Engineering Connection Assessment

P2445 Homestead Solar Project Connection

KEC Homestead Solar GP Corp.

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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.

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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

KEC Homestead Solar GP Corp. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its approved Homestead Solar Project (Facility) to the AIES. The Facility includes an approved collector substation, designated Homestead 1111S 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 400 MW and a Rate DTS, *Demand Transmission Service*, contract capacity of 1.5 MW; and a request for transmission development (collectively, the Project).

The scheduled in-service date (ISD) for the Project is November 1, 2024.

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 of Fort Macleod (Area 53), which is part of the AESO South planning region. Fort Macleod (Area 53) is surrounded by the planning areas of High River (Area 46), Stavely (Area 49), Lethbridge (Area 54), Glenwood (Area 55) and is connected to the BC Hydro transmission system.

From a transmission system perspective, Fort Macleod (Area 53) consists primarily of a 500 kV, 240 kV, 138 kV and 69 kV transmission system. Fort Macleod (Area 53) is connected to Stavely (Area 49) through one 138 kV transmission line and two 240 kV transmission lines, connected to Lethbridge (Area 54) through two 138 kV transmission lines and two 240 kV transmission lines, and connected to Glenwood (Area 55) through one 138 kV transmission line and one 69 kV transmission line. Fort Macleod area is also connected to the BC Hydro transmission system through one 138 kV transmission line.

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 Fort Macleod Planning Area (Area 53), Lethbridge (Area 54), Stavely (Area 49), and Brooks (Area 47), including the tie lines connecting these planning areas to the rest of the AIES. The 240 kV transmission lines 985L and 1003L in Calgary (Area 6) are also included as part of the Study Area.

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 nine 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 240 kV Transmission Line 1037L or 1038L

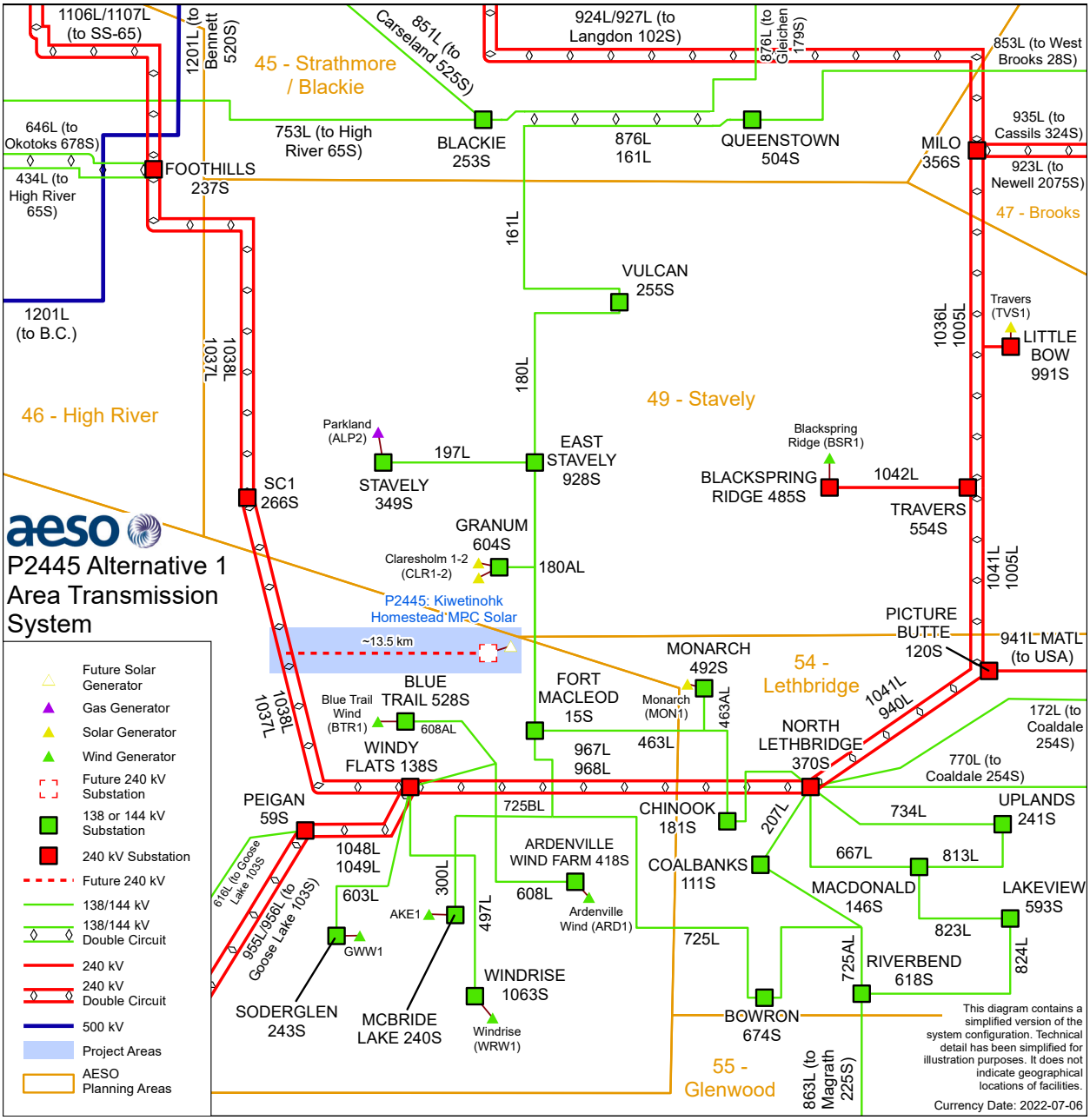
This alternative included the following developments:

