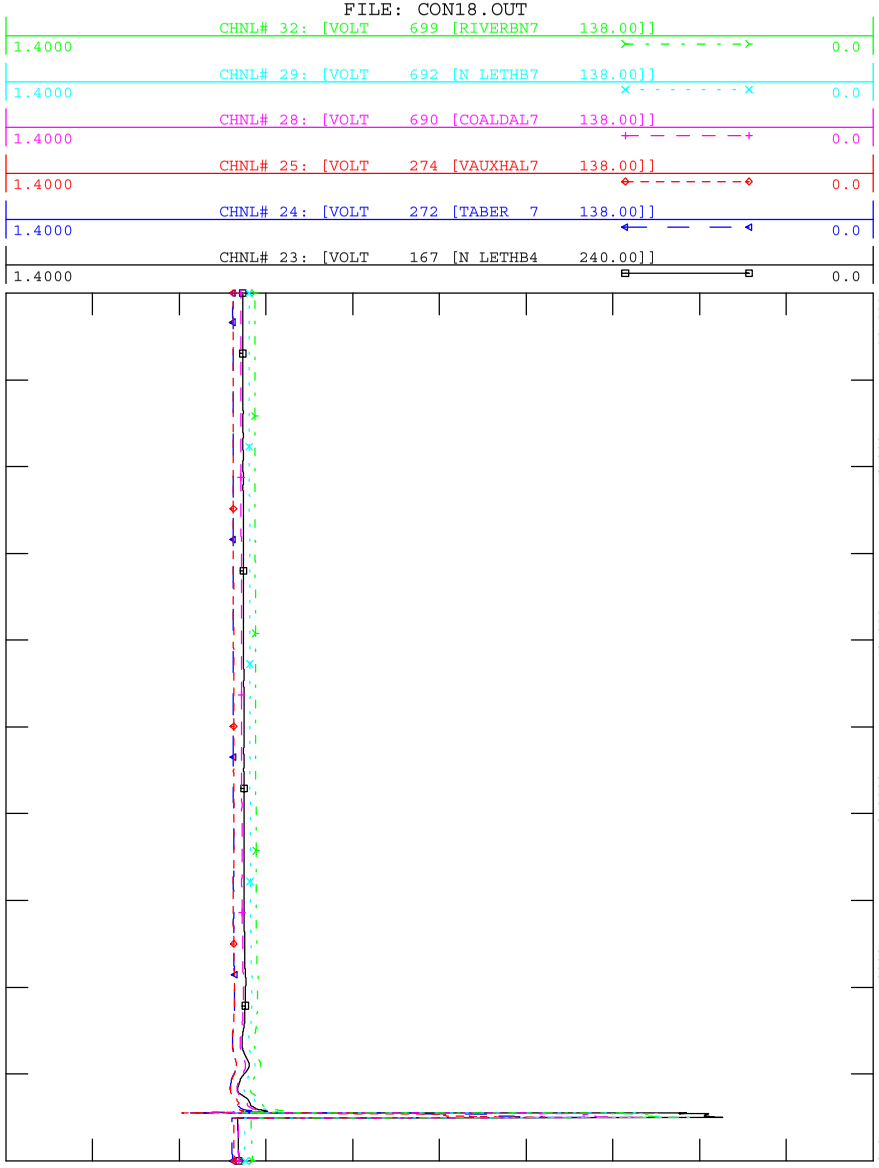
FIG D-SC4-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

THU, JUN 15 2023 9:13

FIG D-SC4-19



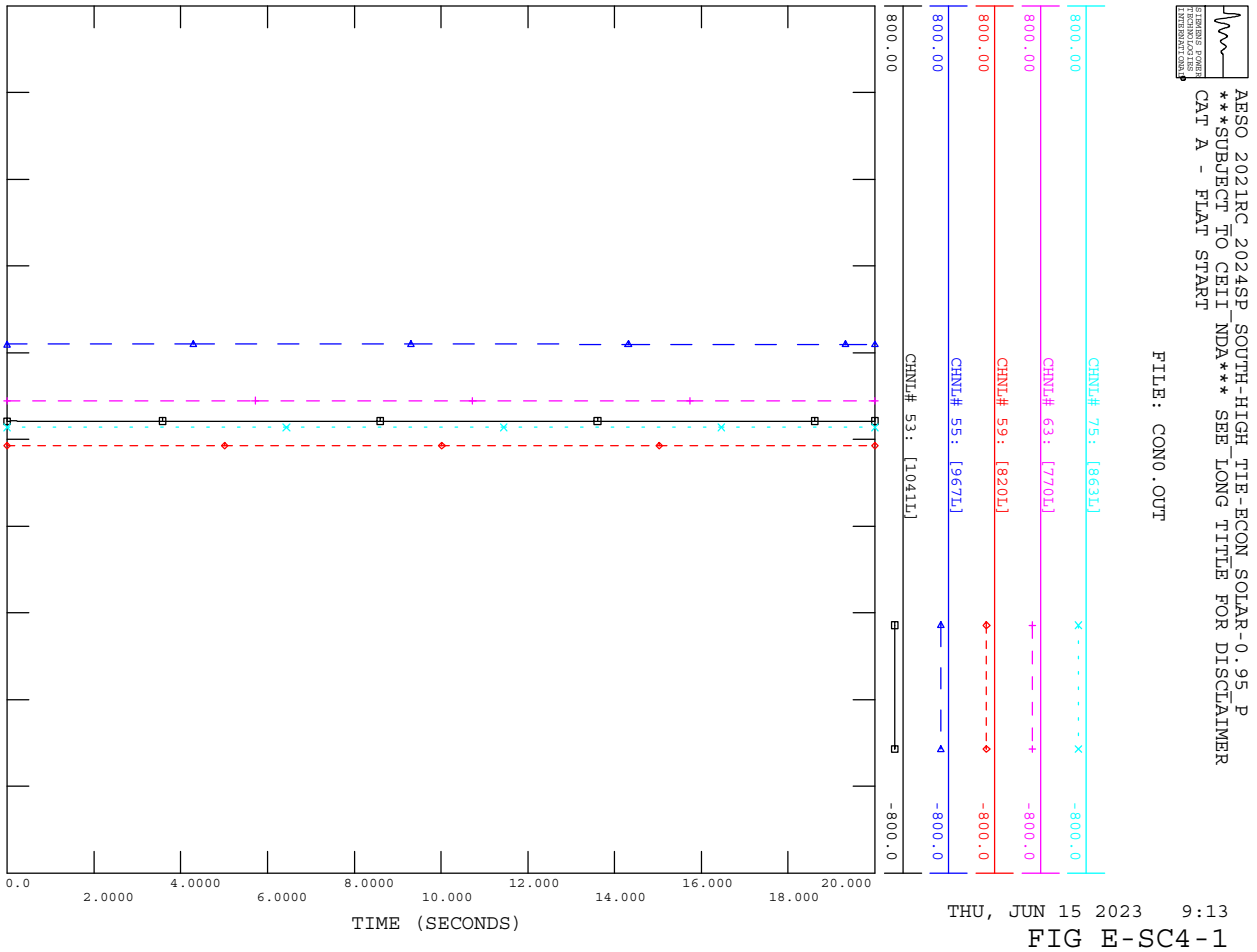


FIG E-SC4-1

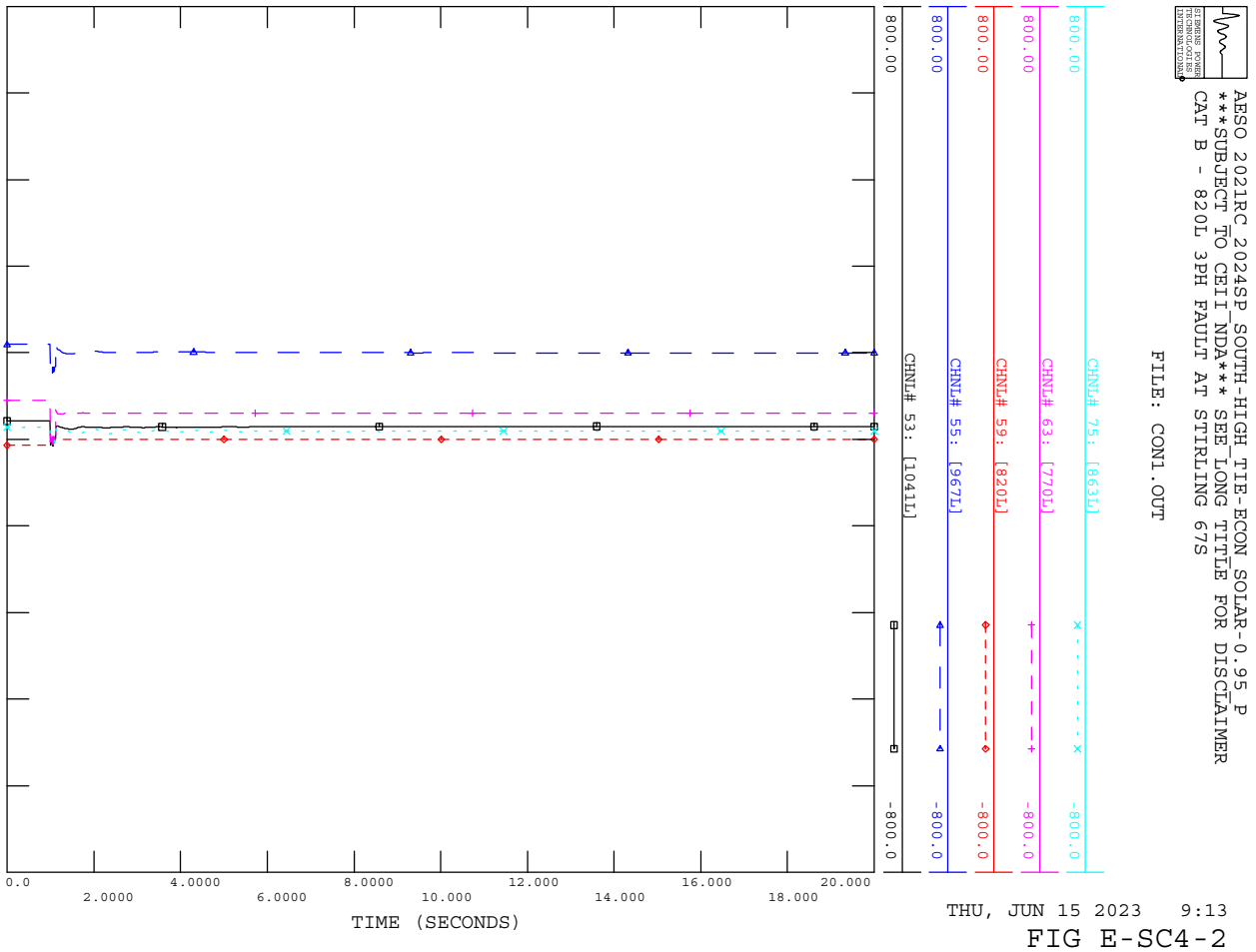


FIG E-SC4-2

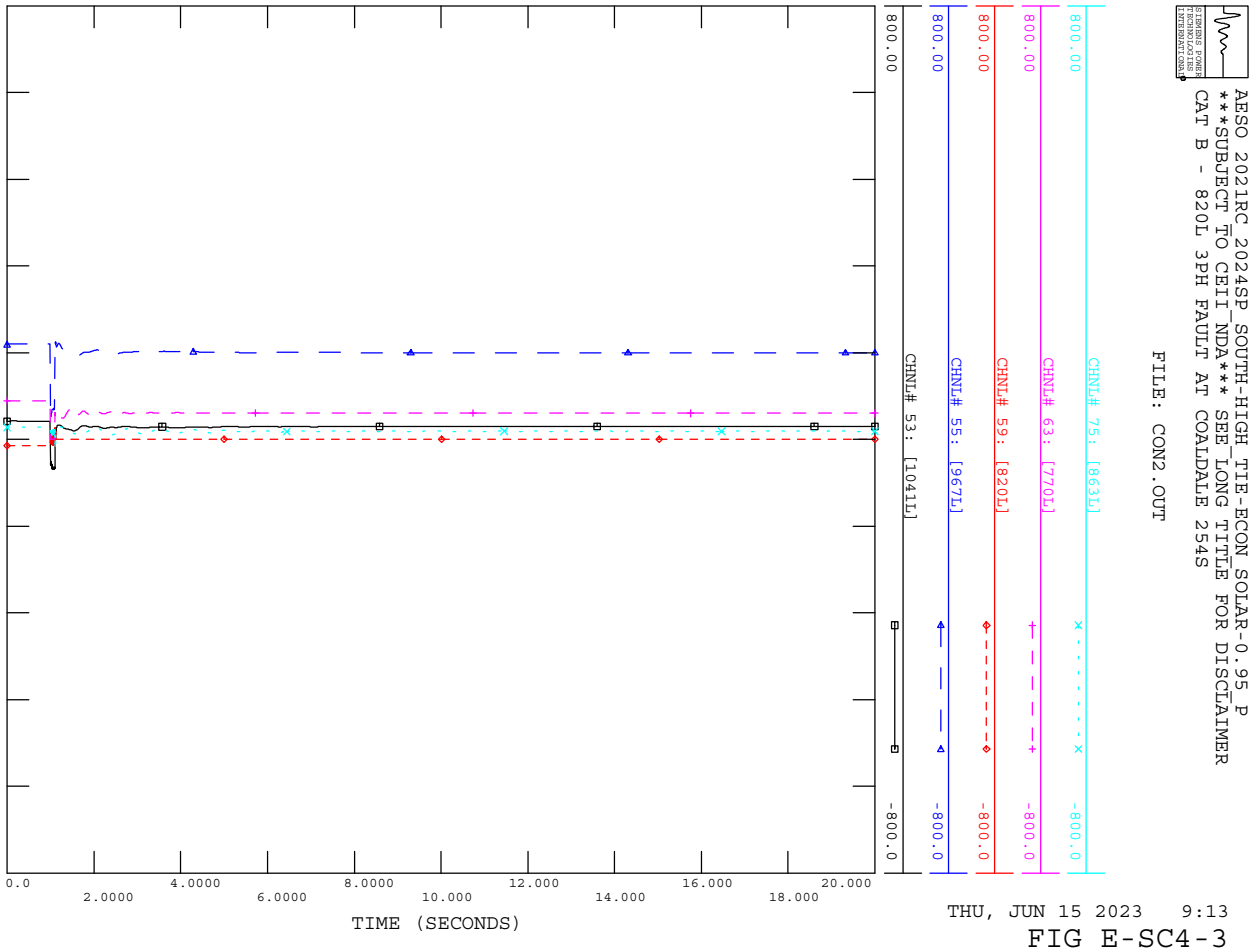


FIG E-SC4-3

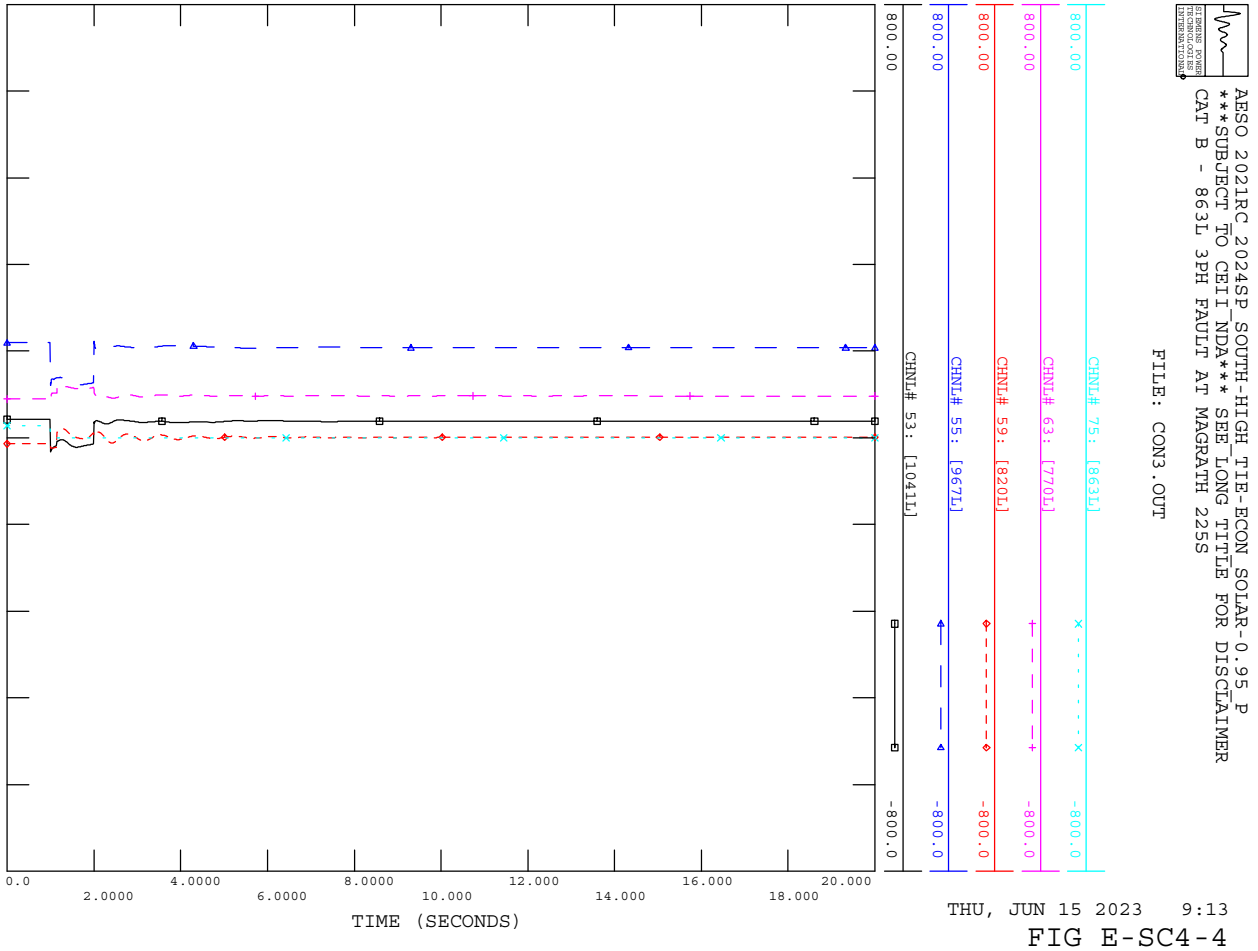


FIG E-SC4-4

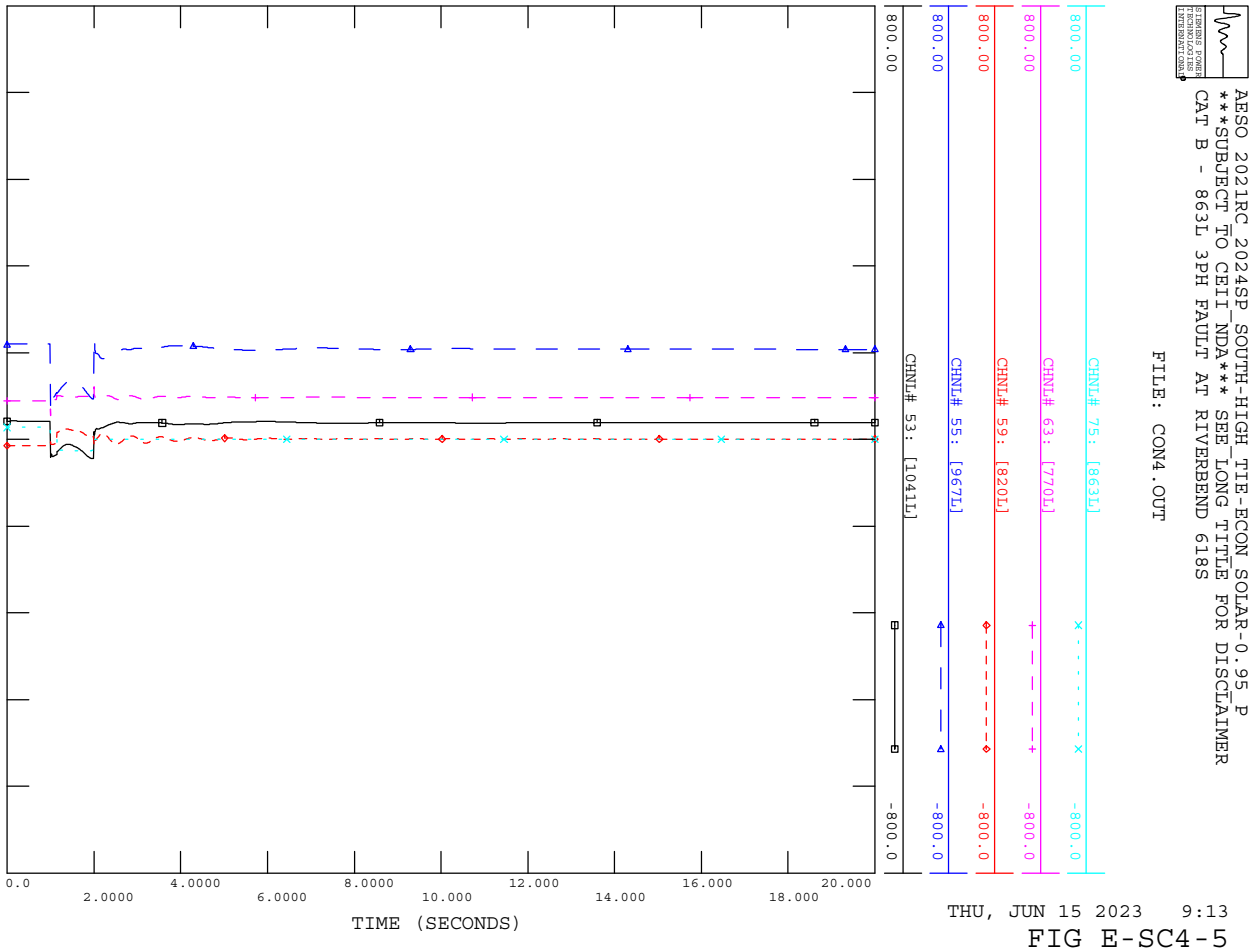


FIG E-SC4-5

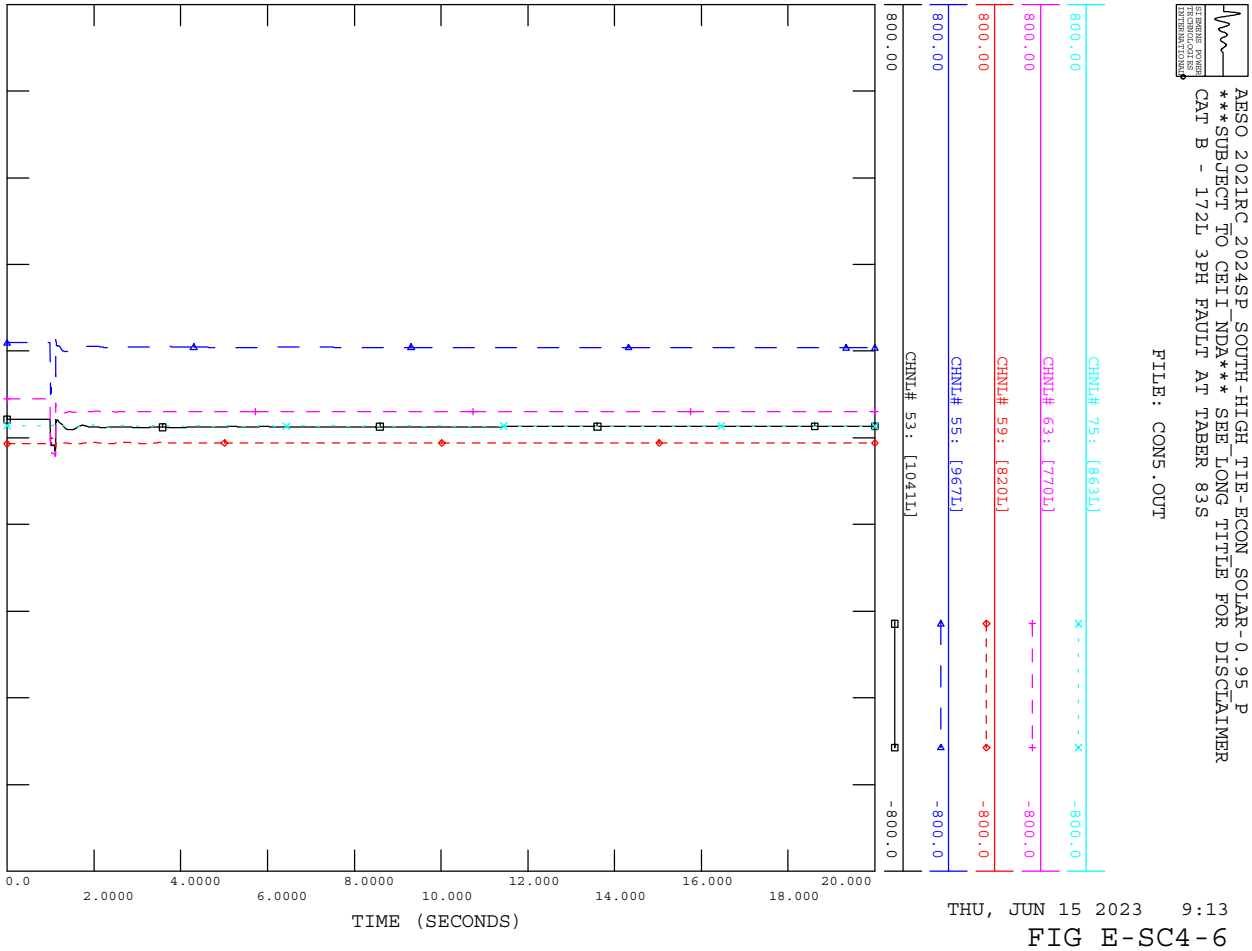


FIG E-SC4-6

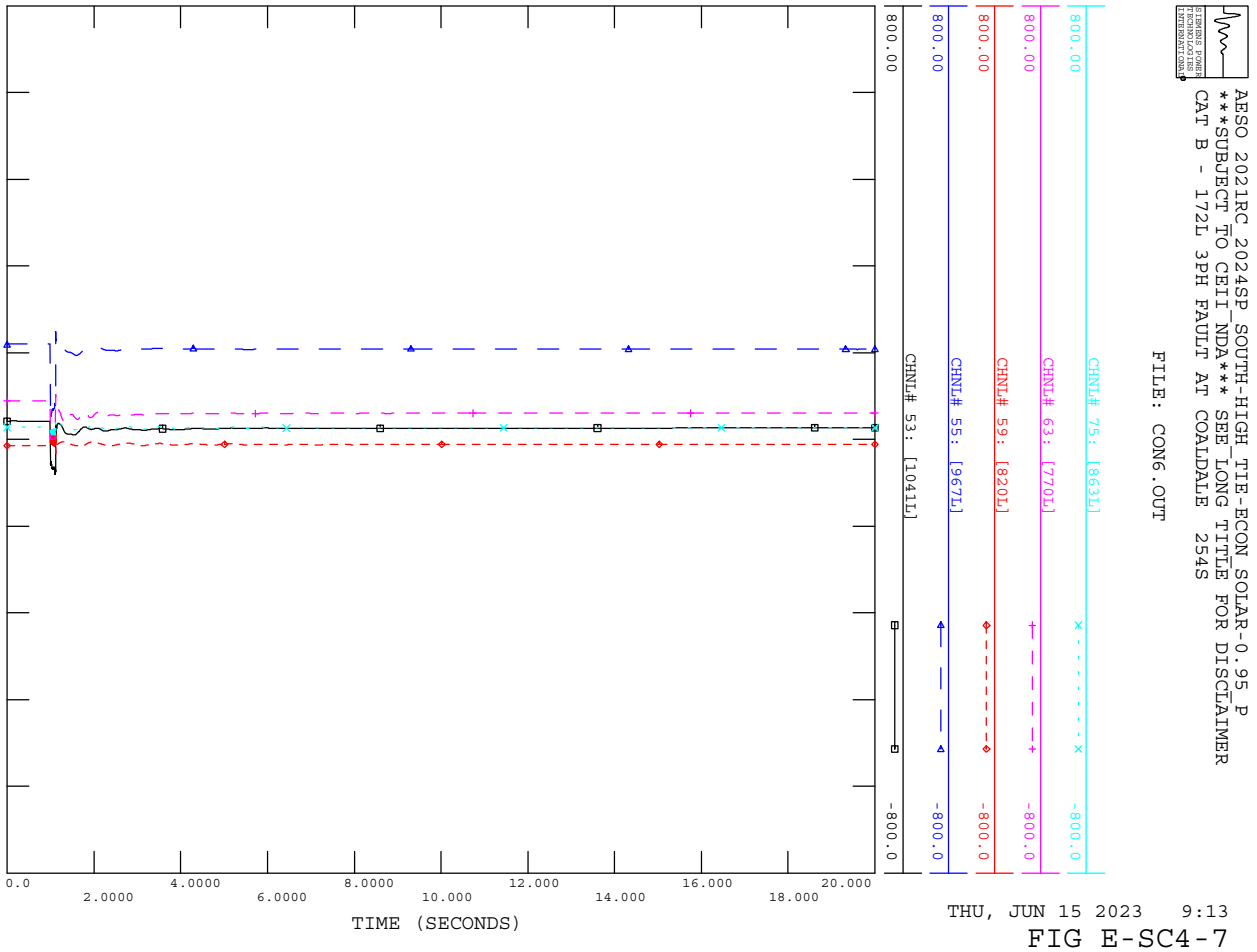


FIG E-SC4-7

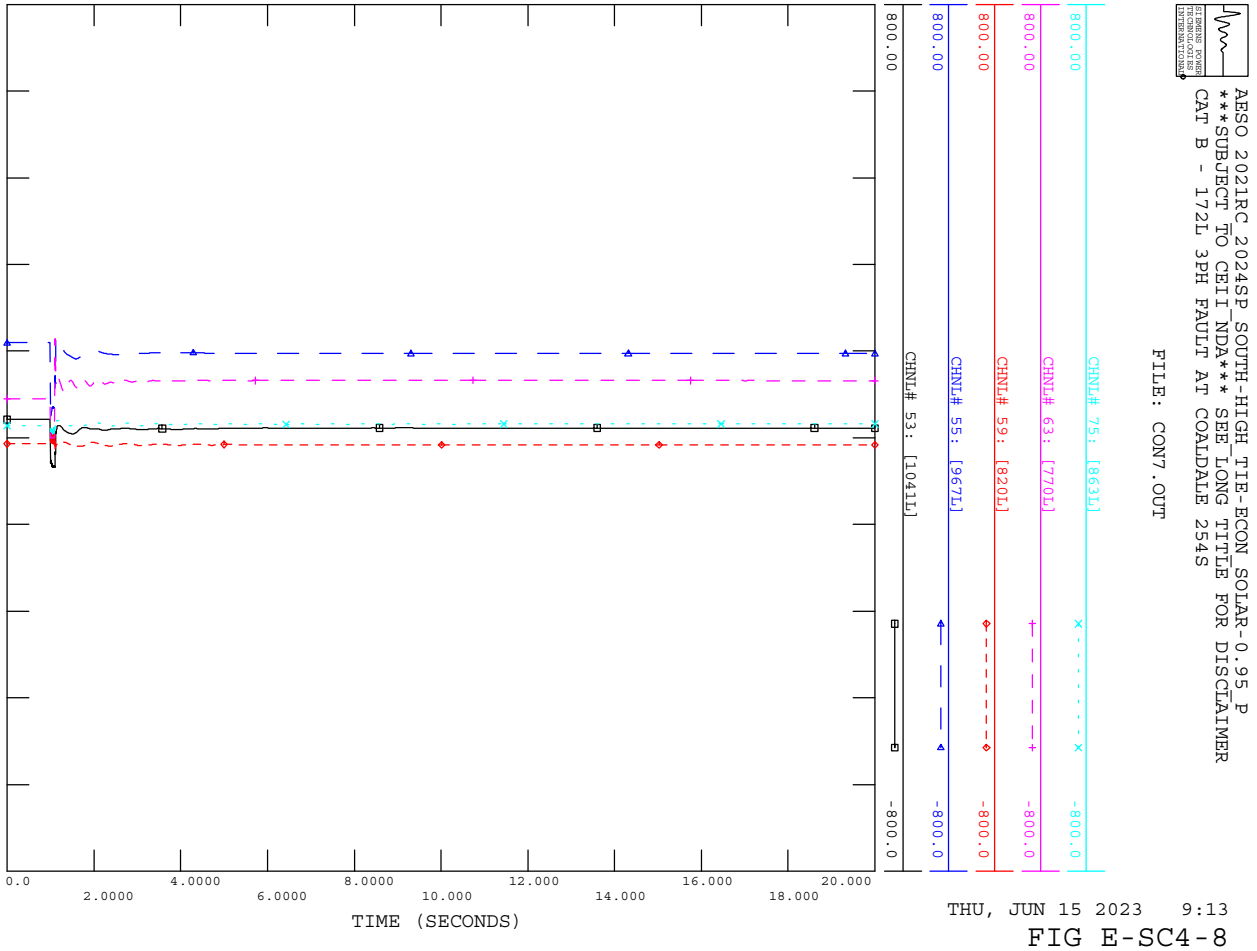


FIG E-SC4-8

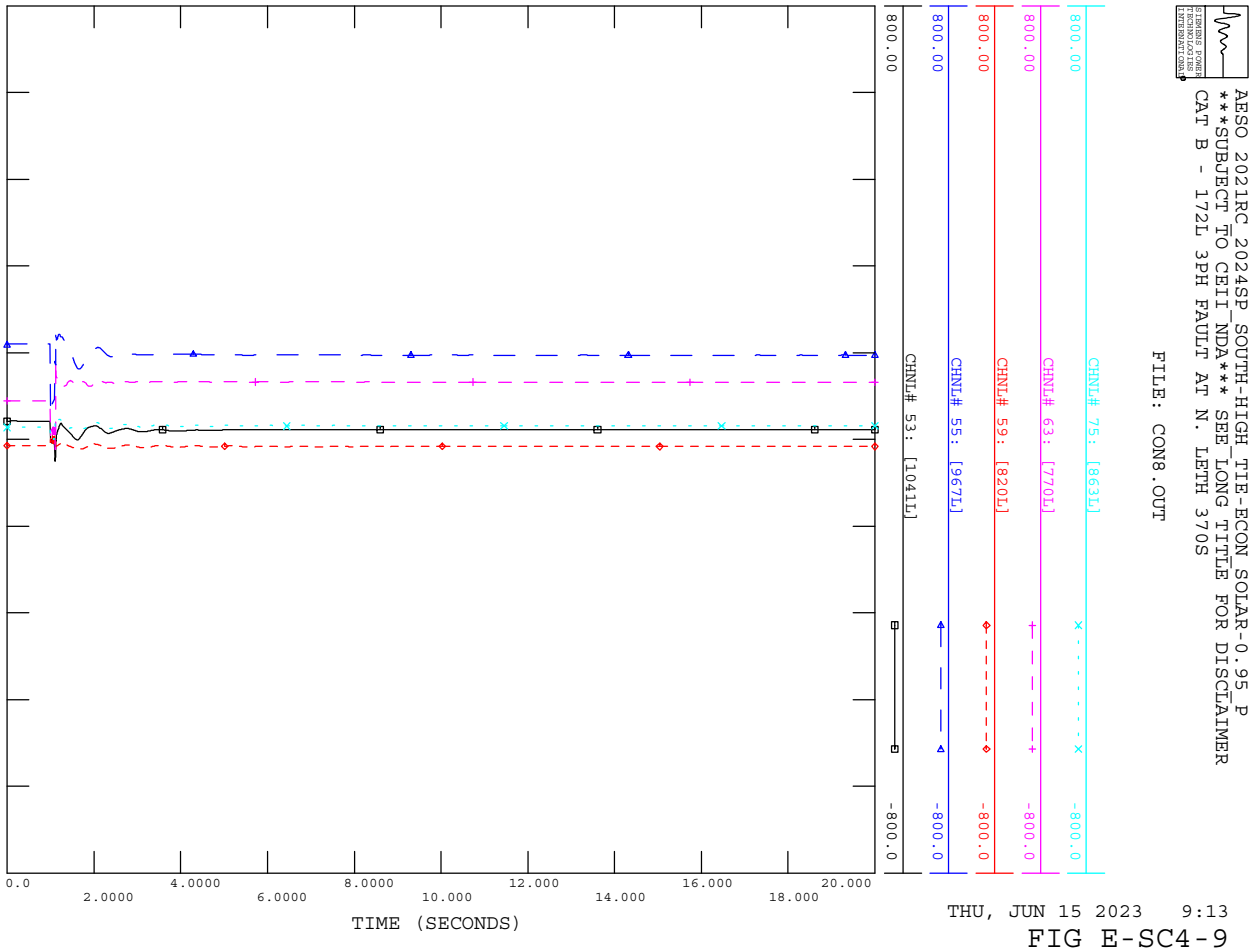


FIG E-SC4-9

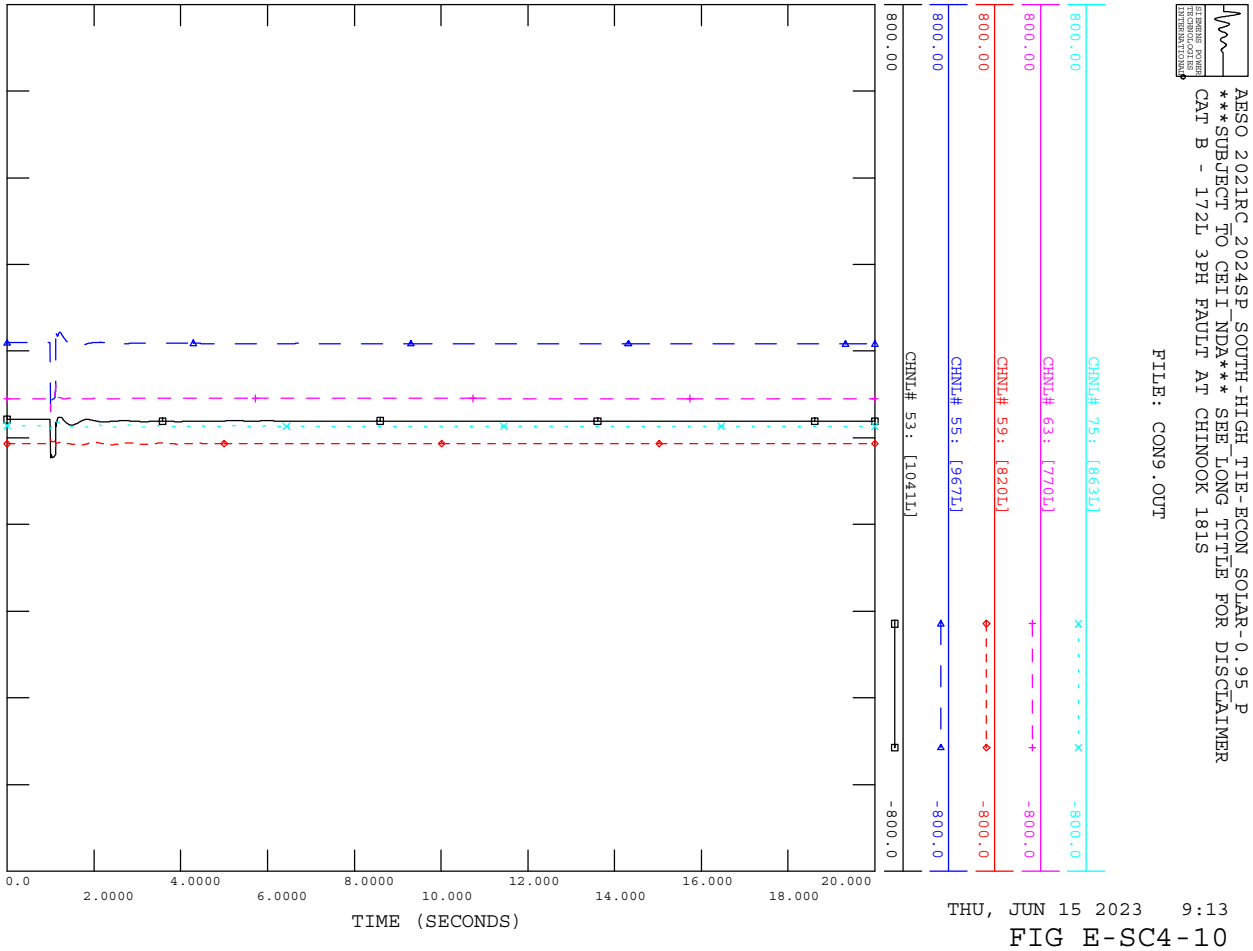


FIG E-SC4-10

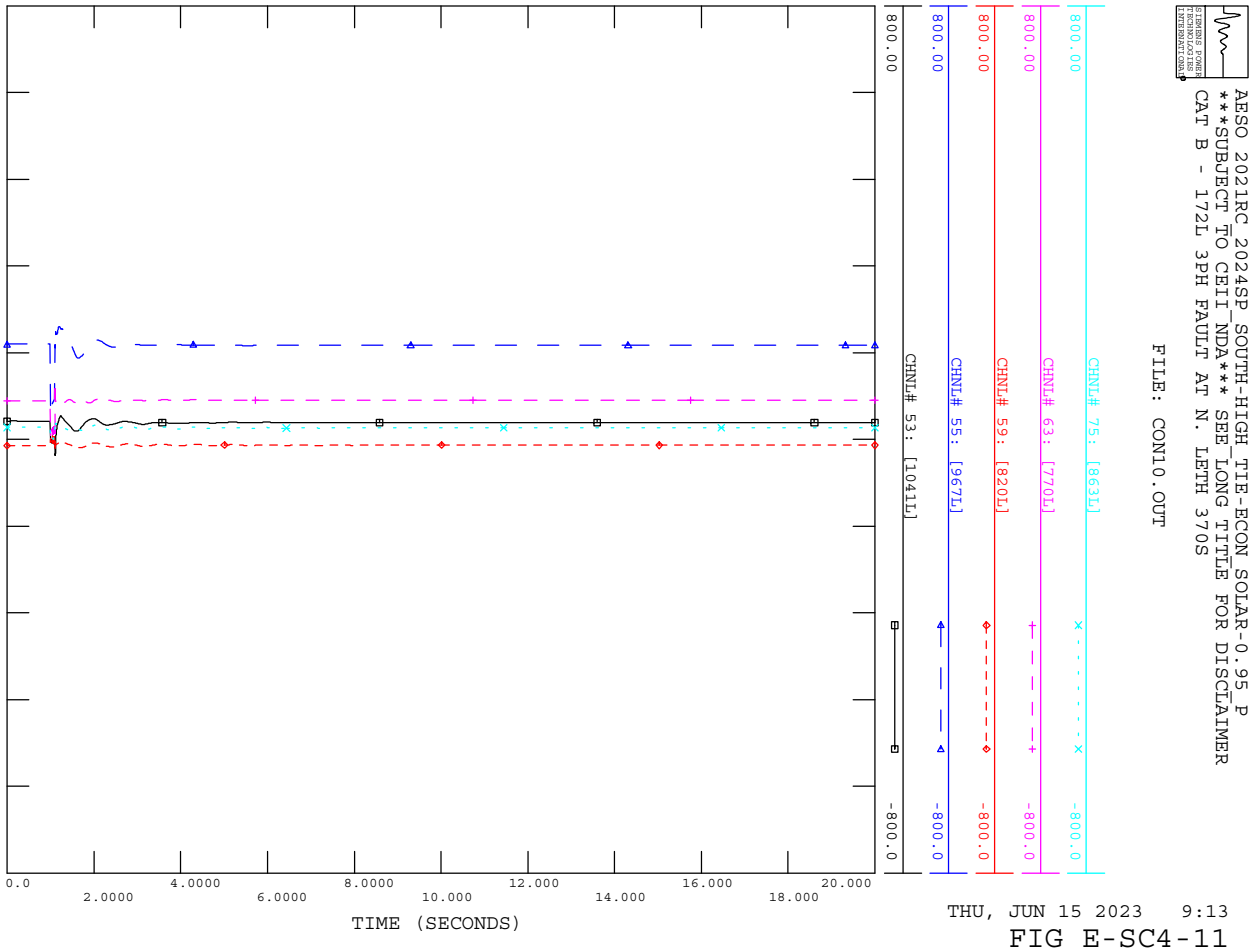


FIG E-SC4-11

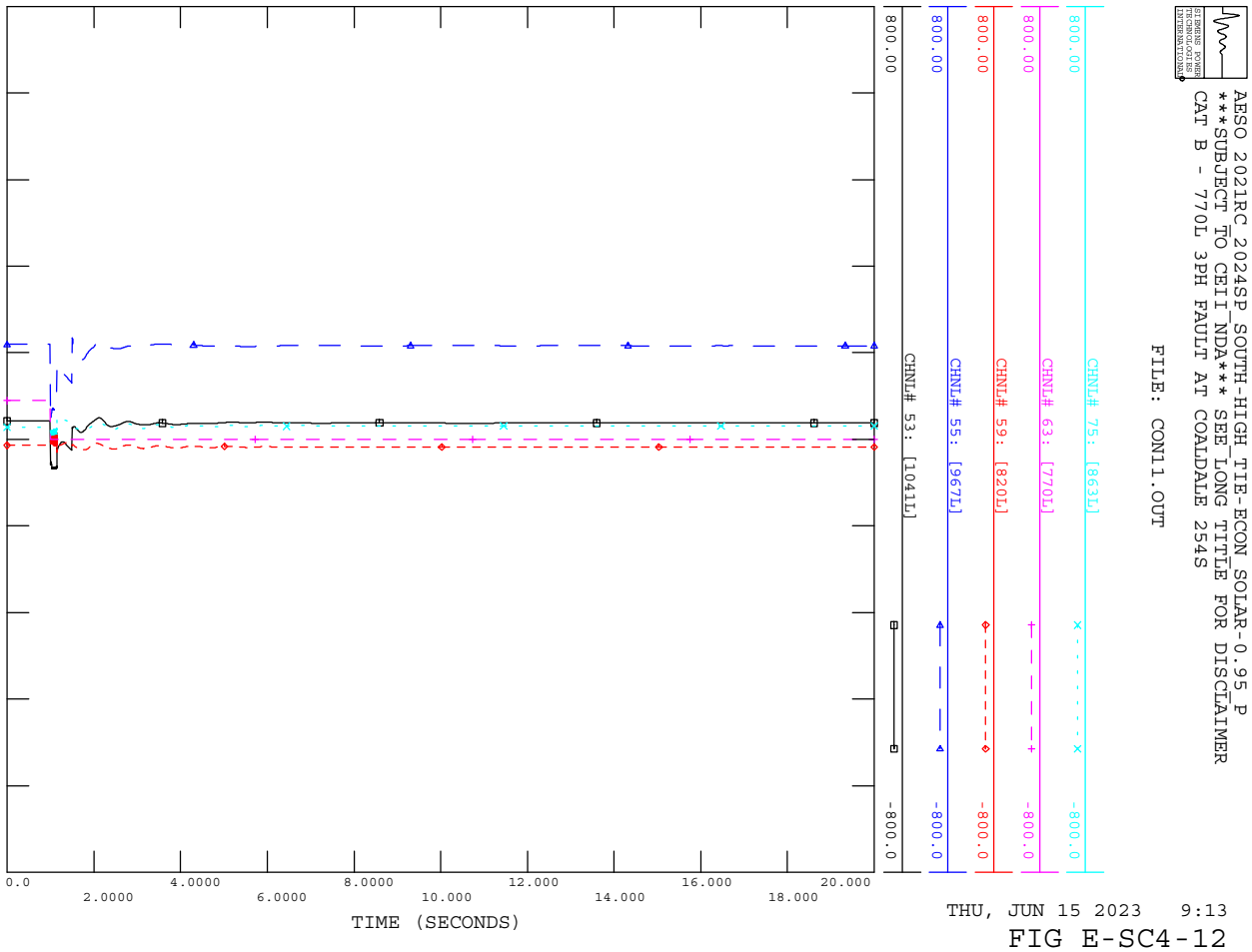


FIG E-SC4-12

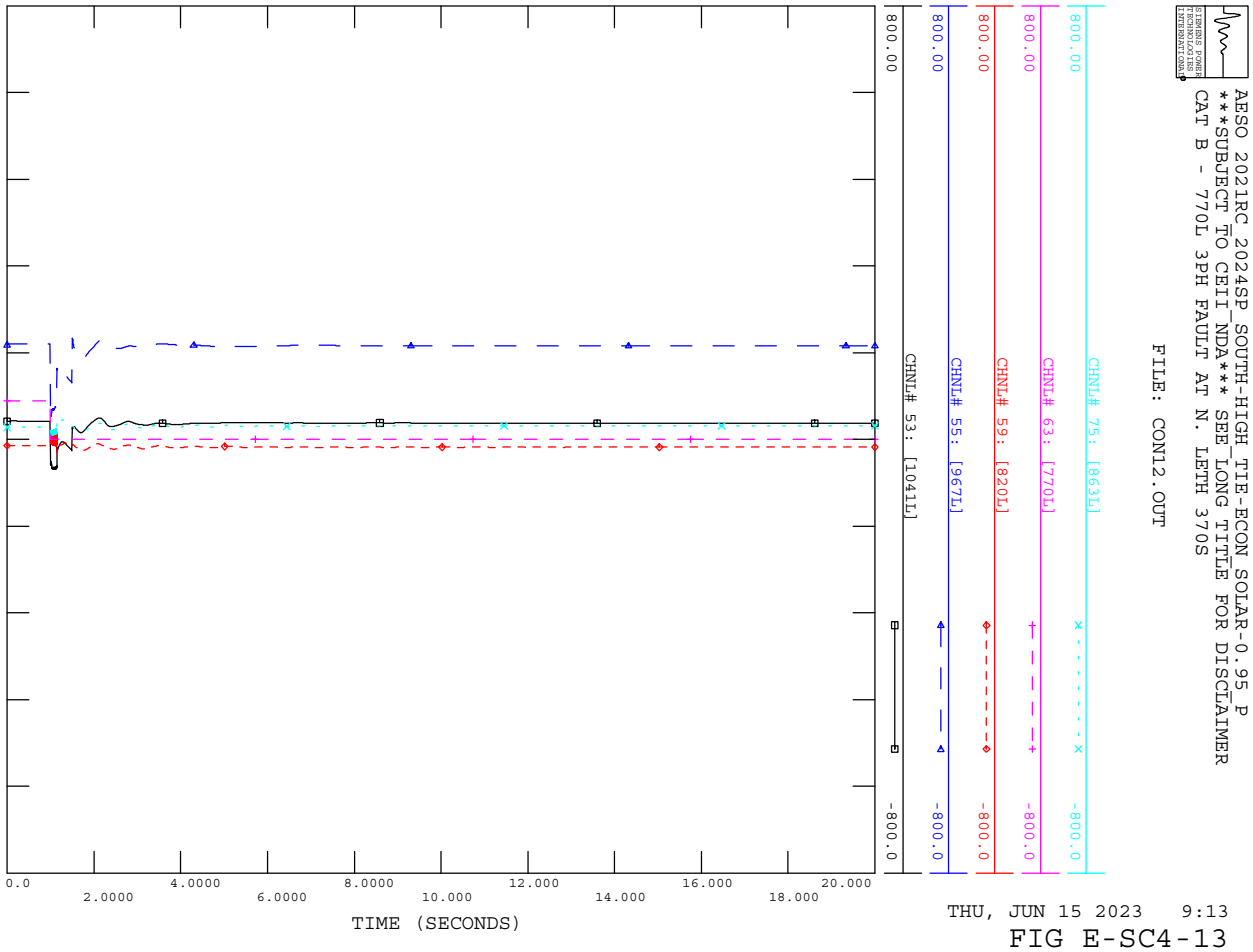


FIG E-SC4-13

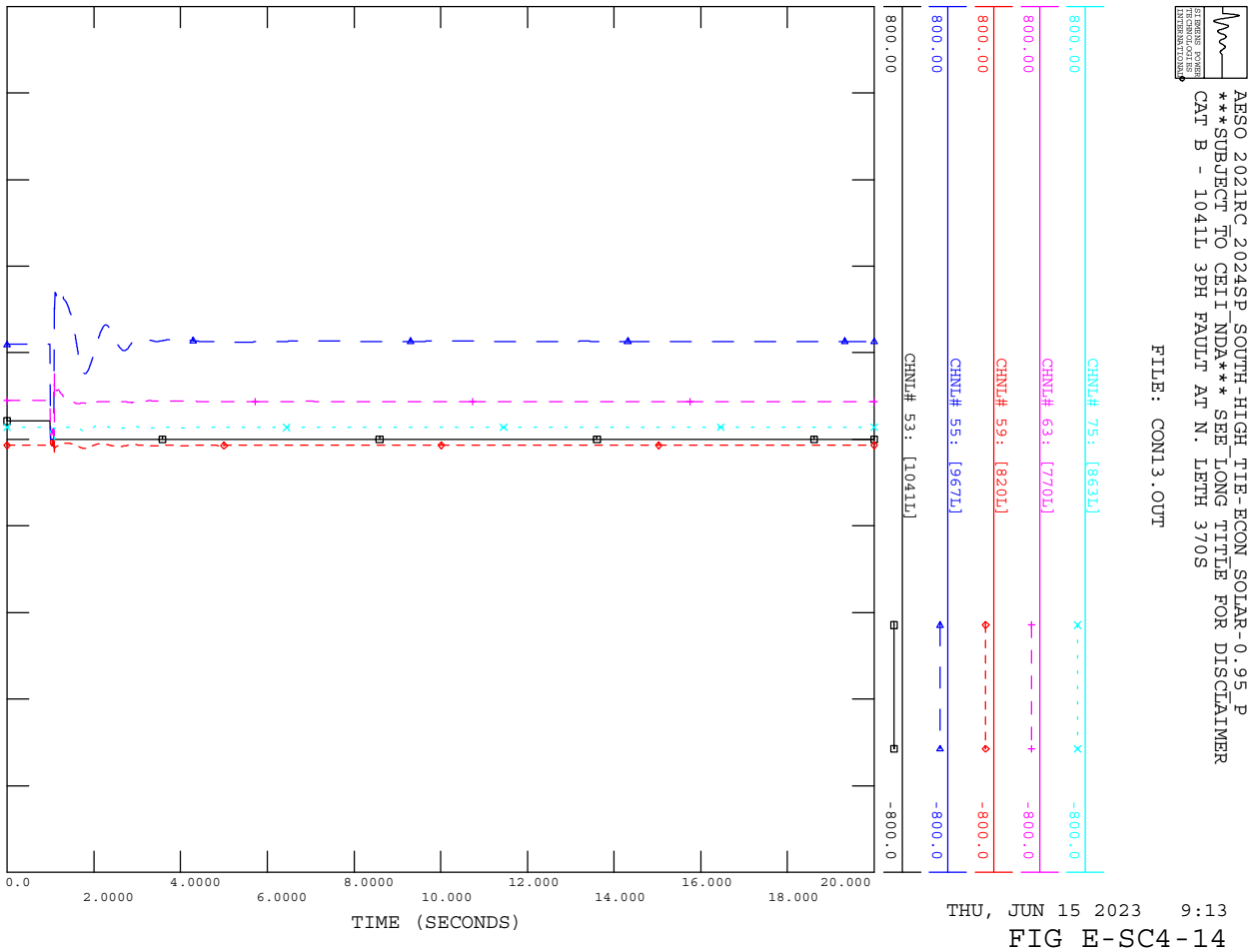


FIG E-SC4-14

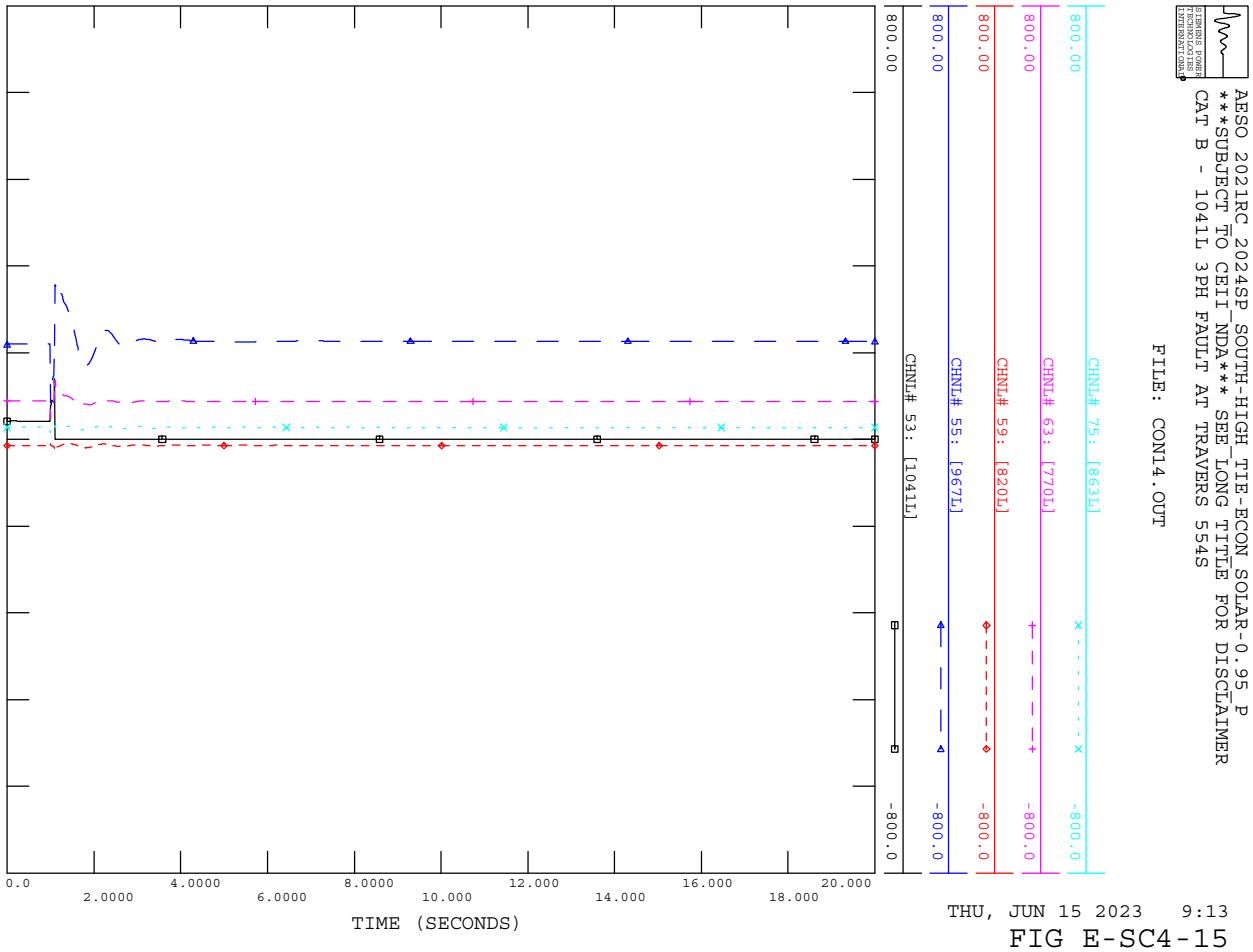


FIG E-SC4-15

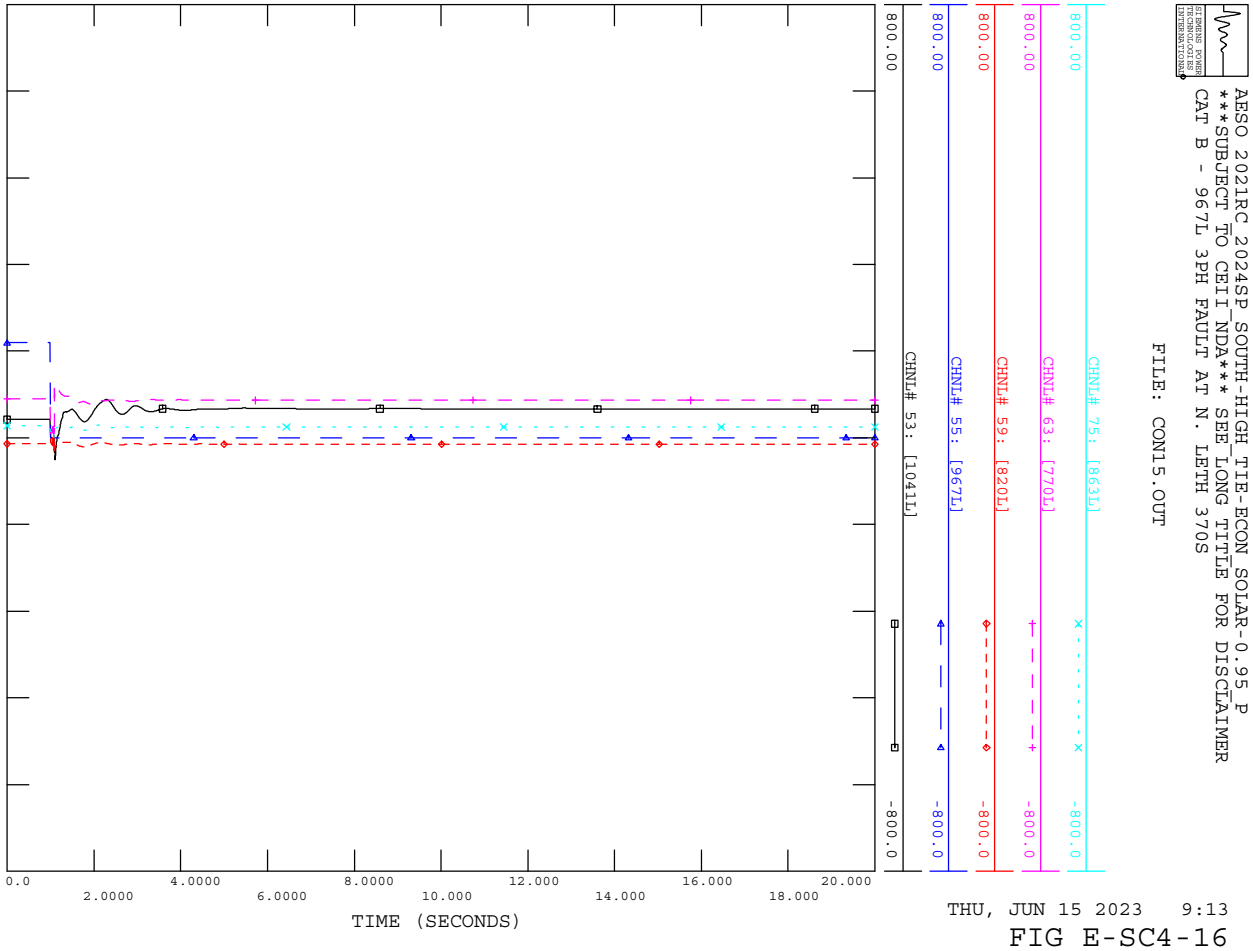


FIG E-SC4-16

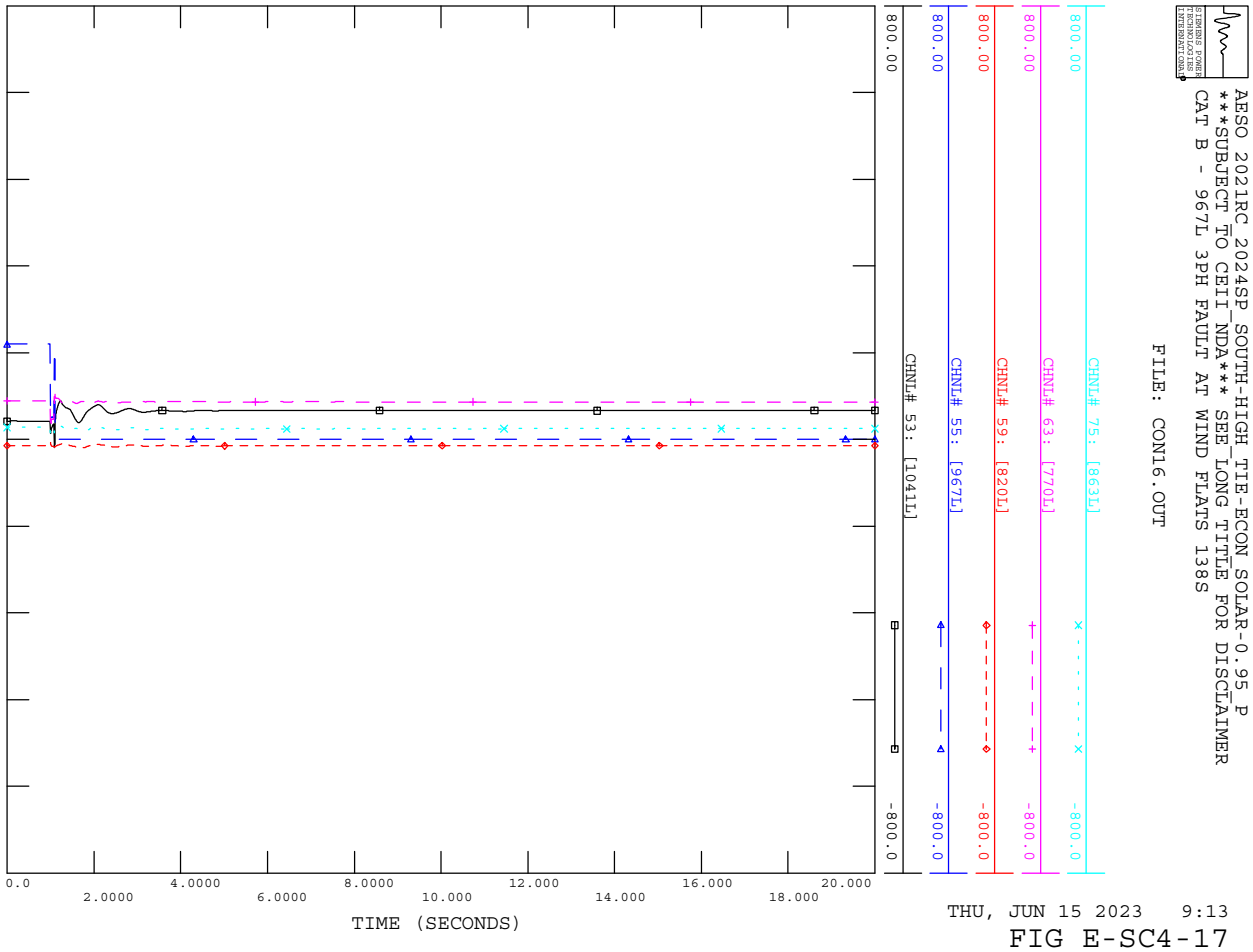


FIG E-SC4-17

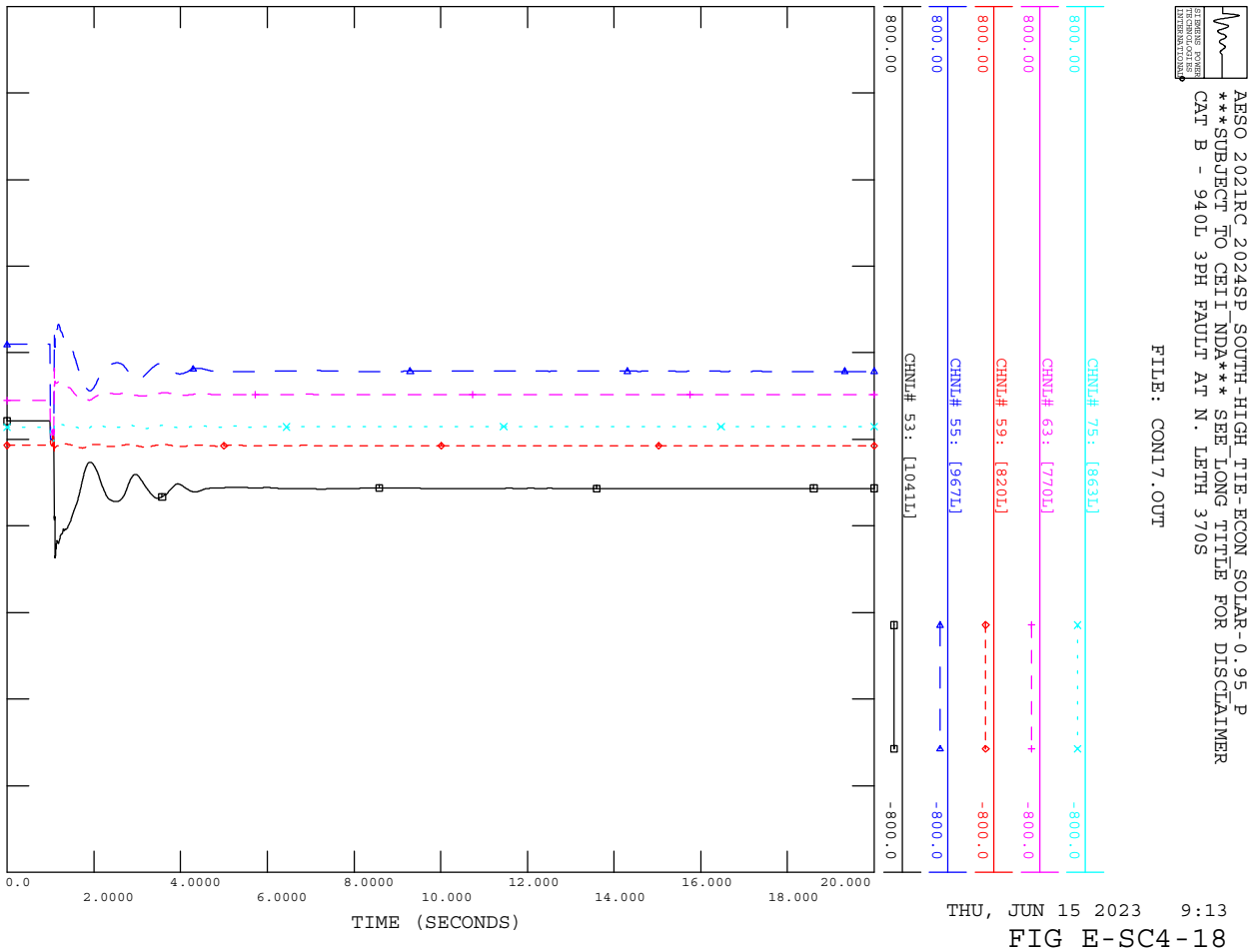


FIG E-SC4-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

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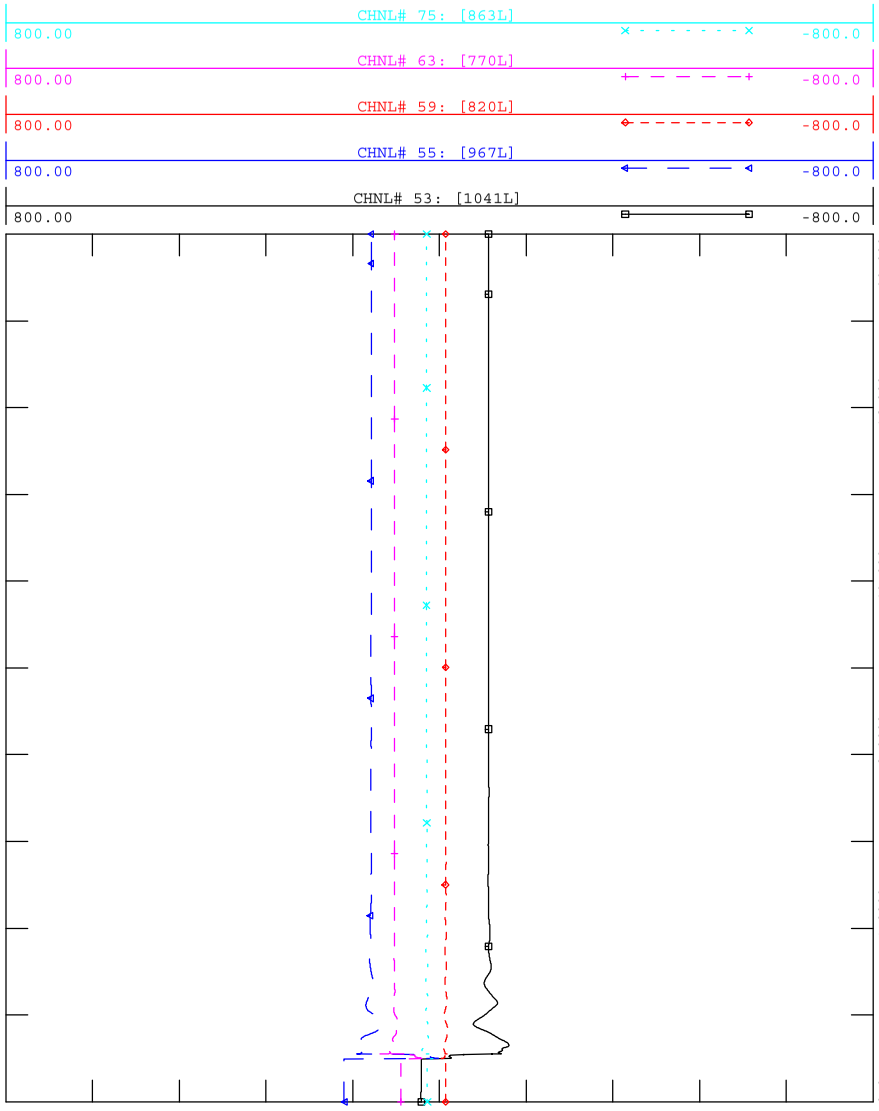
FIG E-SC4-19