- Add one 240 kV circuit, approximately 13.5 km[1] in length, to connect the Facility to the existing 240 kV transmission line 1037L (between Windy Flats 138S and SC1 266S substations) using a T-tap configuration in addition to a line crossing; or
- Add one 240 kV circuit, approximately 13.5 km in length, to connect the Facility to the existing 240 kV transmission line 1038L (between Windy Flats 138S and SC1 266S substations) using a T-tap configuration; and
- Add or modify associated equipment as required for the above 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 – In-and-Out connection to 240 kV Transmission Line 1037L or 1038L

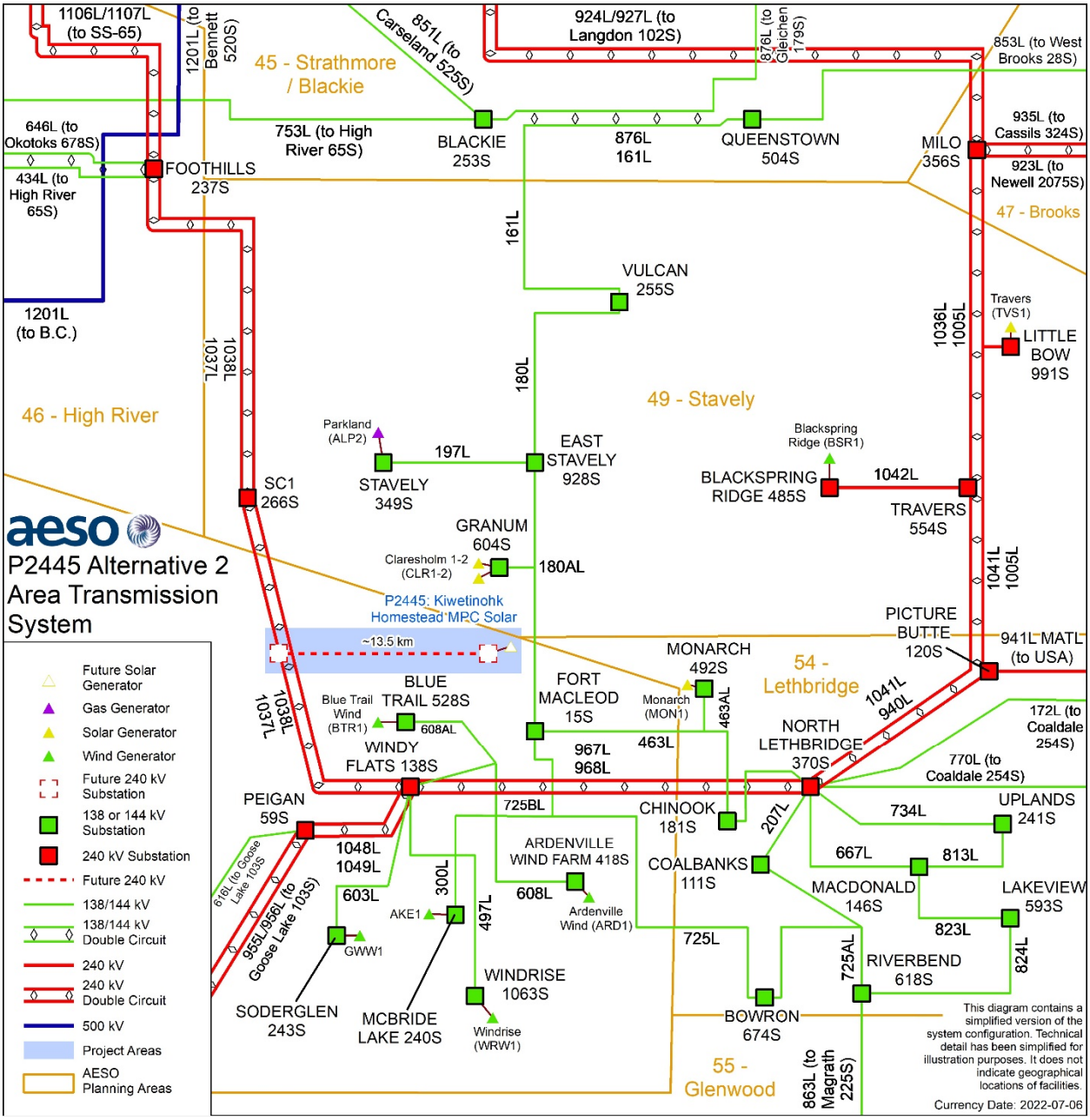
This alternative included the following developments:

- Add a new 240 kV switching substation including three 240 kV circuit breakers, connected to either of the existing 240 kV transmission lines 1037L or 1038L (between the SC1 266S and the Windy Flats 138S substations) using an in-and-out configuration;
- Add one 240 kV circuit, approximately 13.5 km[2] in length, to connect the Facility to the 240 kV switching substation; 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 –T-Tap Connection to the 240 kV Transmission Line 967L or 968L