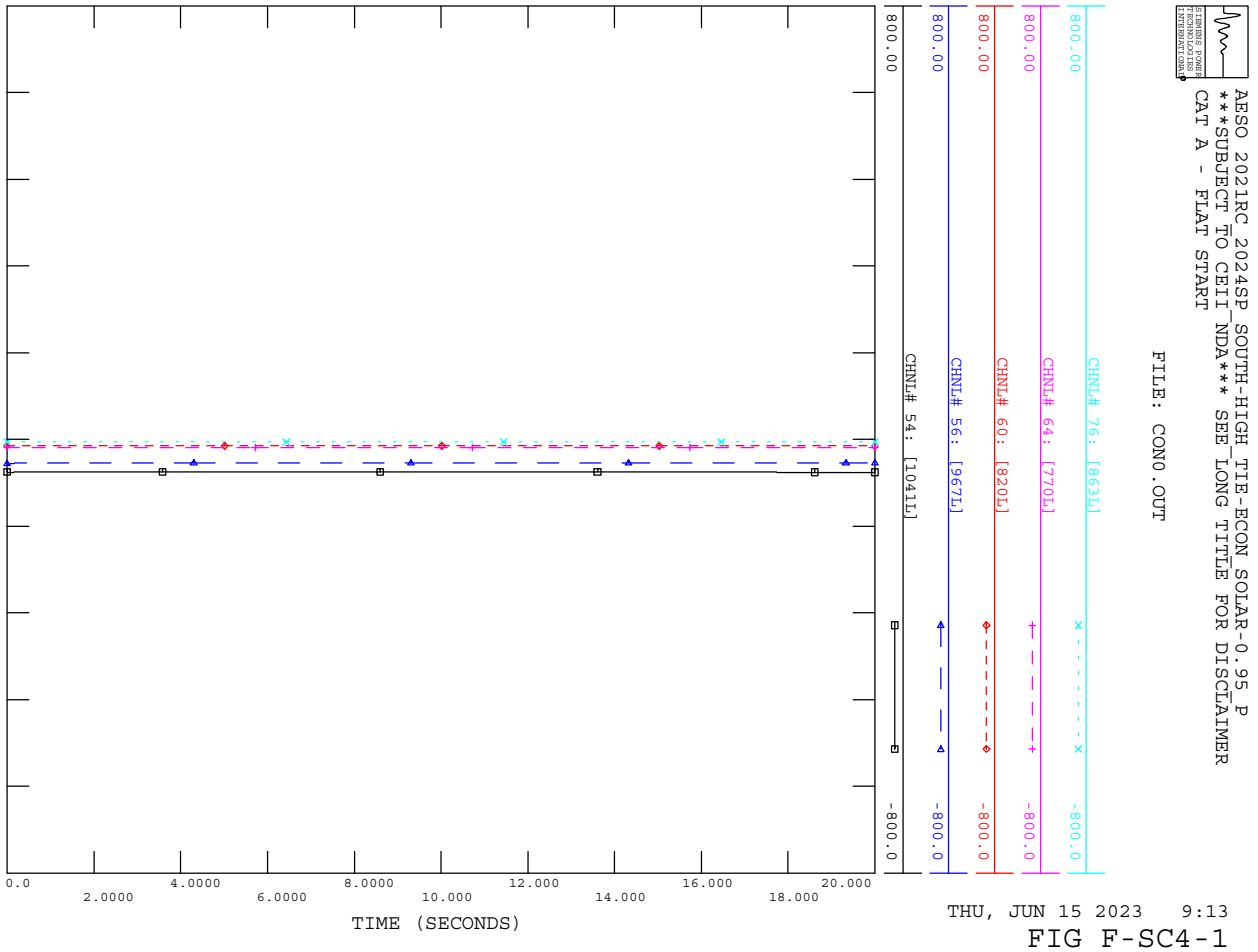


FIG F-SC4-1

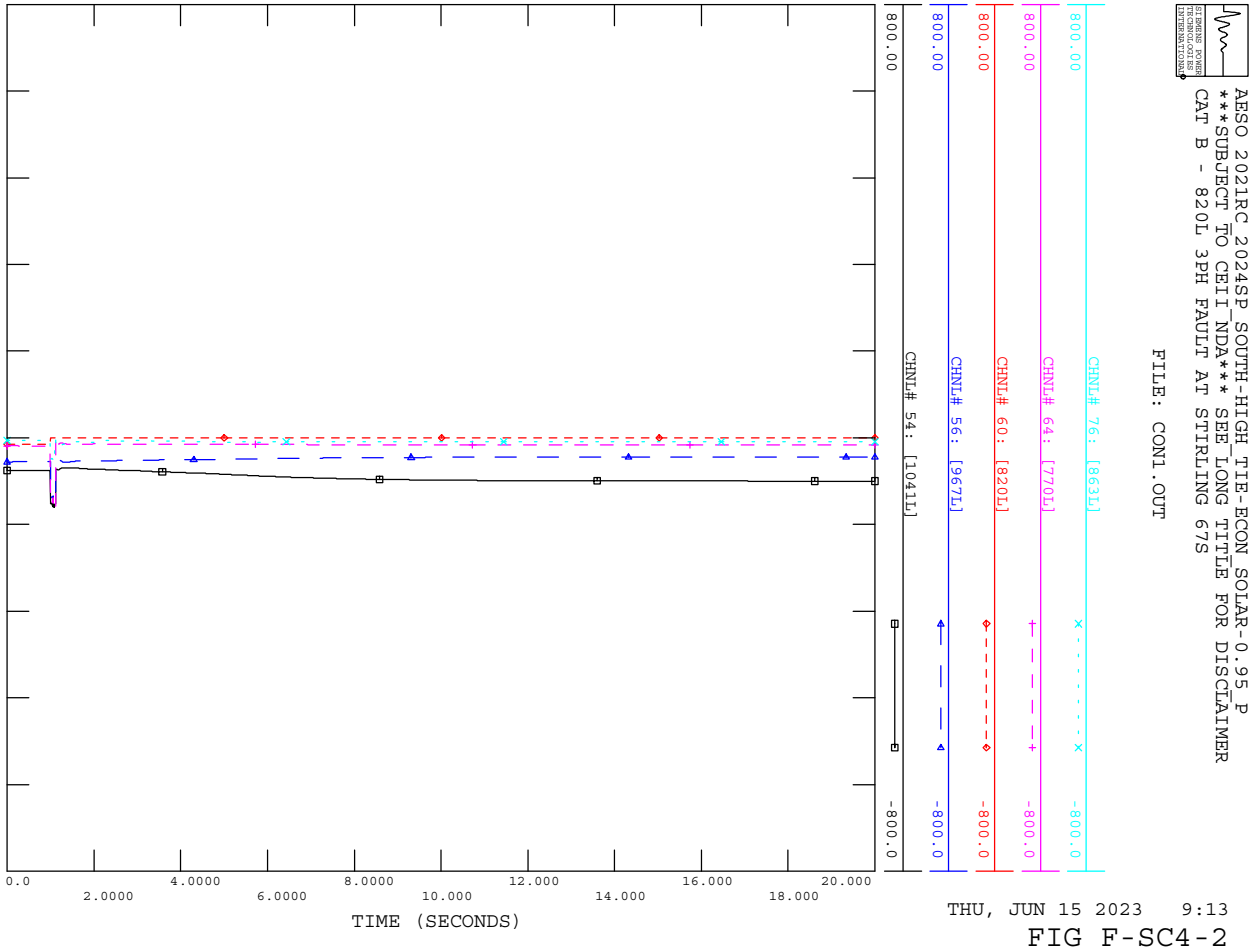


FIG F-SC4-2

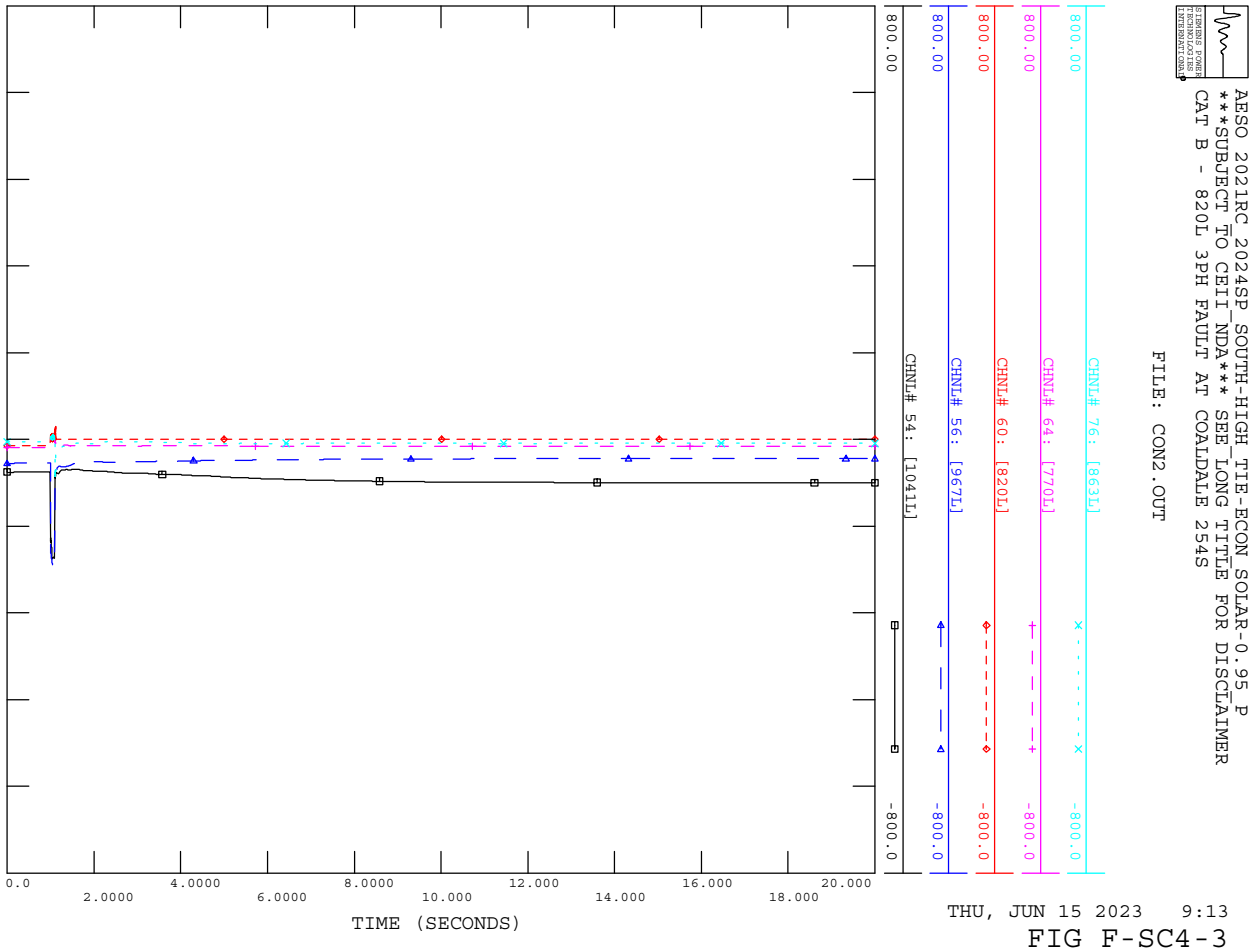


FIG F-SC4-3

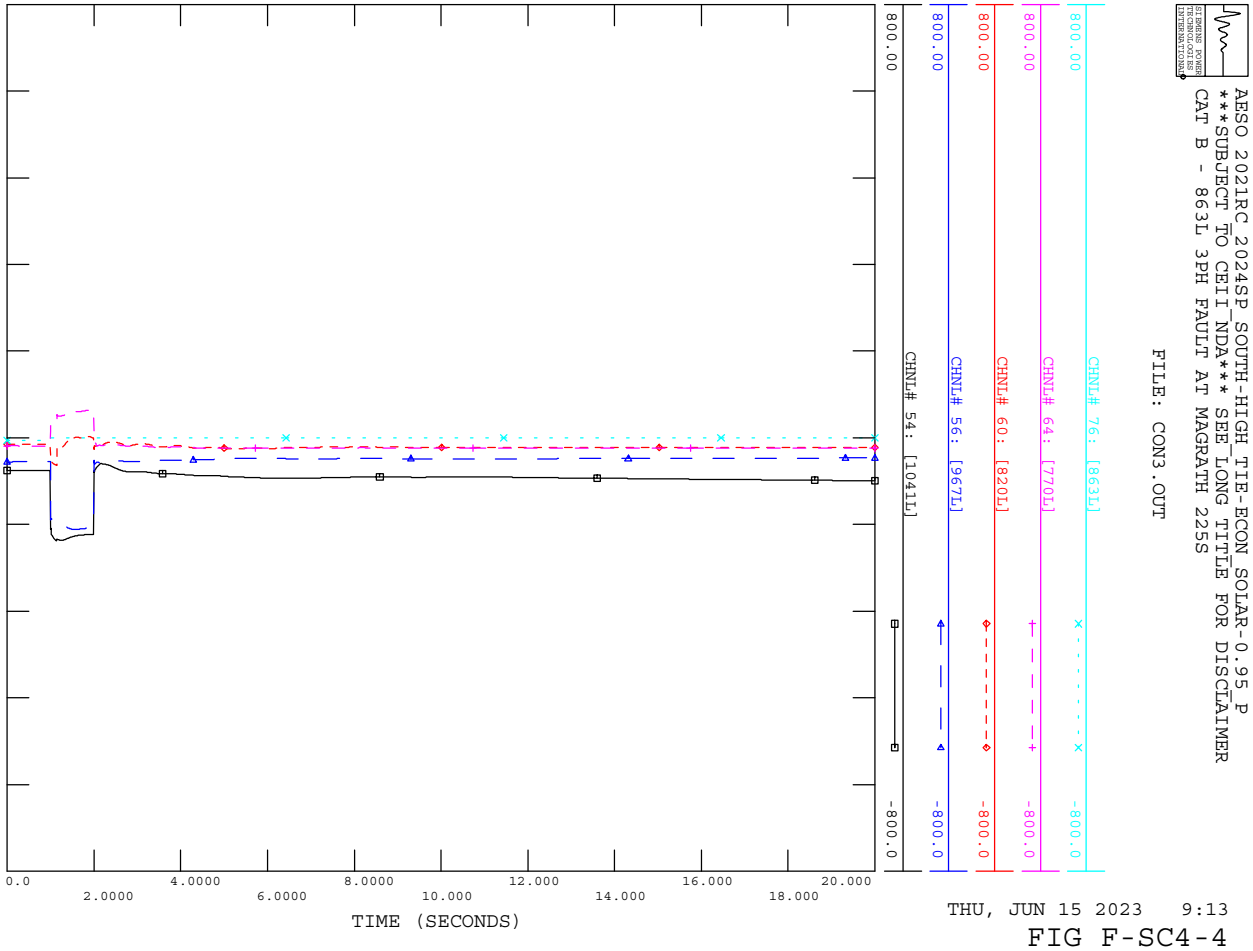


FIG F-SC4-4

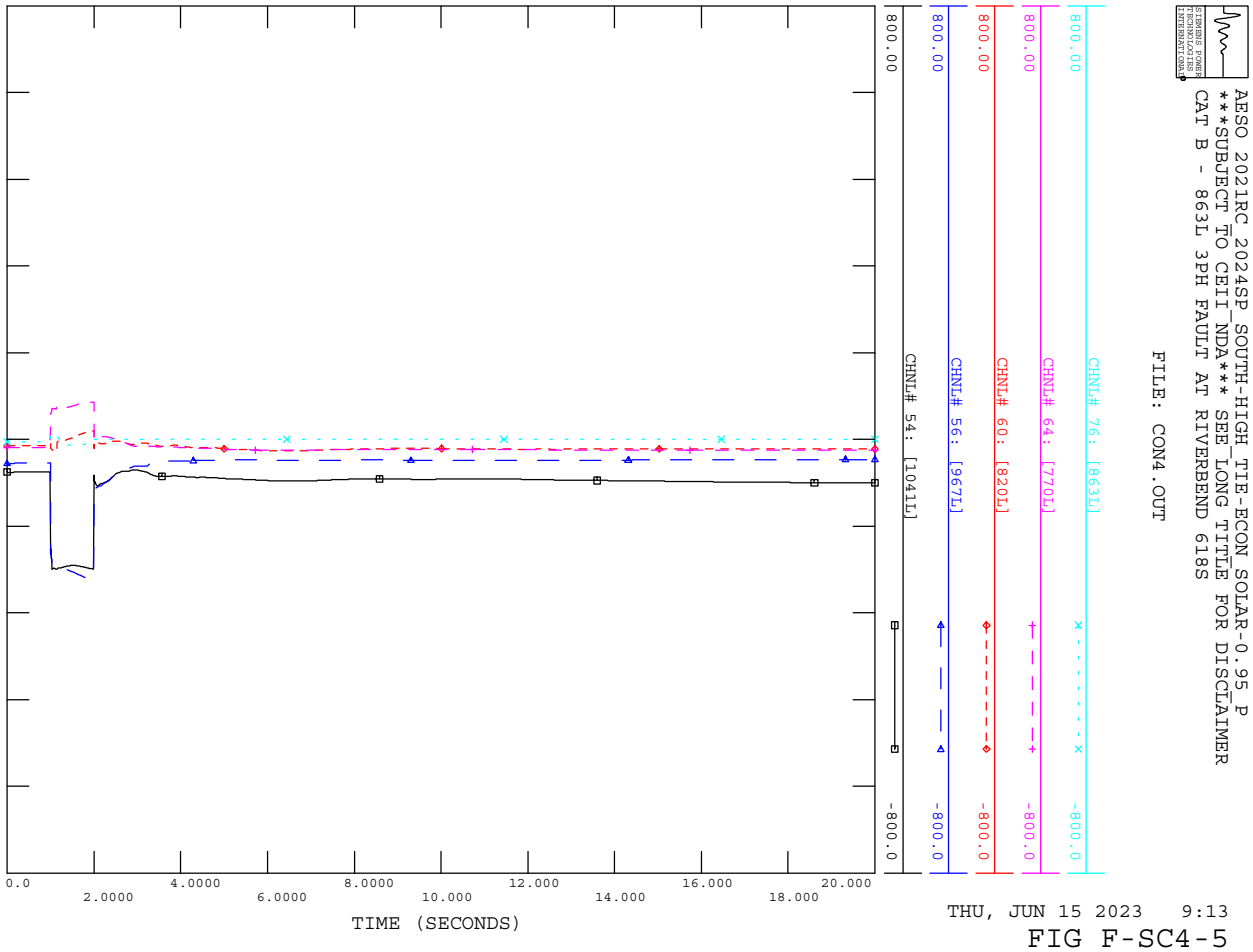


FIG F-SC4-5

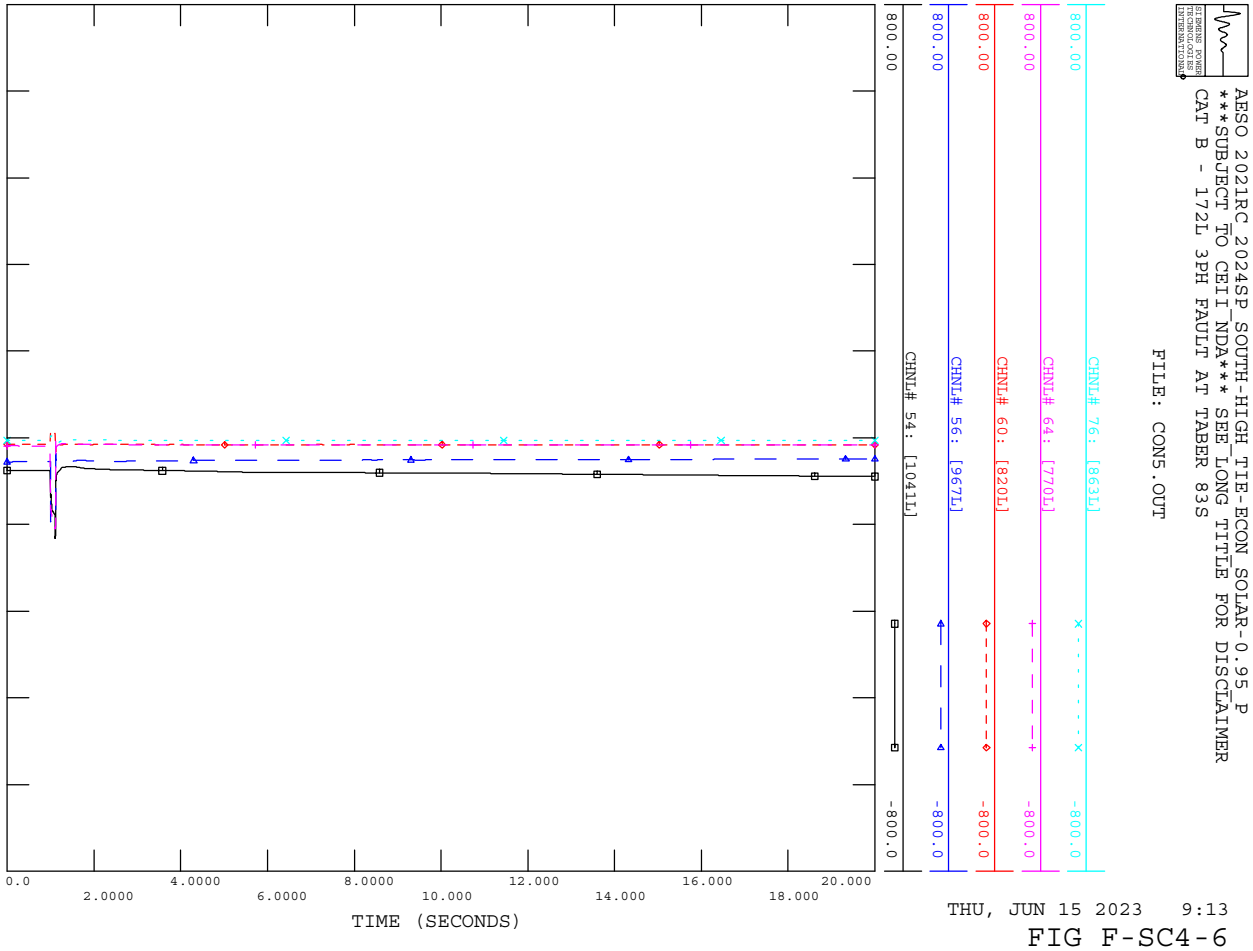


FIG F-SC4-6

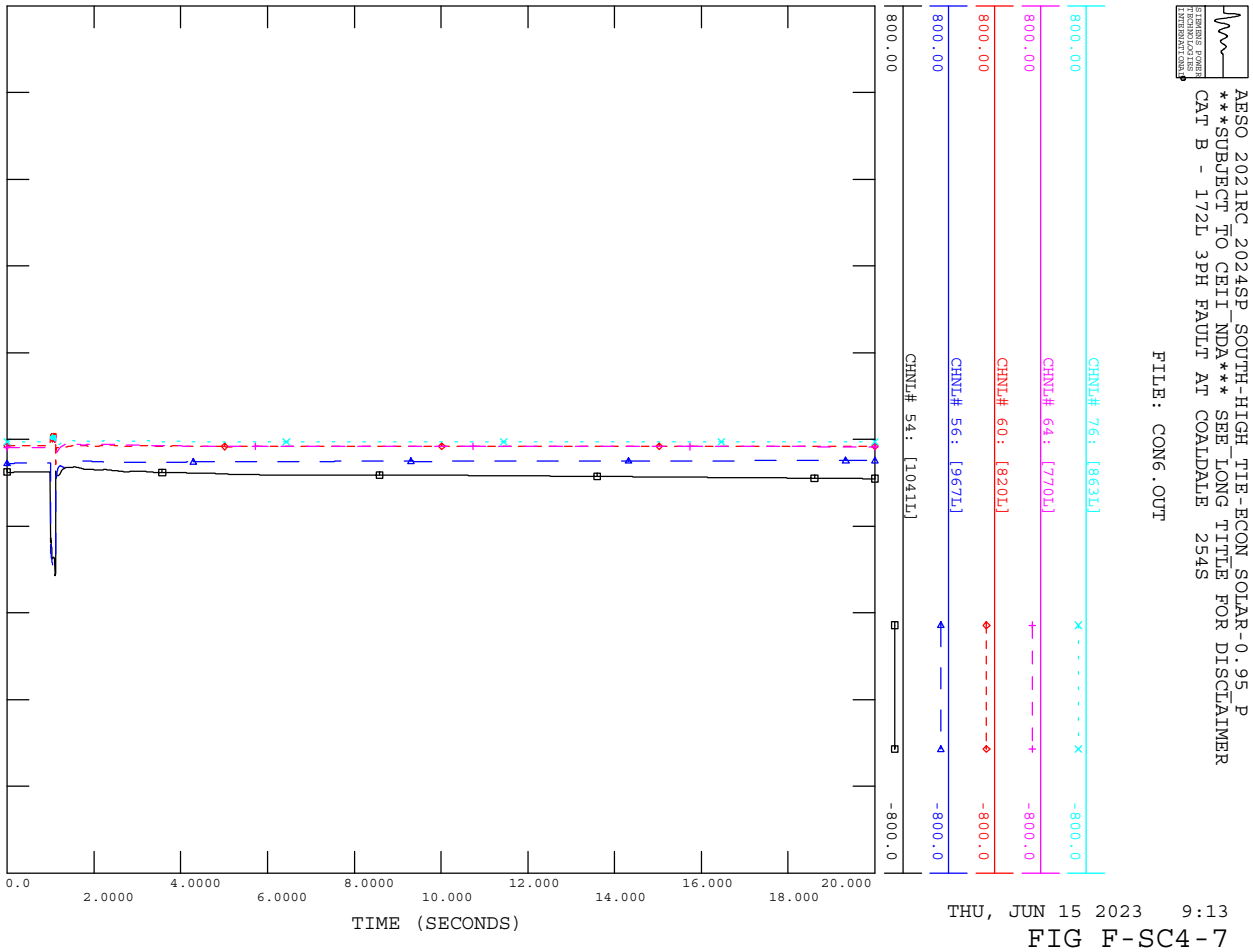


FIG F-SC4-7

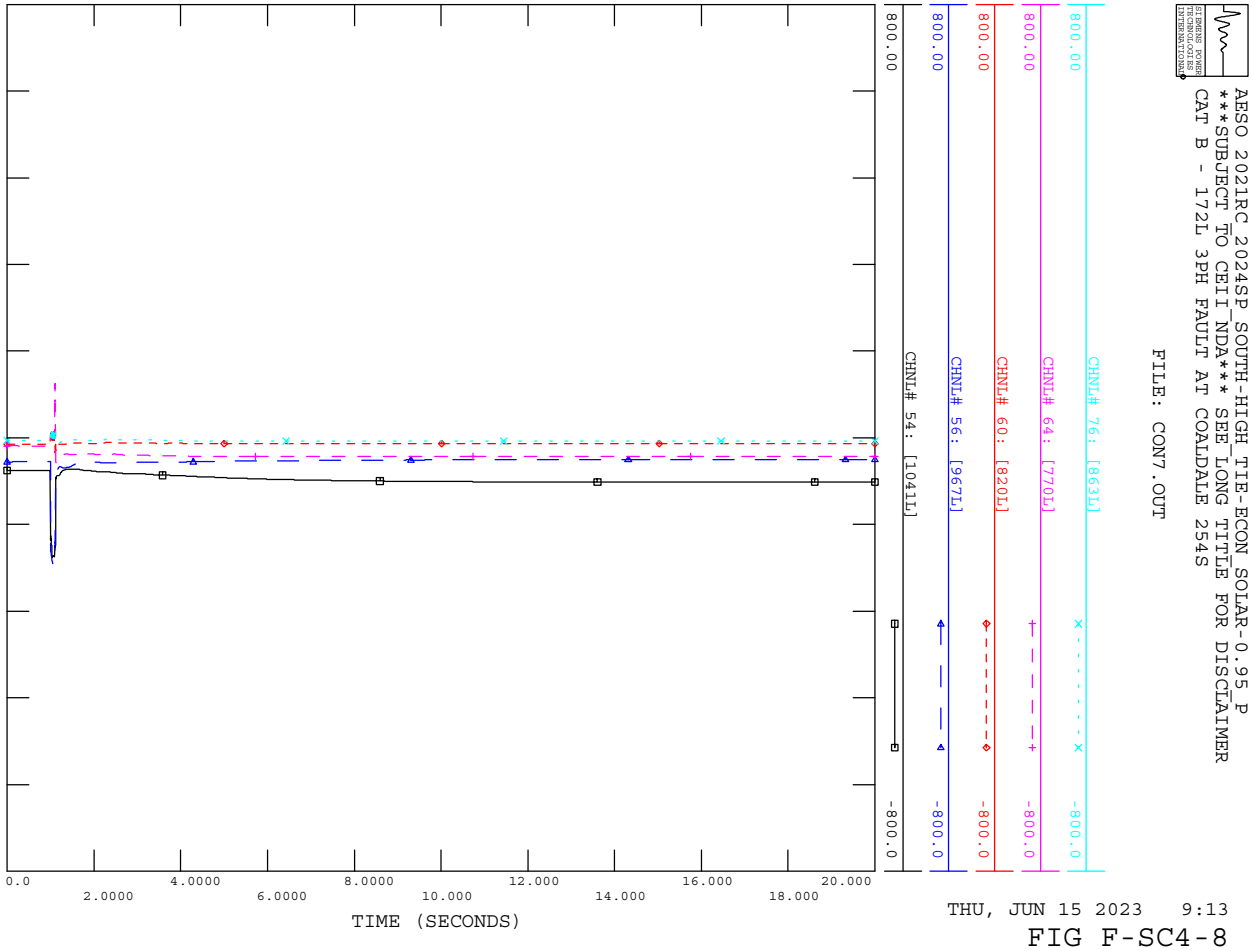


FIG F-SC4-8

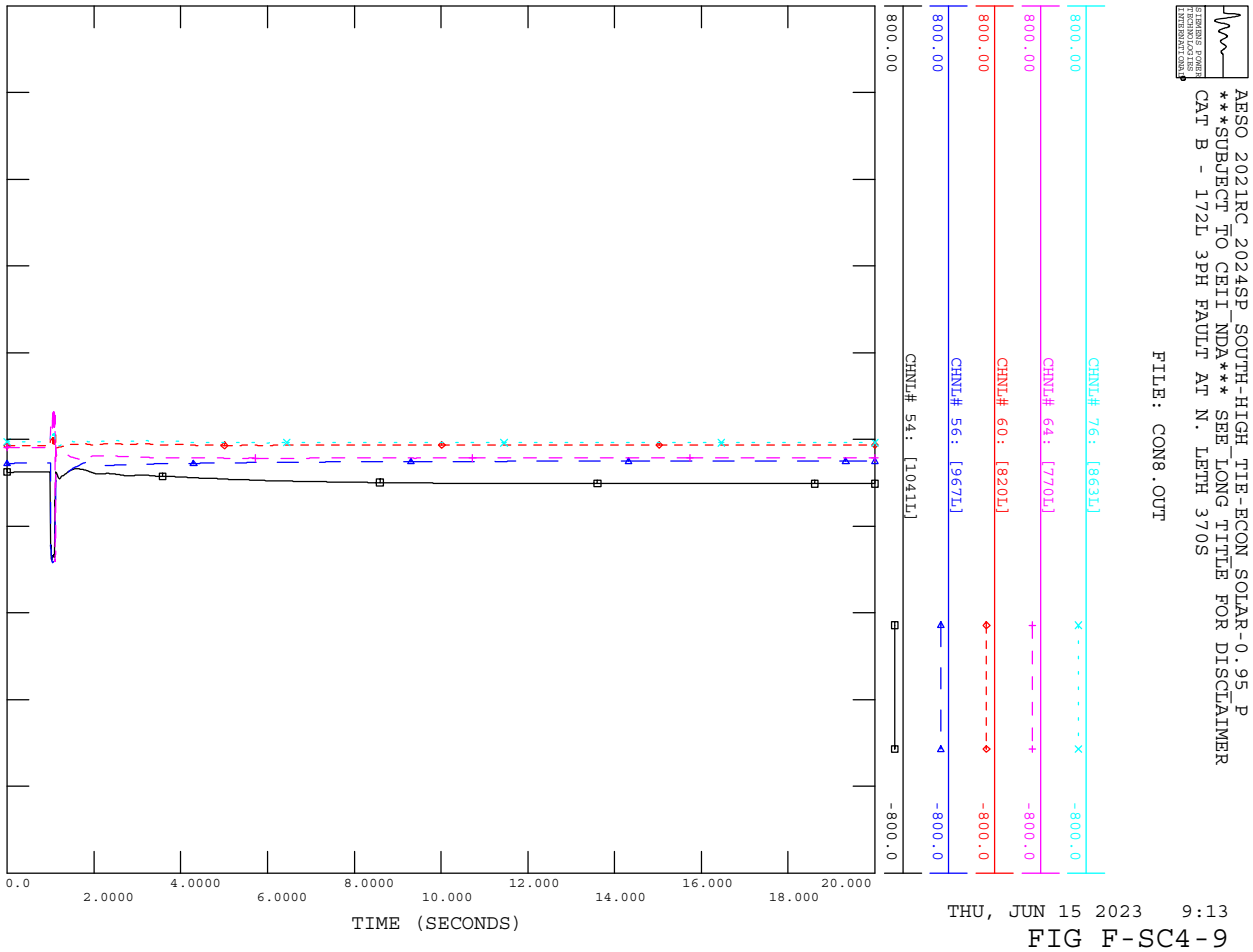


FIG F-SC4-9

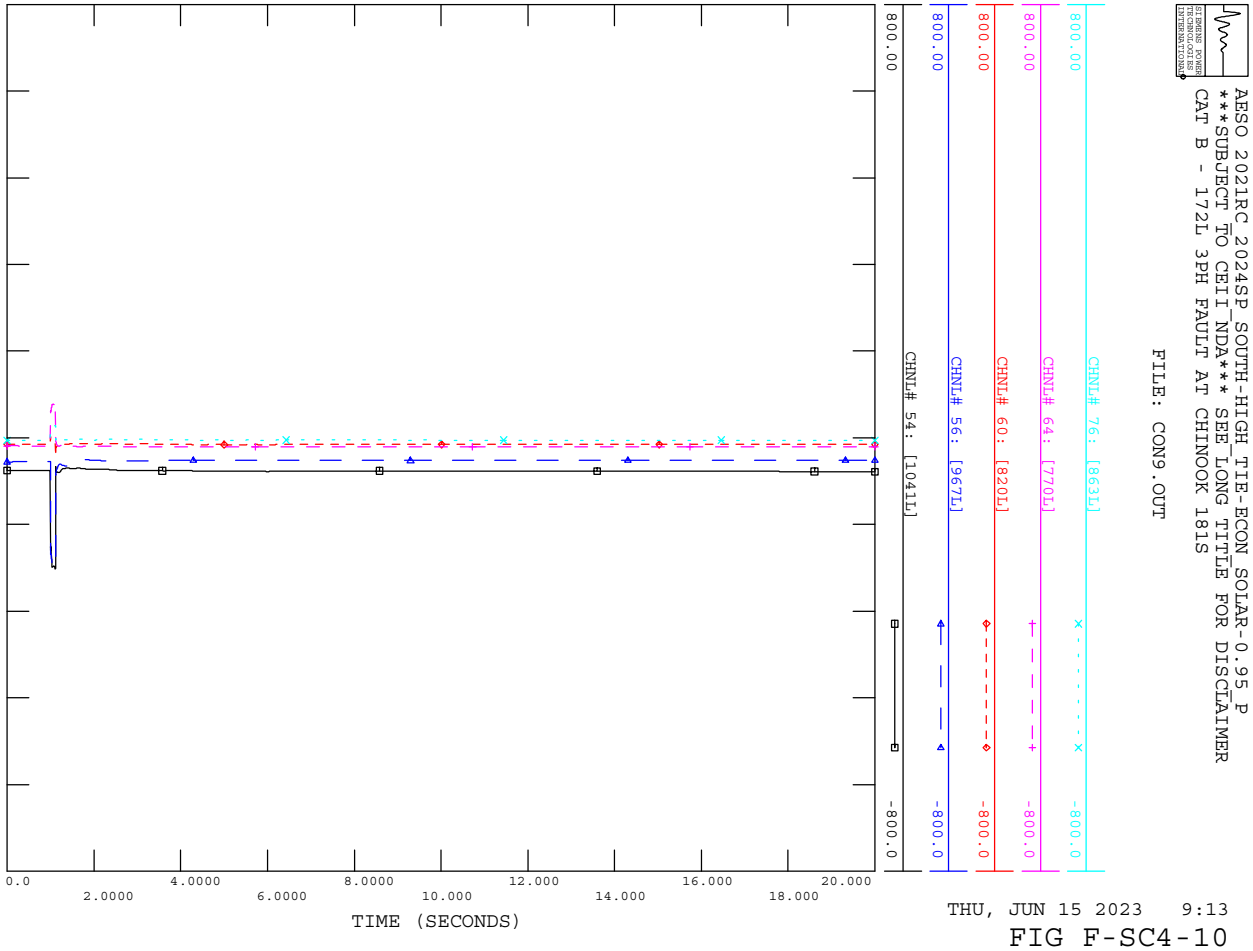


FIG F-SC4-10

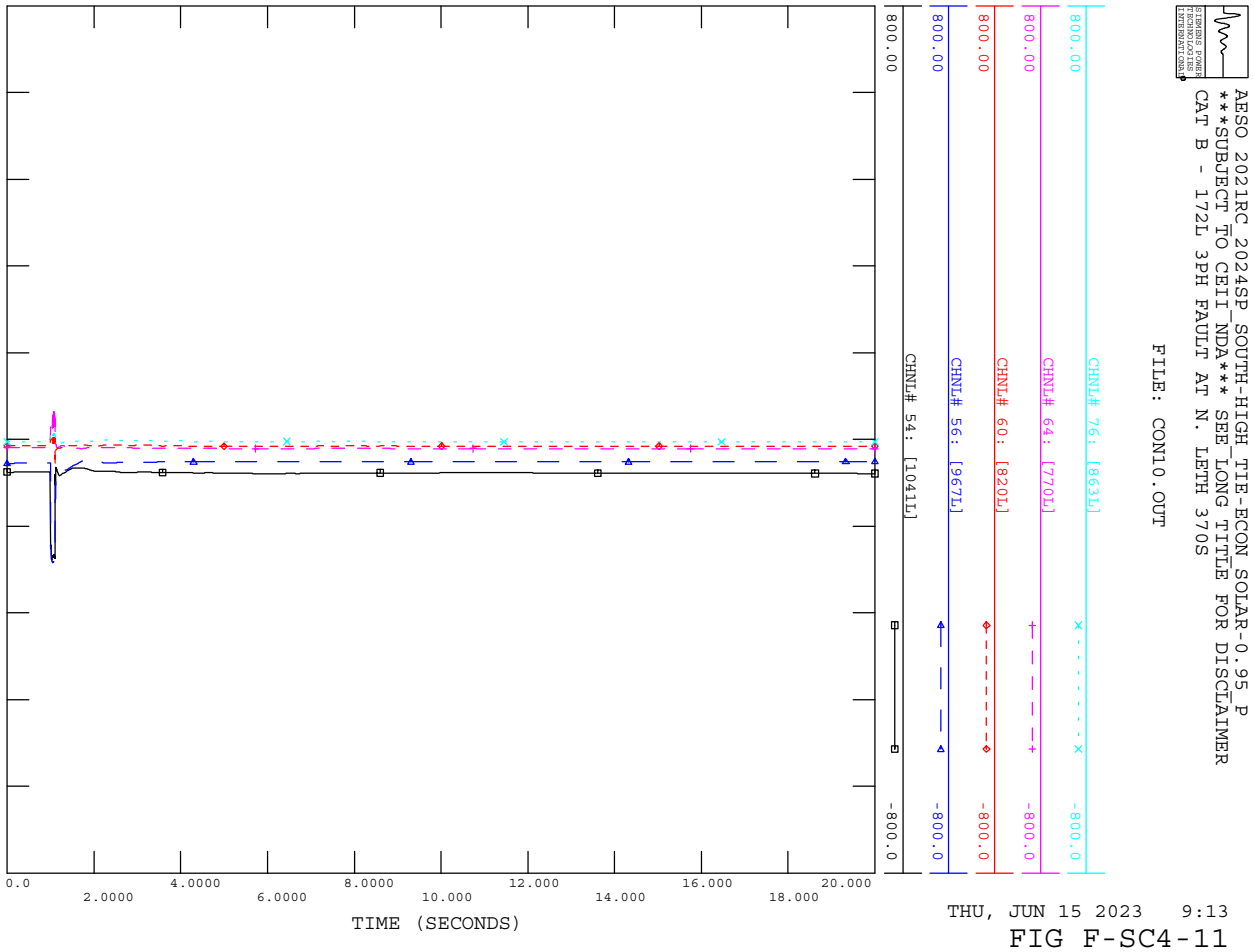


FIG F-SC4-11

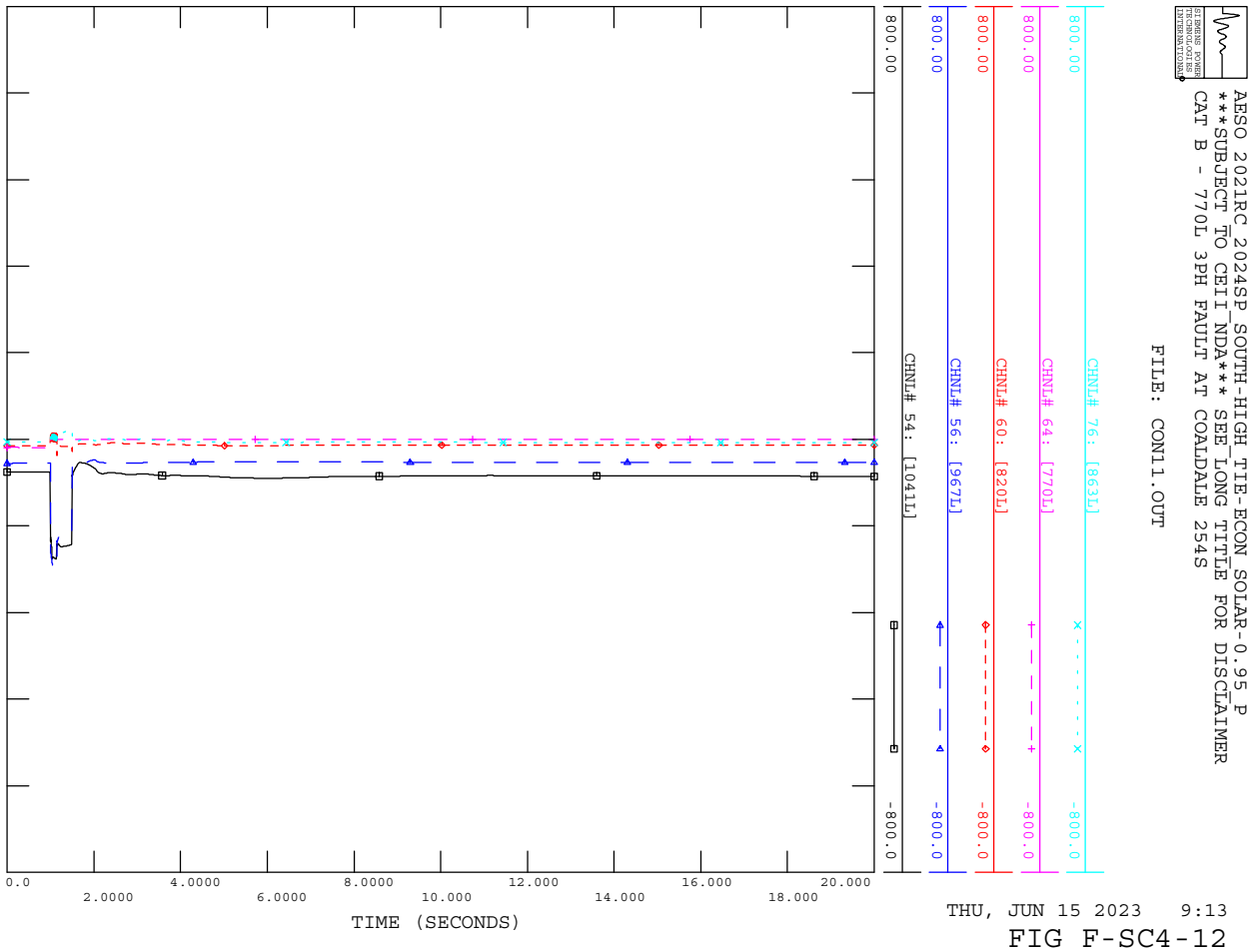


FIG F-SC4-12

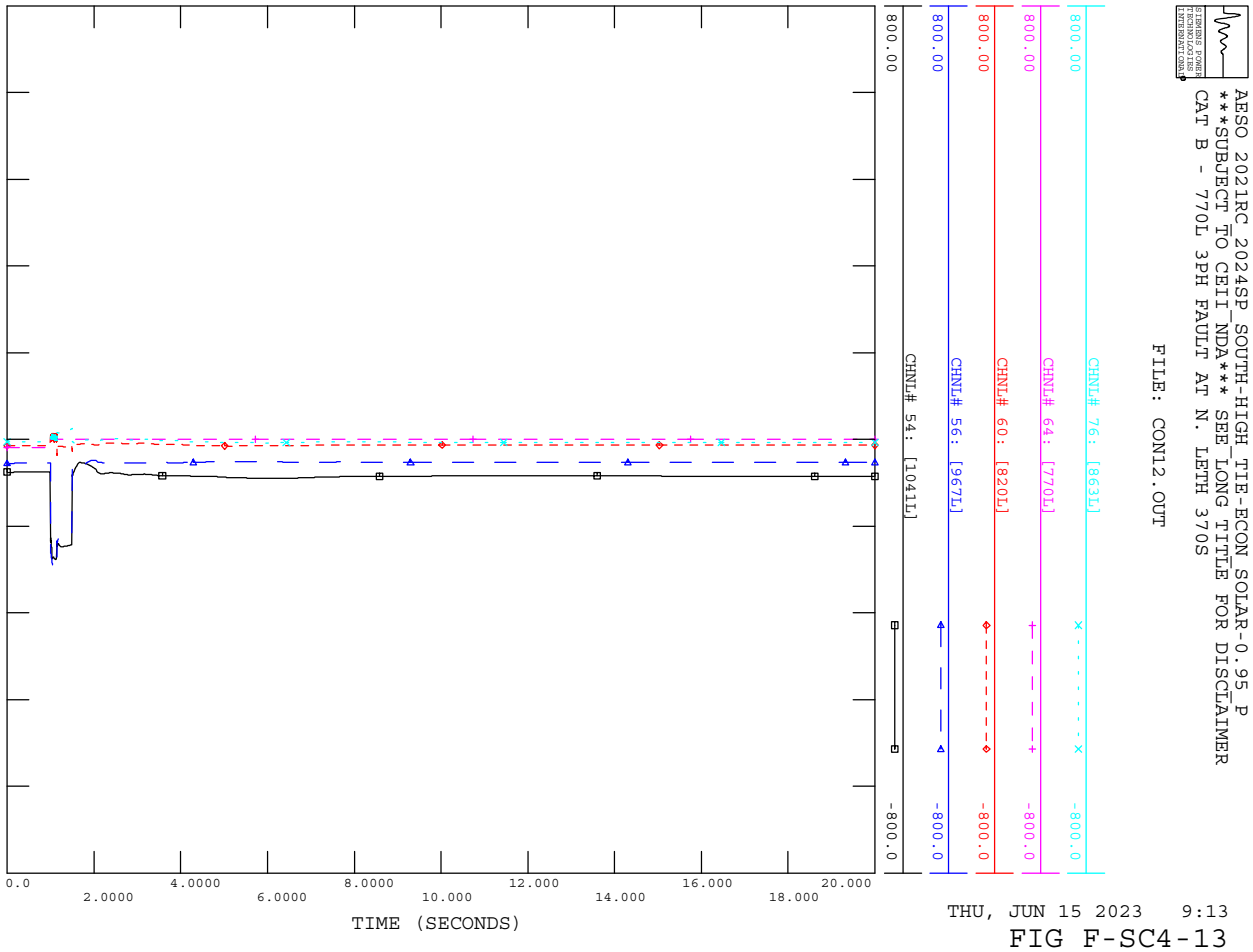


FIG F-SC4-13

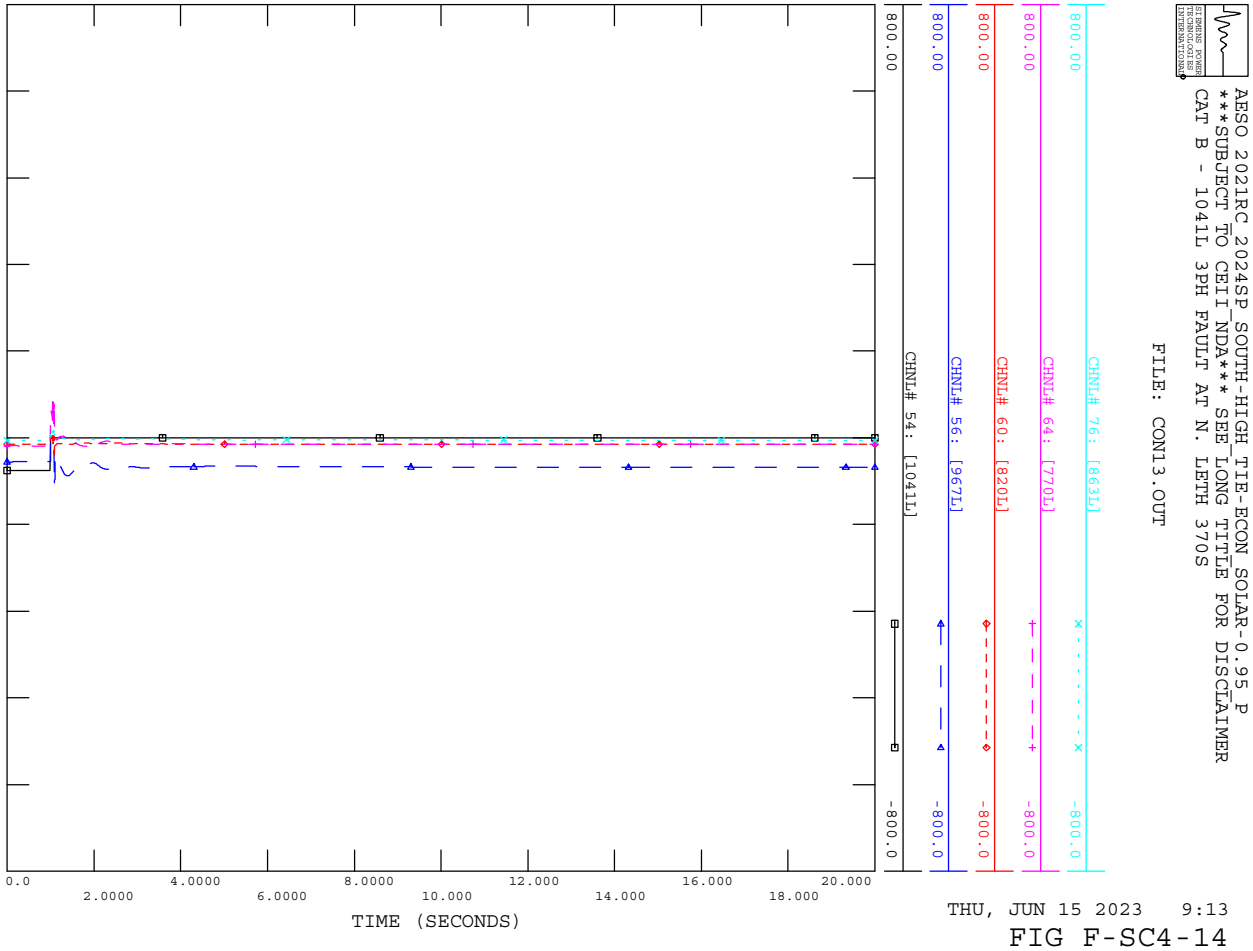


FIG F-SC4-14

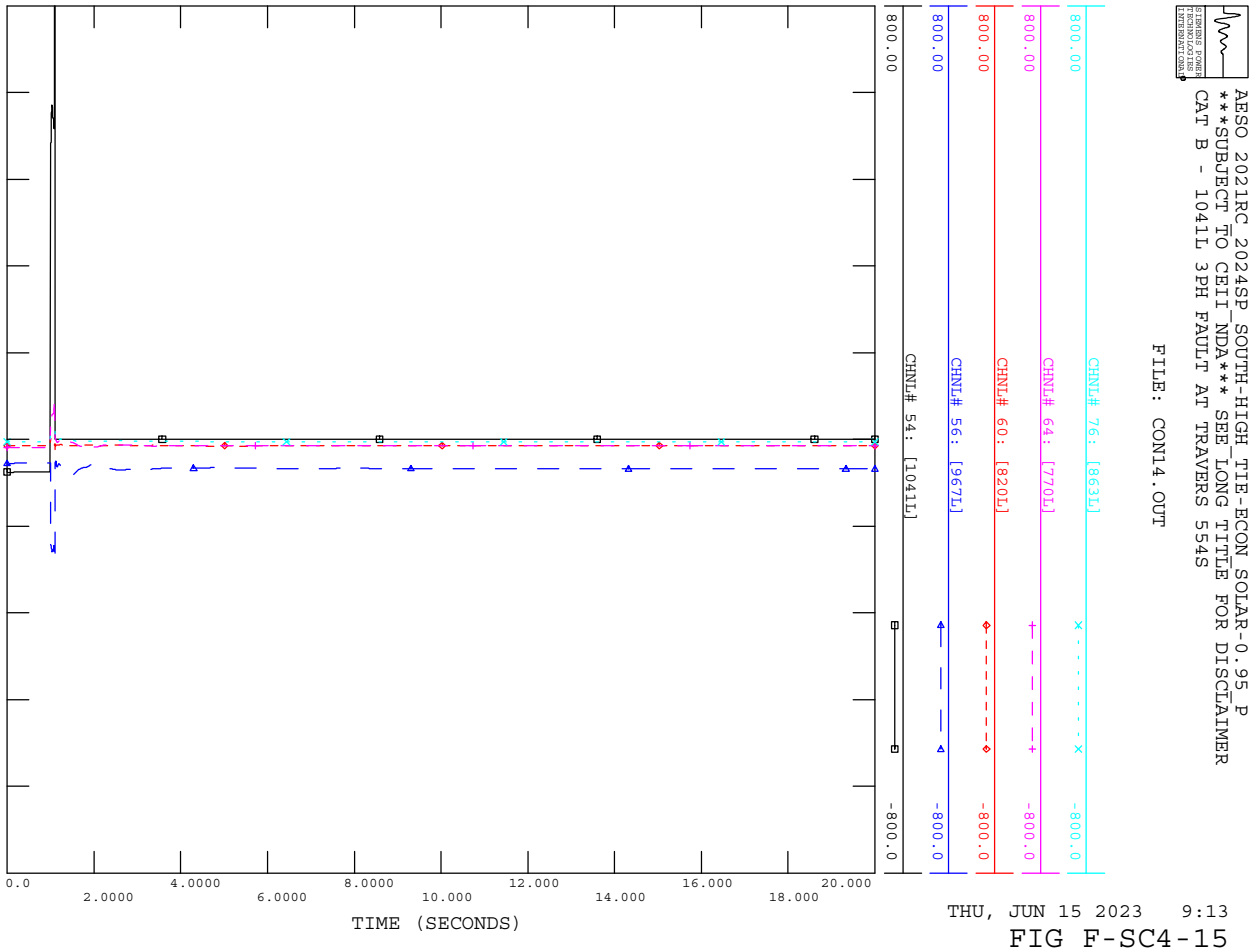


FIG F-SC4-15

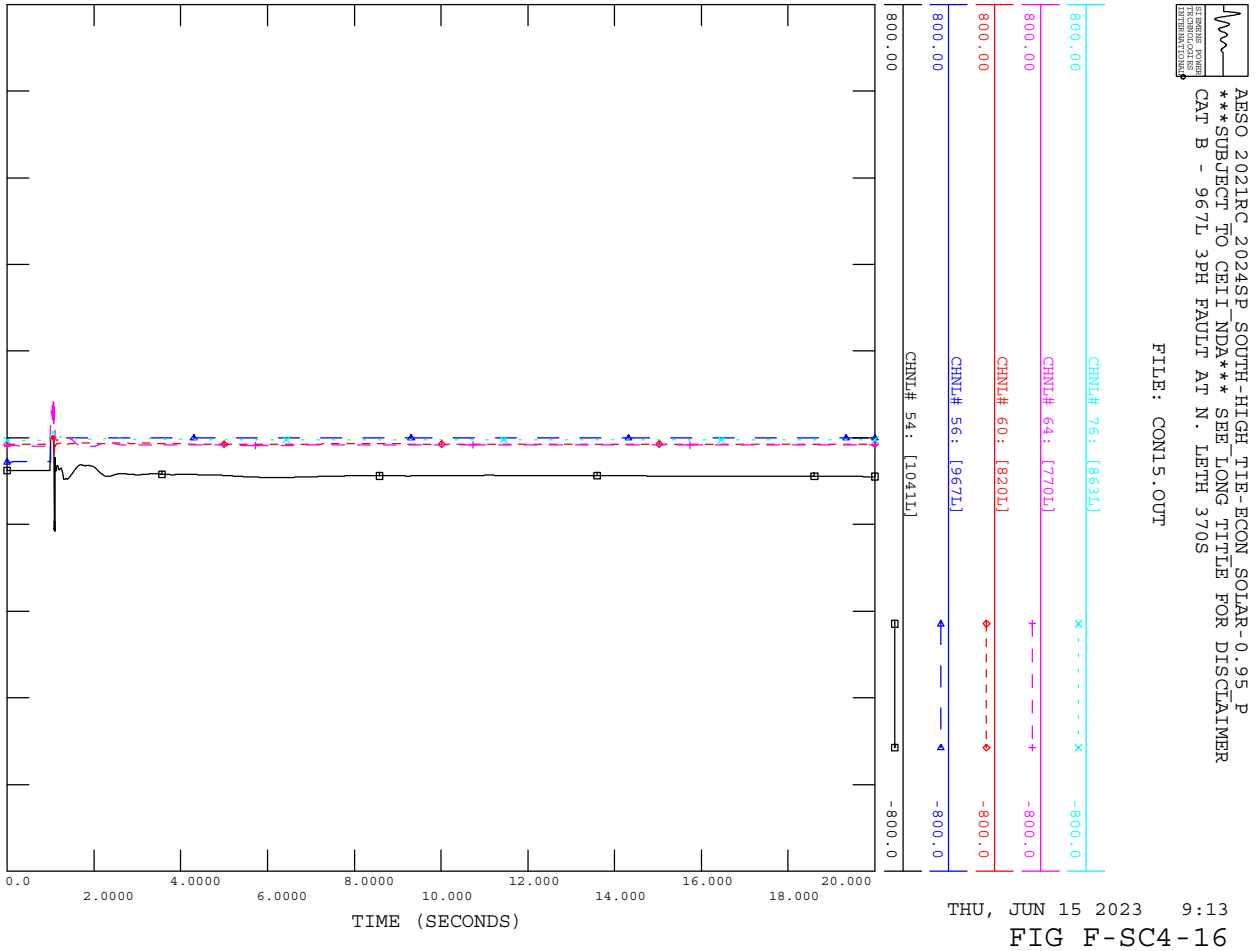


FIG F-SC4-16

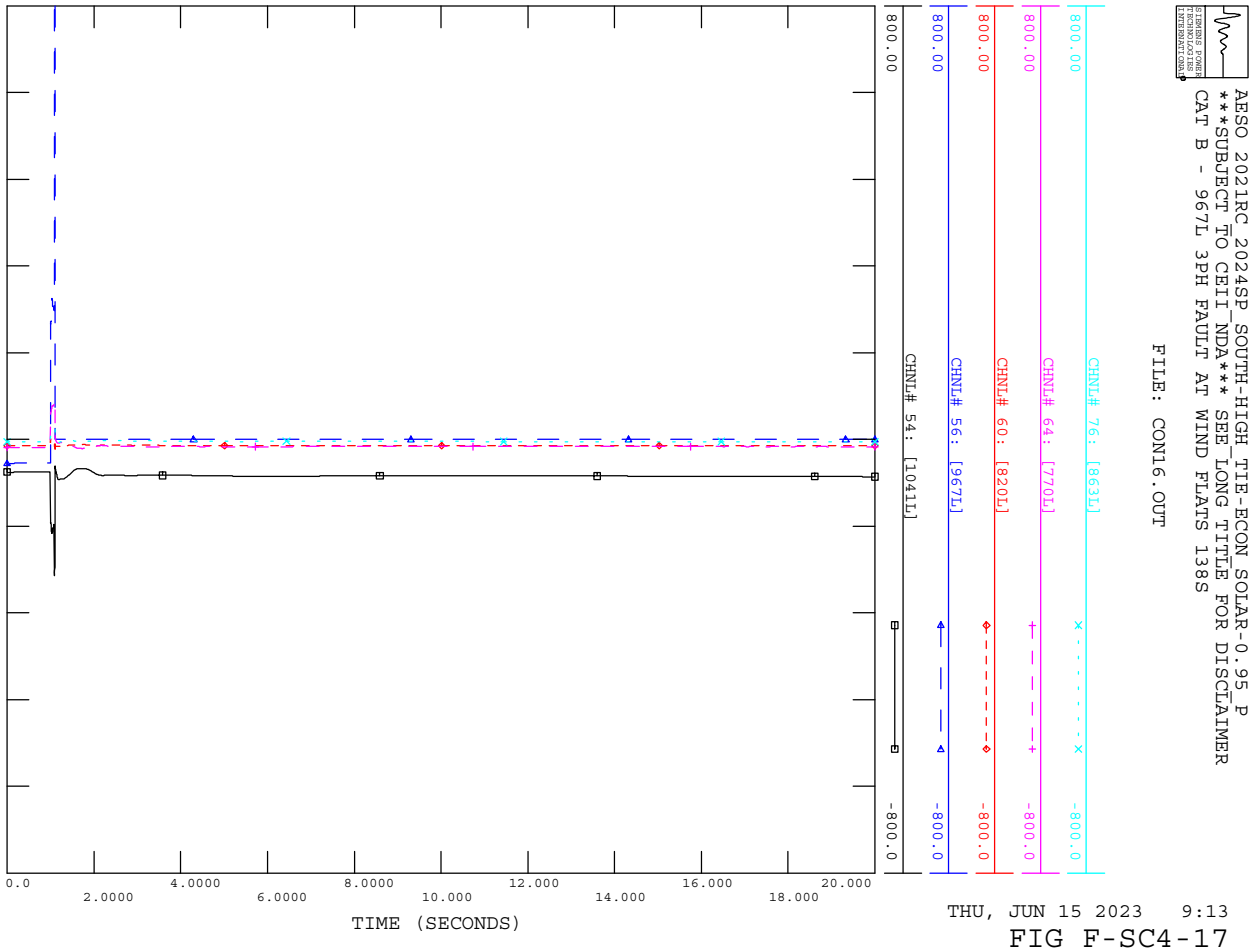


FIG F-SC4-17

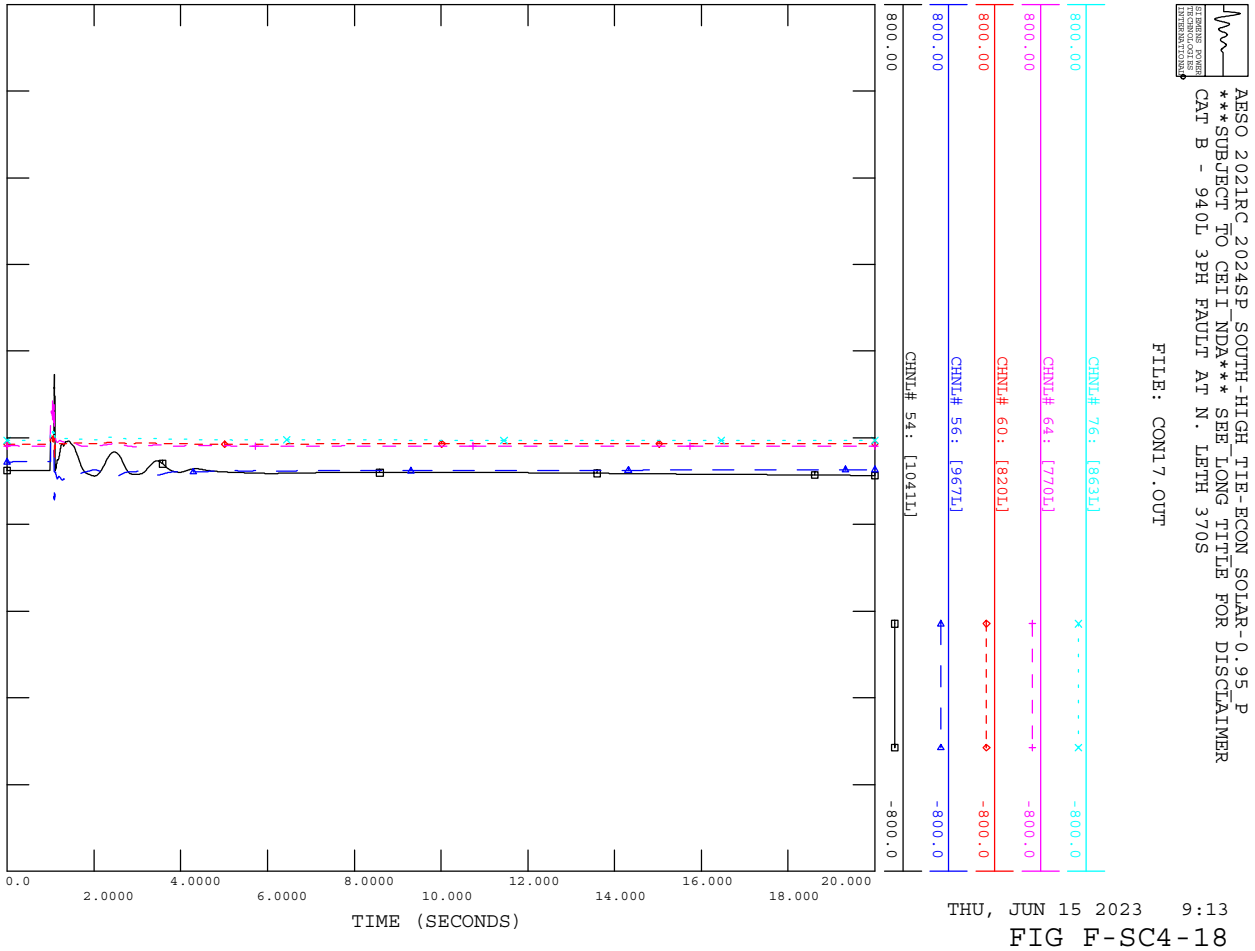


FIG F-SC4-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
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CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

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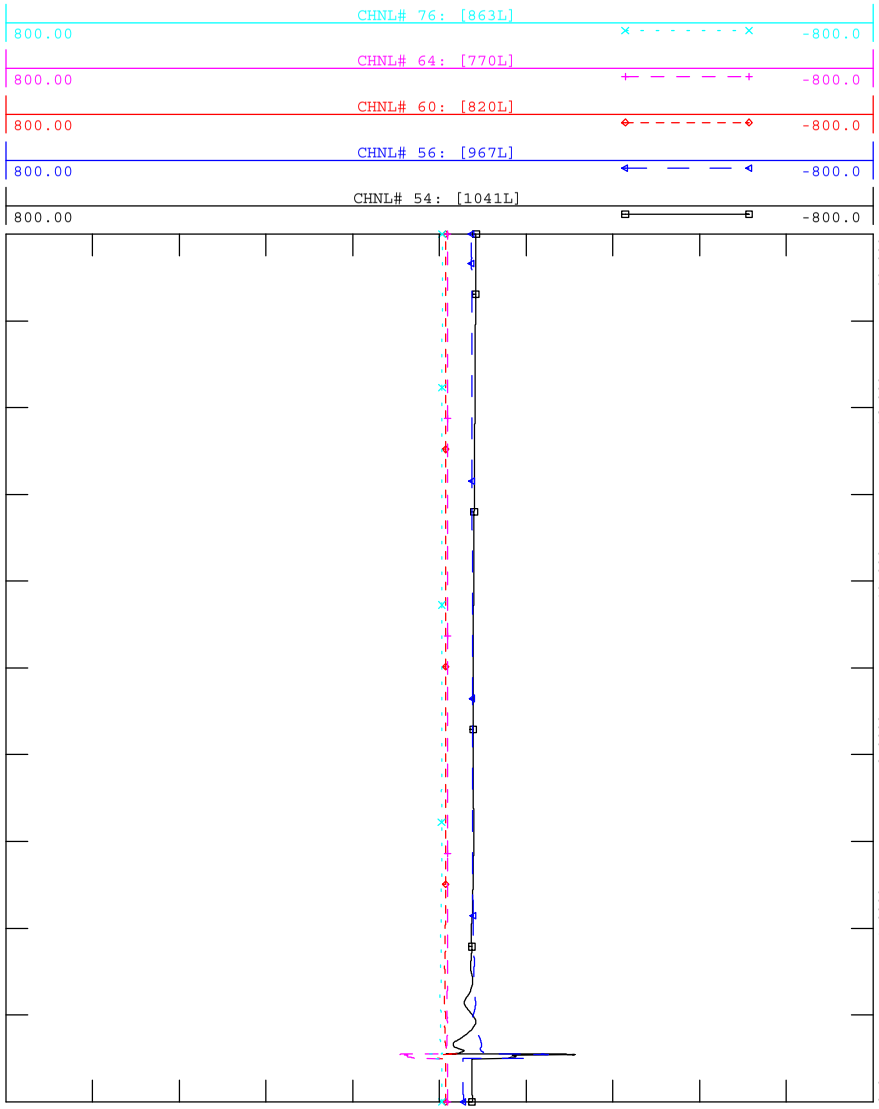
FIG F-SC4-19



Scenario 8

Summer Light Post Project Sensitivity

Transient Response Plot Key

Table Summer Light Post Project Sensitivity Figure Reference:

Scenario	Plots	Figure #
Summer Light Post Project Sensitivity	Power Plots	B-SC8-POST-1 to B-SC8-POST-19
	Var Plots	C-SC8-POST-1 to C-SC8-POST-19
	Bus Voltage Plots	D-SC8-POST-1 to D-SC8-POST-19
	Branchflow MW Plots	E-SC8-POST-1 to E-SC8-POST-19
	Branchflow MVar Plots	F-SC8-POST-1 to F-SC8-POST-19

Table Summer Light Post Project Figures:

Category	Line Element	Substation Terminals		Faulted End	Figure Reference
A	n/a	Flat Start		n/a	B-SC8-POST-1 C-SC8-POST-1 D-SC8-POST-1 E-SC8-POST-1 F-SC8-POST-1
B	820L	Stirling 67S	Coaldale 254S	67S	B-SC8-POST-2 C-SC8-POST-2 D-SC8-POST-2 E-SC8-POST-2 F-SC8-POST-2
				254S	B-SC8-POST-3 C-SC8-POST-3 D-SC8-POST-3 E-SC8-POST-3 F-SC8-POST-3
B	863L	Magrath 225S	Riverbend 618S	225S	B-SC8-POST-4 C-SC8-POST-4 D-SC8-POST-4 E-SC8-POST-4 F-SC8-POST-4
				618S	B-SC8-POST-5 C-SC8-POST-5 D-SC8-POST-5 E-SC8-POST-5 F-SC8-POST-5
B	172L	Taber 83S	Coaldale 254S	83S	B-SC8-POST-6 C-SC8-POST-6 D-SC8-POST-6 E-SC8-POST-6 F-SC8-POST-6
				254S	B-SC8-POST-7 C-SC8-POST-7 D-SC8-POST-7 E-SC8-POST-7 F-SC8-POST-7
B	172L	Coaldale 254S	N. Leth 370S	254S	B-SC8-POST-8 C-SC8-POST-8 D-SC8-POST-8 E-SC8-POST-8 F-SC8-POST-8
				370S	B-SC8-POST-9 C-SC8-POST-9 D-SC8-POST-9 E-SC8-POST-9 F-SC8-POST-9
B	172L	Chinook 181S	N. Leth 370S	181S	B-SC8-POST-10 C-SC8-POST-10

					D-SC8-POST-10 E-SC8-POST-10 F-SC8-POST-10
				370S	B-SC8-POST-11 C-SC8-POST-11 D-SC8-POST-11 E-SC8-POST-11 F-SC8-POST-11
B	770L	Coaldale 254S	N. Leth 370S	254S	B-SC8-POST-12 C-SC8-POST-12 D-SC8-POST-12 E-SC8-POST-12 F-SC8-POST-12
				370S	B-SC8-POST-13 C-SC8-POST-13 D-SC8-POST-13 E-SC8-POST-13 F-SC8-POST-13
B	1041L	N. Leth 370S	Travers 554S	370S	B-SC8-POST-14 C-SC8-POST-14 D-SC8-POST-14 E-SC8-POST-14 F-SC8-POST-14
				554S	B-SC8-POST-15 C-SC8-POST-15 D-SC8-POST-15 E-SC8-POST-15 F-SC8-POST-15
B	967L	N. Leth 370S	Wind Flats 138S	370S	B-SC8-POST-16 C-SC8-POST-16 D-SC8-POST-16 E-SC8-POST-16 F-SC8-POST-16
				138S	B-SC8-POST-17 C-SC8-POST-17 D-SC8-POST-17 E-SC8-POST-17 F-SC8-POST-17
B	940L	N. Leth 370S	Picture Butte 120S	370S	B-SC8-POST-18 C-SC8-POST-18 D-SC8-POST-18 E-SC8-POST-18 F-SC8-POST-18
				120S	B-SC8-POST-19 C-SC8-POST-19 D-SC8-POST-19 E-SC8-POST-19 F-SC8-POST-19

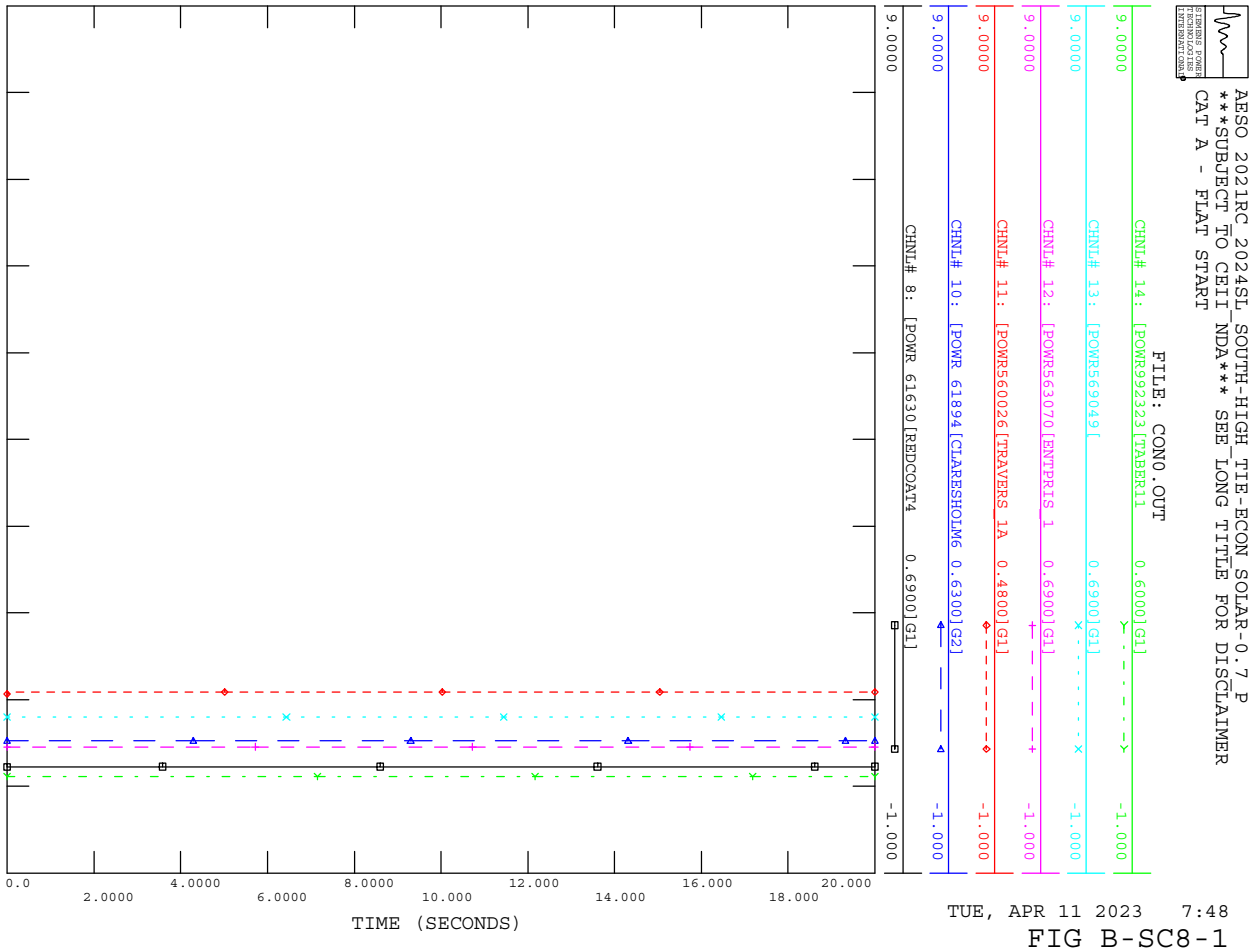


FIG B-SC8-1

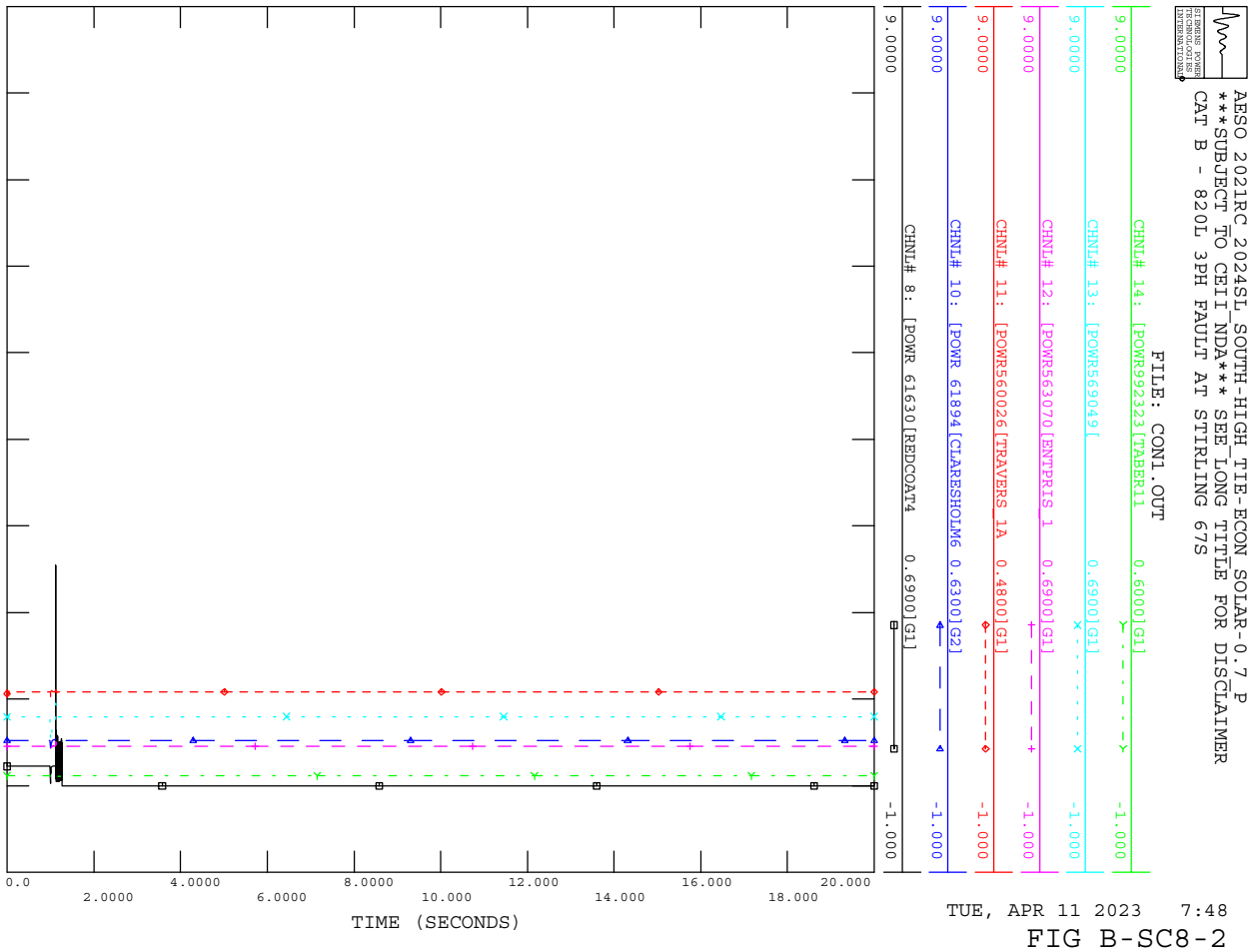


FIG B-SC8-2

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 820L 3PH FAULT AT COALDALE 254S

FILE: CON2.OUT

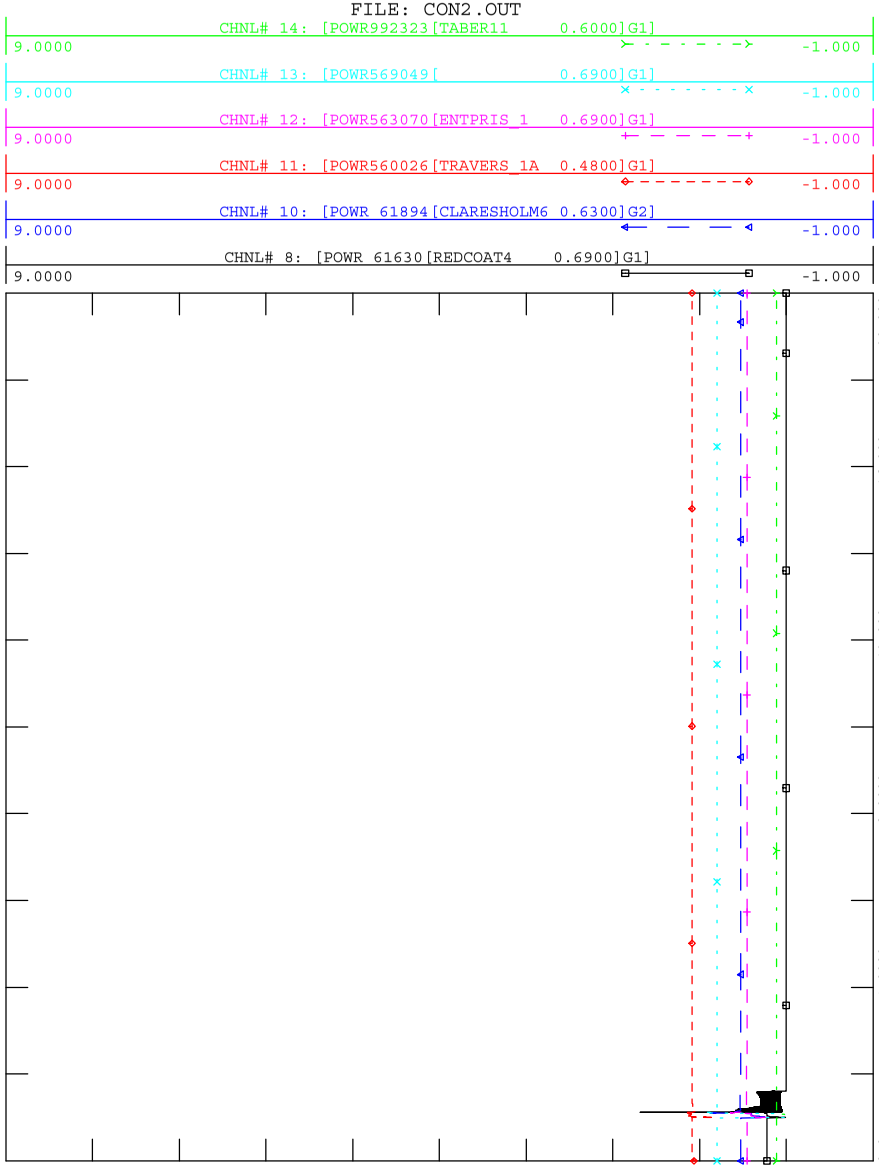


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FIG B-SC8-3

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT MAGRATH 225S

FILE: CON3.OUT

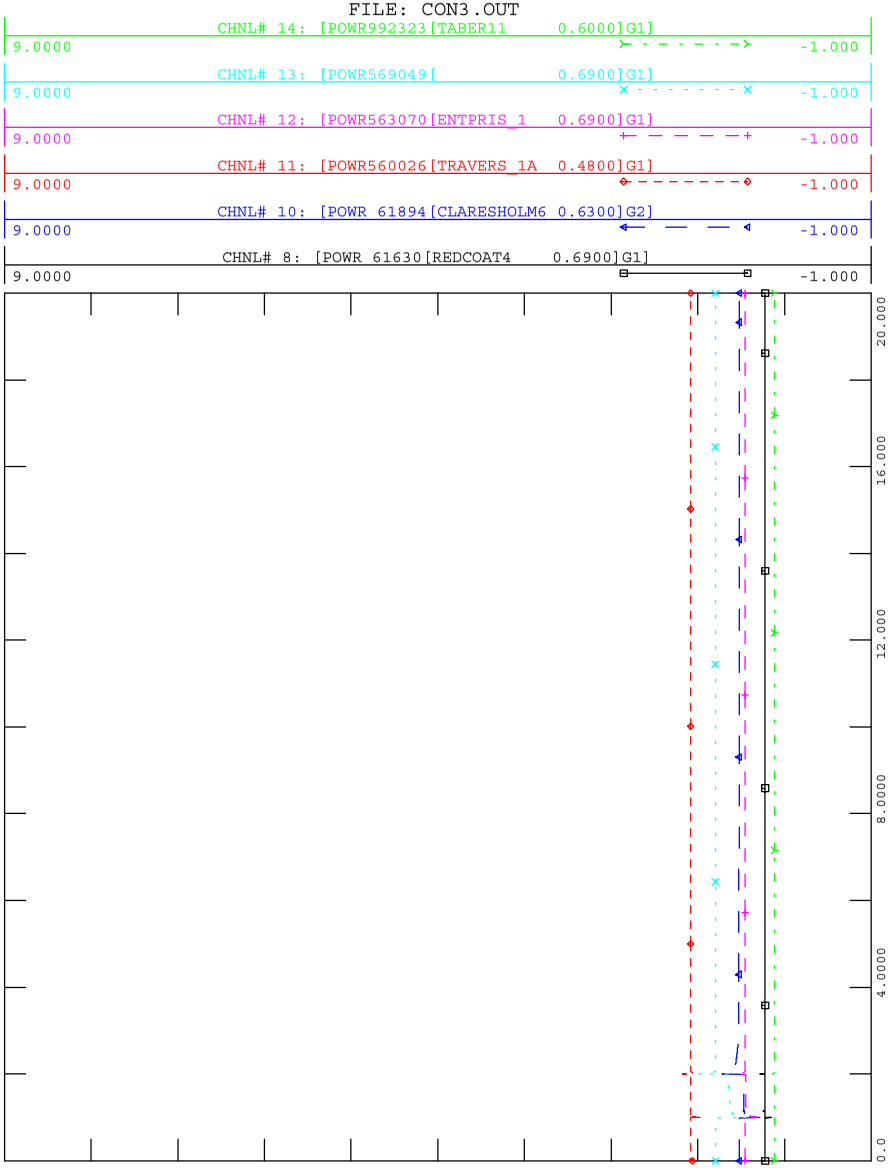

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FIG B-SC8-4

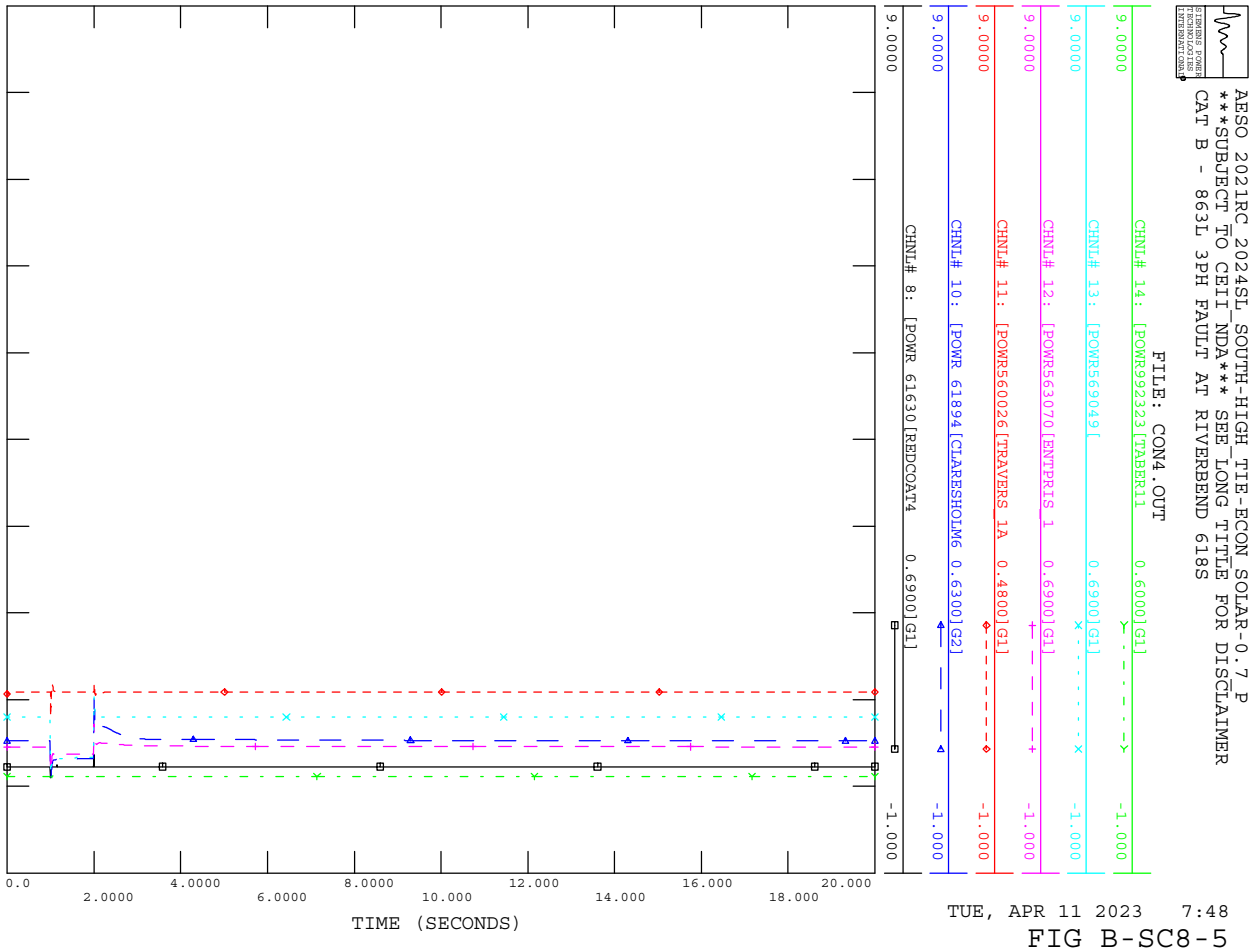

FIG B-SC8-5

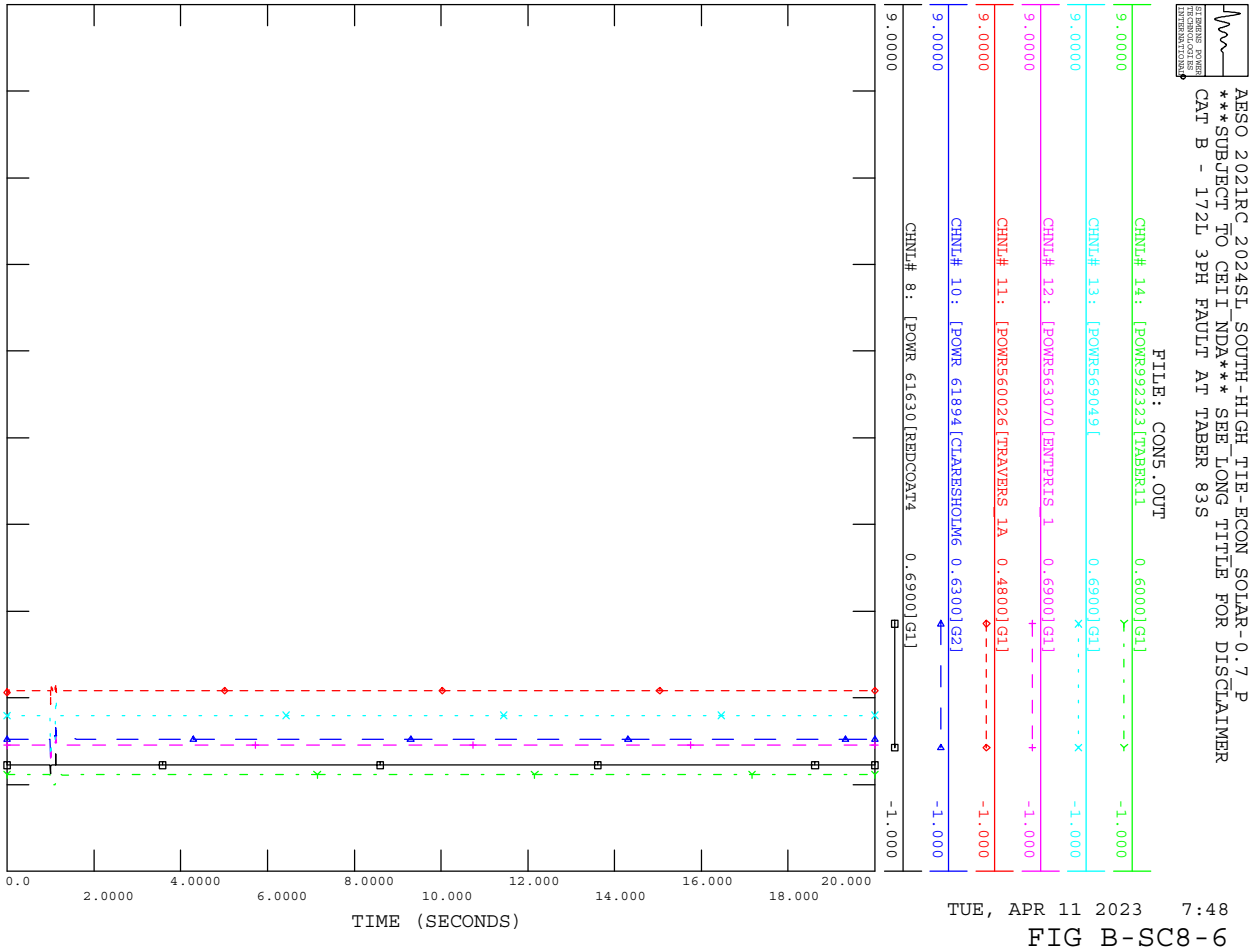

FIG B-SC8-6

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT COALDALE 254S

FILE: CON6.OUT

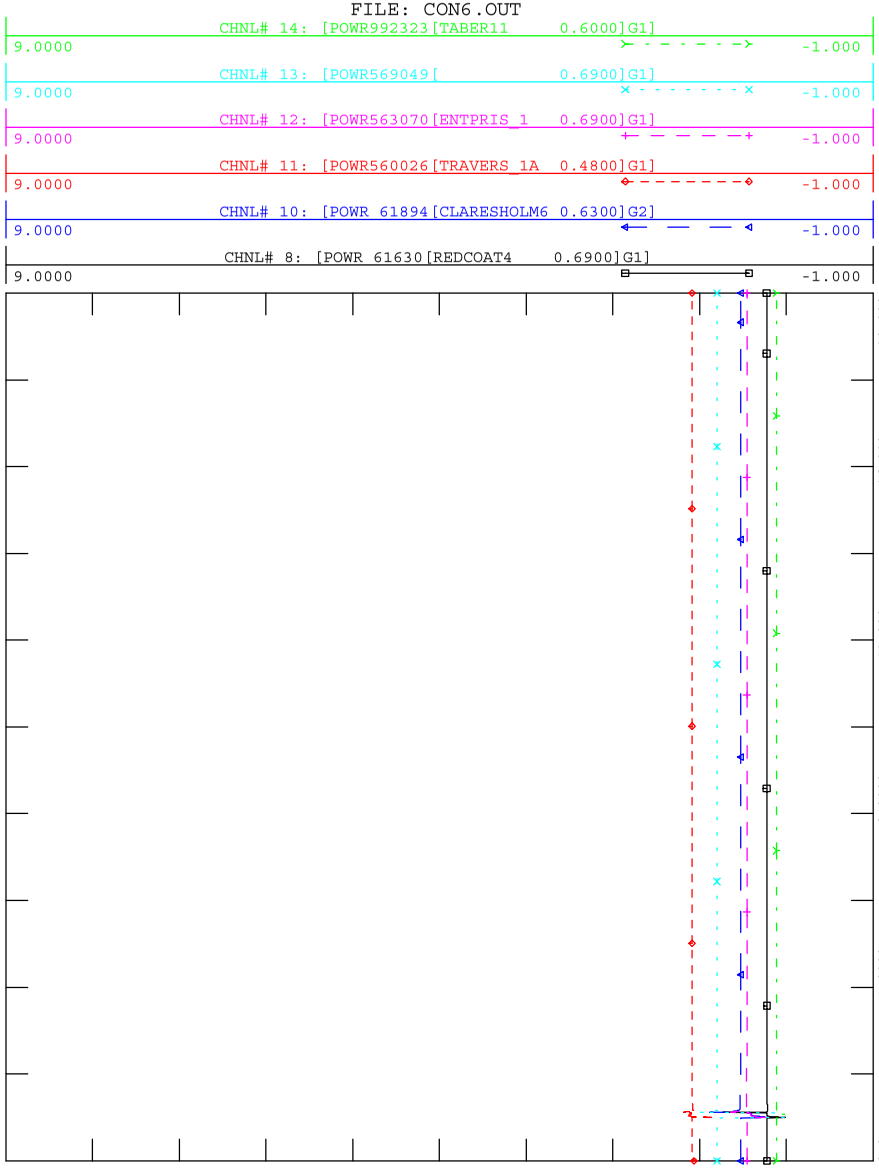

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FIG B-SC8-7

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT COALDALE 254S

FILE: CON7.OUT

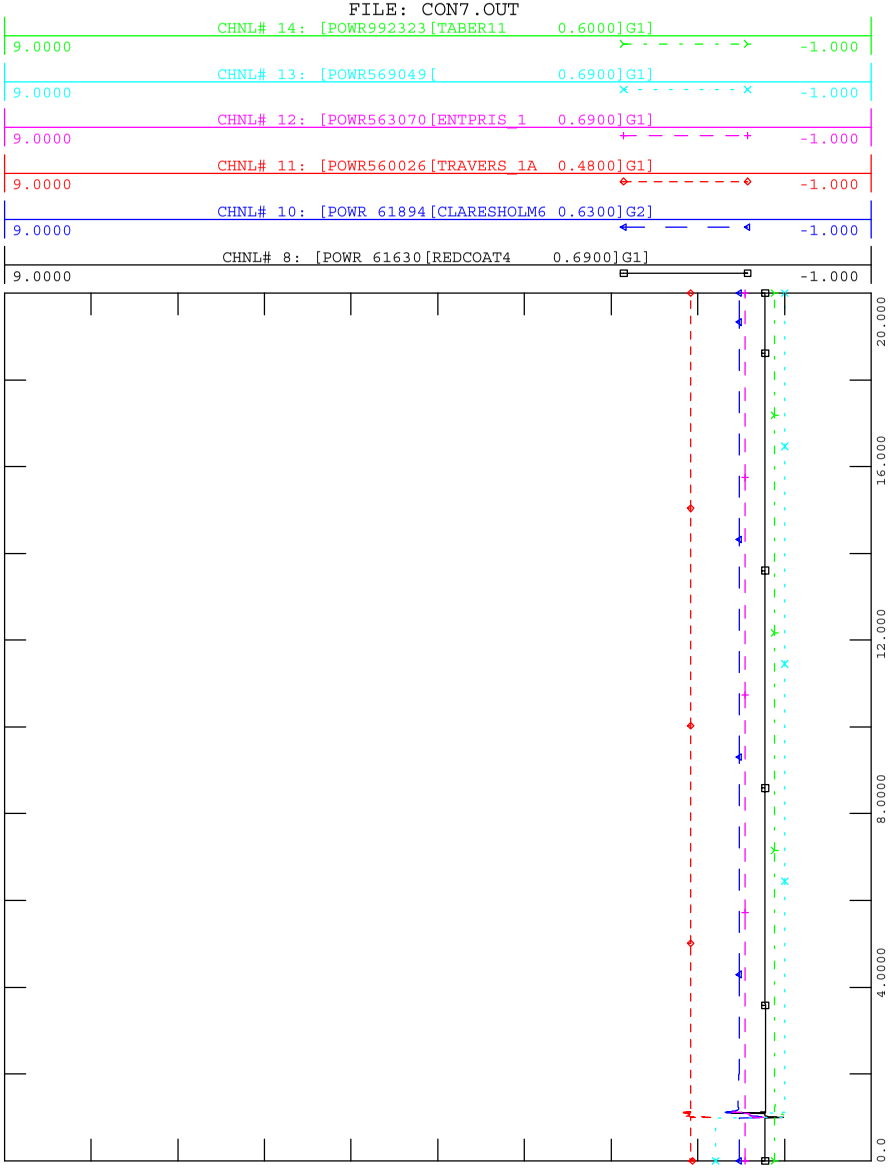

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FIG B-SC8-8

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON8.OUT

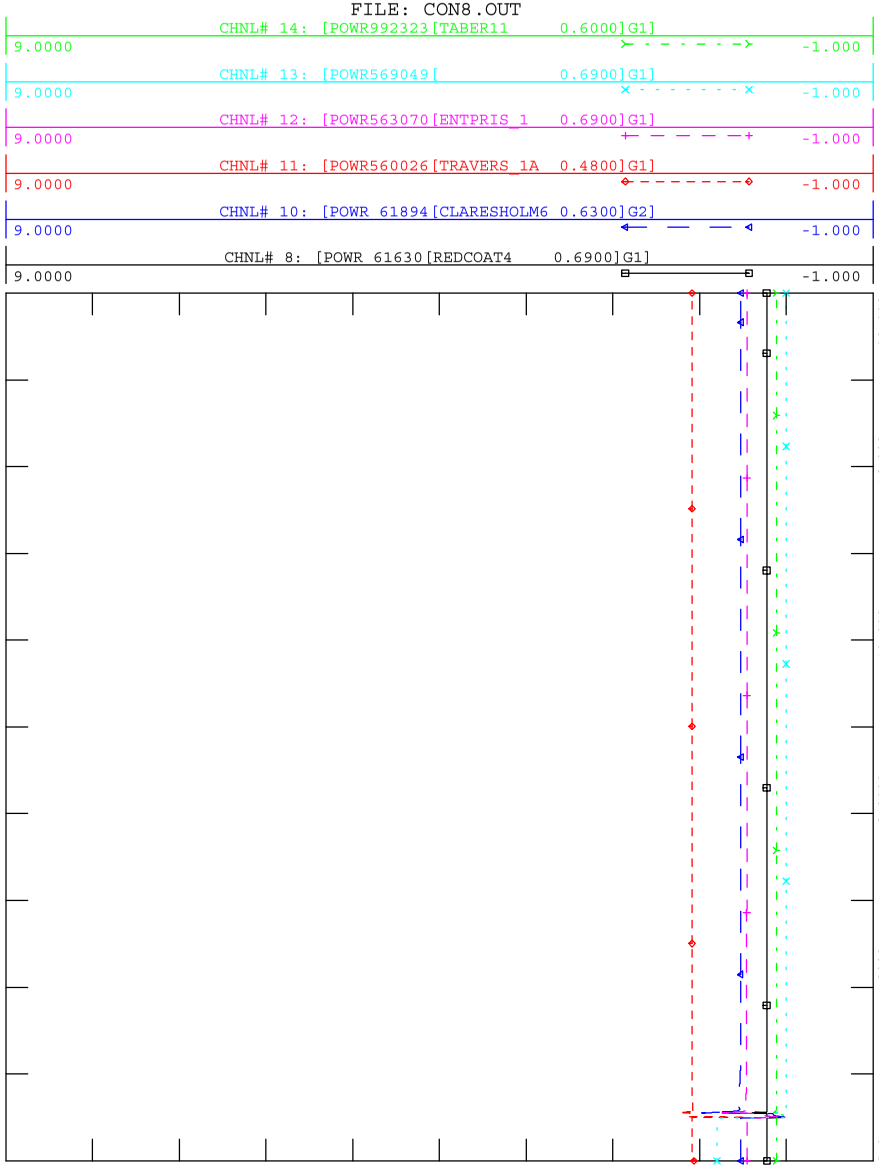

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FIG B-SC8-9

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT CHINOOK 181S

FILE: CON9.OUT

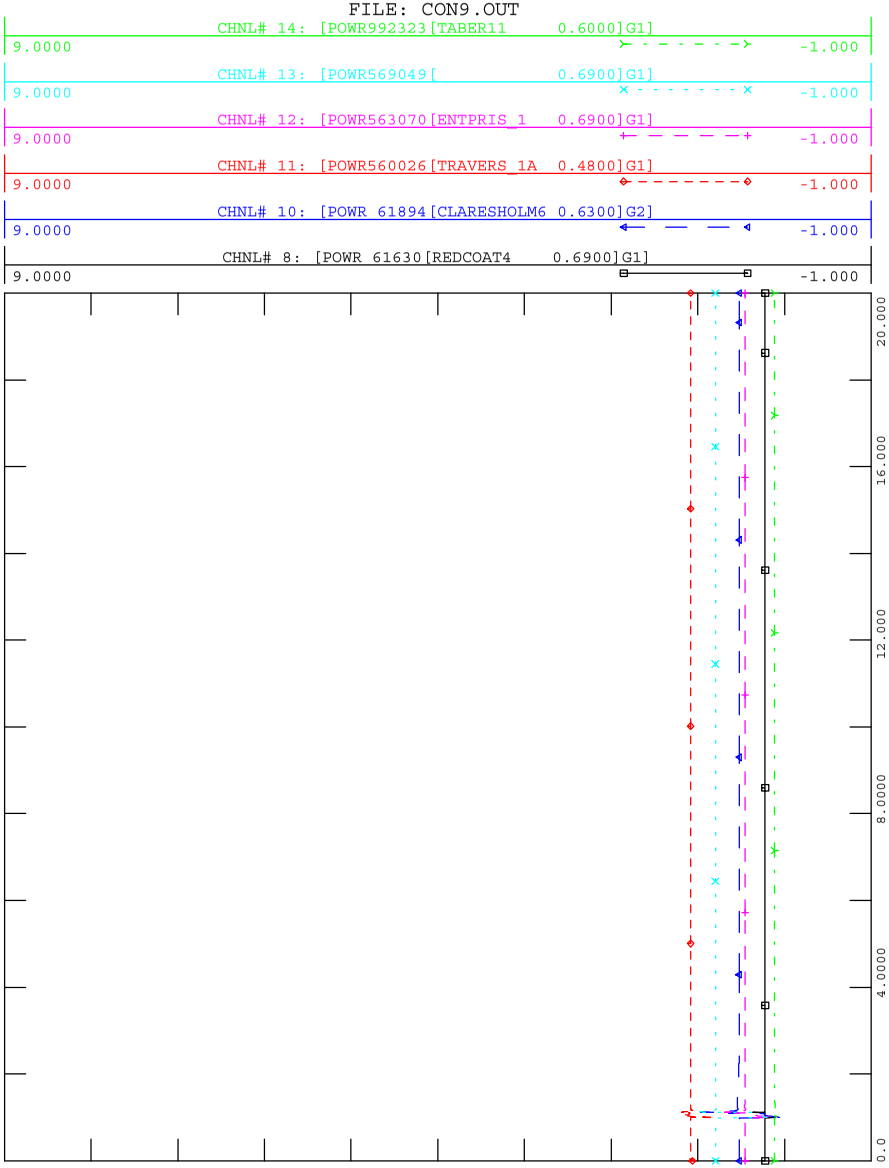

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FIG B-SC8-10

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

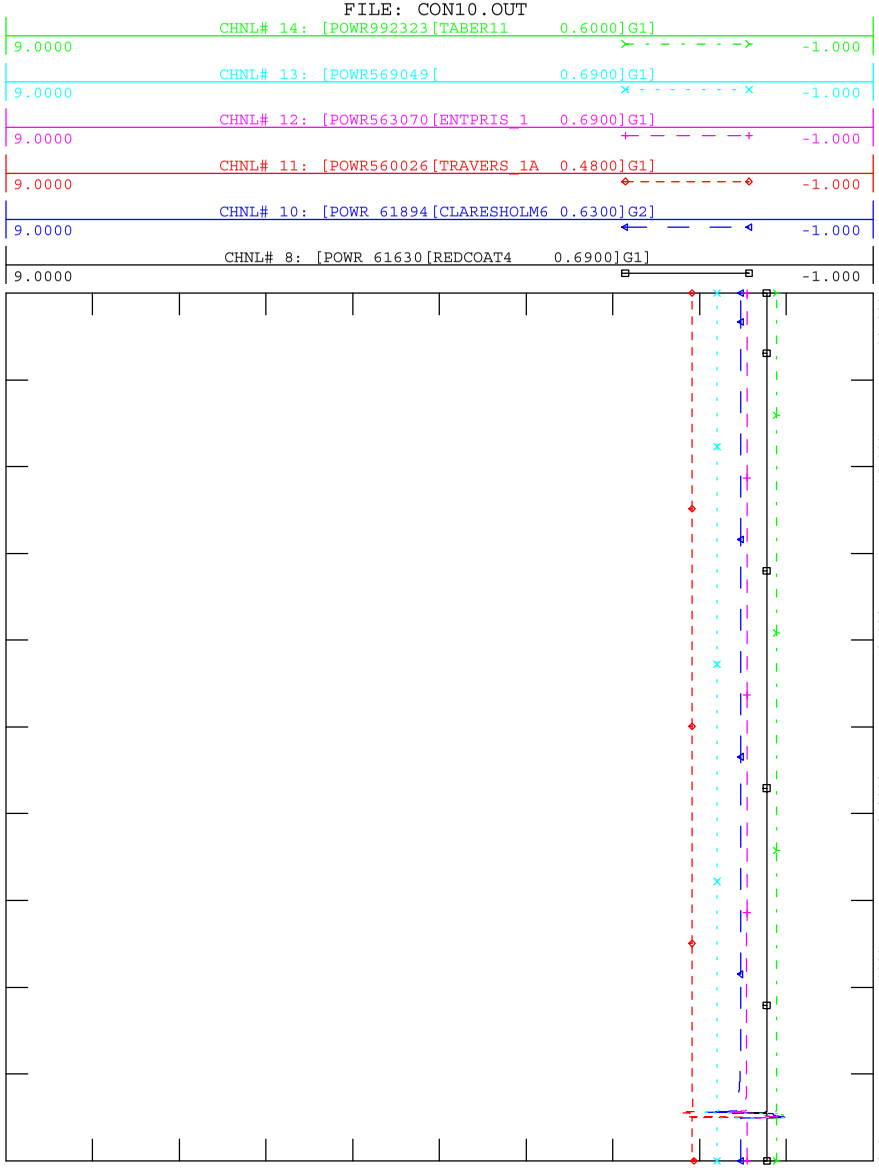

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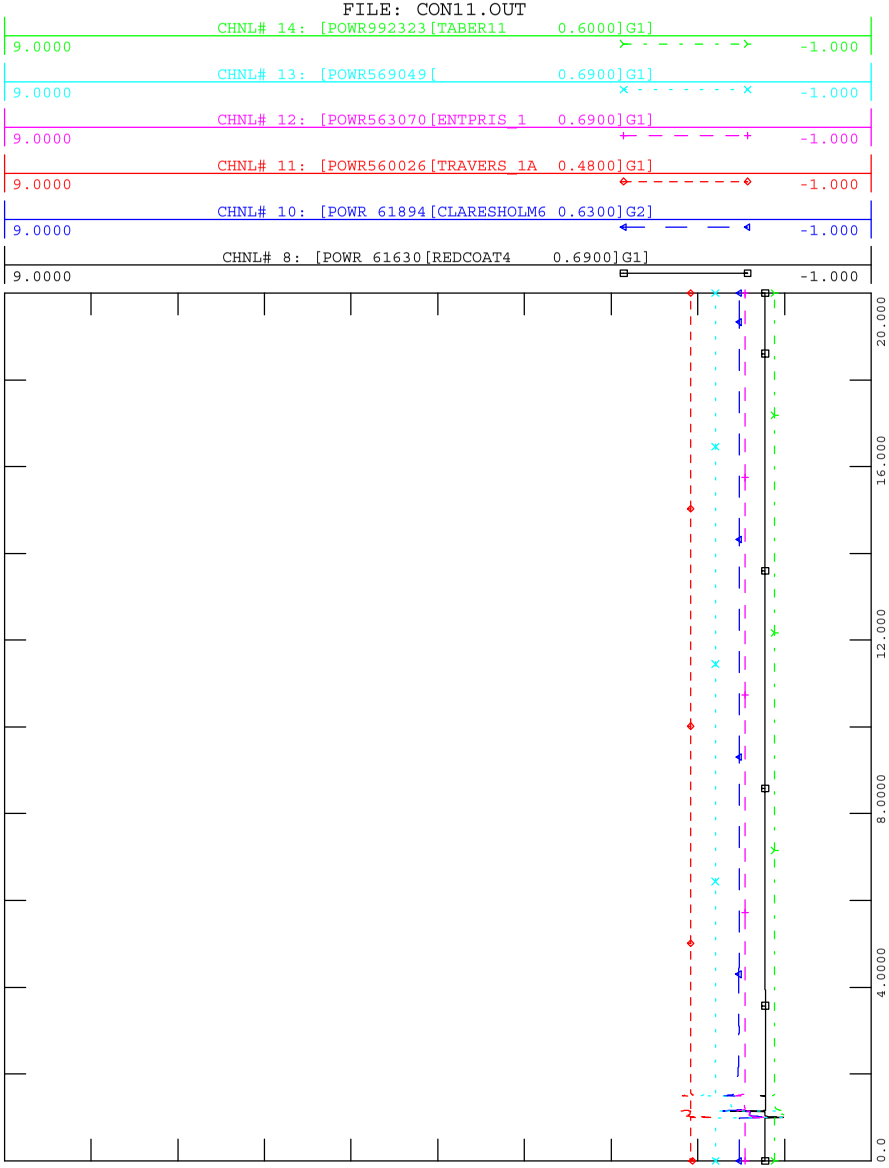
FIG B-SC8-11

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT



TUE, APR 11 2023 7:48
FIG B-SC8-12

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

FILE: CON12.OUT

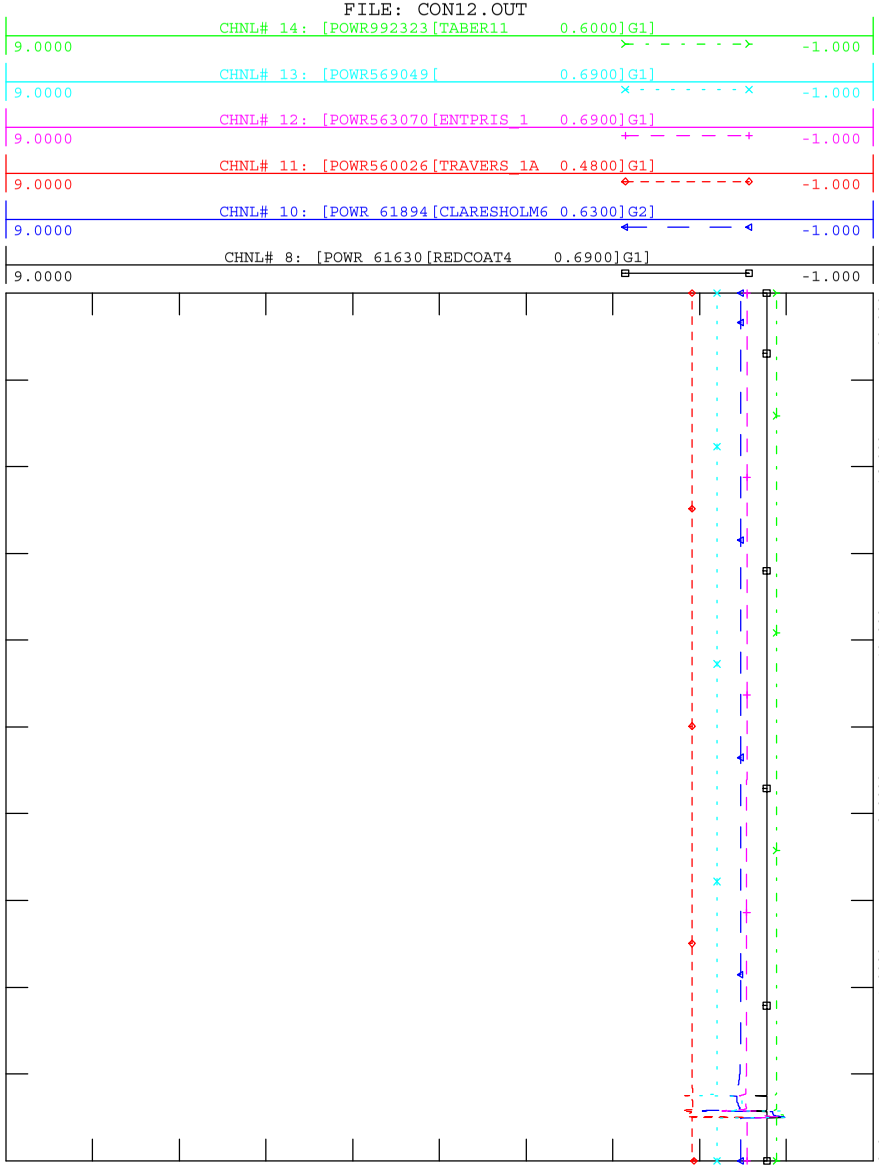


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FIG B-SC8-13

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

FILE: CON13.OUT

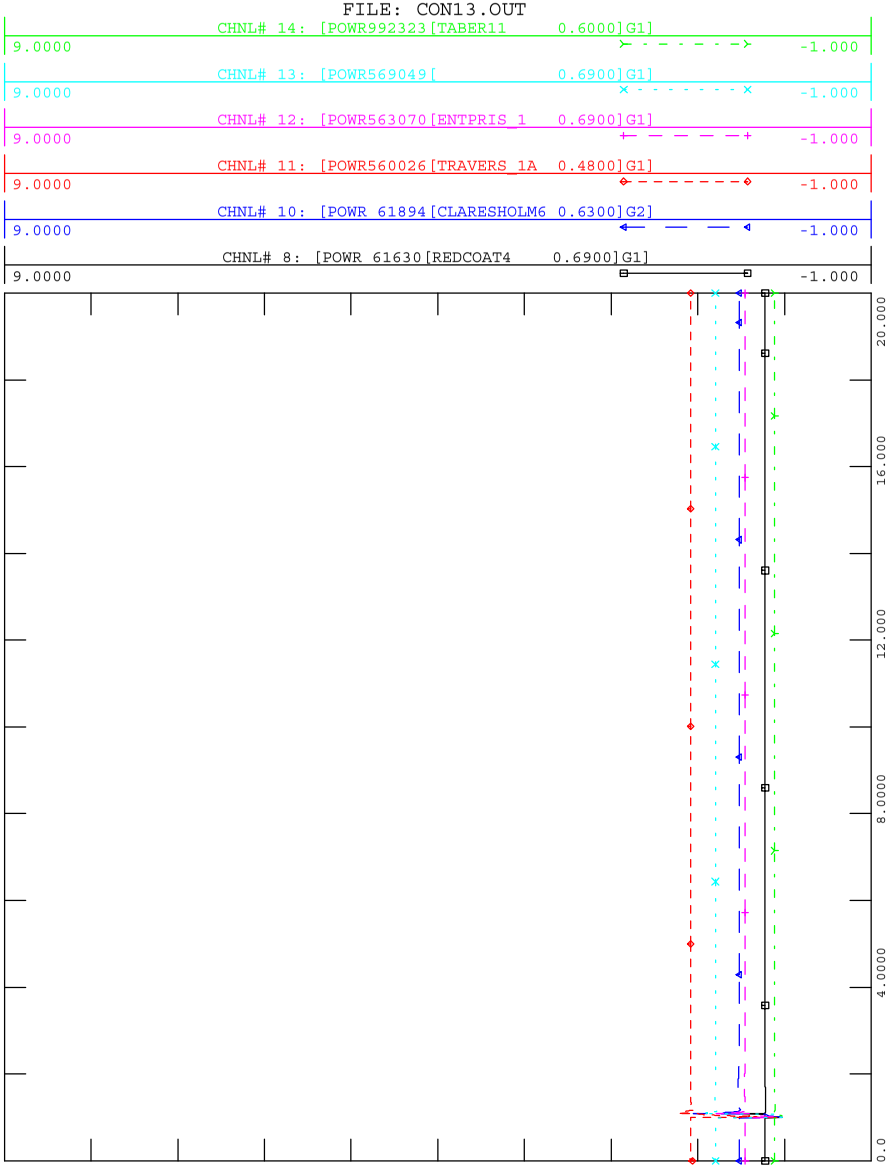

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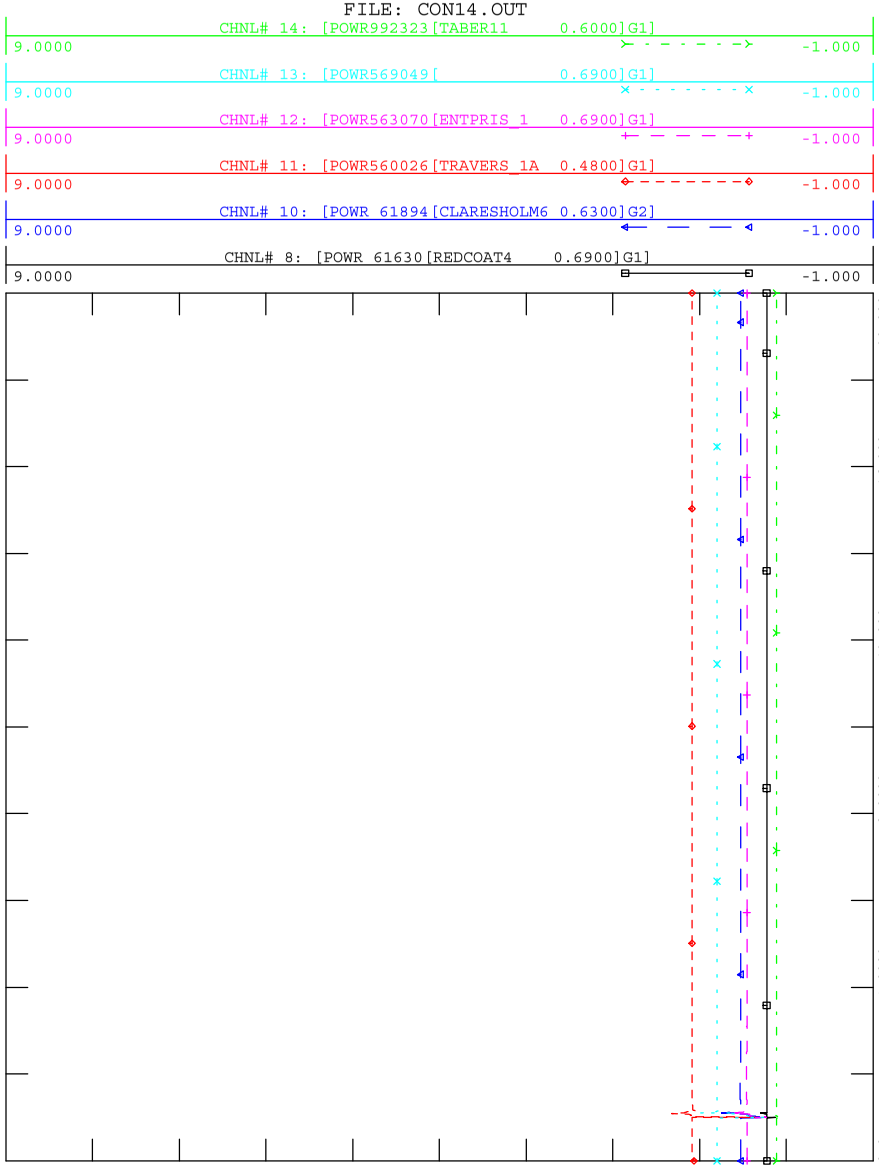
FIG B-SC8-14

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

FILE: CON14.OUT

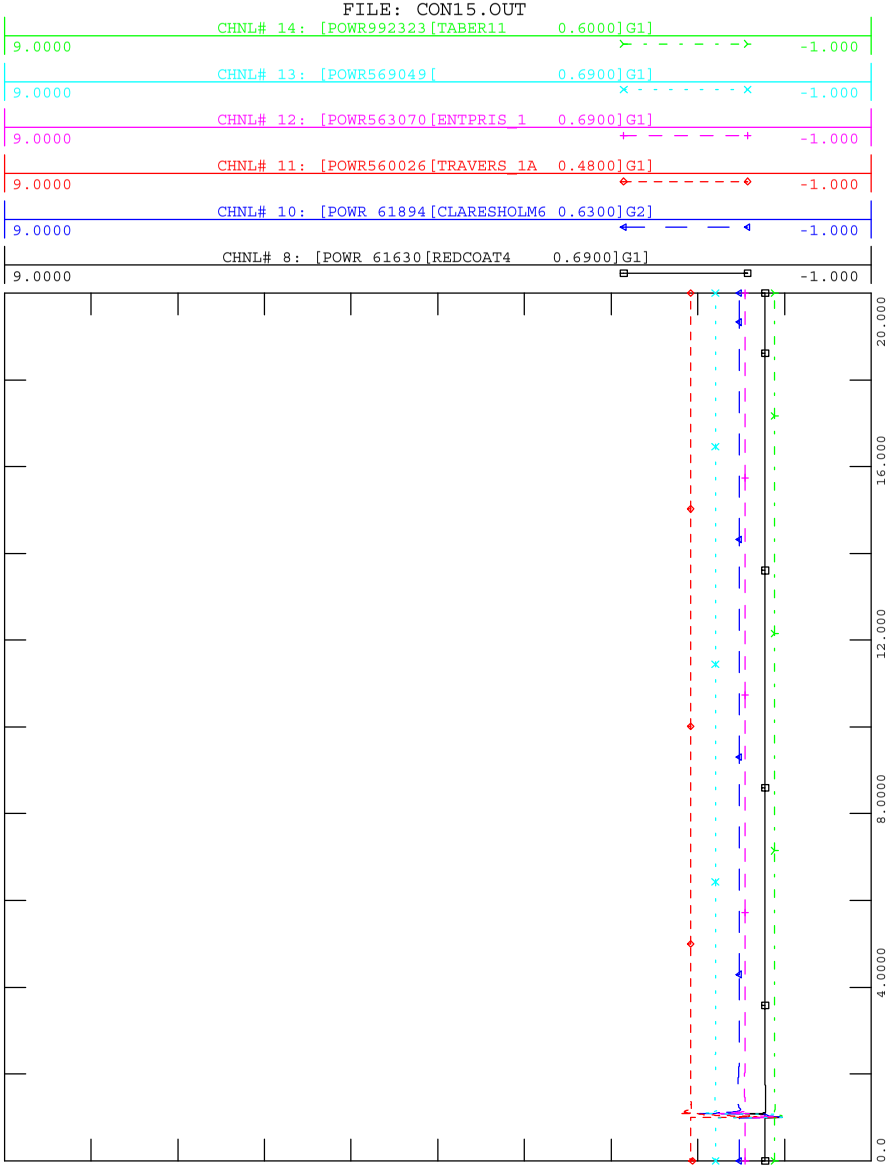


TUE, APR 11 2023 7:49

FIG B-SC8-15

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

FILE: CON15.OUT

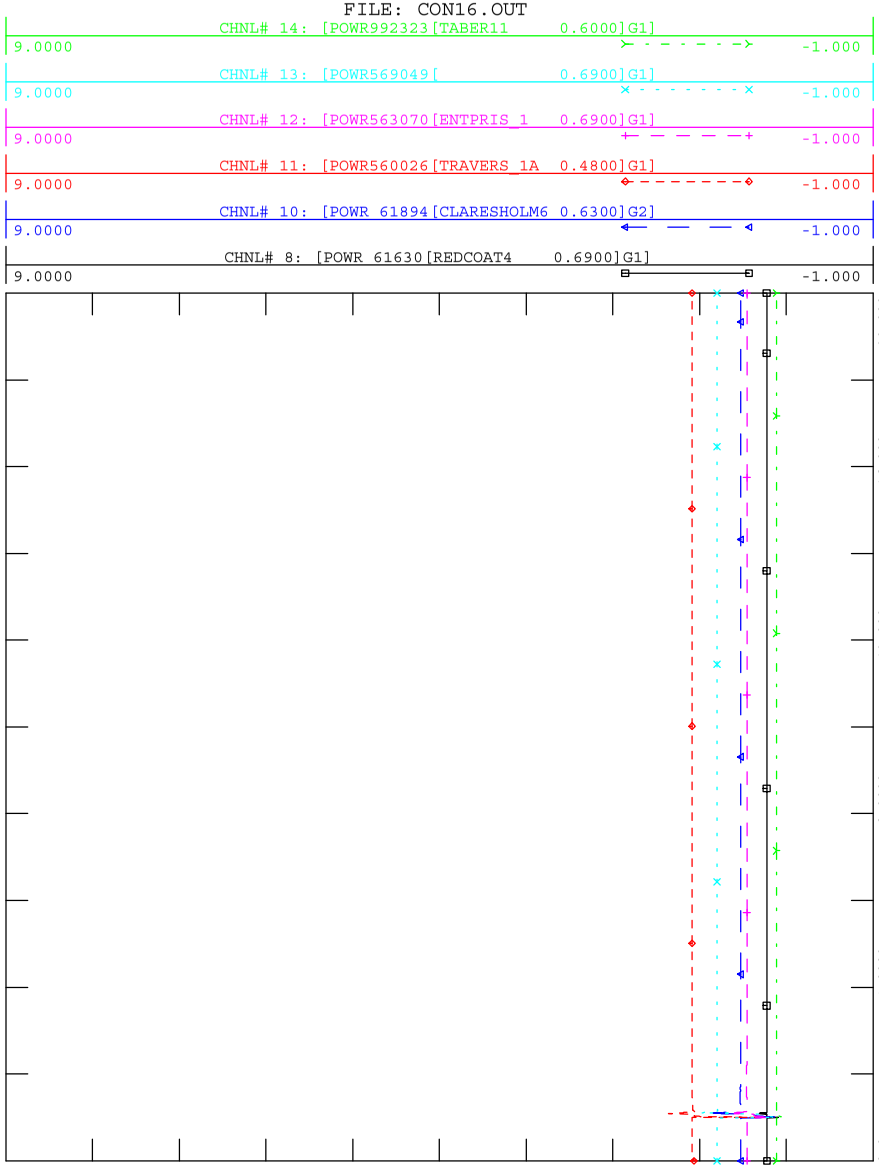


TUE, APR 11 2023 7:49

FIG B-SC8-16

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT WIND FLATS 138S

FILE: CON16.OUT

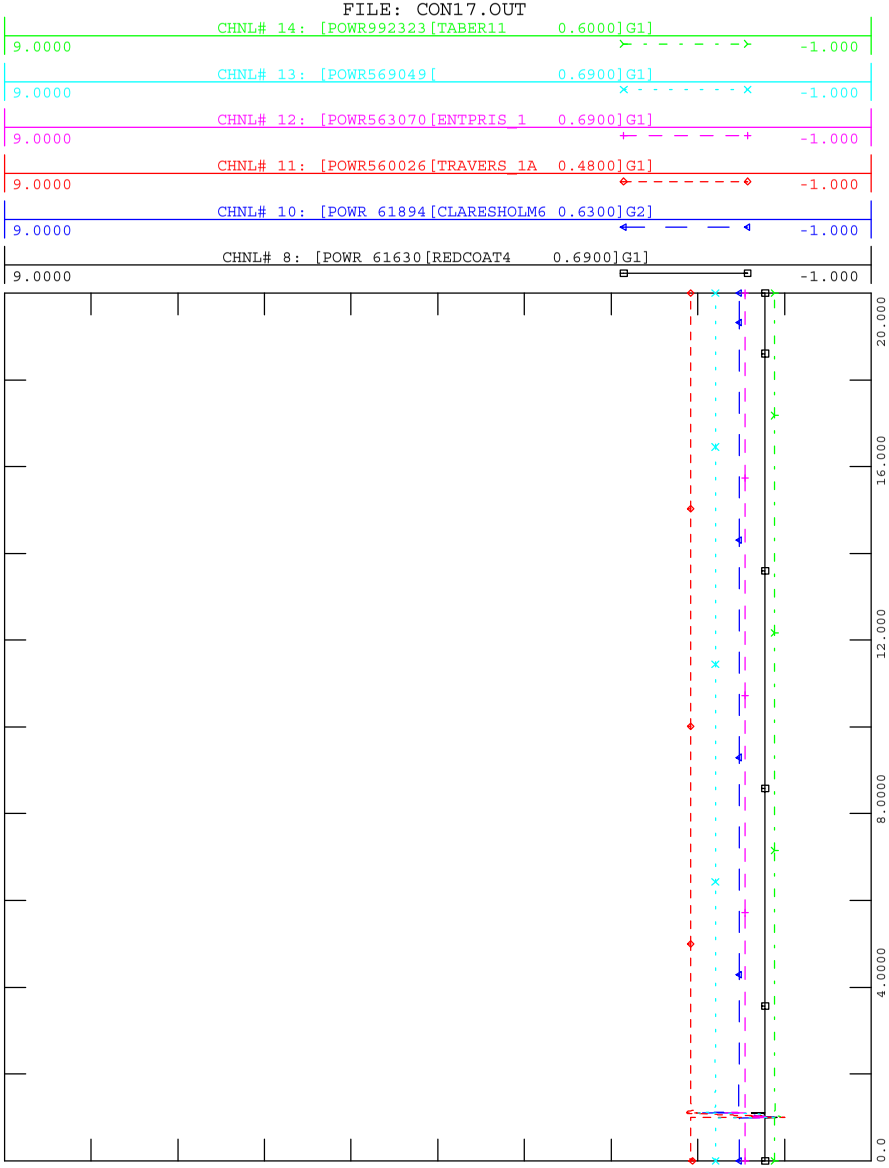


TUE, APR 11 2023 7:49

FIG B-SC8-17

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT N. LETH 370S

FILE: CON17.OUT

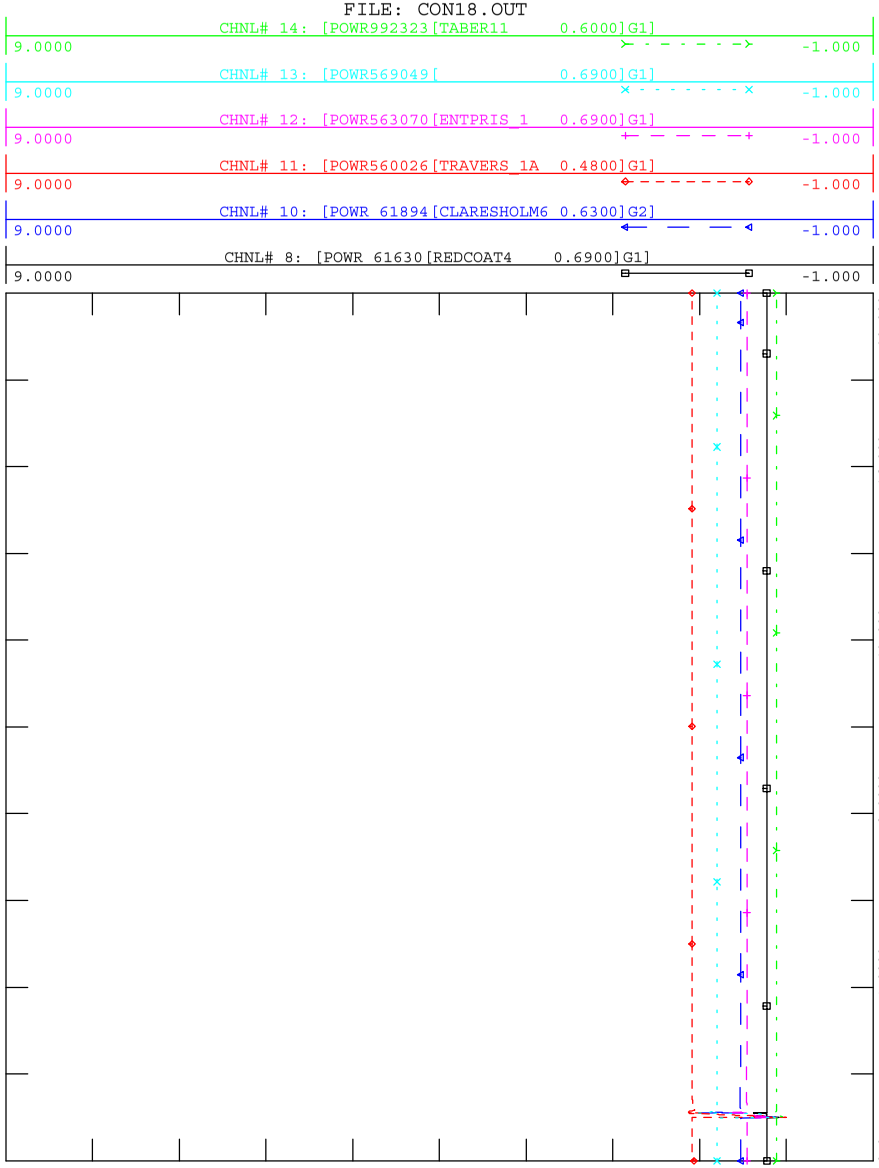


TUE, APR 11 2023 7:49

FIG B-SC8-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



TUE, APR 11 2023 7:49

FIG B-SC8-19

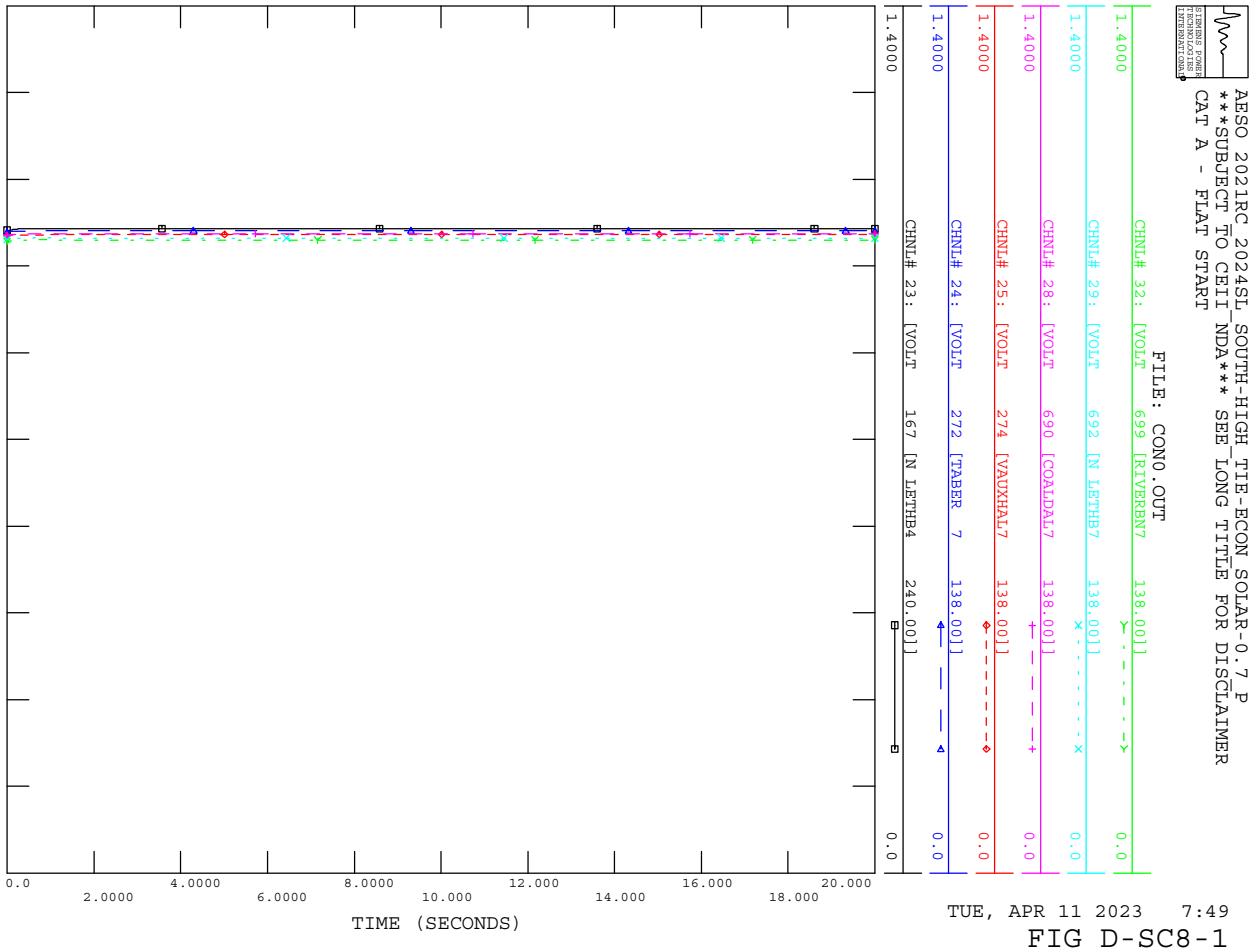


FIG D-SC8-1

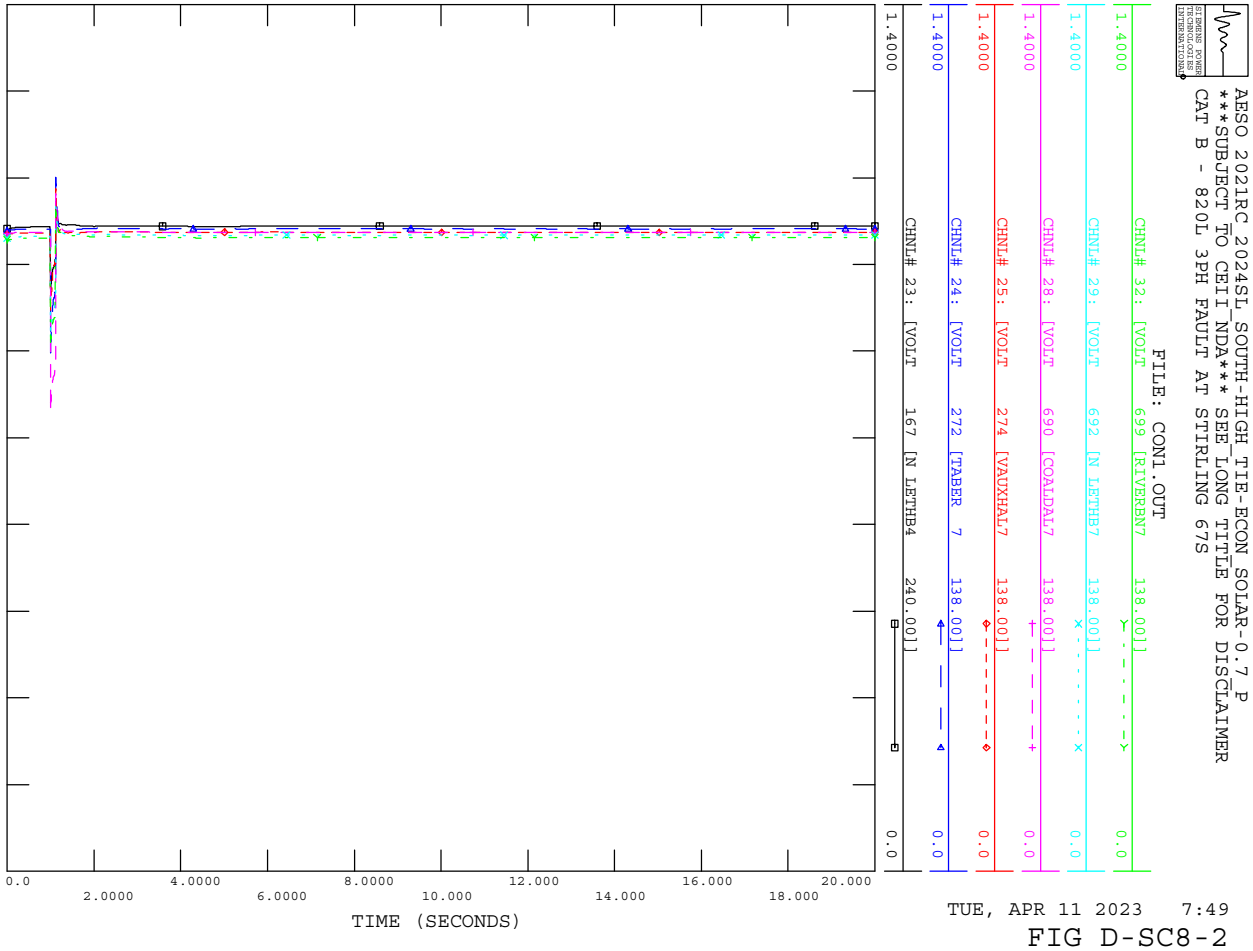


FIG D-SC8-2

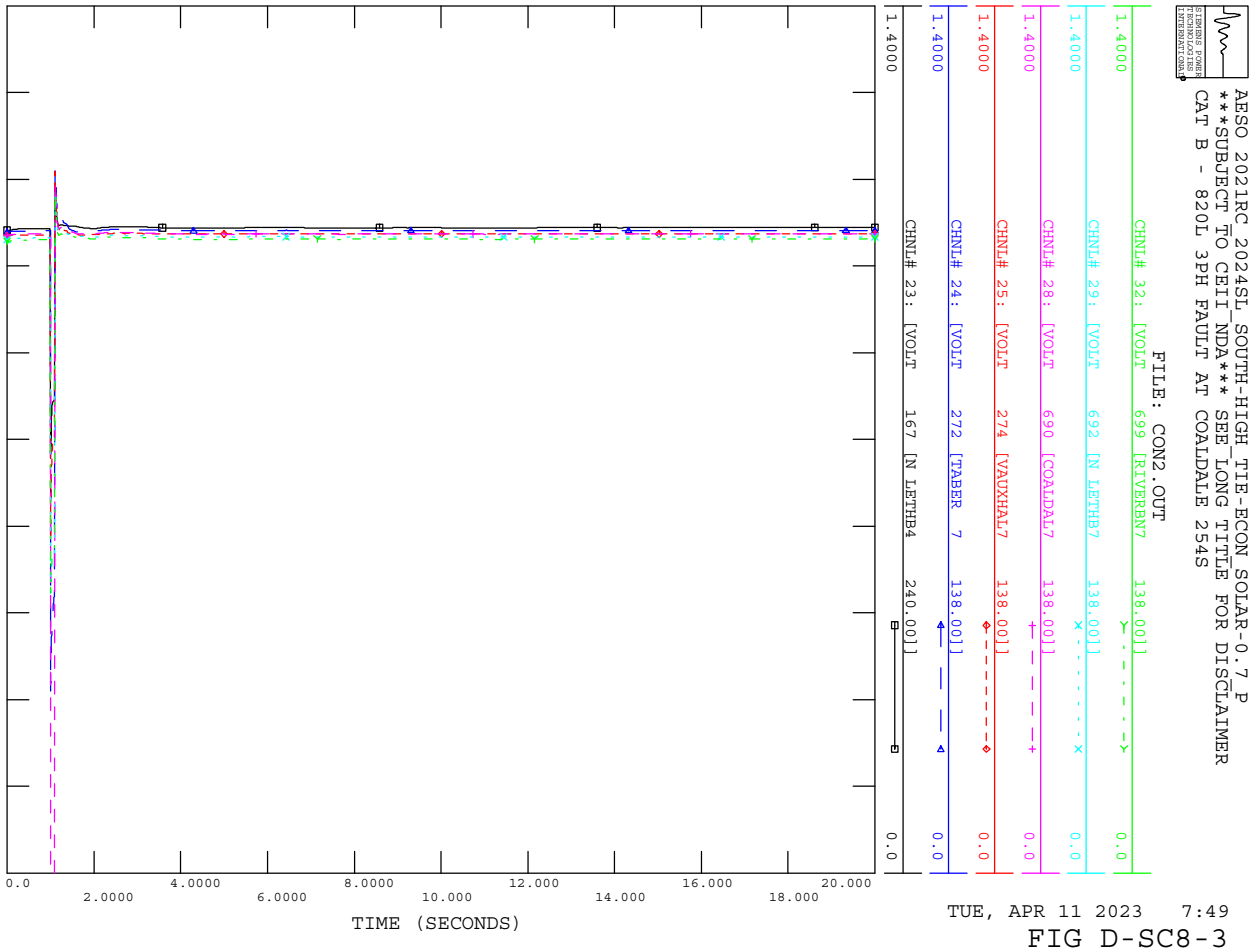


FIG D-SC8-3

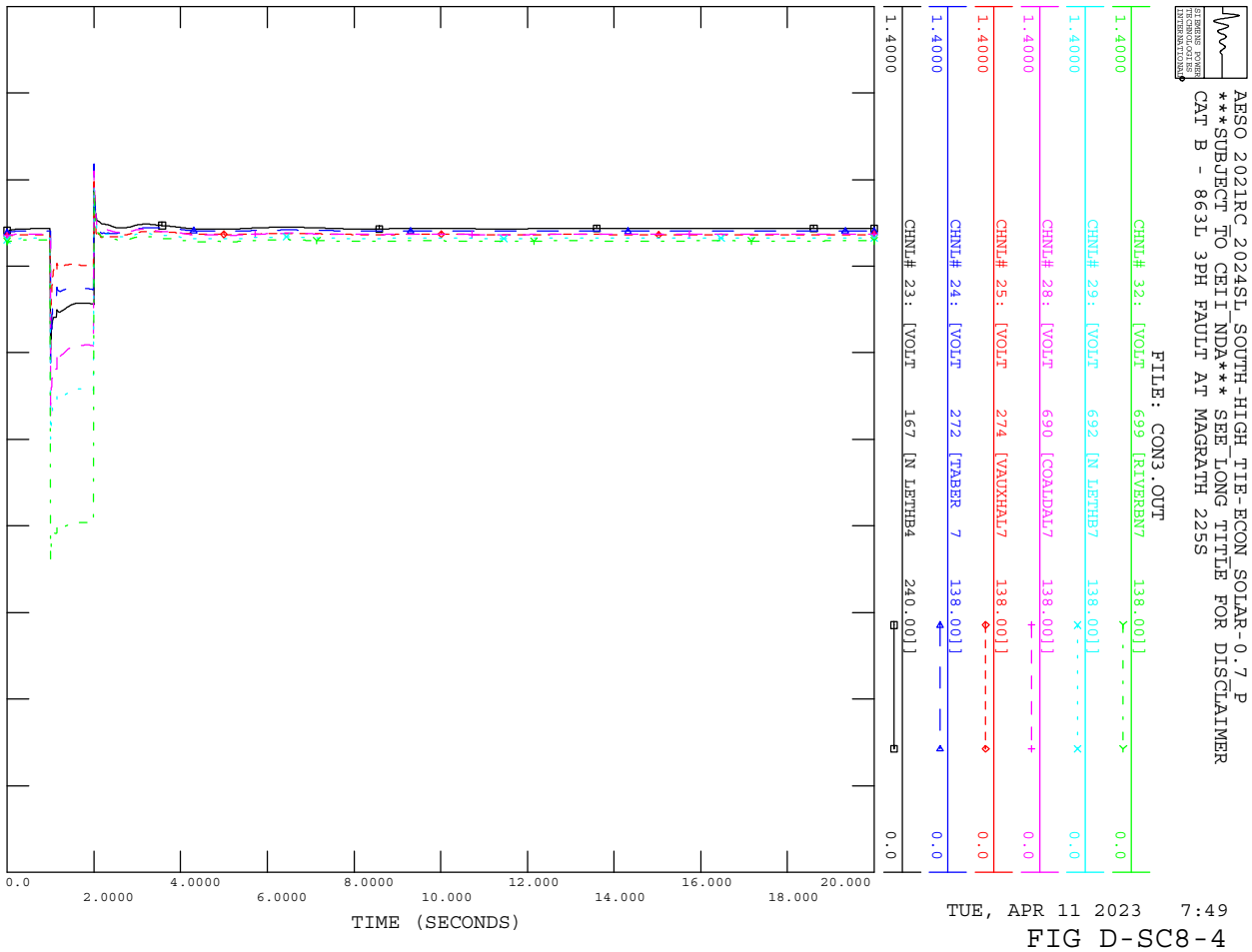


FIG D-SC8-4

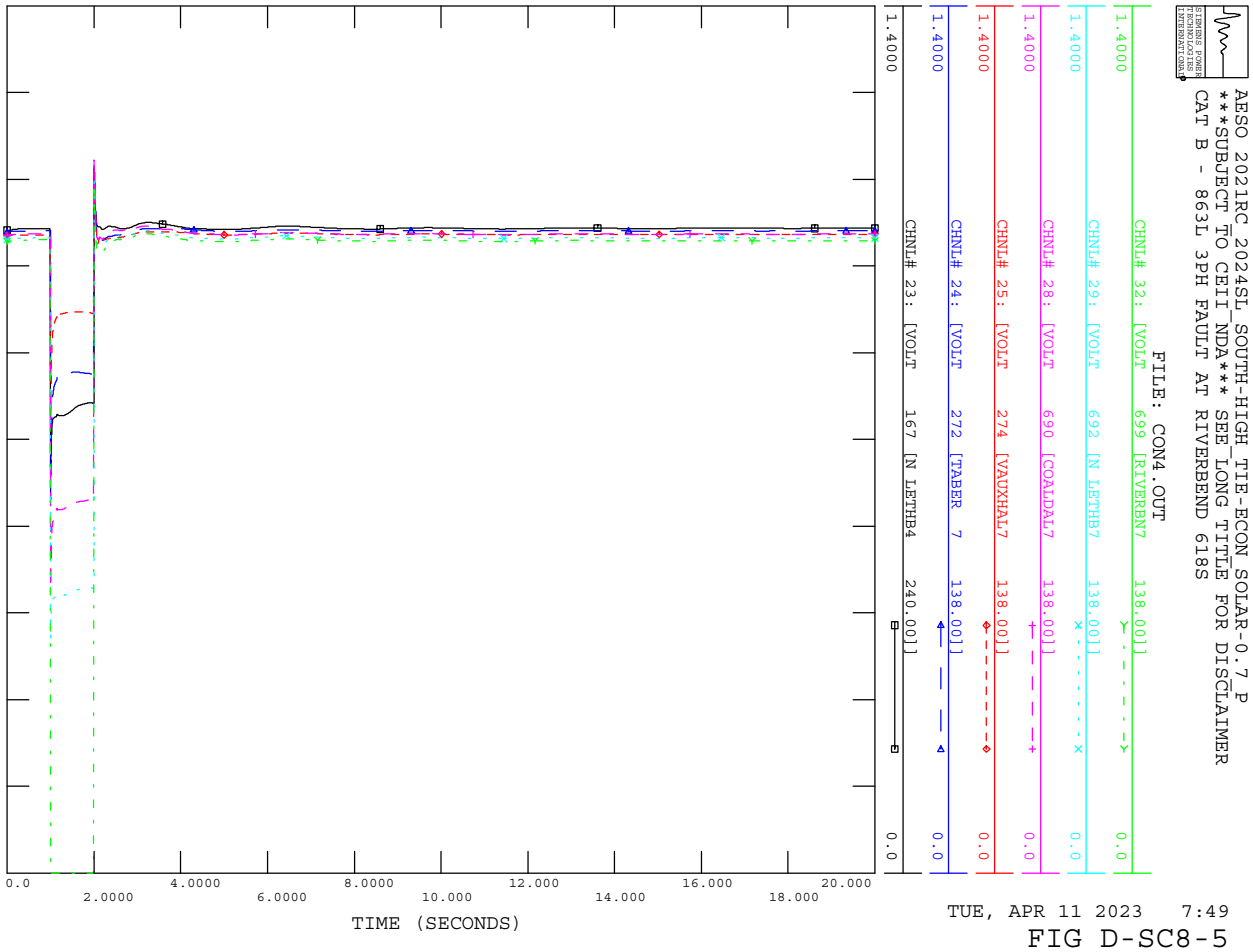


FIG D-SC8-5

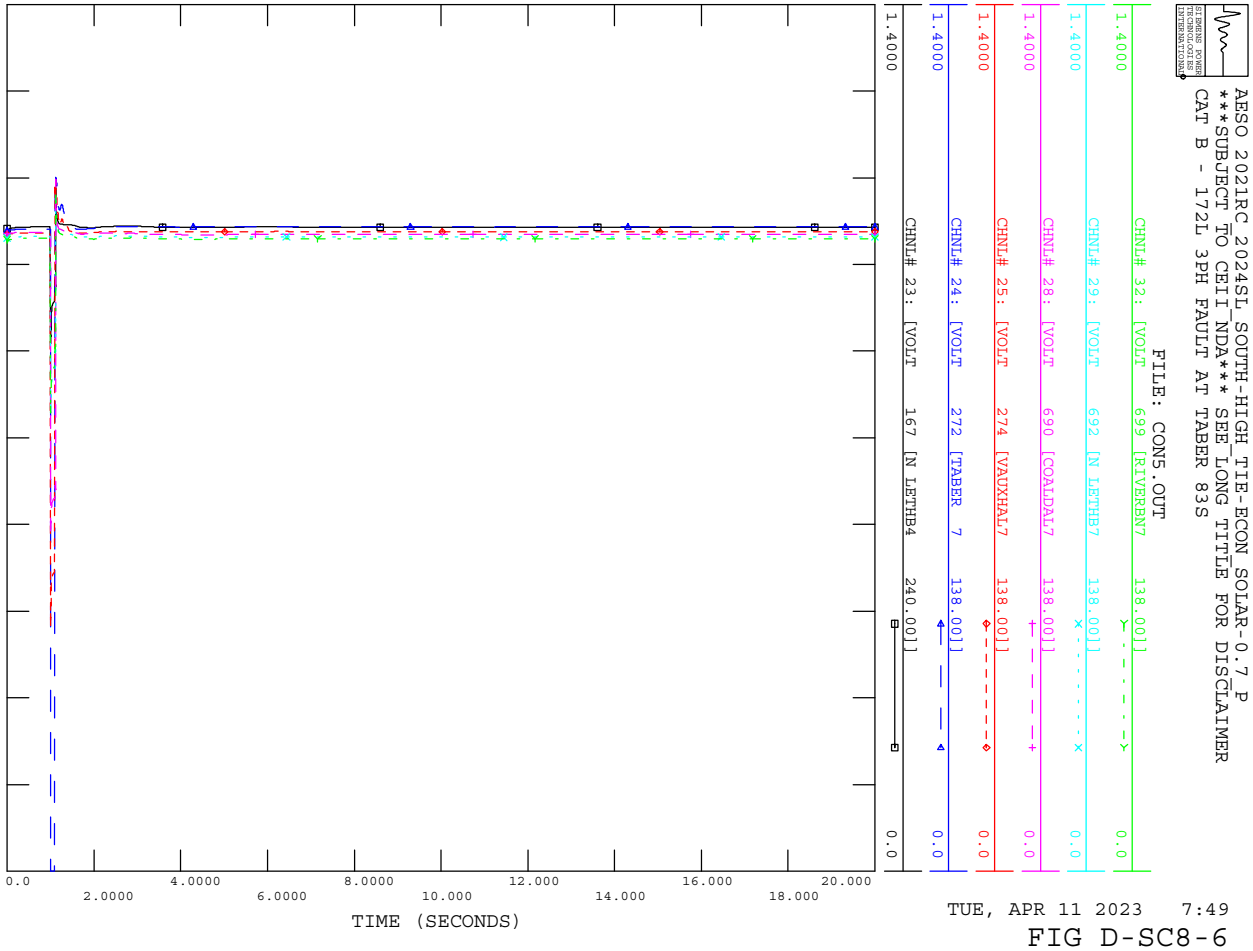


FIG D-SC8-6

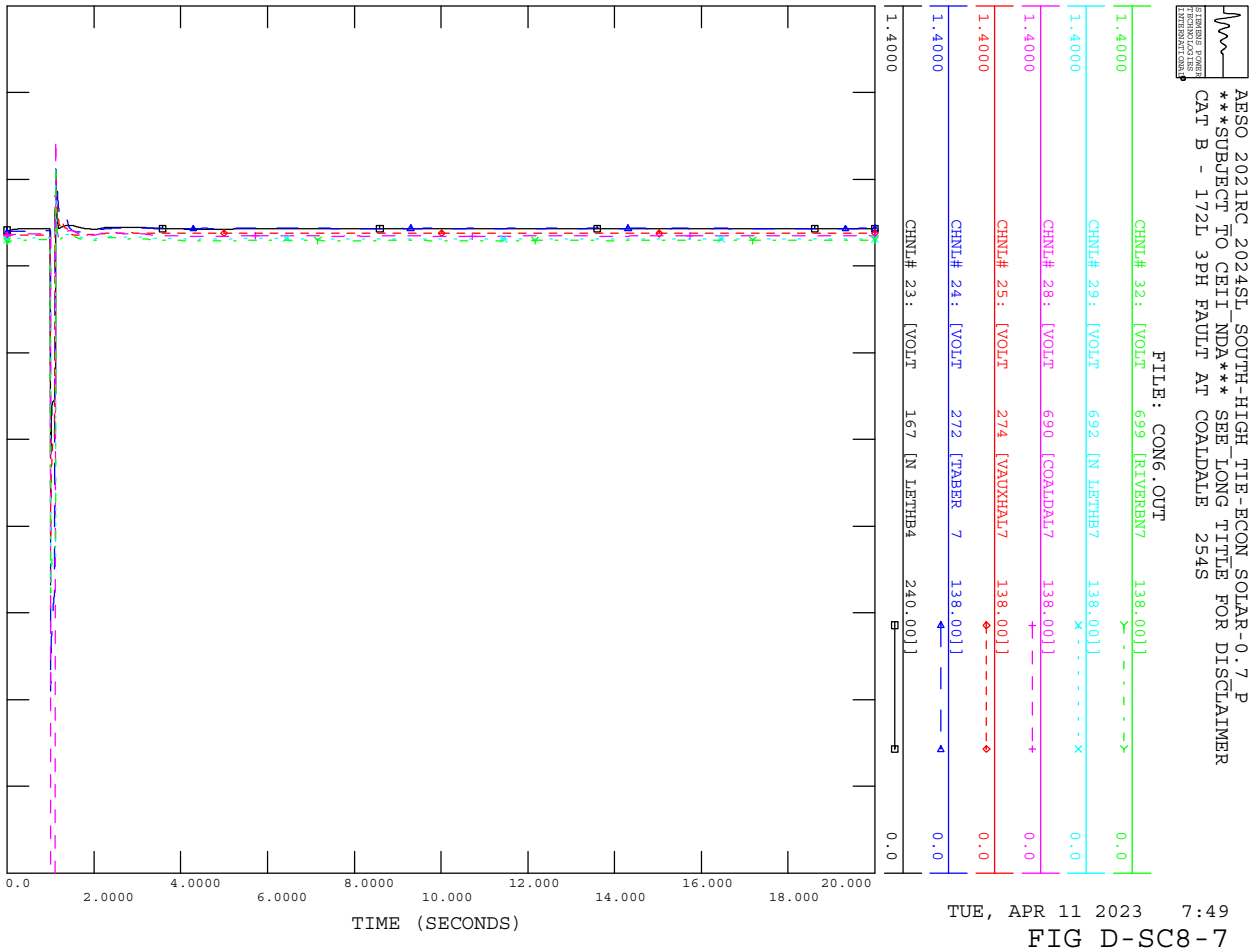


FIG D-SC8-7

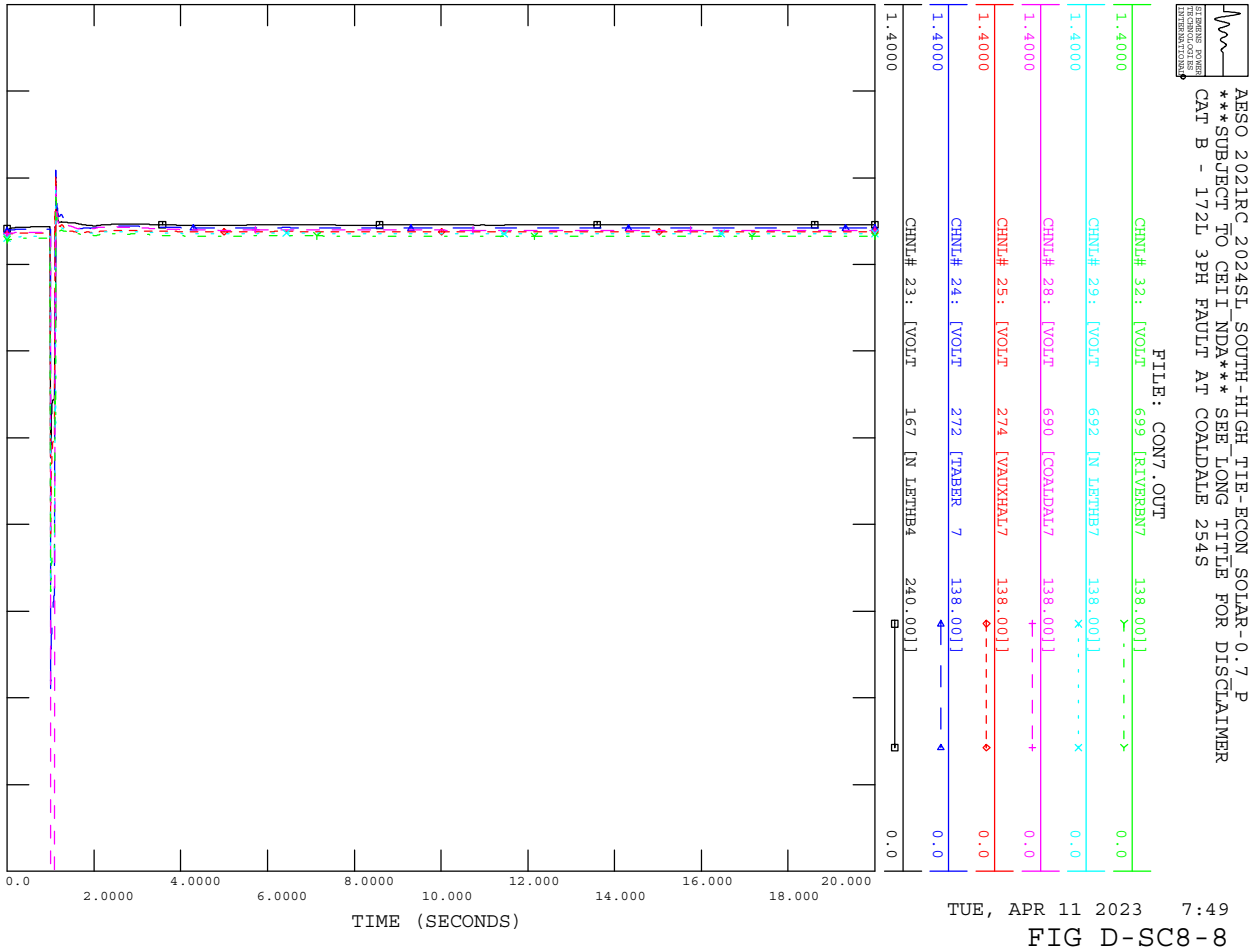


FIG D-SC8-8

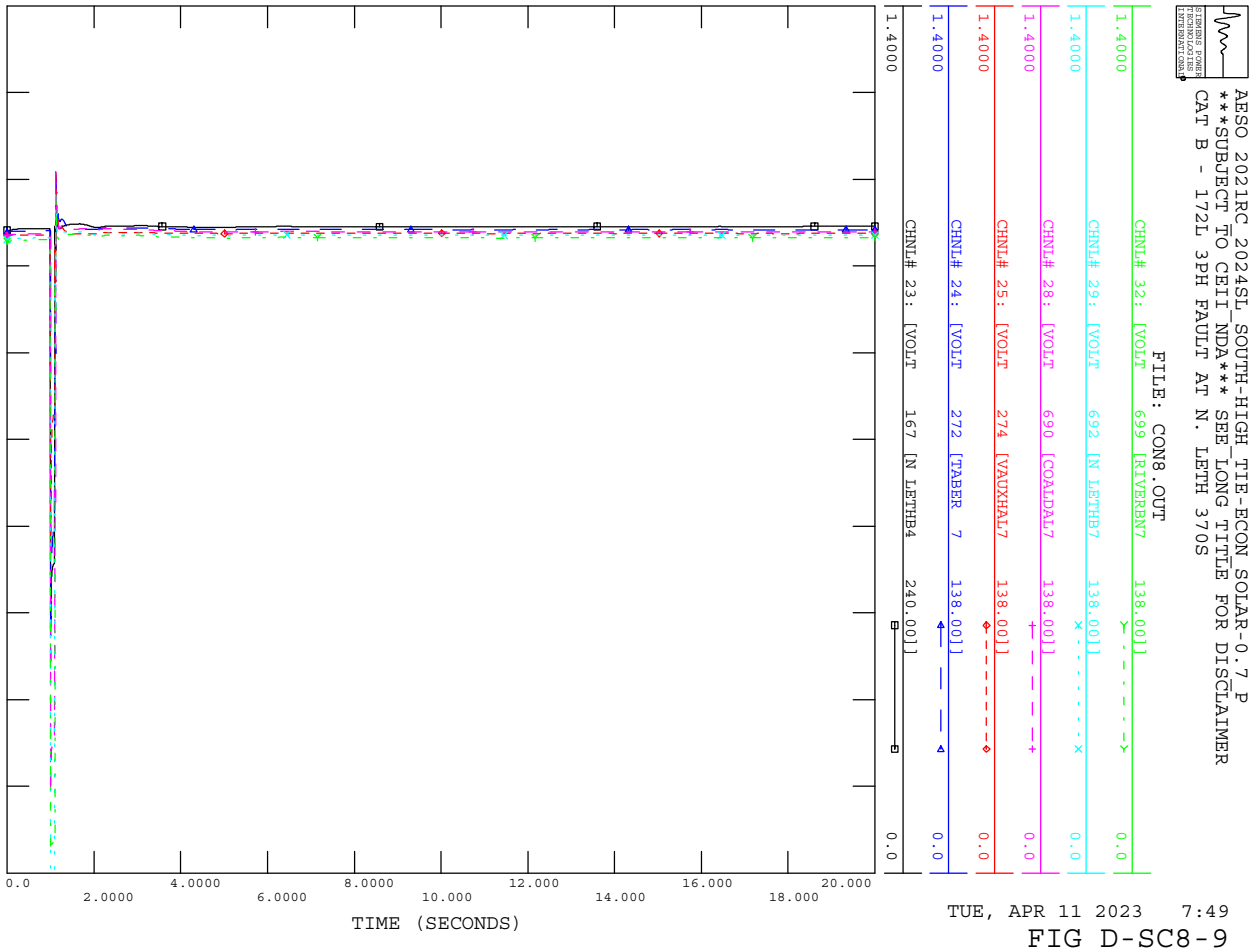


FIG D-SC8-9

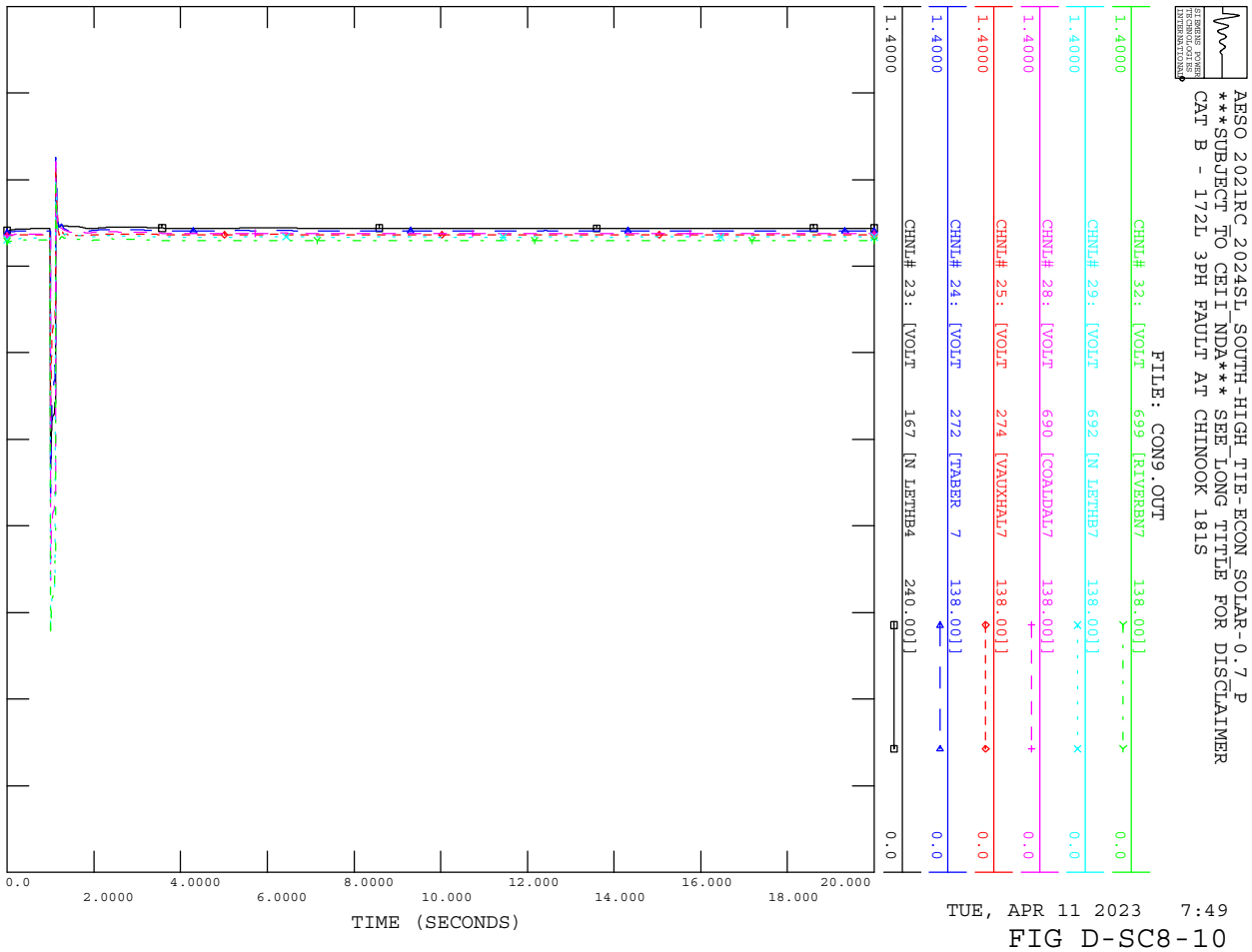


FIG D-SC8-10

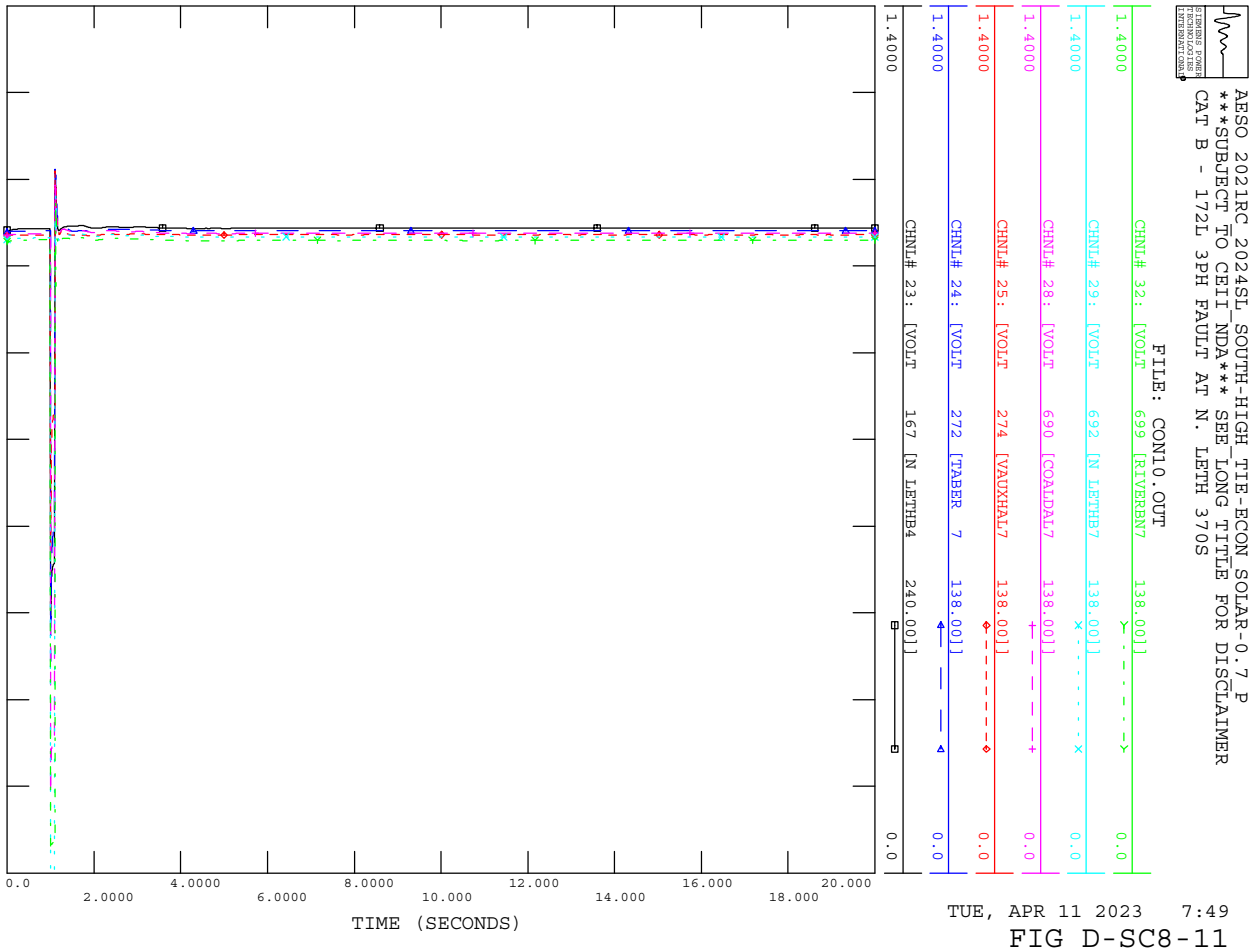


FIG D-SC8-11

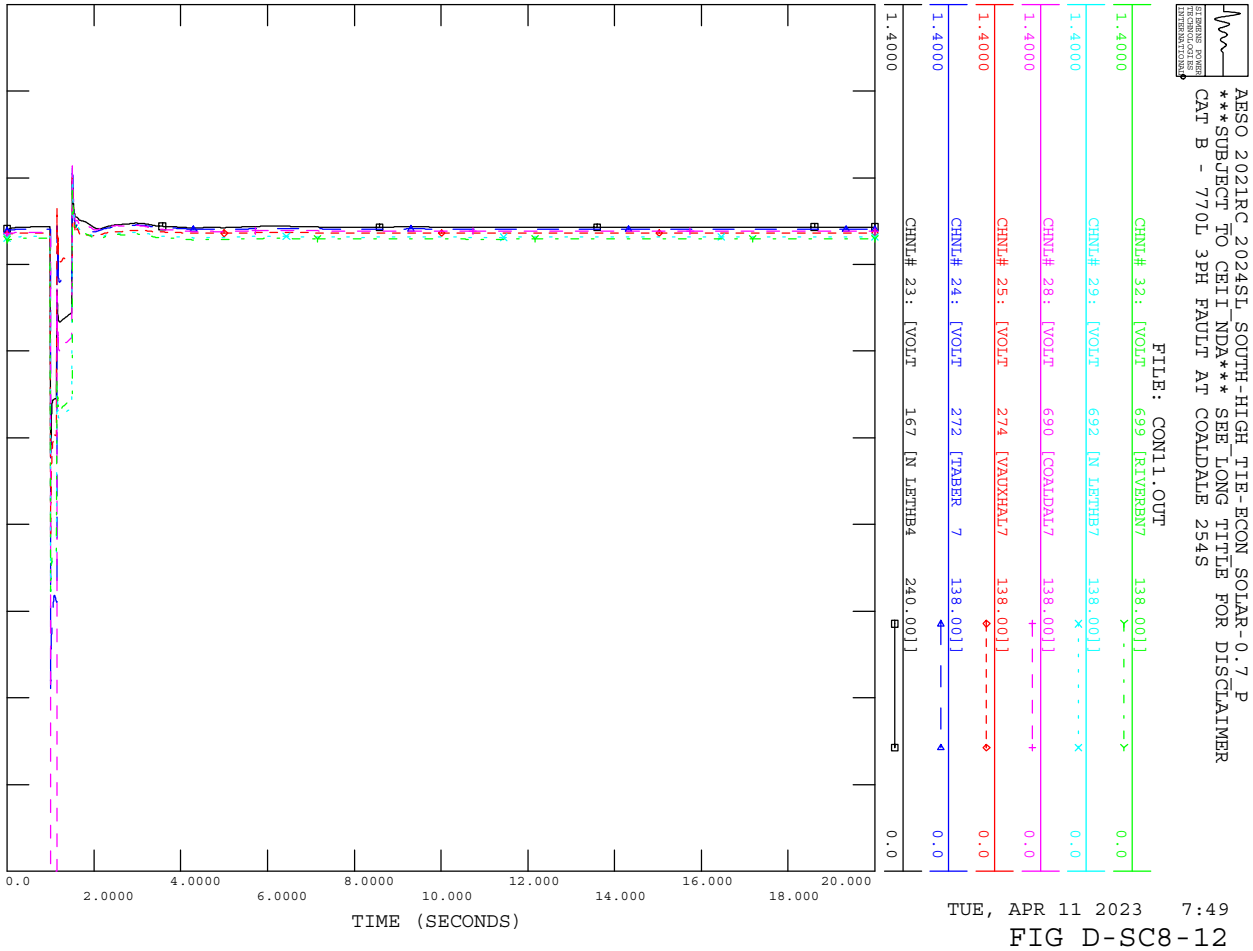


FIG D-SC8-12

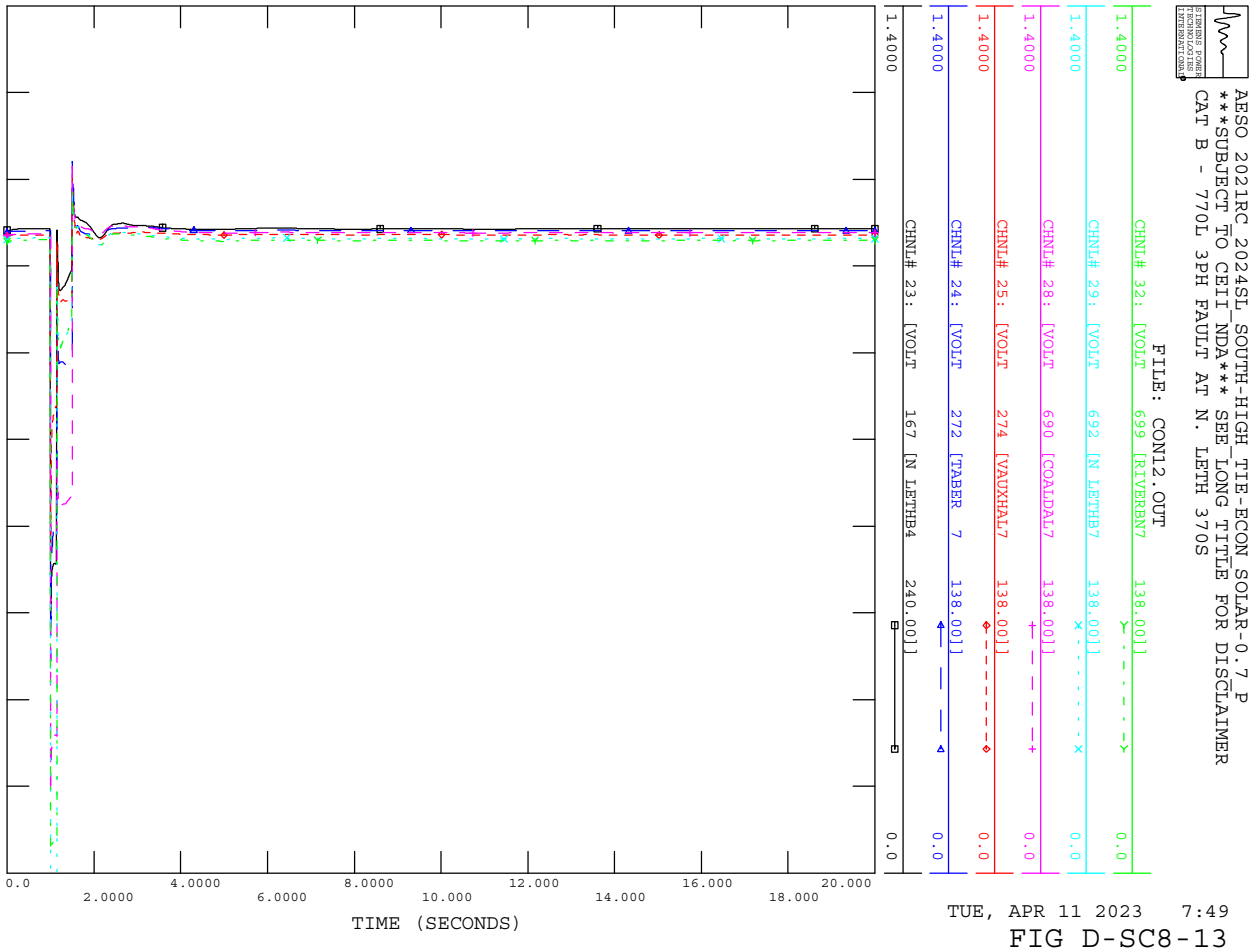


FIG D-SC8-13

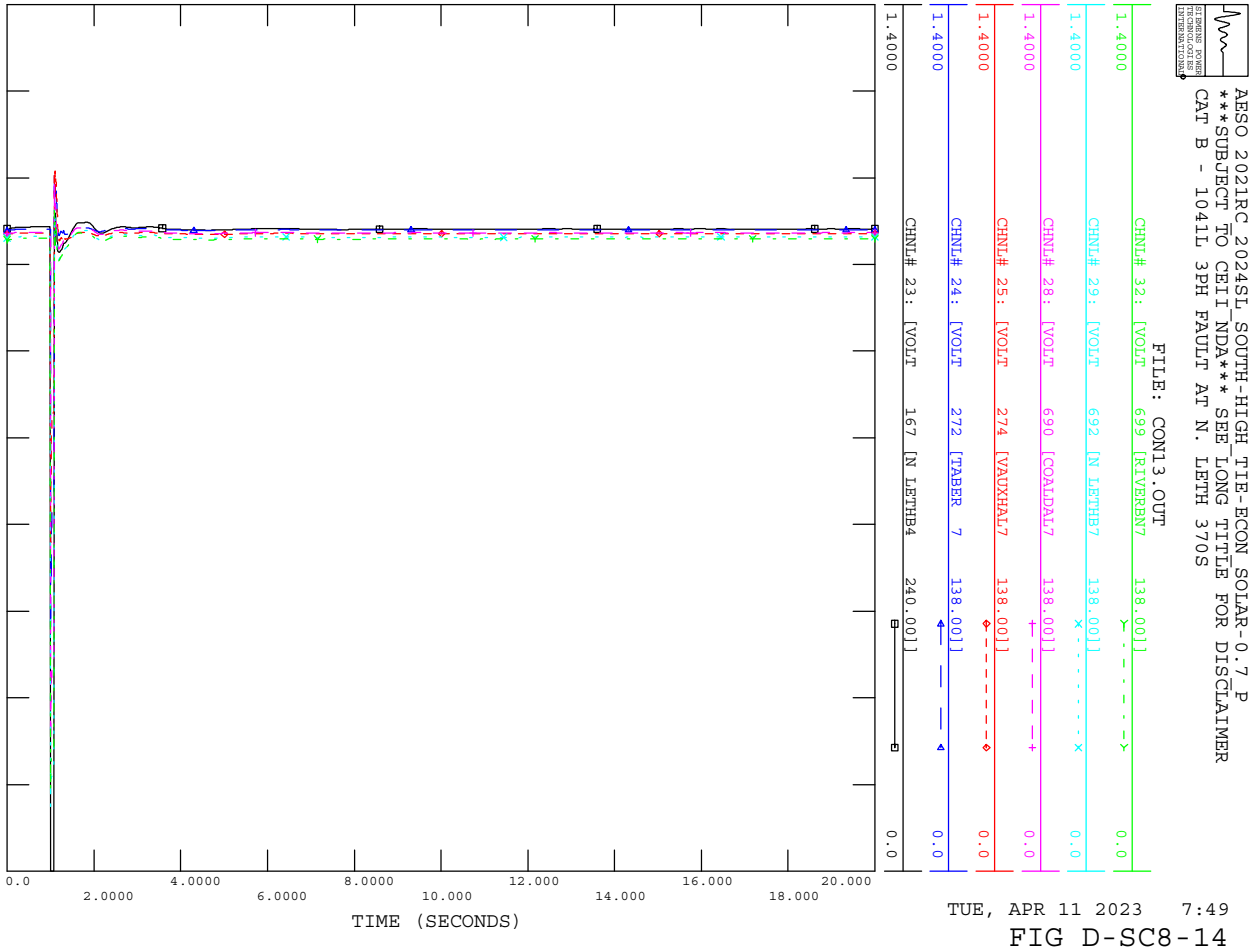


FIG D-SC8-14

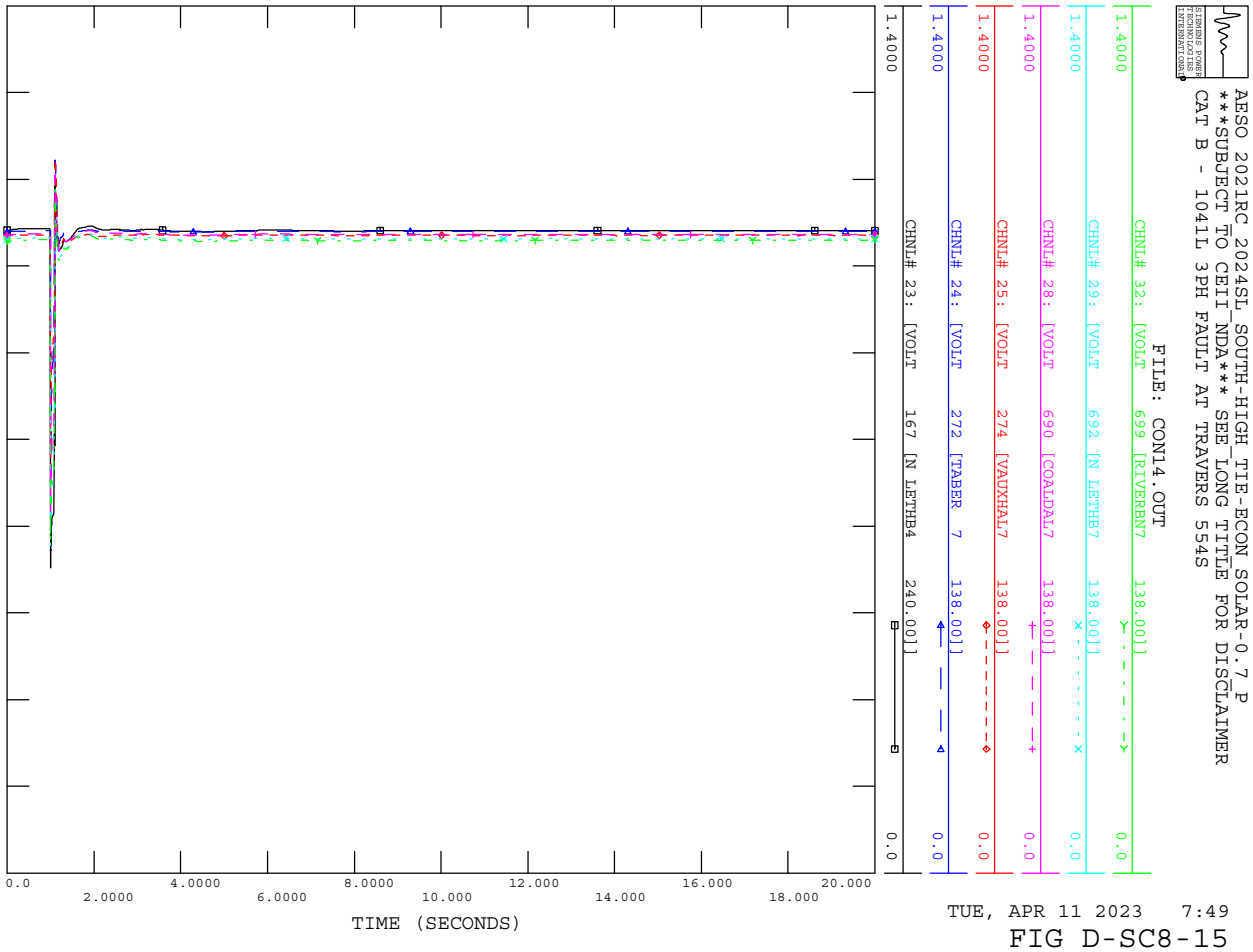


FIG D-SC8-15

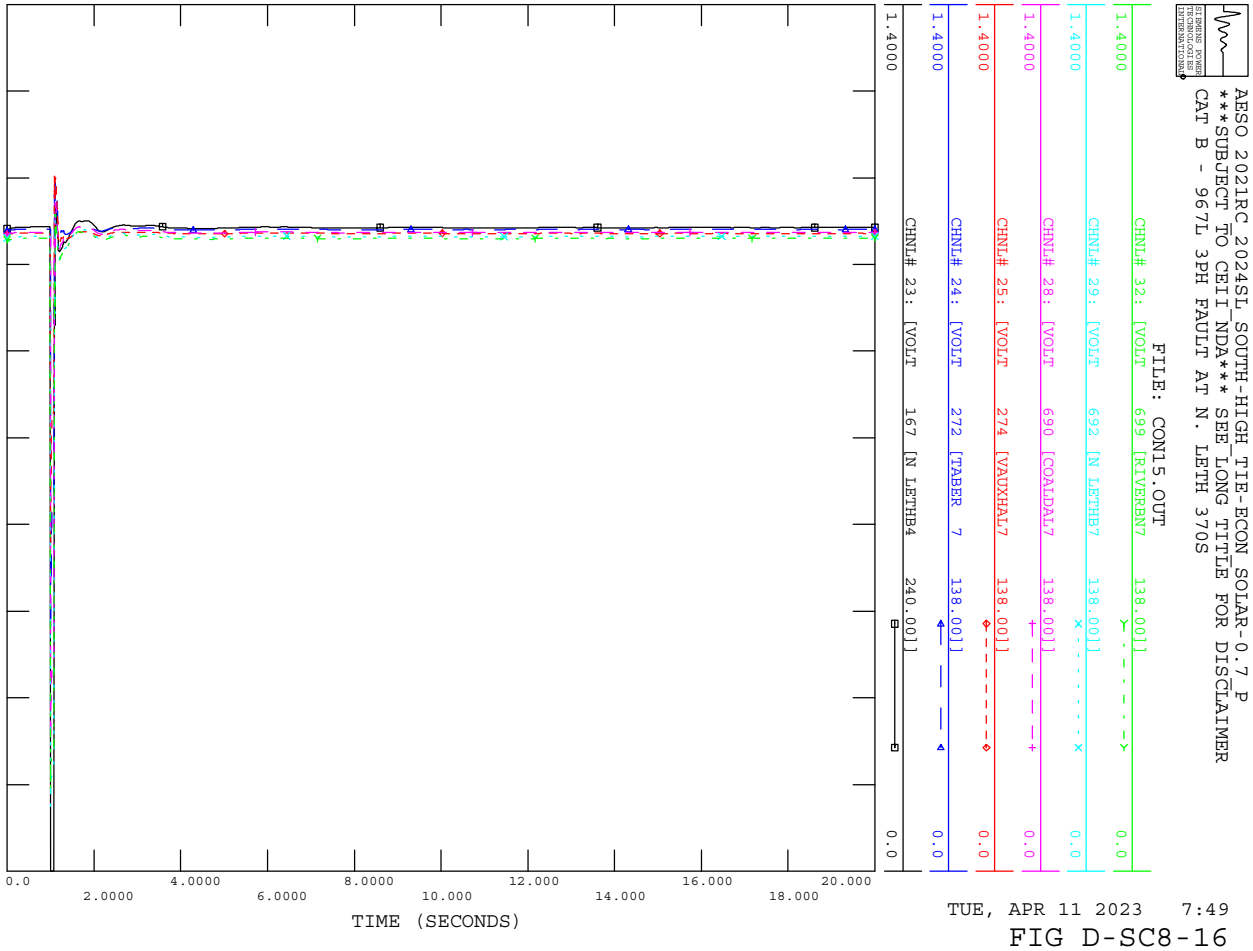


FIG D-SC8-16

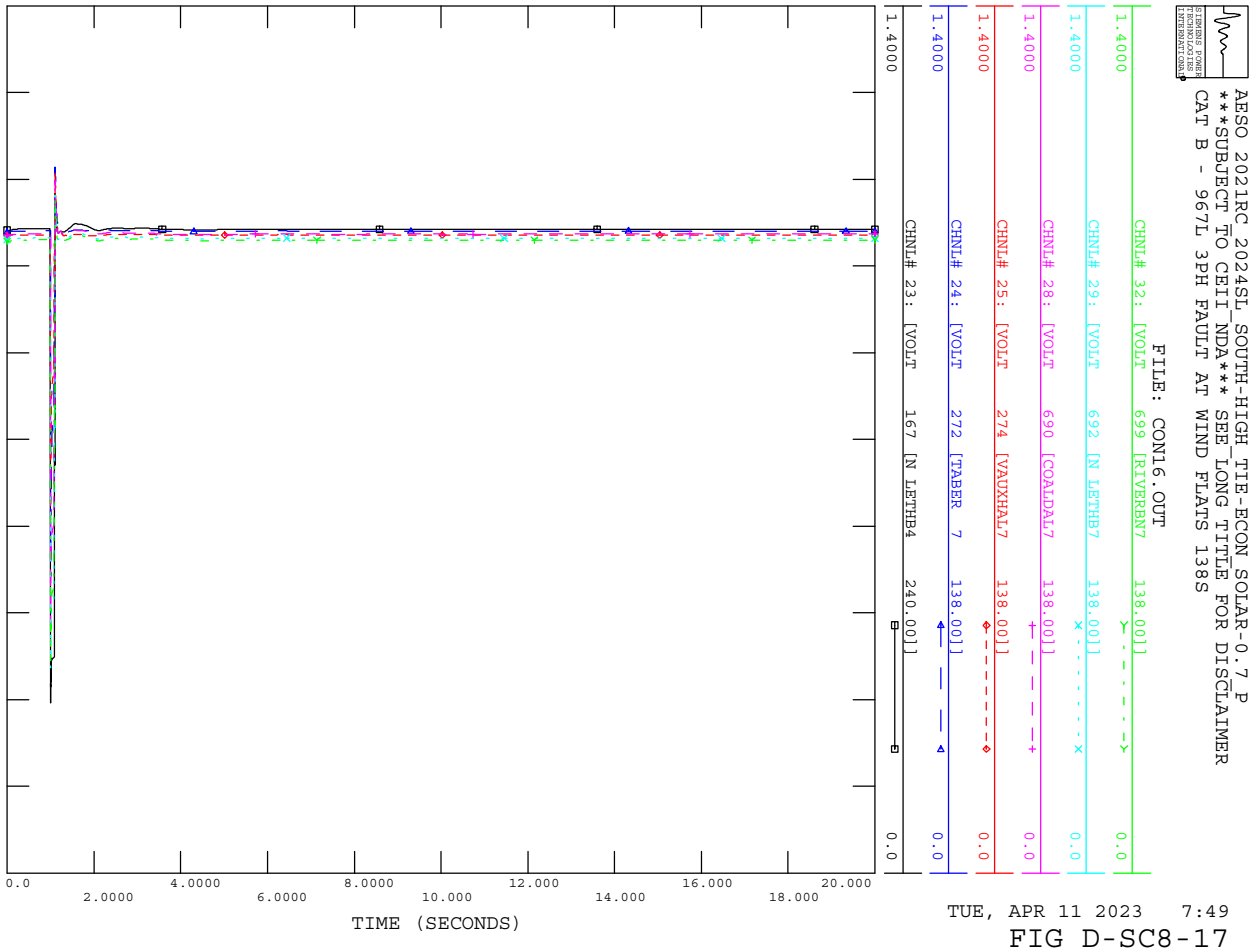


FIG D-SC8-17

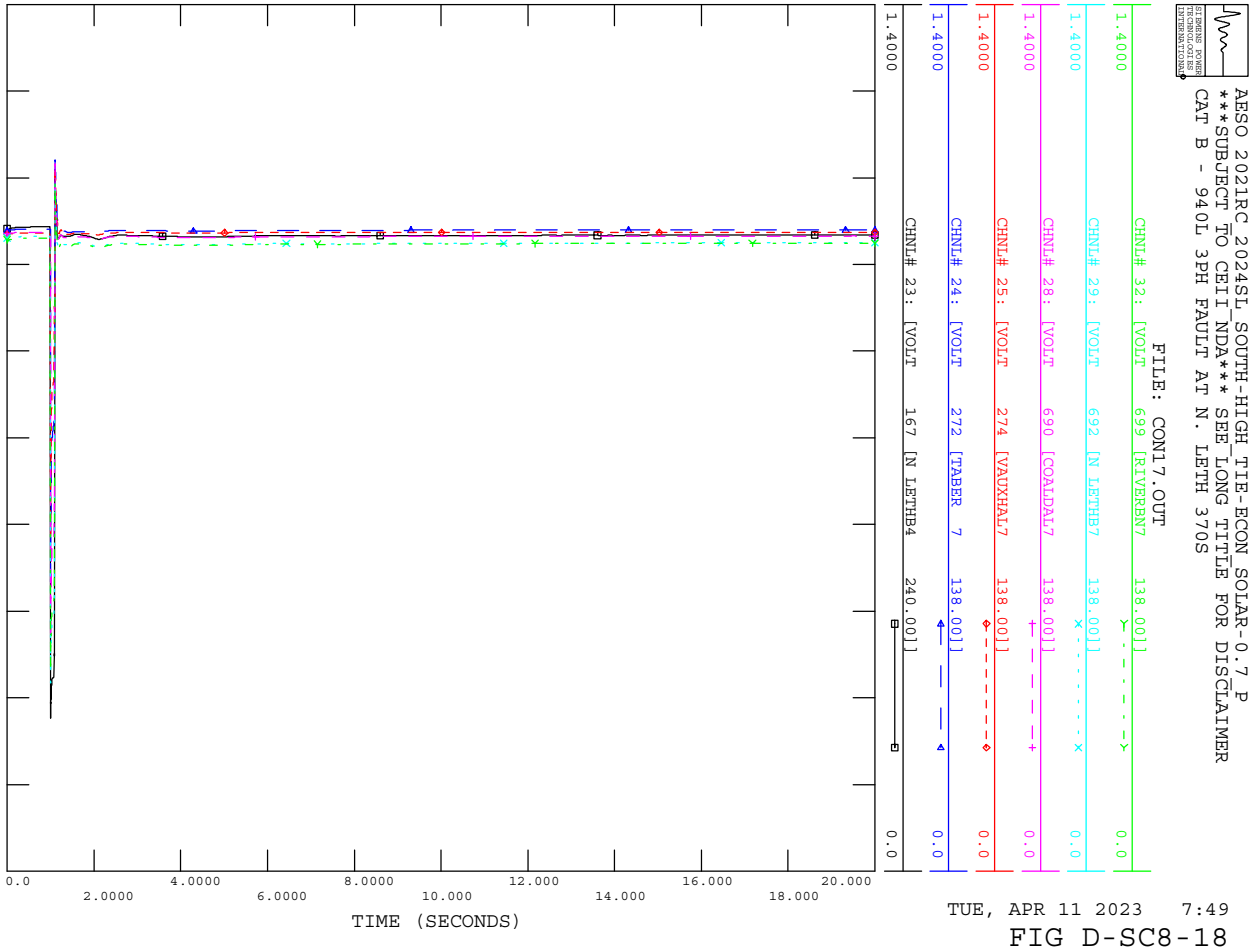
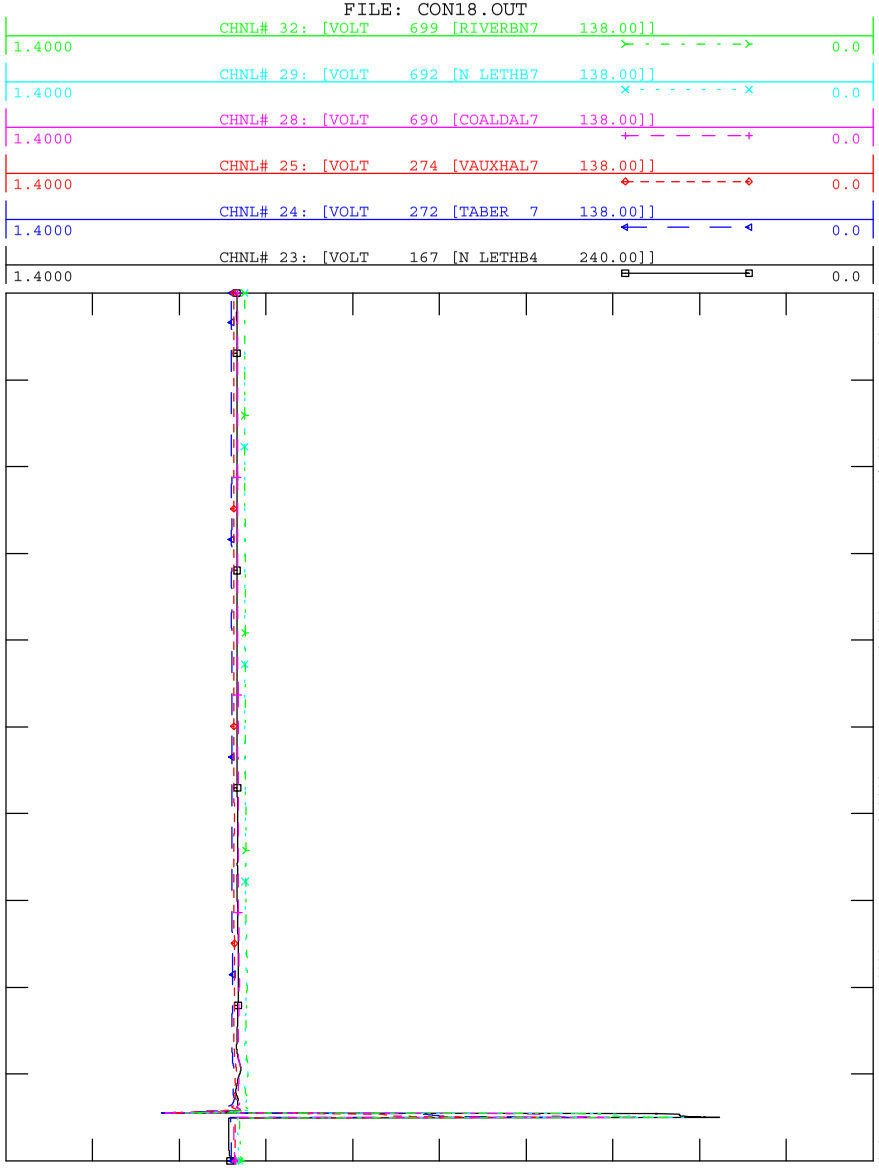