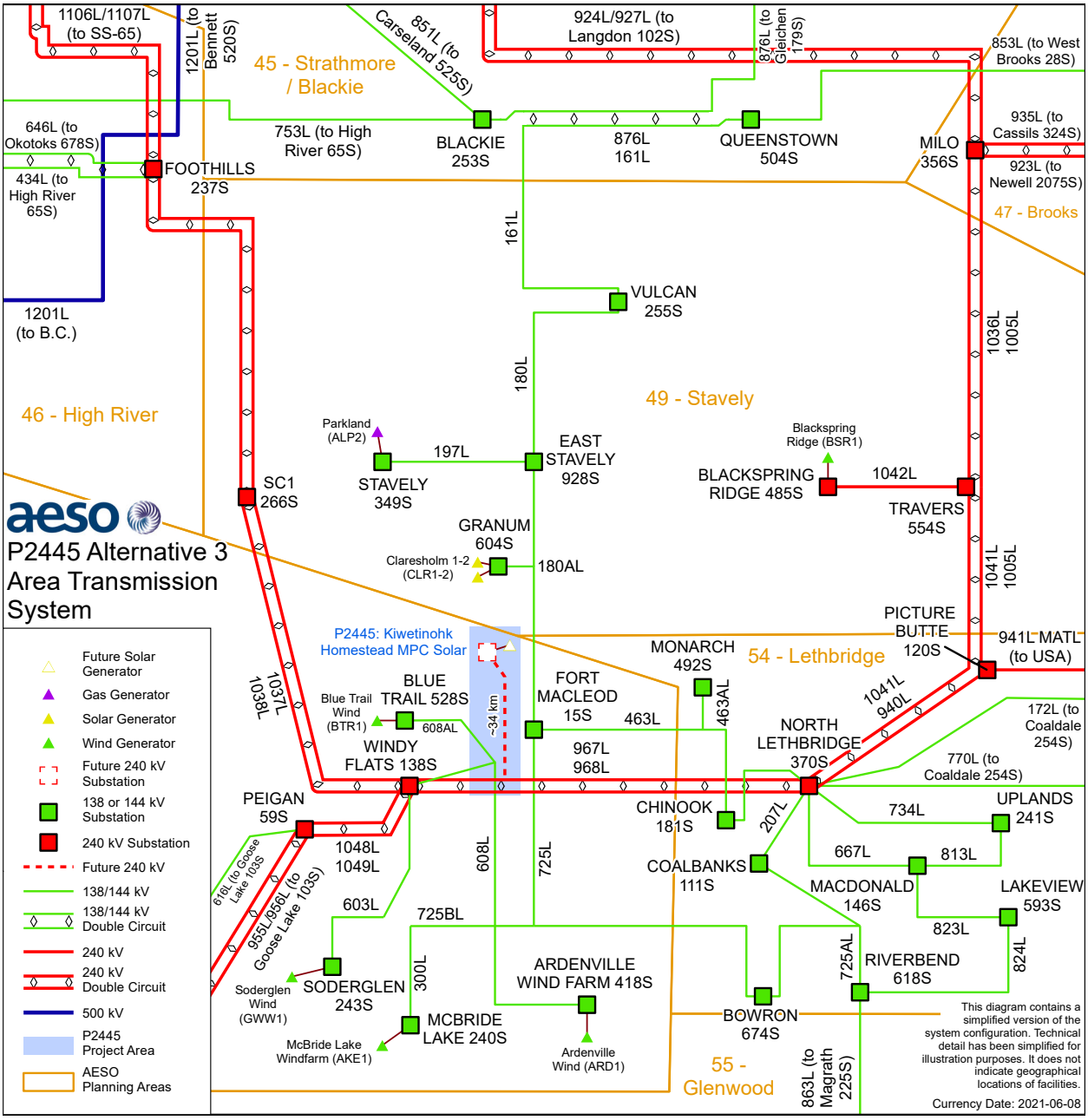
This alternative included the following developments:

- Add one 240 kV circuit, approximately 34 km[3] in length, to connect the Facility to either of the existing 240 kV transmission lines 967L or 968L (between North Lethbridge 370S and Windy Flats 138S 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 3-3.

[3] Exact line length to be determined by TFO

Figure 3-3: Connection Alternative 3



Alternative 4 – In-and-out Connection to the 240 kV Transmission Line 967L or 968L