FIG D-SC8-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



TUE, APR 11 2023 7:49

FIG D-SC8-19

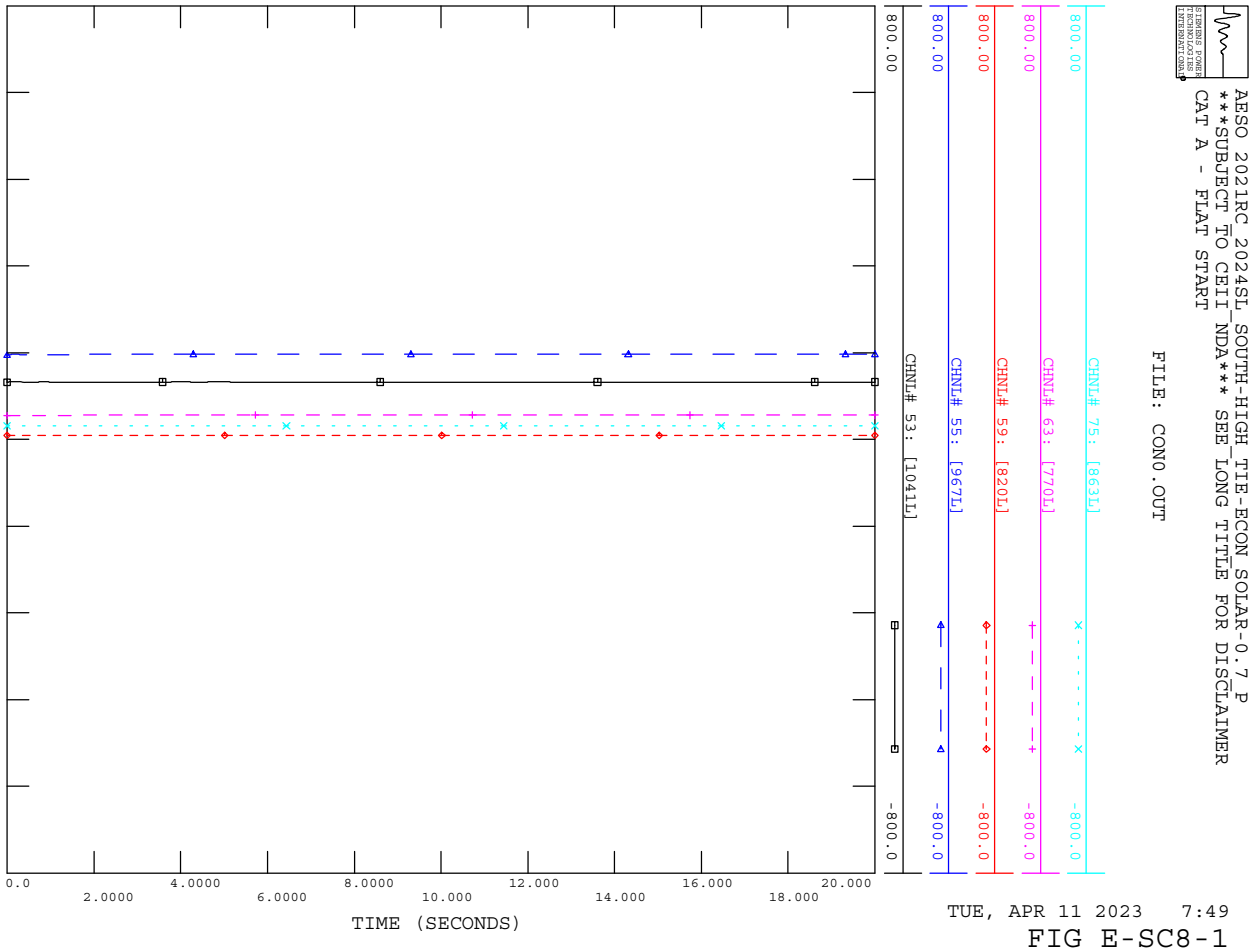


FIG E-SC8-1

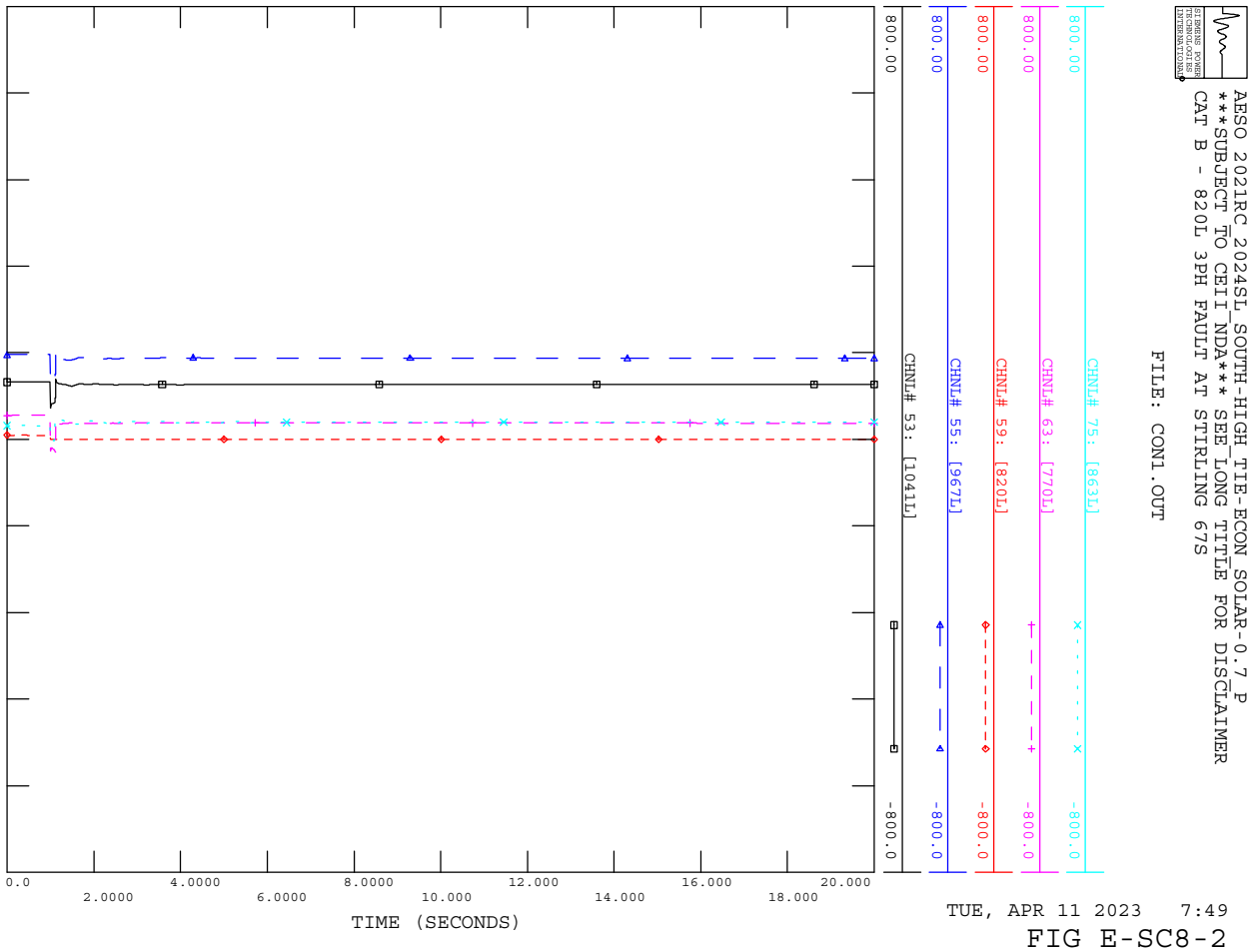


FIG E-SC8-2

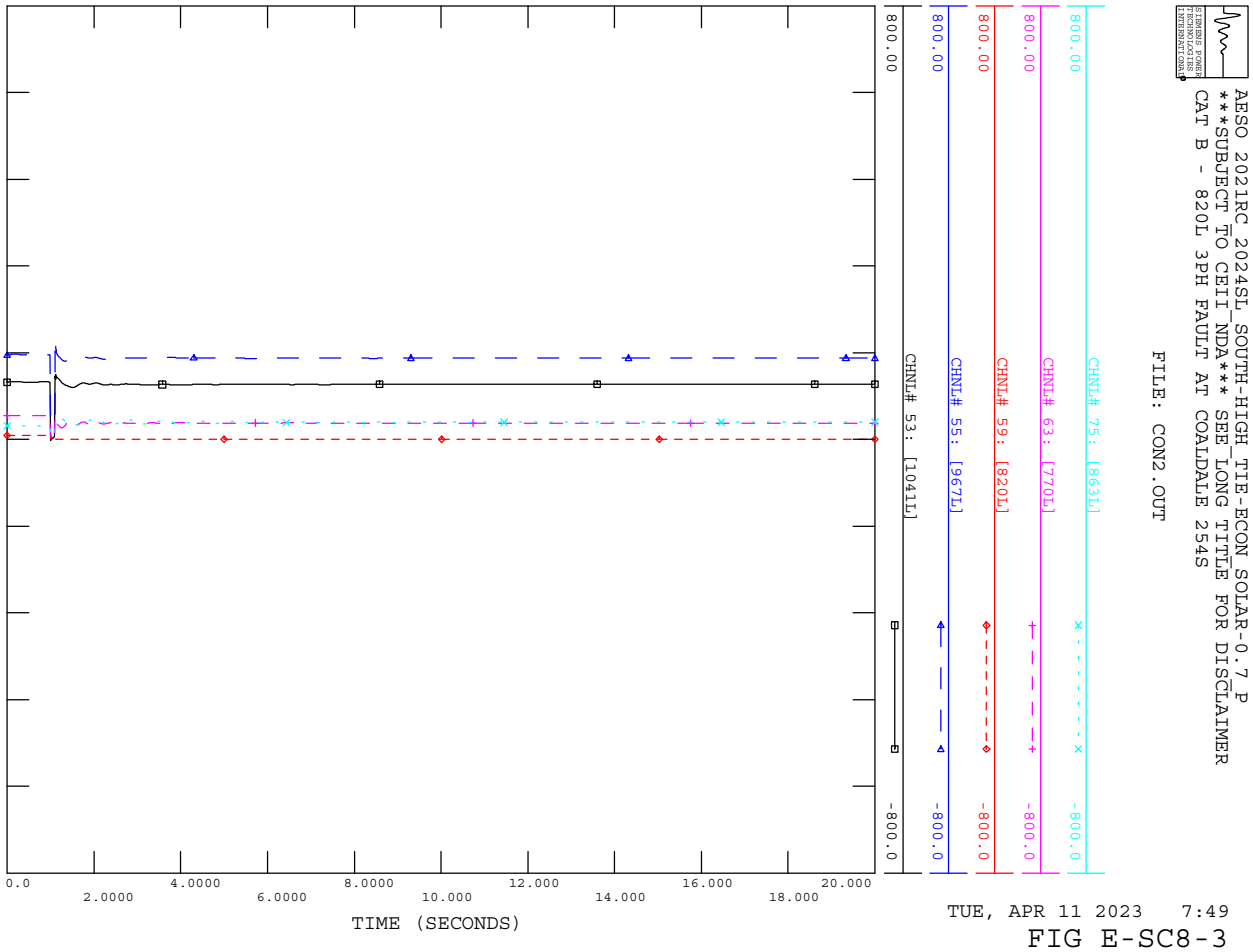


FIG E-SC8-3

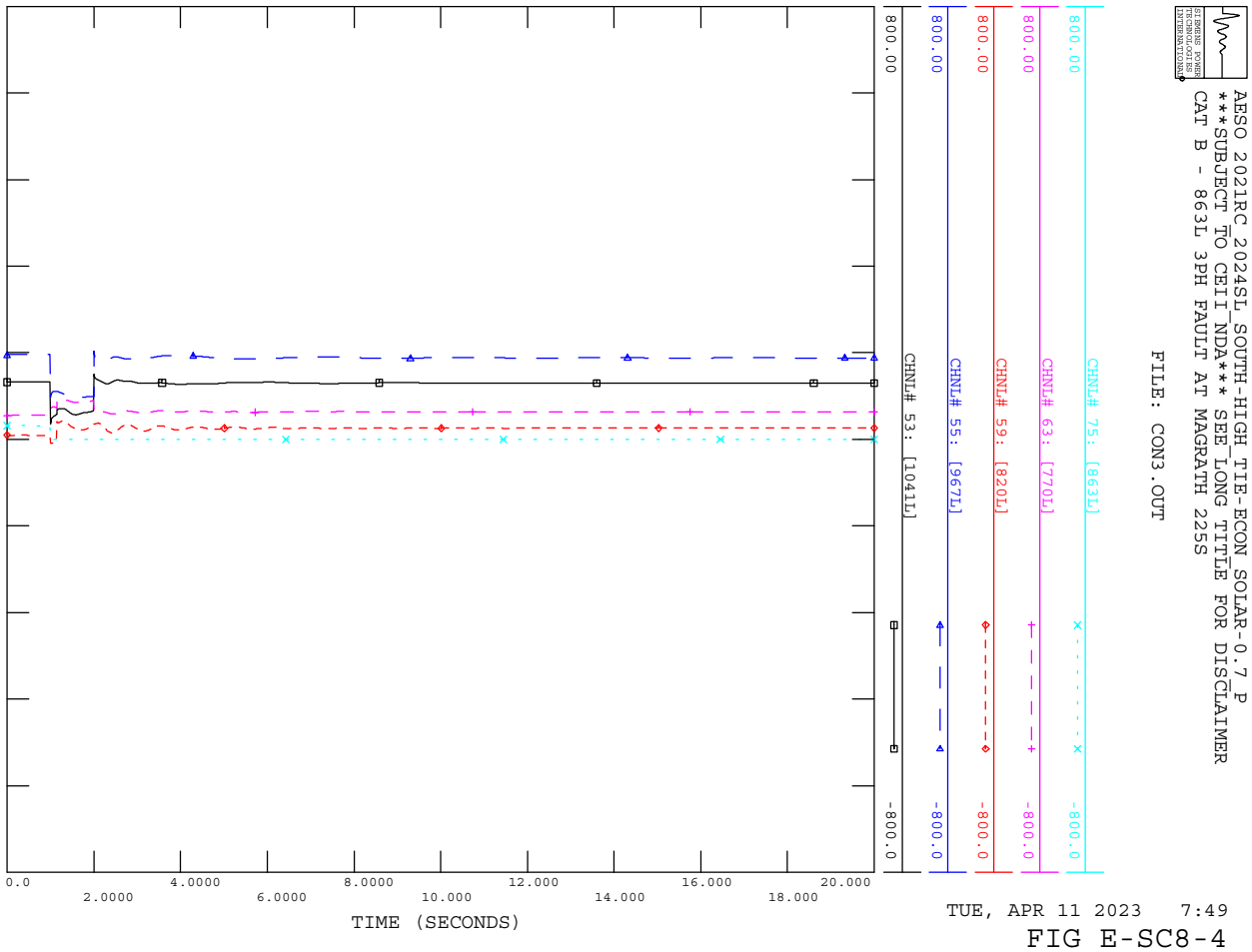


FIG E-SC8-4

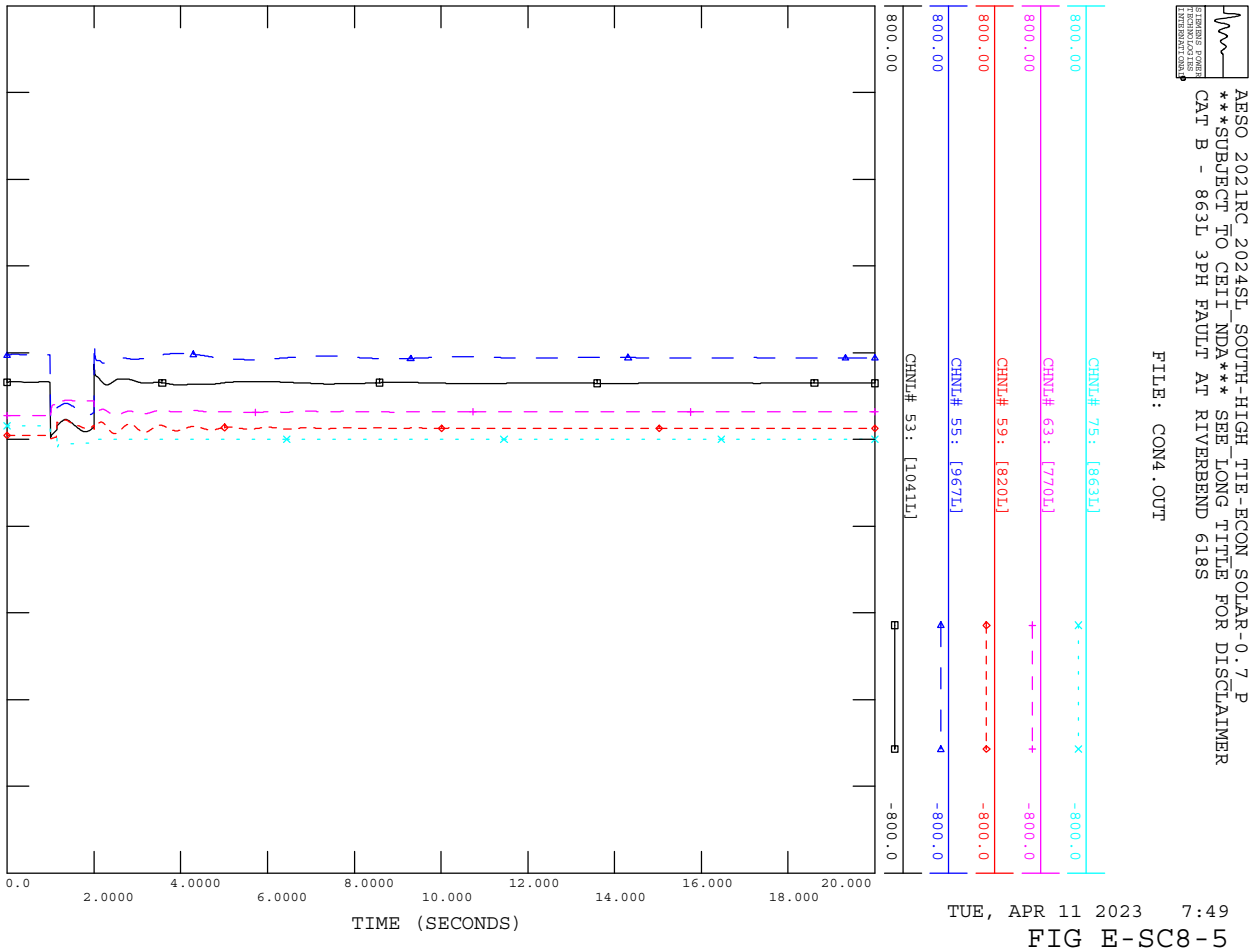


FIG E-SC8-5

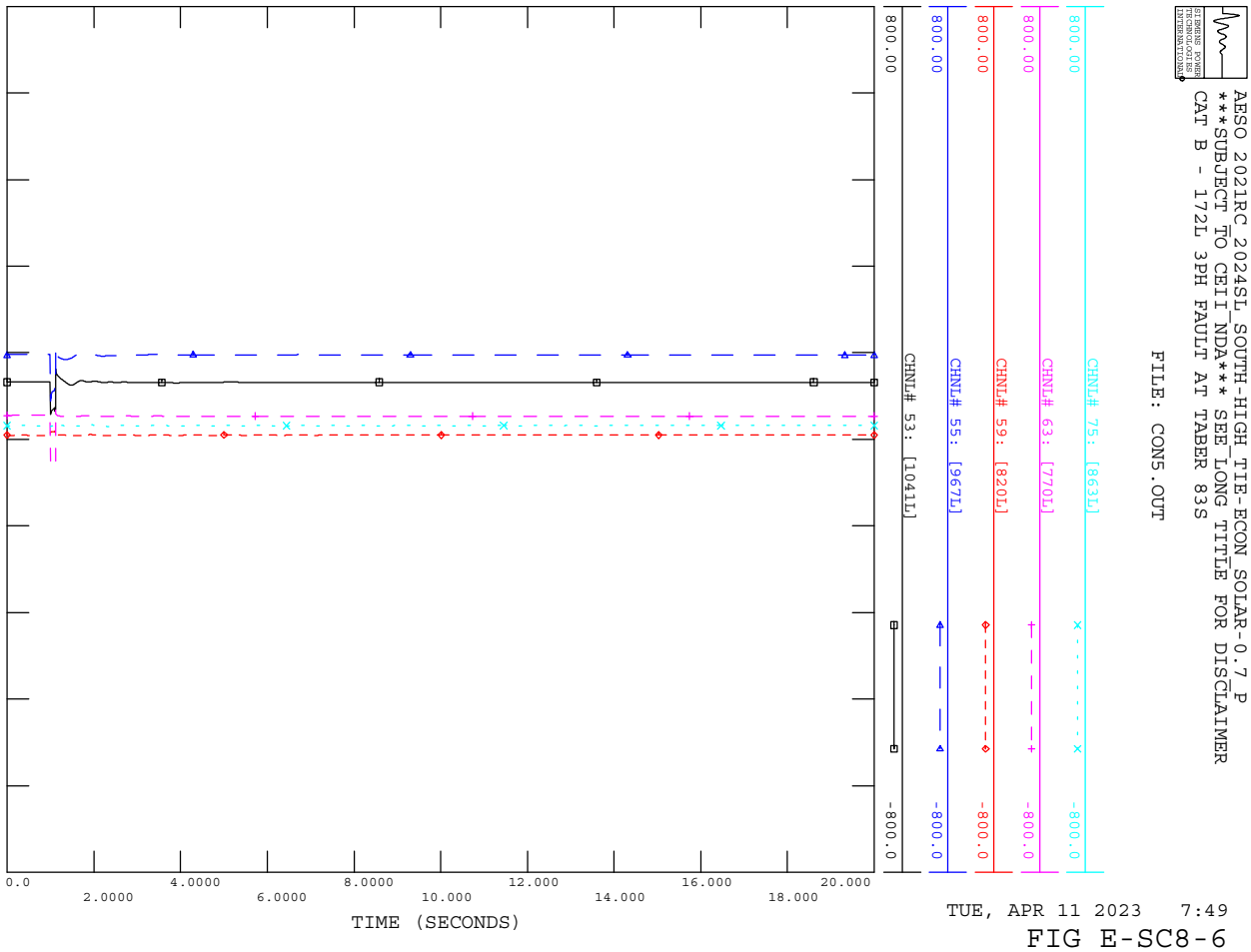


FIG E-SC8-6

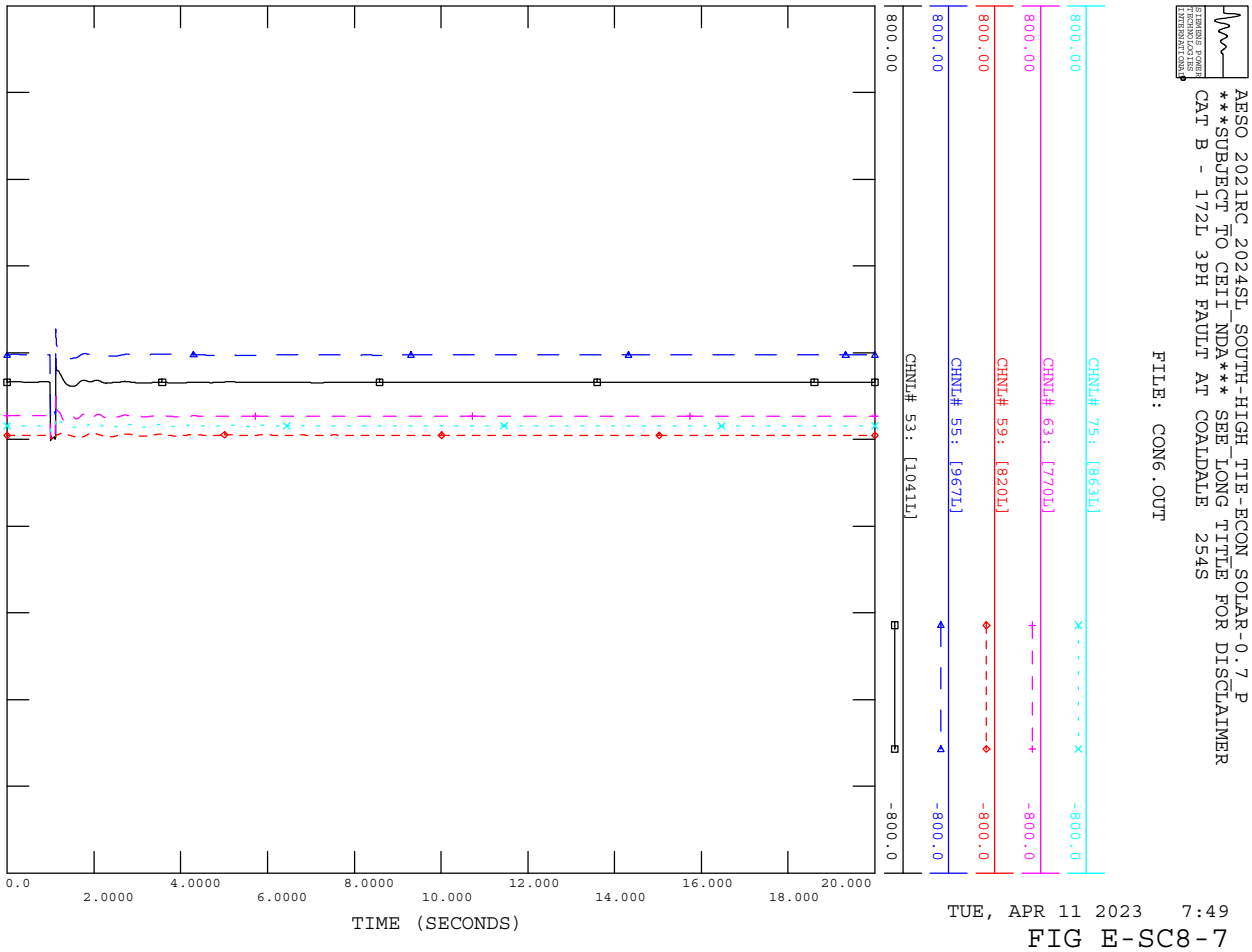


FIG E-SC8-7

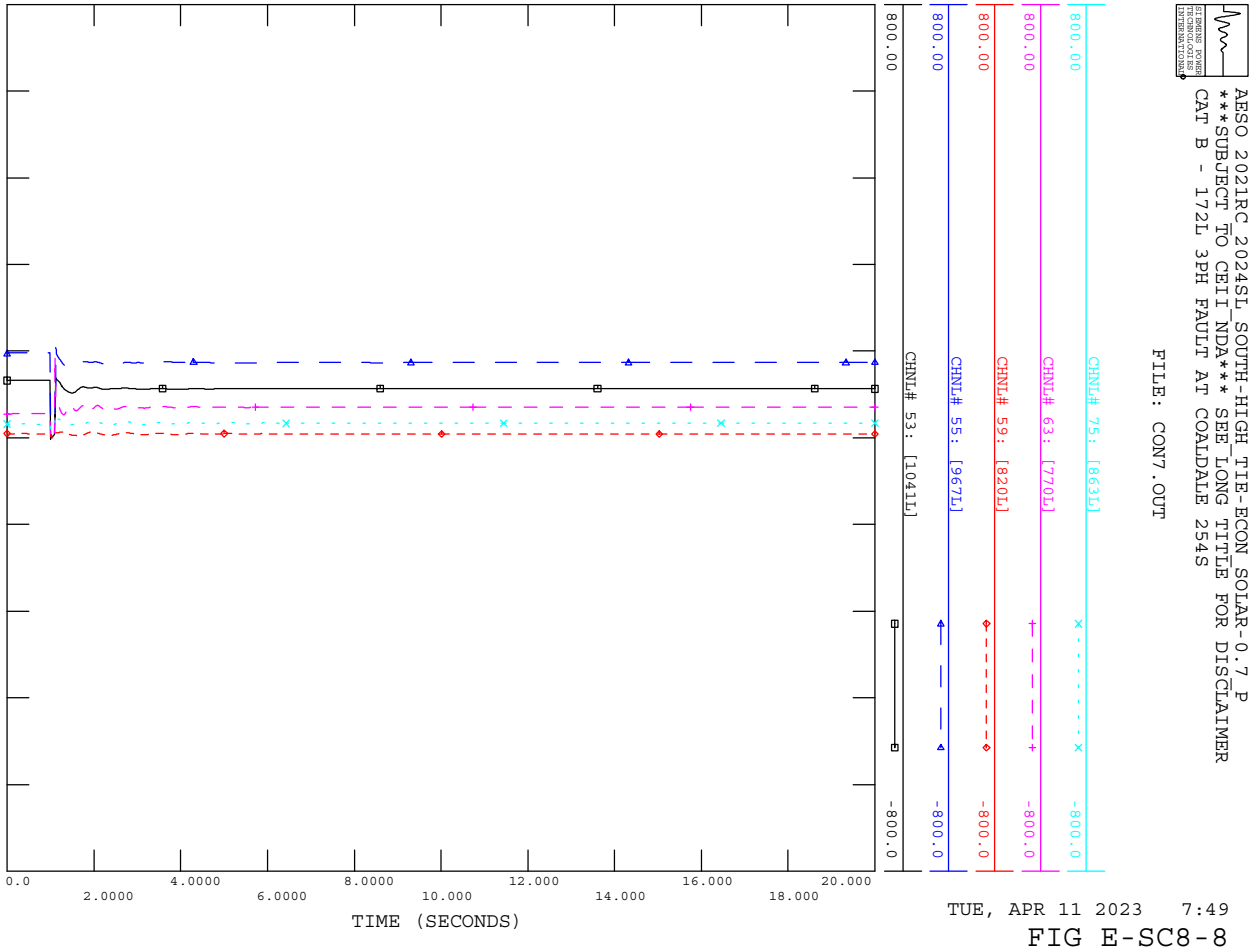


FIG E-SC8-8

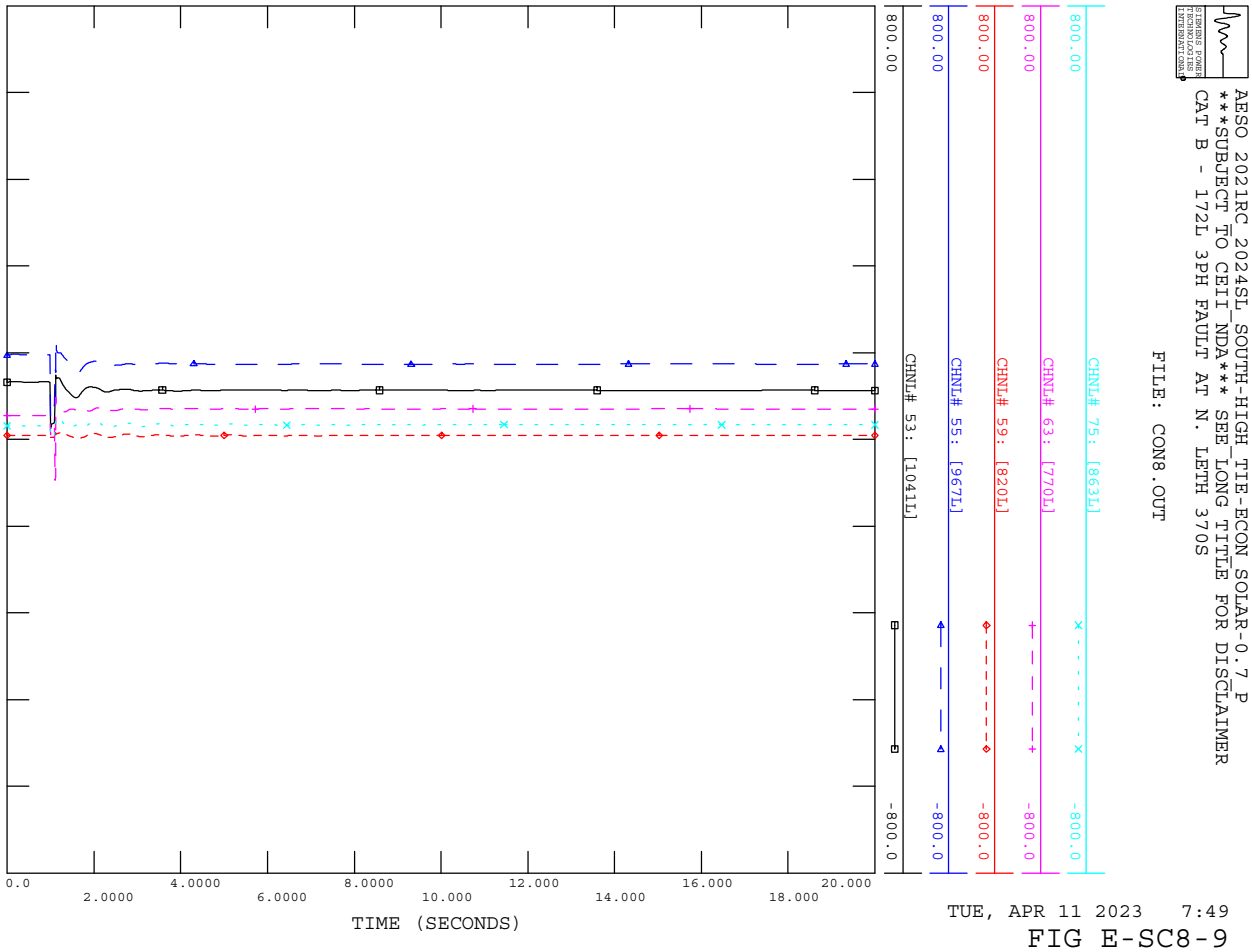


FIG E-SC8-9

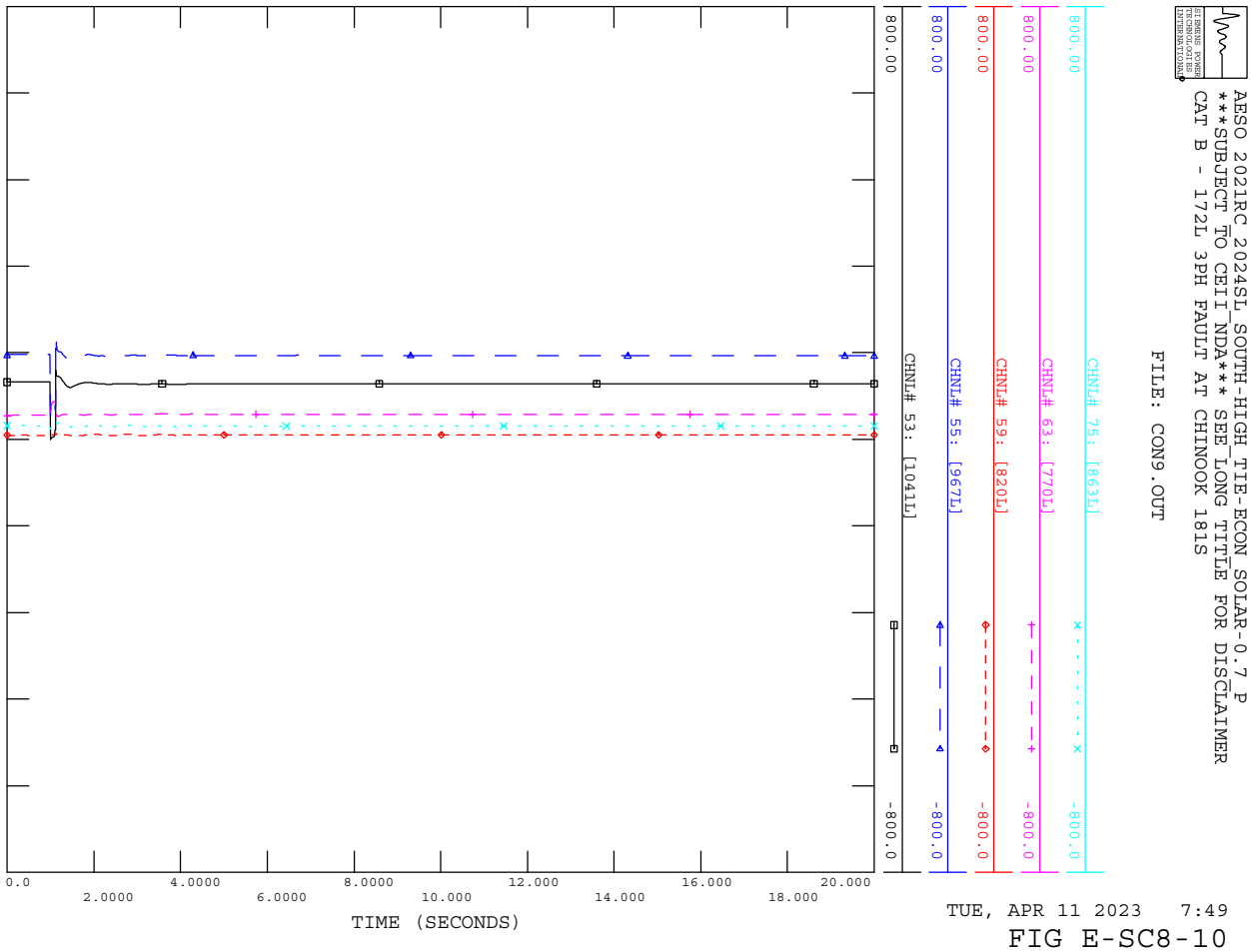


FIG E-SC8-10

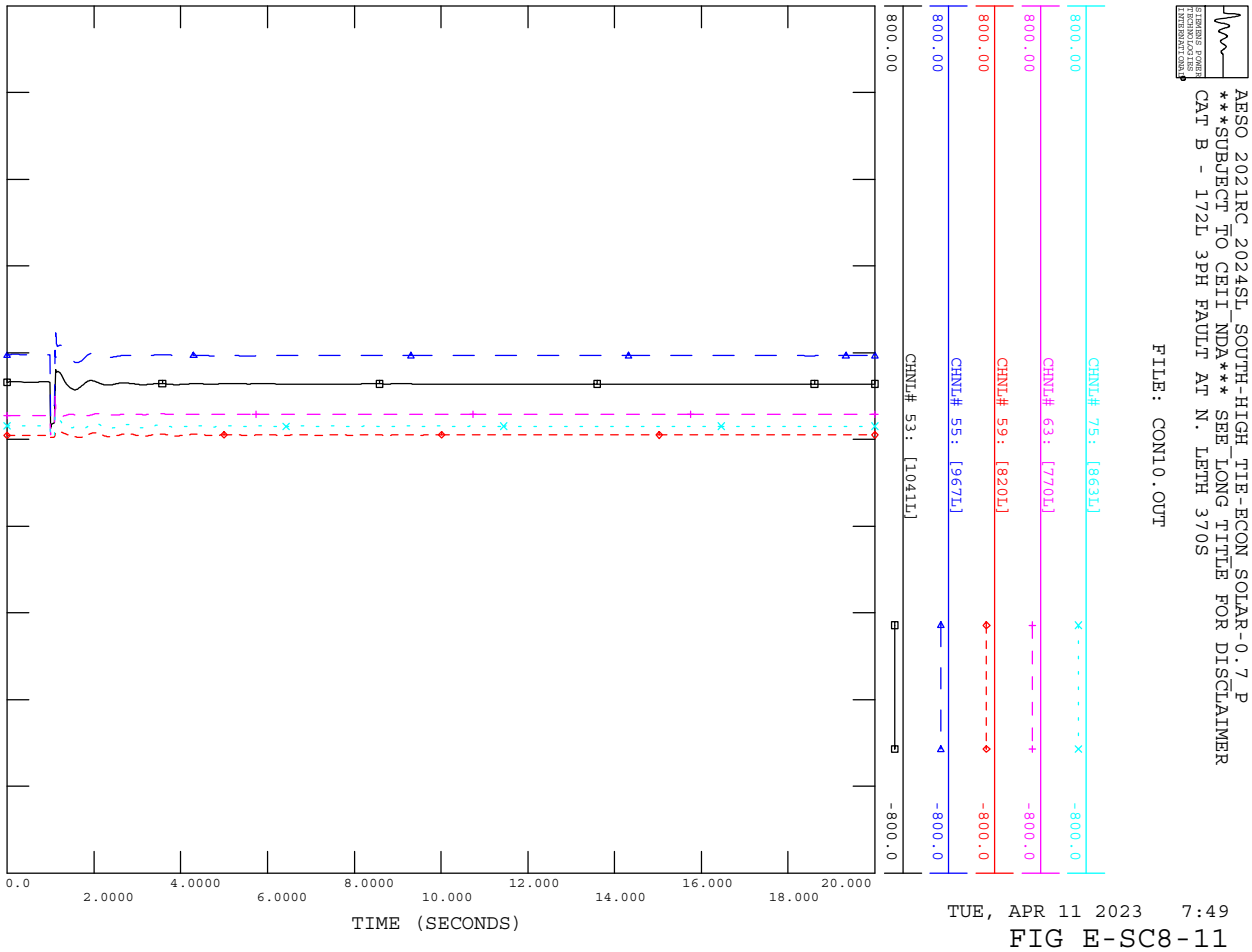


FIG E-SC8-11

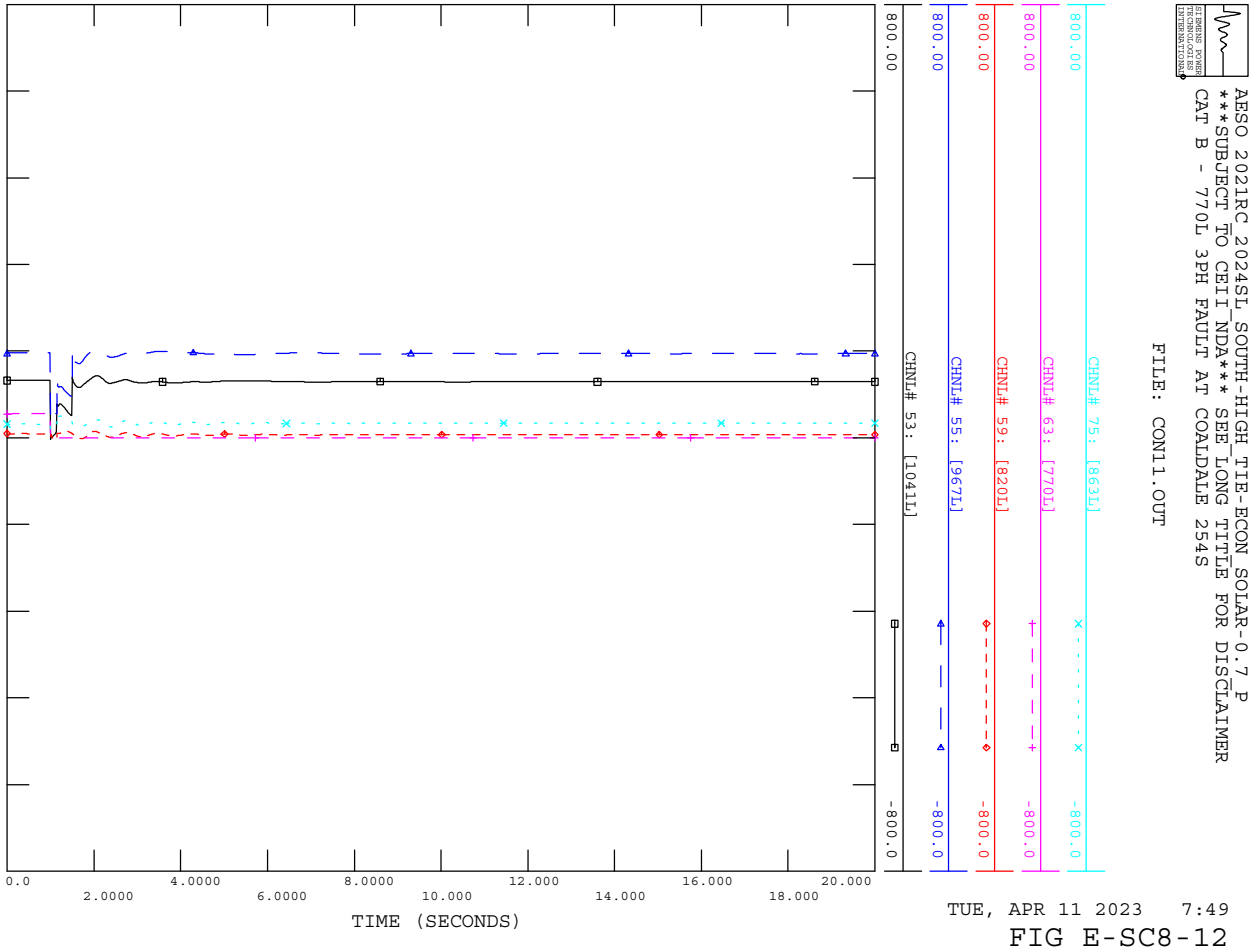


FIG E-SC8-12

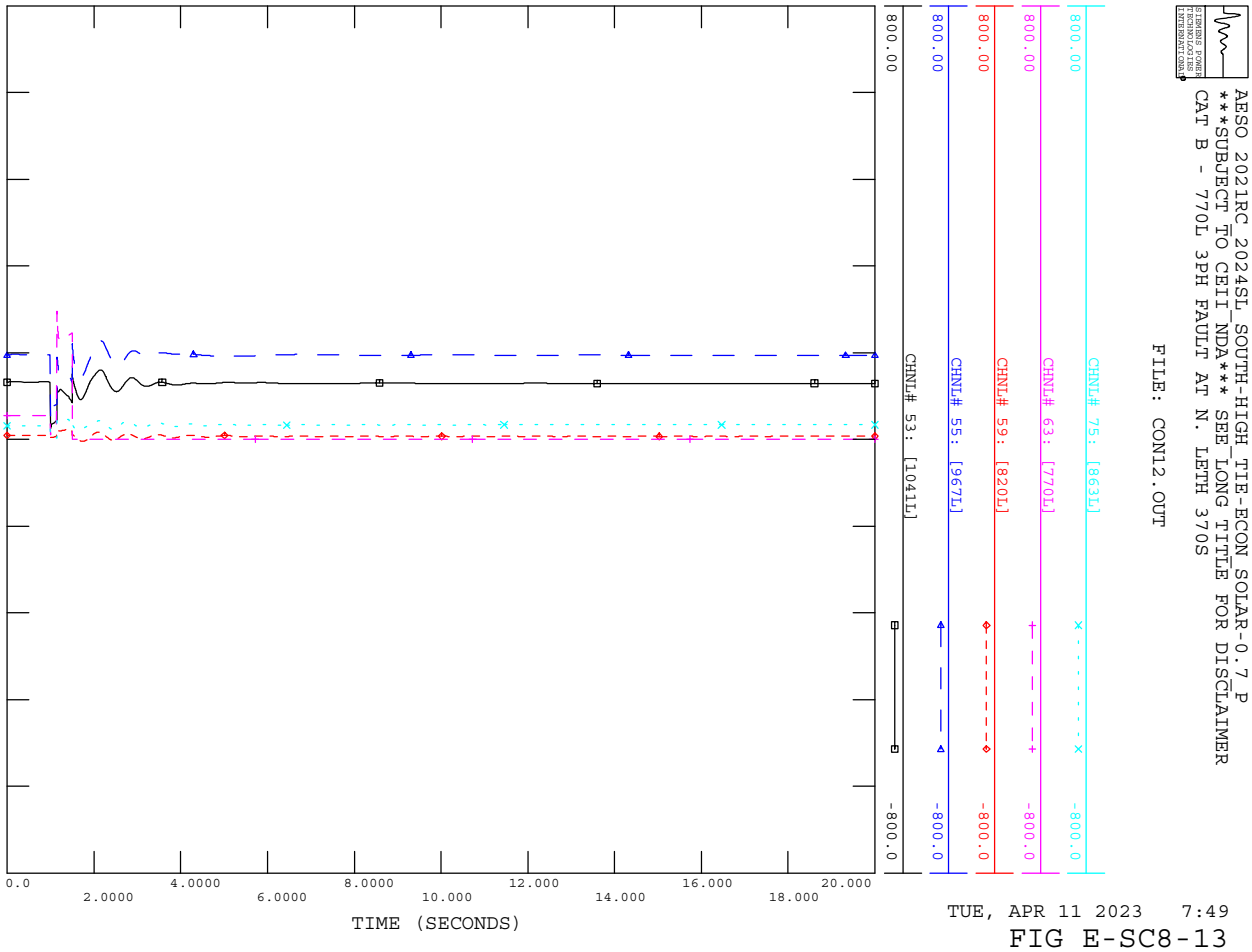


FIG E-SC8-13

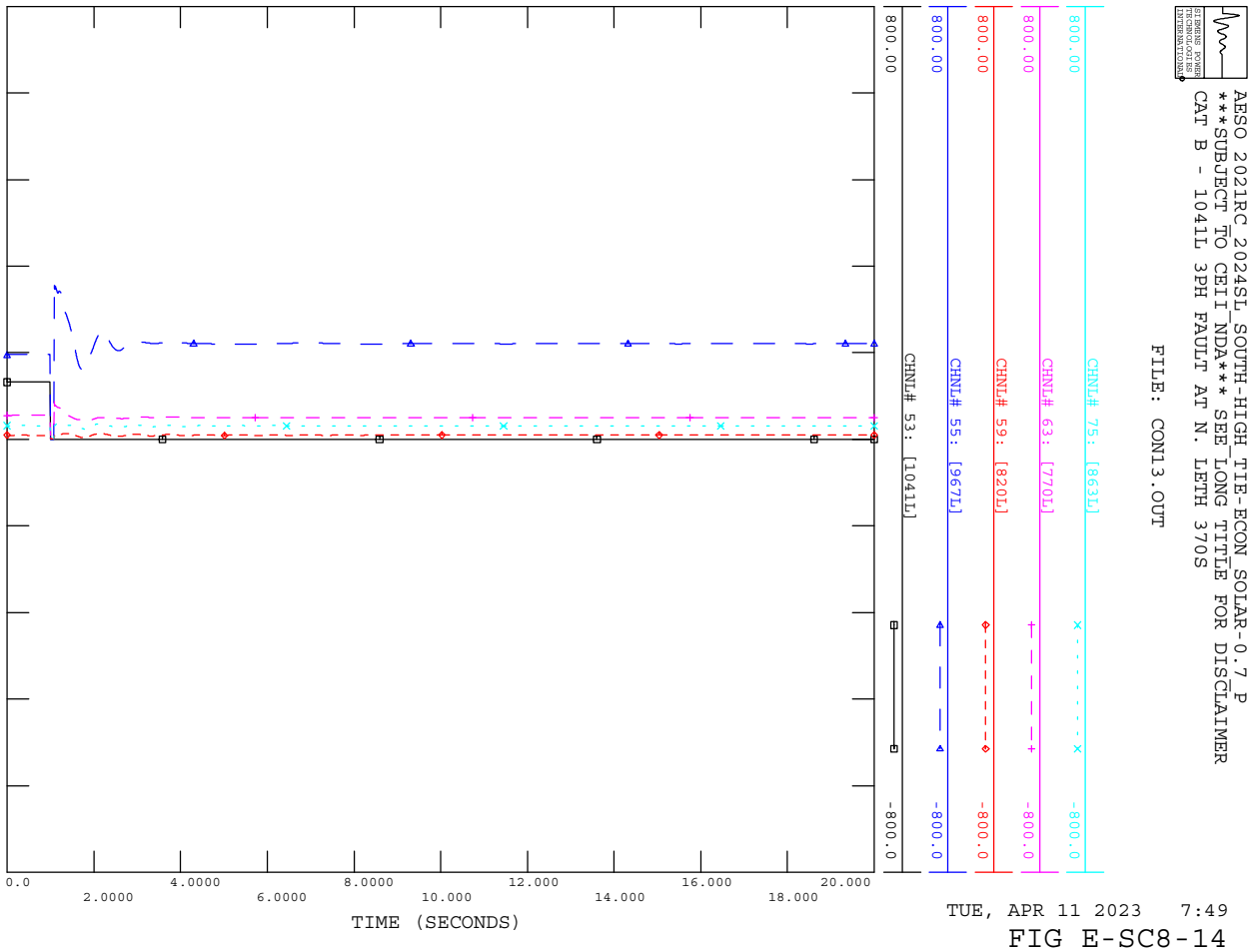


FIG E-SC8-14

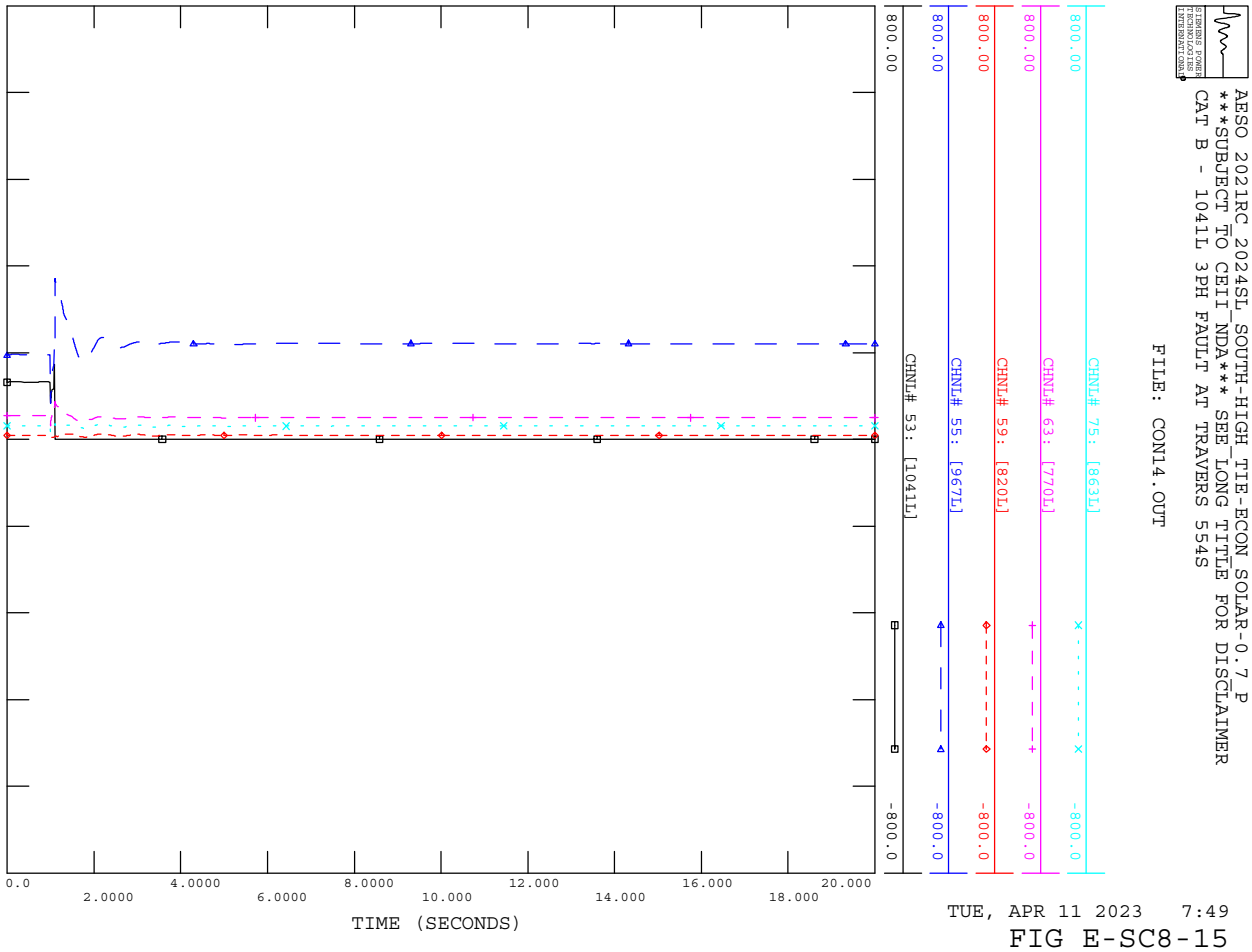


FIG E-SC8-15

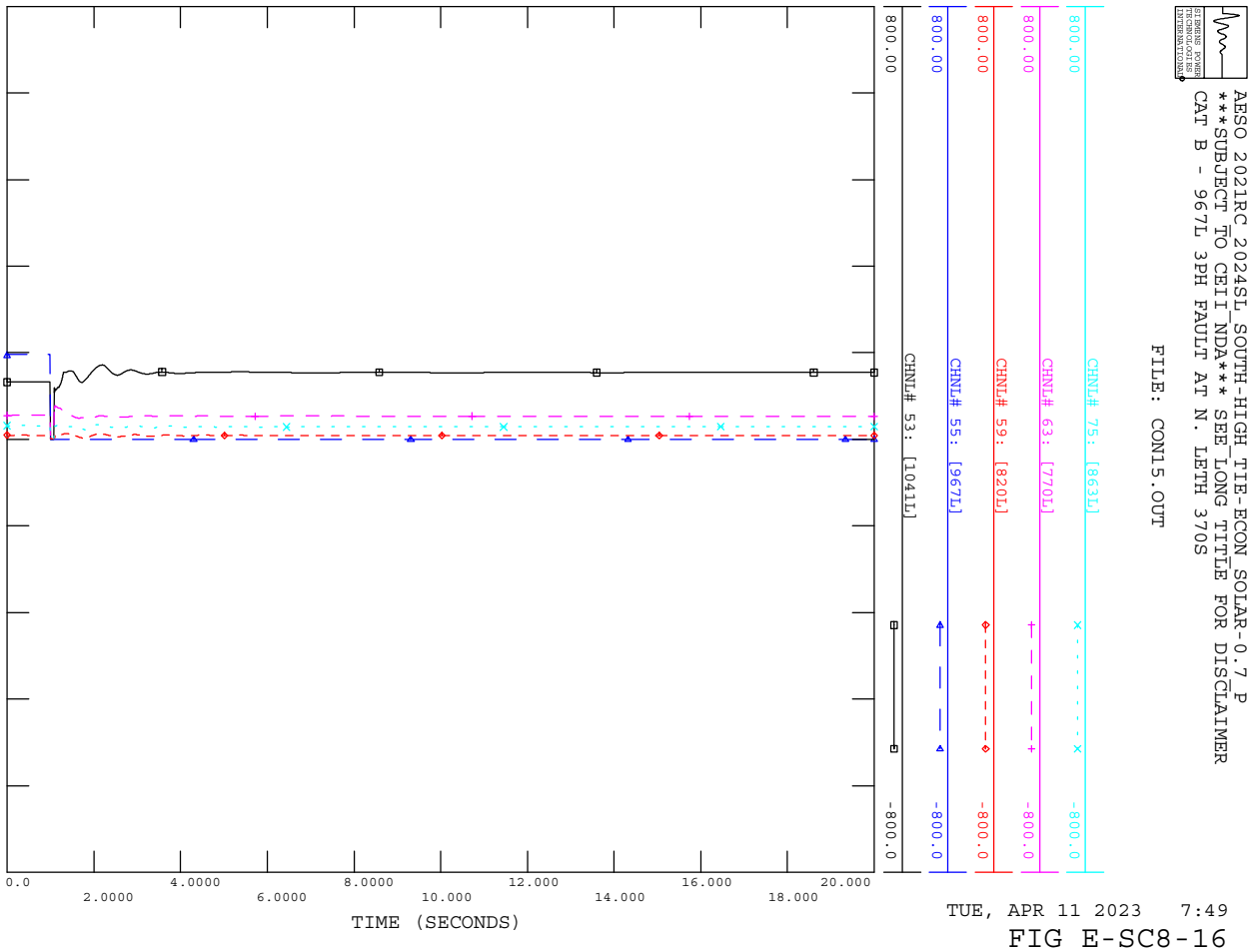


FIG E-SC8-16

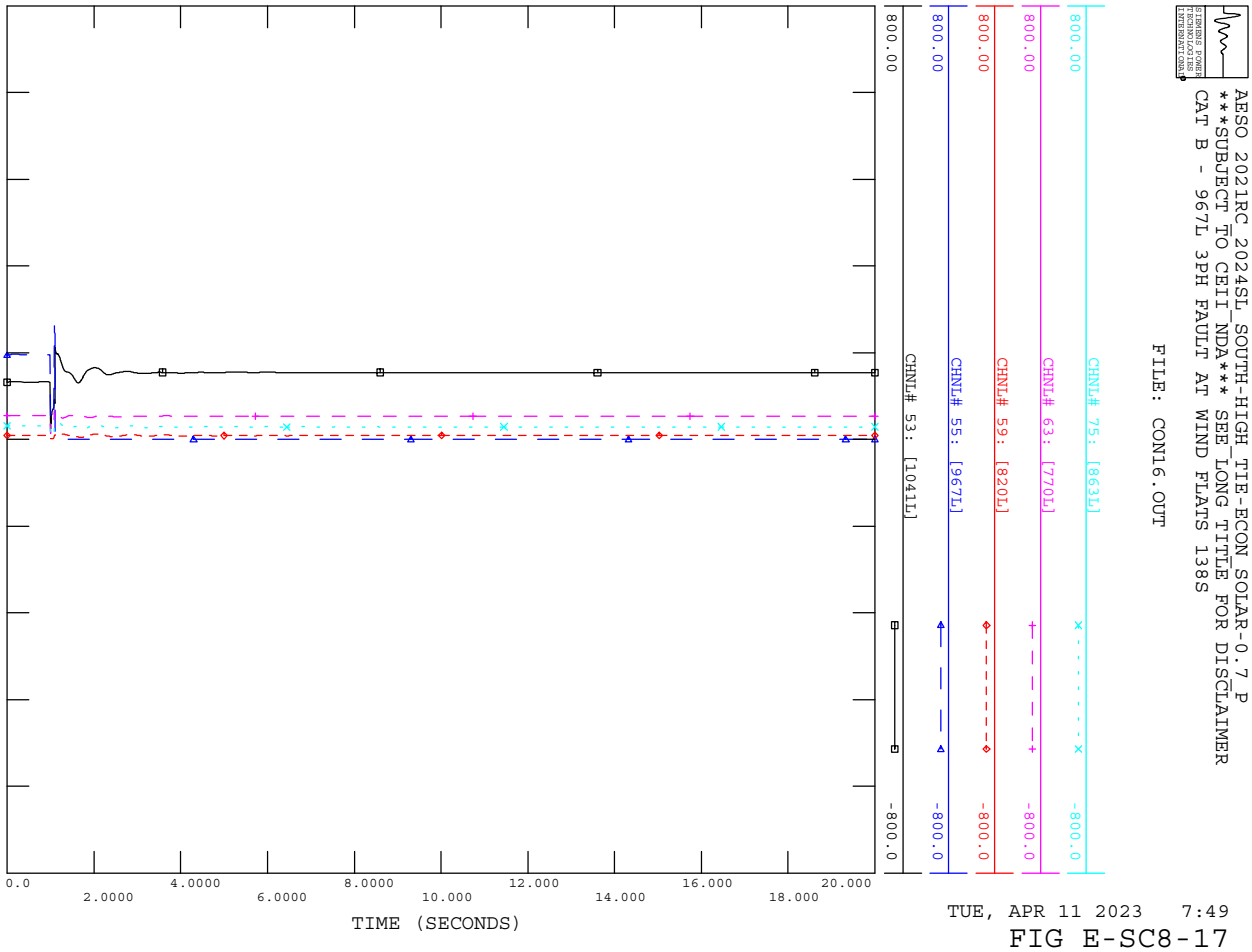


FIG E-SC8-17

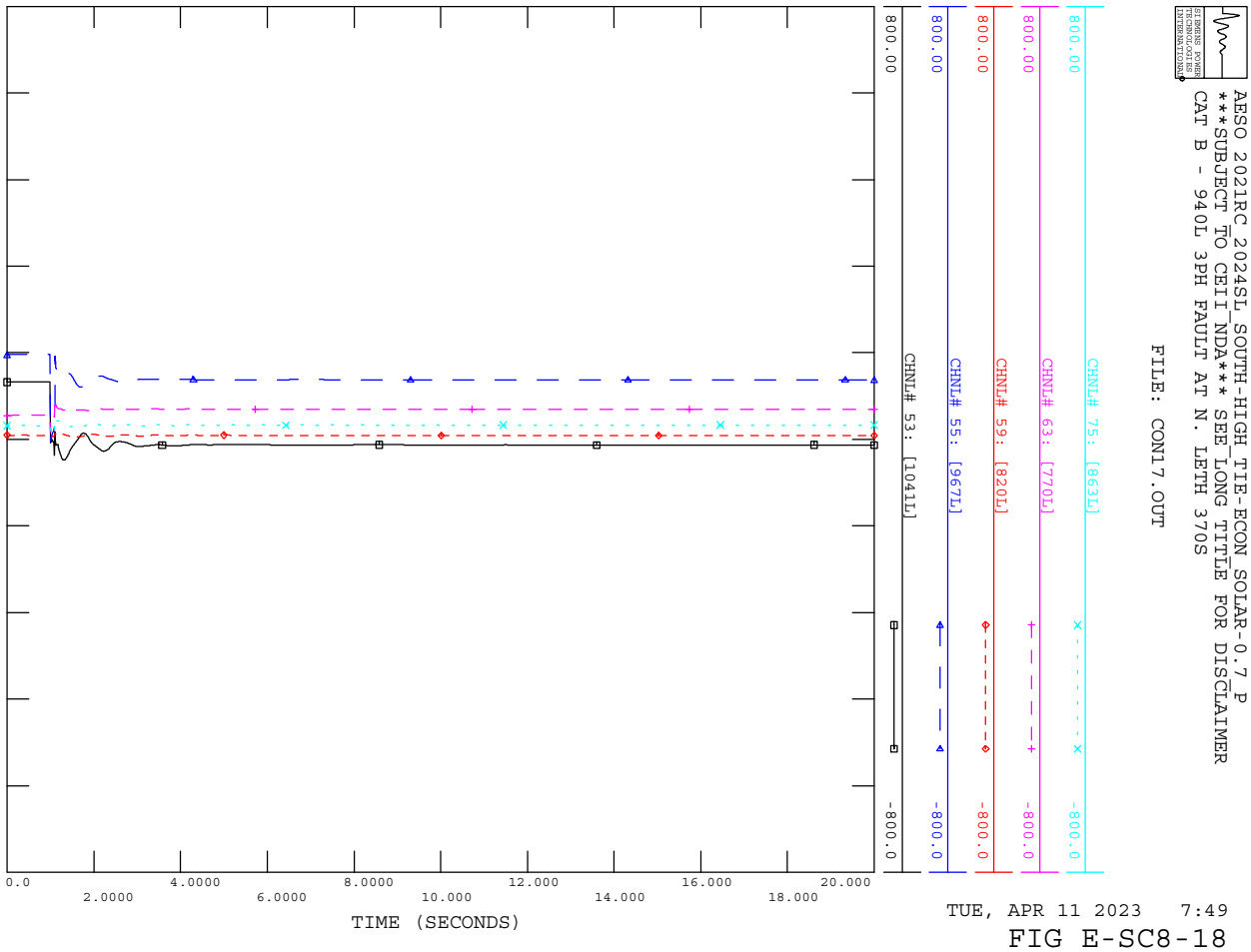


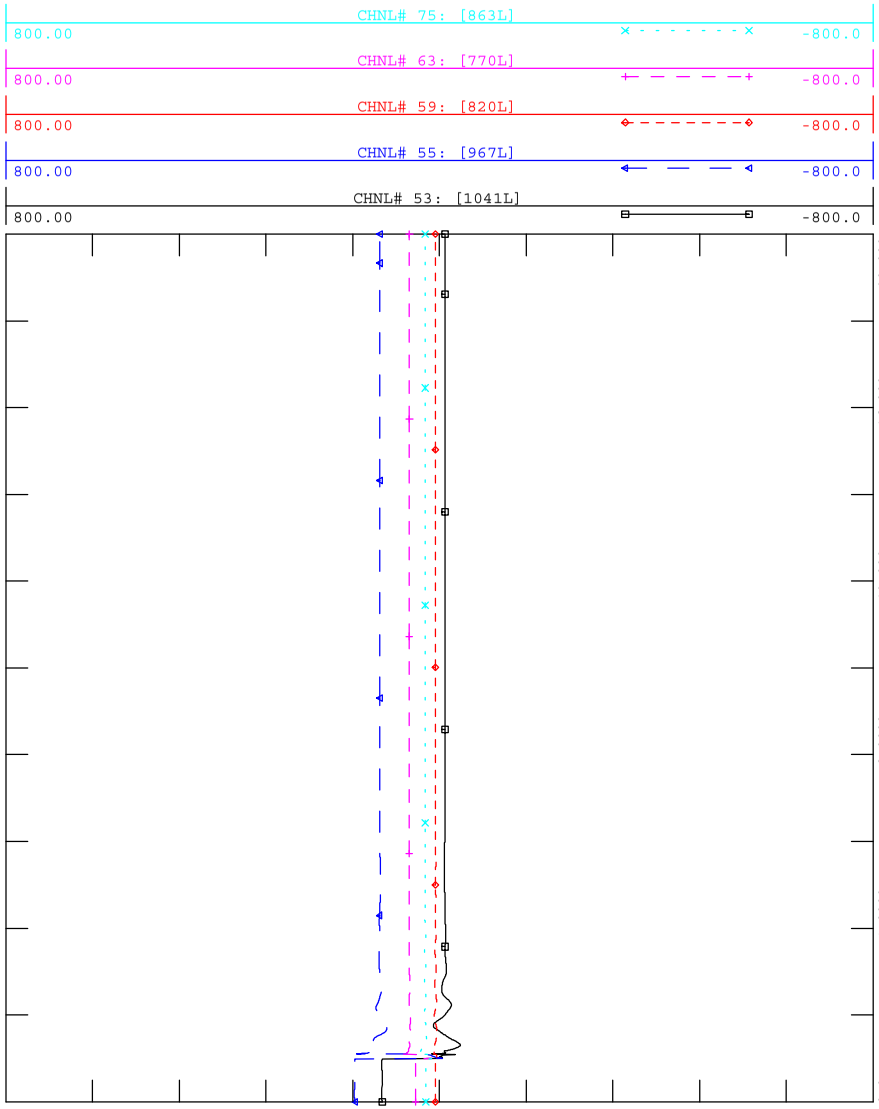
FIG E-SC8-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

TUE, APR 11 2023 7:49

FIG E-SC8-19



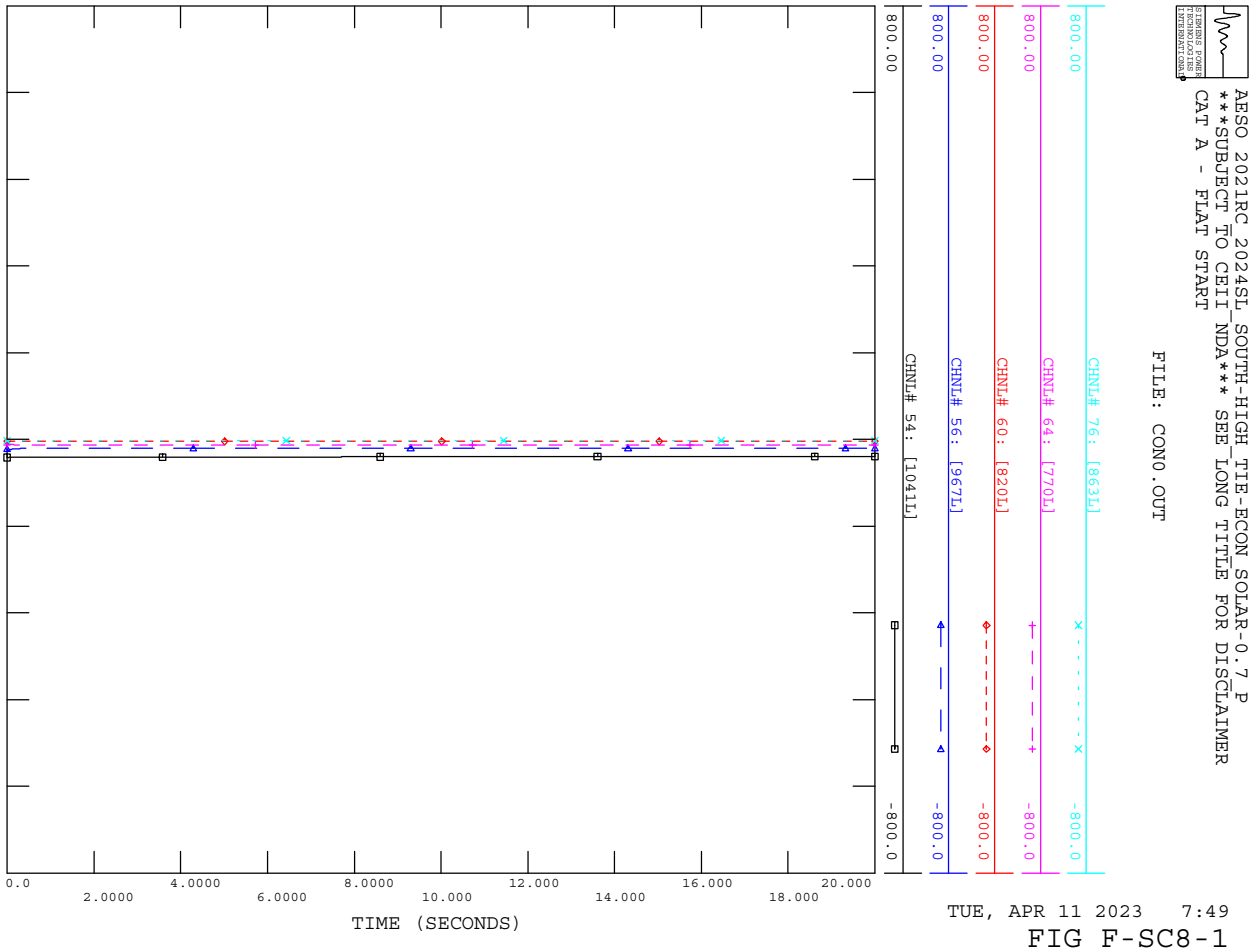


FIG F-SC8-1

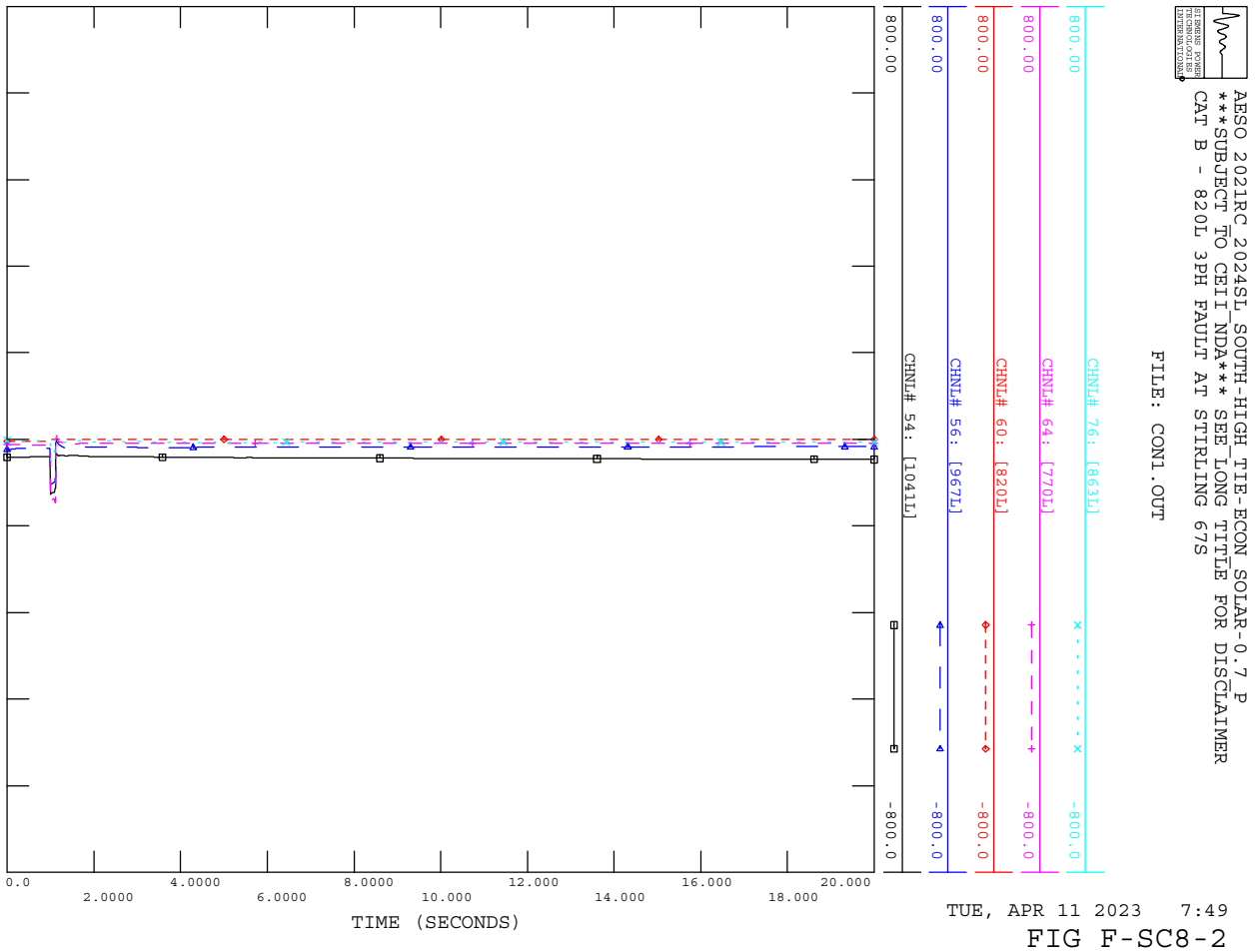


FIG F-SC8-2

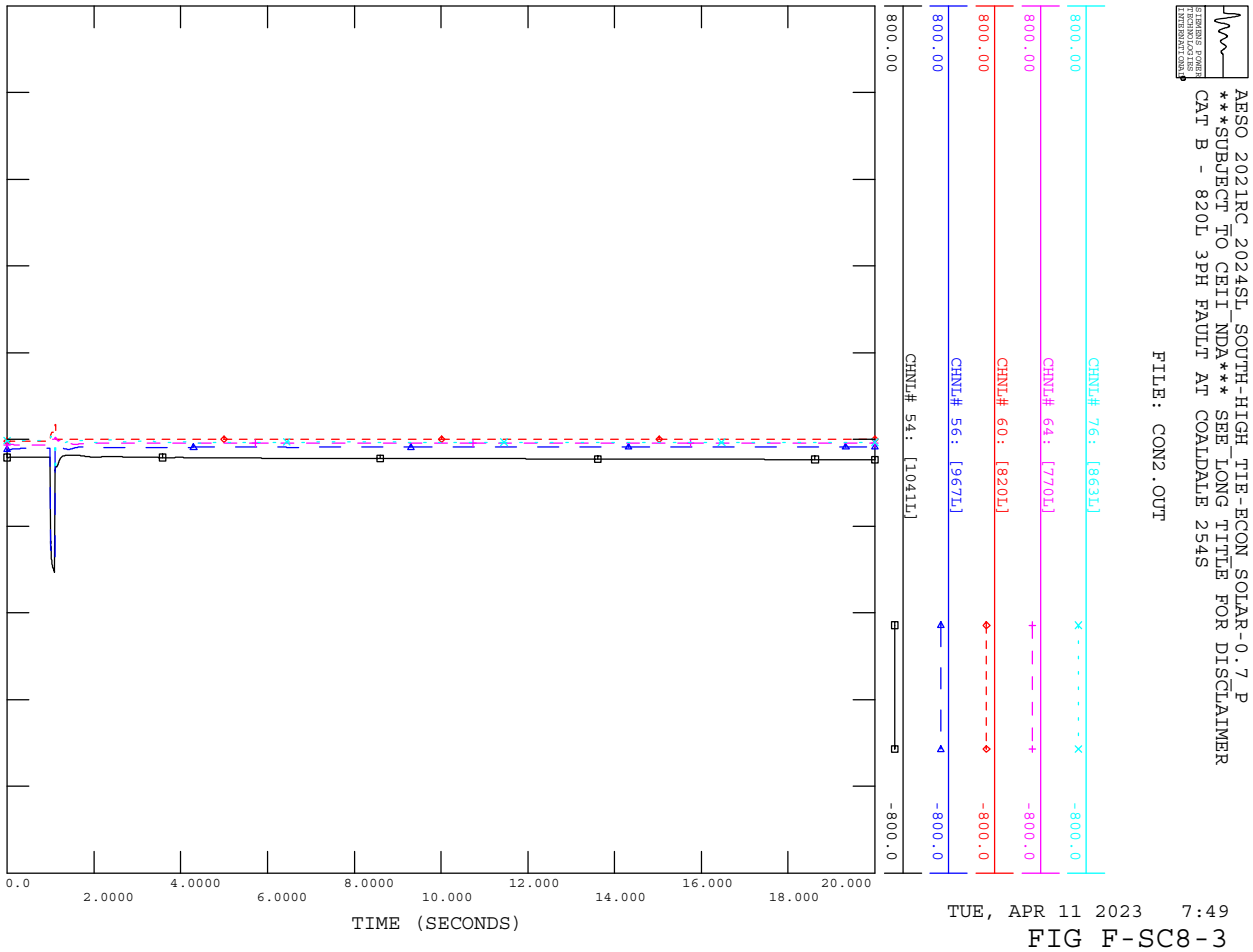


FIG F-SC8-3

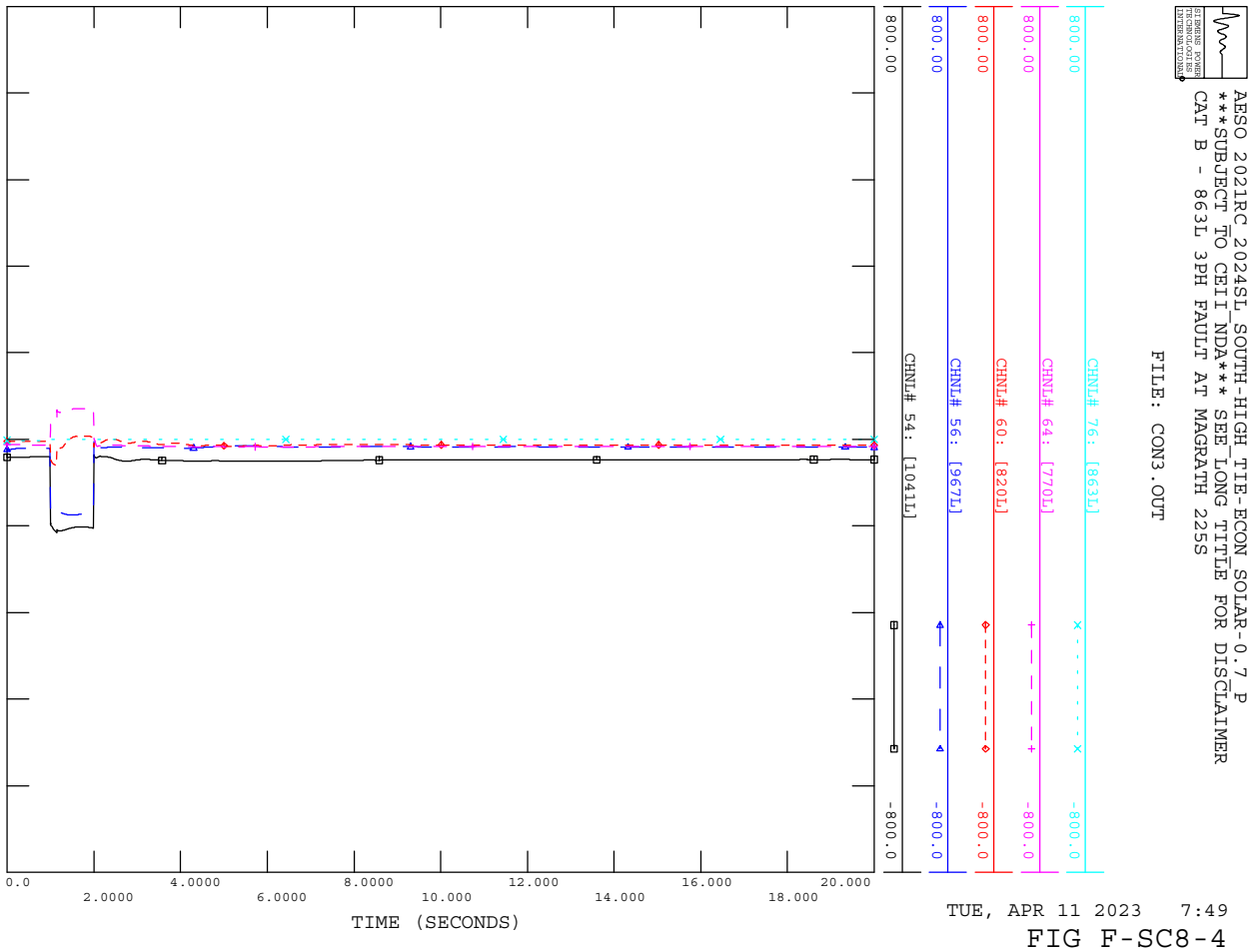


FIG F-SC8-4

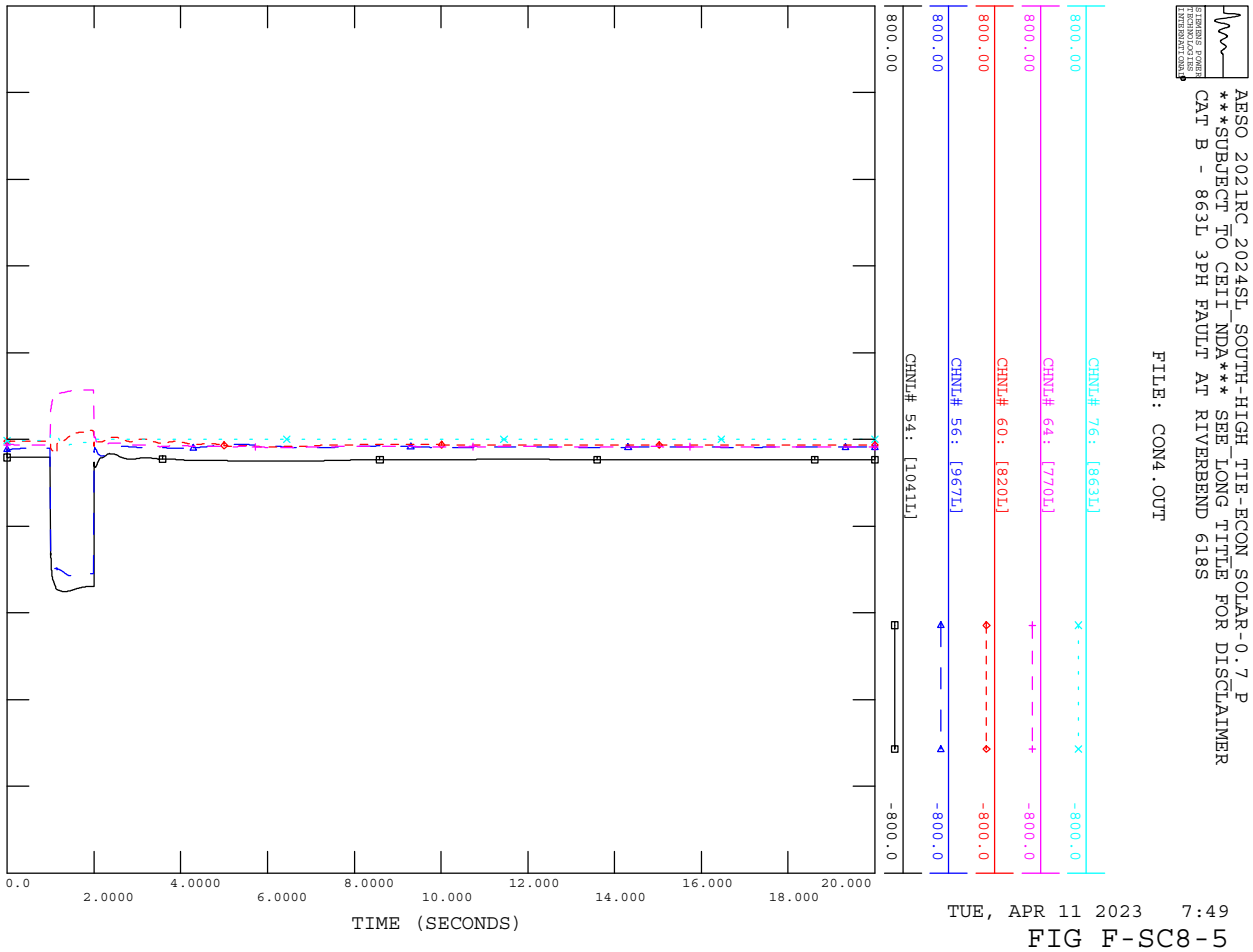


FIG F-SC8-5

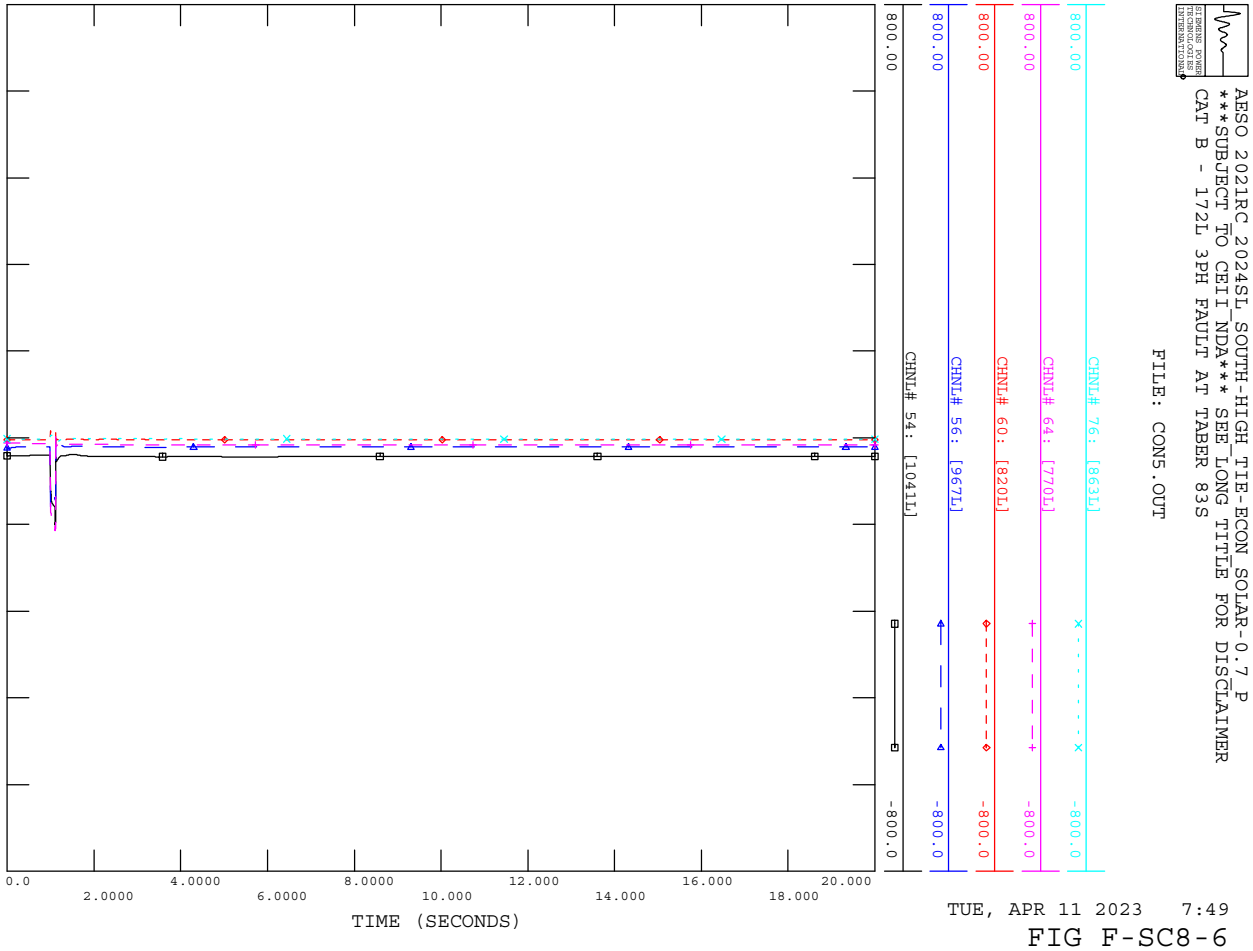


FIG F-SC8-6

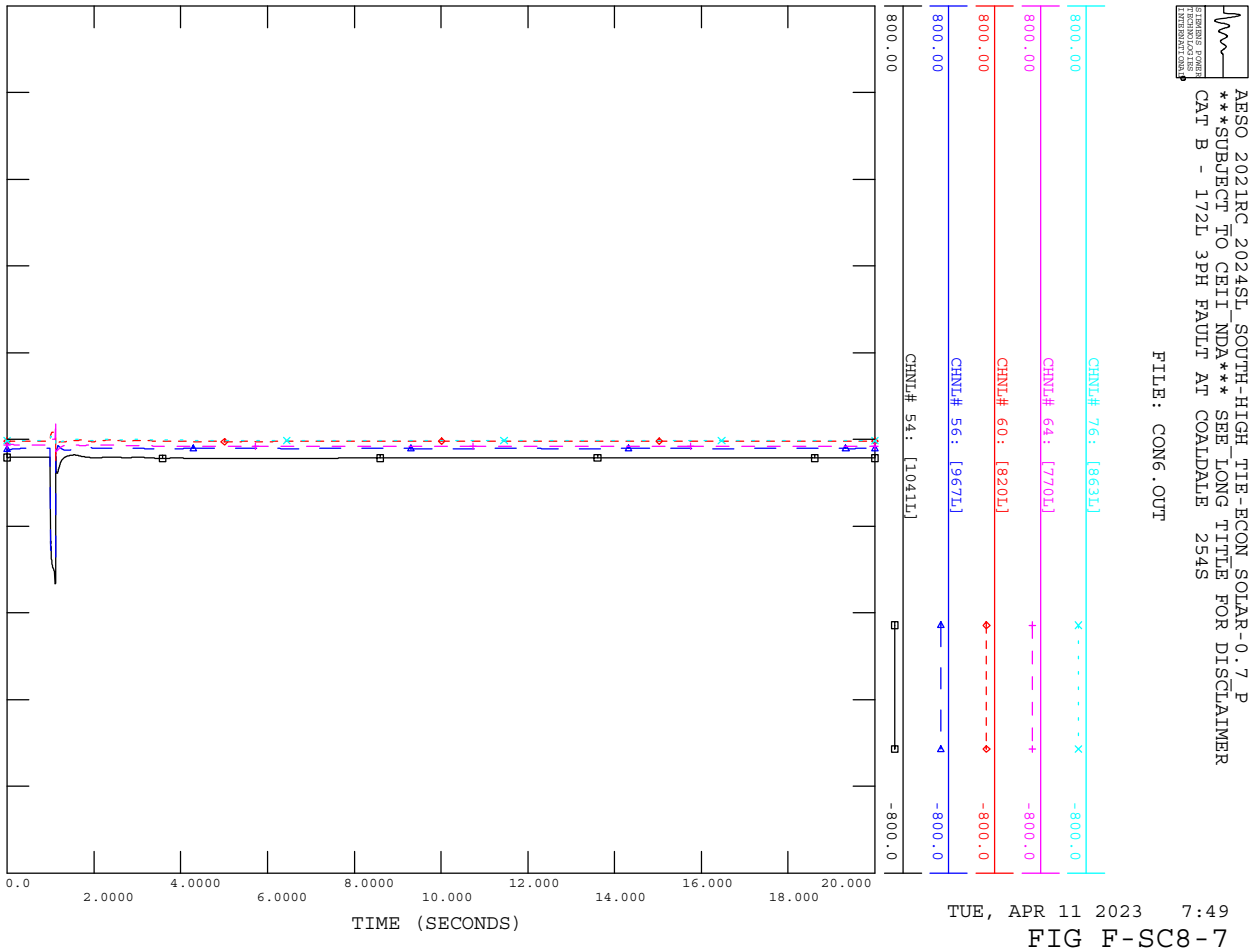


FIG F-SC8-7

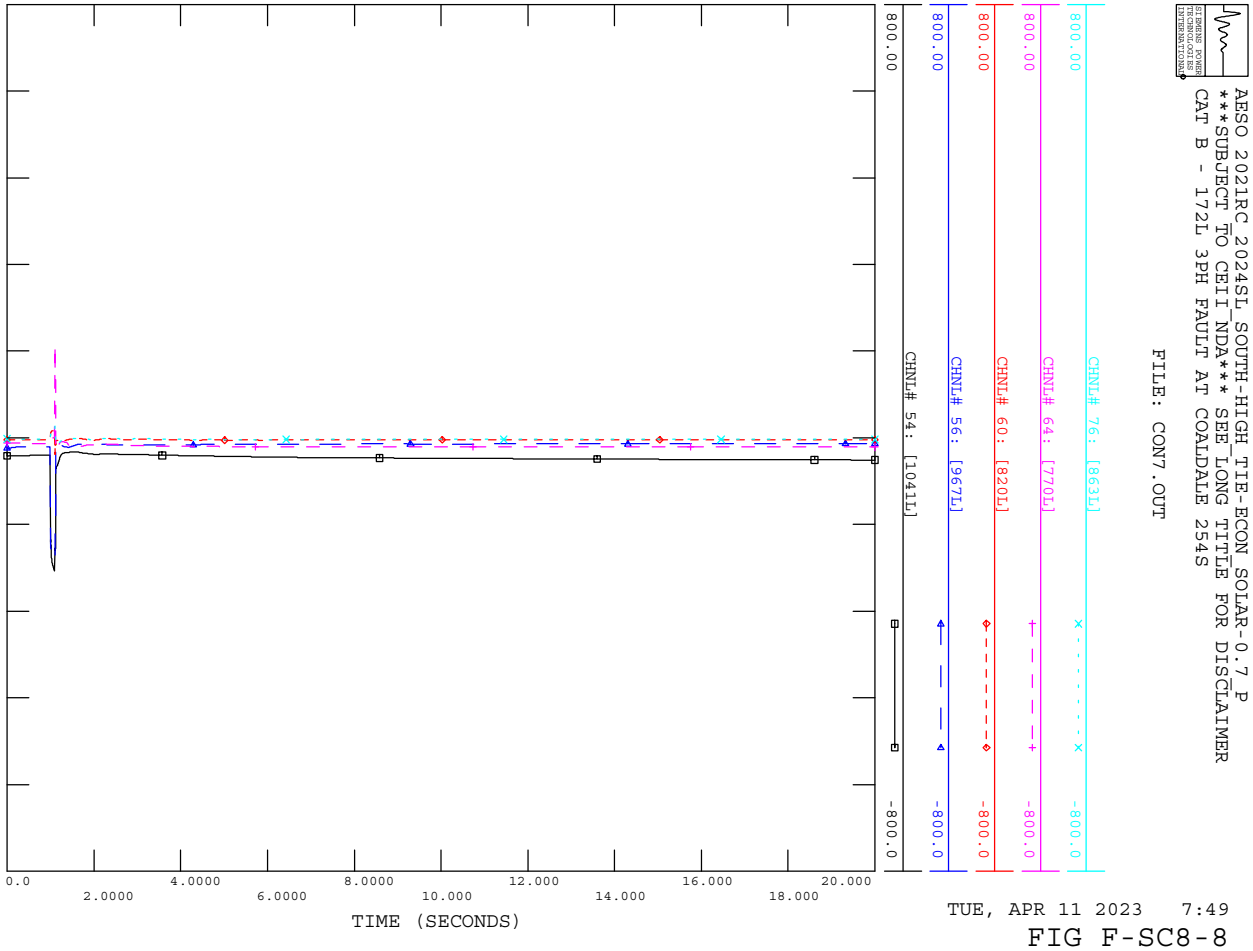


FIG F-SC8-8

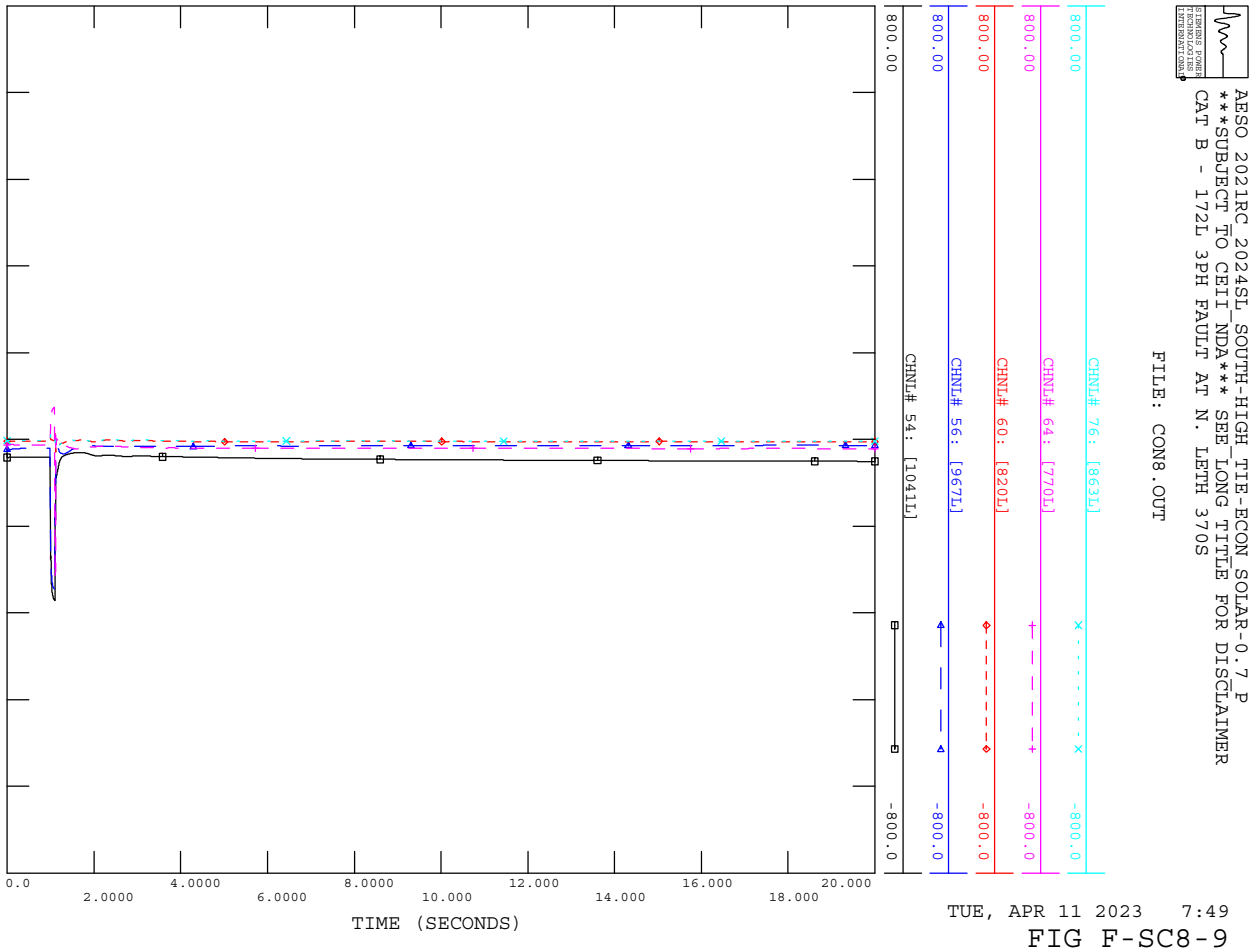


FIG F-SC8-9

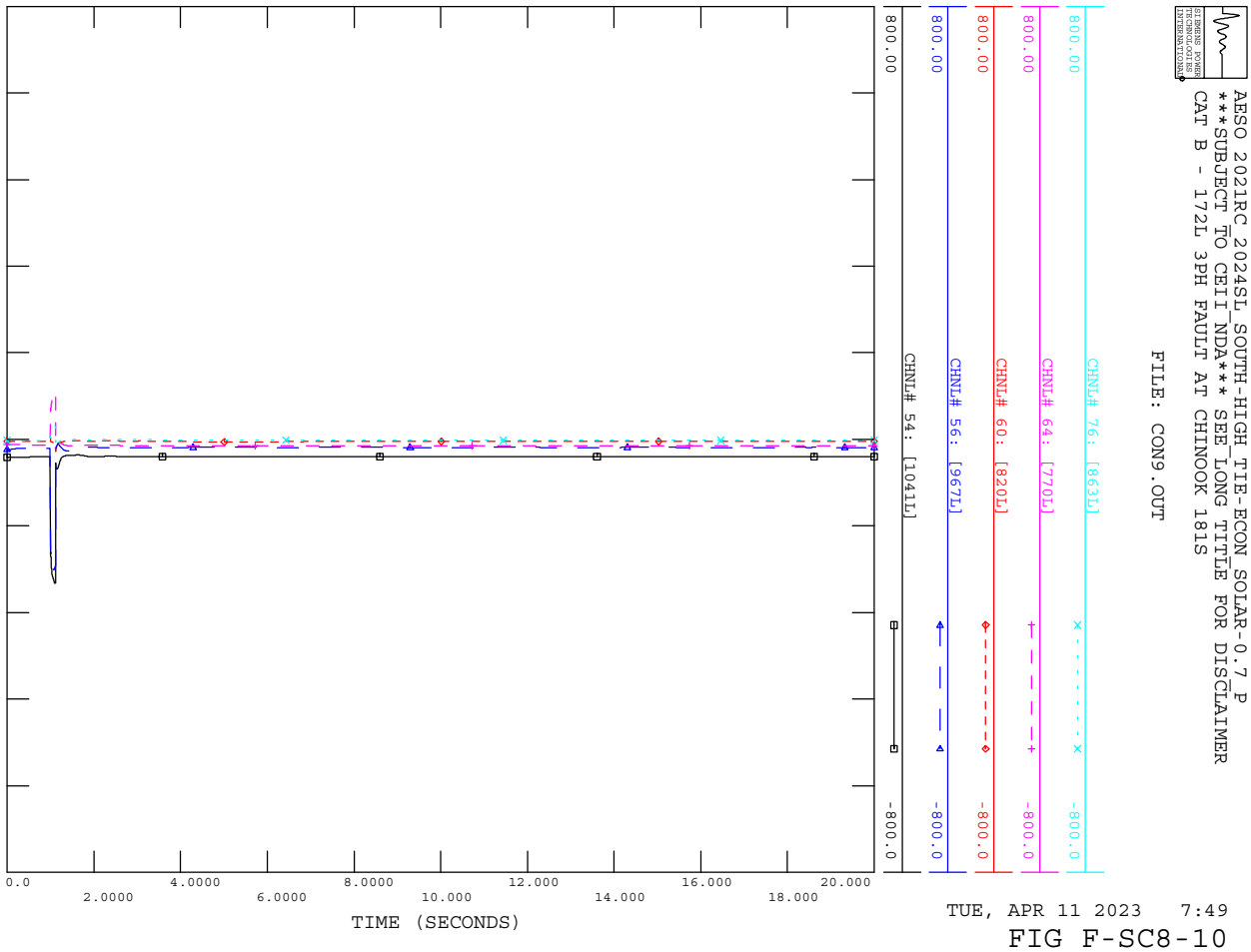


FIG F-SC8-10

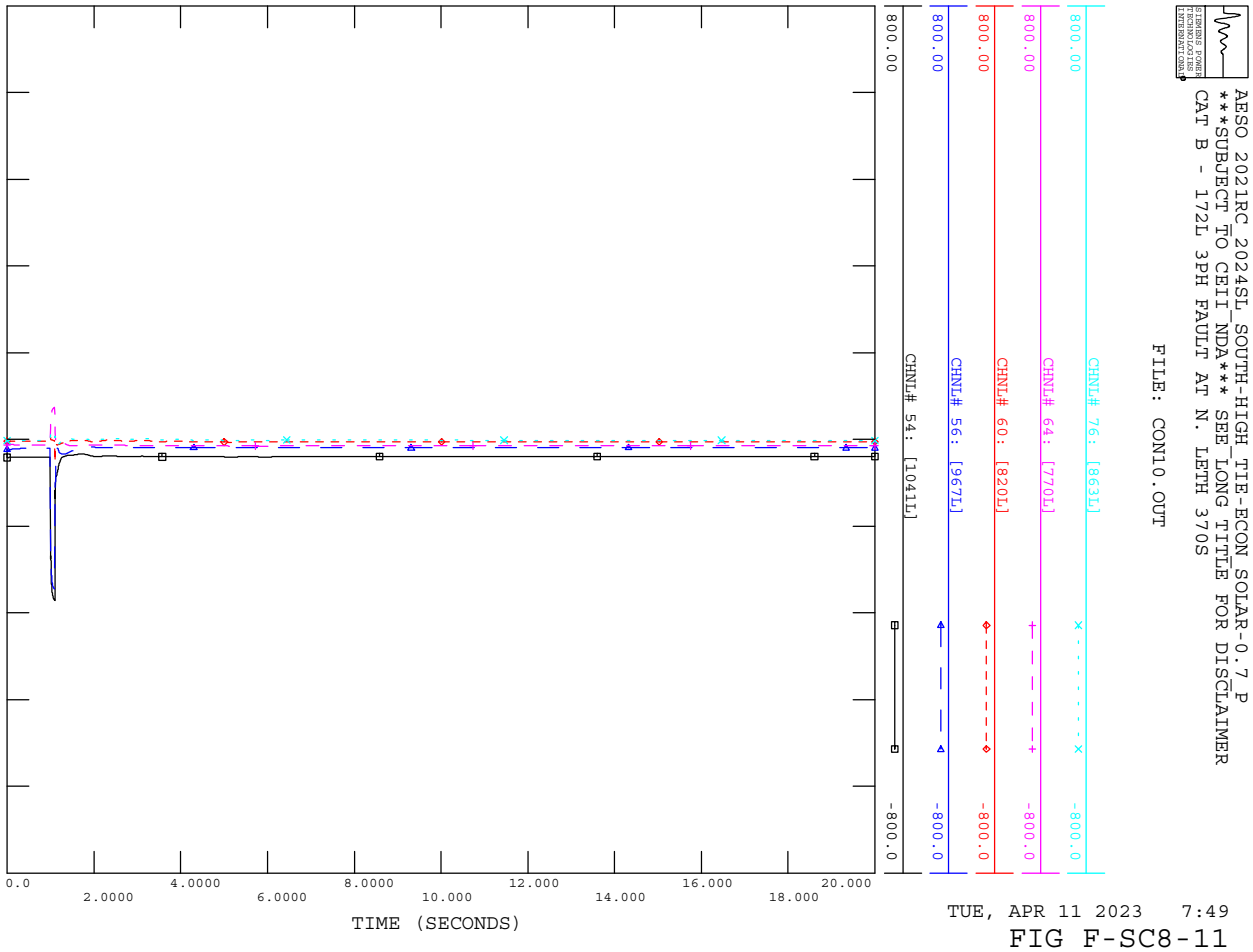


FIG F-SC8-11

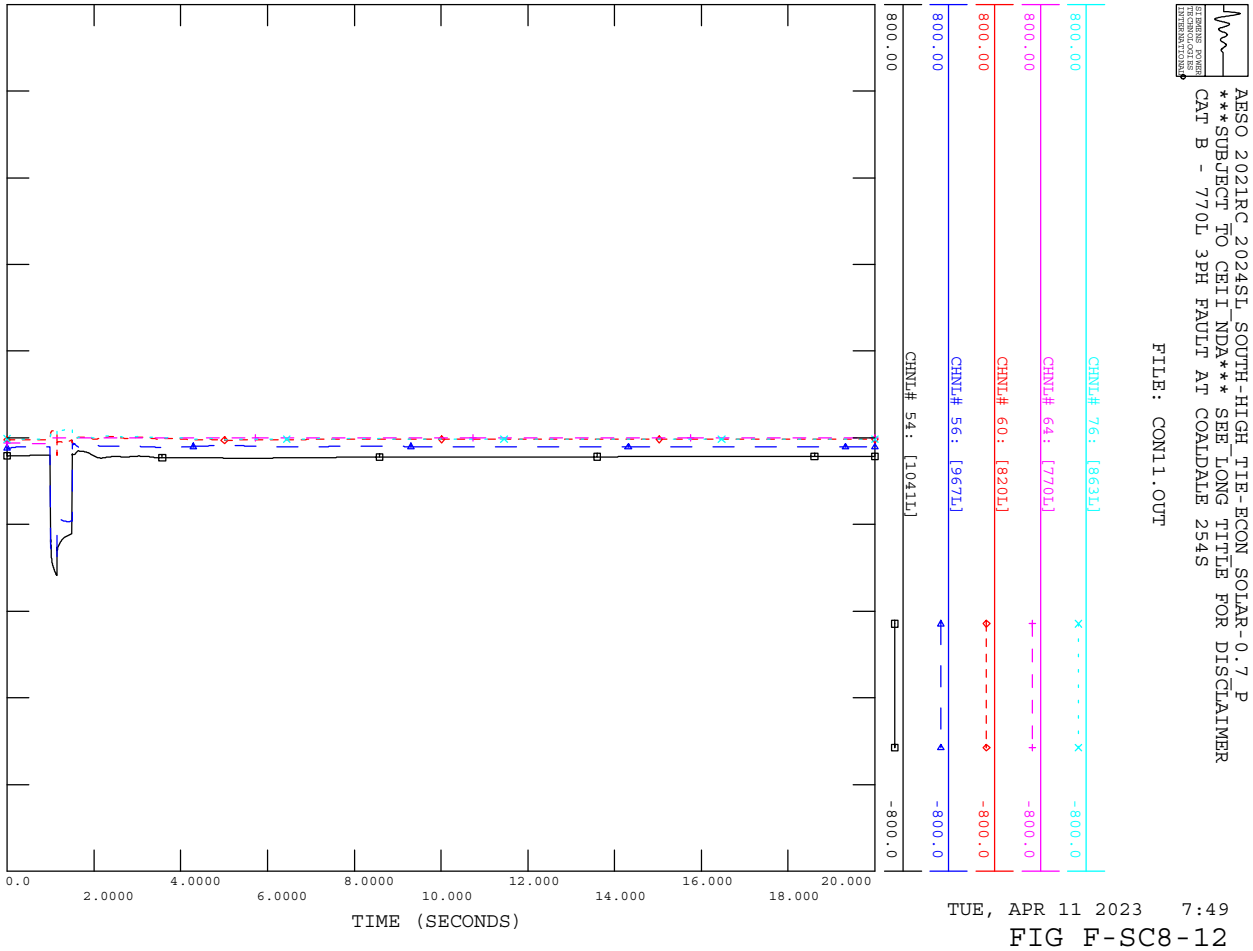


FIG F-SC8-12

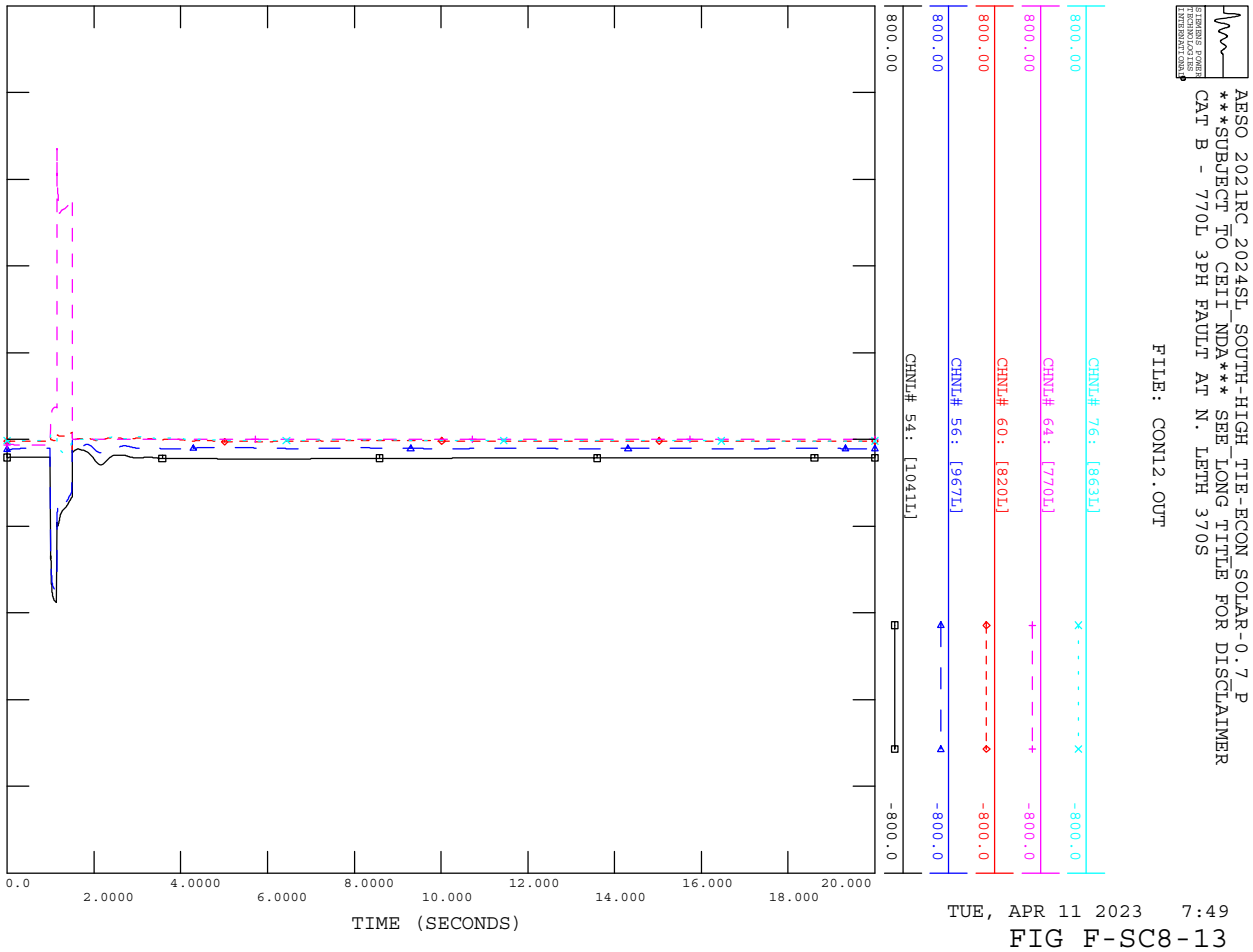


FIG F-SC8-13

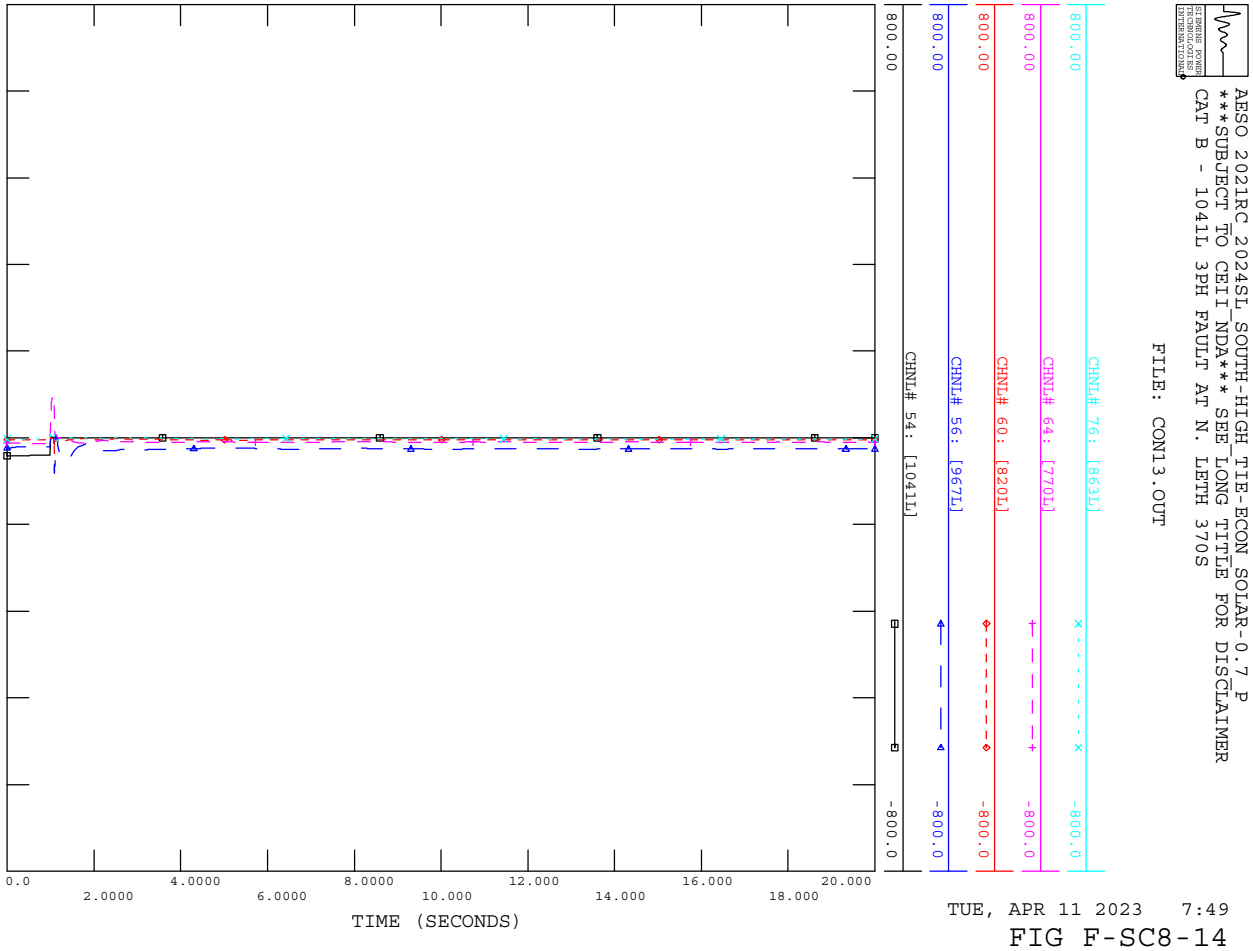
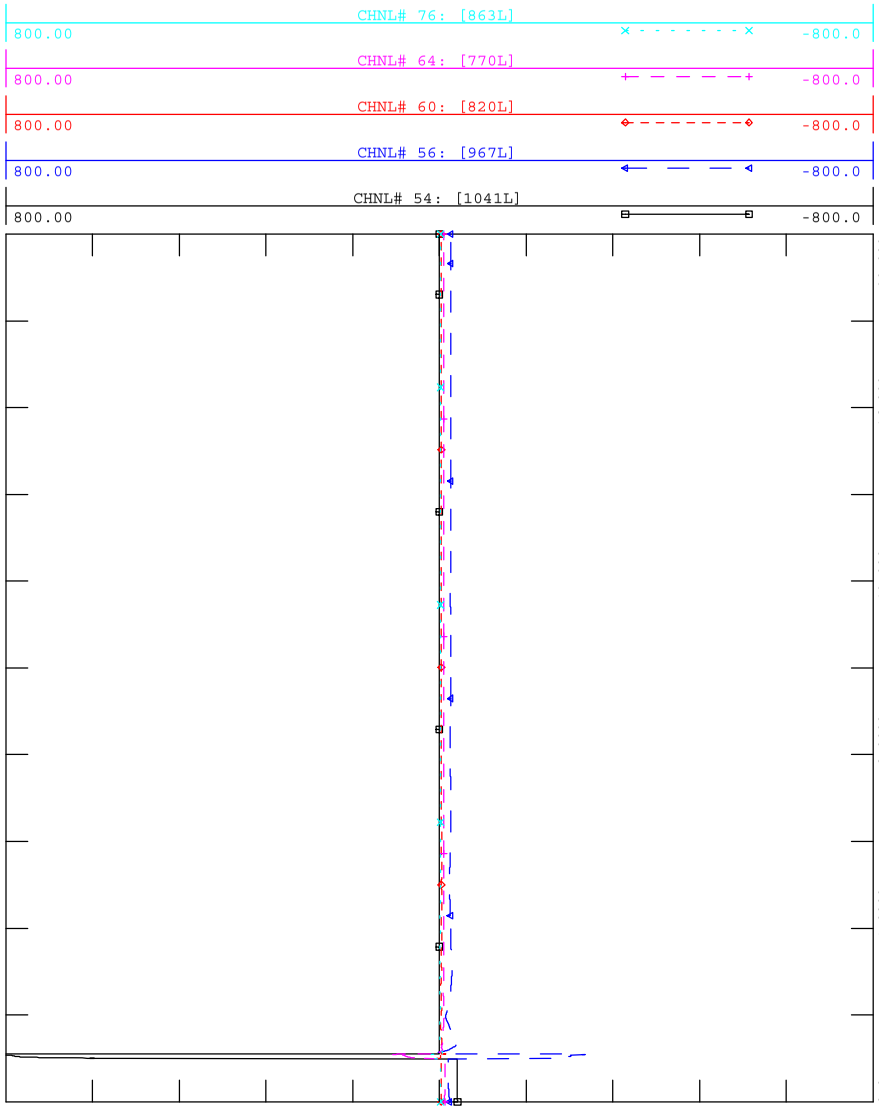