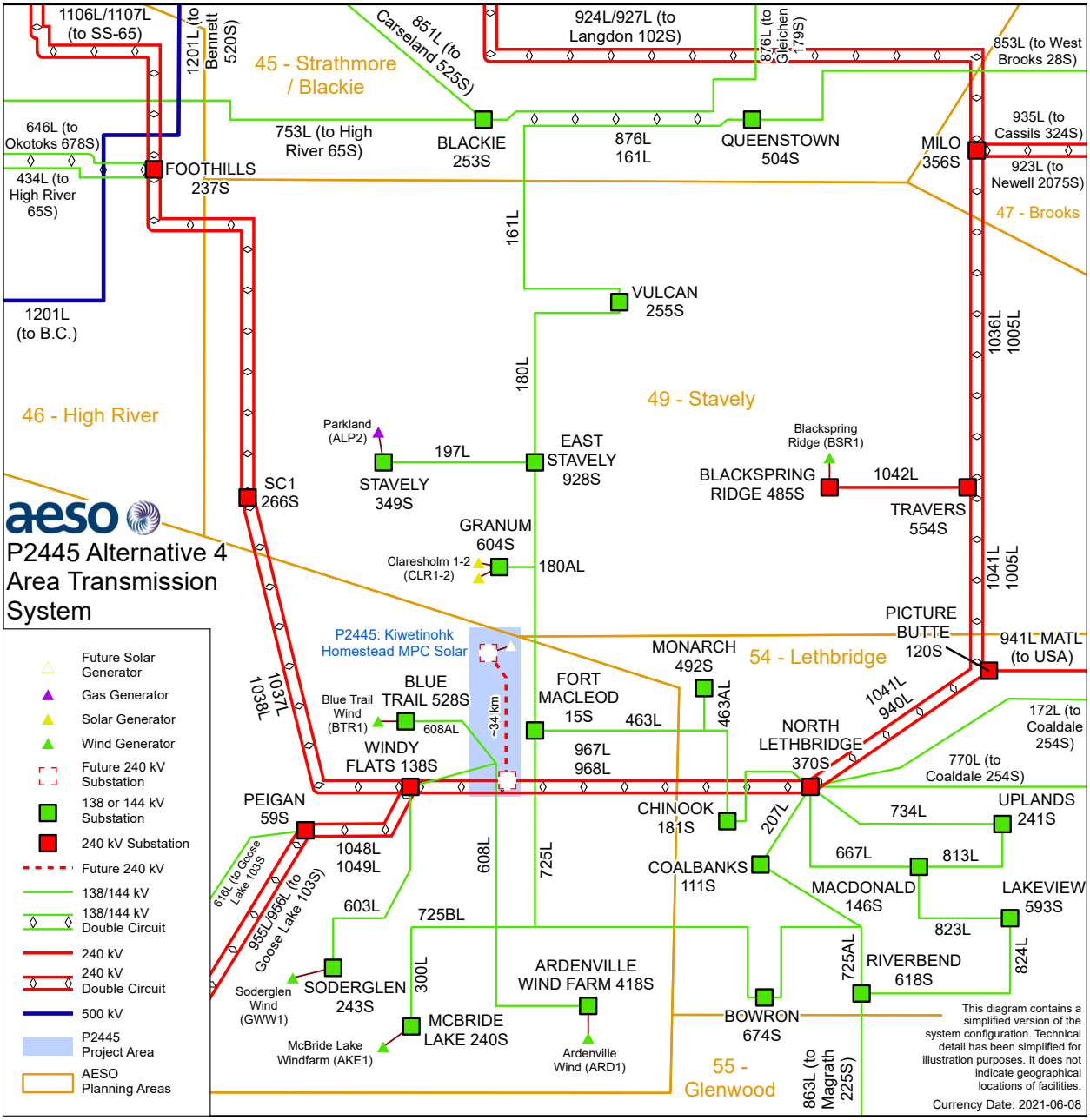
This alternative included the following developments:

- Add a new 240 kV switching substation including three 240 kV circuit breakers, connected to either of the existing 240 kV transmission line 967L or 968L (between North Lethbridge 370S and Windy Flats 138S substations) using an in-and-out configuration;
- Add one 240 kV circuit, approximately 34 km[4] in length, to connect the Facility to the 240 kV switching substation; and
- Add or modify associated equipment as required for the above transmission developments.