FIG F-SC8-14

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

FILE: CON14.OUT

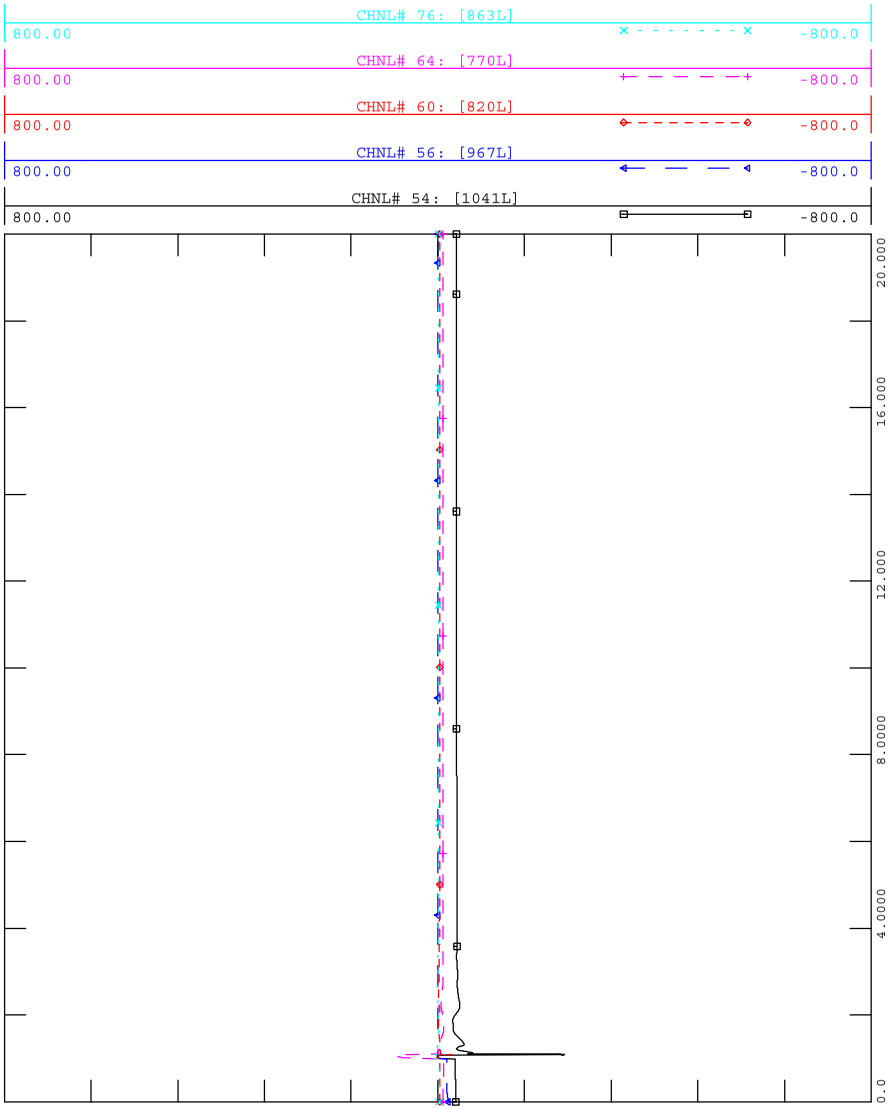


TUE, APR 11 2023 7:49

FIG F-SC8-15

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

FILE: CON15.OUT



TUE, APR 11 2023 7:49

FIG F-SC8-16

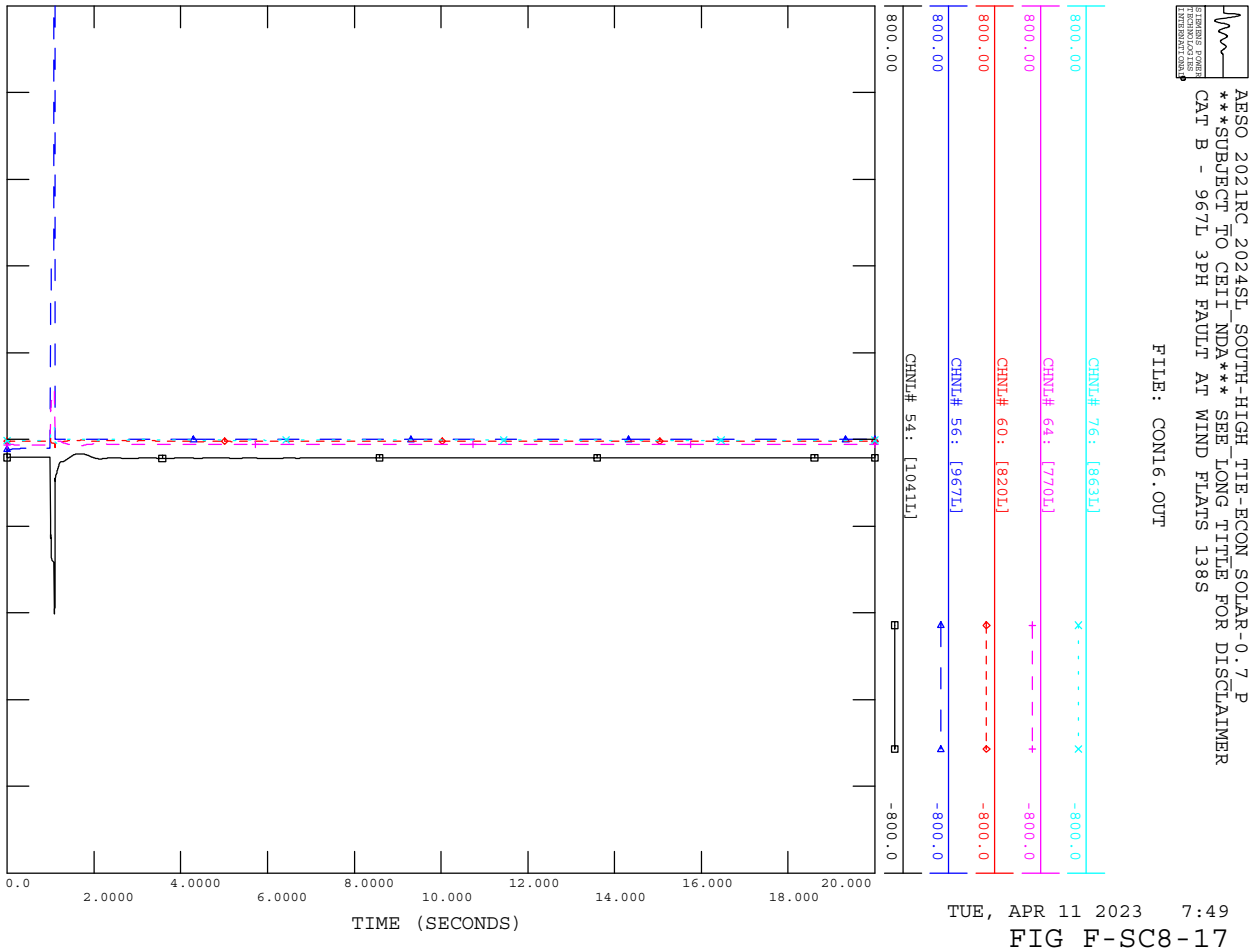


FIG F-SC8-17

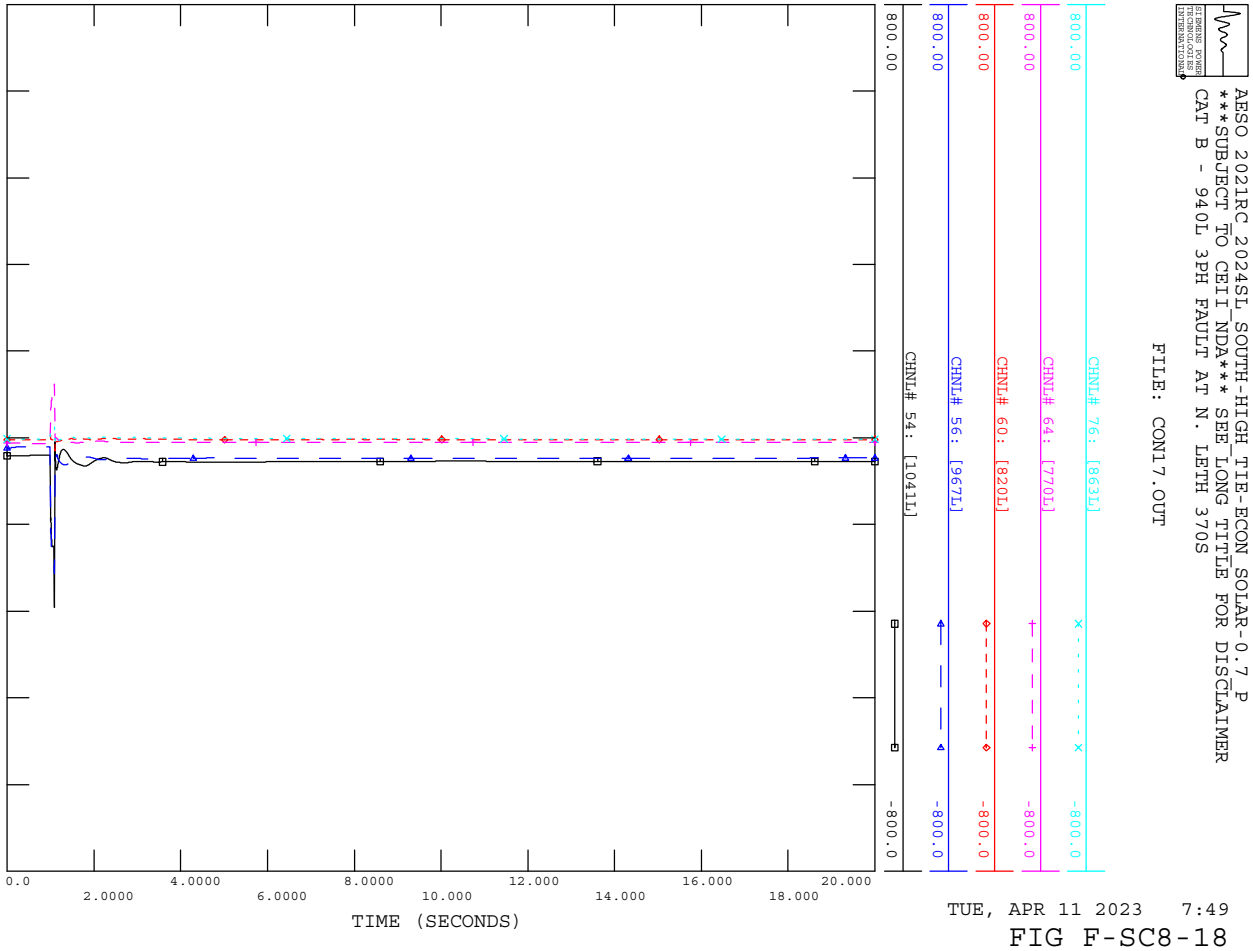


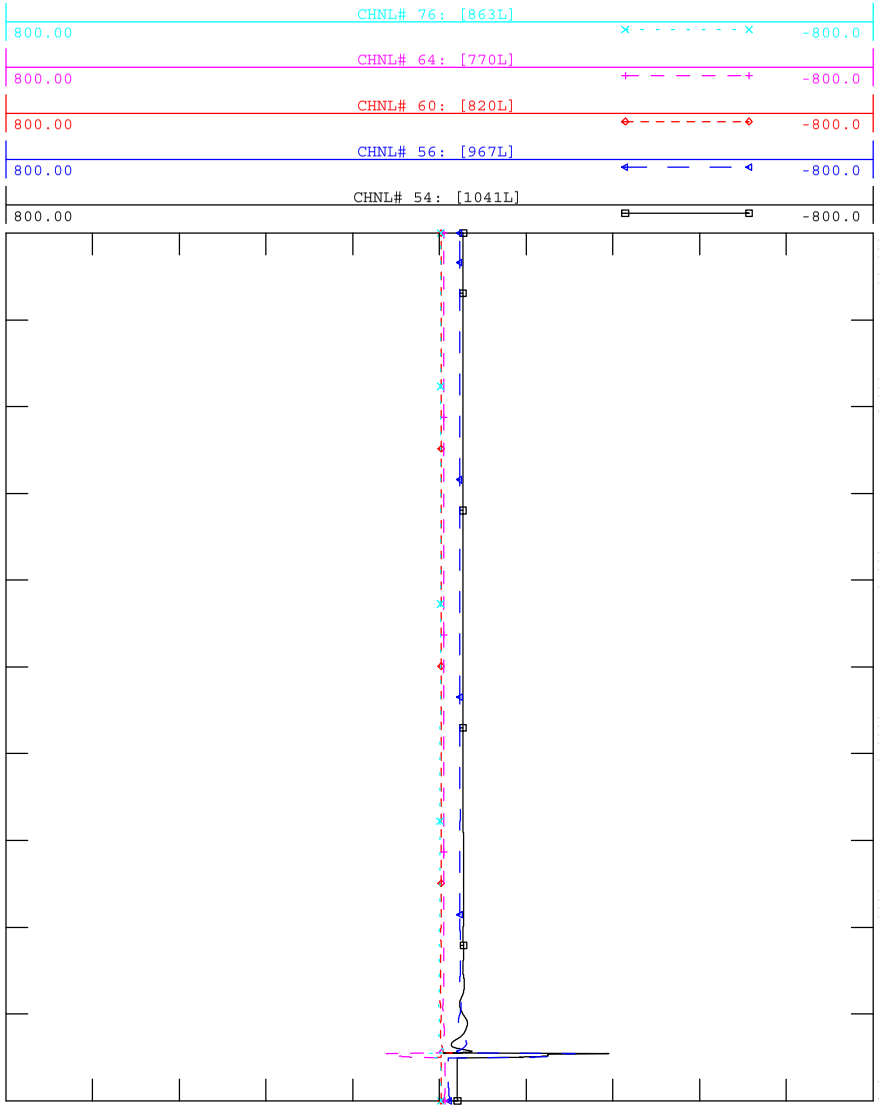
FIG F-SC8-18

AESO 2021RC_2024SL_SOUTH-HIGH_TIE-ECON_SOLAR-0.7_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

TUE, APR 11 2023 7:49

FIG F-SC8-19



Scenario 9

Summer Peak Post Project Sensitivity

Transient Response Plot Key

Table Summer Peak Post Project Sensitivity Figure Reference:

Scenario	Plots	Figure #
Summer Peak Post Project Sensitivity	Power Plots	B-SC9-POST-1 to B-SC9-POST-19
	Var Plots	C-SC9-POST-1 to C-SC9-POST-19
	Bus Voltage Plots	D-SC9-POST-1 to D-SC9-POST-19
	Branchflow MW Plots	E-SC9-POST-1 to E-SC9-POST-19
	Branchflow MVar Plots	F-SC9-POST-1 to F-SC9-POST-19

Table Summer Peak Post Project Figures:

Category	Line Element	Substation Terminals		Faulted End	Figure Reference
A	n/a	Flat Start		n/a	B-SC9-POST-1 C-SC9-POST-1 D-SC9-POST-1 E-SC9-POST-1 F-SC9-POST-1
B	820L	Stirling 67S	Coaldale 254S	67S	B-SC9-POST-2 C-SC9-POST-2 D-SC9-POST-2 E-SC9-POST-2 F-SC9-POST-2
				254S	B-SC9-POST-3 C-SC9-POST-3 D-SC9-POST-3 E-SC9-POST-3 F-SC9-POST-3
B	863L	Magrath 225S	Riverbend 618S	225S	B-SC9-POST-4 C-SC9-POST-4 D-SC9-POST-4 E-SC9-POST-4 F-SC9-POST-4
				618S	B-SC9-POST-5 C-SC9-POST-5 D-SC9-POST-5 E-SC9-POST-5 F-SC9-POST-5
B	172L	Taber 83S	Coaldale 254S	83S	B-SC9-POST-6 C-SC9-POST-6 D-SC9-POST-6 E-SC9-POST-6 F-SC9-POST-6
				254S	B-SC9-POST-7 C-SC9-POST-7 D-SC9-POST-7 E-SC9-POST-7 F-SC9-POST-7
B	172L	Coaldale 254S	N. Leth 370S	254S	B-SC9-POST-8 C-SC9-POST-8 D-SC9-POST-8 E-SC9-POST-8 F-SC9-POST-8
				370S	B-SC9-POST-9 C-SC9-POST-9 D-SC9-POST-9 E-SC9-POST-9 F-SC9-POST-9
B	172L	Chinook 181S	N. Leth 370S	181S	B-SC9-POST-10 C-SC9-POST-10 D-SC9-POST-10

					E-SC9-POST-10 F-SC9-POST-10
				370S	B-SC9-POST-11 C-SC9-POST-11 D-SC9-POST-11 E-SC9-POST-11 F-SC9-POST-11
B	770L	Coaldale 254S	N. Leth 370S	254S	B-SC9-POST-12 C-SC9-POST-12 D-SC9-POST-12 E-SC9-POST-12 F-SC9-POST-12
				370S	B-SC9-POST-13 C-SC9-POST-13 D-SC9-POST-13 E-SC9-POST-13 F-SC9-POST-13
B	1041L	N. Leth 370S	Travers 554S	370S	B-SC9-POST-14 C-SC9-POST-14 D-SC9-POST-14 E-SC9-POST-14 F-SC9-POST-14
				554S	B-SC9-POST-15 C-SC9-POST-15 D-SC9-POST-15 E-SC9-POST-15 F-SC9-POST-15
B	967L	N. Leth 370S	Wind Flats 138S	370S	B-SC9-POST-16 C-SC9-POST-16 D-SC9-POST-16 E-SC9-POST-16 F-SC9-POST-16
				138S	B-SC9-POST-17 C-SC9-POST-17 D-SC9-POST-17 E-SC9-POST-17 F-SC9-POST-17
B	940L	N. Leth 370S	Picture Butte 120S	370S	B-SC9-POST-18 C-SC9-POST-18 D-SC9-POST-18 E-SC9-POST-18 F-SC9-POST-18
				120S	B-SC9-POST-19 C-SC9-POST-19 D-SC9-POST-19 E-SC9-POST-19 F-SC9-POST-19

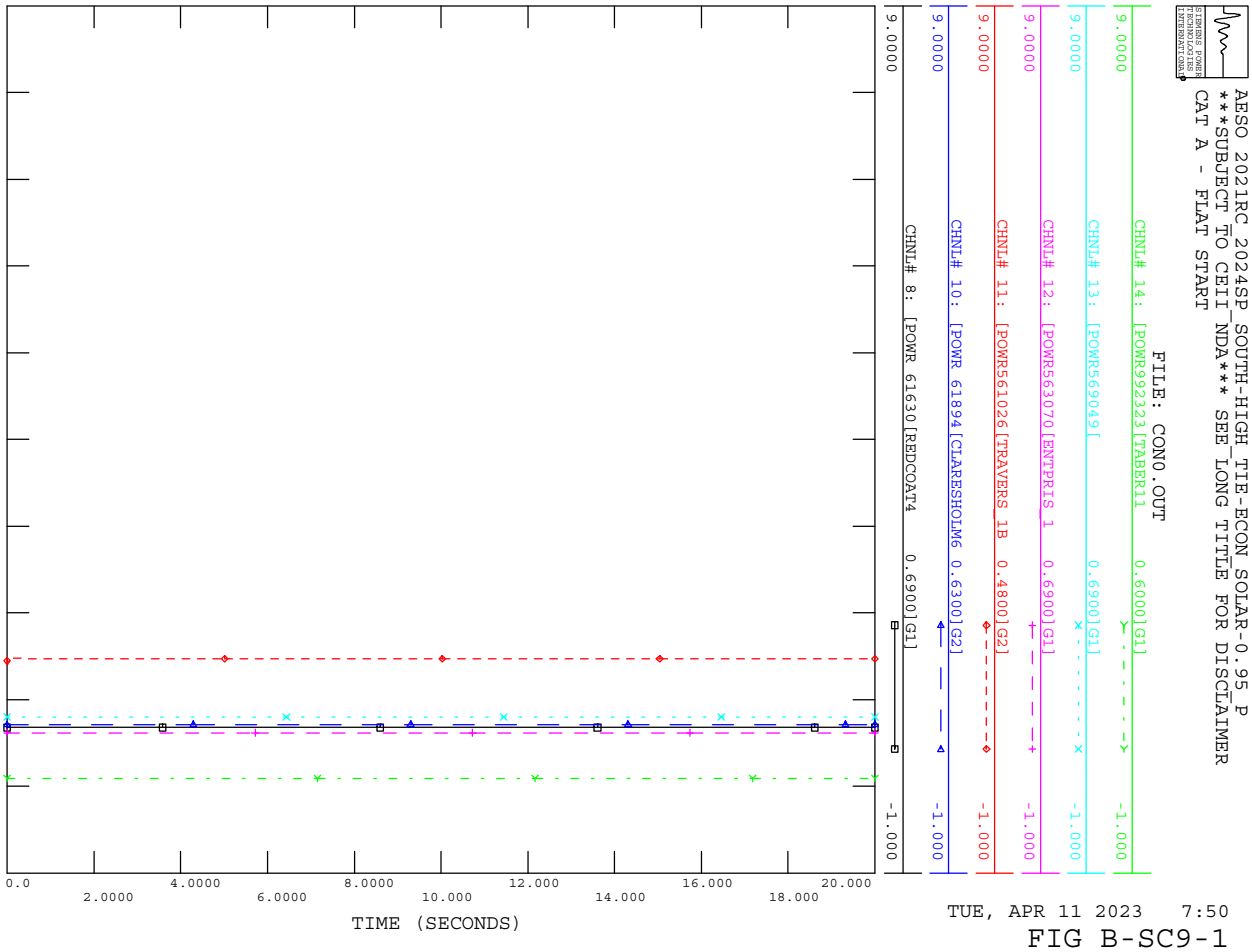


FIG B-SC9-1

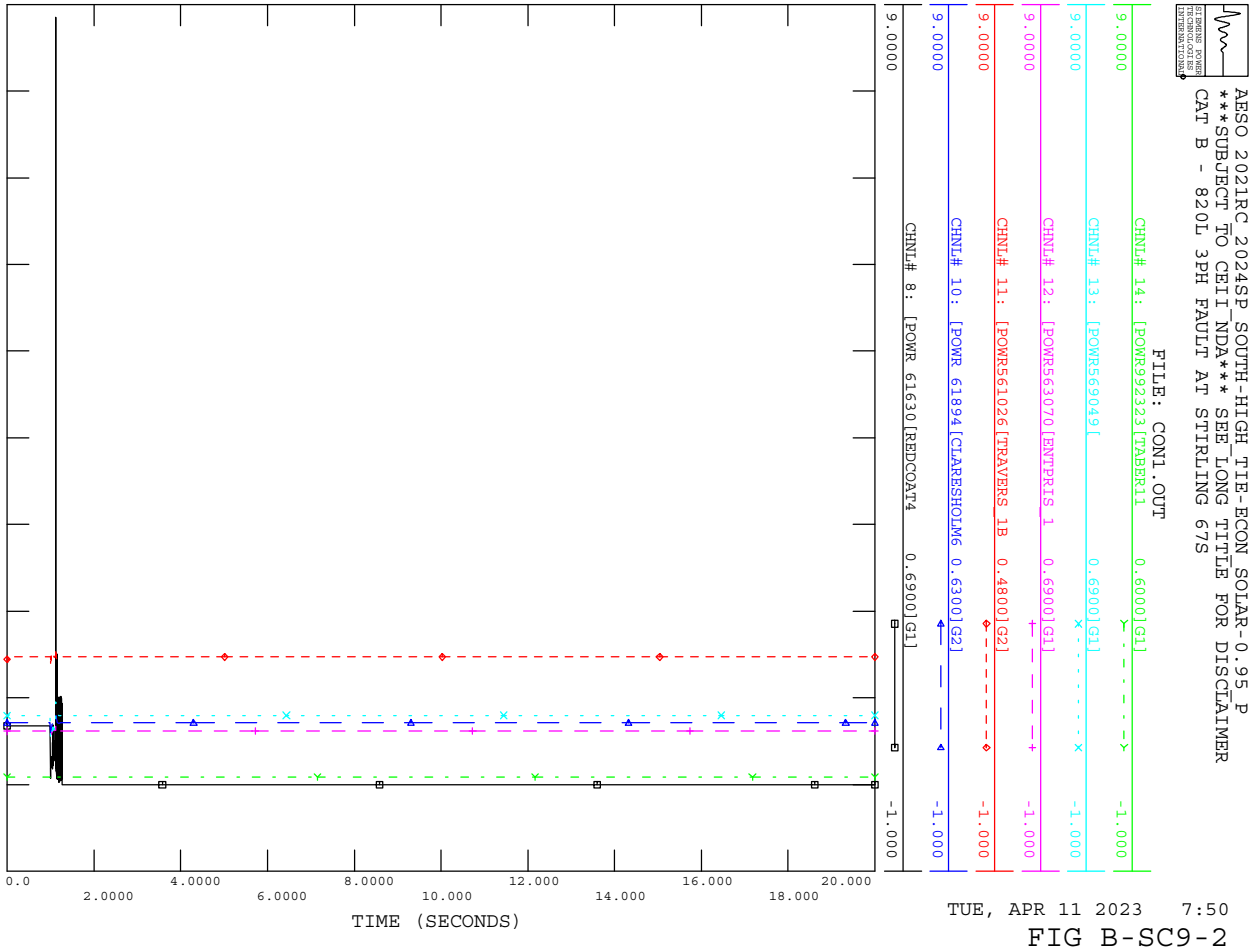
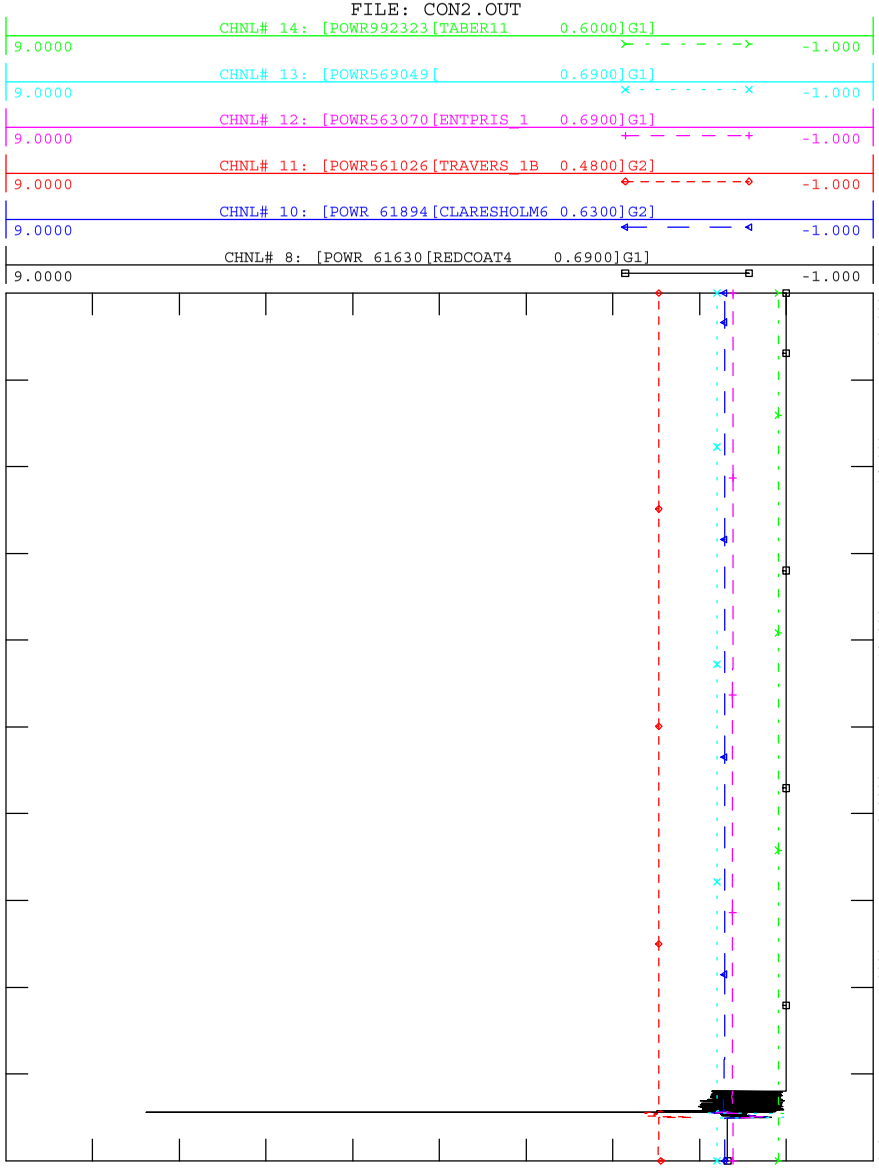


FIG B-SC9-2

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 820L 3PH FAULT AT COALDALE 254S

FILE: CON2.OUT

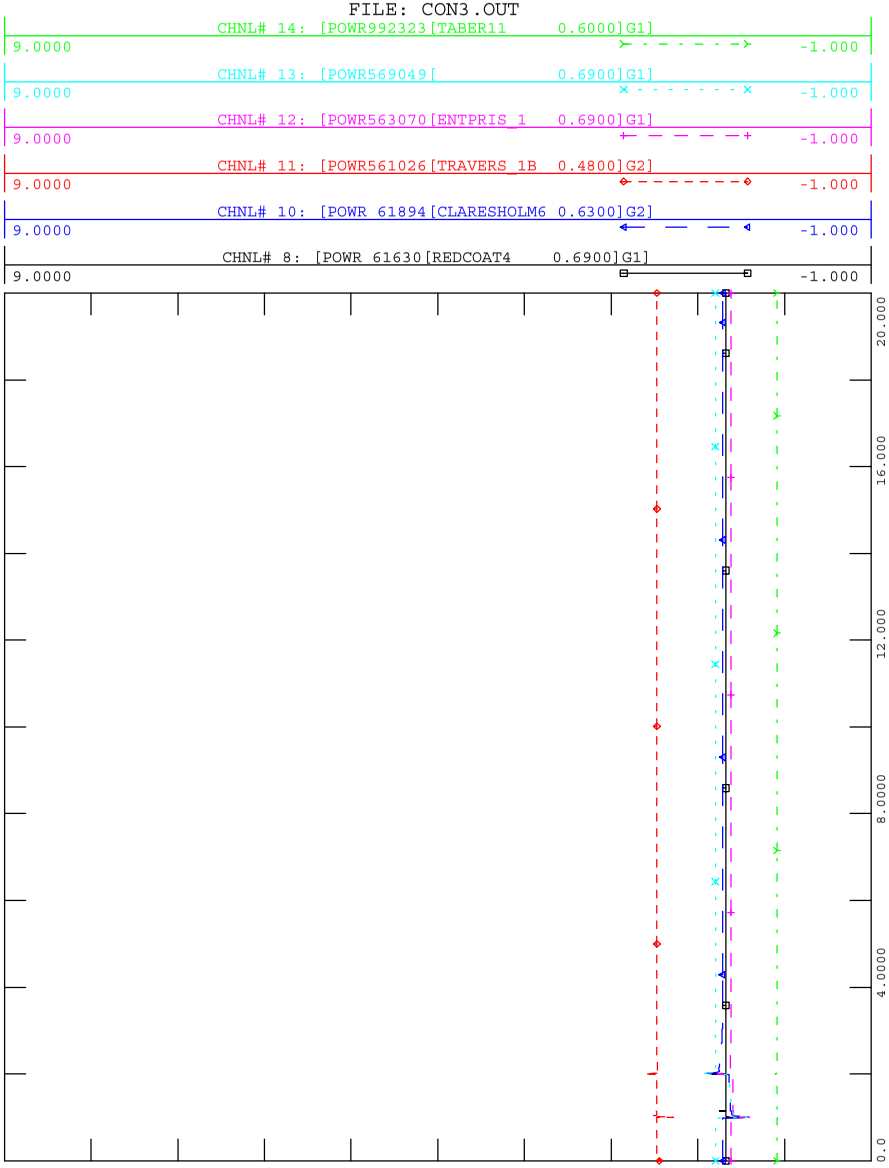


TUE, APR 11 2023 7:50

FIG B-SC9-3

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT MAGRATH 225S

FILE: CON3.OUT



TUE, APR 11 2023 7:50

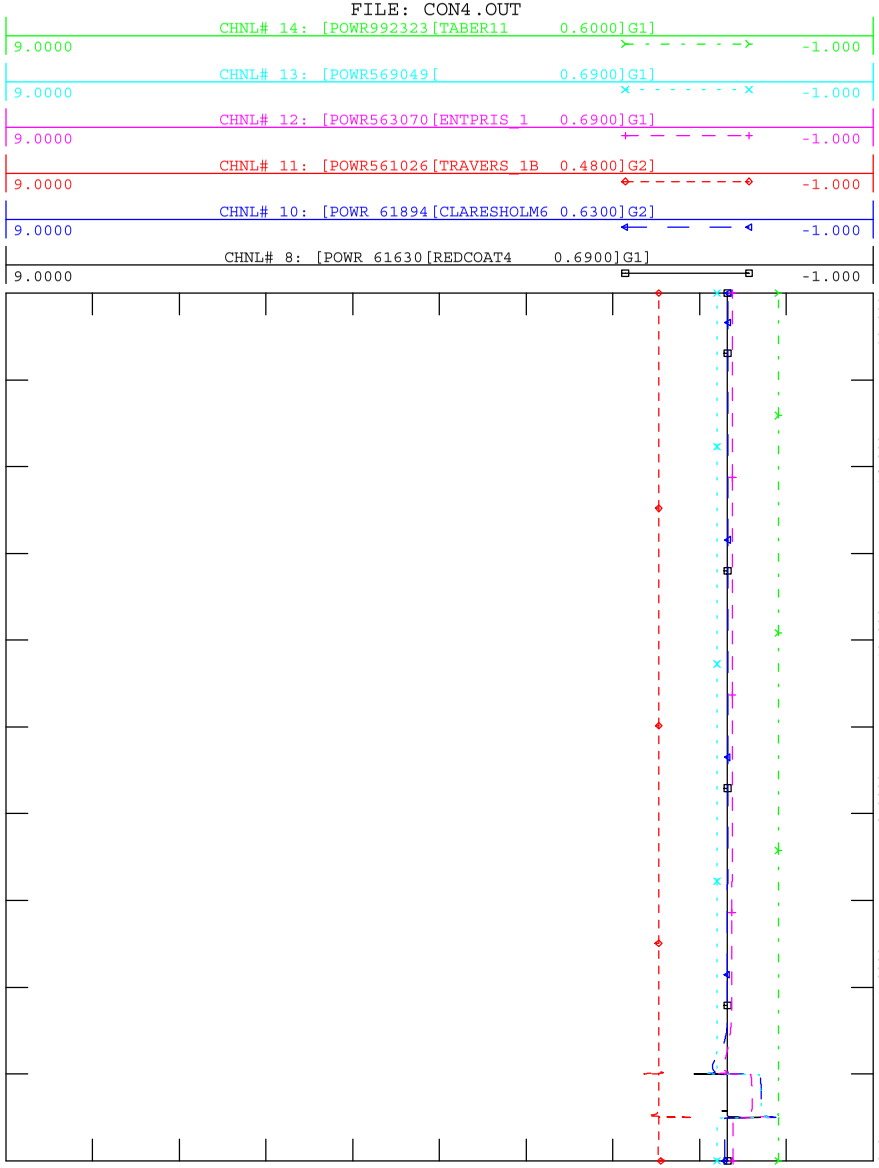
FIG B-SC9-4

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT RIVERBEND 618S

FILE: CON4.OUT

TUE, APR 11 2023 7:50

FIG B-SC9-5

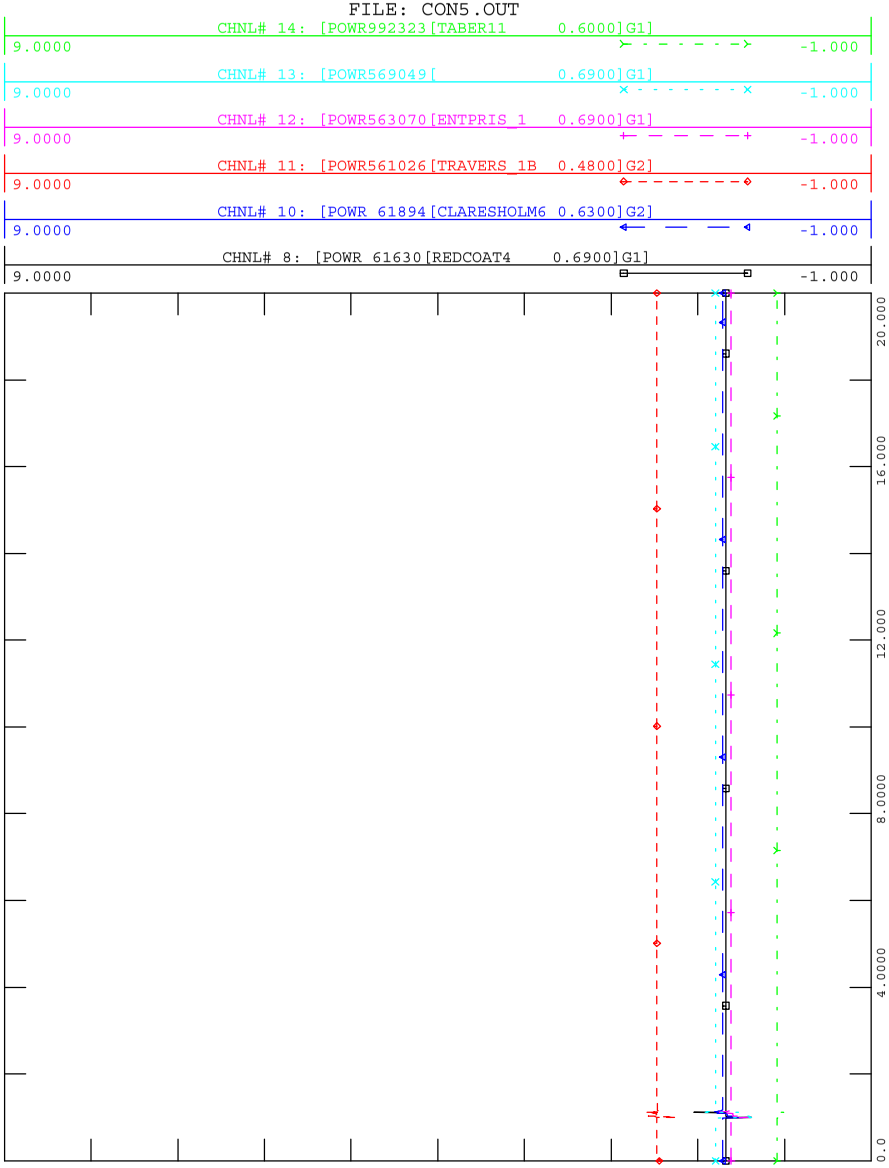


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT TABER 83S

FILE: CON5.OUT

TUE, APR 11 2023 7:50

FIG B-SC9-6



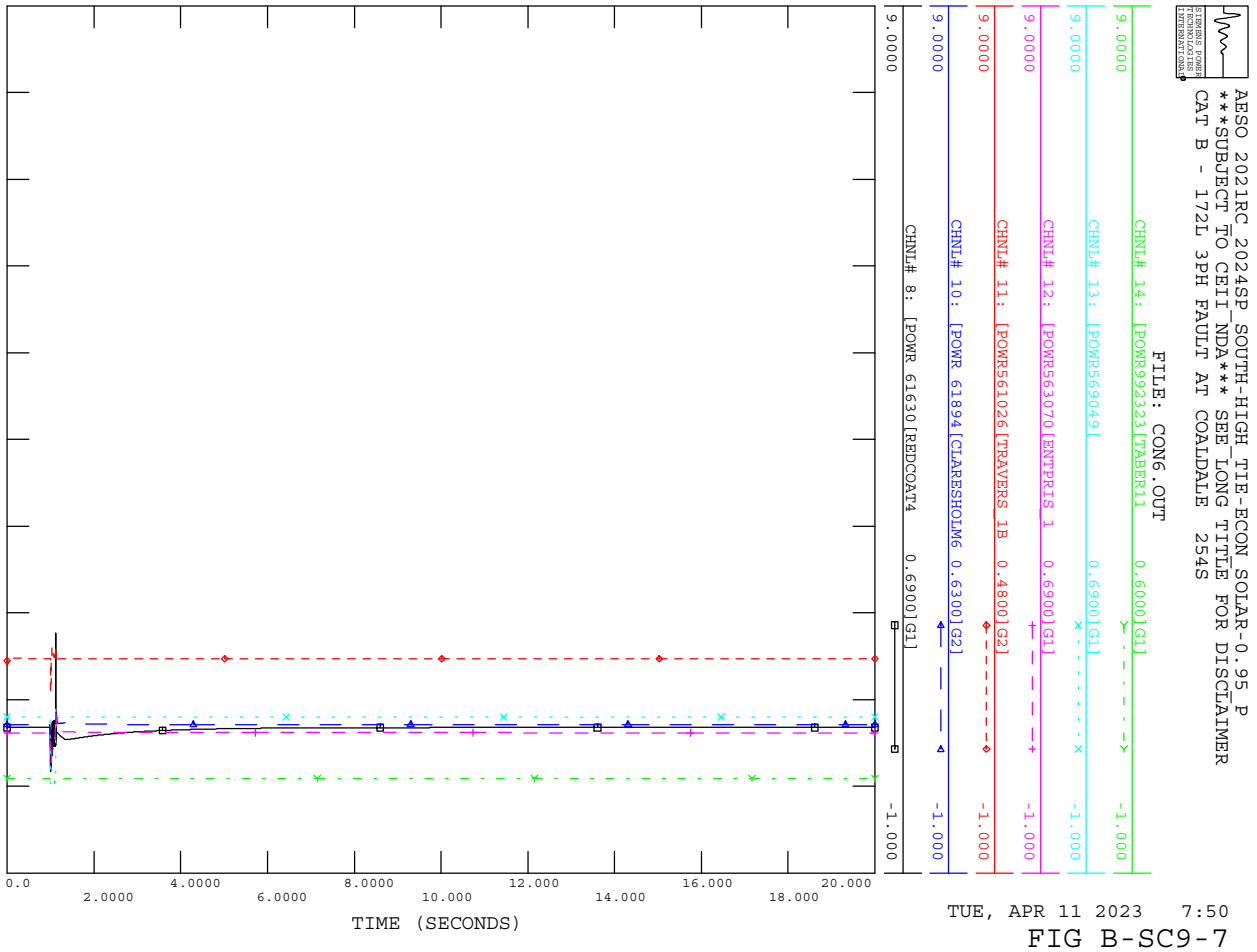


FIG B-SC9-7

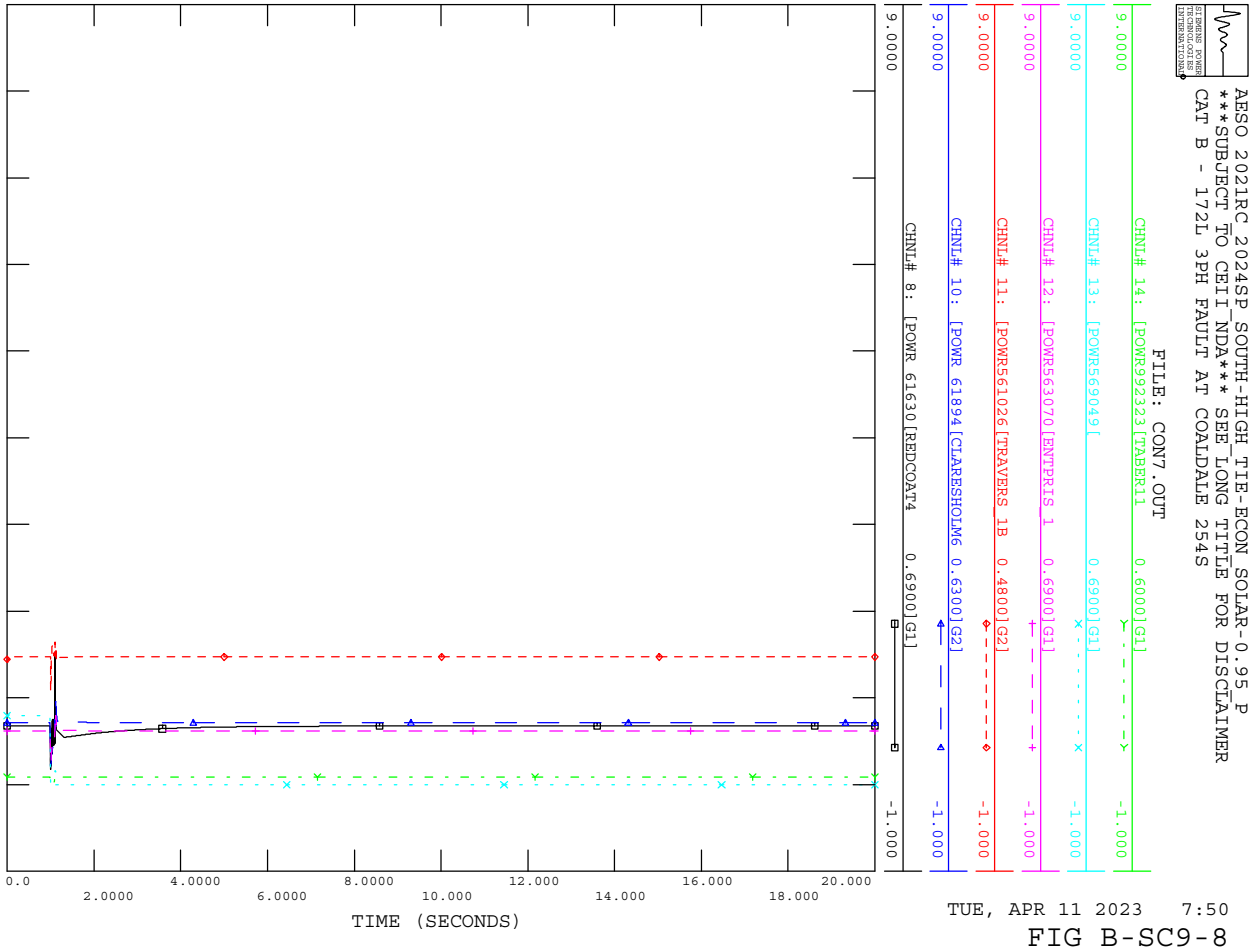


FIG B-SC9-8

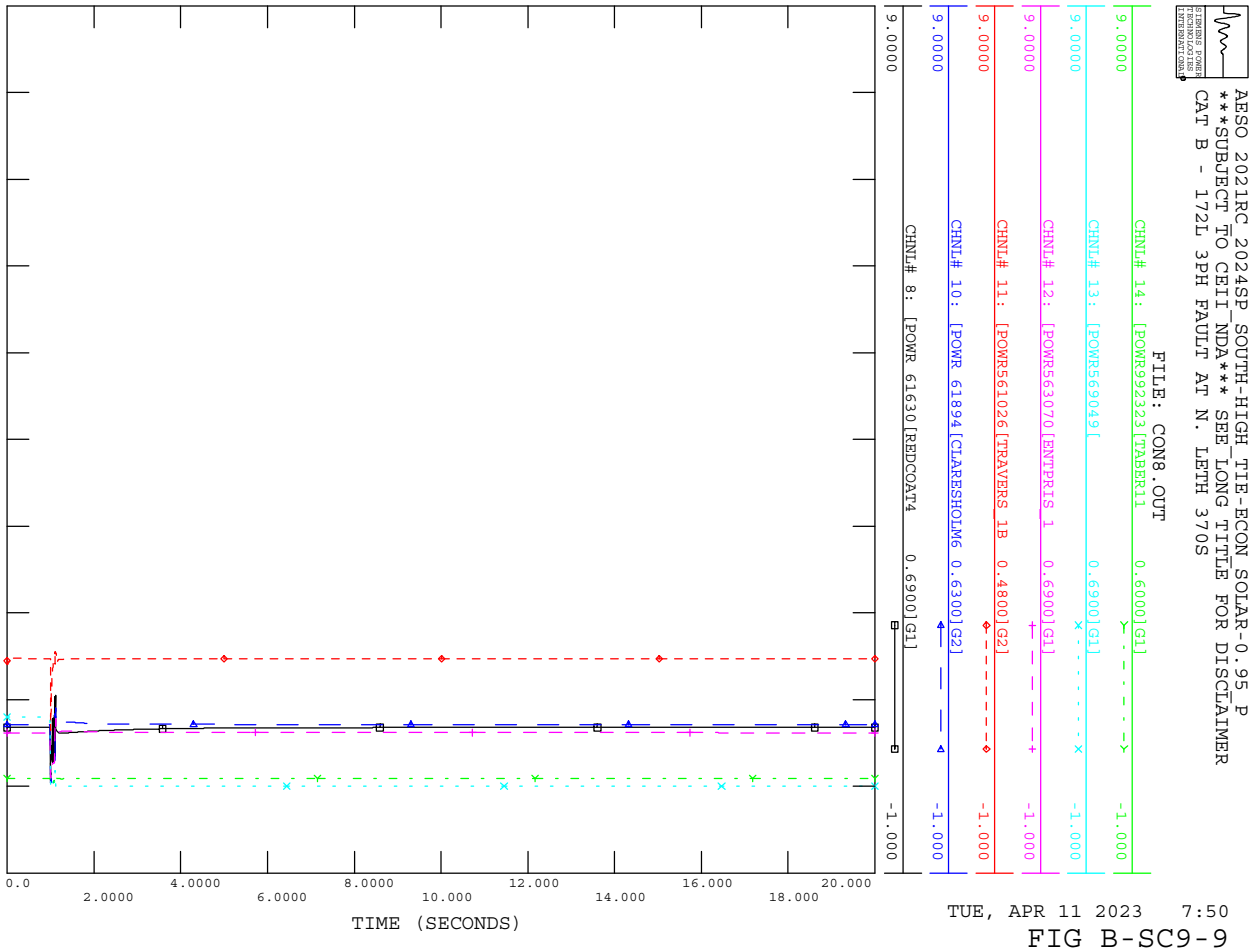


FIG B-SC9-9

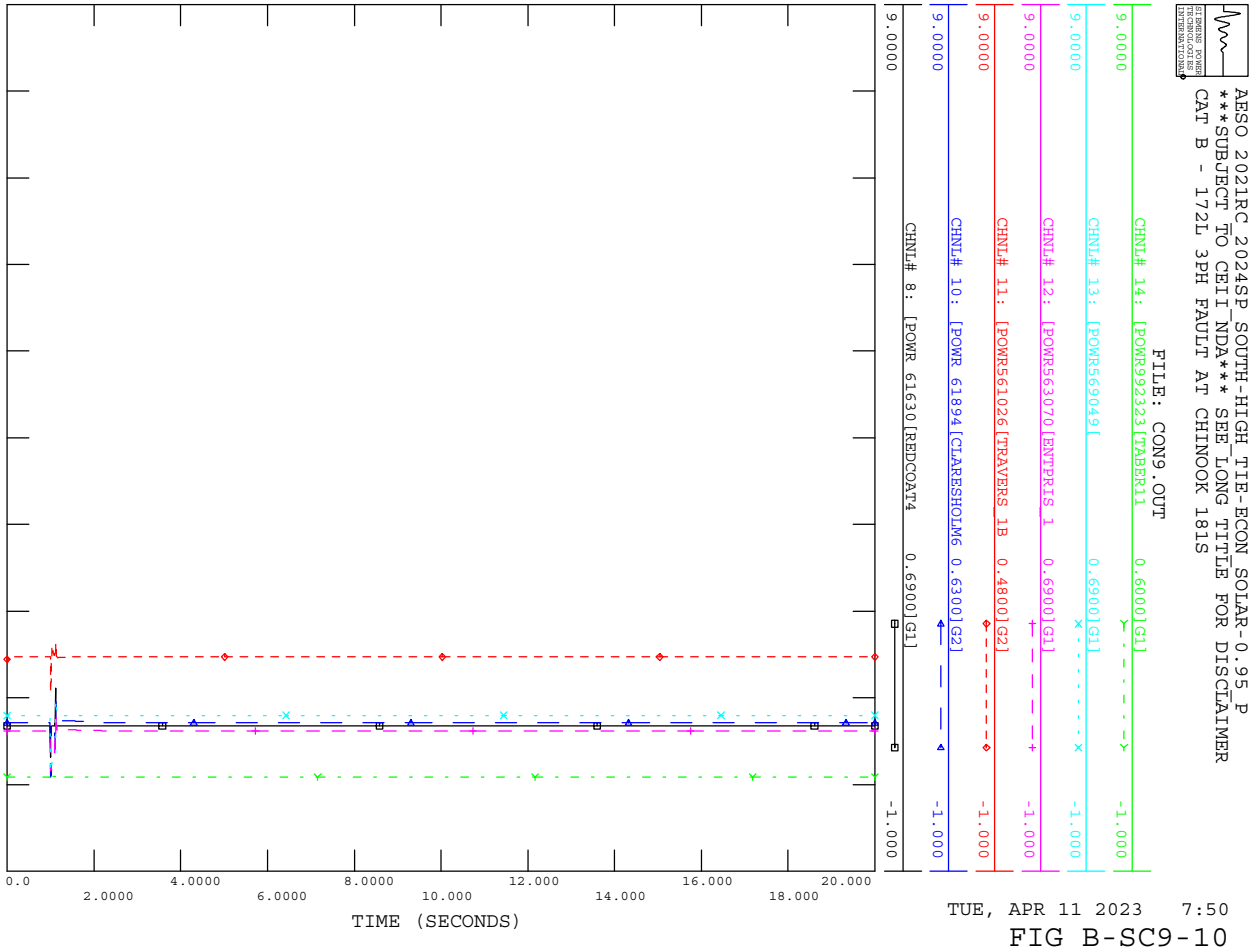
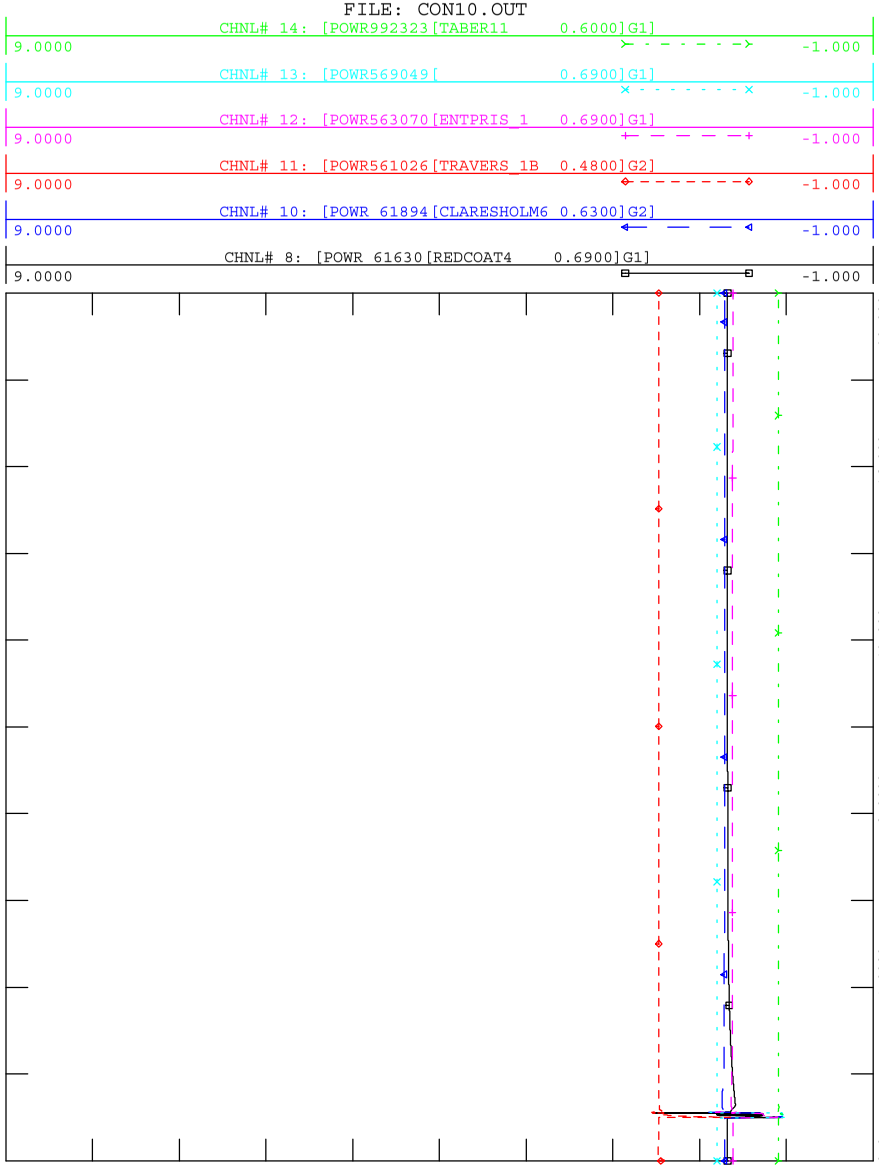


FIG B-SC9-10

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

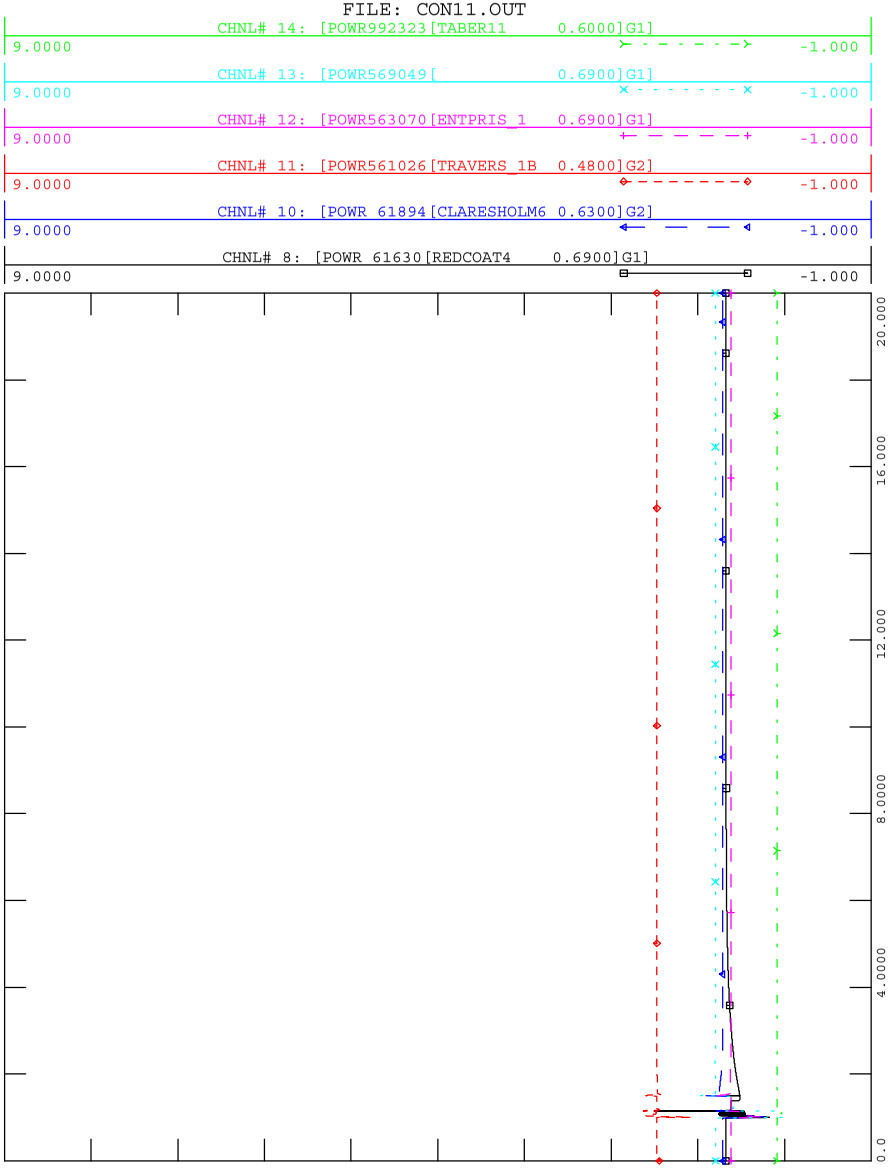


TUE, APR 11 2023 7:50

FIG B-SC9-11

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT



TUE, APR 11 2023 7:50

FIG B-SC9-12

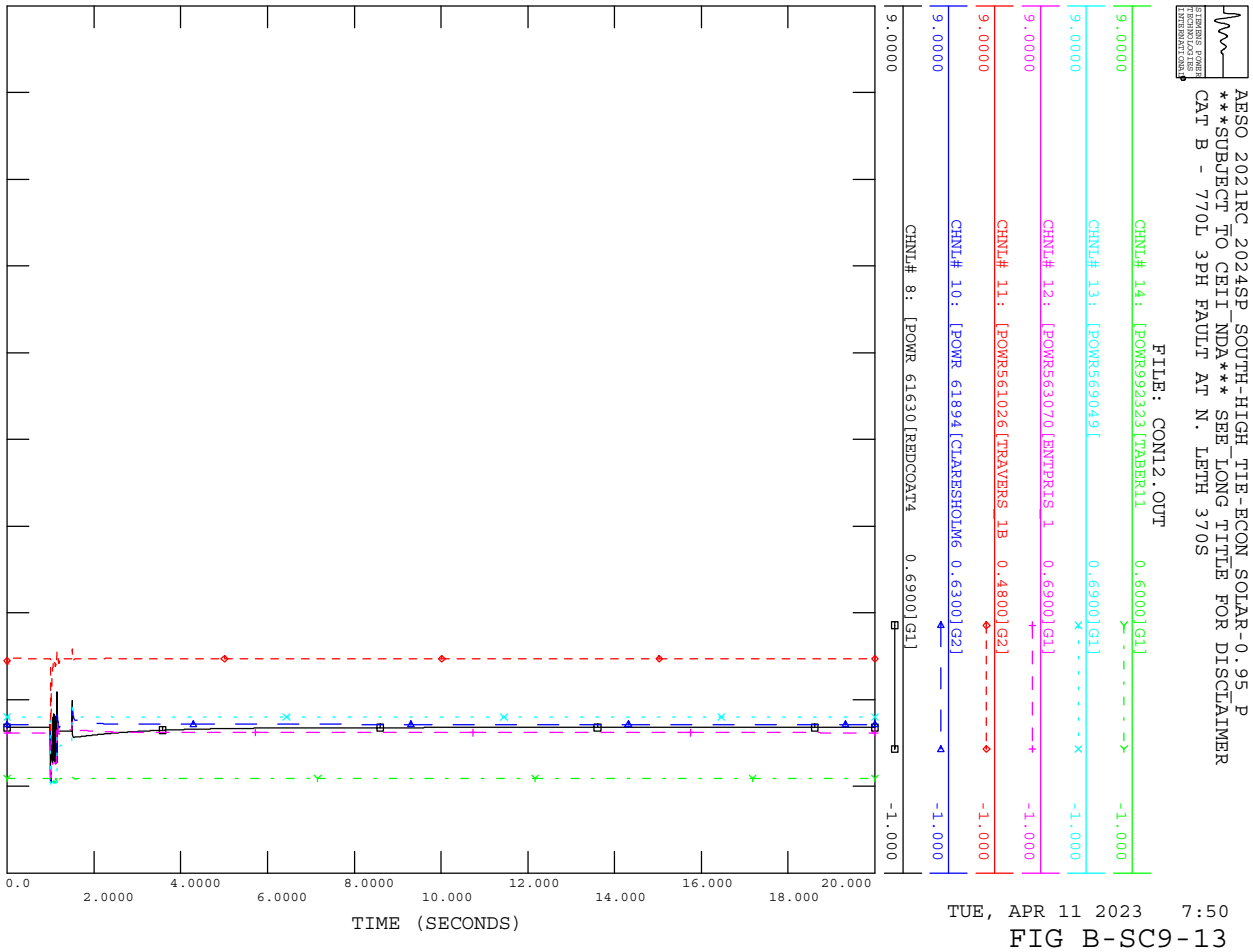


FIG B-SC9-13

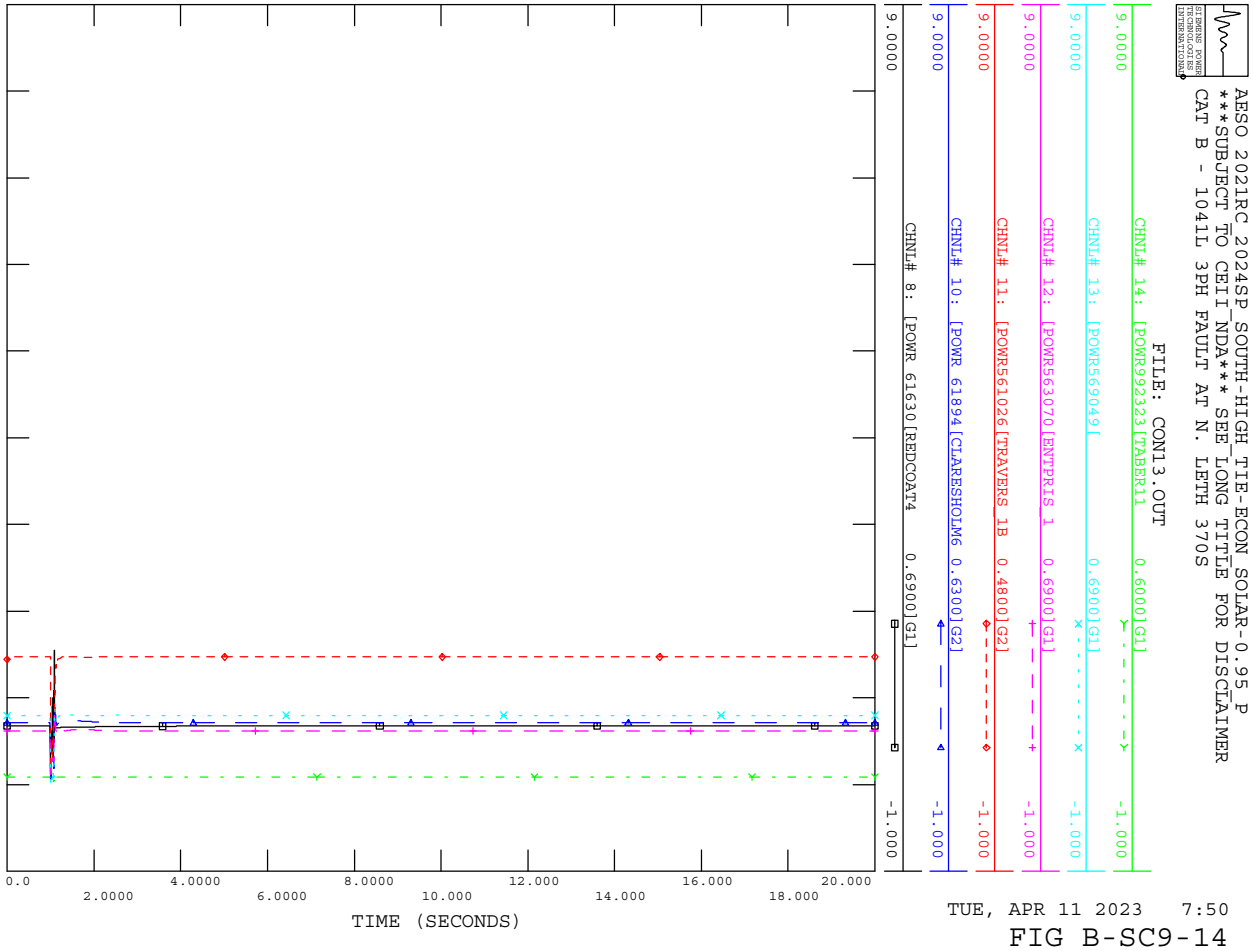


FIG B-SC9-14

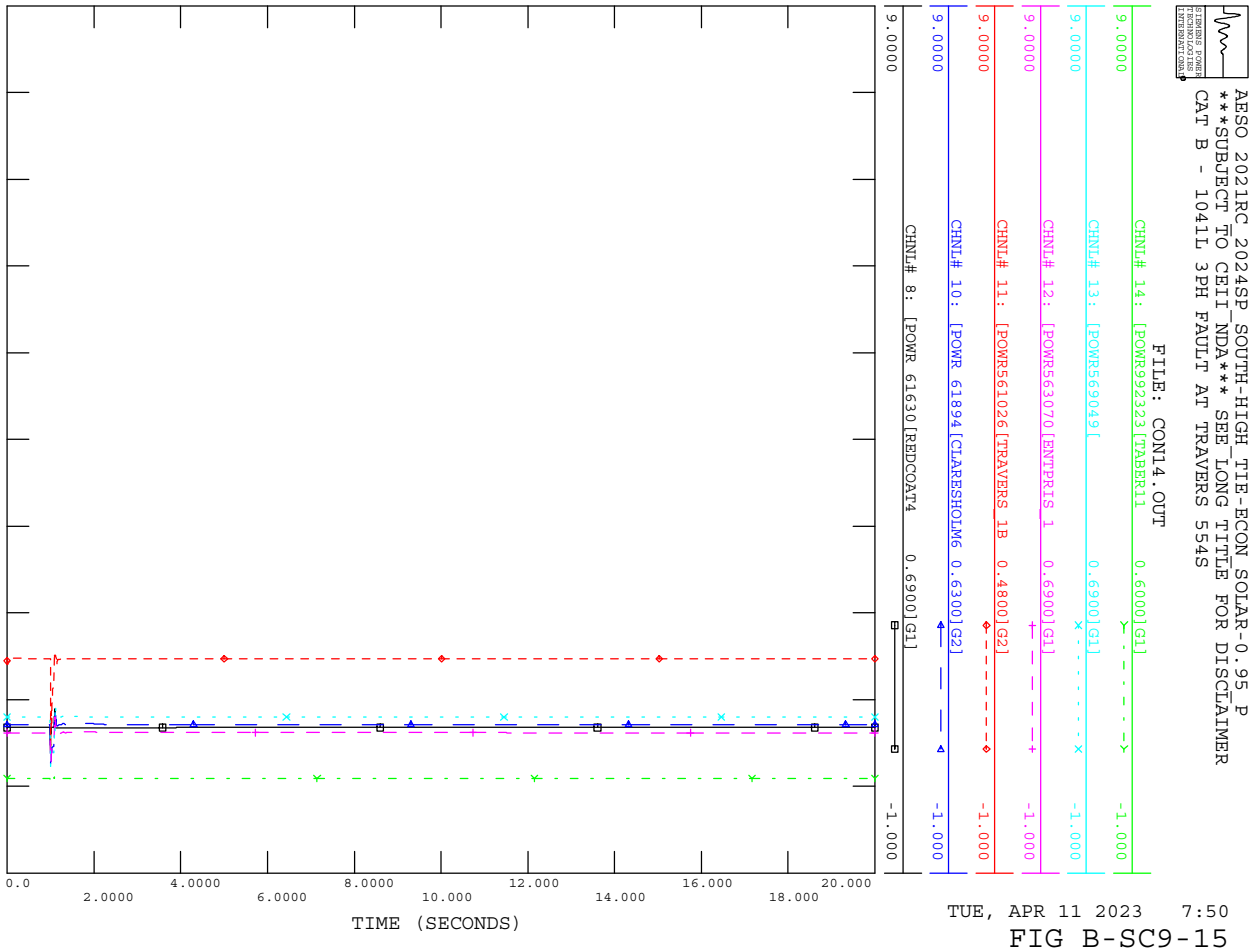


FIG B-SC9-15

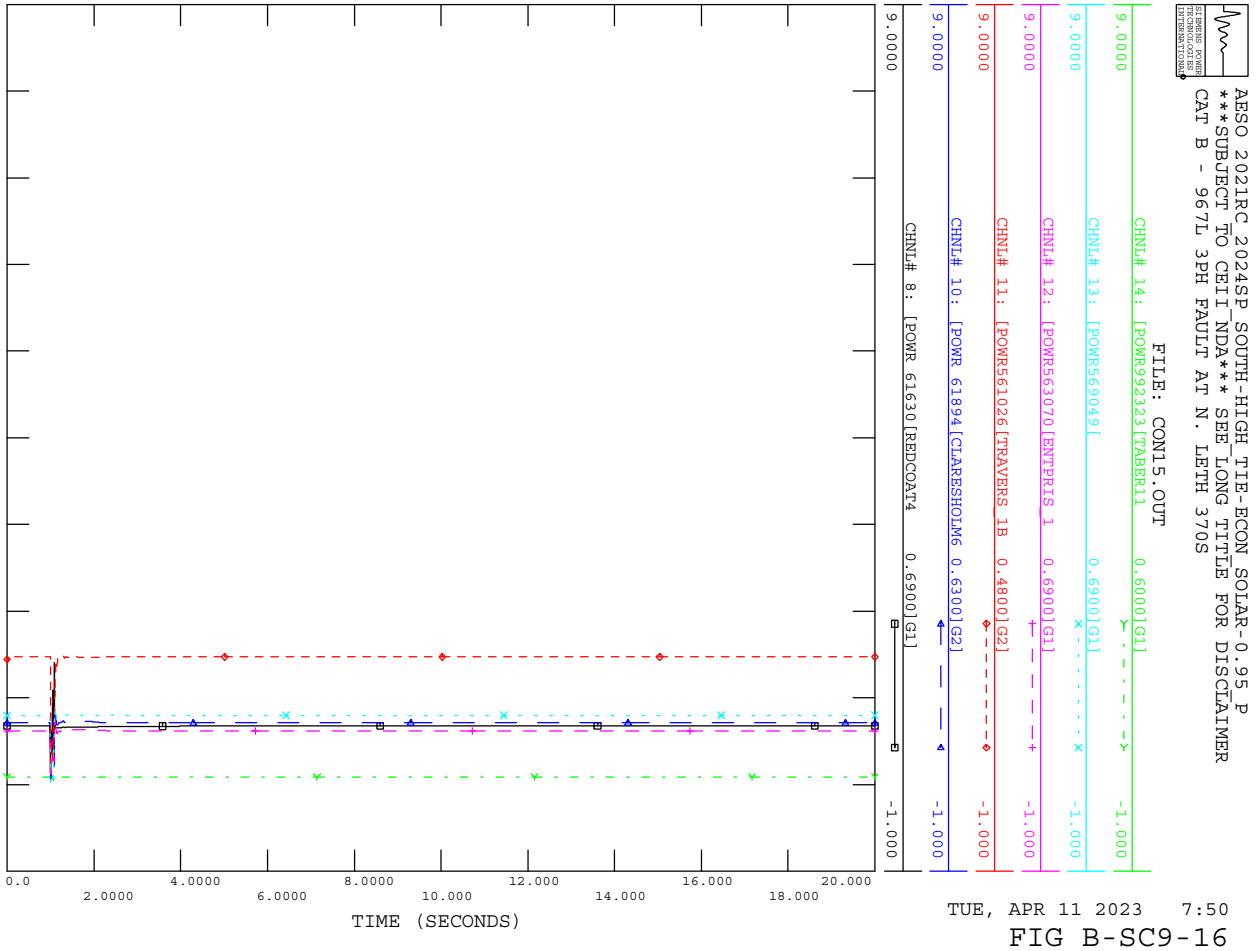


FIG B-SC9-16

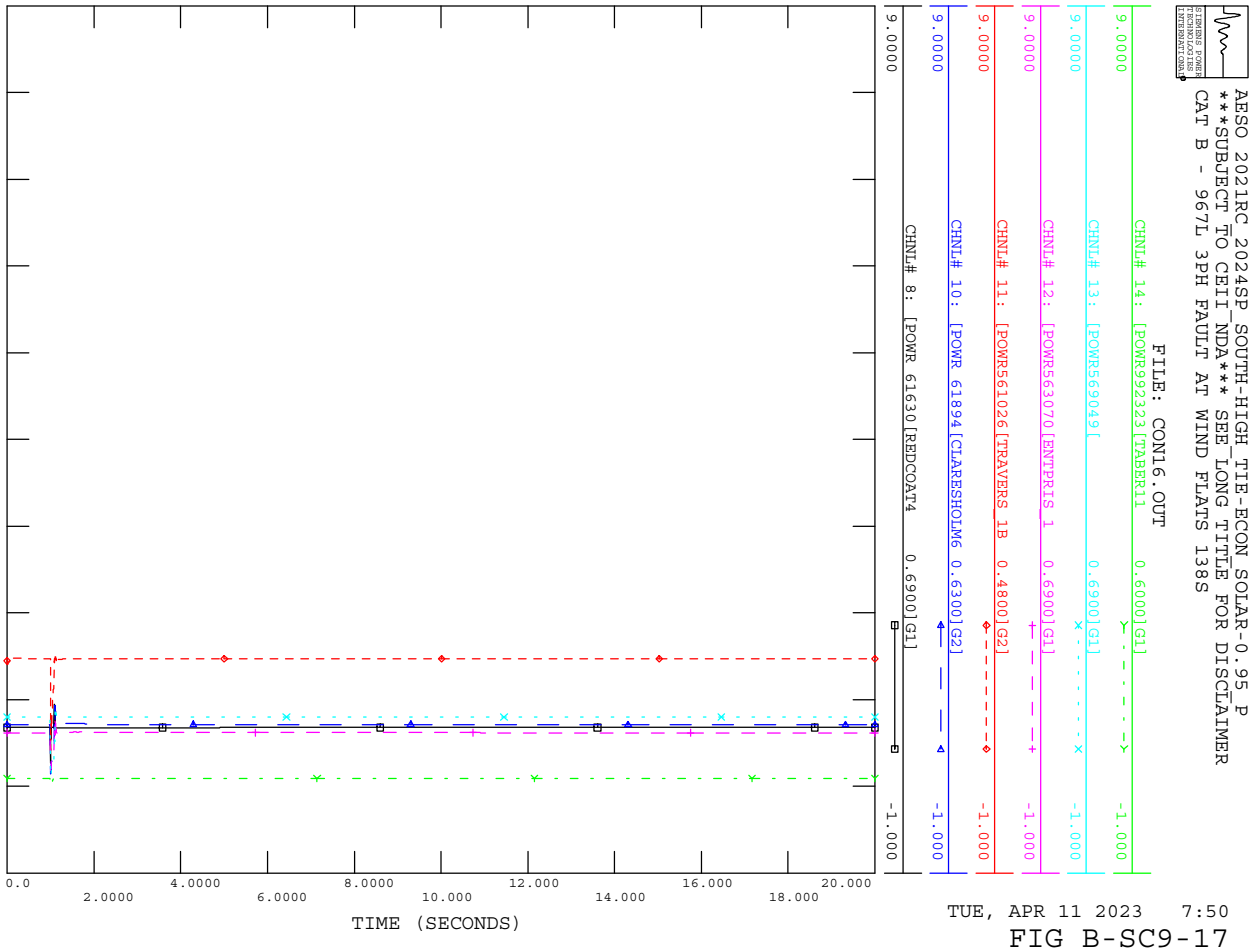


FIG B-SC9-17

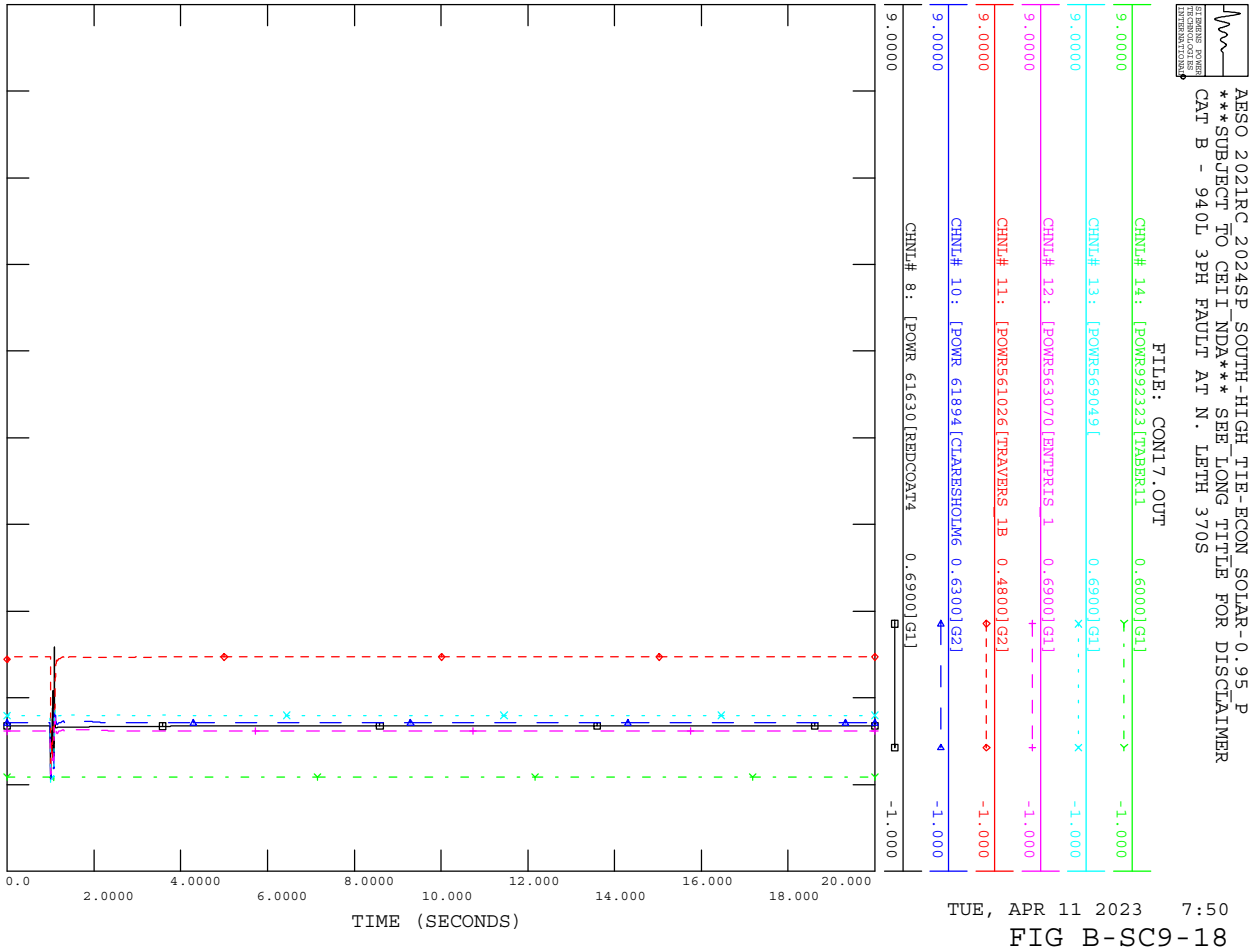
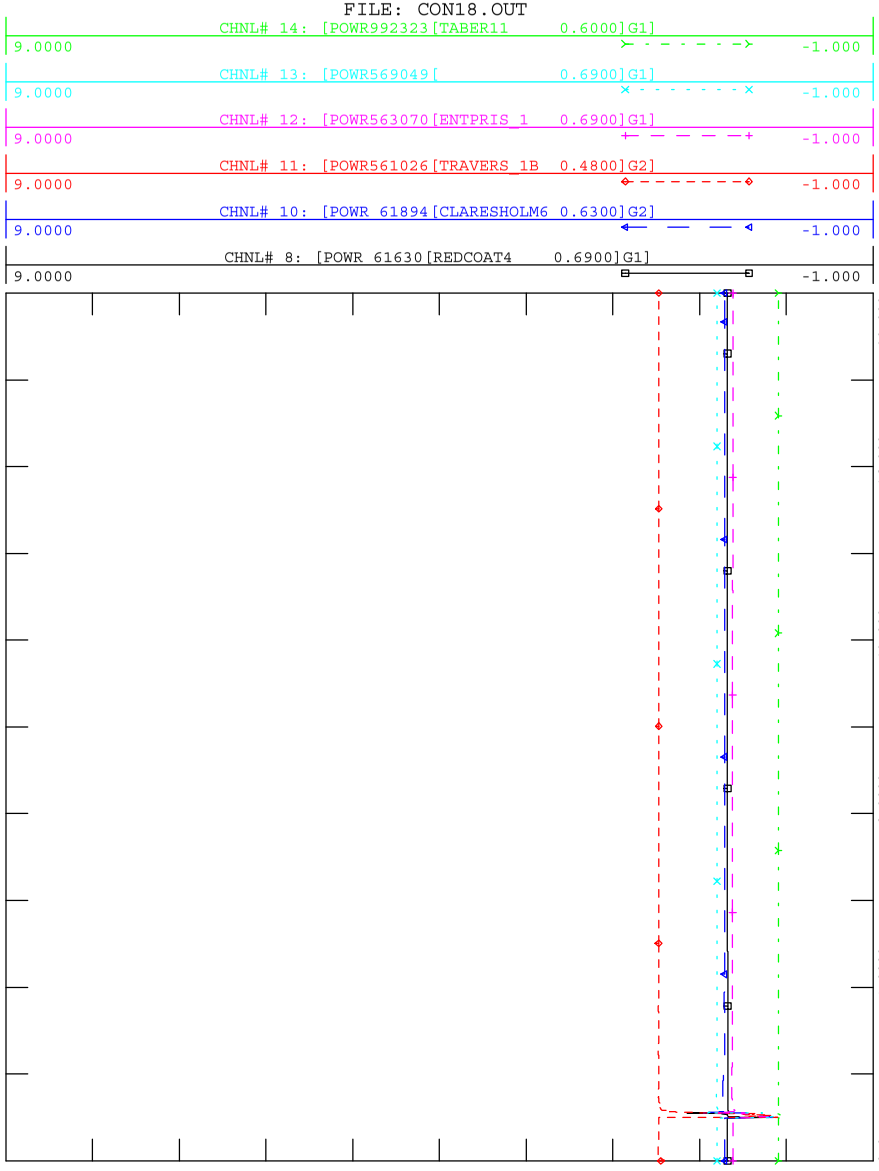


FIG B-SC9-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



TUE, APR 11 2023 7:50

FIG B-SC9-19

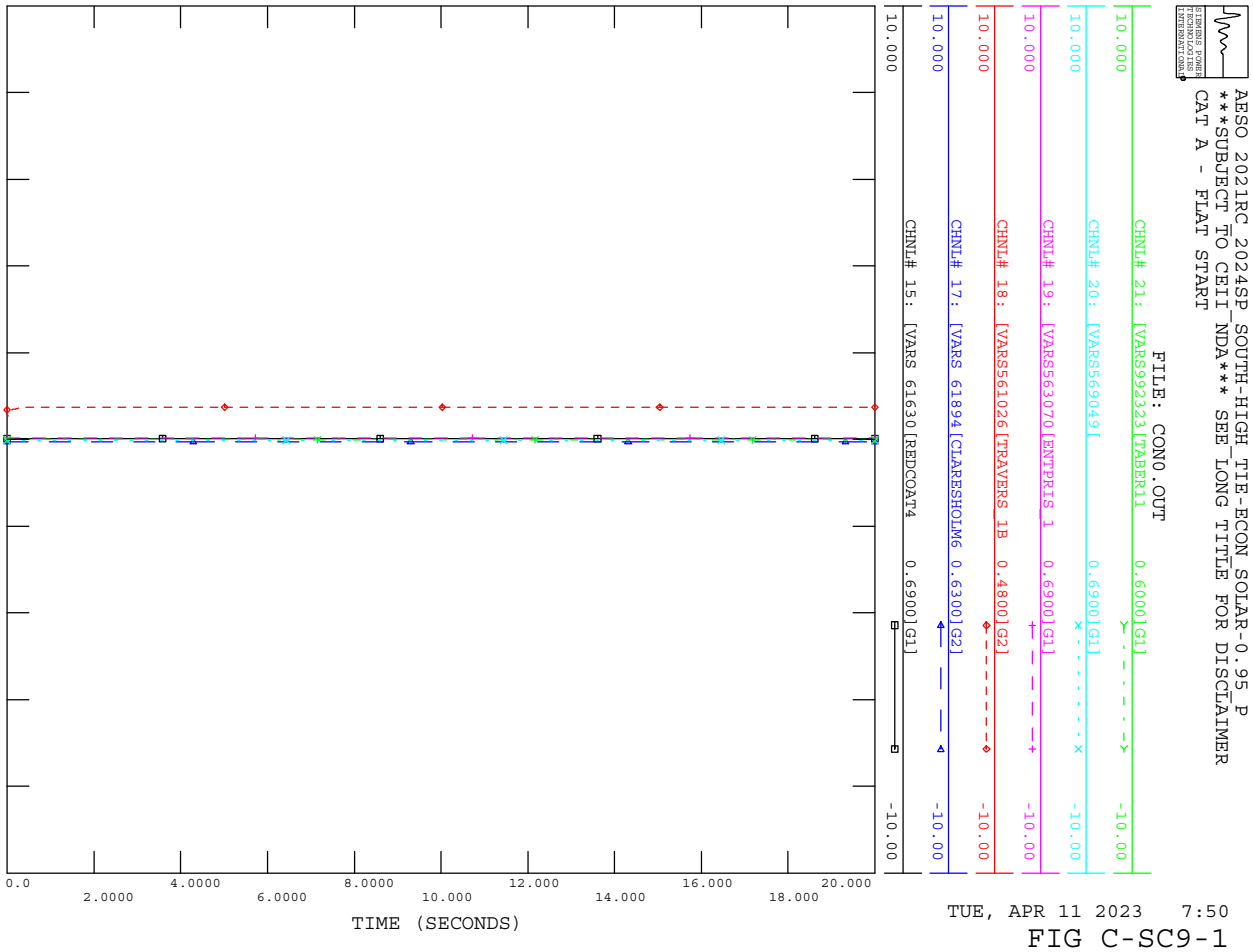


FIG C-SC9-1

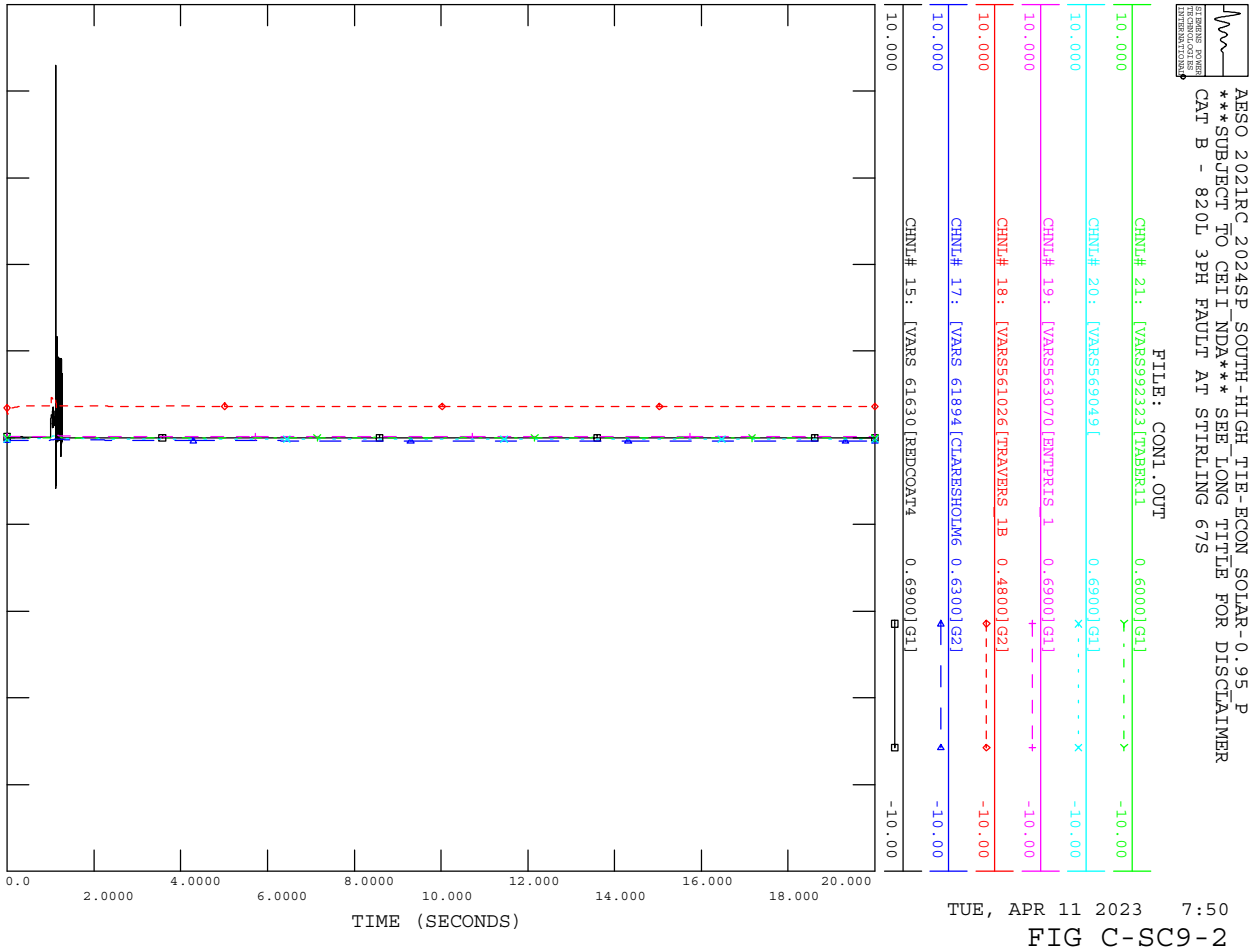


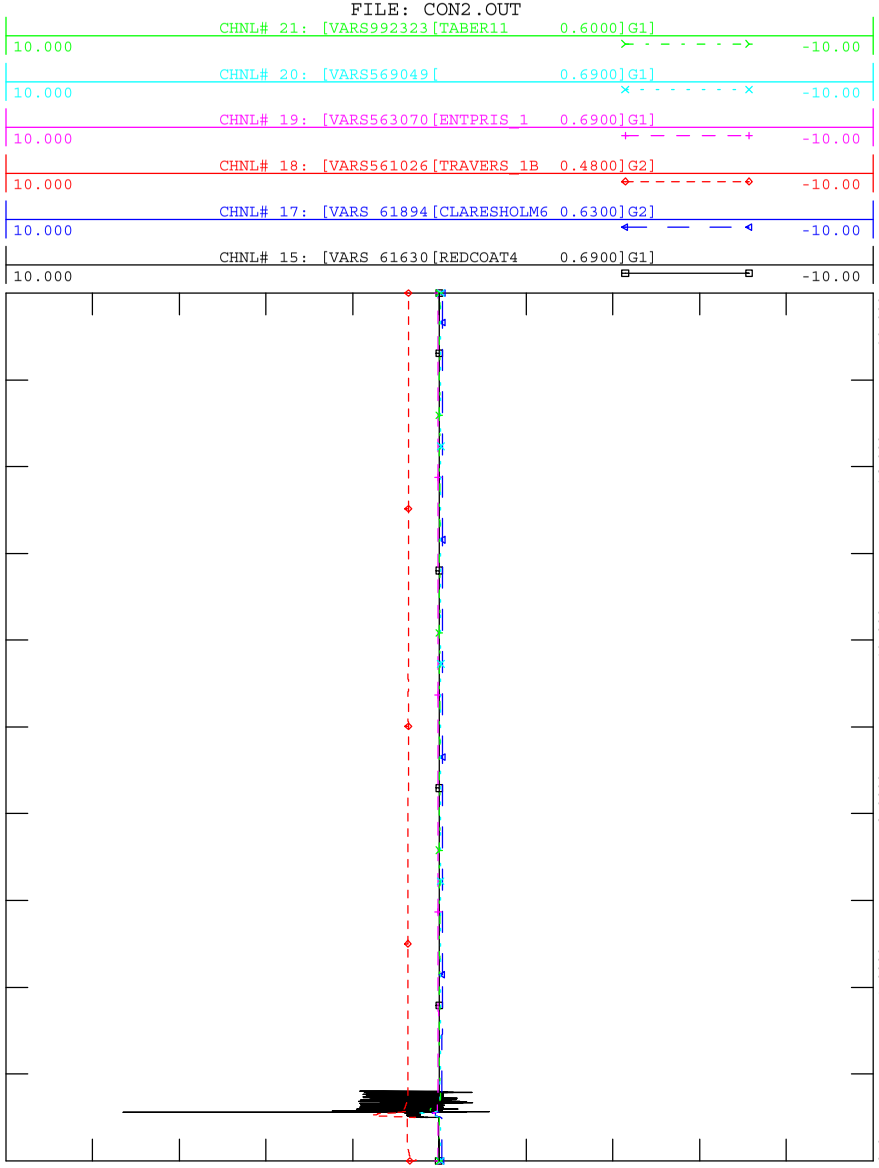
FIG C-SC9-2

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 820L 3PH FAULT AT COALDALE 254S

FILE: CON2.OUT

TUE, APR 11 2023 7:50

FIG C-SC9-3

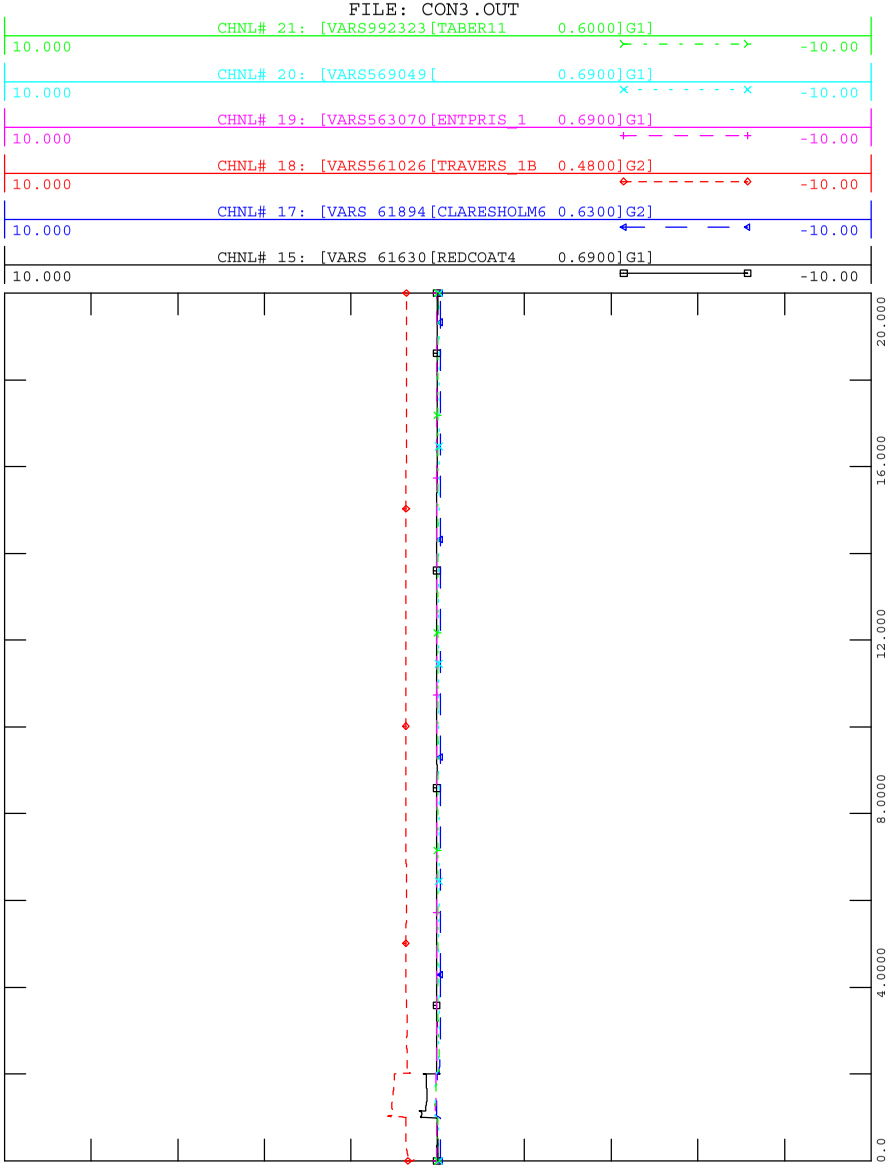


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT MAGRATH 225S

FILE: CON3.OUT

TUE, APR 11 2023 7:50

FIG C-SC9-4

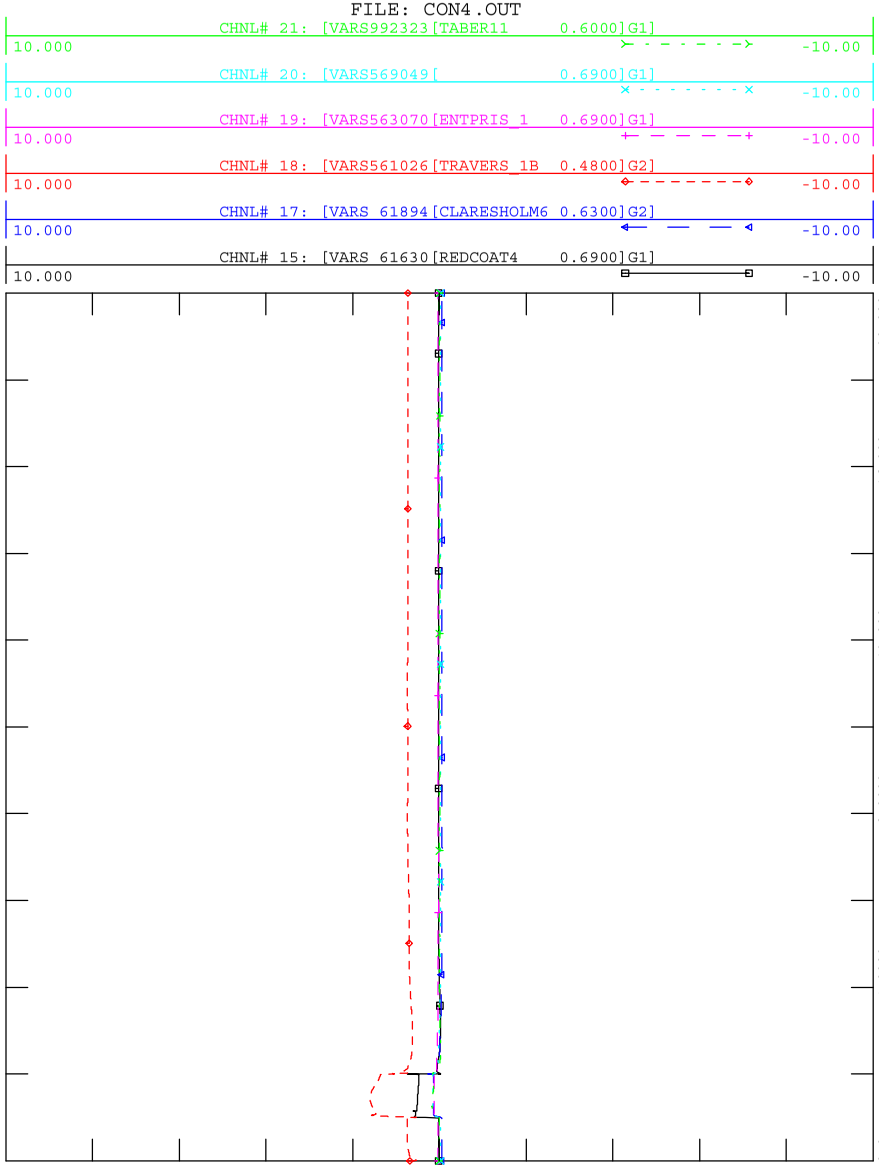


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT RIVERBEND 618S

FILE: CON4.OUT

TUE, APR 11 2023 7:50

FIG C-SC9-5

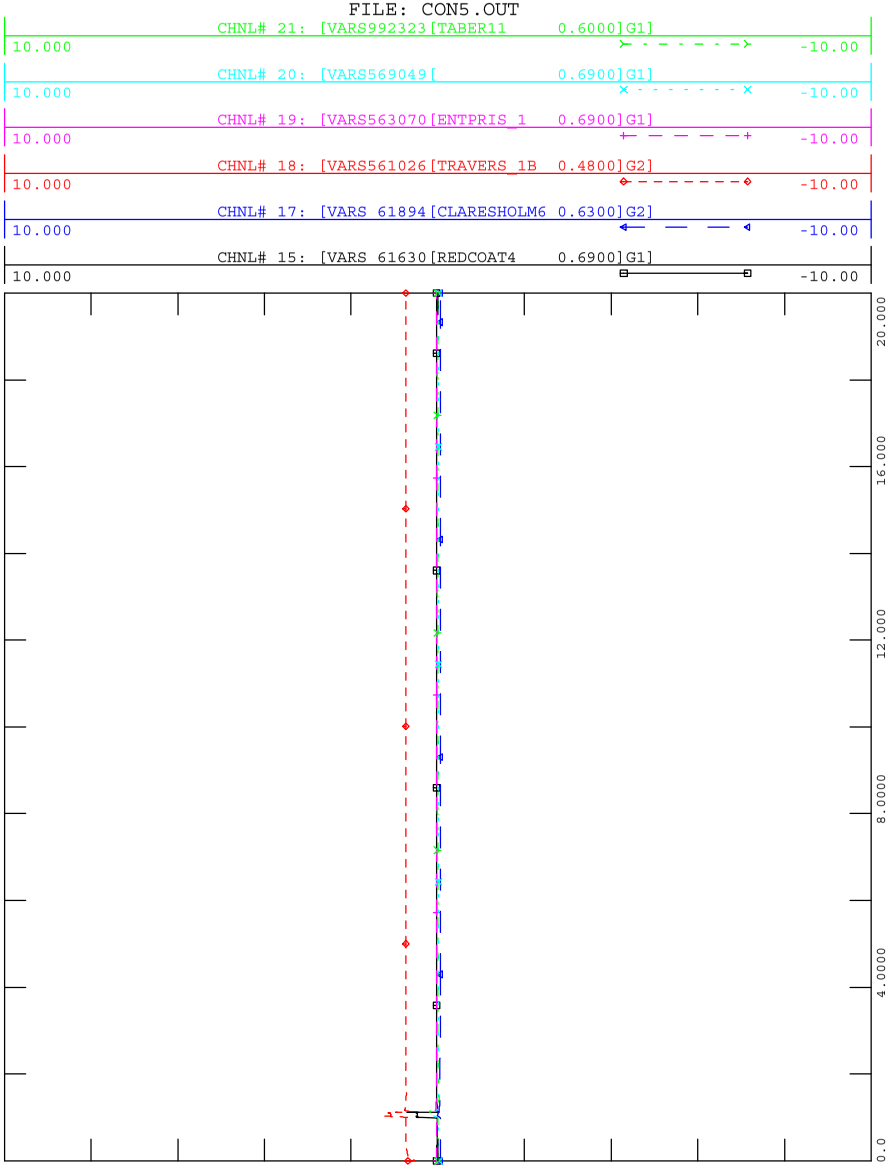


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT TABER 83S

FILE: CON5.OUT

TUE, APR 11 2023 7:50

FIG C-SC9-6



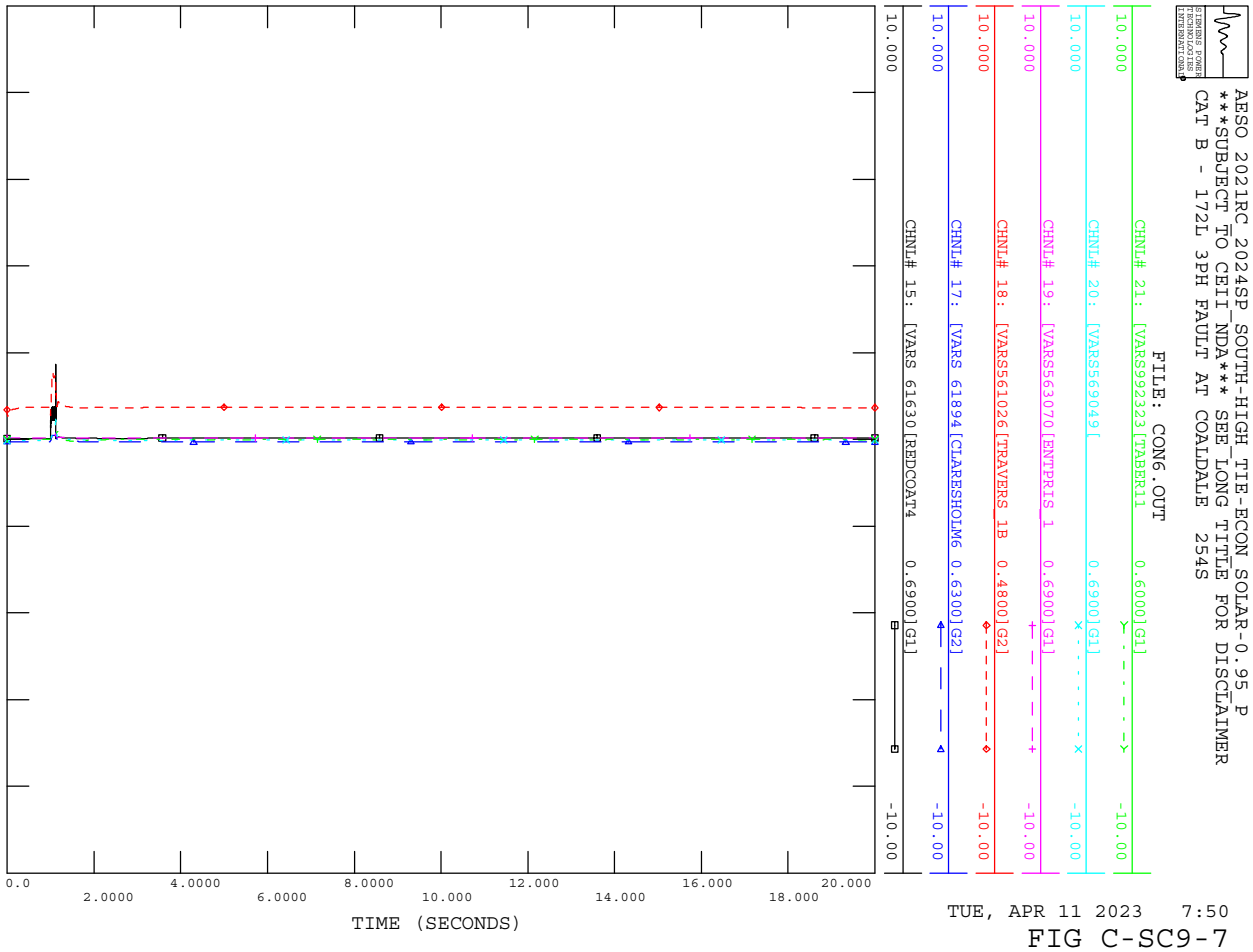


FIG C-SC9-7

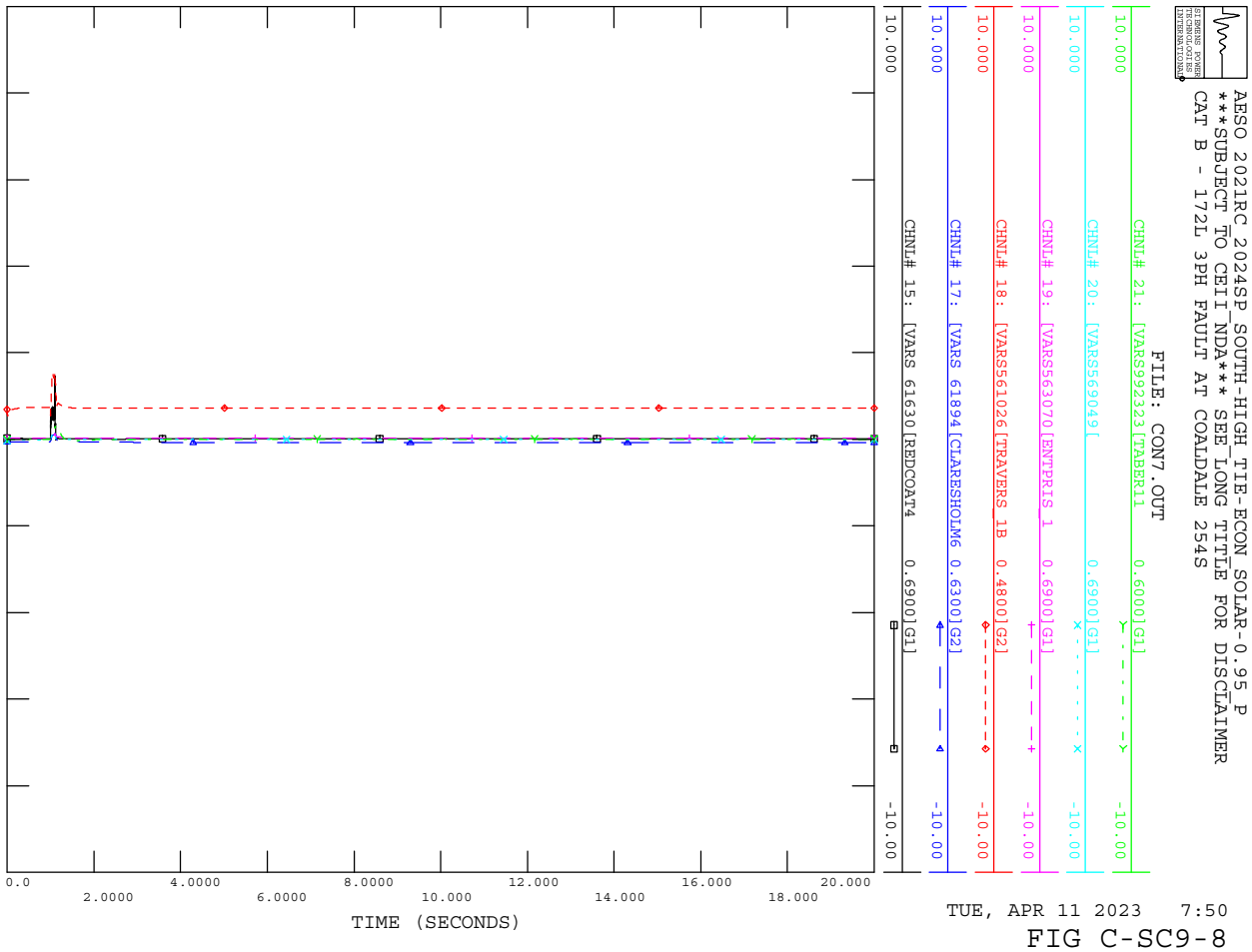
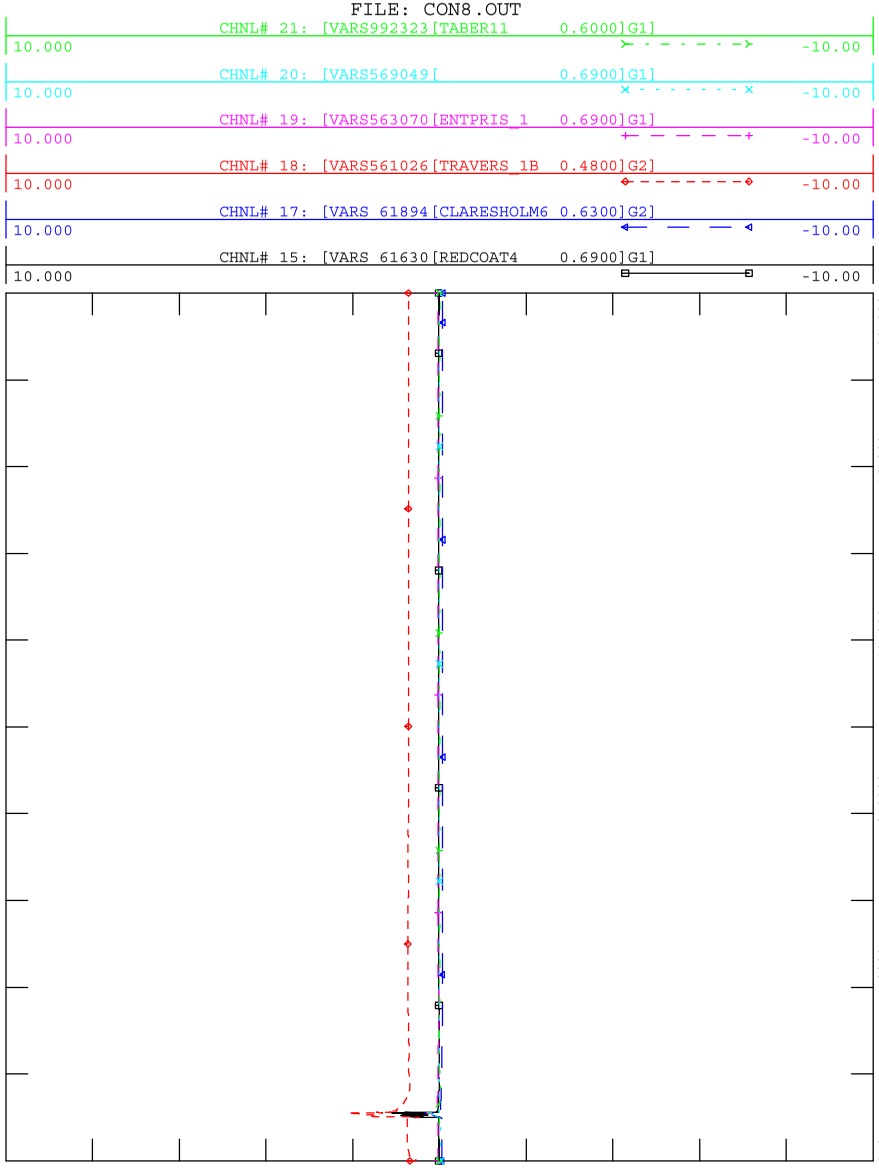