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

[4] Exact line length to be determined by TFO

Figure 3-4: Connection Alternative 4



Alternative 5 –Radial 240 kV Connection to Windy Flats 138S Substation

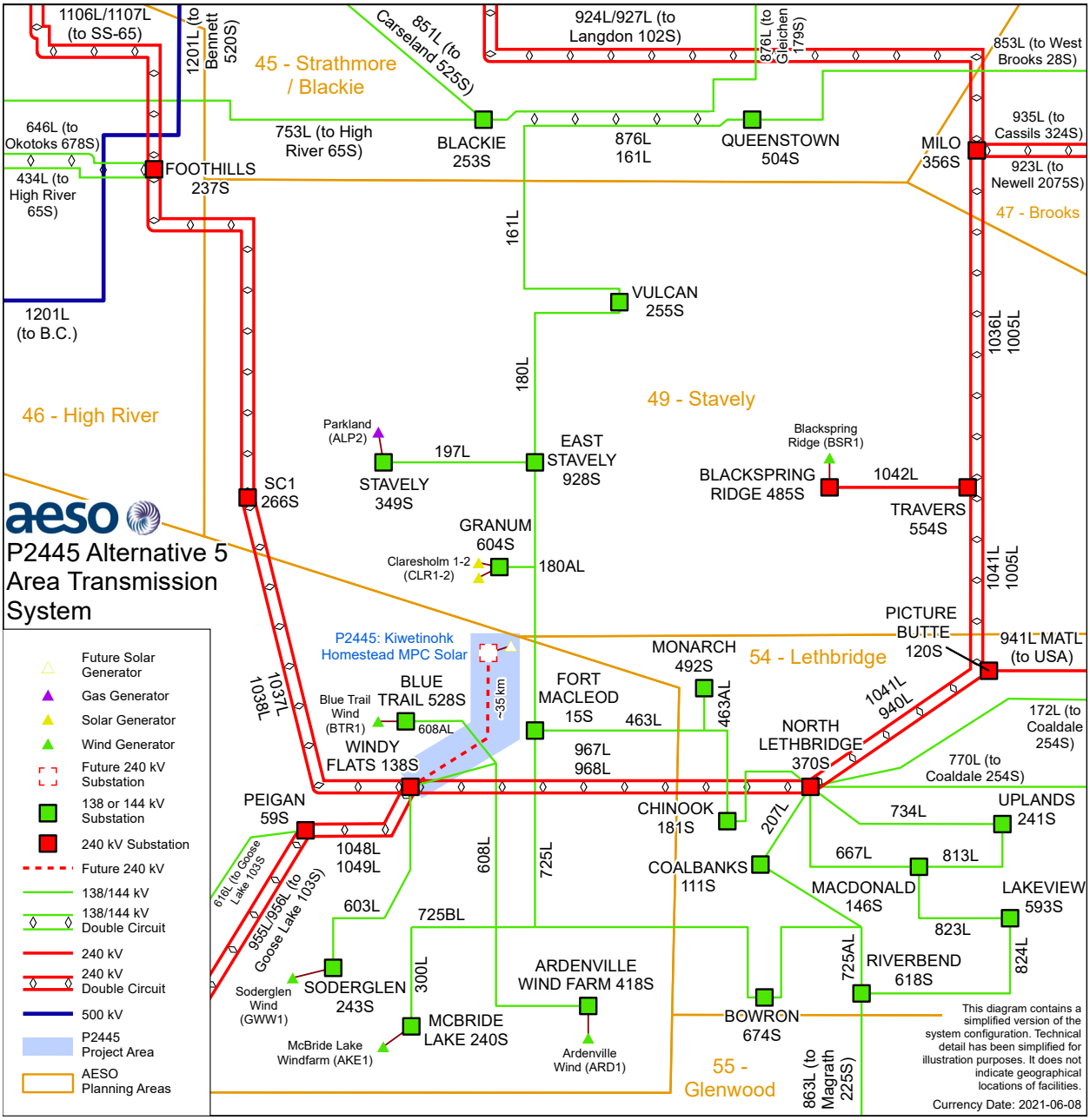
This alternative included the following developments:

- Modify the existing Windy Flats 138S substation, including adding one 240 kV circuit breaker;
- Add one 240 kV circuit, approximately 35 km[5] in length, to connect the Facility to the existing Windy Flats 138S 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 3-5.

[5] Exact line length to be determined by TFO

Figure 3-5: Connection Alternative 5



Alternative 6 – Radial 240 kV Connection to North Lethbridge 370S Substation

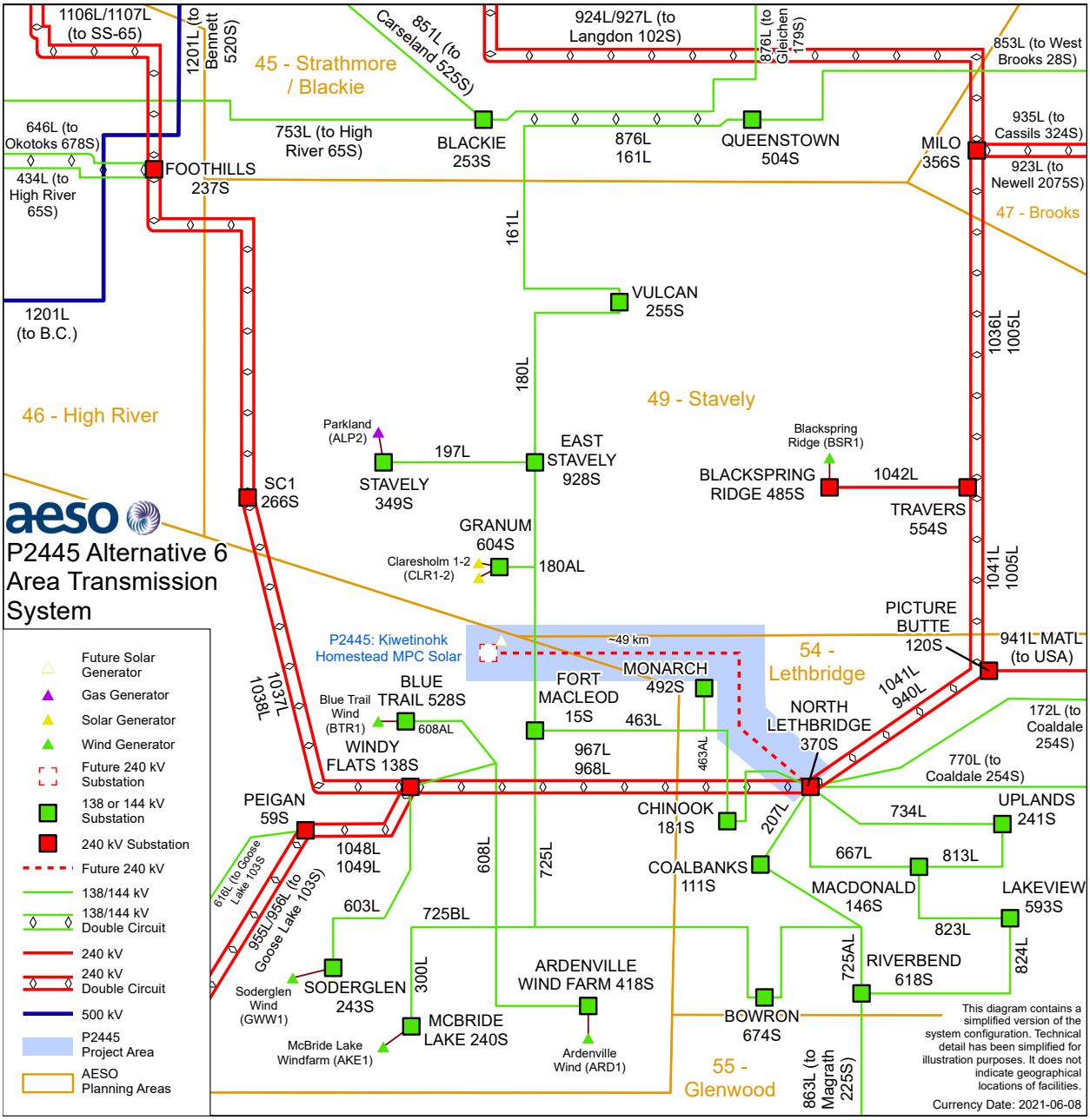
This alternative included the following developments:

- Modify the existing North Lethbridge 370S substation, including adding one 240 kV circuit breaker;
- Add one 240 kV circuit, approximately 49 km[6] in length, to connect the Facility to the existing 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 3-6.