FIG C-SC9-8

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON8.OUT

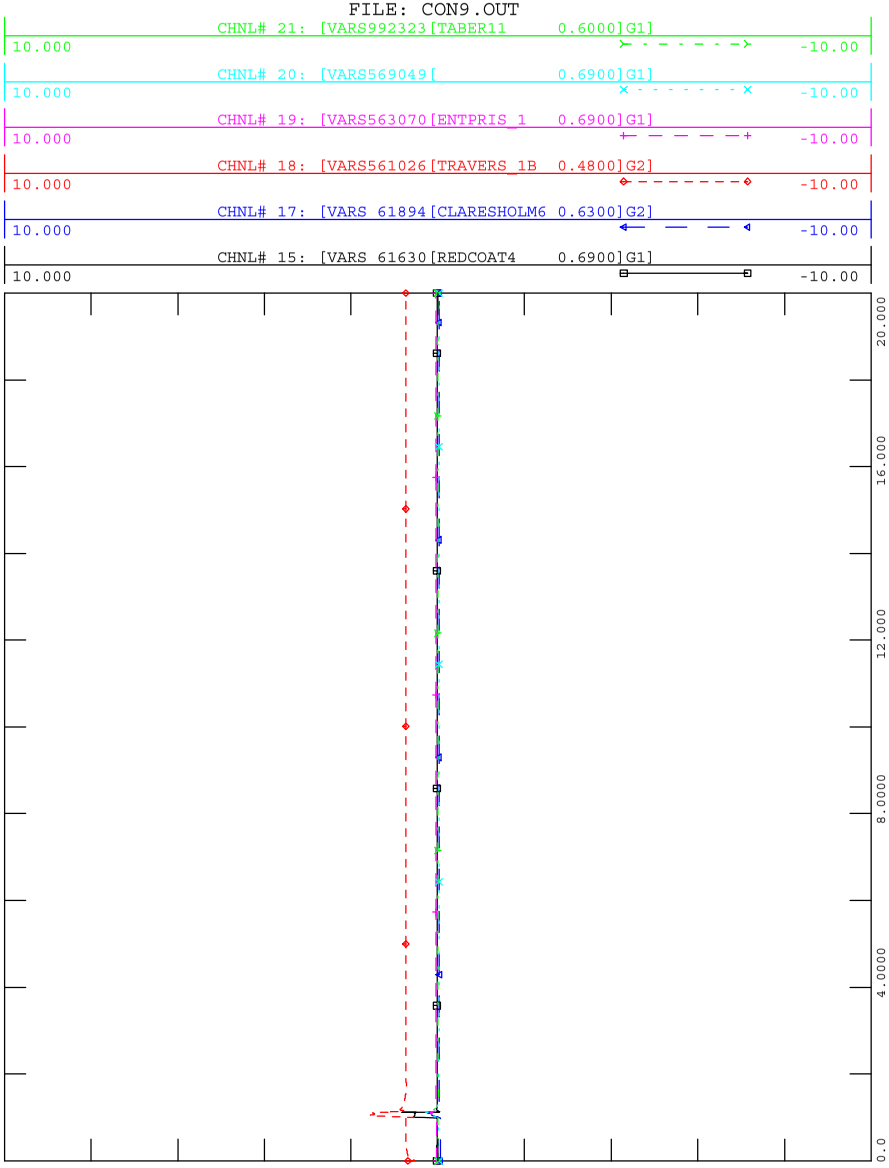


TUE, APR 11 2023 7:50

FIG C-SC9-9

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT CHINOOK 181S

FILE: CON9.OUT

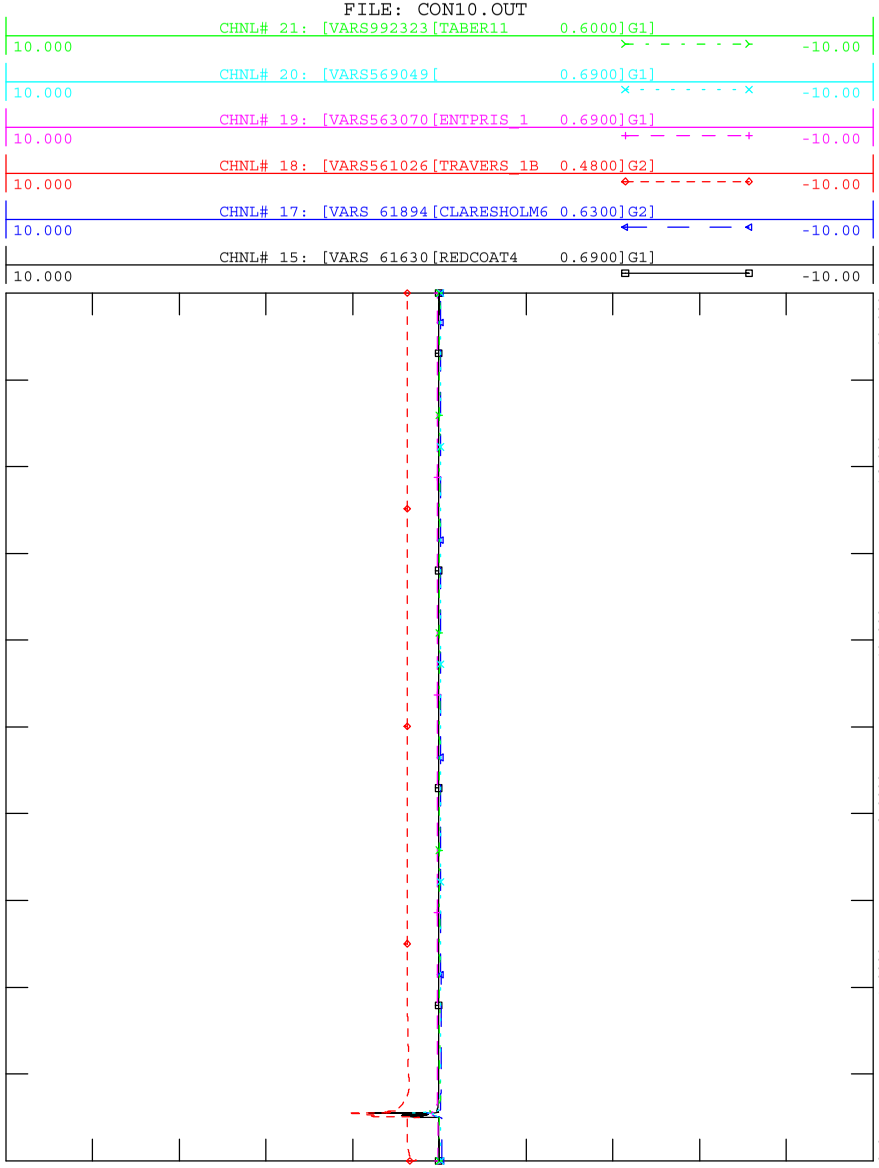


TUE, APR 11 2023 7:50

FIG C-SC9-10

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

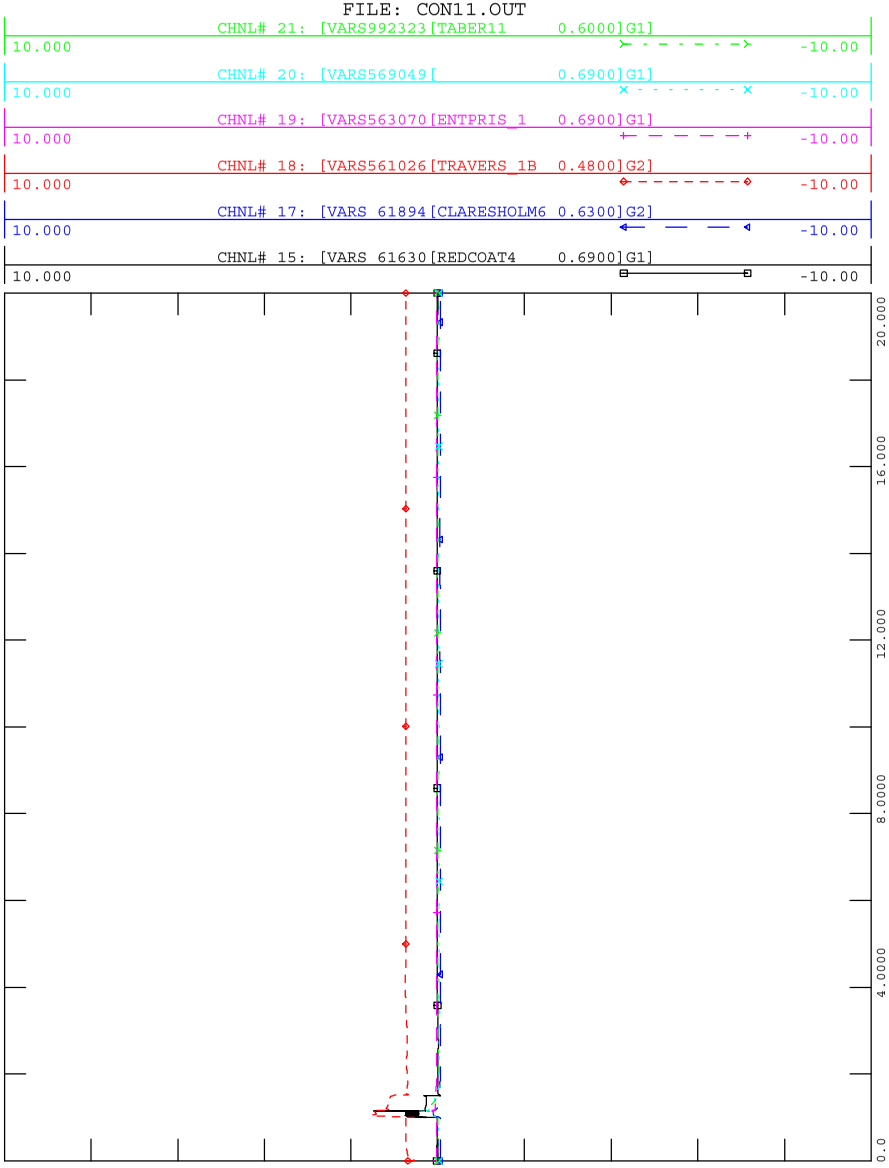


TUE, APR 11 2023 7:50

FIG C-SC9-11

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT

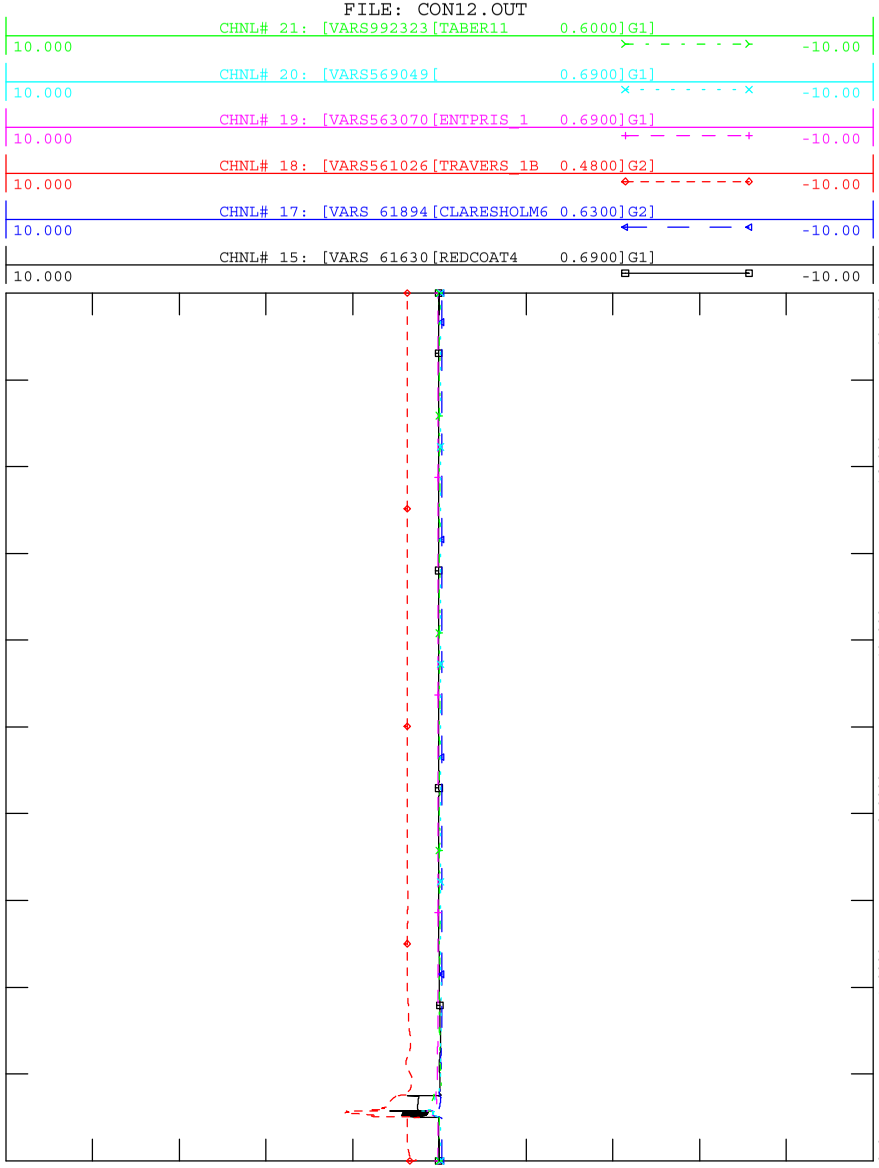


TUE, APR 11 2023 7:50

FIG C-SC9-12

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT N. LETH 370S

FILE: CON12.OUT

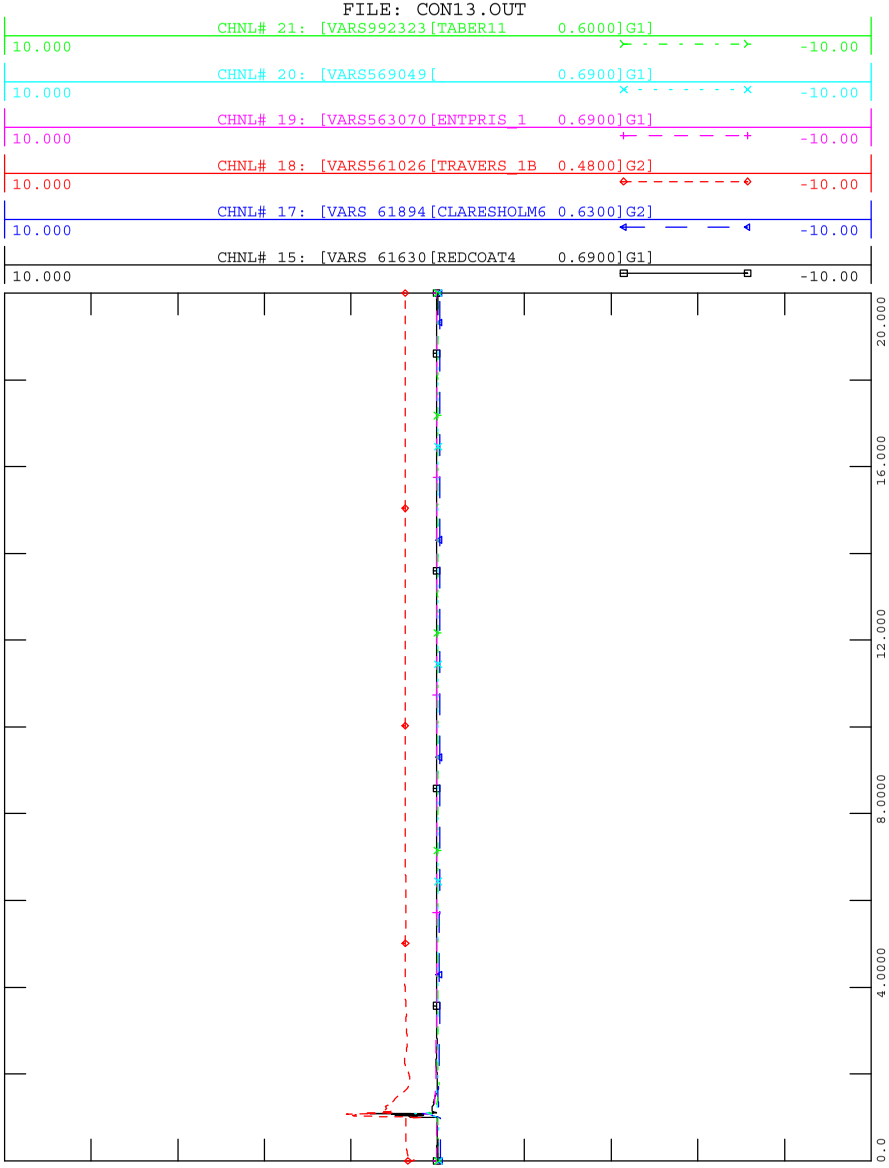


TUE, APR 11 2023 7:50

FIG C-SC9-13

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT N. LETH 370S

FILE: CON13.OUT

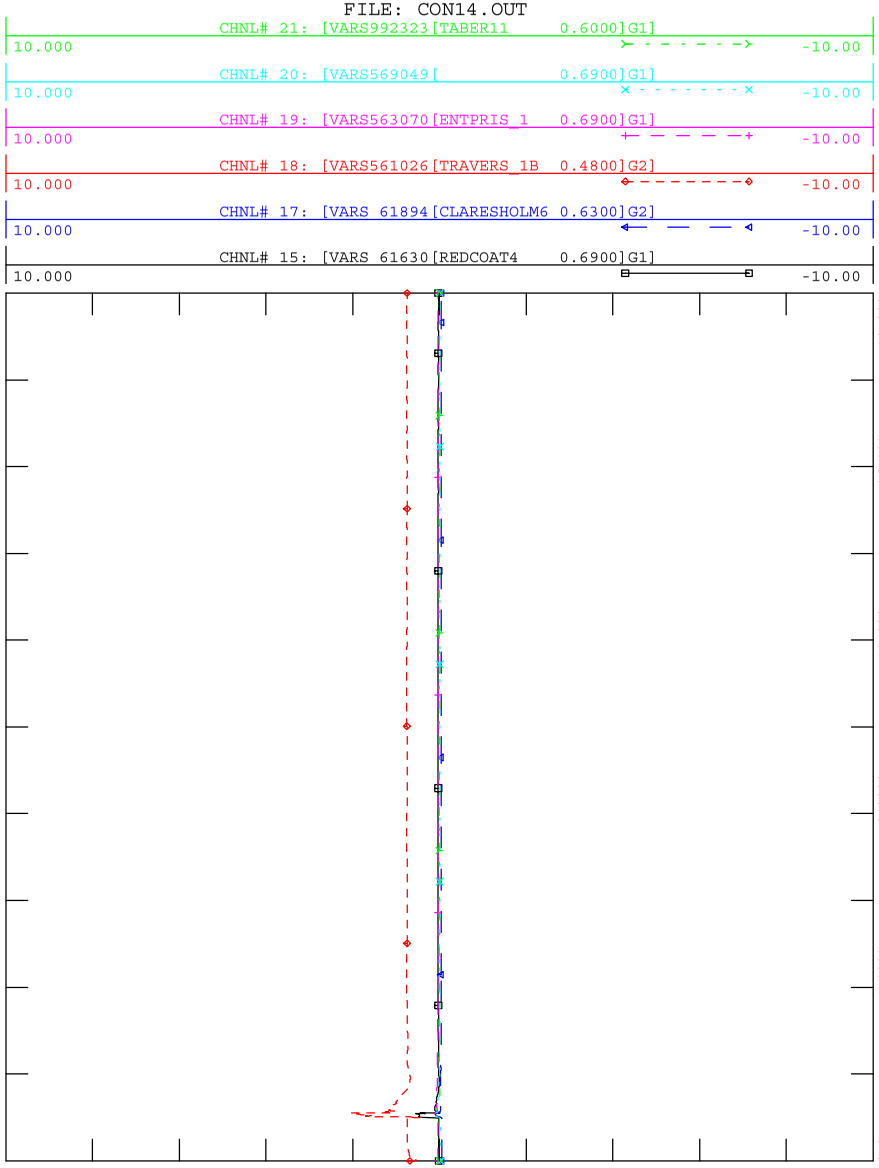


TUE, APR 11 2023 7:50

FIG C-SC9-14

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 1041L 3PH FAULT AT TRAVERS 554S

FILE: CON14.OUT

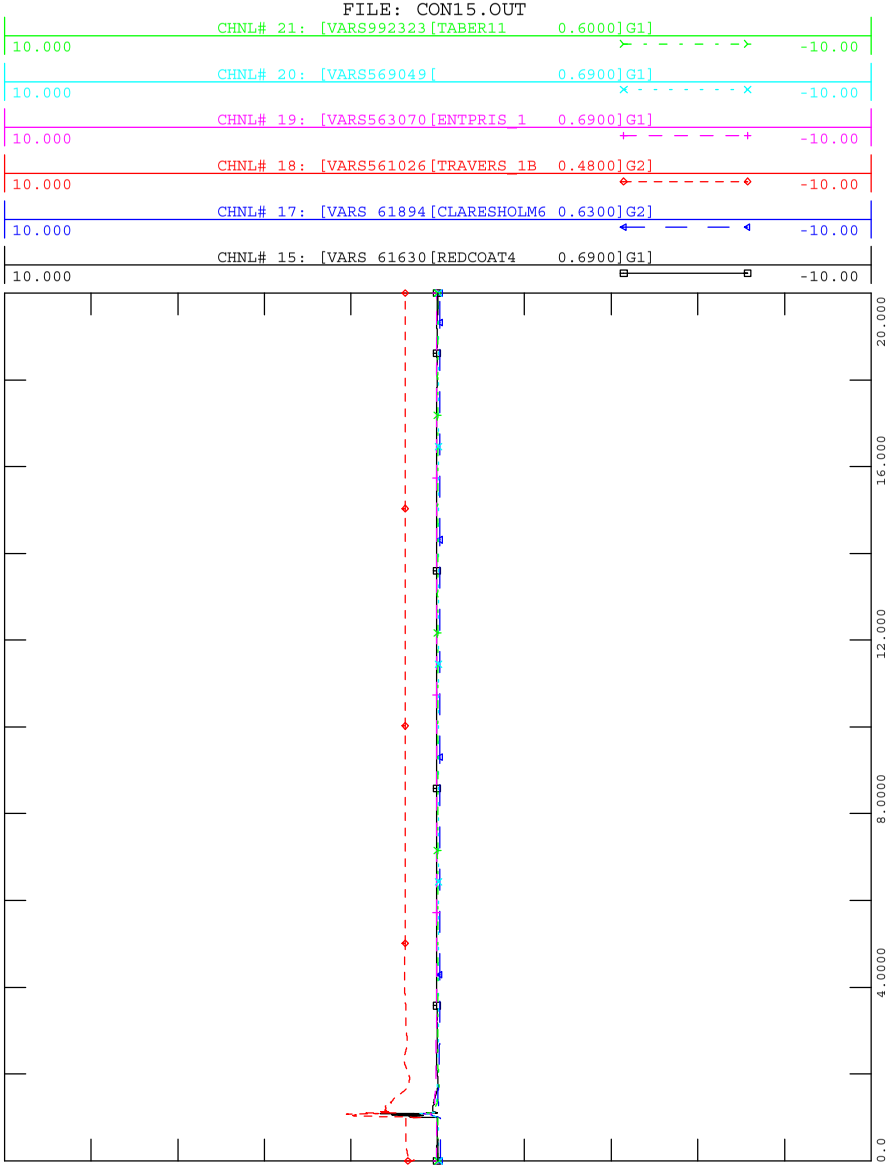


TUE, APR 11 2023 7:50

FIG C-SC9-15

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT N. LETH 370S

FILE: CON15.OUT

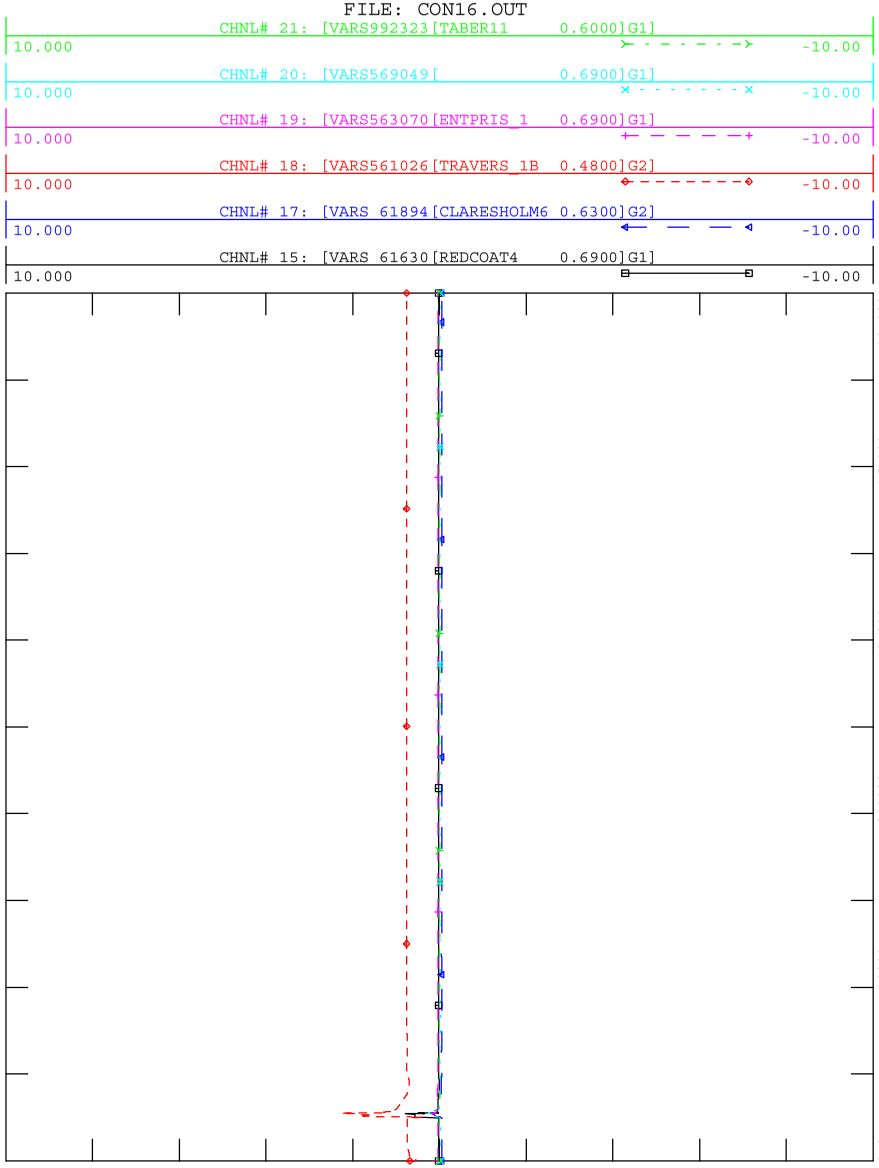


TUE, APR 11 2023 7:50

FIG C-SC9-16

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 967L 3PH FAULT AT WIND FLATS 138S

FILE: CON16.OUT

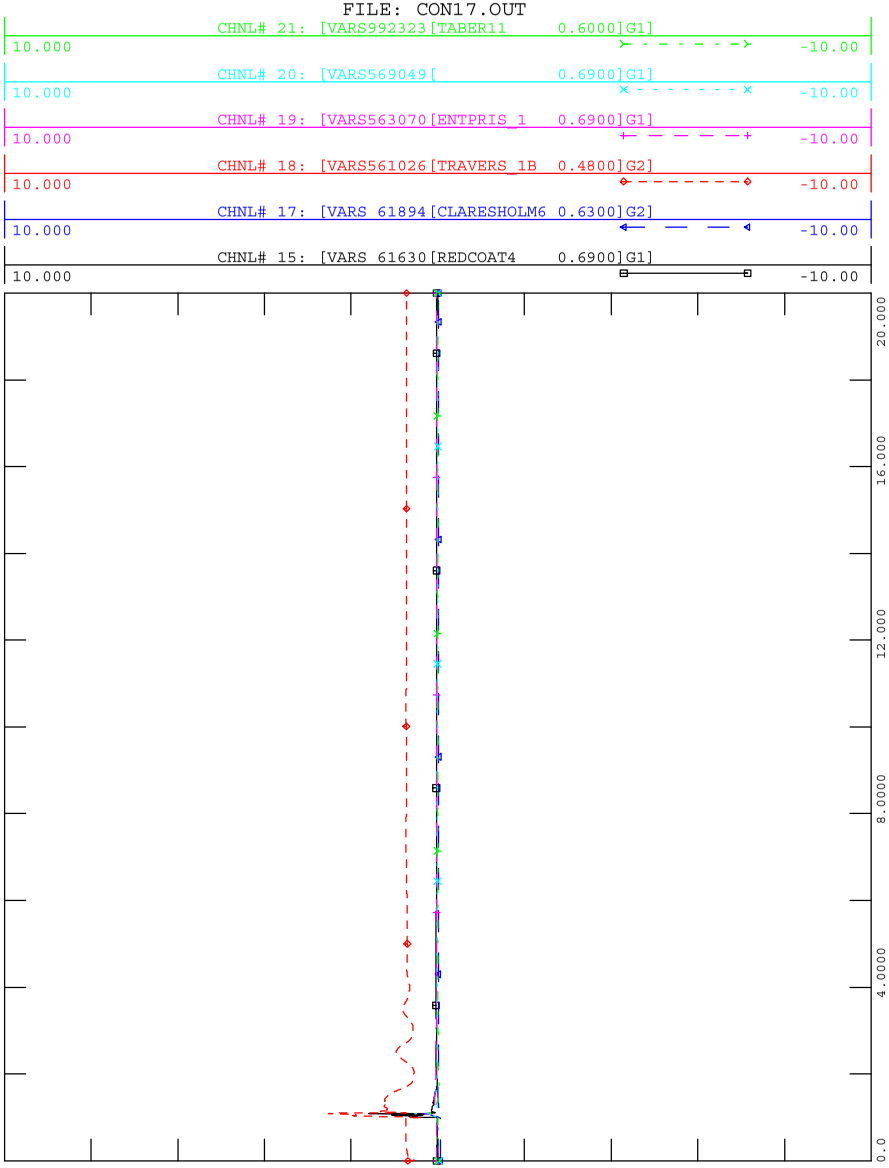


TUE, APR 11 2023 7:50

FIG C-SC9-17

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT N. LETH 370S

FILE: CON17.OUT

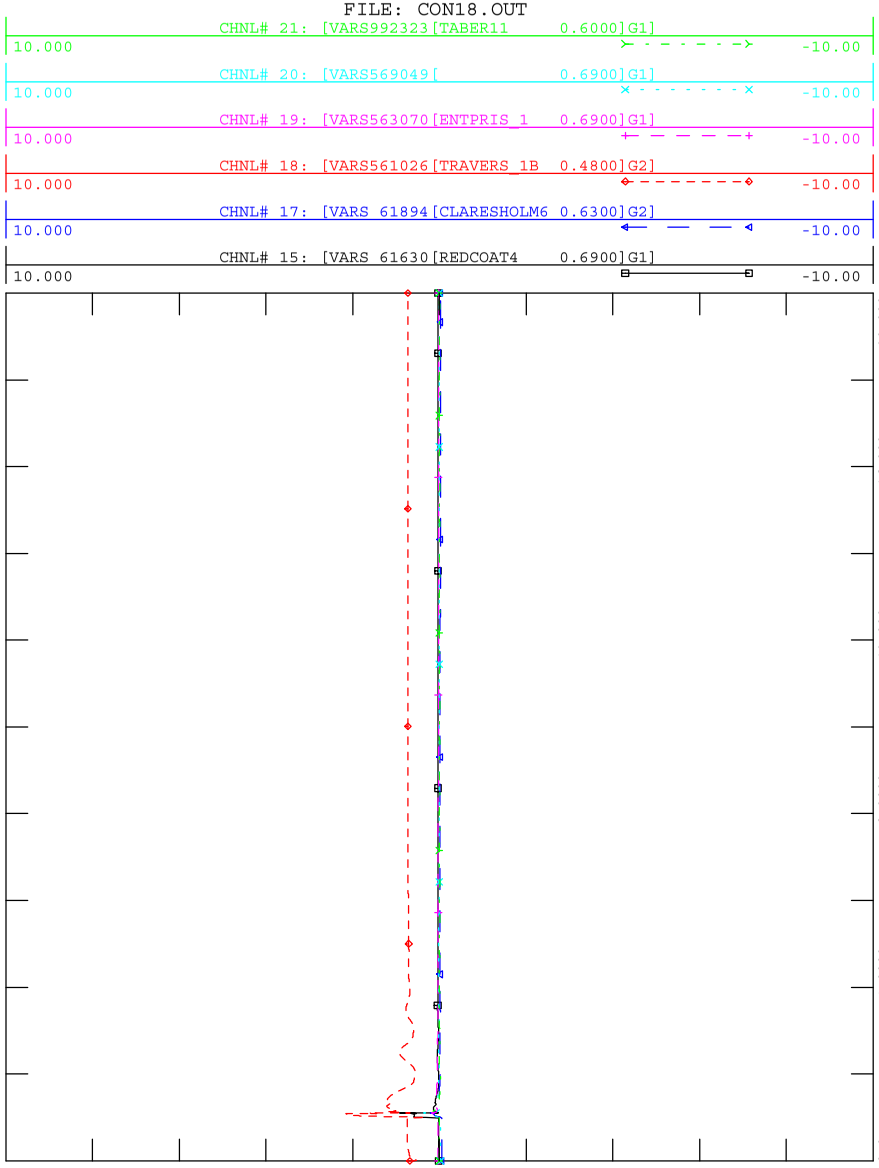


TUE, APR 11 2023 7:50

FIG C-SC9-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT



TUE, APR 11 2023 7:50

FIG C-SC9-19

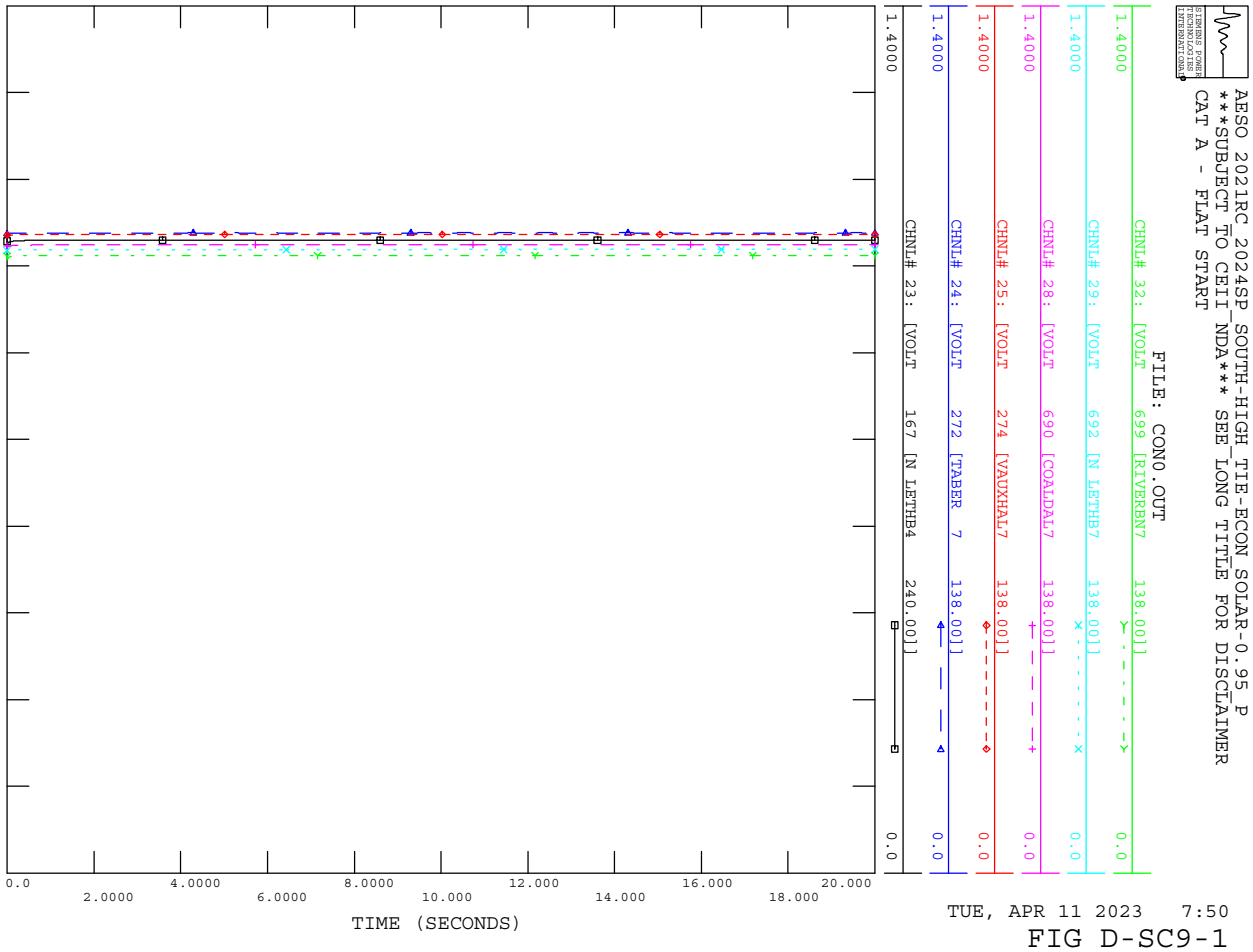


FIG D-SC9-1

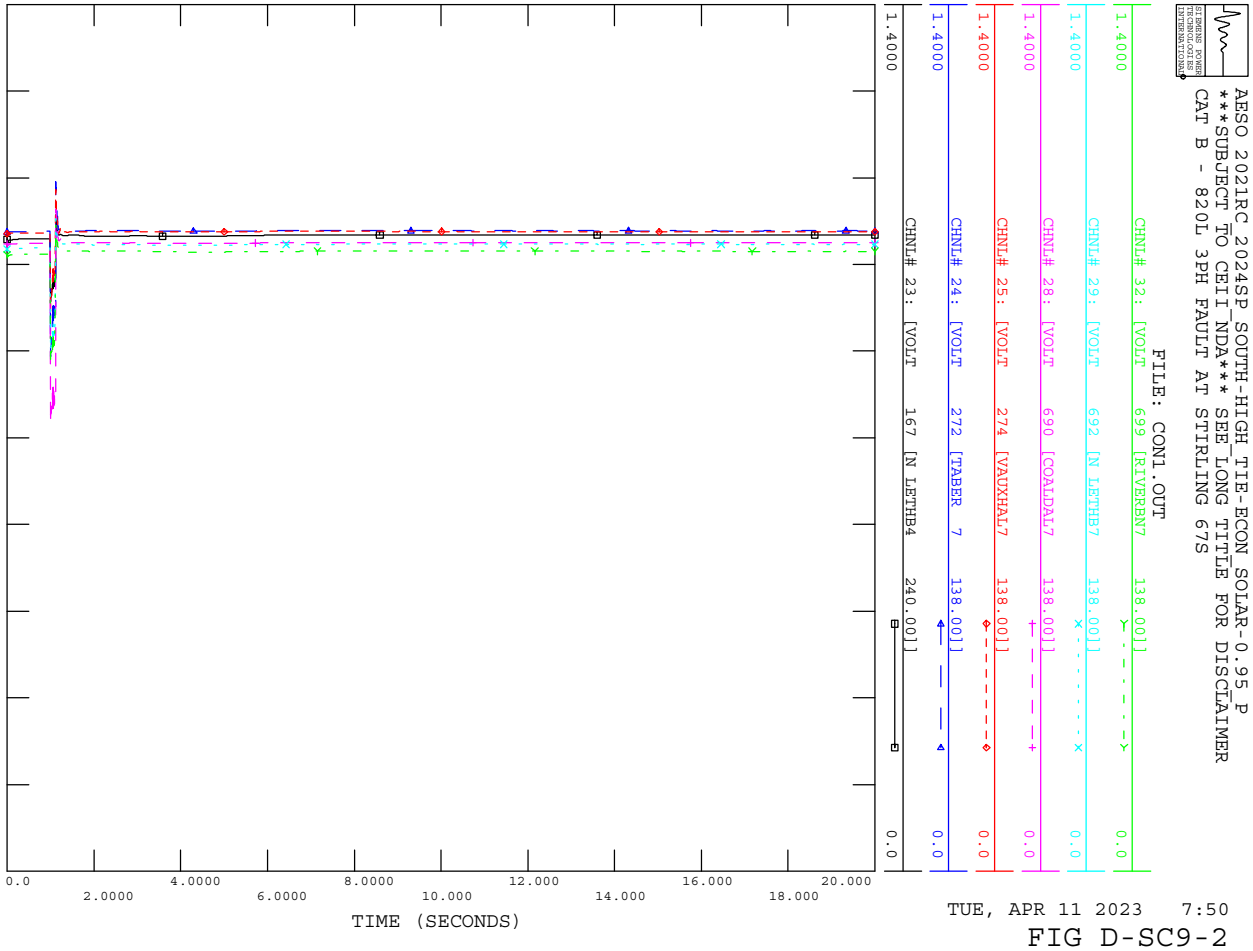


FIG D-SC9-2

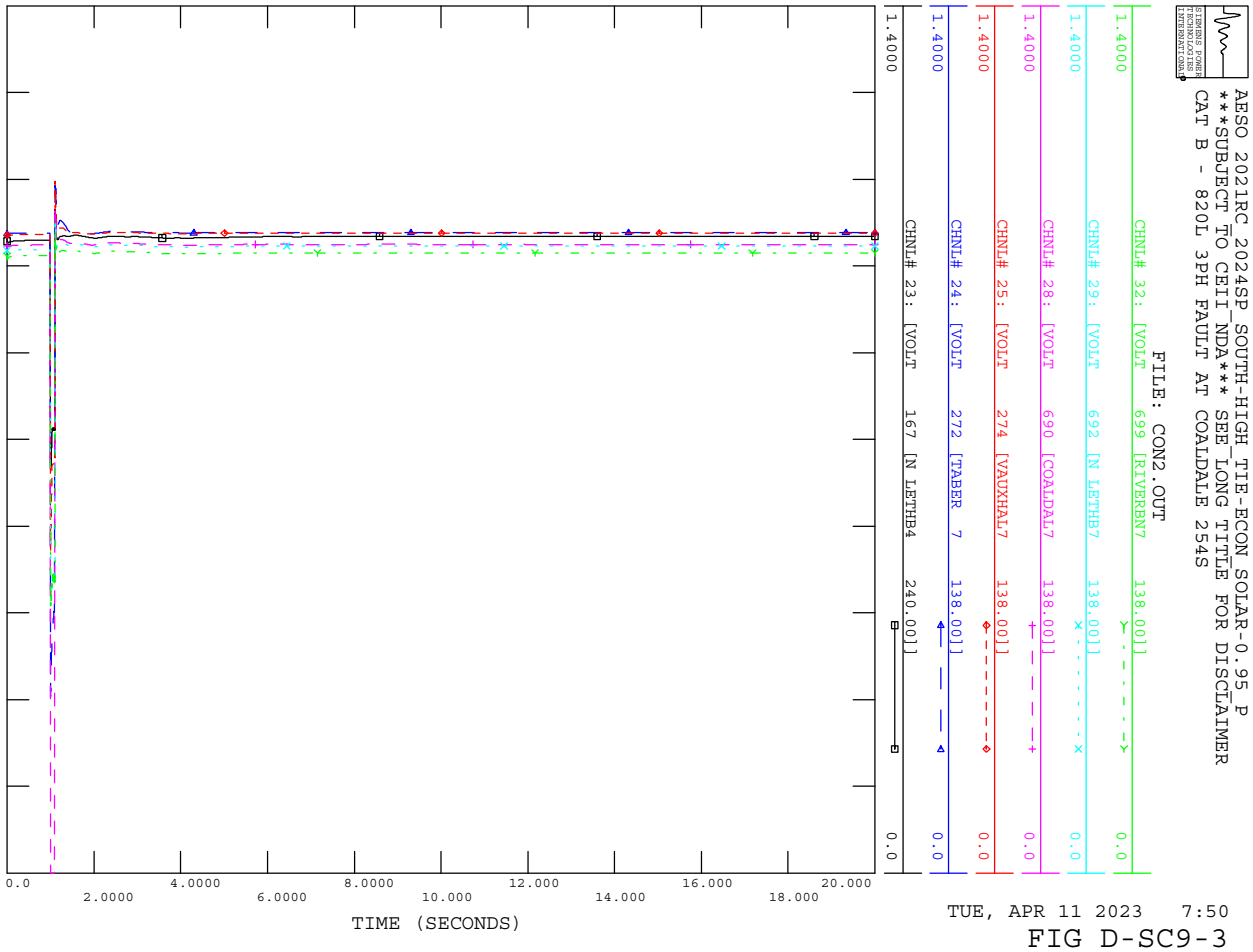


FIG D-SC9-3

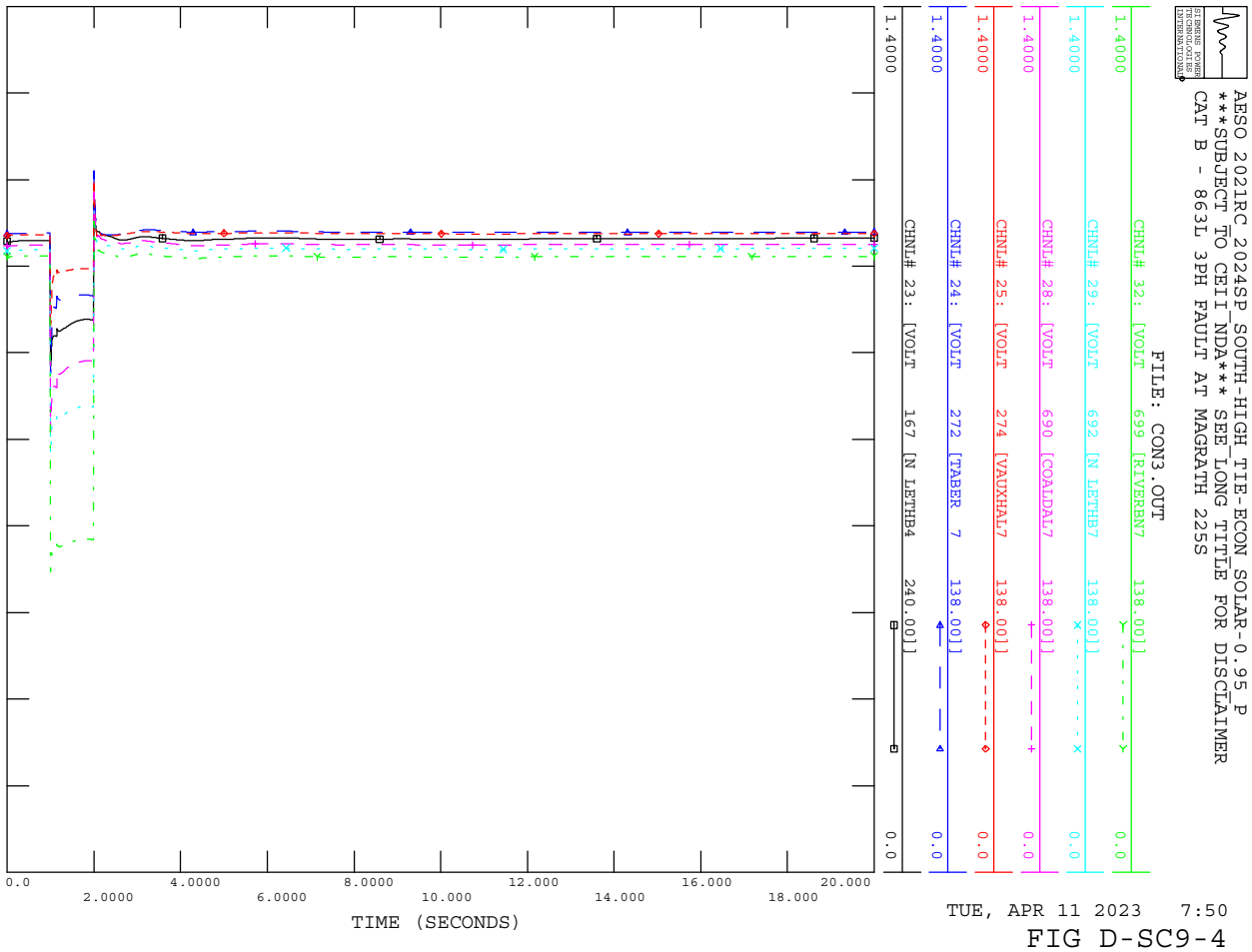


FIG D-SC9-4

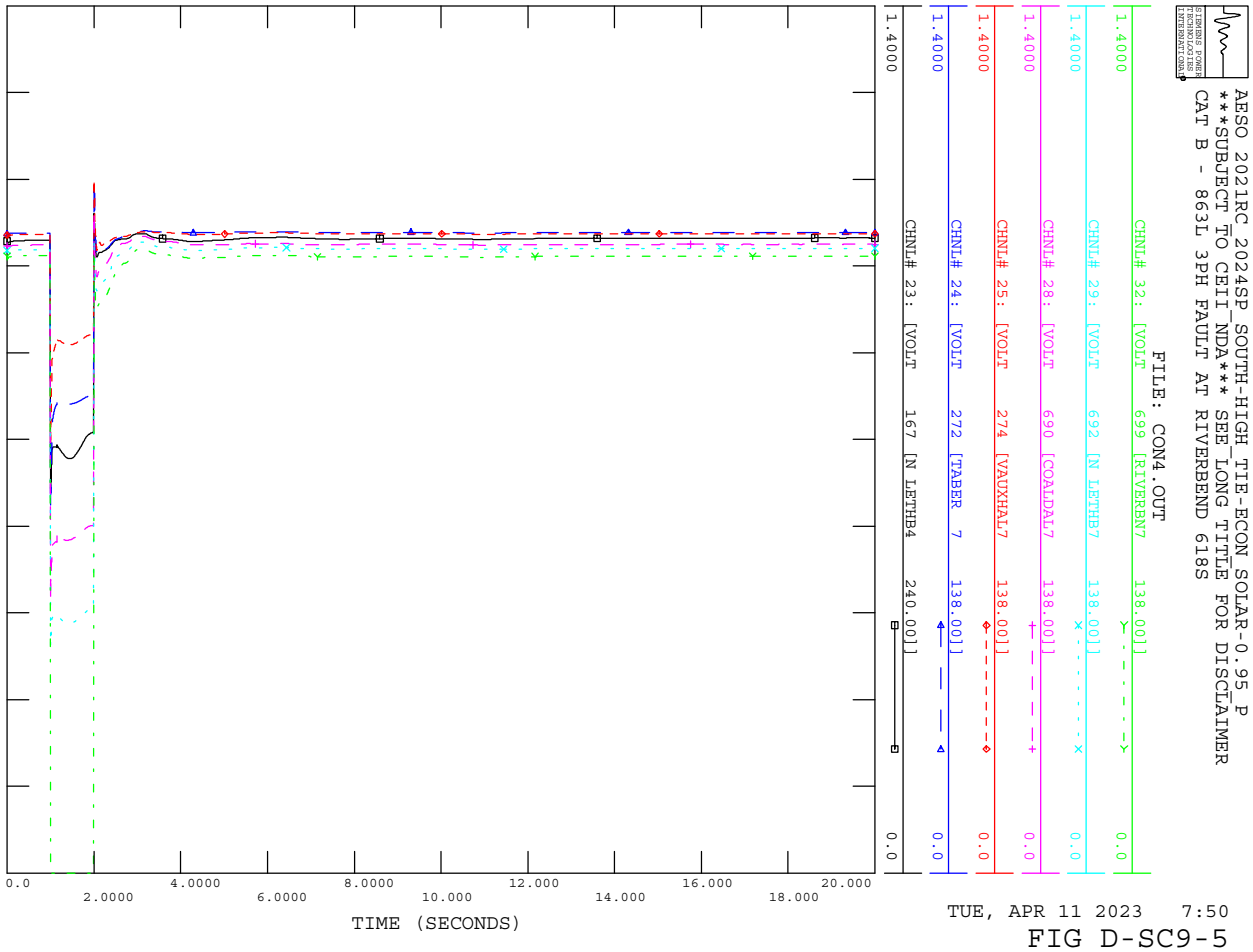


FIG D-SC9-5

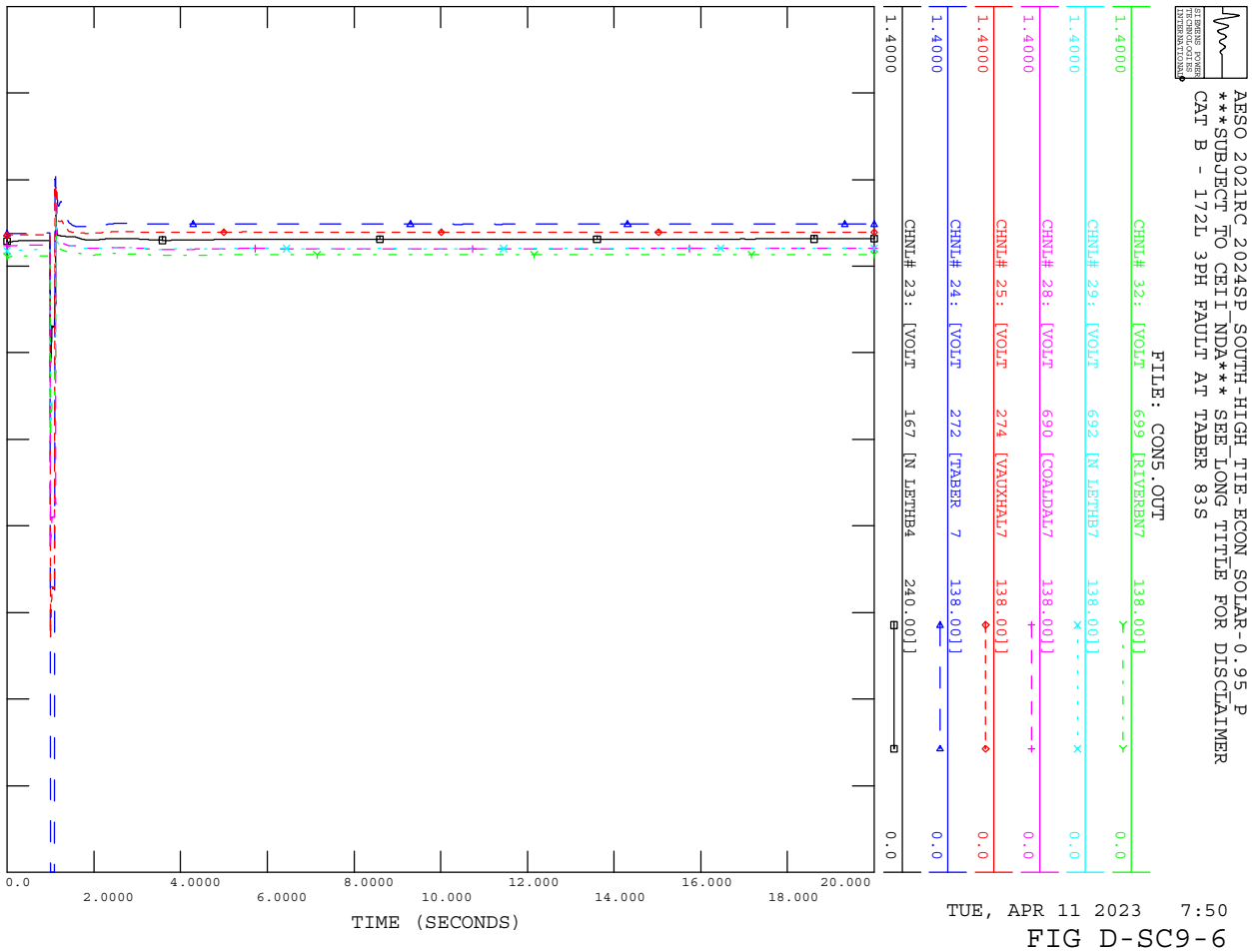


FIG D-SC9-6

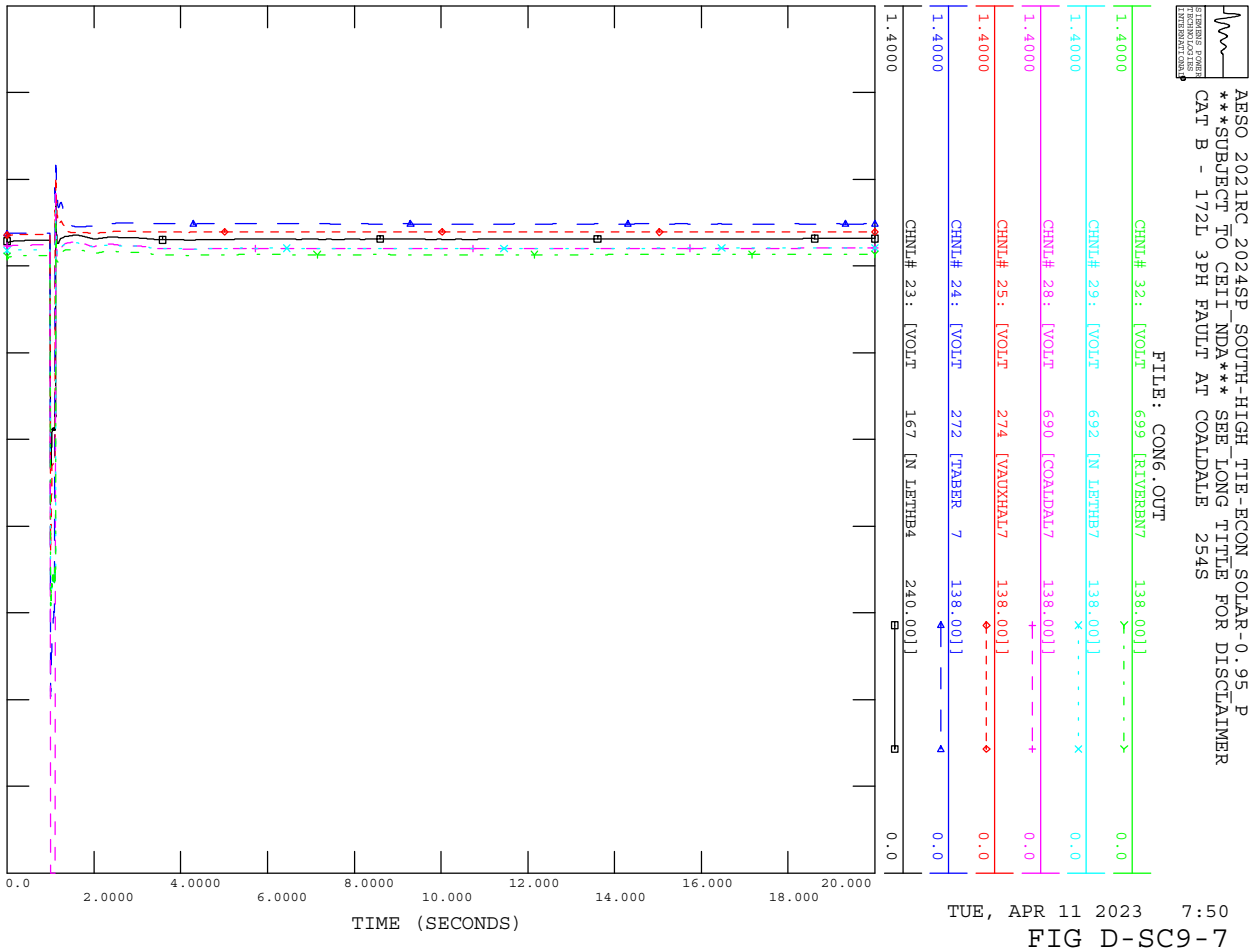


FIG D-SC9-7

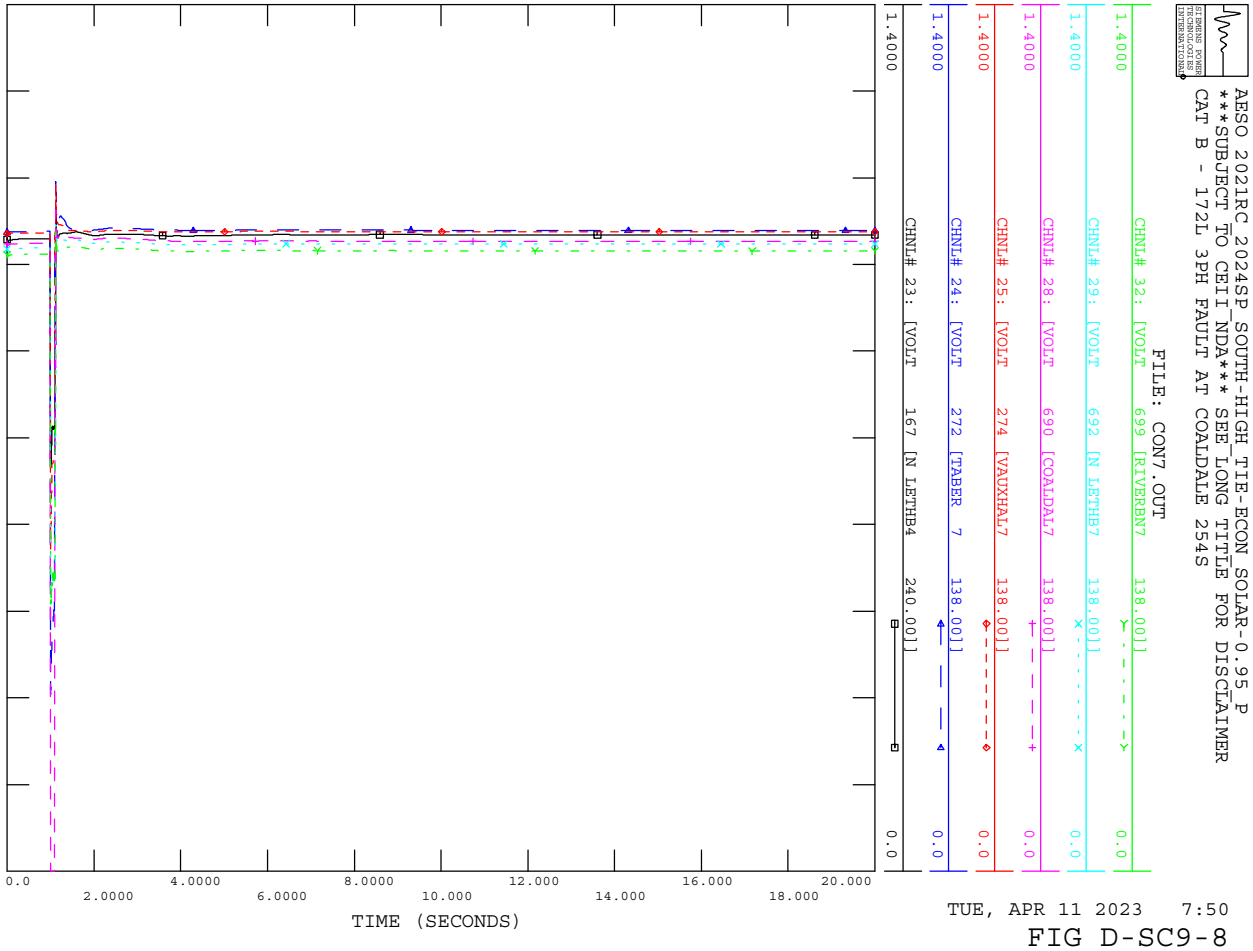


FIG D-SC9-8

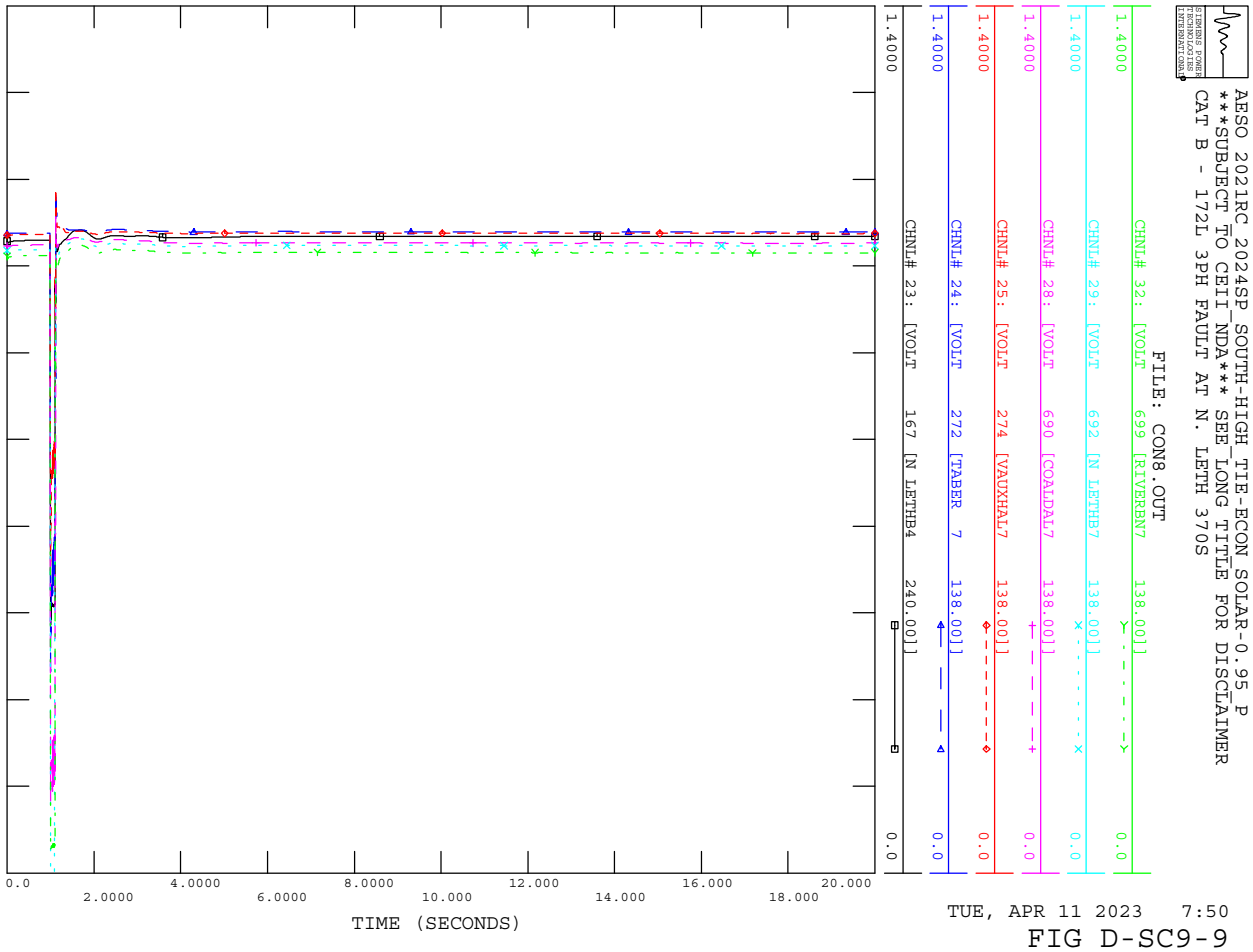


FIG D-SC9-9

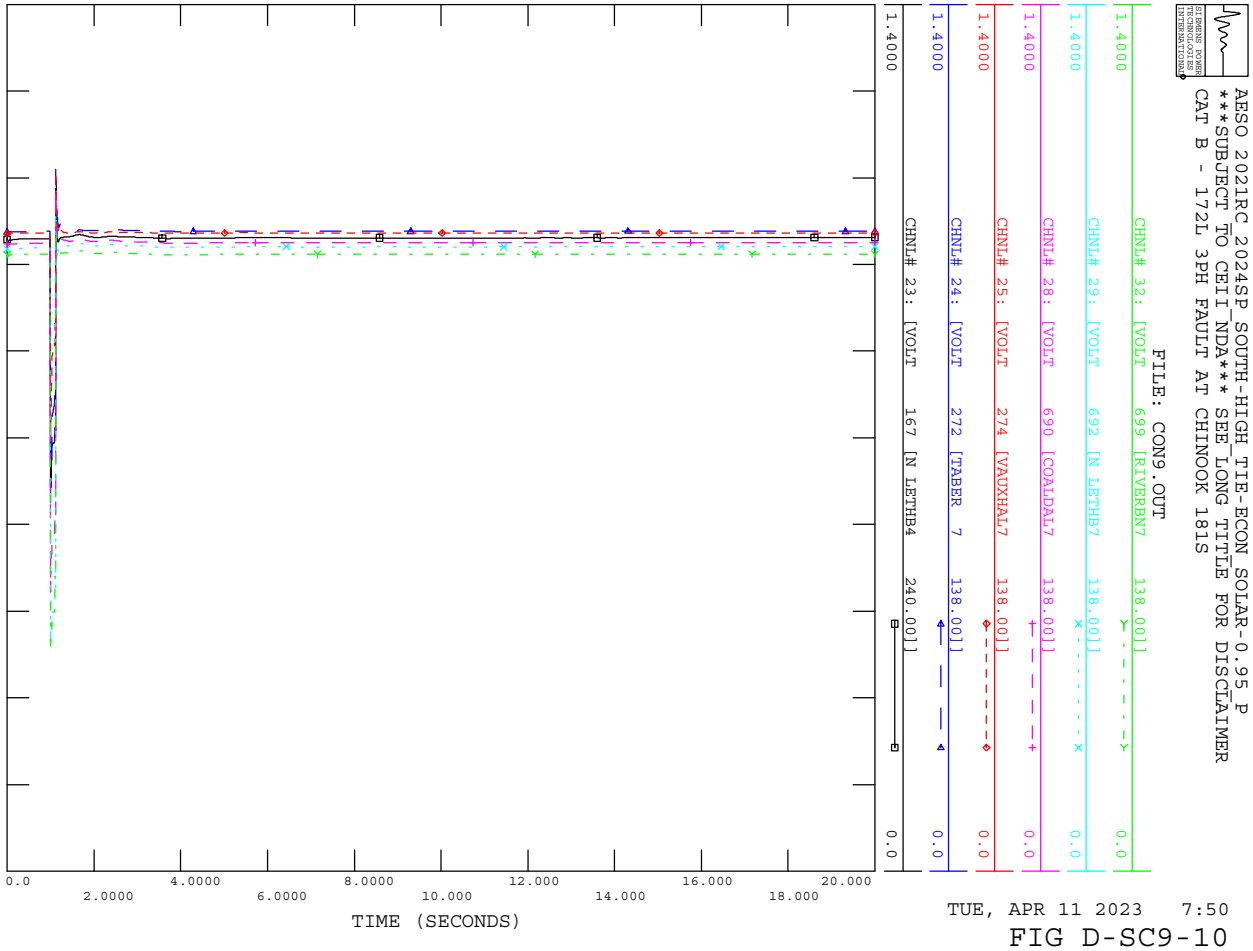


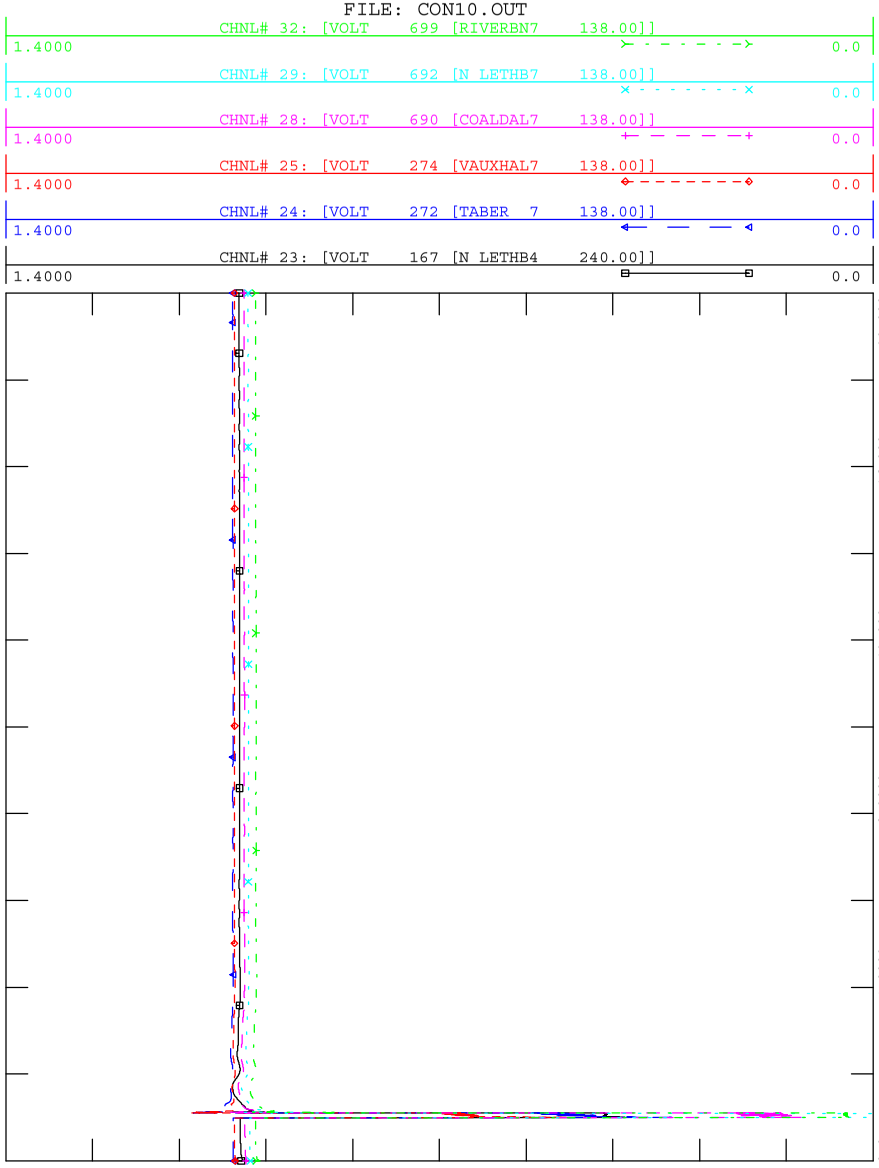
FIG D-SC9-10

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT N. LETH 370S

FILE: CON10.OUT

TUE, APR 11 2023 7:50

FIG D-SC9-11

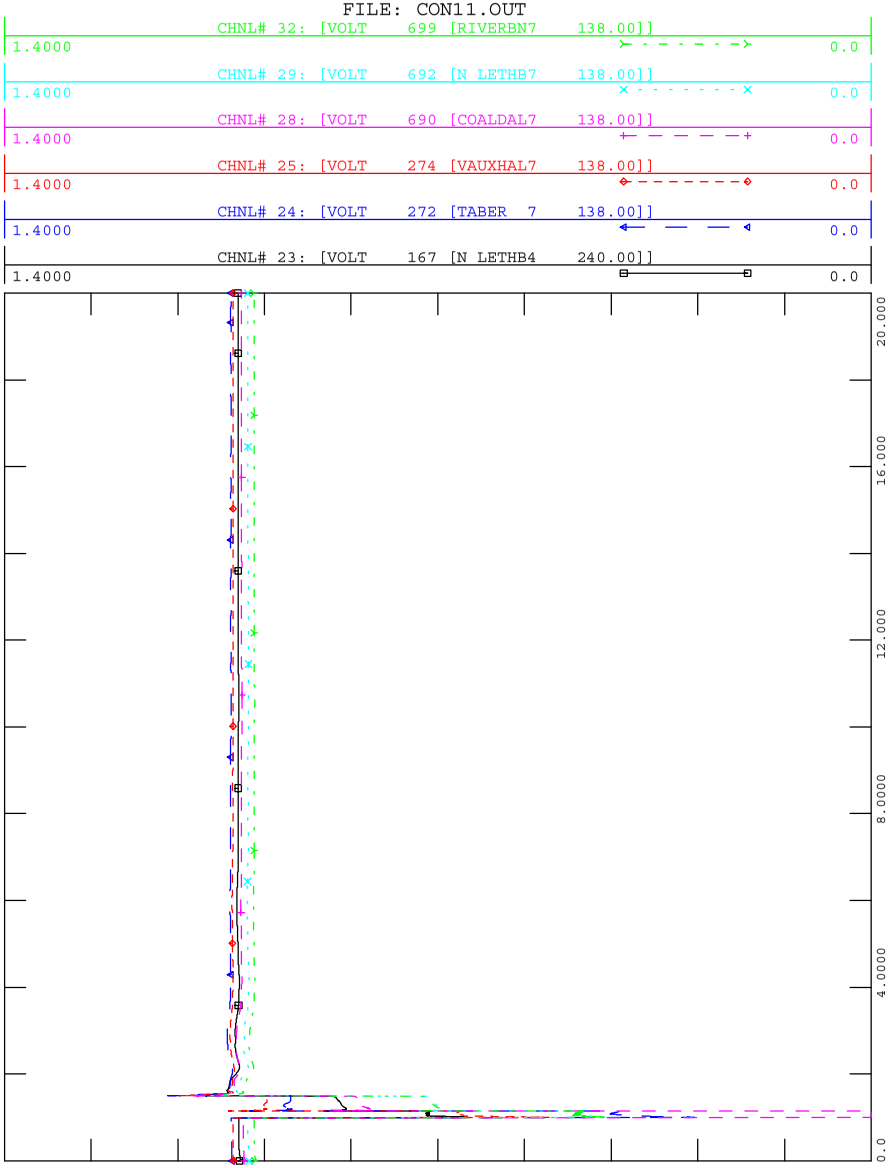


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 770L 3PH FAULT AT COALDALE 254S

FILE: CON11.OUT

TUE, APR 11 2023 7:50

FIG D-SC9-12



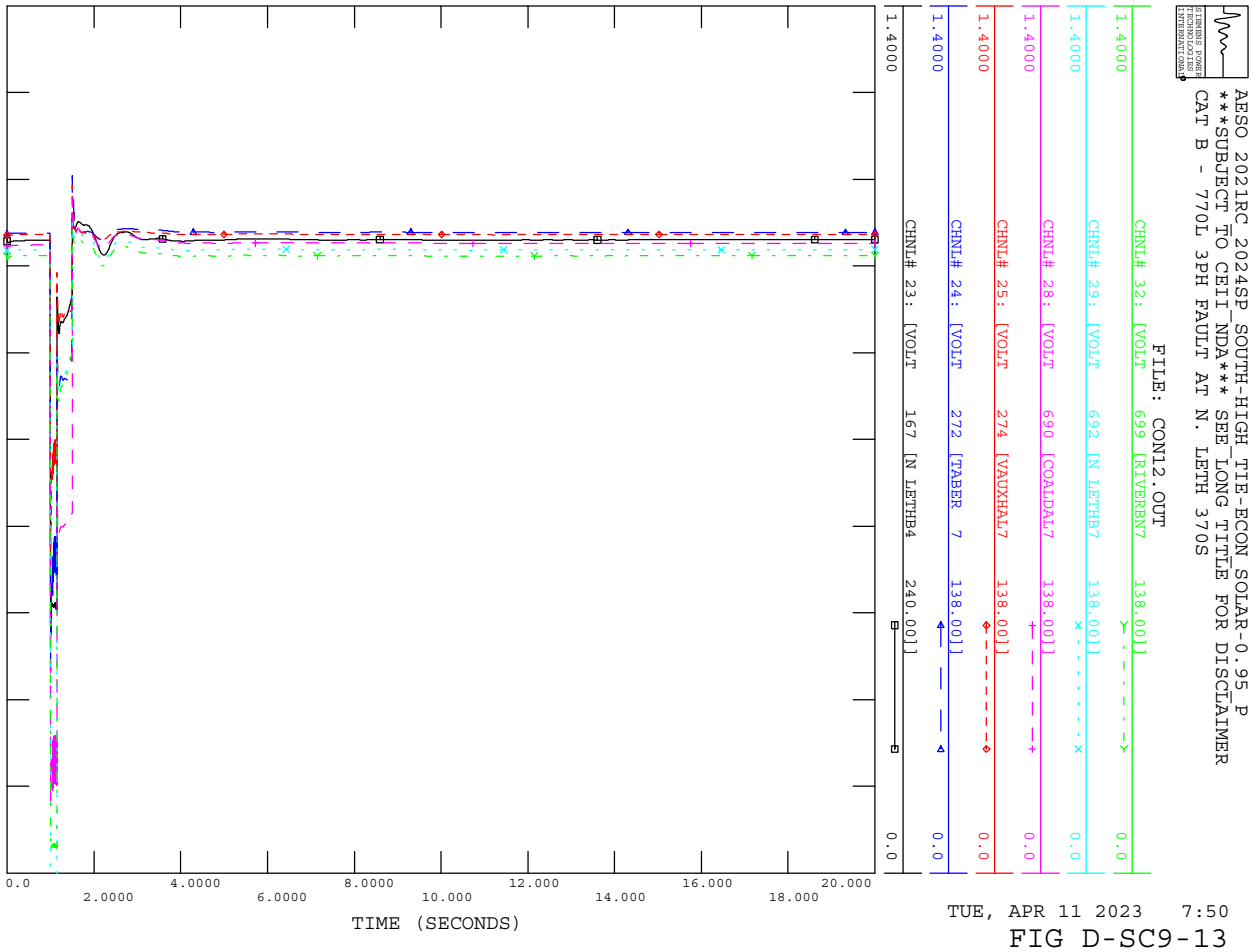


FIG D-SC9-13

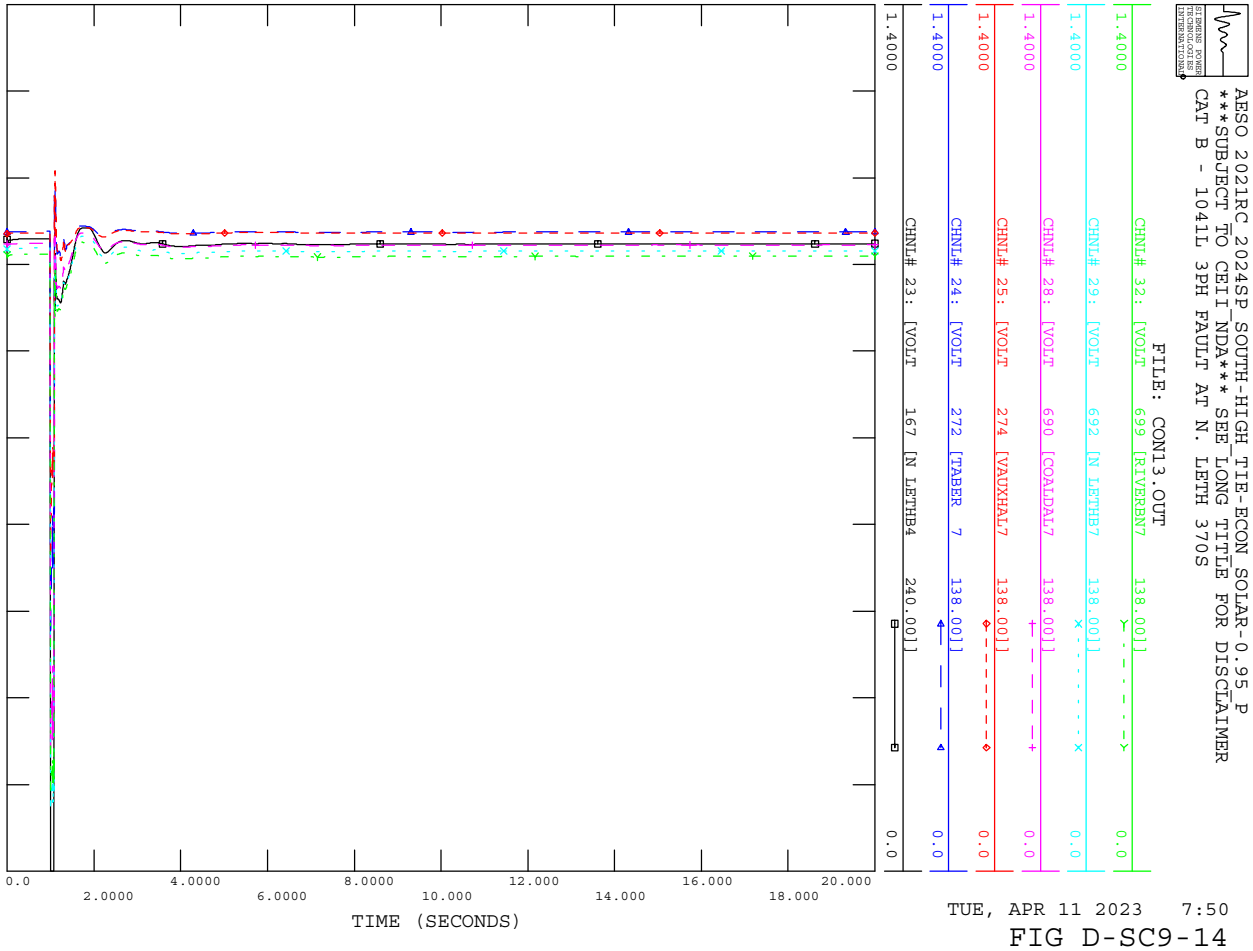


FIG D-SC9-14

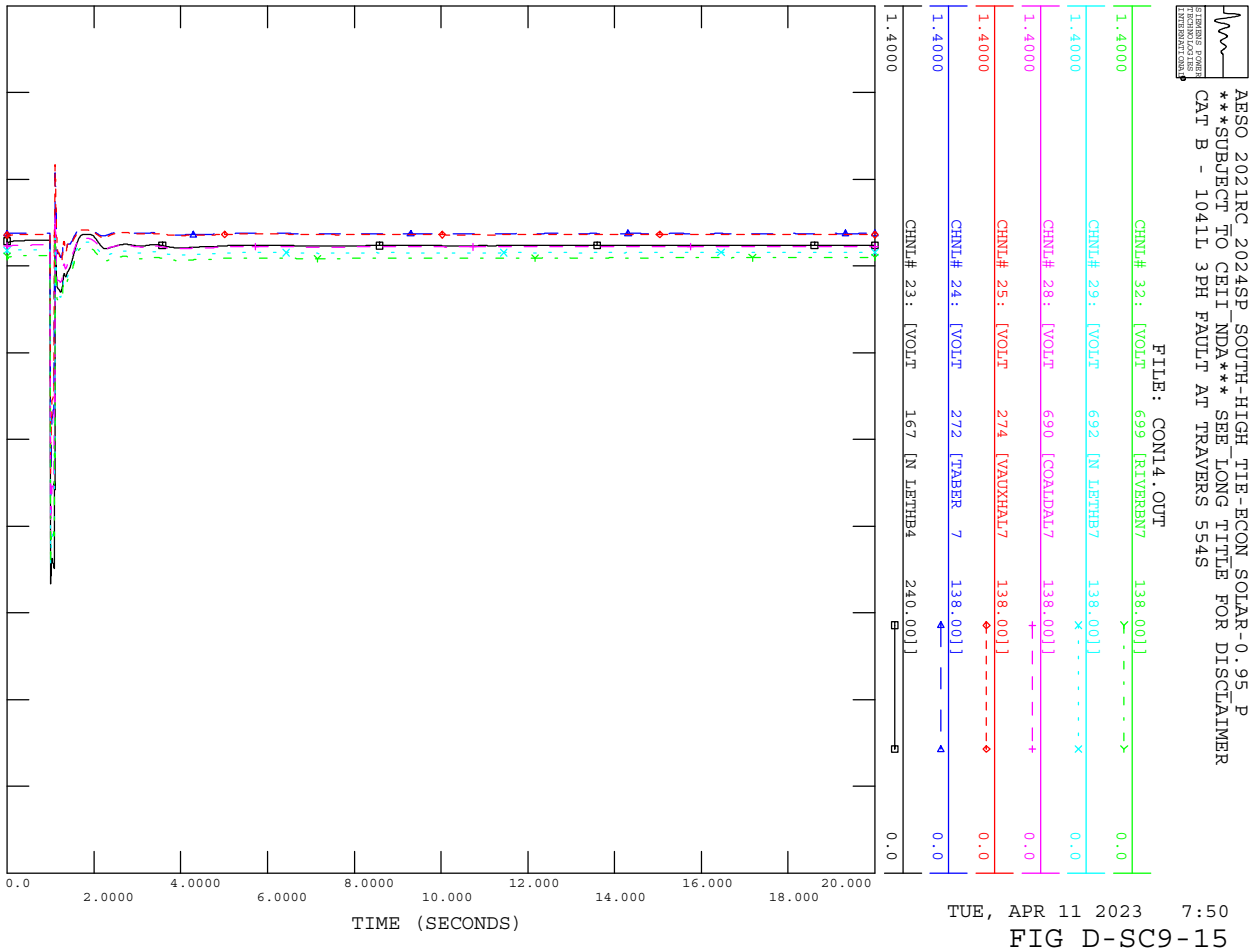


FIG D-SC9-15

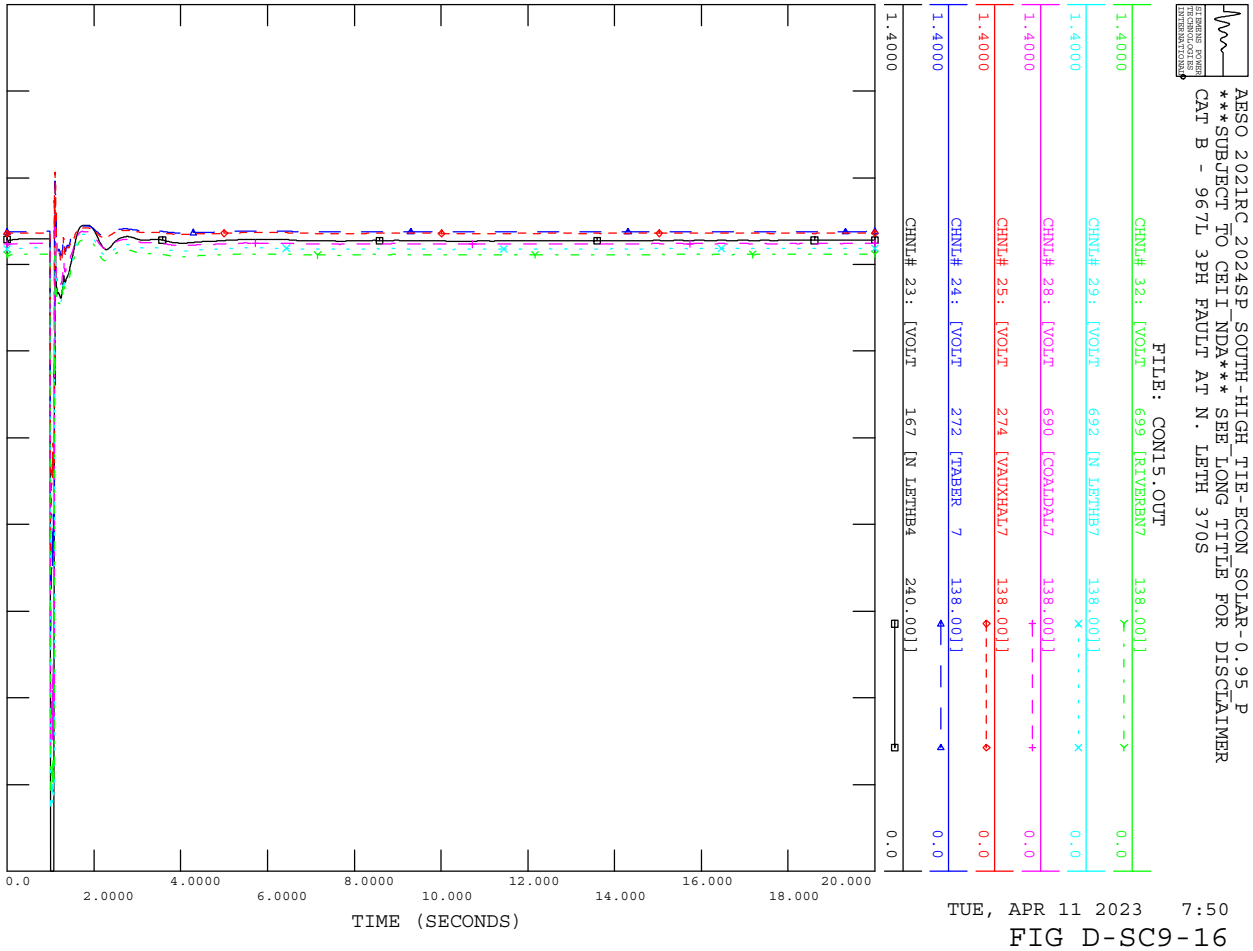


FIG D-SC9-16

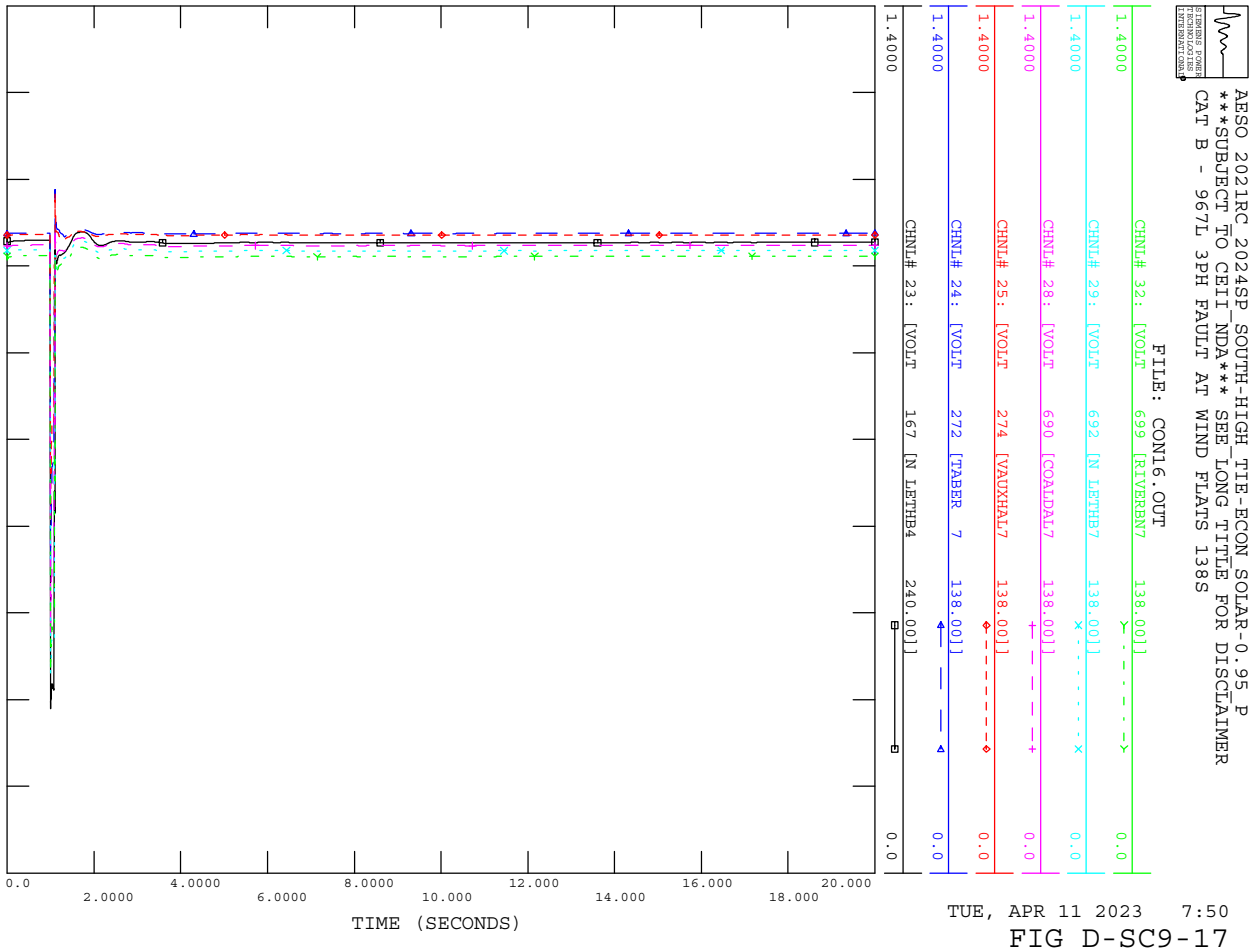


FIG D-SC9-17

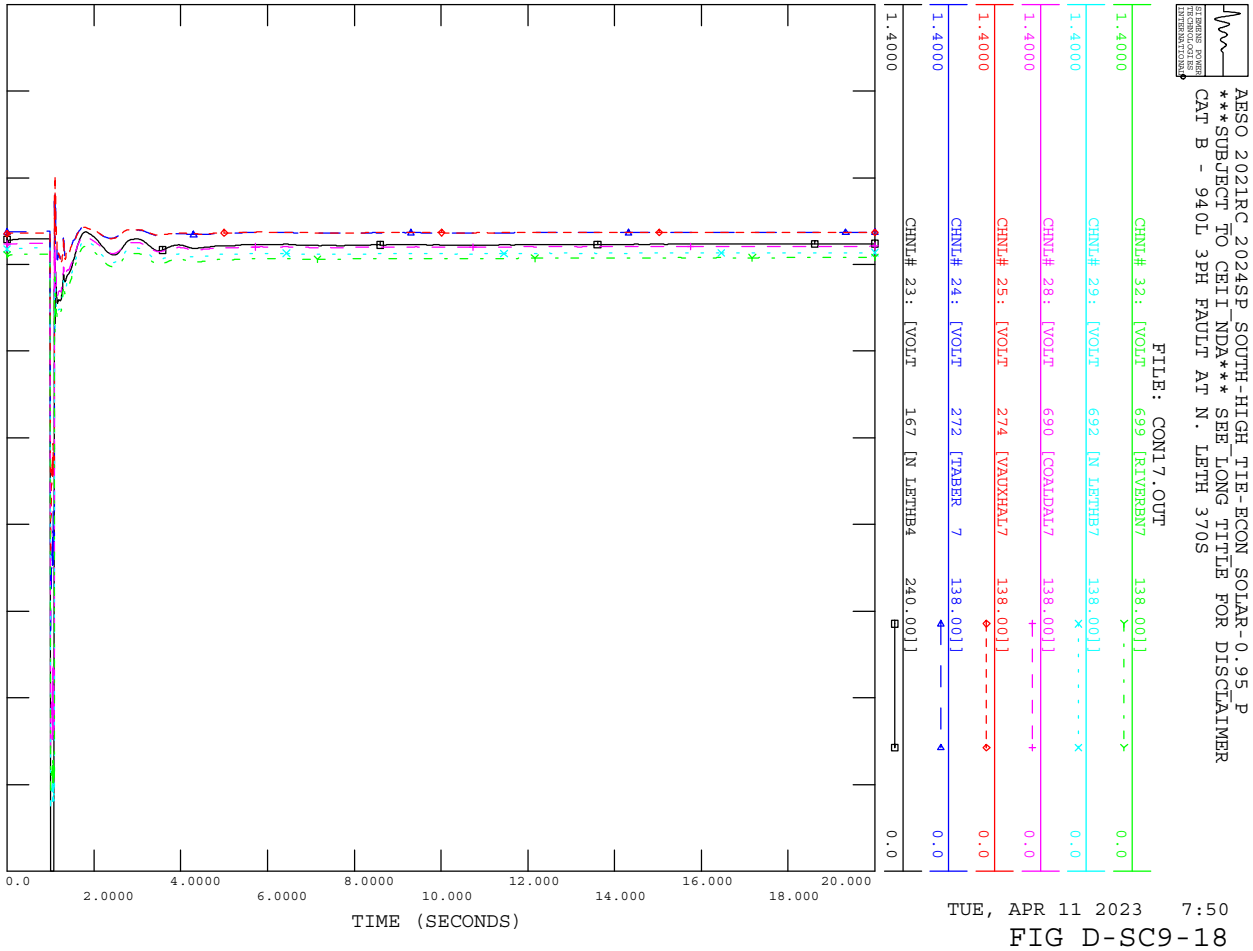


FIG D-SC9-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

FILE: CON18.OUT

CHNL# 32: [VOLT 699 [RIVERBN7 138.00]]
1.4000 0.0

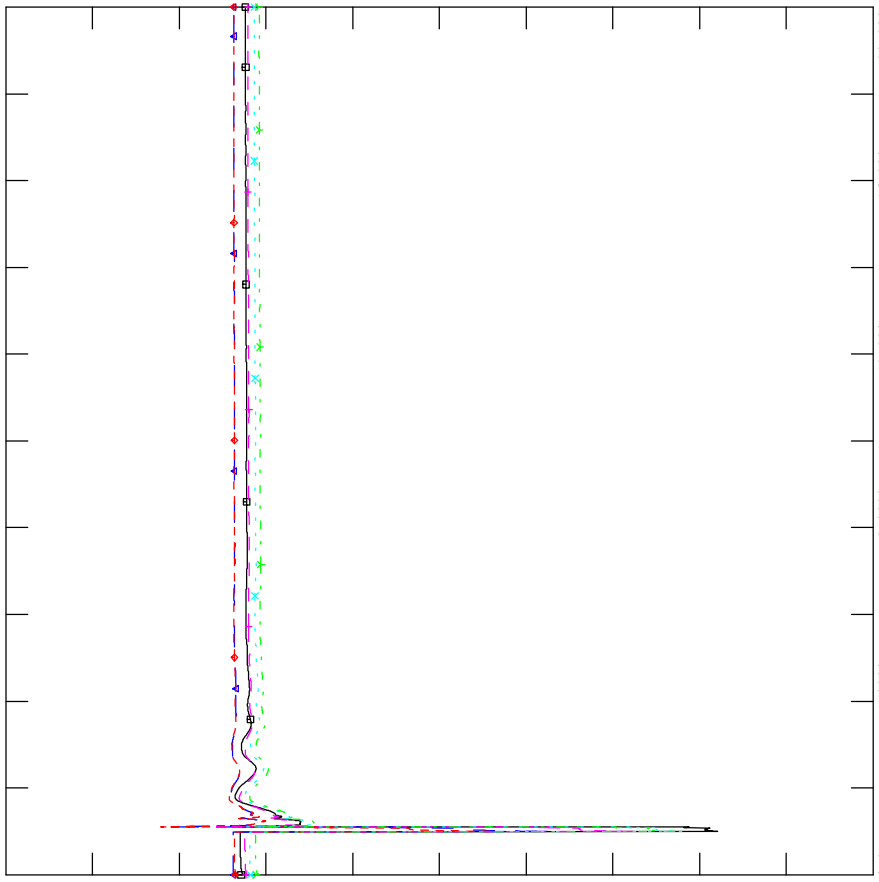
CHNL# 29: [VOLT 692 [N LETHB7 138.00]]
1.4000 0.0

CHNL# 28: [VOLT 690 [COALDAL7 138.00]]
1.4000 0.0

CHNL# 25: [VOLT 274 [VAUXHAL7 138.00]]
1.4000 0.0

CHNL# 24: [VOLT 272 [TABER 7 138.00]]
1.4000 0.0

CHNL# 23: [VOLT 167 [N LETHB4 240.00]]
1.4000 0.0



TUE, APR 11 2023 7:50

FIG D-SC9-19

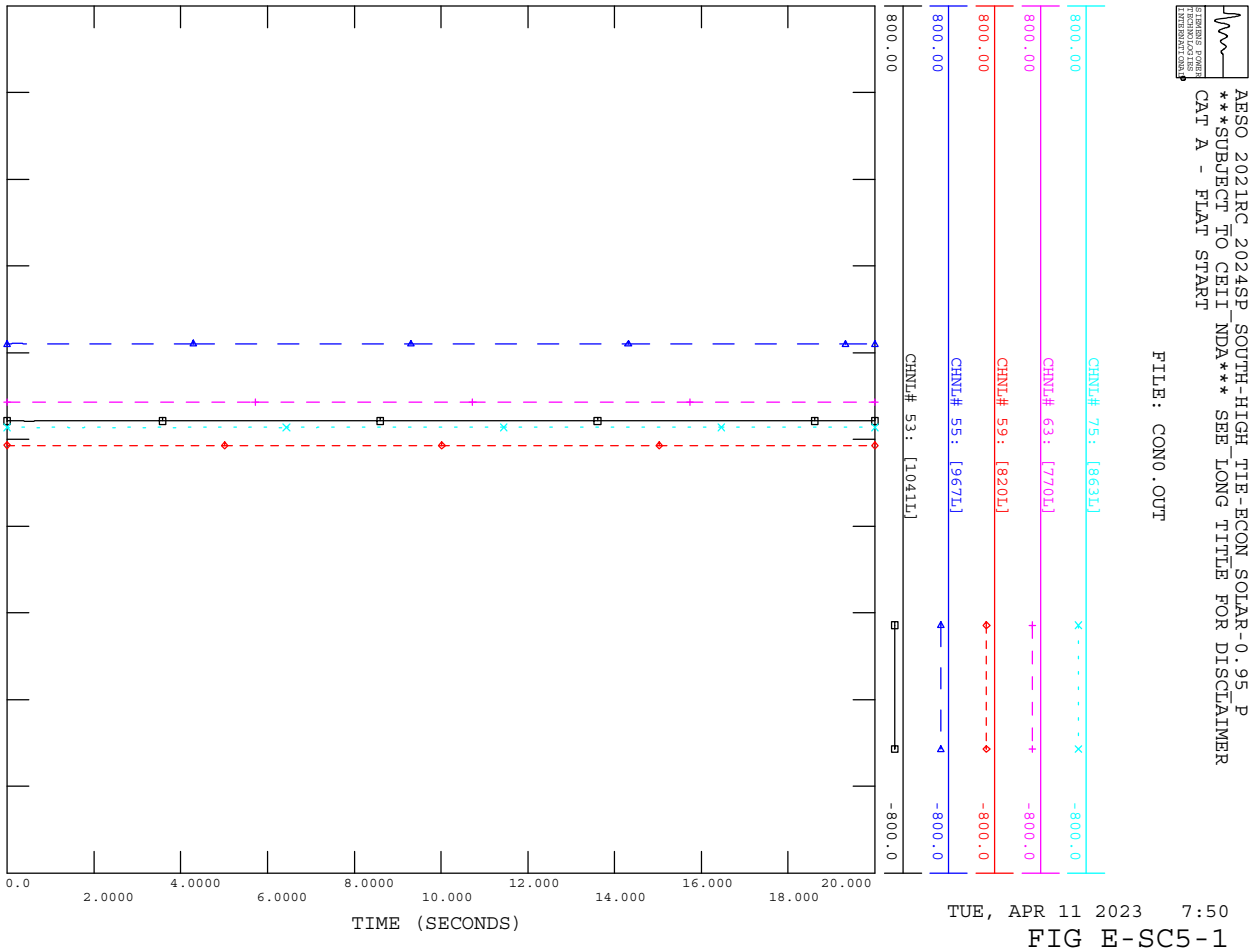


FIG E-SC5-1

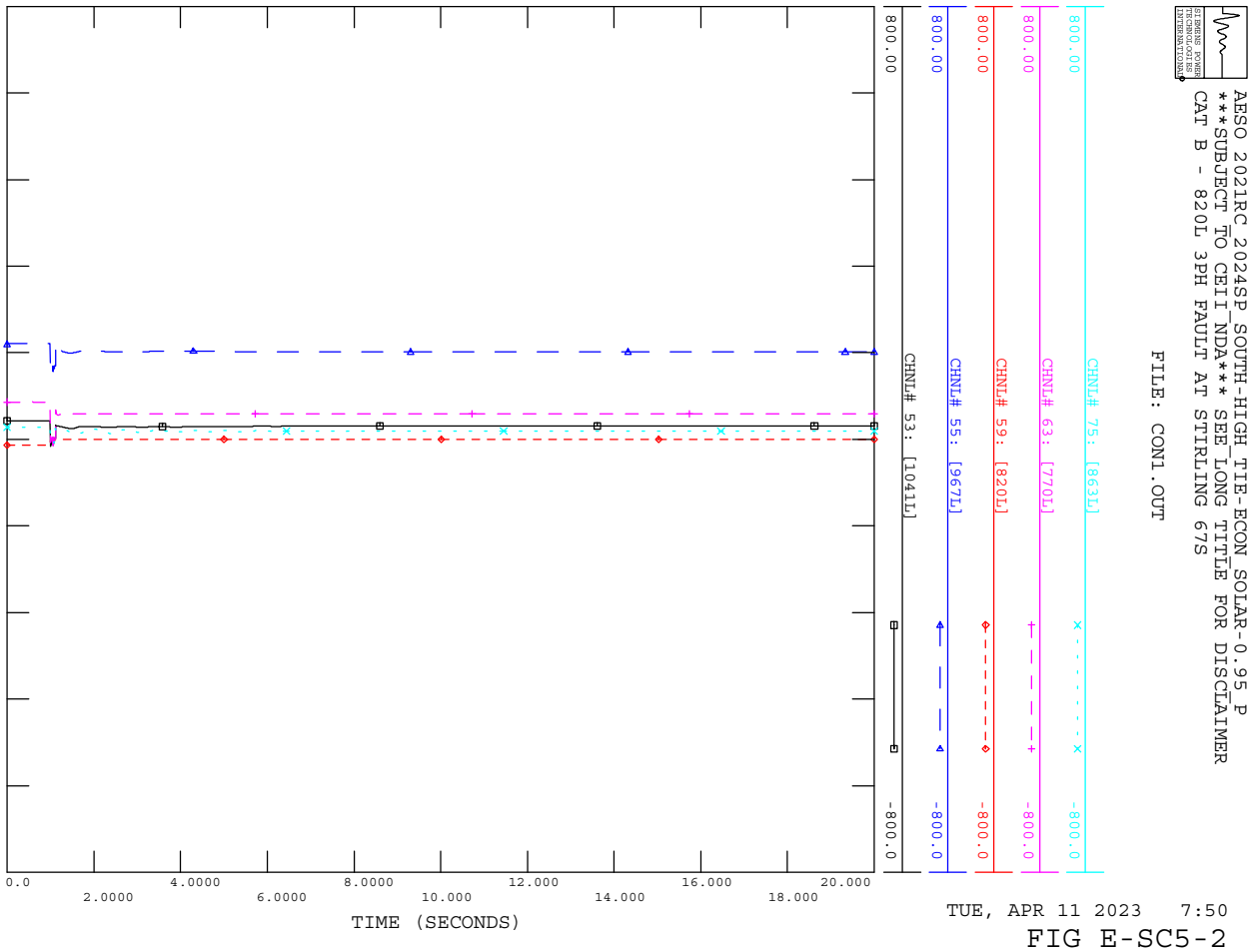


FIG E-SC5-2

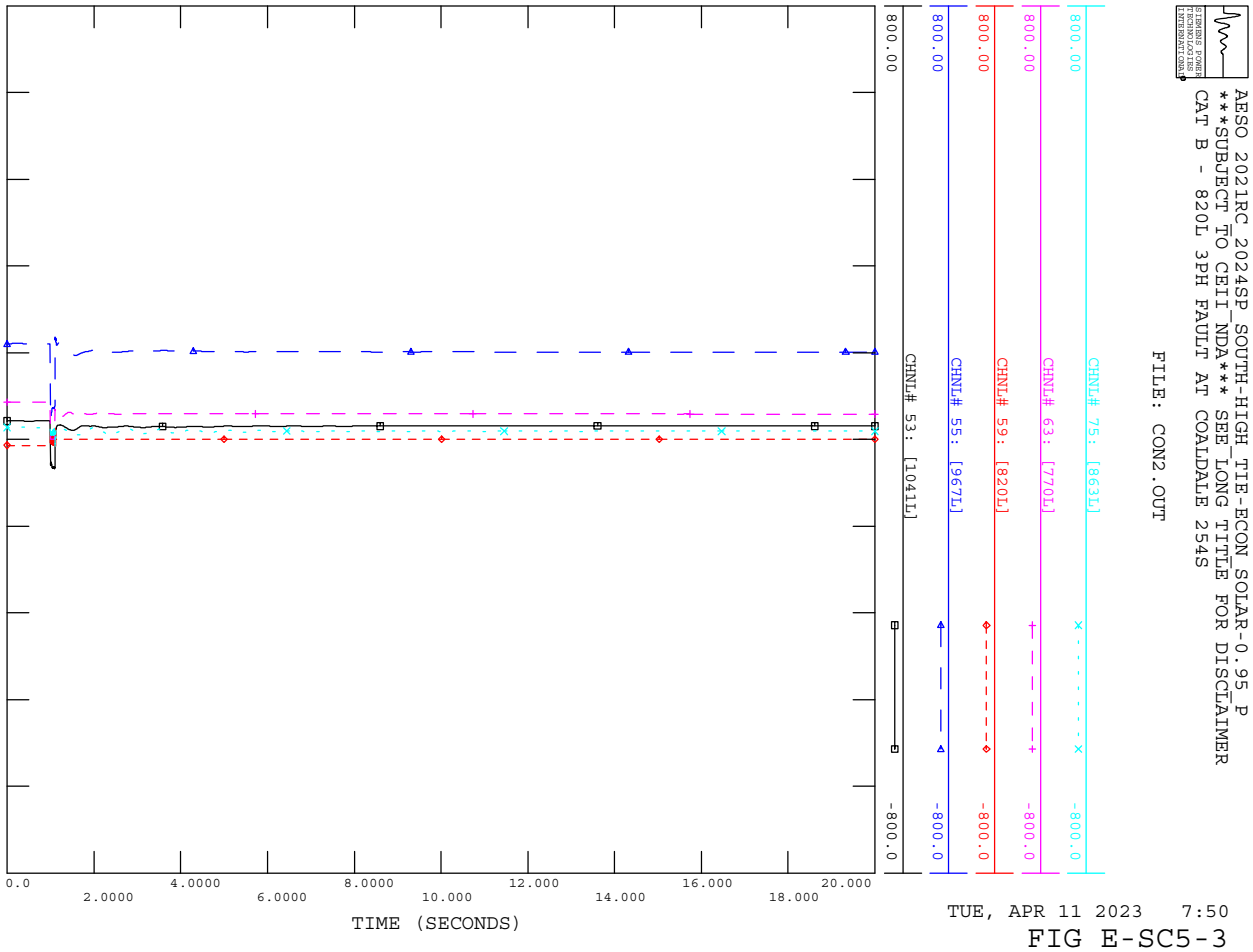


FIG E-SC5-3

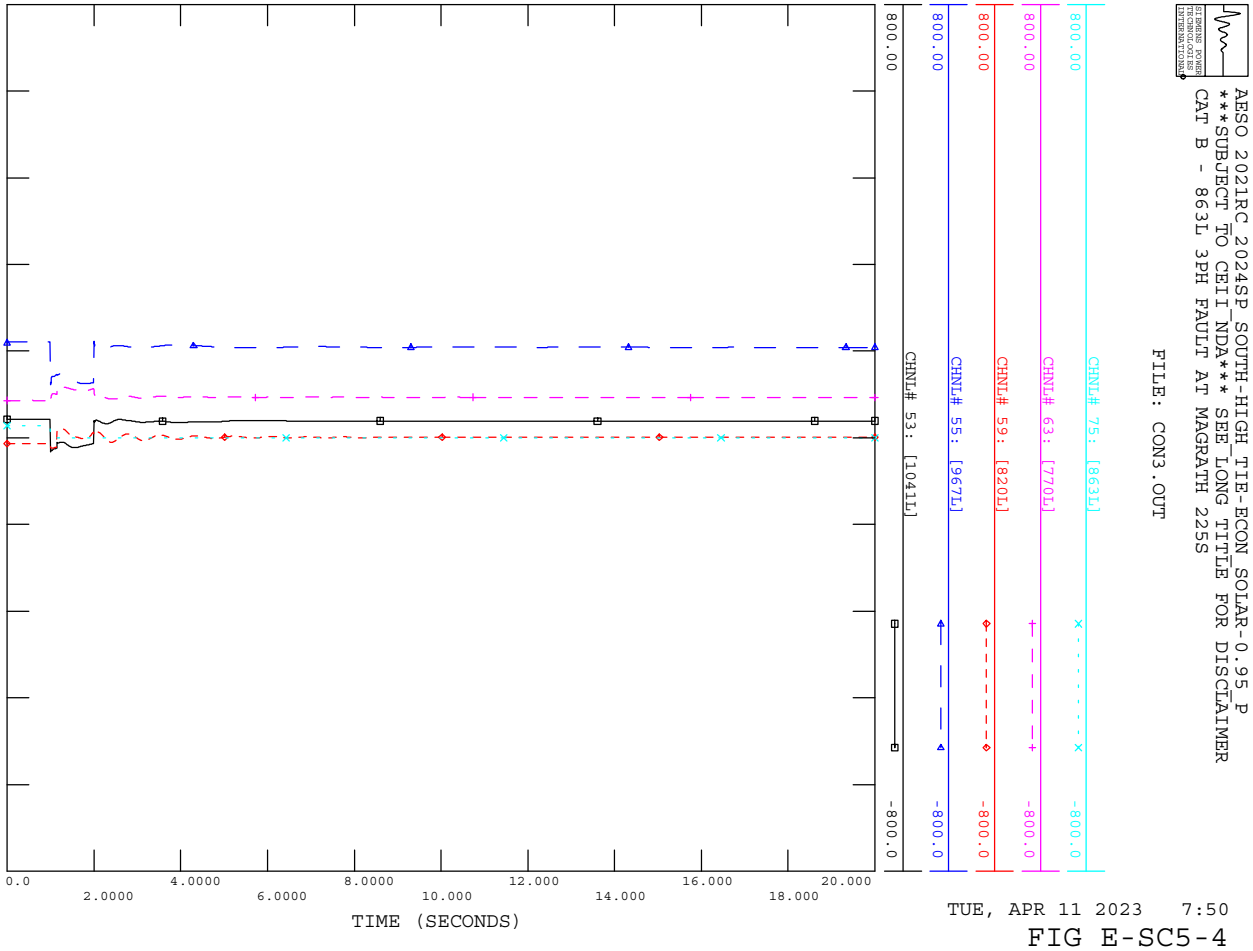


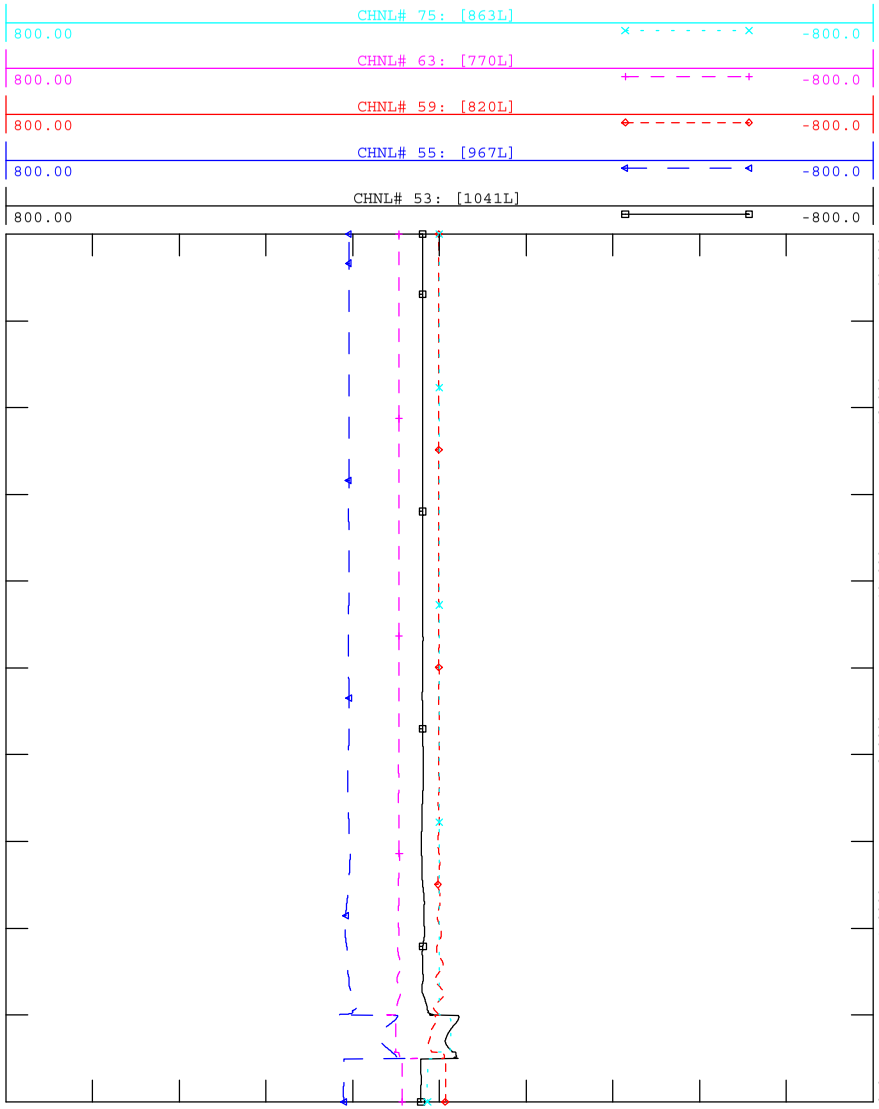
FIG E-SC5-4

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 863L 3PH FAULT AT RIVERBEND 618S

FILE: CON4.OUT

TUE, APR 11 2023 7:50

FIG E-SC5-5

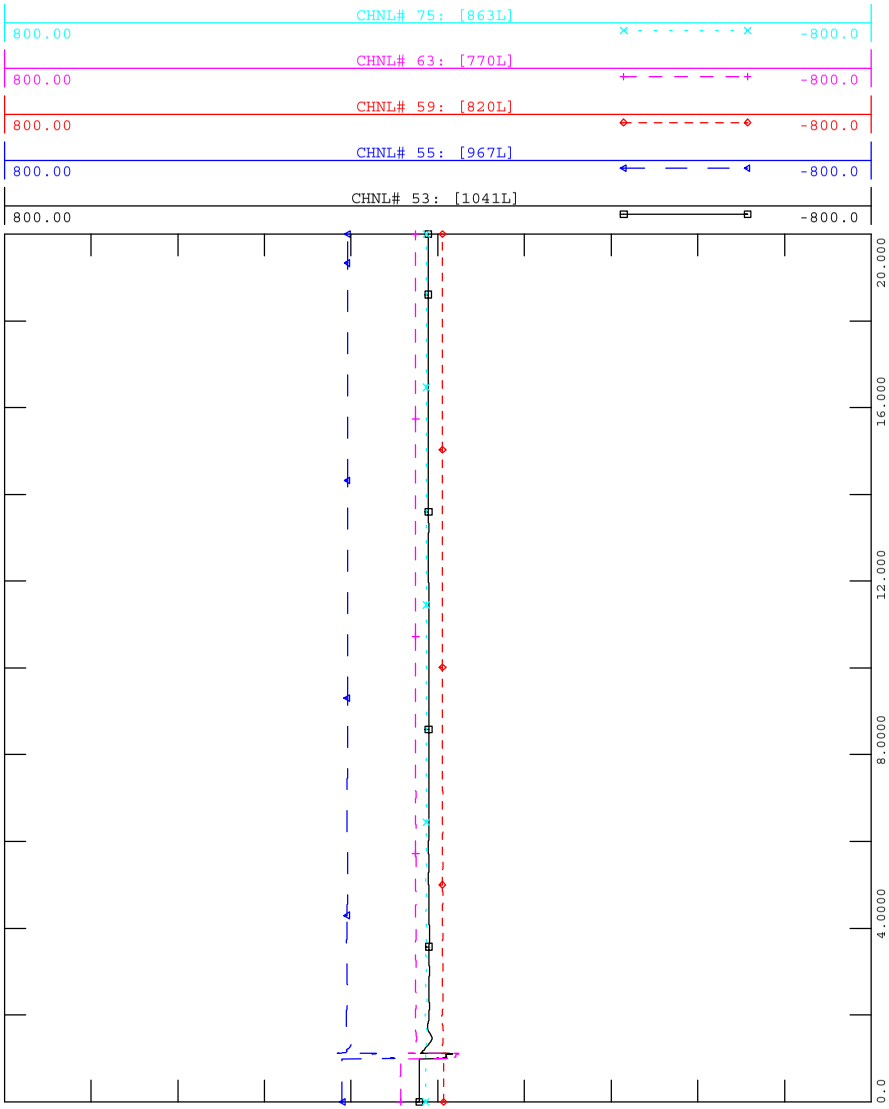


AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 172L 3PH FAULT AT TABER 83S

FILE: CON5.OUT

TUE, APR 11 2023 7:50

FIG E-SC5-6



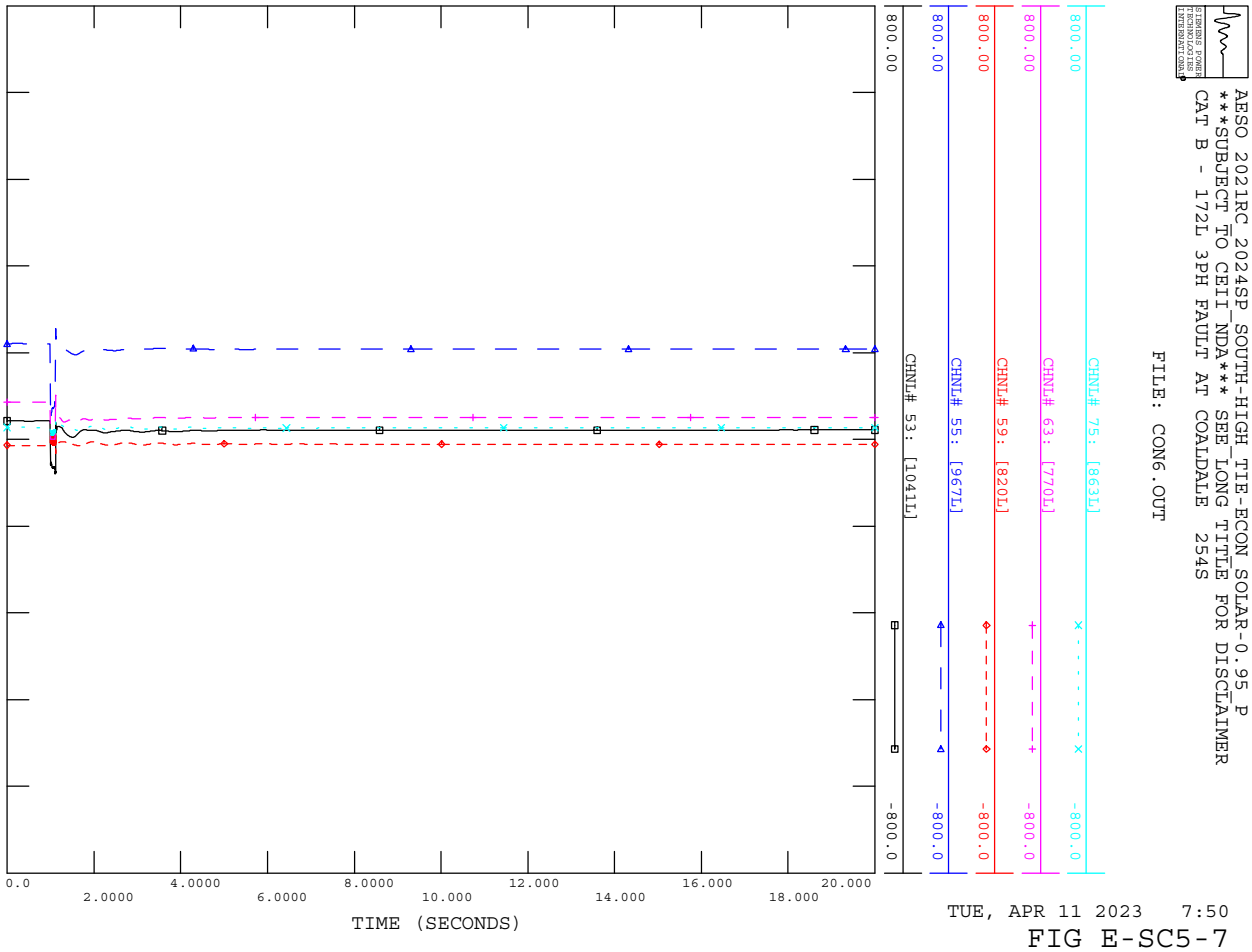


FIG E-SC5-7

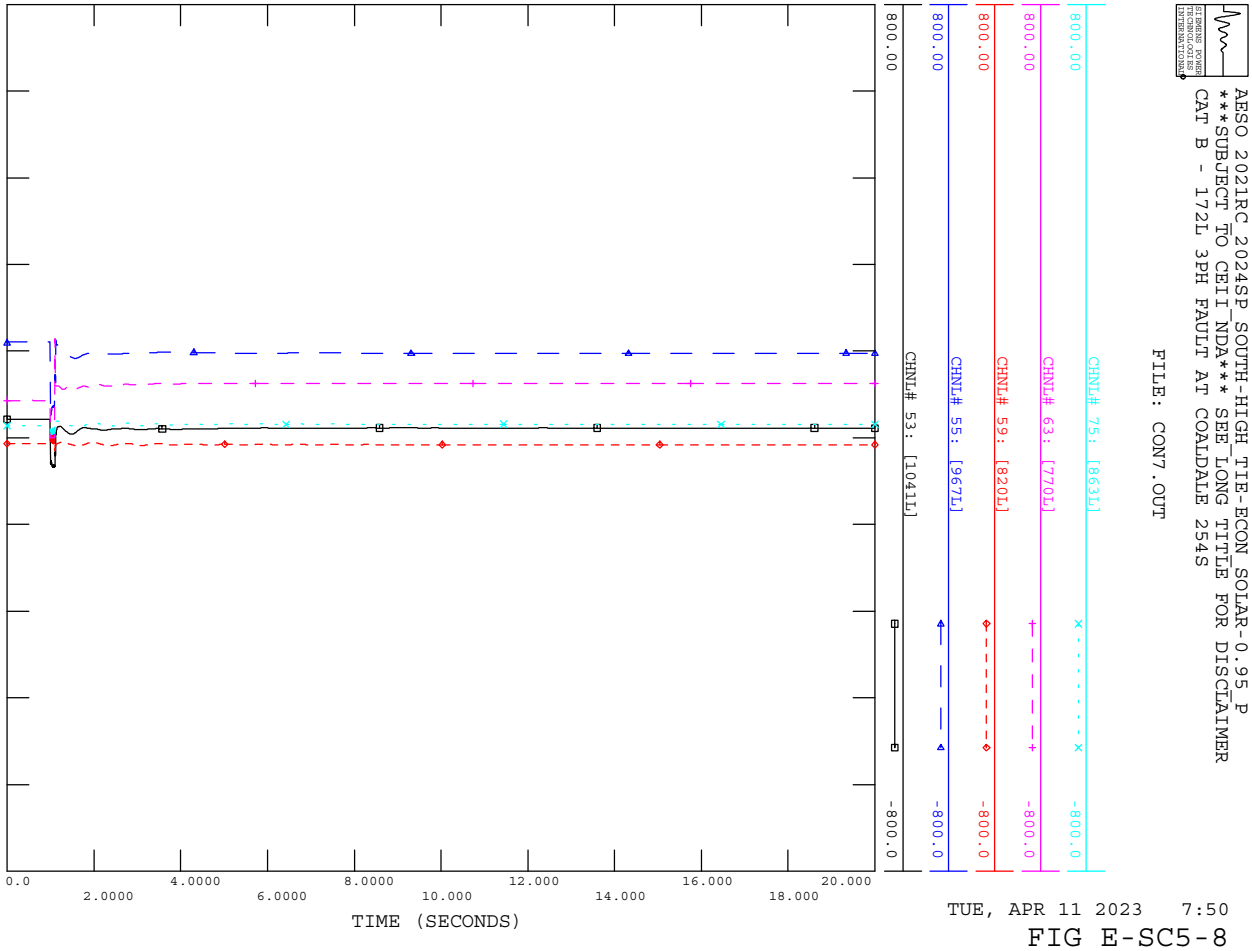


FIG E-SC5-8

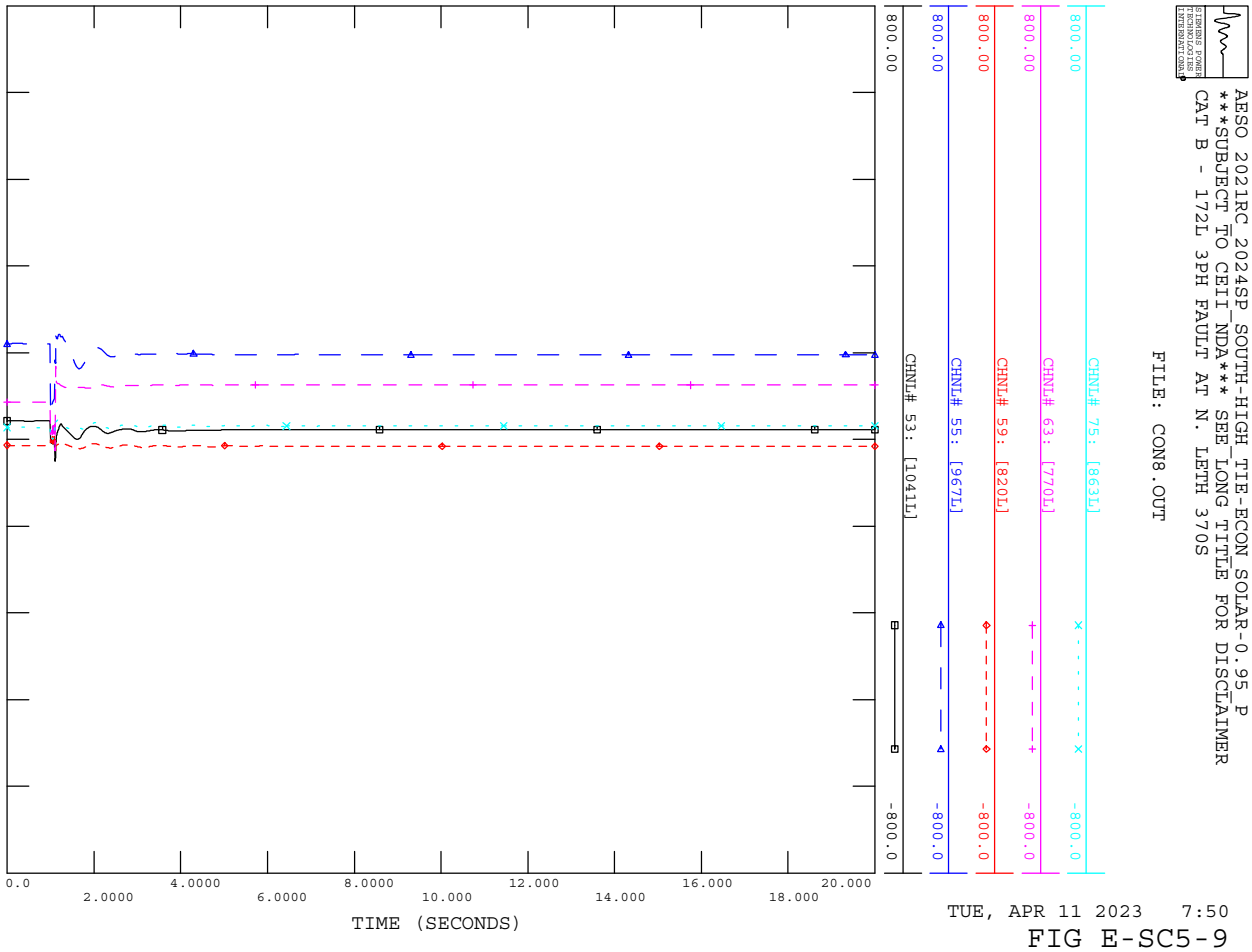


FIG E-SC5-9

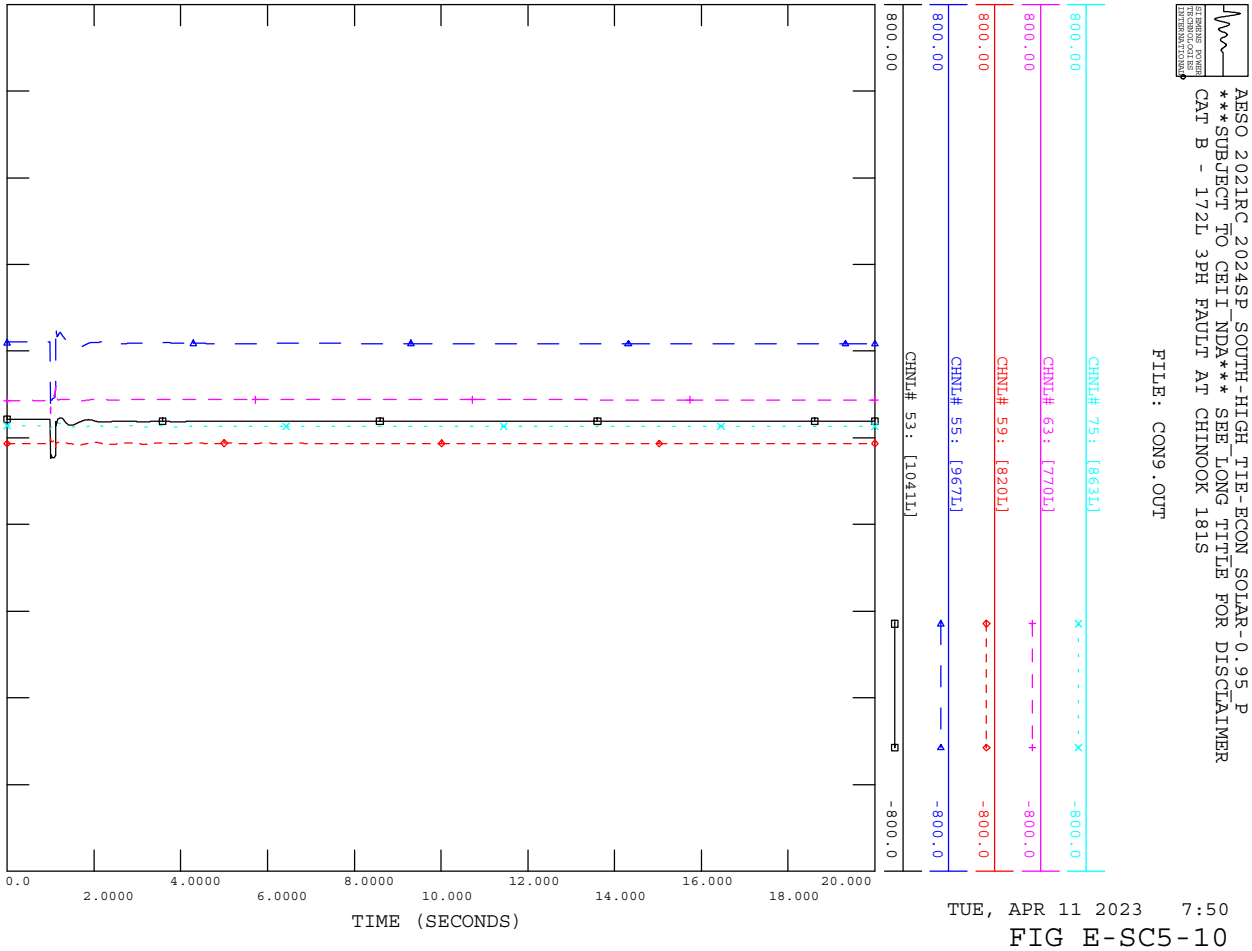


FIG E-SC5-10

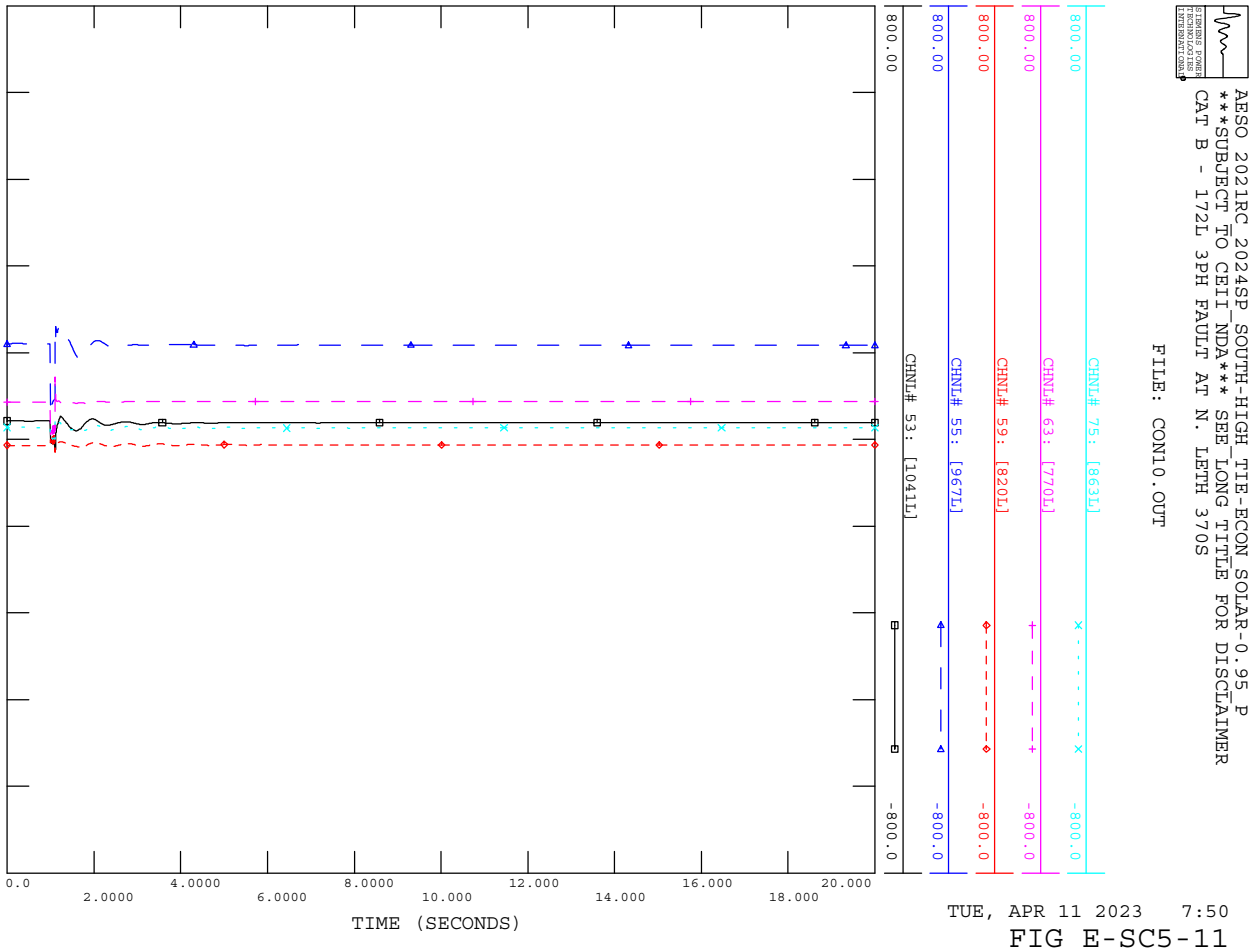


FIG E-SC5-11

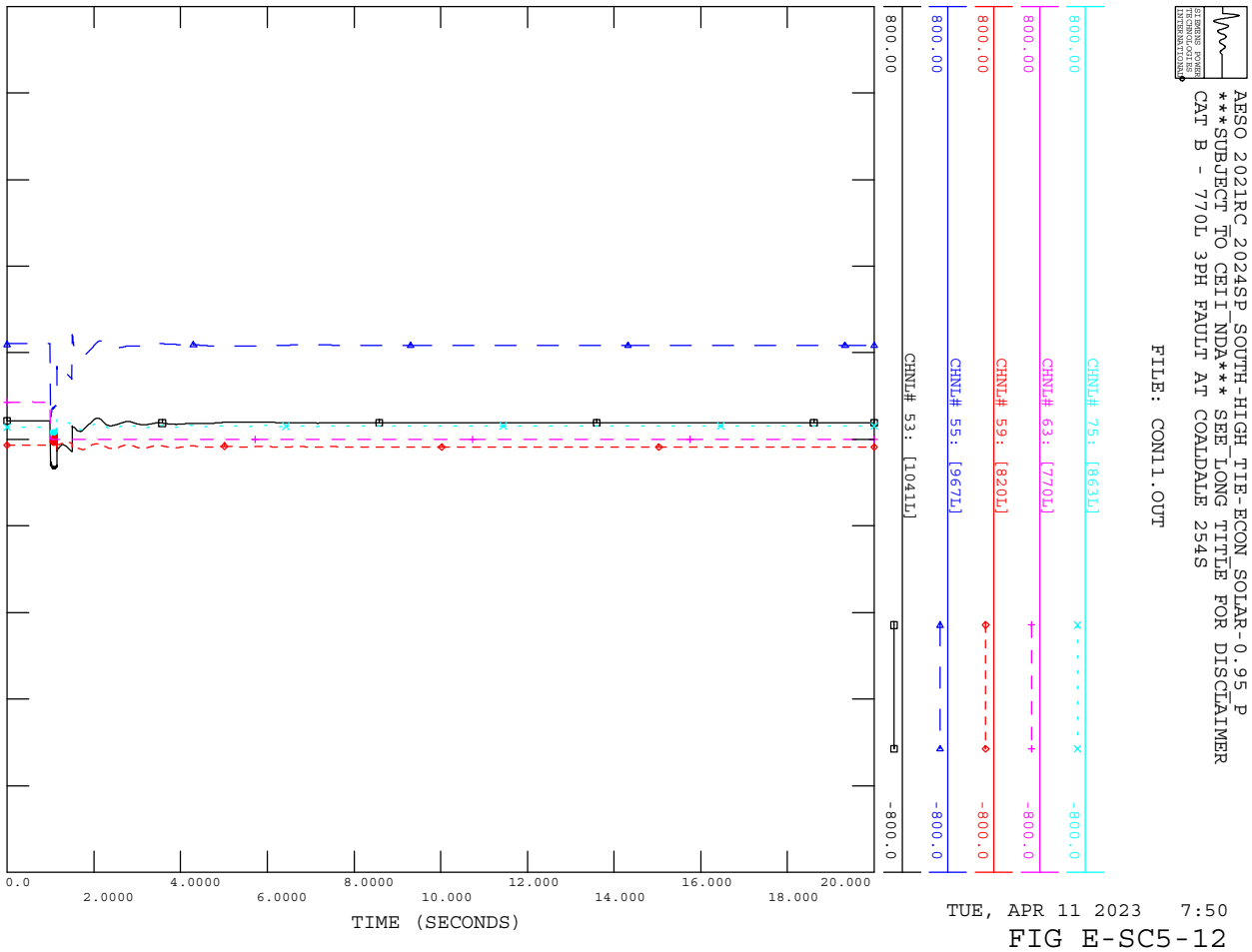


FIG E-SC5-12

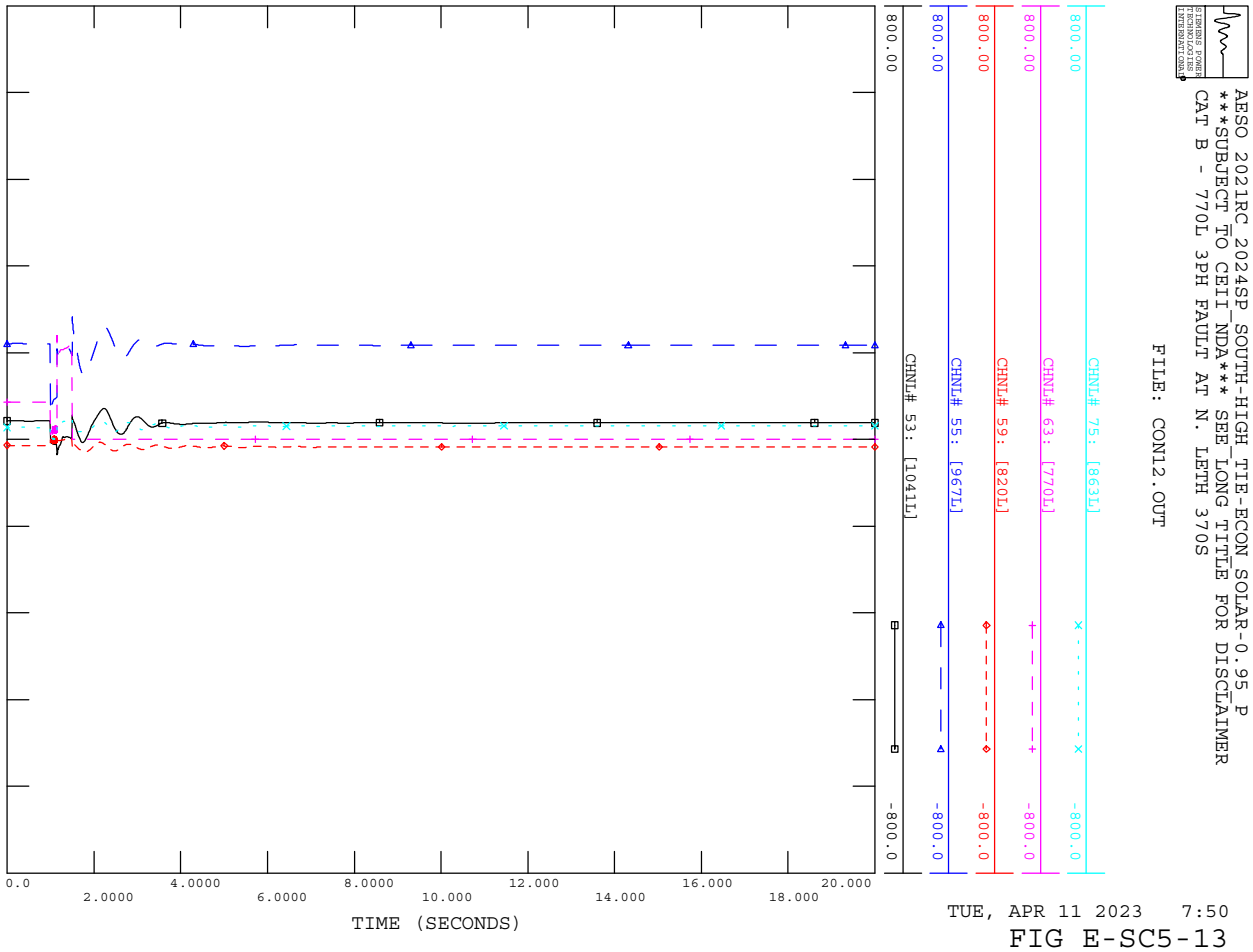


FIG E-SC5-13

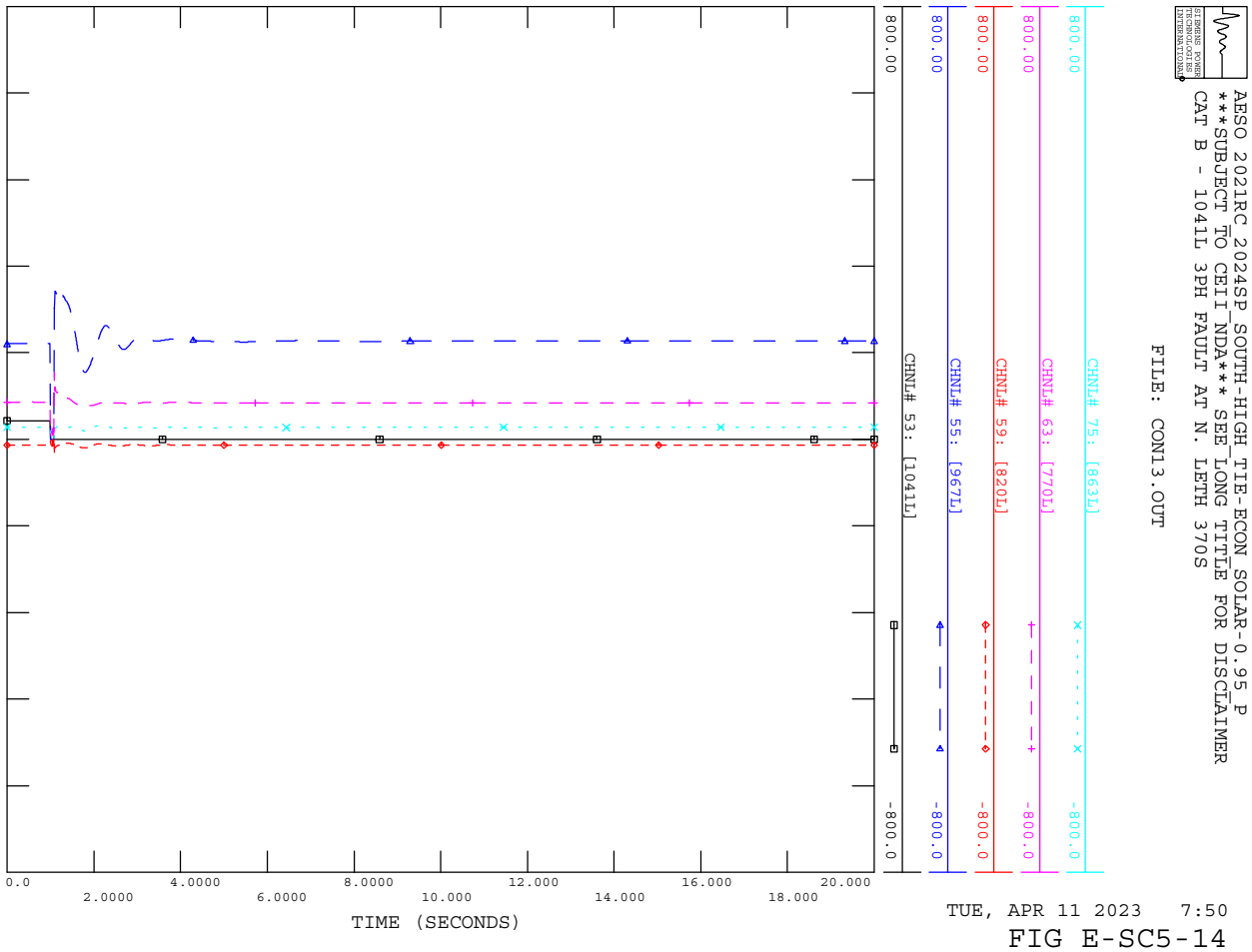


FIG E-SC5-14

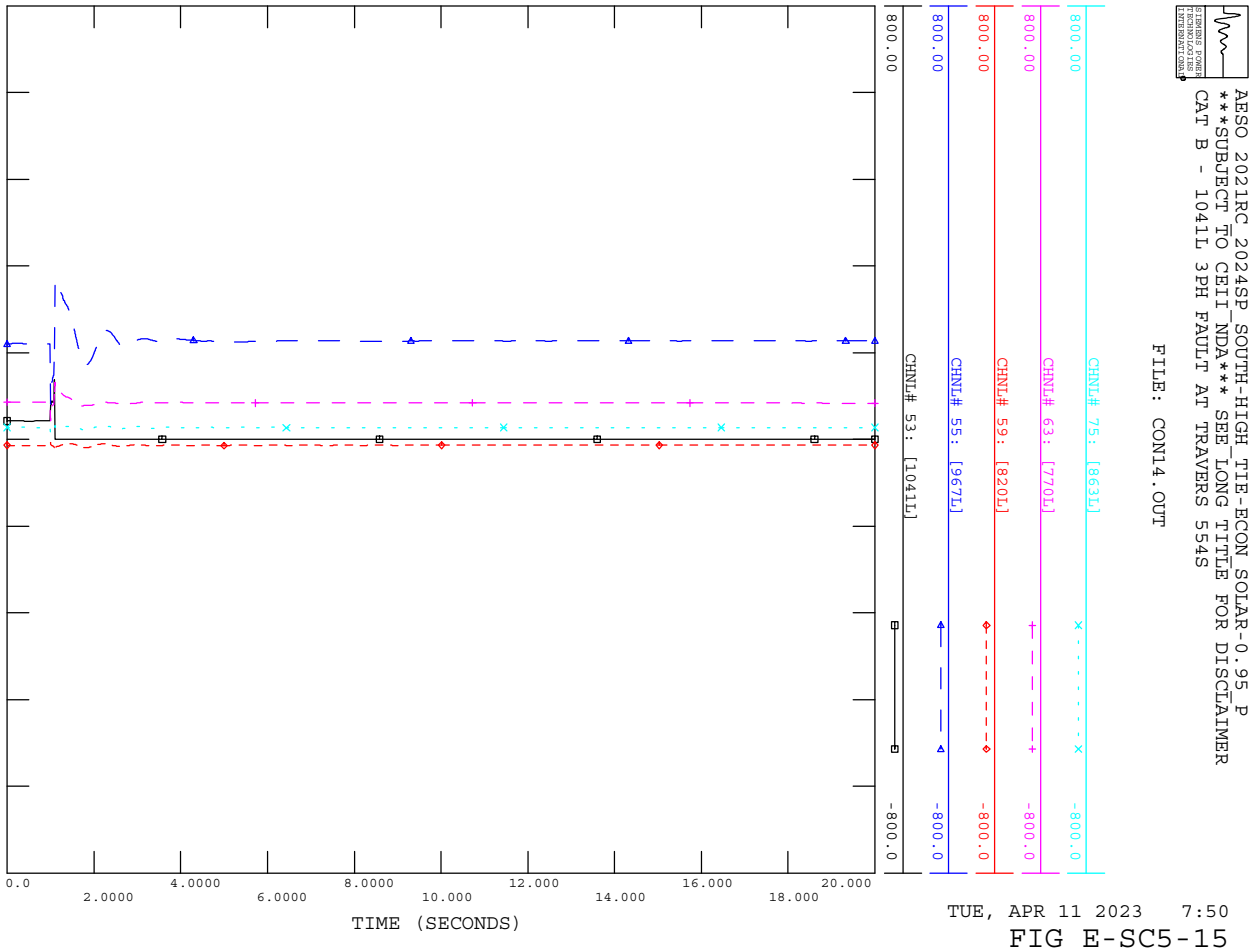


FIG E-SC5-15

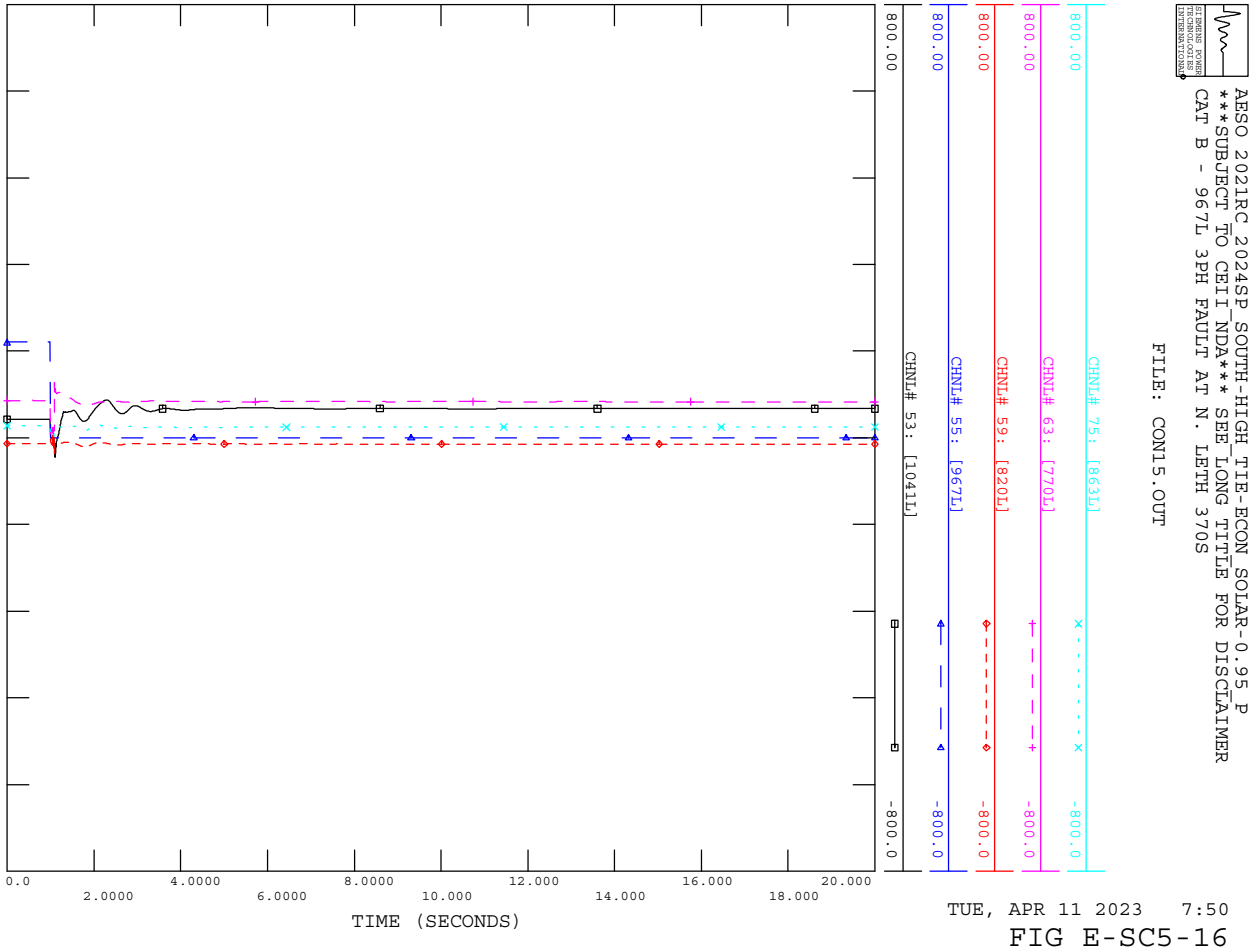


FIG E-SC5-16

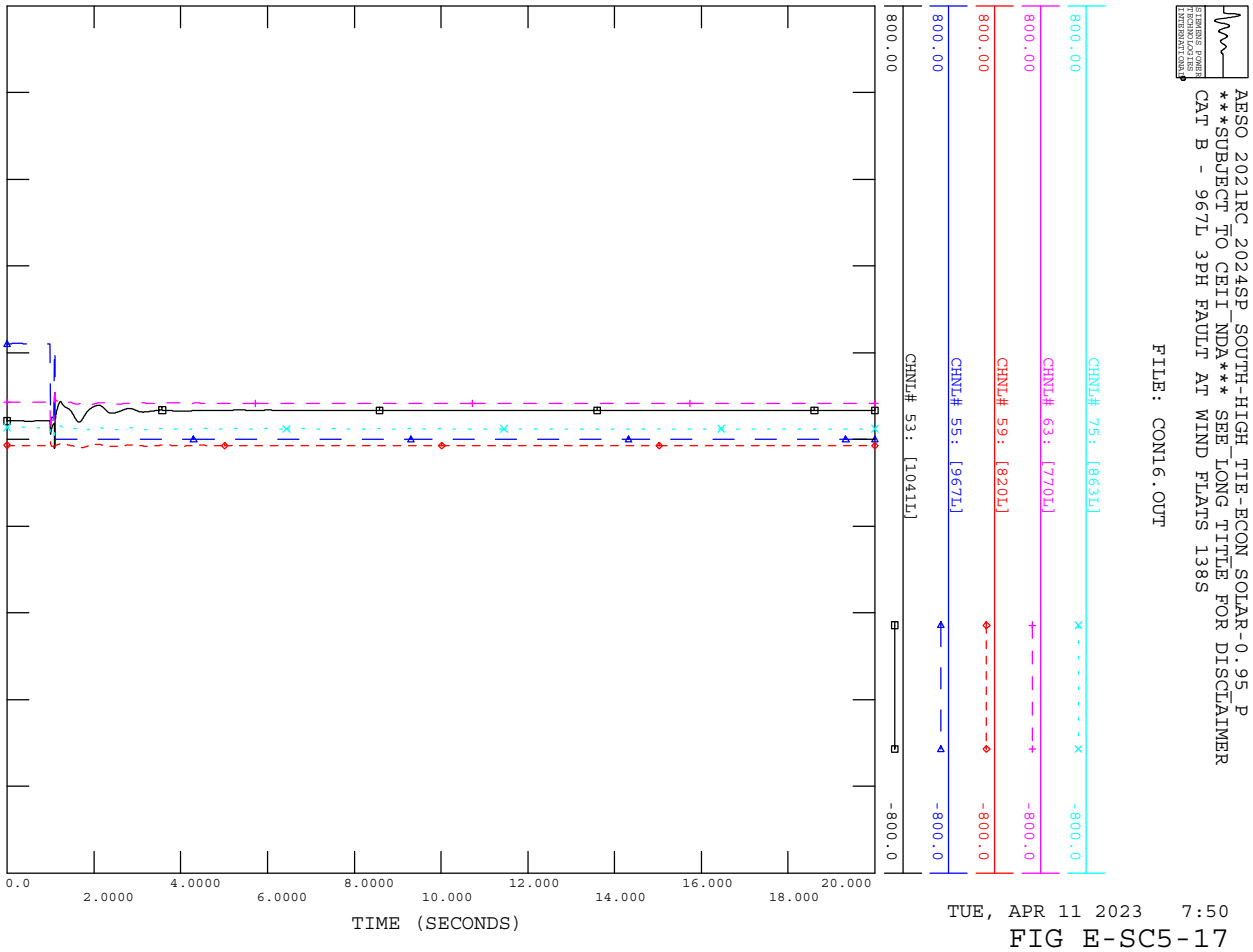


FIG E-SC5-17

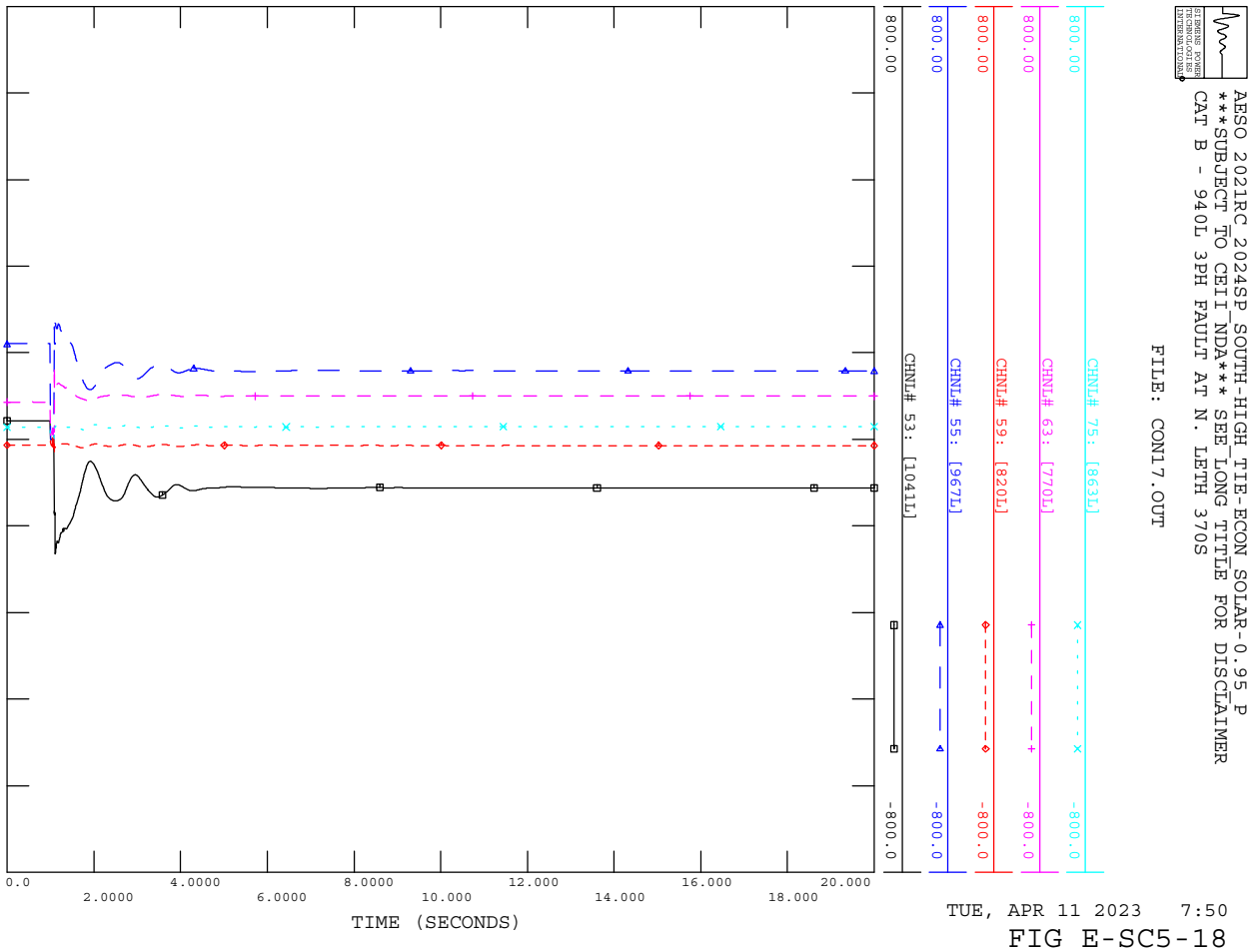


FIG E-SC5-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

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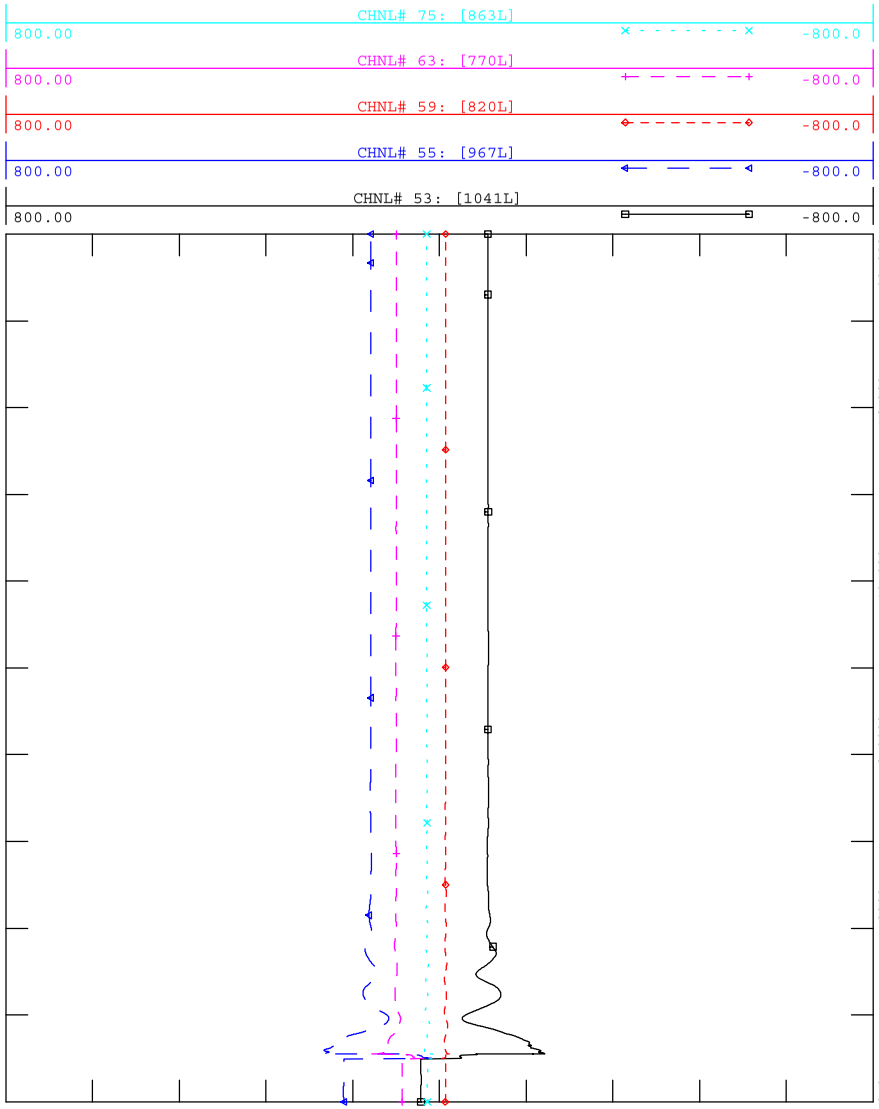
FIG E-SC5-19



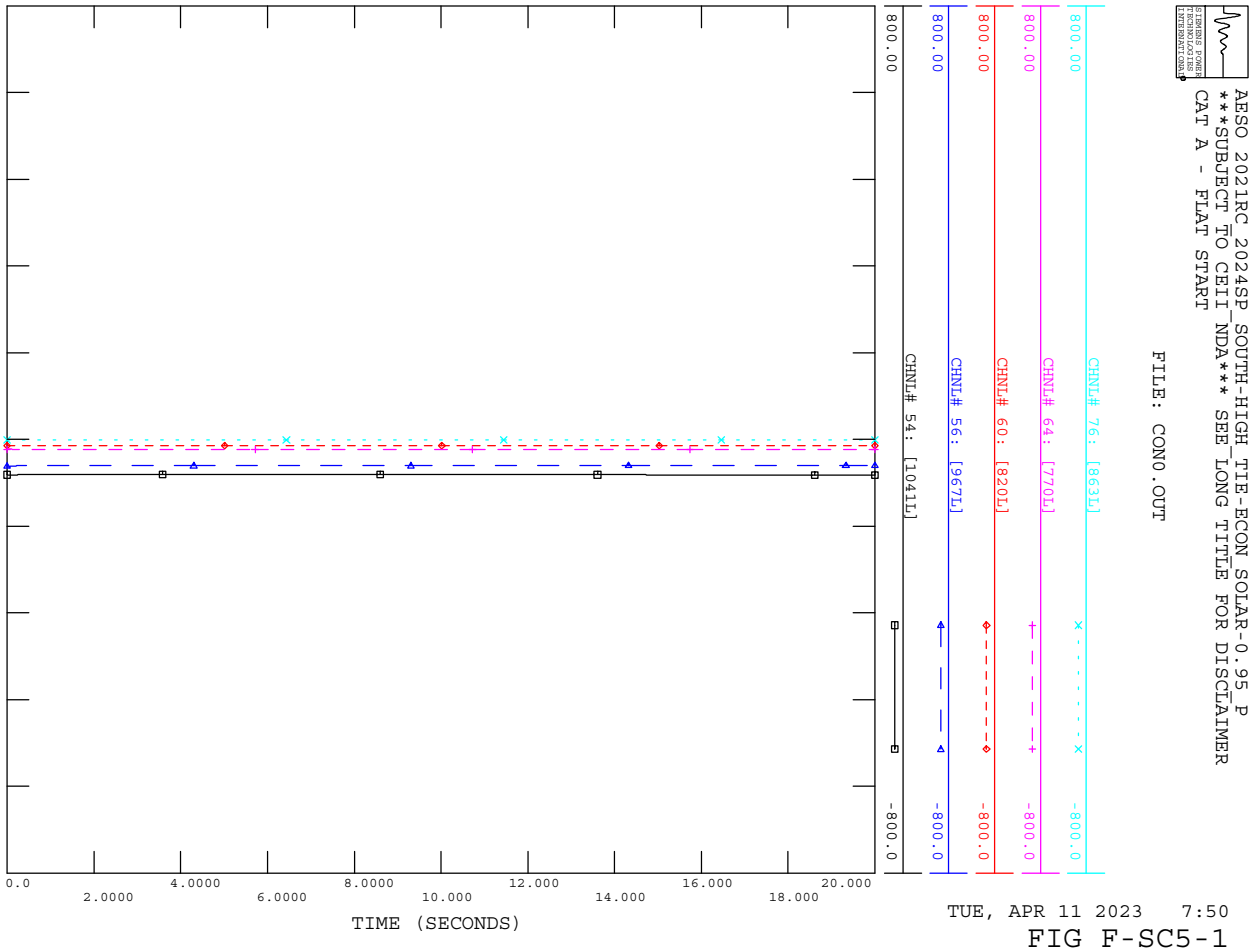


FIG F-SC5-1

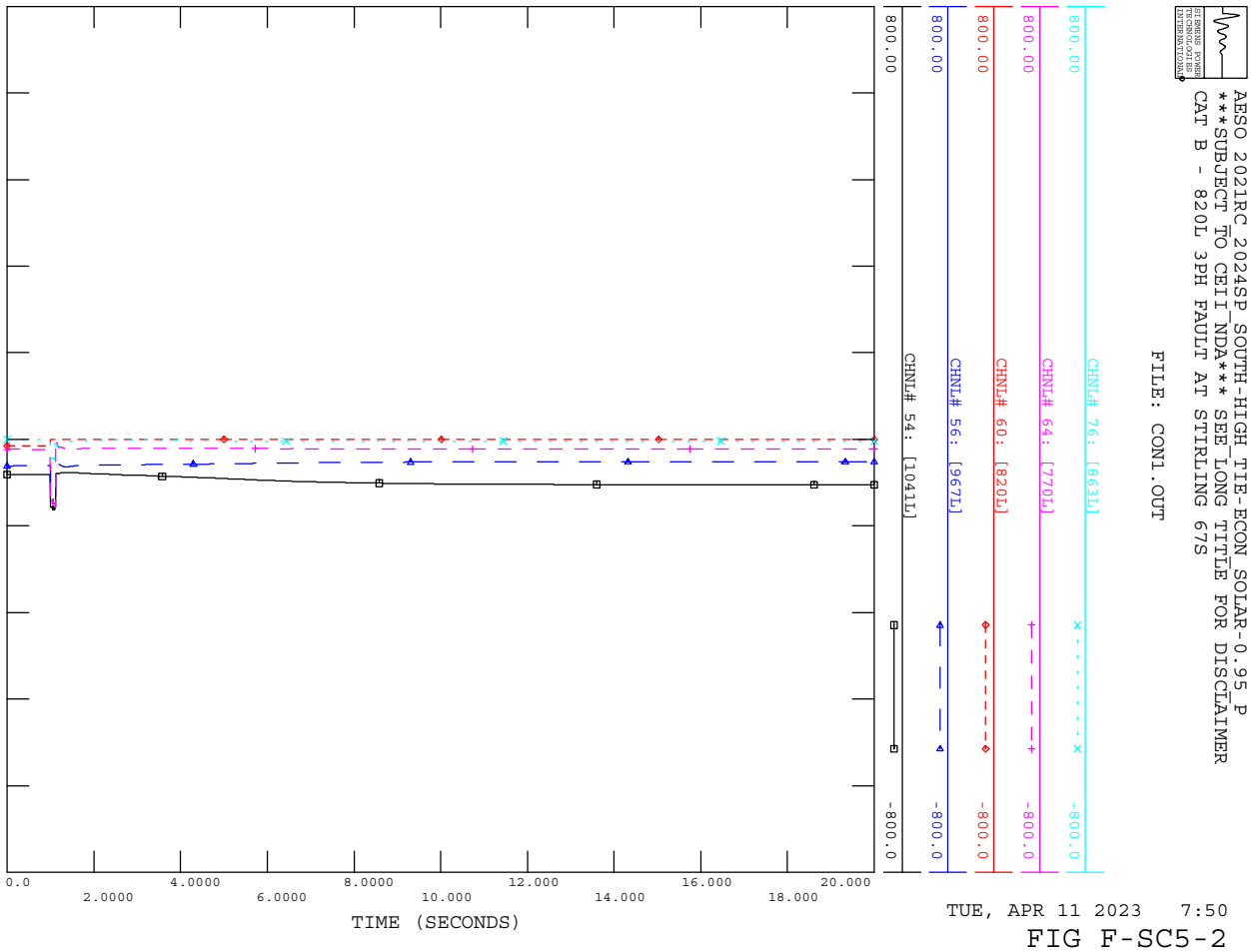


FIG F-SC5-2

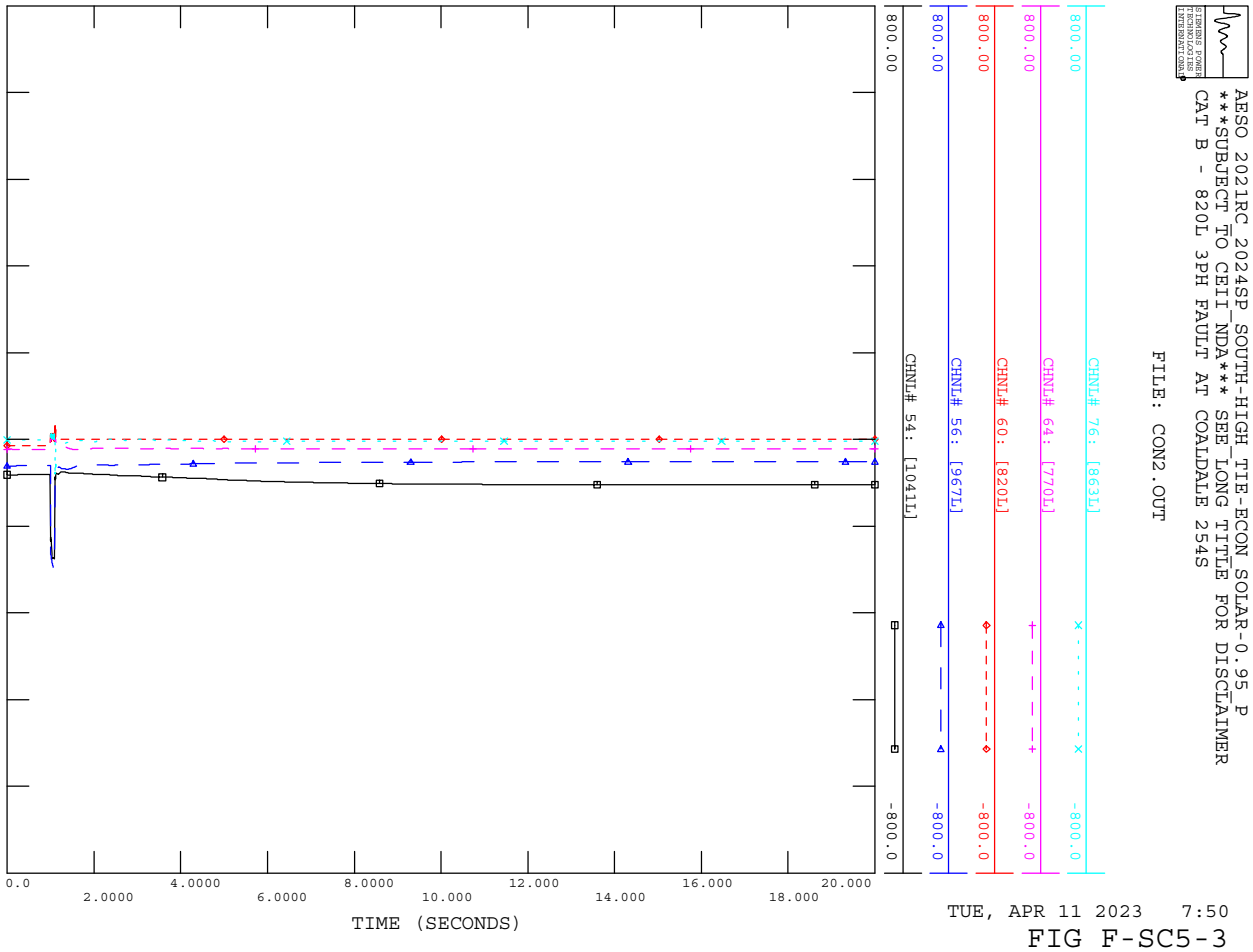


FIG F-SC5-3

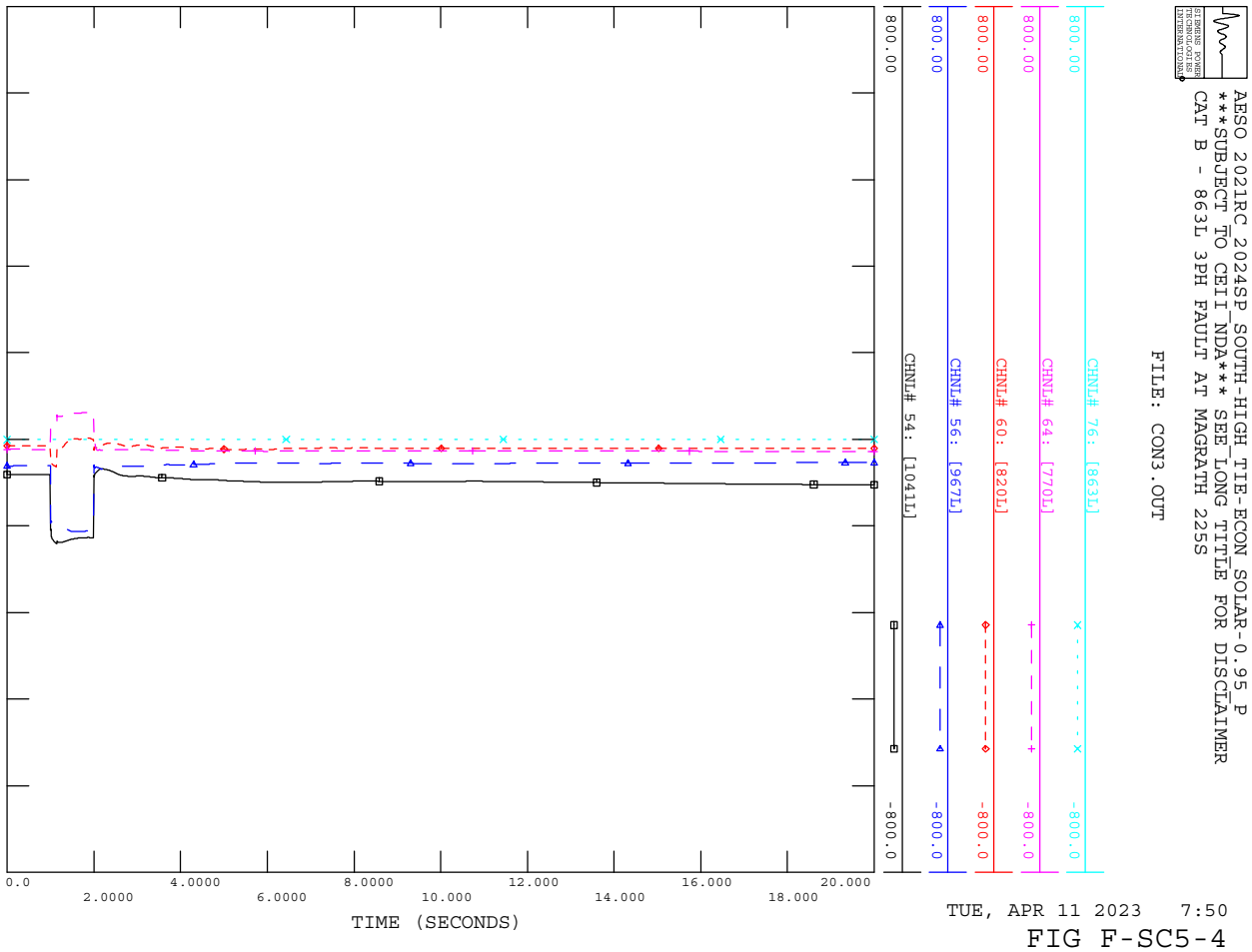


FIG F-SC5-4

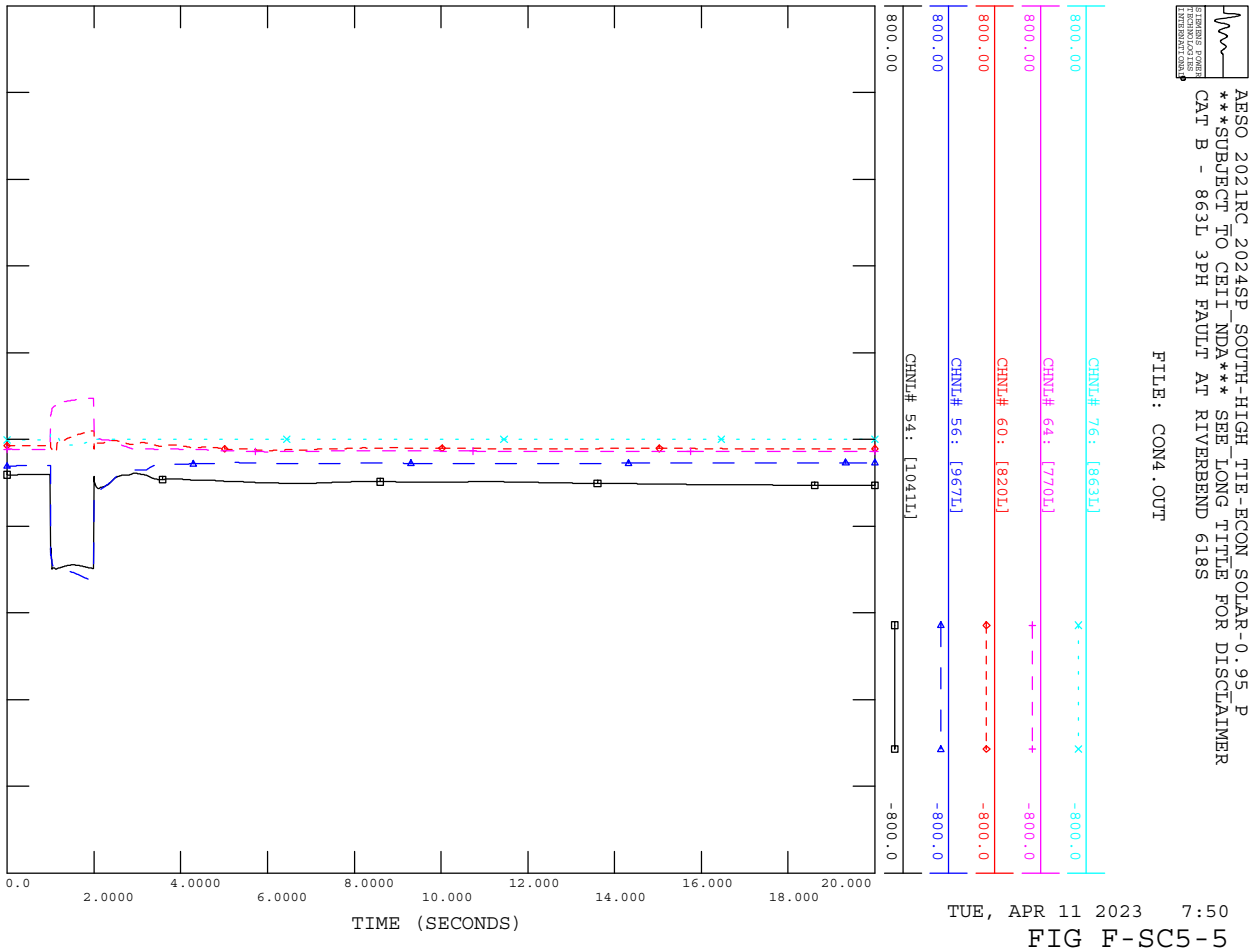


FIG F-SC5-5

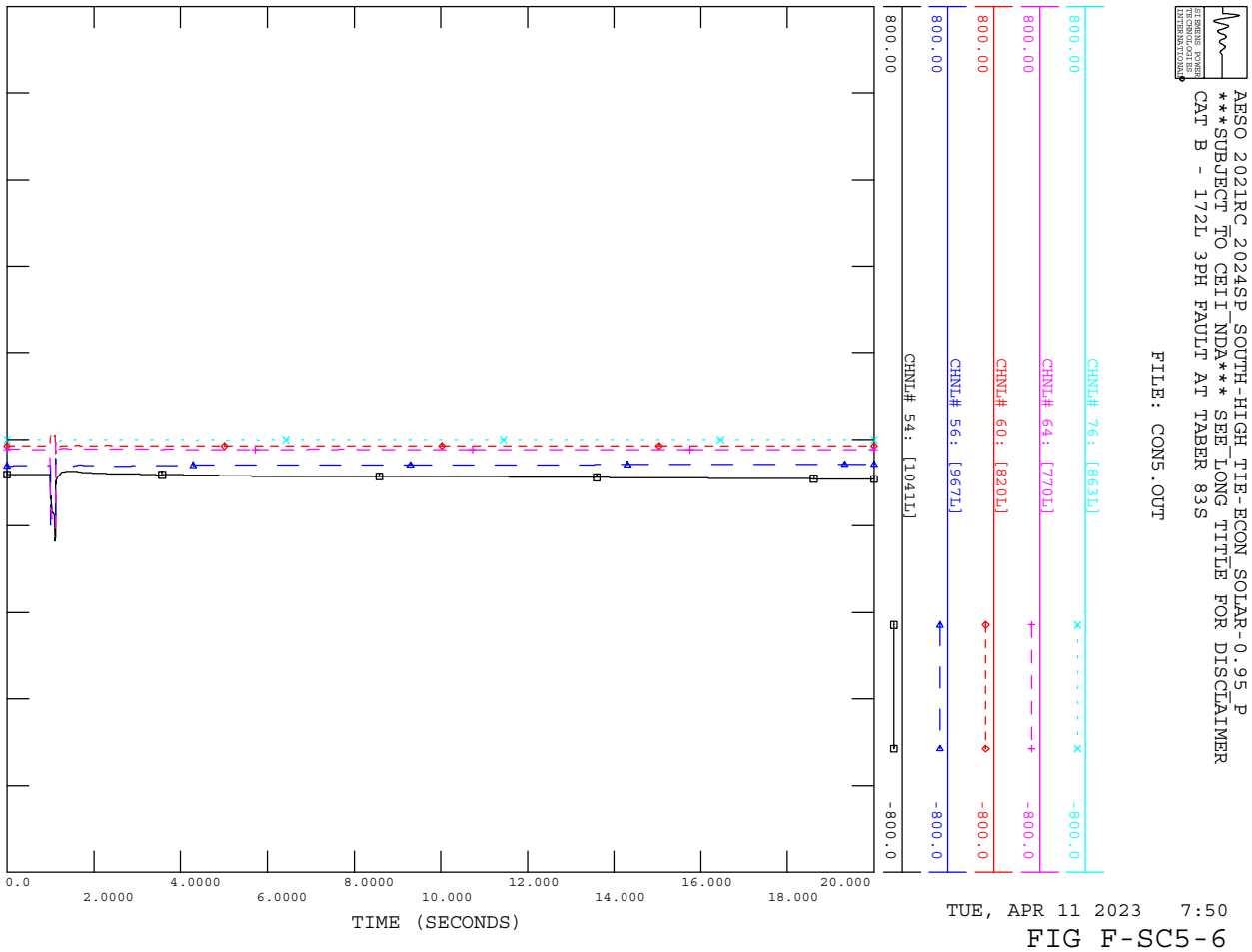


FIG F-SC5-6

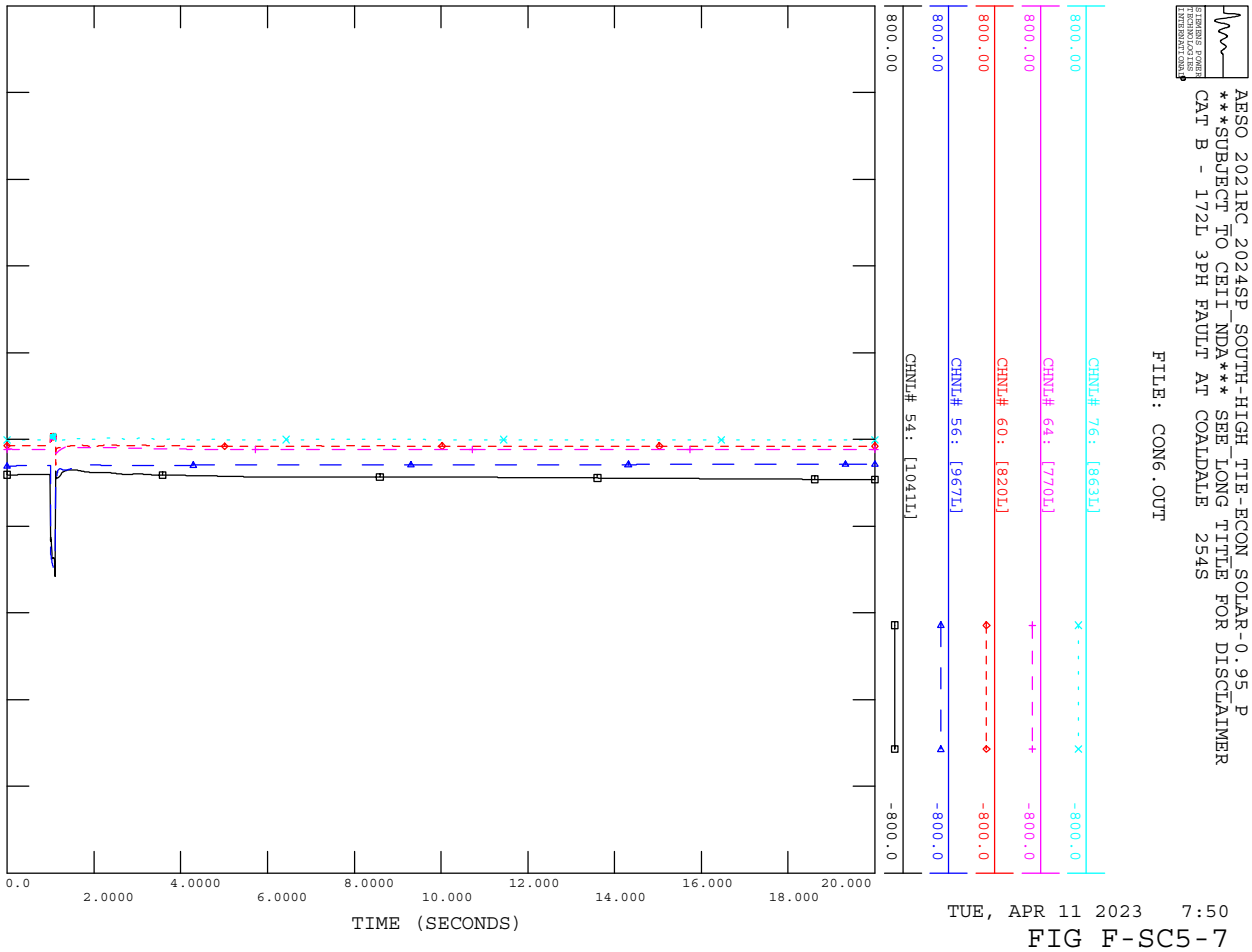


FIG F-SC5-7

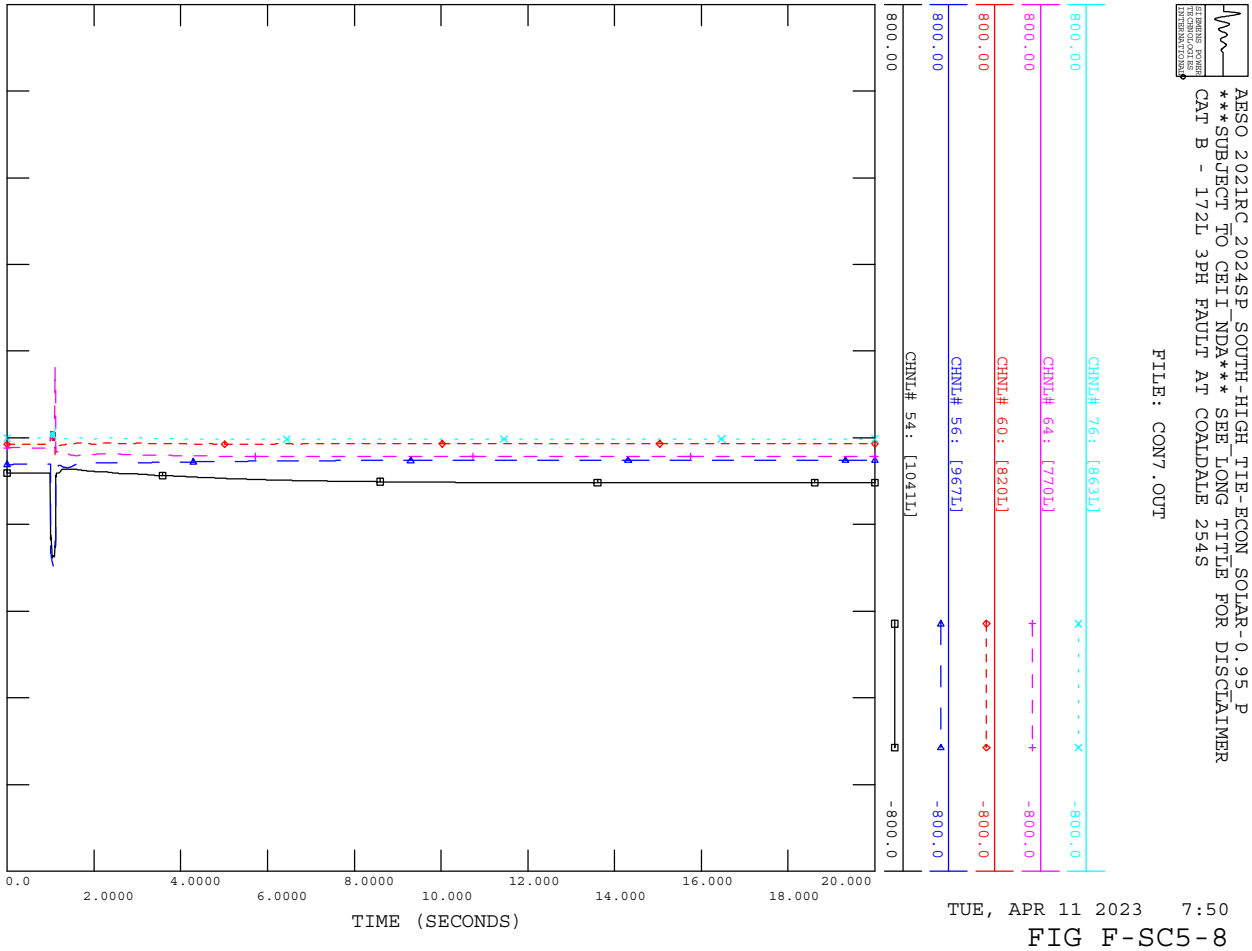


FIG F-SC5-8

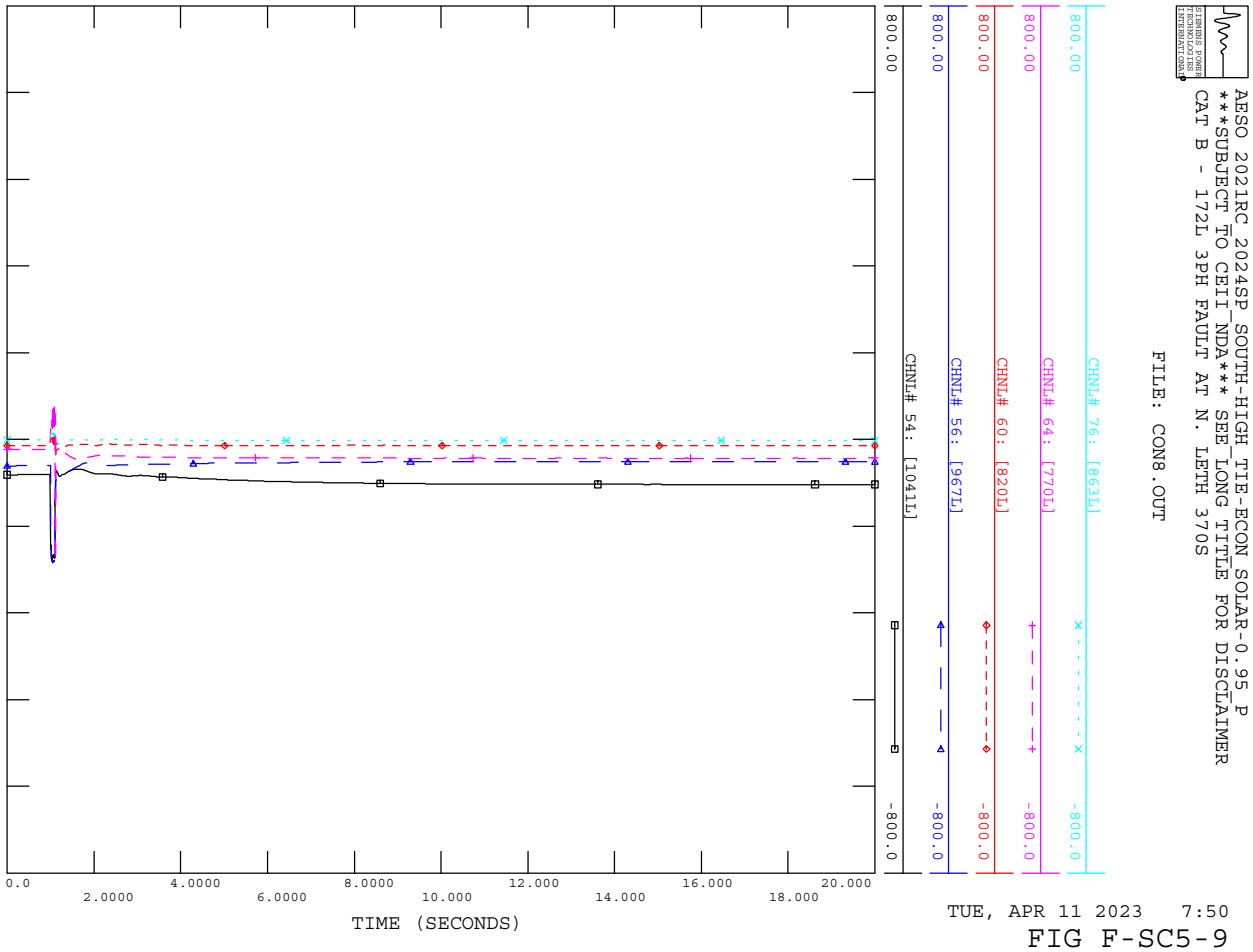


FIG F-SC5-9

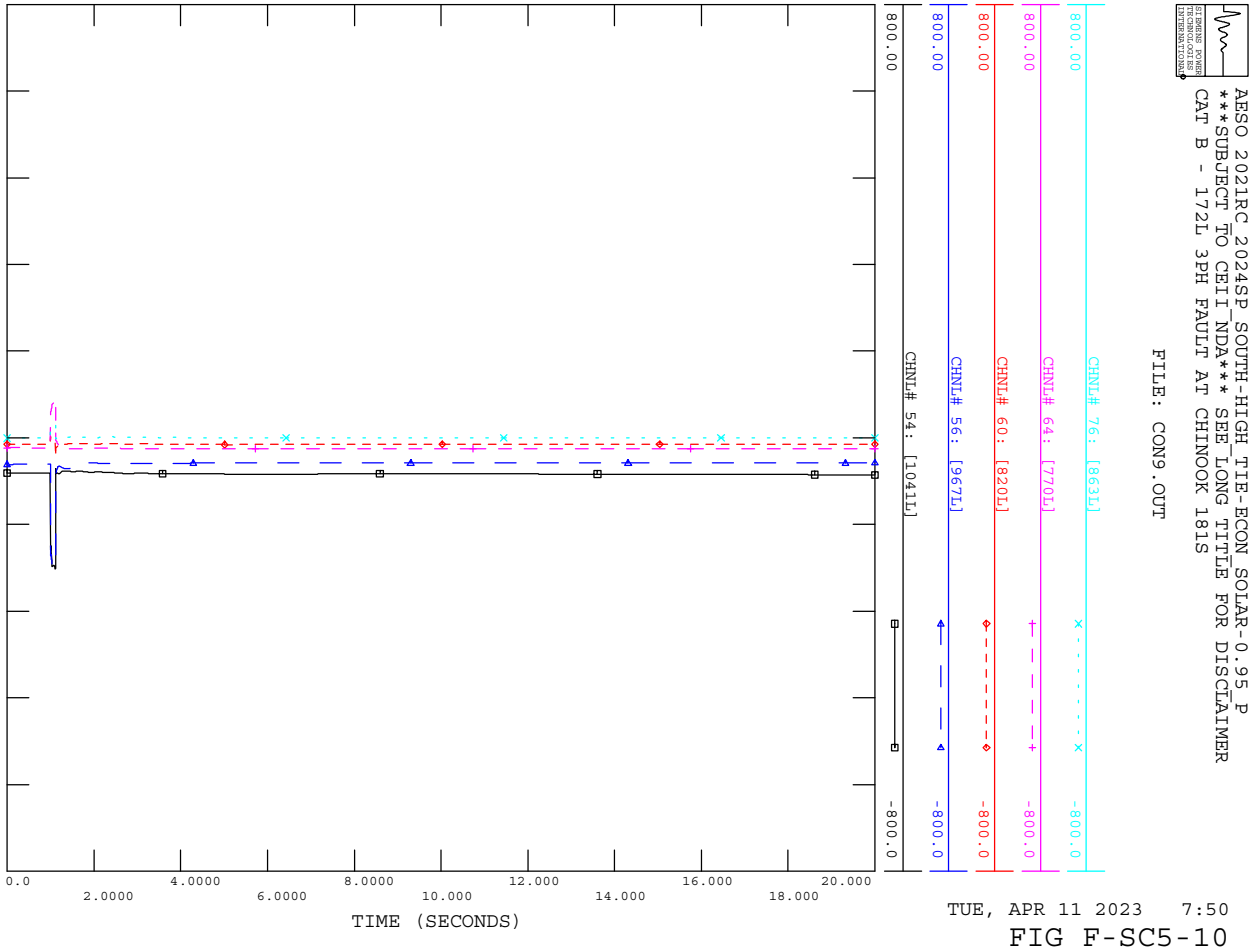


FIG F-SC5-10

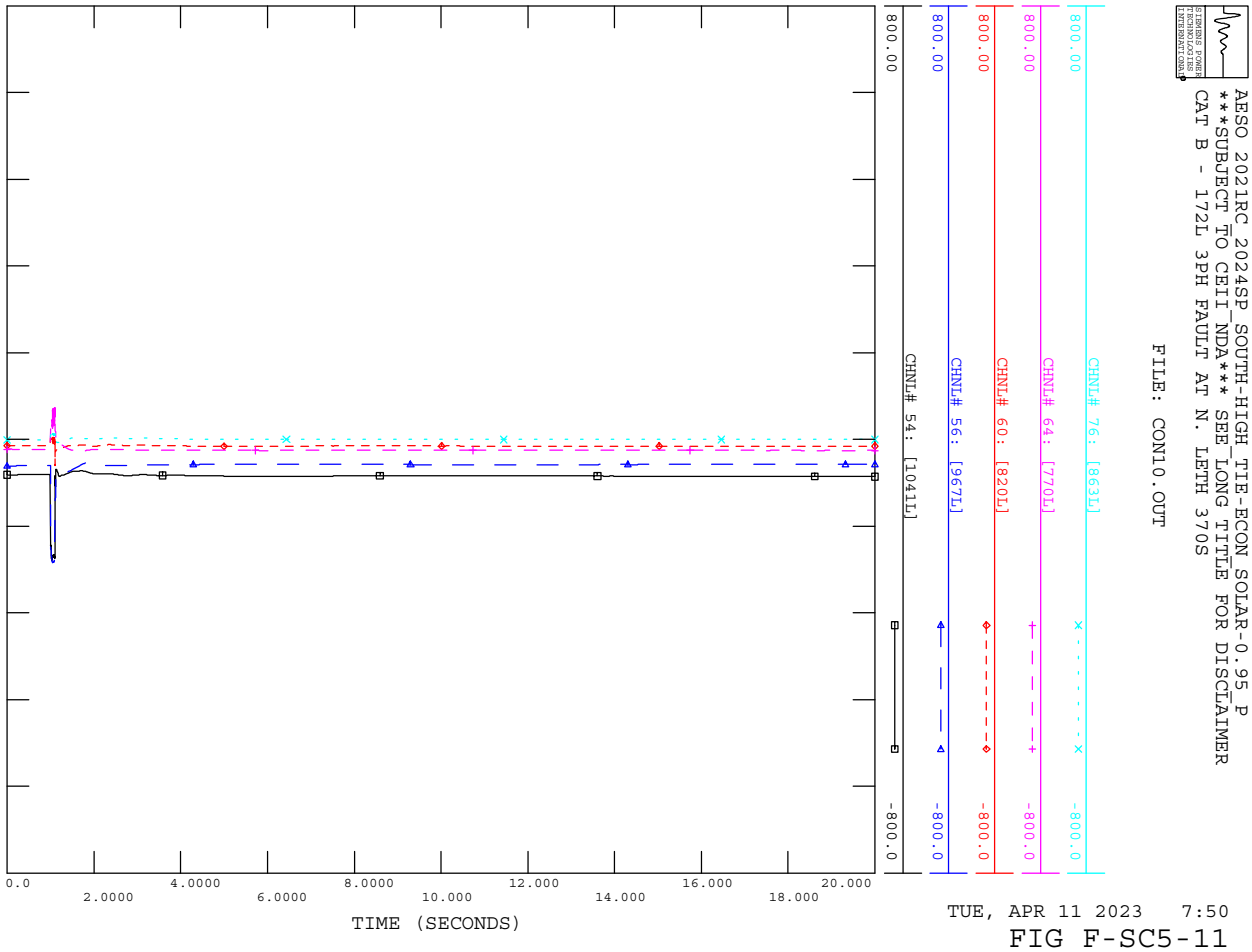


FIG F-SC5-11

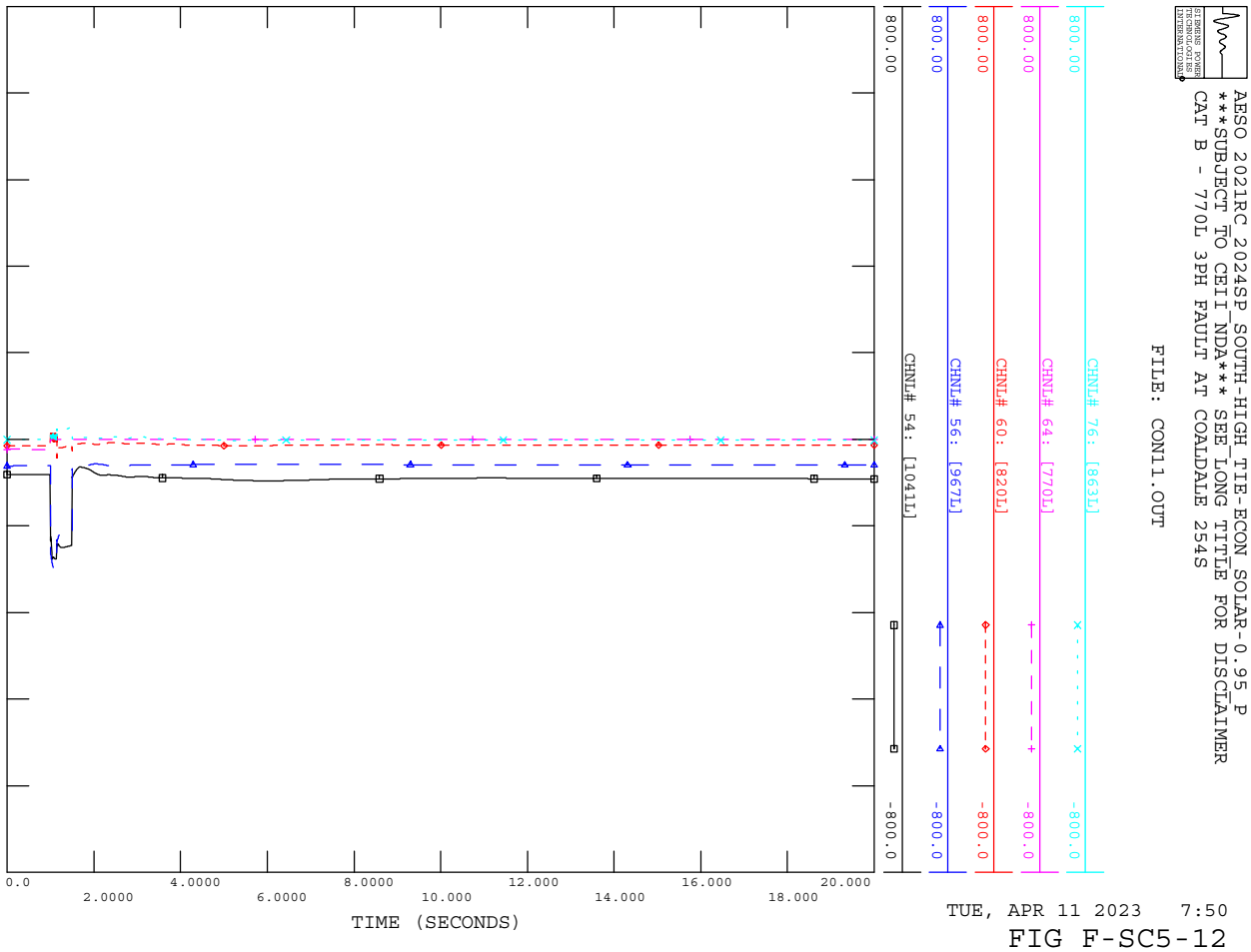


FIG F-SC5-12

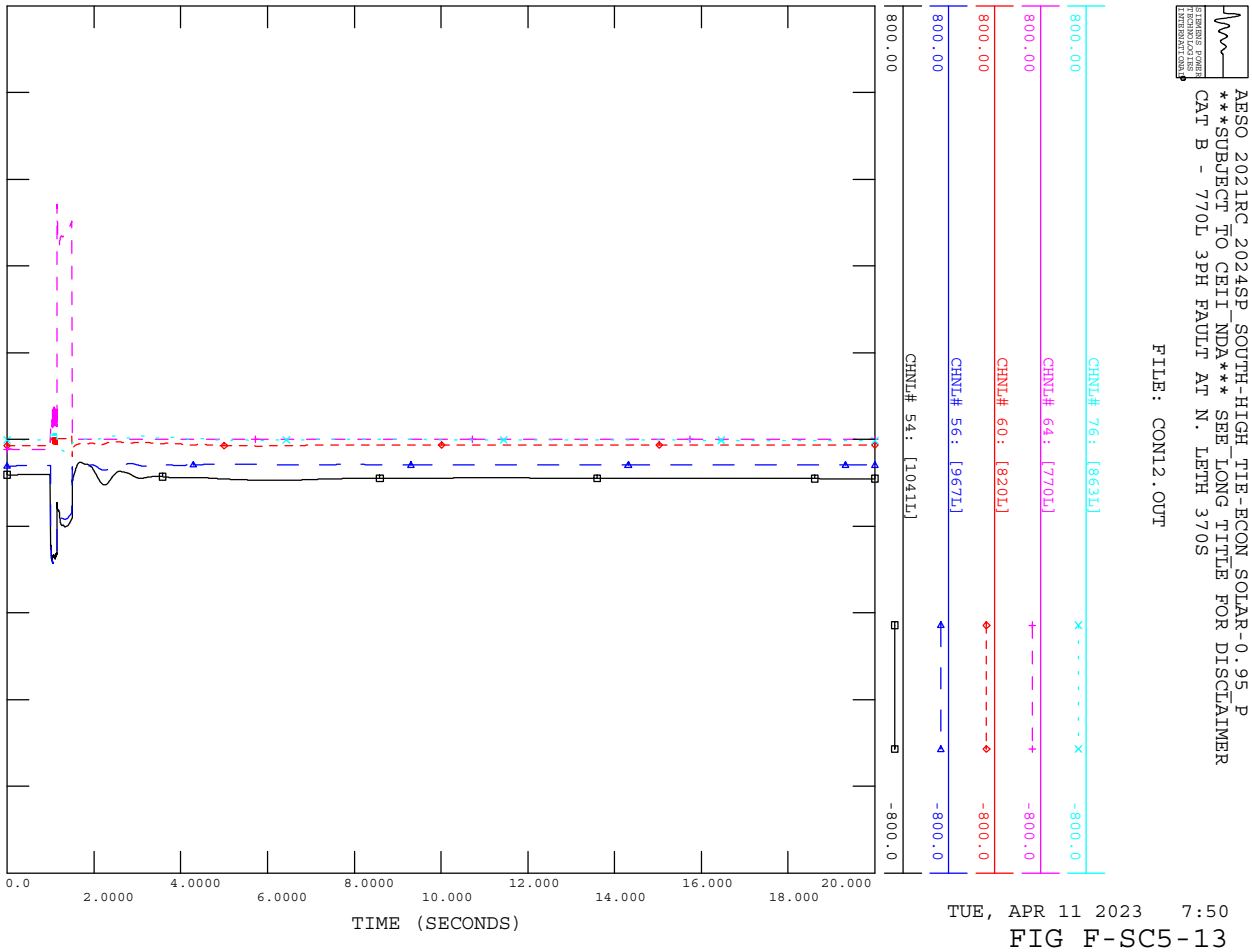


FIG F-SC5-13

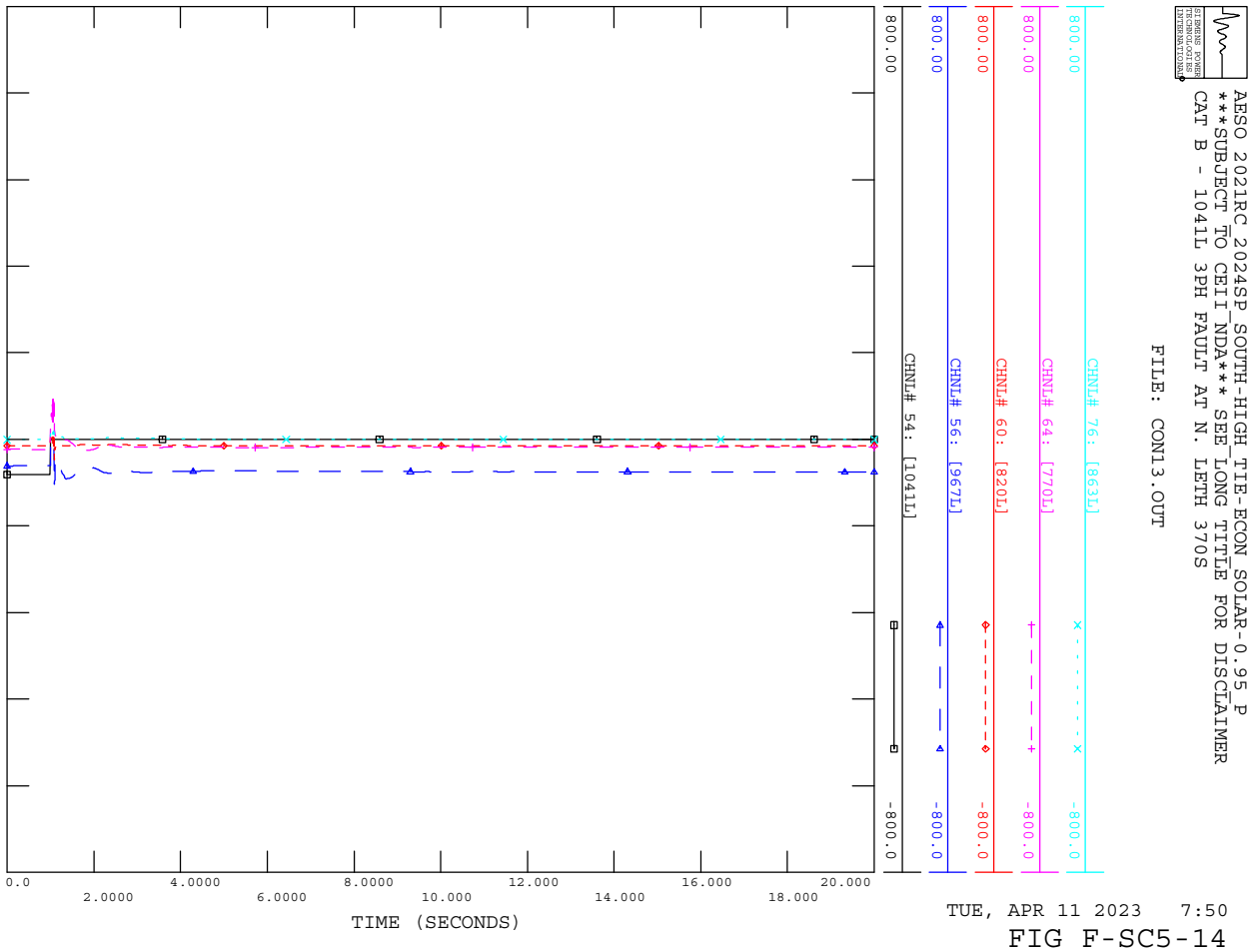


FIG F-SC5-14

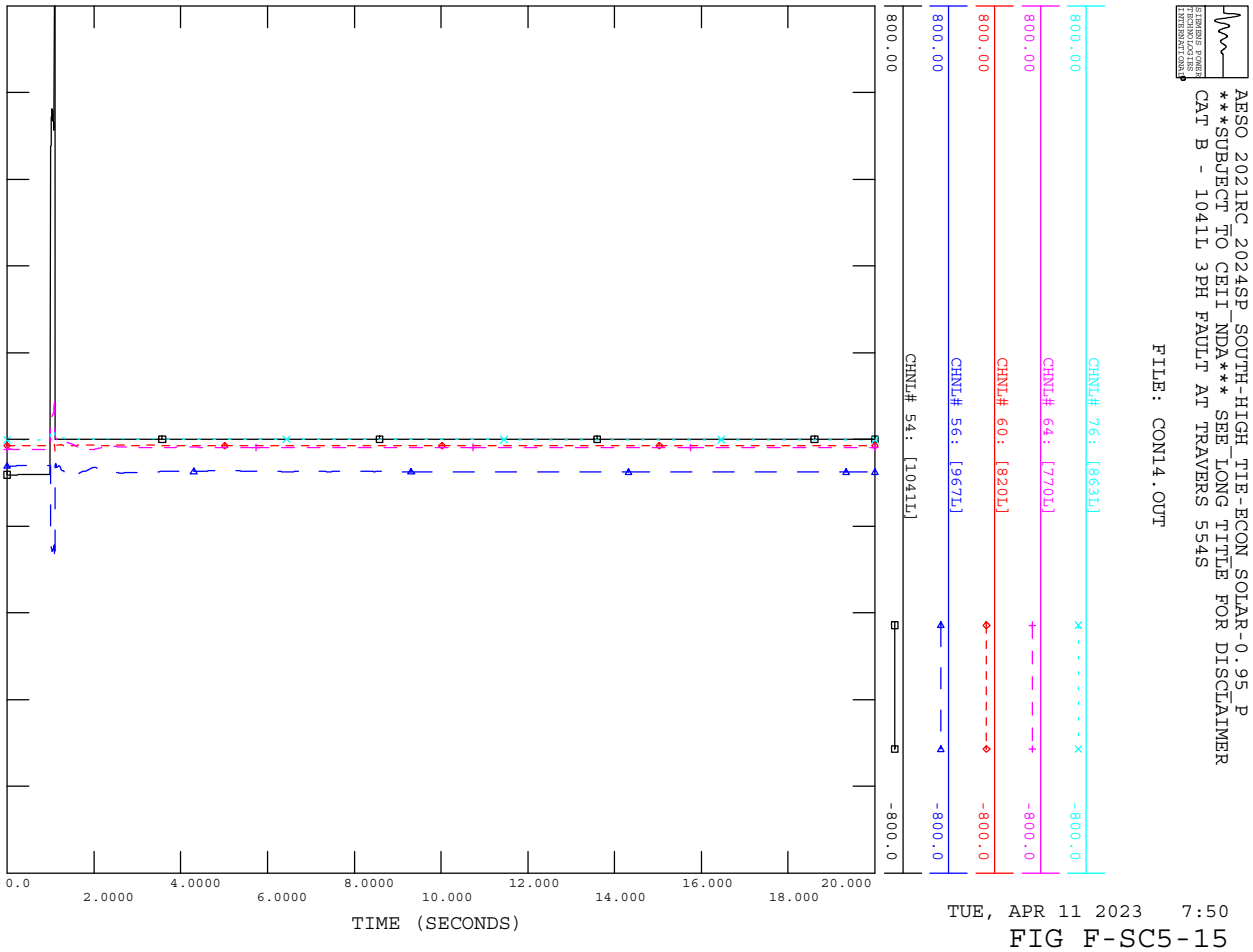


FIG F-SC5-15

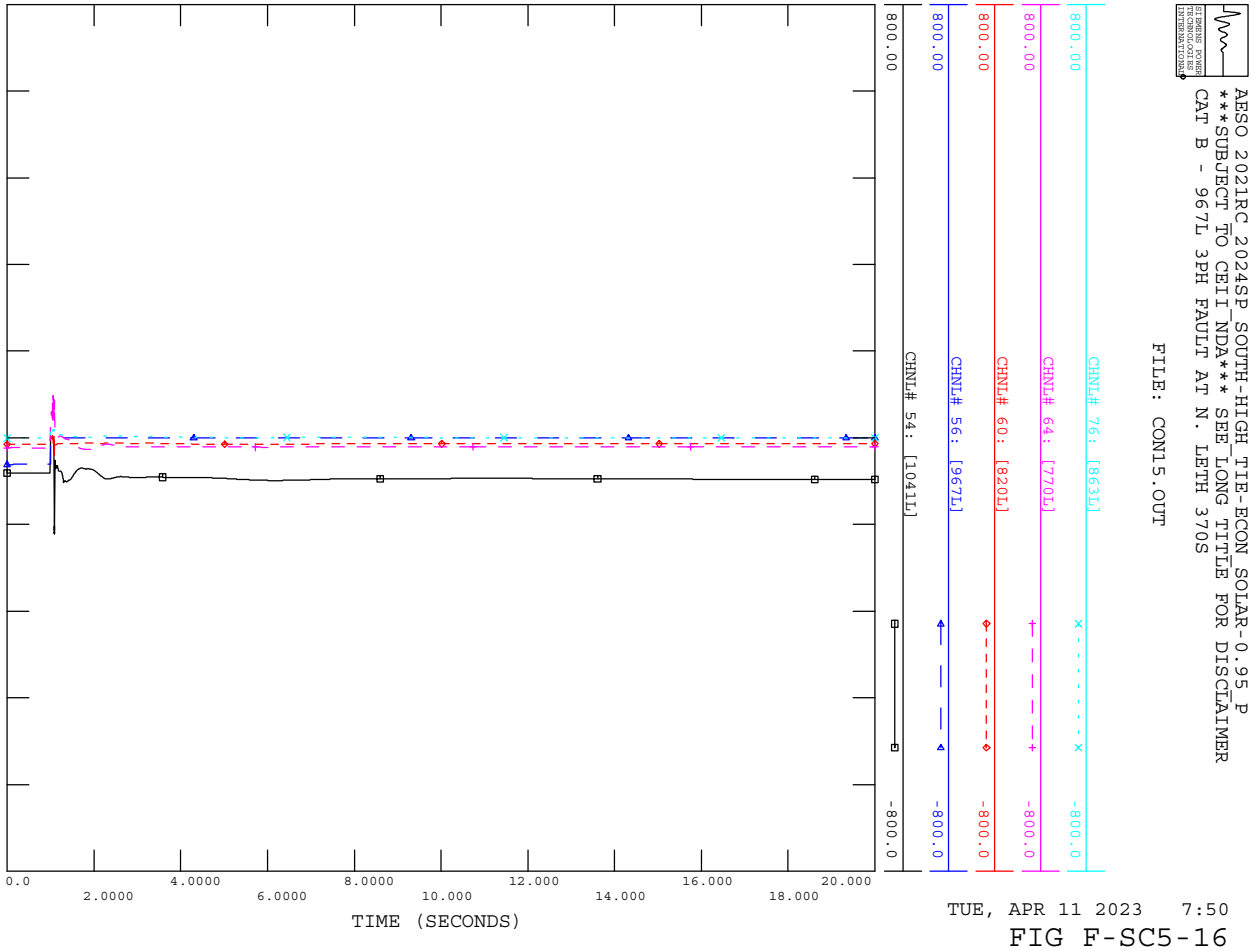


FIG F-SC5-16

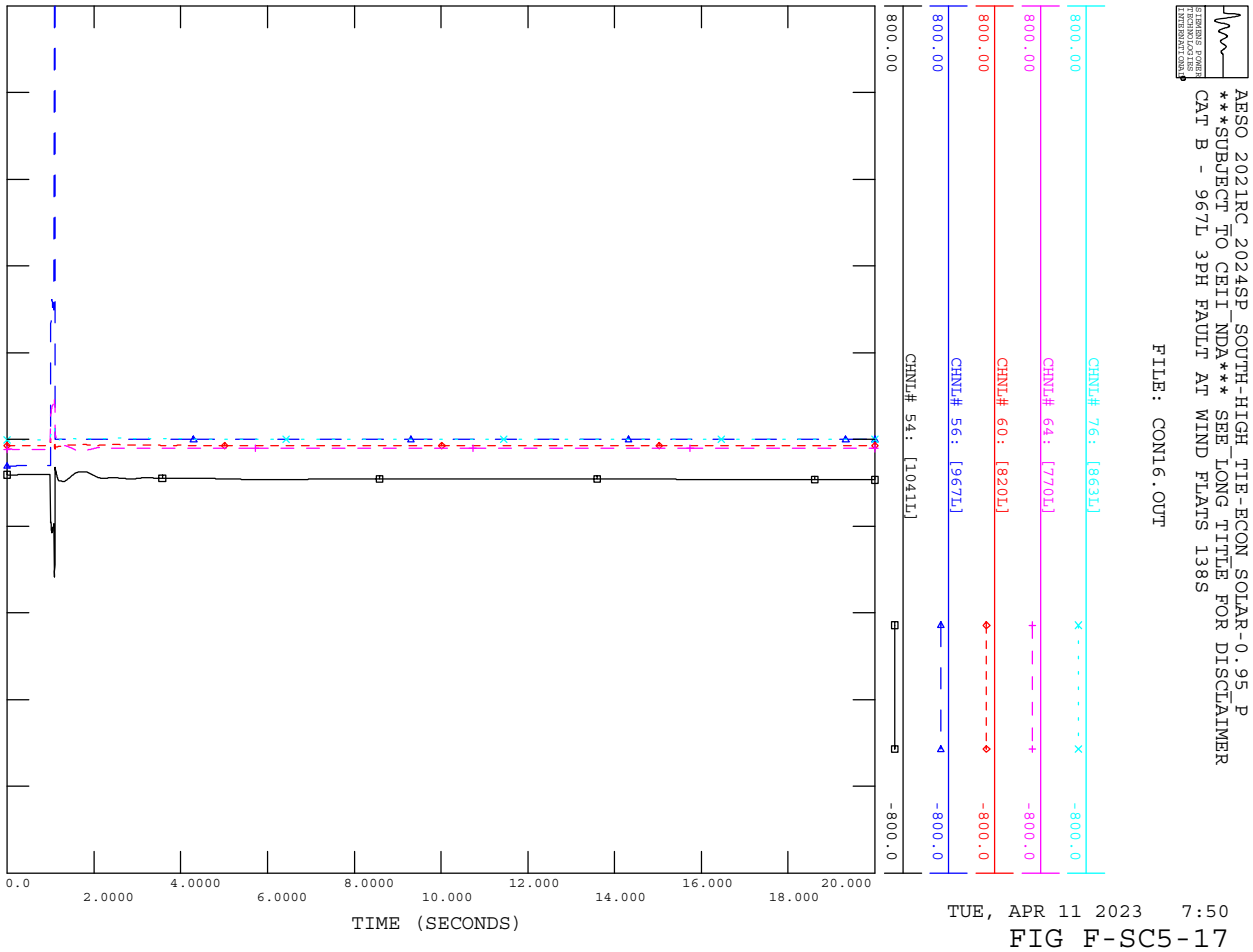


FIG F-SC5-17

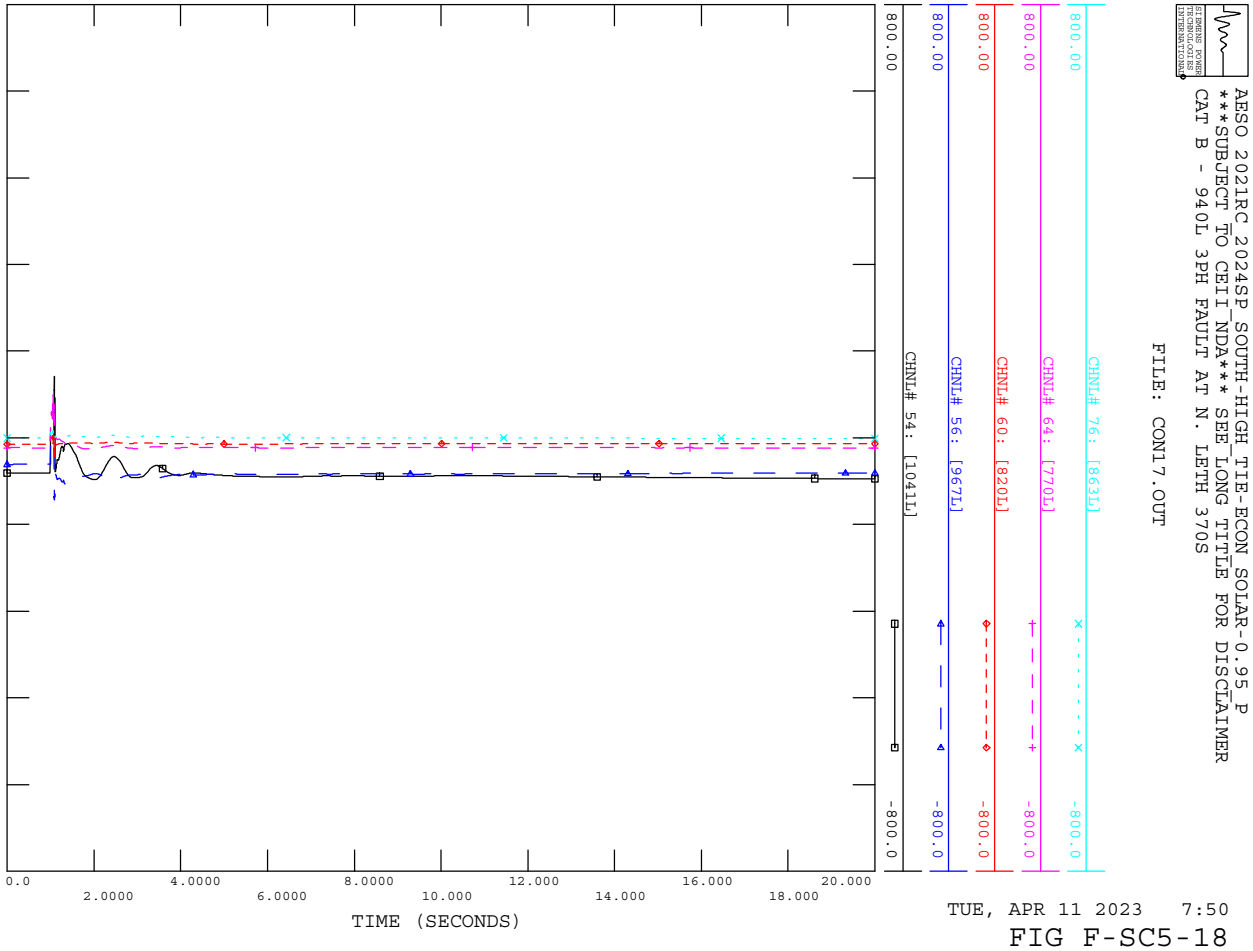


FIG F-SC5-18

AESO 2021RC_2024SP_SOUTH-HIGH_TIE-ECON_SOLAR-0.95_P
SUBJECT TO CEII NDA SEE LONG TITLE FOR DISCLAIMER
CAT B - 940L 3PH FAULT AT PICTURE BUTTE 120S

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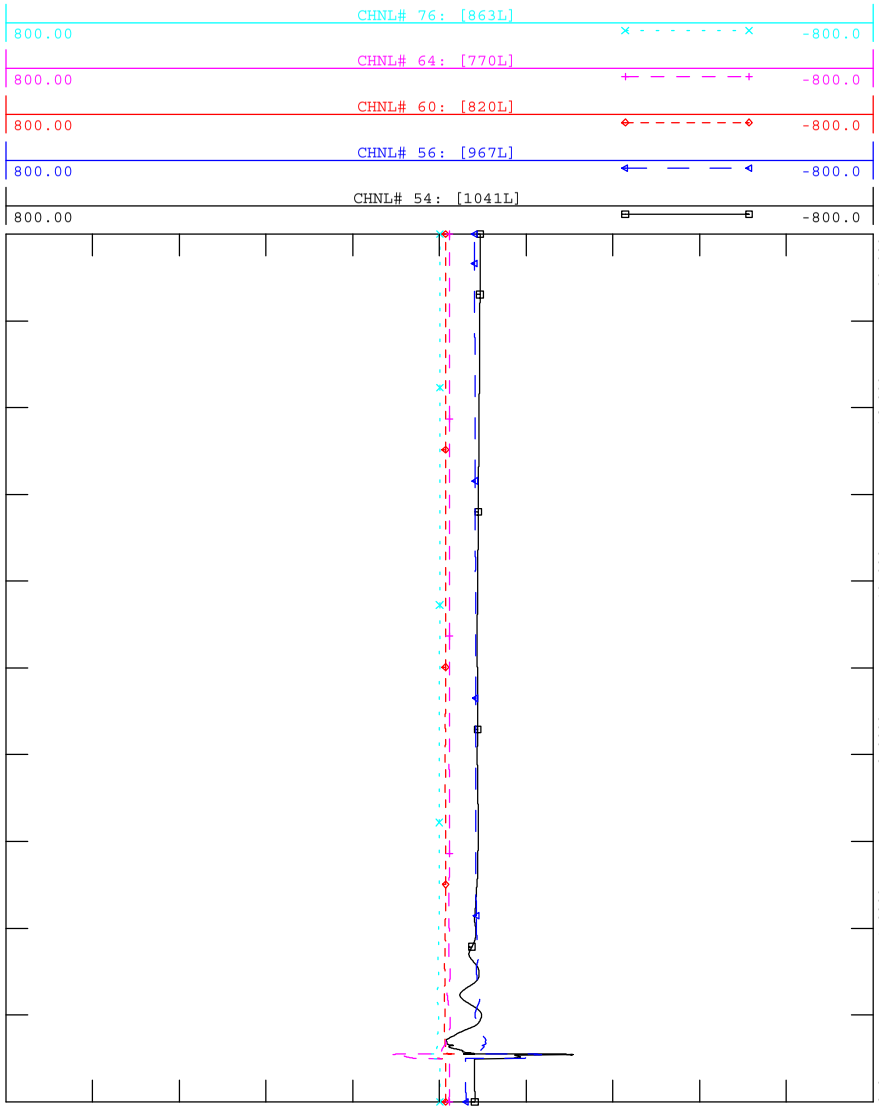
FIG F-SC5-19



Attachment A5

Dynamic Data and Assumptions

Study Area load representation assumed for the transient studies is in Table A5-1

Table A5-1: Transient Stability Analysis Load Representation

Planning Areas	% of load specified as Large Motors	% of load specified as Small Motors	The Remainder of the Load (excluding Motor loads)	
			Active Power	Reactive Power
			Constant Current	Constant Impedance
Areas in NW and NE regions	*40%*	*30%*	*100%*	*100%*
Areas in other regions	*10%*	*10%*	*100%*	*100%*

The subsequent tables below are the dynamic data for the wind turbine modelling used to conduct studies for this project:

Table A5-2: REGCAU1

Wind Turbine Dynamic Data (REGCAU1 model)											
Tg	**Rrpwr**	**Brkpt**	**Zerox**	**Lvpl1**	**Volim**	**Lvpnt1**	**Lvpnt0**	**Iolim**	**Tfltr**	**Khv**	**Iqrmax**
0.02	10.0	0.01	0.0	1	2	0.01	0	-1.0	0.02	0.0	30.0
Iqrmin	**Accel**	**M**									
-30.0	1.0	1									

Table A5-3: REECAU1

Wind Turbine Dynamic Data (REECAU1 model)											
Vdip (pu)	**Vup (pu)**	**Trv (s)**	**dbd1 (pu)**	**dbd2 (pu)**	**Kqv (pu)**	**Iqhl (pu)**	**Iqll (pu)**	**Vref0 (pu)**	**Iqfrz (pu)**	**Thld (s)**	**Thld2**
0.85	2	0.02	-0.2	0.12	2.0	1.0	-1.0	1.0	0.0	0.0	0.0
Tp (s)	**QMax (pu)**	**QMin (pu)**	**VMAX (pu)**	**VMIN (pu)**	**Kqp (pu)**	**Kqi (pu)**	**Kvp (pu)**	**Kvi (pu)**	**Vbias (pu)**	**Tiq (s)**	**dPmax**
0.02	1.0	-1.0	1.2	-1.2	1.0	5.0	1.0	5.0	0.0	0.02	30.0
dPmin (pu/s) (<0)	**PMAX (pu)**	**PMIN (pu)**	**Imax (pu)**	**Tpord (s)**	**Vq1 (pu)**	**Iq1 (pu)**	**Vq2 (pu)**	**Iq2 (pu)**	**Vq3 (pu)**	**Iq3 (pu)**	**Vq4 (pu)**
-30	1.0	0.0	1.0	0.025	0.1	1.0	1.0	1.0	0.0	0.0	0.0
Iq4 (pu)	**Vp1 (pu)**	**Ip1 (pu)**	**Vp2 (pu)**	**Ip2 (pu)**	**Vp3 (pu)**	**Ip3 (pu)**	**Vp4 (pu)**	**Ip4 (pu)**	**M0**	**M1**	**M2**
0.0	0.1	1.0	1.1	1.0	0.0	0.0	0.0	0.0	0	0	0
M3	**M4**	**M5**									
0	0	1									

Table A5-4: REPCTAU1

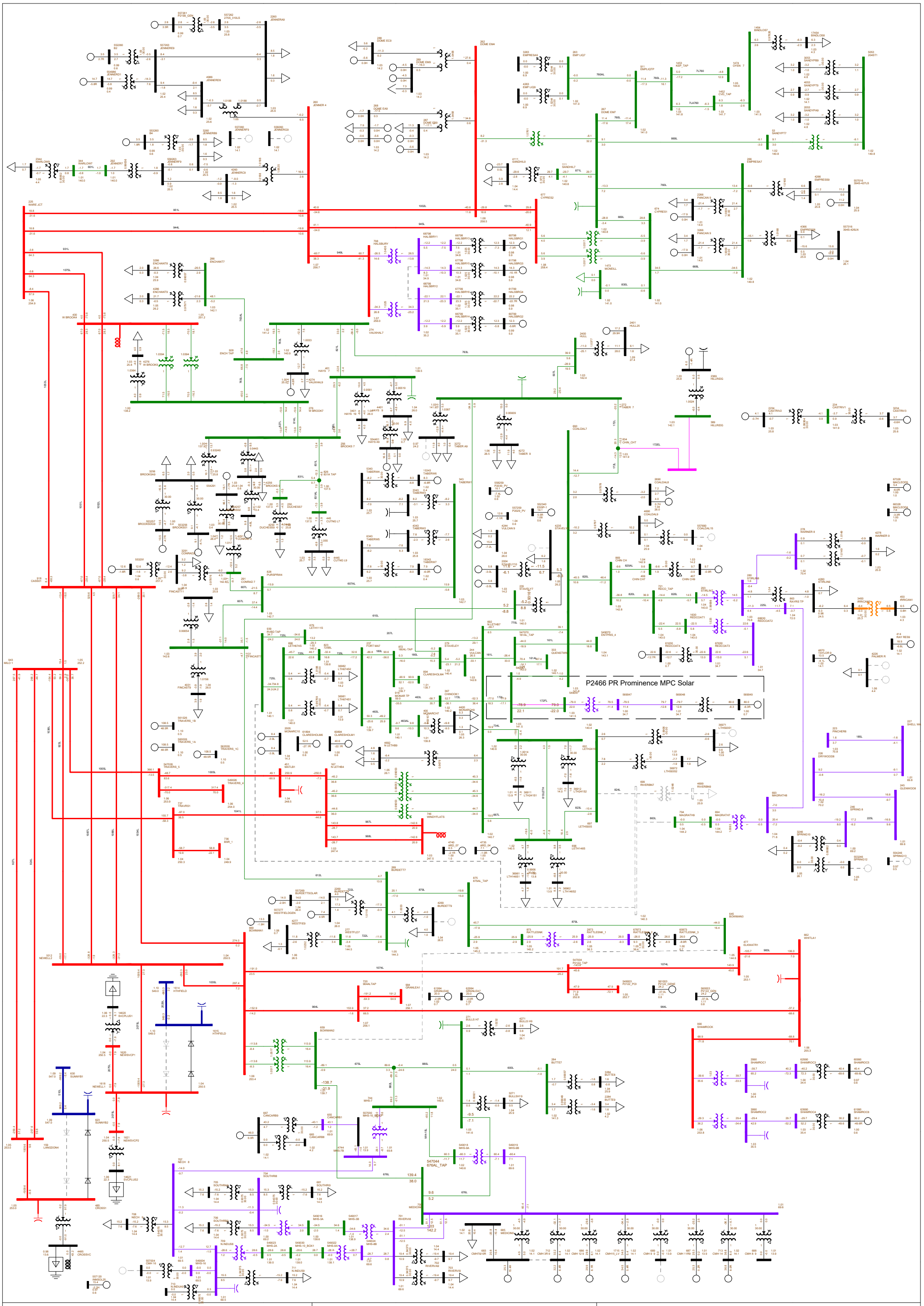
Wind Turbine Dynamic Data (REPCTAU1 model)											
Tfltr	**Kp**	**Ki**	**Tft**	**Tfv**	**Vfrz**	**Rc**	**Xc**	**Kc**	**emax**	**emin**	**dbd1**
0.02	1.0	3.4	0.0	0.1	0.85	0.0	0.0	0.0	0.1	-0.1	0.0
dbd2	**Qmax**	**Qmin**	**Kpg**	**Kig**	**Tp**	**fdbd1**	**Fdbd2**	**femax**	**femin**	**Pmax**	**Pmin**
0.0	1.0	-1.0	1.0	1.0	0.02	-0.01666	0.01666	1.0	-1.0	1.0	0.0
Tg	**Ddn**	**Dup**	**M0**	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**		
0.1	20.0	20.0	0	0	0	0	0	1	1		

Attachment A6

Post-Mitigation Power Flow Diagrams

Table A6: List of Post RAS Mitigation Load Flow Diagrams

Figure	Category	Contingency
A6 SL Post- 1	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A6 SL Post- 2	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A6 SL Post- 3	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A6 SL Post- 4	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A6 SP Post- 5	B (N-1)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
A6 SP Post- 6	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A6 SP Post- 7	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A6 SP Post- 8	B (N-1)	924L (Langdon 102S - Milo 356S)
A6 SP Post- 9	B (N-1)	927L (Langdon 102S - Milo 356S)
A6 SP Post- 10	B (N-1)	610L (Fincastle 336S - Taber 83S)
A6 SP Post- 11	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A6 SP Post- 12	B (N-1)	770L (Coaldale 254S - North Lethbridge 370S)
A6 SL Post Sens- 13	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A6 SL Post Sens- 14	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A6 SL Post Sens- 15	B (N-1)	13L50 (Newell 2075S - Heathfield 2029S)
A6 SL Post Sens- 16	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A6 SP Post Sens- 17	B (N-1)	674ST1 or T2 (Borwon 674S Transformer T1 or T2)
A6 SP Post Sens- 18	B (N-1)	618ST1 (Riverbend 618S Transformer T1)
A6 SP Post Sens- 19	B (N-1)	863L or 891L (Riverbend 618S - Garden City 226S - Magrath 225S)
A6 SP Post Sens- 20	B (N-1)	924L (Langdon 102S - Milo 356S)
A6 SP Post Sens- 21	B (N-1)	927L (Langdon 102S - Milo 356S)
A6 SP Post Sens- 22	B (N-1)	610L (Fincastle 336S - Taber 83S)
A6 SP Post Sens- 23	B (N-1)	225ST1 (Magrath 225S Transformer T1)
A6 SP Post Sens- 24	B (N-1)	770L (Coaldale 254S - North Lethbridge 370S)


P2466 PR Prominence MPC Solar
A6 SL Post - 1
2024SL SC3 POST
618ST1 CONTINGENCY
WED, JUL 05 2023 15:36
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC3 POST
86SL CONTINGENCY
WED, JUL 05 2023 15:37

A6 SL Post - 2

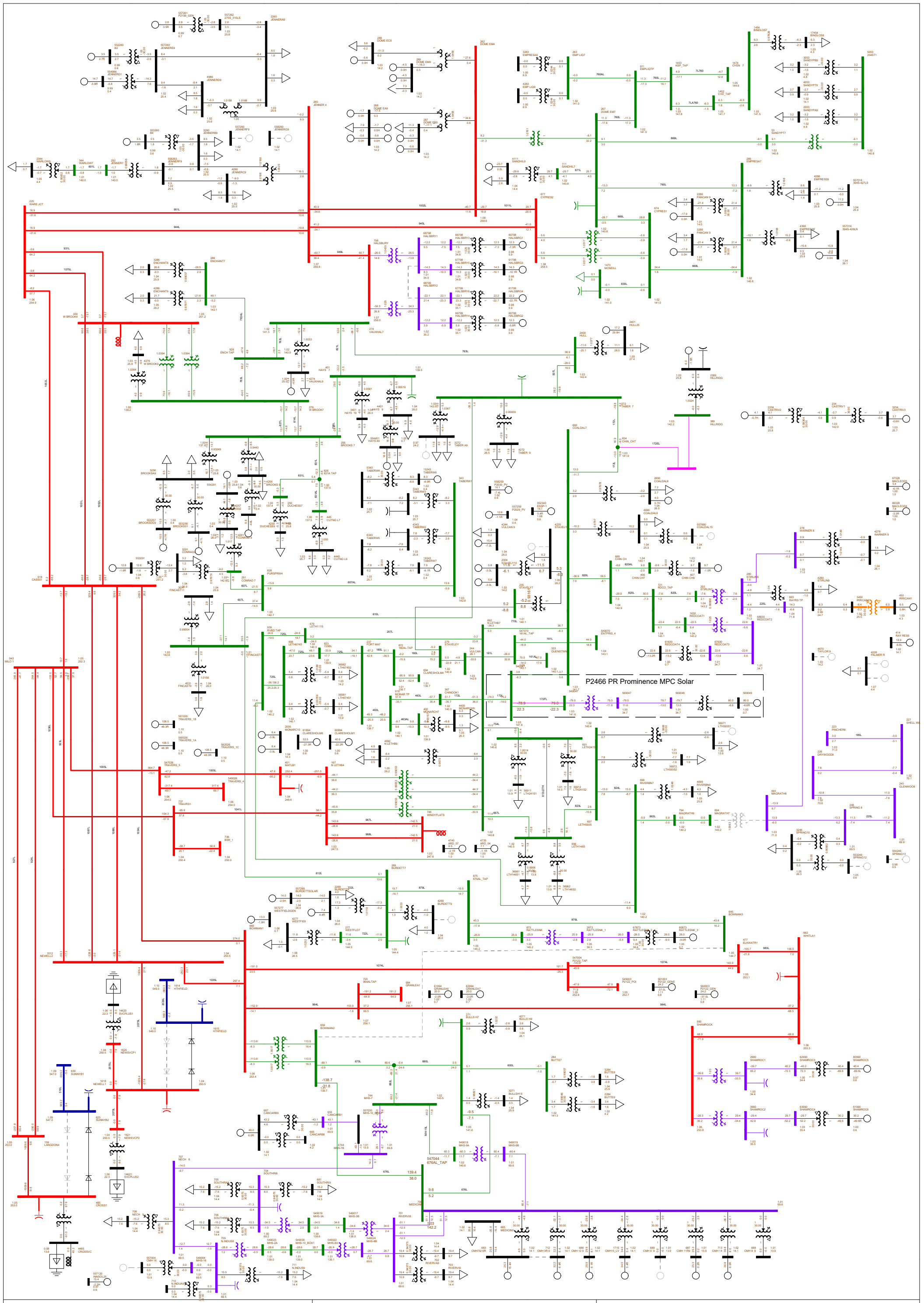
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

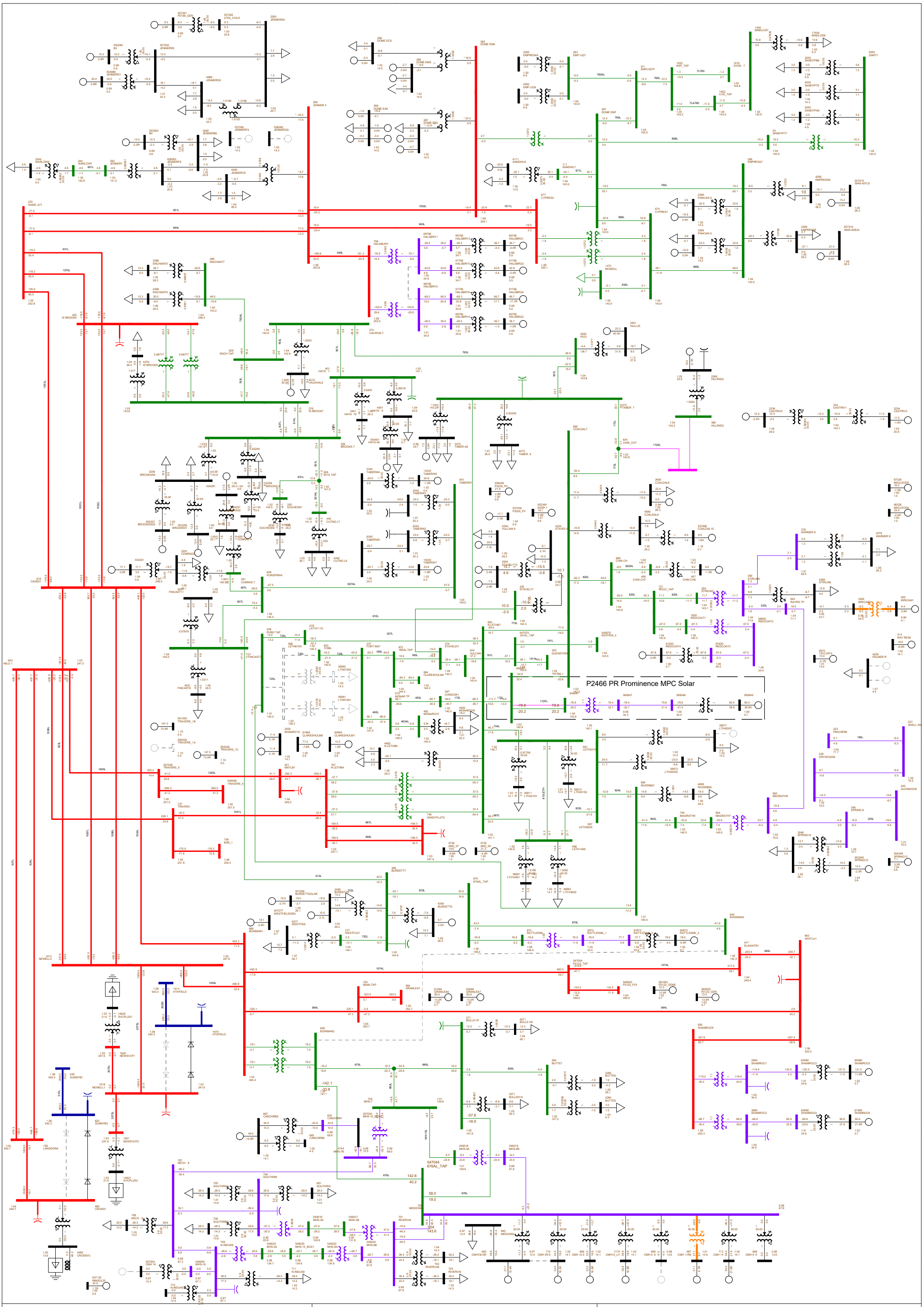
P2466 PR Prominence MPC Solar

2024SL SC3 POST
EATL CONTINGENCY
WED, JUL 05 2023 15:37

A6 SL Post - 3

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000


P2466 PR Prominence MPC Solar
A6 SL Post - 4
2024SL SC3 POST
229BT1 CONTINGENCY
WED, JUL 05 2023 15:37
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SP SC4 POST
674BT1 CONTINGENCY
WED, JUL 05 2023 15:37

A6 SP Post - 5

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
618ST1 CONTINGENCY
WED, JUL 05 2023 15:38

A6 SP Post - 6

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
86SL CONTINGENCY
WED, JUL 05 2023 15:38

A6 SP Post - 7

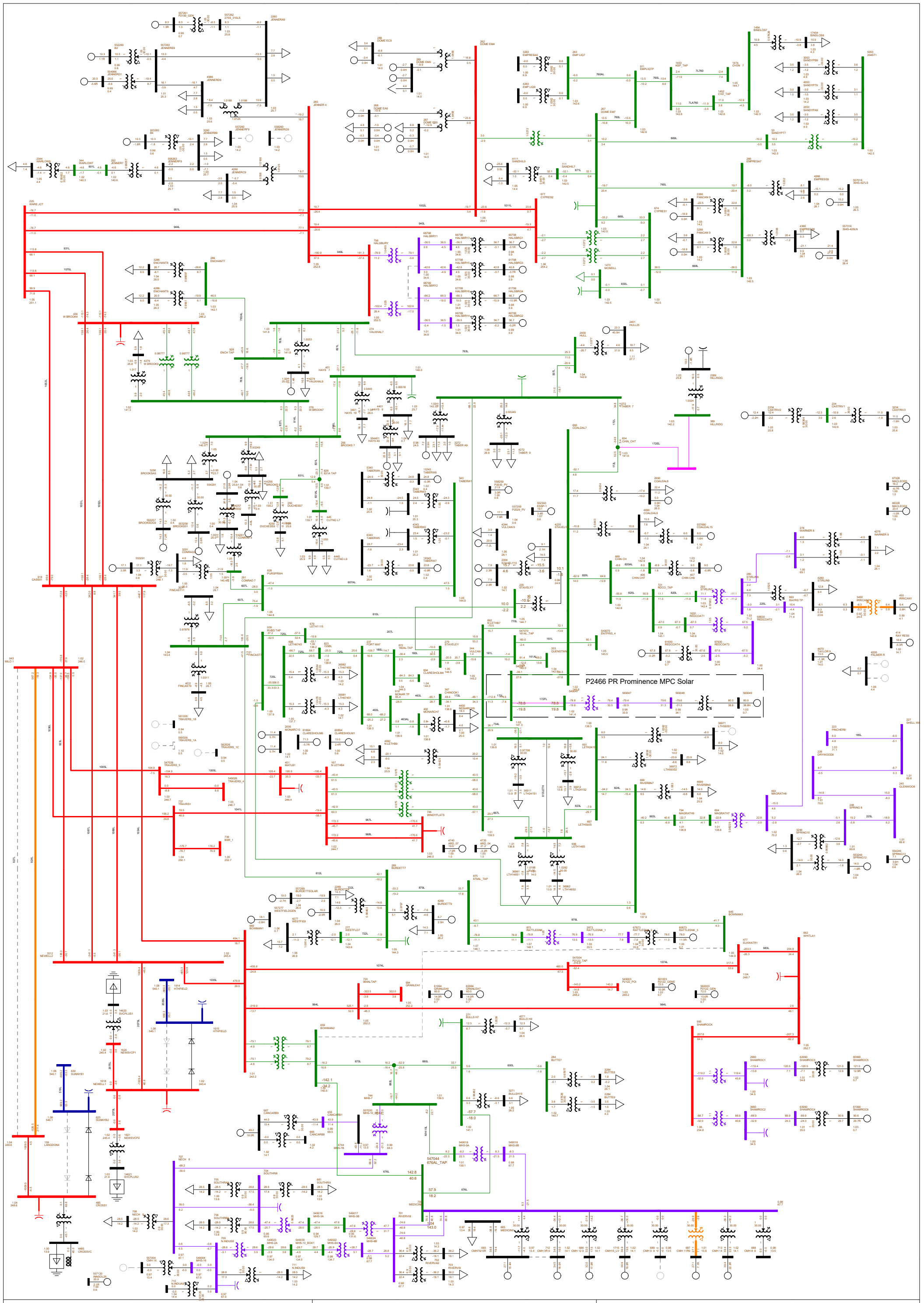
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
924L CONTINGENCY
WED, JUL 05 2023 15:38

A6 SP Post - 8

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000


P2466 PR Prominence MPC Solar
A6 SP Post - 9
2024SP SC4 POST
927L CONTINGENCY
WED, JUL 05 2023 15:38
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
61QL CONTINGENCY
WED, JUL 05 2023 15:39

A6 SP Post - 10

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
229BT1 CONTINGENCY
WED, JUL 05 2023 15:39

A6 SP Post - 11

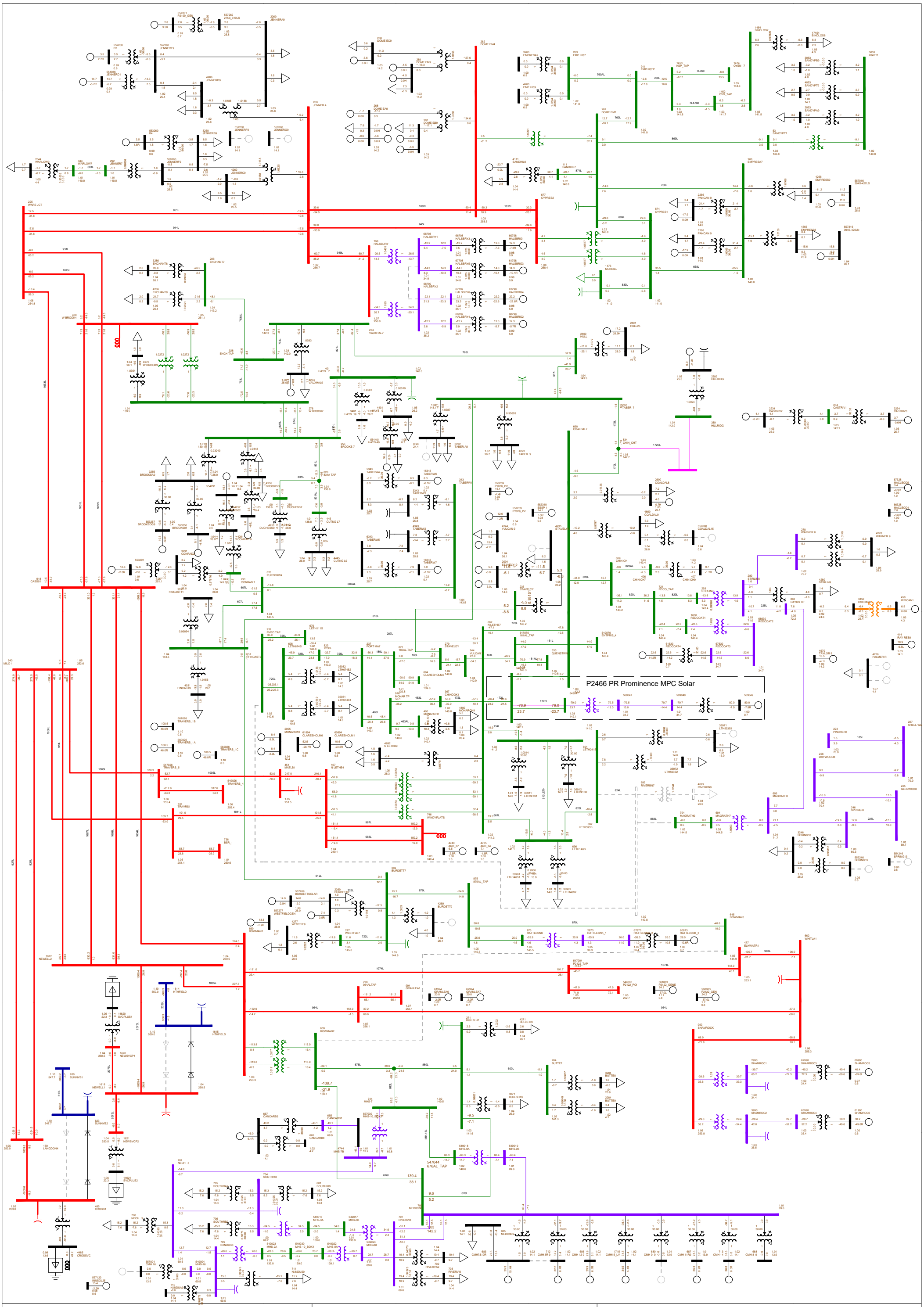
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC4 POST
77L CONTINGENCY
WED, JUL 05 2023 15:39

A6 SP Post - 12

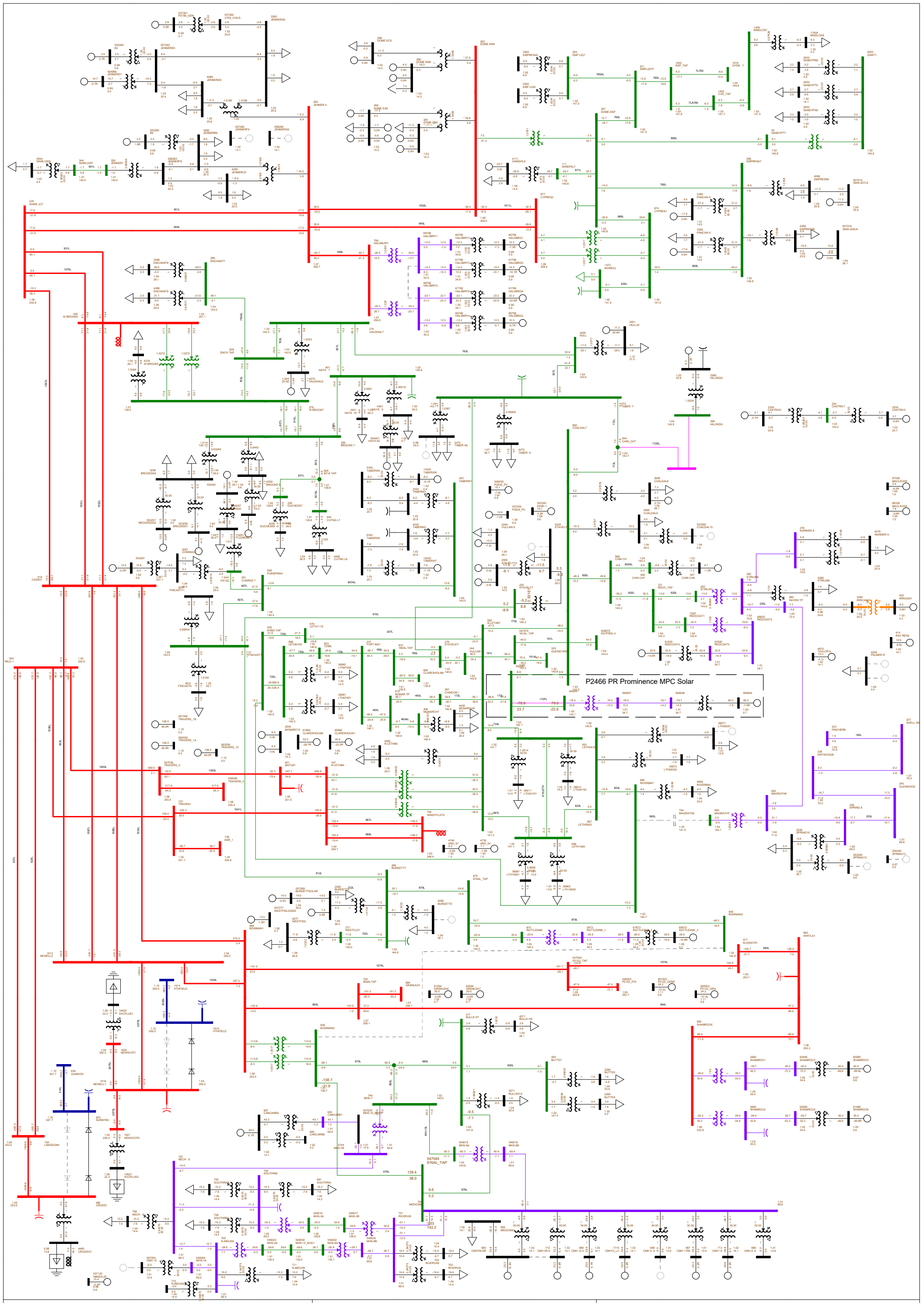
Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 POSTSENS
81BST1 CONTINGENCY
WED, JUL 05 2023 15:39

A6 SL Post Sens - 13

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



2024SL SC8 POSTSENS
86SL CONTINGENCY
WED, JUL 05 2023 15:40

A6 SL Post Sens - 14

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 POSTSENS
EATL CONTINGENCY
WED, JUL 05 2023 15:40

A6 SL Post Sens - 15

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A

kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SL SC8 POSTSENS
2SBT1 CONTINGENCY
WED, JUL 05 2023 15:40

A6 SL Post Sens - 16

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
674BT1 CONTINGENCY
WED, JUL 05 2023 15:40

A6 SP Post Sens - 17

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
618ST1 CONTINGENCY
WED, JUL 05 2023 15:40

A6 SP Post Sens - 18

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
86SL CONTINGENCY
WED, JUL 05 2023 15:41

A6 SP Post Sens - 19

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
924L CONTINGENCY
WED, JUL 05 2023 15:41

A6 SP Post Sens - 20

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0% Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

A6 SP Post Sens - 21

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
61QL CONTINGENCY
WED, JUL 05 2023 15:41

A6 SP Post Sens - 22

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
229BT1 CONTINGENCY
WED, JUL 05 2023 15:42

A6 SP Post Sens - 23

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

P2466 PR Prominence MPC Solar

2024SP SC9 POSTSENS
77/L CONTINGENCY
WED, JUL 05 2023 15:42

A6 SP Post Sens - 24

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0%Rate A
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A7

Constraint Effective Factors Table

Table A7-1: Generator Types

Plant	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
Type	Hydro	Hydro	Hydro	Solar	Solar	Wind	Solar	Gas	Gas	Solar	Solar	Gas	Solar	Hydro	Wind	Wind	Solar	Wind		Solar	Solar	Solar	Solar	Wind	Solar	Wind	Solar	Solar	Solar

Table A7-2: 2024SL Post-Project Scenario 3, Generators Effectiveness Factors under Category B Condition (N-1)

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
161L or 161AL	180L (180AL - Fort Macleod 15S)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bowron 674ST1 or T2	463L (Chinook 181S - 463AL)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Riverbend 618ST1	225L (Glenwood 229S - Spring Coulee 385S)	-2.97%	-3.18%	-3.08%	90.98%	0.24%	-2.01%	0.87%	-2.93%	-0.46%	0.00%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	-0.35%	0.69%	49.59%	0.00%	-3.38%	0.00%	2.59%
863L or 891L	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.44%	22.65%	1.40%	1.79%	2.59%	1.70%	2.89%	2.09%	0.00%	1.13%	1.79%	1.42%	44.35%	44.35%	2.00%	1.26%	0.48%	0.50%	58.82%	1.22%	1.79%	0.48%	0.47%	1.12%	0.00%	2.25%	0.00%	1.19%
924L	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.44%	22.65%	1.40%	1.79%	2.59%	1.70%	2.89%	2.09%	0.00%	1.14%	1.79%	1.43%	44.35%	0.00%	2.00%	1.26%	0.48%	0.50%	58.83%	1.22%	1.79%	0.48%	0.47%	1.12%	0.00%	2.25%	0.00%	1.20%
927L	225L (Glenwood 229S - Spring Coulee 385S)	4.87%	15.86%	10.75%	2.49%	1.93%	2.60%	1.87%	2.84%	2.19%	0.00%	2.10%	1.93%	1.64%	19.43%	6.92%	2.11%	2.43%	0.89%	0.94%	40.42%	1.47%	1.93%	0.89%	0.84%	2.06%	0.00%	2.65%	0.00%	1.46%
940L	1005L (Little Bow 991S - Milo 356S)	4.87%	15.86%	10.75%	2.49%	1.93%	2.60%	1.87%	2.84%	2.19%	0.00%	2.10%	1.93%	1.64%	19.43%	6.92%	2.11%	2.43%	0.89%	0.94%	40.42%	1.47%	1.93%	0.89%	0.84%	2.06%	0.00%	2.65%	0.00%	1.46%
967L	225L (Glenwood 229S - Spring Coulee 385S)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
968L	225L (Glenwood 229S - Spring Coulee 385S)	5.14%	16.07%	10.98%	2.80%	2.11%	2.85%	2.04%	3.12%	2.39%	0.00%	2.31%	2.11%	1.79%	19.61%	7.20%	2.31%	2.68%	1.07%	1.24%	40.45%	1.60%	2.11%	1.07%	0.89%	2.26%	0.00%	2.95%	0.00%	1.58%
EATL	225L (Glenwood 229S - Spring Coulee 385S)	5.14%	16.07%	10.98%	2.80%	2.11%	2.85%	2.04%	3.12%	2.39%	0.00%	2.31%	2.11%	1.79%	19.61%	7.20%	2.31%	2.68%	1.07%	1.24%	40.45%	1.60%	2.11%	1.07%	0.89%	2.26%	0.00%	2.95%	0.00%	1.58%
Stirling 67ST2	225L (Glenwood 229S - Spring Coulee 385S)	4.73%	15.73%	10.61%	2.36%	1.78%	2.46%	1.72%	2.70%	2.04%	0.00%	1.95%	1.78%	1.49%	19.30%	6.79%	1.96%	2.29%	0.72%	0.80%	40.30%	1.31%	1.78%	0.72%	0.65%	1.91%	0.00%	2.51%	0.00%	1.30%
Magrath 225ST1	225L (Glenwood 229S - Spring Coulee 385S)	2.01%	24.28%	24.28%	2.32%	1.38%	1.84%	1.34%	2.01%	1.56%	0.00%	1.94%	1.38%	1.19%	24.28%	8.06%	1.50%	2.31%	0.69%	0.77%	43.99%	1.07%	1.38%	0.68%	0.60%	1.89%	0.00%	2.09%	0.00%	1.06%

Table A7-3: 2024SP Post-Project Scenario 4, Generators Effectiveness Factors under Category B Condition (N-1)

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
725L or 725AL	463L (Chinook 181S - 463AL)	-2.97%	-3.14%	-3.06%	90.98%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	0.00%	51.55%	0.24%	1.81%	-3.19%	-3.70%	-0.25%	67.34%	-0.36%	-1.39%	-2.67%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	0.00%	2.59%
725L or 725AL	463L (463AL - Fort Macleod 15S)	-2.97%	-3.14%	-3.06%	-9.02%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	0.00%	51.55%	0.24%	1.81%	-3.19%	-3.70%	-0.25%	67.34%	-0.36%	-1.39%	-2.67%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	0.00%	2.59%
463L or 463AL	725L (Bowron 674S - 725BL)	-3.05%	-4.17%	-3.65%	0.00%	0.23%	-1.95%	0.84%	-2.84%	-0.45%	0.00%	49.77%	0.23%	1.74%	-4.54%	-5.75%	-0.24%	65.01%	-0.33%	-1.32%	-3.66%	2.43%	0.23%	0.00%	0.00%	47.87%	0.00%	-3.25%	0.00%	2.50%
Bowron 674ST1 or T2	463L (Chinook 181S - 463AL)	-2.97%	-3.18%	-3.08%	90.98%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	0.00%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	0.00%	2.59%
Bowron 674ST1 or T2	463L (463AL - Fort Macleod 15S)	-2.97%	-3.18%	-3.08%	-9.02%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	0.00%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	0.00%	2.59%
Riverbend 618ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	0.00%	1.13%	1.78%	1.42%	44.35%	44.35%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	0.00%	1.19%

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
Riverbend 618ST1	225L (Spring Coulee 385S - Magrath 225S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	0.00%	1.13%	1.78%	1.42%	44.35%	44.35%	2.00%	1.25%	0.48%	0.50%	-41.18%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	0.00%	1.19%
Riverbend 618ST1	225L (Stirling 67S - 225AL)	-7.95%	64.57%	-22.65%	-1.40%	-1.78%	-2.59%	-1.70%	-2.88%	-2.09%	0.00%	-1.13%	-1.78%	-1.42%	55.65%	55.65%	-2.00%	-1.25%	-0.48%	-0.50%	41.18%	-1.21%	-1.78%	0.00%	0.00%	-1.12%	0.00%	-2.25%	0.00%	-1.19%
863L or 891L	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	0.00%	1.13%	1.78%	1.42%	44.35%	0.00%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	0.00%	1.19%
924L	927L (Langdon 102S - Milo 356S)	30.68%	29.02%	29.79%	30.28%	34.15%	31.93%	34.90%	30.99%	33.51%	0.00%	33.61%	34.15%	35.88%	28.48%	29.69%	33.70%	32.07%	38.32%	31.99%	26.13%	36.63%	34.15%	0.00%	0.00%	33.80%	0.00%	30.57%	0.00%	36.70%
924L	225L (Glenwood 229S - Spring Coulee 385S)	4.86%	15.85%	10.74%	2.48%	1.93%	2.59%	1.86%	2.83%	2.18%	0.00%	2.09%	1.93%	1.64%	19.42%	6.91%	2.10%	2.42%	0.89%	0.93%	40.41%	1.47%	1.93%	0.00%	0.00%	2.05%	0.00%	2.64%	0.00%	1.45%
927L	924L (Langdon 102S - Milo 356S)	30.65%	28.99%	29.76%	30.25%	34.11%	31.89%	34.86%	30.95%	33.47%	0.00%	33.57%	34.11%	35.84%	28.45%	29.66%	33.67%	32.04%	38.28%	31.95%	26.11%	36.59%	34.11%	0.00%	0.00%	33.77%	0.00%	30.54%	0.00%	36.66%
927L	225L (Glenwood 229S - Spring Coulee 385S)	4.86%	15.85%	10.74%	2.48%	1.93%	2.59%	1.86%	2.83%	2.18%	0.00%	2.09%	1.93%	1.64%	19.42%	6.91%	2.10%	2.42%	0.89%	0.93%	40.41%	1.47%	1.93%	0.00%	0.00%	2.05%	0.00%	2.64%	0.00%	1.45%
940L	1005L (Little Bow 991S - Milo 356S)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
967L	225L (Glenwood 229S - Spring Coulee 385S)	5.13%	16.06%	10.98%	2.79%	2.10%	2.84%	2.03%	3.12%	2.39%	0.00%	2.30%	2.10%	1.78%	19.61%	7.19%	2.30%	2.68%	1.06%	1.24%	40.45%	1.59%	2.10%	0.00%	0.00%	2.26%	0.00%	2.94%	0.00%	1.58%
968L	225L (Glenwood 229S - Spring Coulee 385S)	5.13%	16.06%	10.98%	2.79%	2.10%	2.84%	2.03%	3.12%	2.39%	0.00%	2.30%	2.10%	1.78%	19.61%	7.19%	2.30%	2.68%	1.06%	1.24%	40.45%	1.59%	2.10%	0.00%	0.00%	2.26%	0.00%	2.94%	0.00%	1.58%
610L	879L (879AL - Bowmanton 244S)	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Magrath 225ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	0.00%	1.13%	1.78%	1.42%	44.35%	1.41%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	0.00%	1.19%
Vauxhall 158ST2	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	0.00%	-0.76%	32.13%	0.00%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	0.00%	1.63%
Hull 257ST1	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	0.00%	45.98%	40.33%	0.00%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	0.00%	1.63%
Riverbend 618ST1	172L (North Lethbridge 370S - 172FL)	37.80%	25.98%	31.48%	-6.28%	22.08%	35.13%	20.52%	39.98%	26.98%	0.00%	-1.49%	22.08%	15.97%	22.14%	22.14%	25.48%	-3.67%	-0.82%	-2.36%	15.91%	12.52%	22.08%	0.00%	0.00%	-1.22%	0.00%	63.04%	0.00%	12.17%
770L	172L (North Lethbridge 370S - 172FL)	60.27%	21.68%	39.63%	-9.56%	37.33%	59.24%	34.71%	67.39%	45.55%	0.00%	-1.63%	37.33%	27.07%	9.15%	-4.97%	43.03%	-5.09%	-1.11%	-3.66%	6.00%	21.28%	37.33%	0.00%	0.00%	-1.20%	0.00%	77.02%	0.00%	20.69%
935L	172L (North Lethbridge 370S - 172FL)	35.90%	12.99%	23.65%	-5.51%	22.86%	35.45%	21.37%	40.13%	27.59%	0.00%	-0.33%	22.86%	16.98%	5.55%	-2.81%	26.14%	-2.60%	-0.85%	-2.24%	3.65%	13.66%	22.86%	0.00%	0.00%	0.00%	0.00%	63.41%	0.00%	13.33%
923L	172L (North Lethbridge 370S - 172FL)	35.90%	12.99%	23.65%	-5.51%	22.87%	35.45%	21.38%	40.13%	27.60%	0.00%	-0.33%	22.87%	16.99%	5.55%	-2.81%	26.15%	-2.60%	-0.85%	-2.25%	3.65%	13.67%	22.87%	0.00%	0.00%	0.00%	0.00%	63.42%	0.00%	13.34%
940L	172L (North Lethbridge 370S - 172FL)	34.85%	11.96%	22.61%	-6.58%	21.86%	34.40%	20.37%	39.07%	26.57%	0.00%	-1.36%	21.86%	15.99%	4.54%	-3.87%	25.12%	-3.65%	-0.75%	1.52%	2.70%	12.68%	21.86%	0.00%	0.00%	-1.08%	0.00%	62.34%	0.00%	12.34%
507L	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	1.63%	45.98%	40.33%	0.00%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	0.00%	1.63%
763L	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	0.00%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	0.00%	1.63%

Table A7-4: 2024SL Post-Project Sensitivity Scenario 8, Generators Effectiveness Factors under Category B Condition (N-1)

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
Vauxhall 158ST2	225L (Glenwood 229S - Spring Coulee 385S)	5.02%	15.93%	10.86%	2.50%	2.29%	2.90%	2.72%	3.01%	2.72%	2.48%	1.96%	2.29%	0.00%	19.47%	6.95%	2.59%	2.36%	0.74%	0.85%	40.44%	0.76%	2.29%	0.73%	0.62%	1.91%	0.00%	2.76%	2.72%	0.76%
Bowron 674ST1 or T2	463L (Chinook 181S - 463AL)	-2.97%	-3.18%	-3.08%	90.98%	0.24%	-2.01%	0.87%	-2.93%	-0.46%	-7.28%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	-0.35%	0.69%	49.59%	0.00%	-3.38%	-0.46%	2.59%
Riverbend 618ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.44%	22.65%	1.40%	1.79%	2.59%	1.70%	2.89%	2.09%	1.41%	1.13%	1.79%	1.42%	44.35%	44.35%	2.00%	1.26%	0.48%	0.50%	58.82%	1.22%	1.79%	0.48%	0.47%	1.12%	0.00%	2.25%	2.09%	1.19%
863L or 891L	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.44%	22.65%	1.40%	1.79%	2.59%	1.70%	2.89%	2.09%	1.41%	1.14%	1.79%	1.43%	44.35%	0.00%	2.00%	1.26%	0.48%	0.50%	58.83%	1.22%	1.79%	0.48%	0.47%	1.12%	0.00%	2.25%	2.09%	1.20%
820L	225L (Glenwood 229S - Spring Coulee 385S)	0.00%	24.28%	24.28%	2.32%	1.38%	1.84%	1.34%	2.01%	1.56%	2.28%	1.94%	1.38%	1.19%	24.28%	8.06%	1.50%	2.31%	0.69%	0.77%	43.99%	1.07%	1.38%	0.68%	0.60%	1.89%	0.00%	2.09%	1.56%	1.06%
924L	225L (Glenwood 229S - Spring Coulee 385S)	4.87%	15.86%	10.75%	2.49%	1.93%	2.60%	1.87%	2.84%	2.19%	2.46%	2.10%	1.93%	1.64%	19.43%	6.92%	2.11%	2.43%	0.89%	0.94%	40.42%	1.47%	1.93%	0.89%	0.84%	2.06%	0.00%	2.65%	2.19%	1.46%
927L	225L (Glenwood 229S - Spring Coulee 385S)	4.87%	15.86%	10.75%	2.49%	1.93%	2.60%	1.87%	2.84%	2.19%	2.46%	2.10%	1.93%	1.64%	19.43%	6.92%	2.11%	2.43%	0.89%	0.94%	40.42%	1.47%	1.93%	0.89%	0.84%	2.06%	0.00%	2.65%	2.19%	1.46%
940L	1005L (Little Bow 991S - Milo 356S)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
967L	225L (Glenwood 229S - Spring Coulee 385S)	5.14%	16.07%	10.98%	2.80%	2.11%	2.85%	2.04%	3.12%	2.39%	2.77%	2.31%	2.11%	1.79%	19.61%	7.20%	2.31%	2.68%	1.07%	1.24%	40.45%	1.60%	2.11%	1.07%	0.89%	2.26%	0.00%	2.95%	2.39%	1.58%
968L	225L (Glenwood 229S - Spring Coulee 385S)	5.14%	16.07%	10.98%	2.80%	2.11%	2.85%	2.04%	3.12%	2.39%	2.77%	2.31%	2.11%	1.79%	19.61%	7.20%	2.31%	2.68%	1.07%	1.24%	40.45%	1.60%	2.11%	1.07%	0.89%	2.26%	0.00%	2.95%	2.39%	1.58%
EATL	225L (Glenwood 229S - Spring Coulee 385S)	4.73%	15.73%	10.61%	2.36%	1.78%	2.46%	1.72%	2.70%	2.04%	2.32%	1.95%	1.78%	1.49%	19.30%	6.79%	1.96%	2.29%	0.72%	0.80%	40.30%	1.31%	1.78%	0.72%	0.65%	1.91%	0.00%	2.51%	2.04%	1.30%
North Lethbridge 370ST3	225L (Glenwood 229S - Spring Coulee 385S)	5.22%	16.19%	11.09%	2.91%	2.07%	2.90%	1.99%	3.20%	2.39%	2.88%	2.31%	2.07%	1.71%	19.75%	7.31%	2.29%	2.73%	0.71%	0.75%	40.62%	1.49%	2.07%	0.71%	0.66%	2.25%	0.00%	3.04%	2.39%	1.47%
North Lethbridge 370ST5	225L (Glenwood 229S - Spring Coulee 385S)	5.22%	16.19%	11.09%	2.91%	2.07%	2.90%	1.99%	3.20%	2.39%	2.88%	2.31%	2.07%	1.71%	19.75%	7.31%	2.29%	2.73%	0.71%	0.75%	40.62%	1.49%	2.07%	0.71%	0.66%	2.25%	0.00%	3.04%	2.39%	1.47%
North Lethbridge 370ST6	225L (Glenwood 229S - Spring Coulee 385S)	5.21%	16.18%	11.08%	2.89%	2.06%	2.89%	1.98%	3.19%	2.38%	2.87%	2.30%	2.06%	1.70%	19.74%	7.30%	2.28%	2.72%	0.71%	0.76%	40.62%	1.49%	2.06%	0.71%	0.66%	2.25%	0.00%	3.03%	2.38%	1.47%
161L or 161AL	180L (180AL - Fort Macleod 15S)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
763L	225L (Glenwood 229S - Spring Coulee 385S)	5.02%	15.93%	10.86%	2.50%	2.29%	2.90%	2.72%	3.01%	2.72%	2.48%	1.96%	2.29%	0.76%	19.47%	6.95%	2.59%	2.36%	0.74%	0.85%	40.44%	0.76%	2.29%	0.73%	0.62%	1.91%	0.00%	2.76%	2.72%	0.76%
Stirling 67ST2	225L (Glenwood 229S - Spring Coulee 385S)	2.01%	24.28%	24.28%	2.32%	1.38%	1.84%	1.34%	2.01%	1.56%	2.28%	1.94%	1.38%	1.19%	24.28%	8.06%	1.50%	2.31%	0.69%	0.77%	43.99%	1.07%	1.38%	0.68%	0.60%	1.89%	0.00%	2.09%	1.56%	1.06%
Magrath 225ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.44%	22.65%	1.40%	1.79%	2.59%	1.70%	2.89%	2.09%	1.41%	1.14%	1.79%	1.43%	44.35%	1.42%	2.00%	1.26%	0.48%	0.50%	58.83%	1.22%	1.79%	0.48%	0.47%	1.12%	0.00%	2.25%	2.09%	1.20%

Table A7-5: 2024SP Post-Project Sensitivity Scenario 9, Generators Effectiveness Factors under Category B Condition (N-1)

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
725L or 725AL	463L (463AL - Fort Macleod 15S)	-2.97%	-3.14%	-3.06%	-9.02%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	-7.29%	51.55%	0.24%	1.81%	-3.19%	-3.70%	-0.25%	67.34%	-0.36%	-1.39%	-2.67%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	-0.47%	2.59%
463L or 463AL	725L (Bowron 674S - 725BL)	-3.05%	-4.17%	-3.65%	0.00%	0.23%	-1.95%	0.84%	-2.84%	-0.45%	-3.78%	49.77%	0.23%	1.74%	-4.54%	-5.75%	-0.24%	65.01%	-0.33%	-1.32%	-3.66%	2.43%	0.23%	0.00%	0.00%	47.87%	0.00%	-3.25%	-0.45%	2.50%
Bowron 674ST1 or T2	172L (Chinook 181S - North Lethbridge 370S)	2.97%	3.18%	3.08%	-90.98%	-0.24%	2.01%	-0.87%	2.93%	0.47%	-92.72%	-51.55%	-0.24%	-1.81%	3.24%	3.77%	0.25%	-67.35%	0.36%	1.39%	2.71%	-2.52%	-0.24%	0.00%	0.00%	-49.59%	0.00%	3.38%	0.47%	-2.59%
Bowron 674ST1 or T2	463L (Chinook 181S - 463AL)	-2.97%	-3.18%	-3.08%	90.98%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	-7.28%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	-0.47%	2.59%
Bowron 674ST1 or T2	463L (463AL - Fort Macleod 15S)	-2.97%	-3.18%	-3.08%	-9.02%	0.24%	-2.01%	0.87%	-2.93%	-0.47%	-7.28%	51.55%	0.24%	1.81%	-3.24%	-3.77%	-0.25%	67.35%	-0.36%	-1.39%	-2.71%	2.52%	0.24%	0.00%	0.00%	49.59%	0.00%	-3.38%	-0.47%	2.59%
Riverbend 618ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	1.41%	1.13%	1.78%	1.42%	44.35%	44.35%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	2.09%	1.19%
Riverbend 618ST1	225L (Spring Coulee 385S - Magrath 225S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	1.41%	1.13%	1.78%	1.42%	44.35%	44.35%	2.00%	1.25%	0.48%	0.50%	-41.18%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	2.09%	1.19%
Riverbend 618ST1	225L (Stirling 67S - 225AL)	-7.95%	64.57%	-22.65%	-1.40%	-1.78%	-2.59%	-1.70%	-2.88%	-2.09%	-1.41%	-1.13%	-1.78%	-1.42%	55.65%	55.65%	-2.00%	-1.25%	-0.48%	-0.50%	41.18%	-1.21%	-1.78%	0.00%	0.00%	-1.12%	0.00%	-2.25%	-2.09%	-1.19%
863L or 891L	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	1.41%	1.13%	1.78%	1.42%	44.35%	0.00%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	2.09%	1.19%
924L	927L (Langdon 102S - Milo 356S)	30.68%	29.02%	29.79%	30.28%	34.15%	31.93%	34.90%	30.99%	33.51%	30.19%	33.61%	34.15%	35.88%	28.48%	29.69%	33.70%	32.07%	38.32%	31.99%	26.13%	36.63%	34.15%	0.00%	0.00%	33.80%	0.00%	30.57%	33.51%	36.70%
924L	225L (Glenwood 229S - Spring Coulee 385S)	4.86%	15.85%	10.74%	2.48%	1.93%	2.59%	1.86%	2.83%	2.18%	2.45%	2.09%	1.93%	1.64%	19.42%	6.91%	2.10%	2.42%	0.89%	0.93%	40.41%	1.47%	1.93%	0.00%	0.00%	2.05%	0.00%	2.64%	2.18%	1.45%
927L	924L (Langdon 102S - Milo 356S)	30.65%	28.99%	29.76%	30.25%	34.11%	31.89%	34.86%	30.95%	33.47%	30.16%	33.57%	34.11%	35.84%	28.45%	29.66%	33.67%	32.04%	38.28%	31.95%	26.11%	36.59%	34.11%	0.00%	0.00%	33.77%	0.00%	30.54%	33.47%	36.66%
927L	225L (Glenwood 229S - Spring Coulee 385S)	4.86%	15.85%	10.74%	2.48%	1.93%	2.59%	1.86%	2.83%	2.18%	2.45%	2.09%	1.93%	1.64%	19.42%	6.91%	2.10%	2.42%	0.89%	0.93%	40.41%	1.47%	1.93%	0.00%	0.00%	2.05%	0.00%	2.64%	2.18%	1.45%
940L	1005L (Little Bow 991S - Milo 356S)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
967L	225L (Glenwood 229S - Spring Coulee 385S)	5.13%	16.06%	10.98%	2.79%	2.10%	2.84%	2.03%	3.12%	2.39%	2.76%	2.30%	2.10%	1.78%	19.61%	7.19%	2.30%	2.68%	1.06%	1.24%	40.45%	1.59%	2.10%	0.00%	0.00%	2.26%	0.00%	2.94%	2.39%	1.58%
968L	225L (Glenwood 229S - Spring Coulee 385S)	5.13%	16.06%	10.98%	2.79%	2.10%	2.84%	2.03%	3.12%	2.39%	2.76%	2.30%	2.10%	1.78%	19.61%	7.19%	2.30%	2.68%	1.06%	1.24%	40.45%	1.59%	2.10%	0.00%	0.00%	2.26%	0.00%	2.94%	2.39%	1.58%
610L	879L (879AL - Bowmanton 244S)	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	-99.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
172L	725L (Bowron 674S - 725BL)	-3.05%	-4.17%	-3.65%	77.23%	0.23%	-1.95%	0.84%	-2.84%	-0.45%	77.23%	49.77%	0.23%	1.74%	-4.54%	-5.75%	-0.24%	65.01%	-0.33%	-1.32%	-3.66%	2.43%	0.23%	0.00%	0.00%	47.87%	0.00%	-3.25%	-0.45%	2.50%
Magrath 225ST1	225L (Glenwood 229S - Spring Coulee 385S)	7.95%	35.43%	22.65%	1.40%	1.78%	2.59%	1.70%	2.88%	2.09%	1.41%	1.13%	1.78%	1.42%	44.35%	1.41%	2.00%	1.25%	0.48%	0.50%	58.82%	1.21%	1.78%	0.00%	0.00%	1.12%	0.00%	2.25%	2.09%	1.19%
Vauxhall 158ST2	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	-2.80%	-0.76%	32.13%	0.00%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
Hull 257ST1	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	0.00%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
Riverbend 618ST1	172L (North Lethbridge 370S - 172FL)	37.80%	25.98%	31.48%	-6.28%	22.08%	35.13%	20.52%	39.98%	26.98%	-6.42%	-1.49%	22.08%	15.97%	22.14%	22.14%	25.48%	-3.67%	-0.82%	-2.36%	15.91%	12.52%	22.08%	0.00%	0.00%	-1.22%	0.00%	63.04%	26.98%	12.17%
863L or 891L	172L (North Lethbridge 370S - 172FL)	37.80%	25.98%	31.48%	-6.29%	22.08%	35.13%	20.52%	39.98%	26.98%	-6.42%	-1.51%	22.08%	15.97%	22.14%	0.00%	25.48%	-3.70%	-0.82%	-2.36%	15.91%	12.52%	22.08%	0.00%	0.00%	-1.24%	0.00%	63.04%	26.98%	12.17%
770L	172L (North Lethbridge 370S - 172FL)	60.27%	21.68%	39.63%	-9.56%	37.33%	59.24%	34.71%	67.39%	45.55%	-9.83%	-1.63%	37.33%	27.07%	9.15%	-4.97%	43.03%	-5.09%	-1.11%	-3.66%	6.00%	21.28%	37.33%	0.00%	0.00%	-1.20%	0.00%	77.02%	45.55%	20.69%
935L	172L (North Lethbridge 370S - 172FL)	35.90%	12.99%	23.65%	-5.51%	22.86%	35.45%	21.37%	40.13%	27.59%	-5.68%	-0.33%	22.86%	16.98%	5.55%	-2.81%	26.14%	-2.60%	-0.85%	-2.24%	3.65%	13.66%	22.86%	0.00%	0.00%	0.00%	0.00%	63.41%	27.59%	13.33%
923L	172L (North Lethbridge 370S - 172FL)	35.90%	12.99%	23.65%	-5.51%	22.87%	35.45%	21.38%	40.13%	27.60%	-5.68%	-0.33%	22.87%	16.99%	5.55%	-2.81%	26.15%	-2.60%	-0.85%	-2.25%	3.65%	13.67%	22.87%	0.00%	0.00%	0.00%	0.00%	63.42%	27.60%	13.34%
940L	172L (North Lethbridge 370S - 172FL)	34.85%	11.96%	22.61%	-6.58%	21.86%	34.40%	20.37%	39.07%	26.57%	-6.76%	-1.36%	21.86%	15.99%	4.54%	-3.87%	25.12%	-3.65%	-0.75%	1.52%	2.70%	12.68%	21.86%	0.00%	0.00%	-1.08%	0.00%	62.34%	26.57%	12.34%

Contingency	Plant / Line	Chin Chute	Raymond	Irrican	Monarch	Burdett	Suncor Chin Chute	Hull	Coaldale	Lethbridge Taber	COL Chinook	Vulcan	Lethbridge Burdett	Vauxhall	Taylor	Magrath	Enmax Taber	Claresholm	Blackspring Ridge	MATL	Spring Coulee	Hays	Westfield	Travers	Buffalo Plains	Enterprise	Tempest	Prominence	Taber Solar	Enchant
507L	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	1.63%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
763L	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
MATL	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
Magrath 225ST1	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%
Coaldale 254ST2	172L (North Lethbridge 370S - 172FL)	41.44%	16.82%	28.27%	-2.72%	32.13%	43.87%	40.33%	45.98%	40.33%	-2.80%	-0.76%	32.13%	1.63%	8.83%	0.22%	37.81%	-1.55%	-0.40%	-1.07%	6.32%	1.63%	32.13%	0.00%	0.00%	-0.66%	0.00%	68.05%	40.33%	1.63%