[6] Exact line length to be determined by TFO

Figure 3-6: Connection Alternative 6



Alternative 7 – Radial 138 kV Connection to Fort Macleod 15S Substation

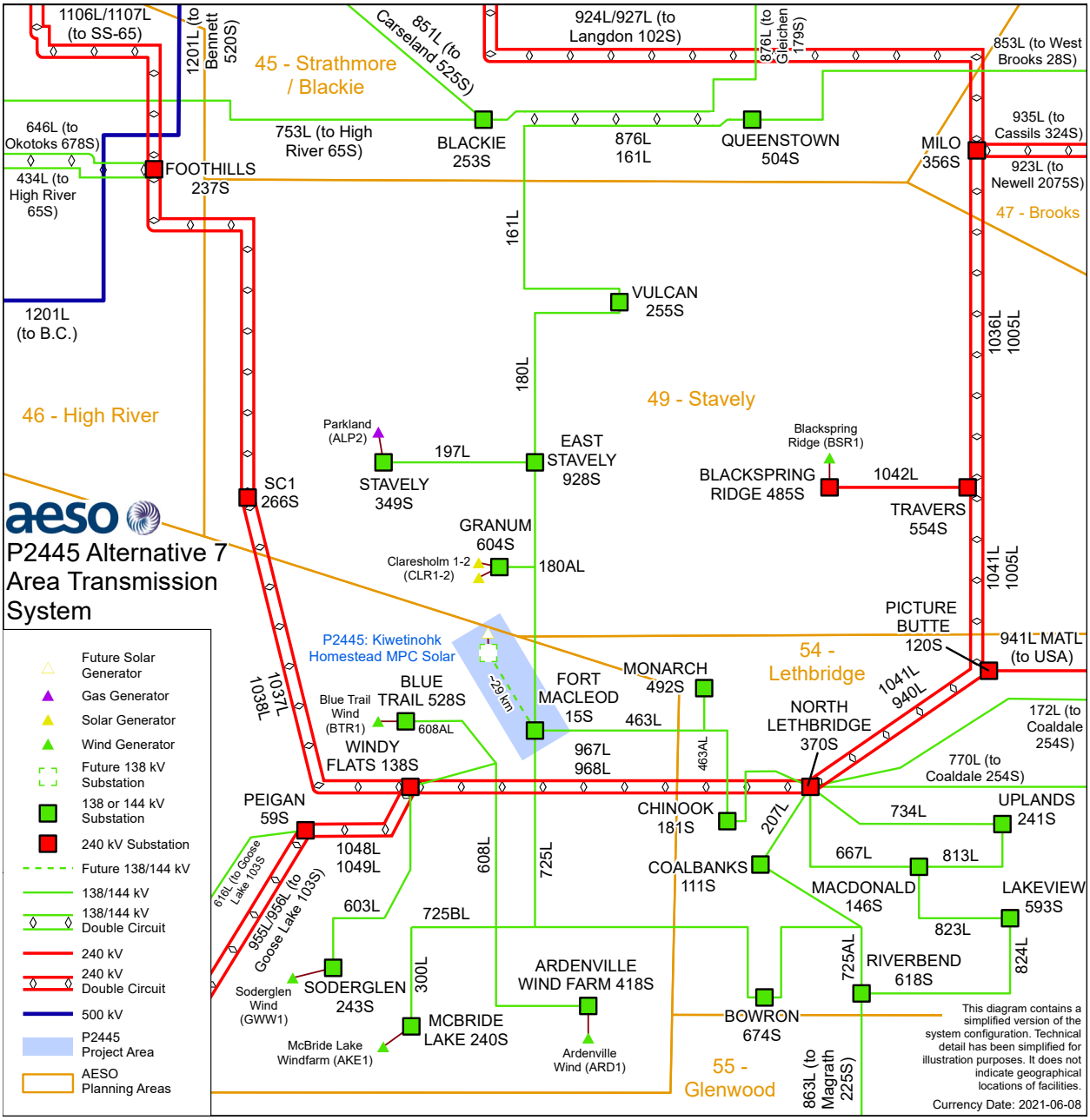
This alternative included the following developments:

- Modify the existing Fort Macleod 15S substation, including adding one 138 kV circuit breaker;
- Add one 138 kV circuit, approximately 29 km[7] in length, to connect the Facility to the existing Fort Macleod 15S 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 3-7.

[7] Exact line length to be determined by TFO

Figure 3-7: Connection Alternative 7



Alternative 8 – In-and-out Connection to the 138 kV Transmission Line 180L

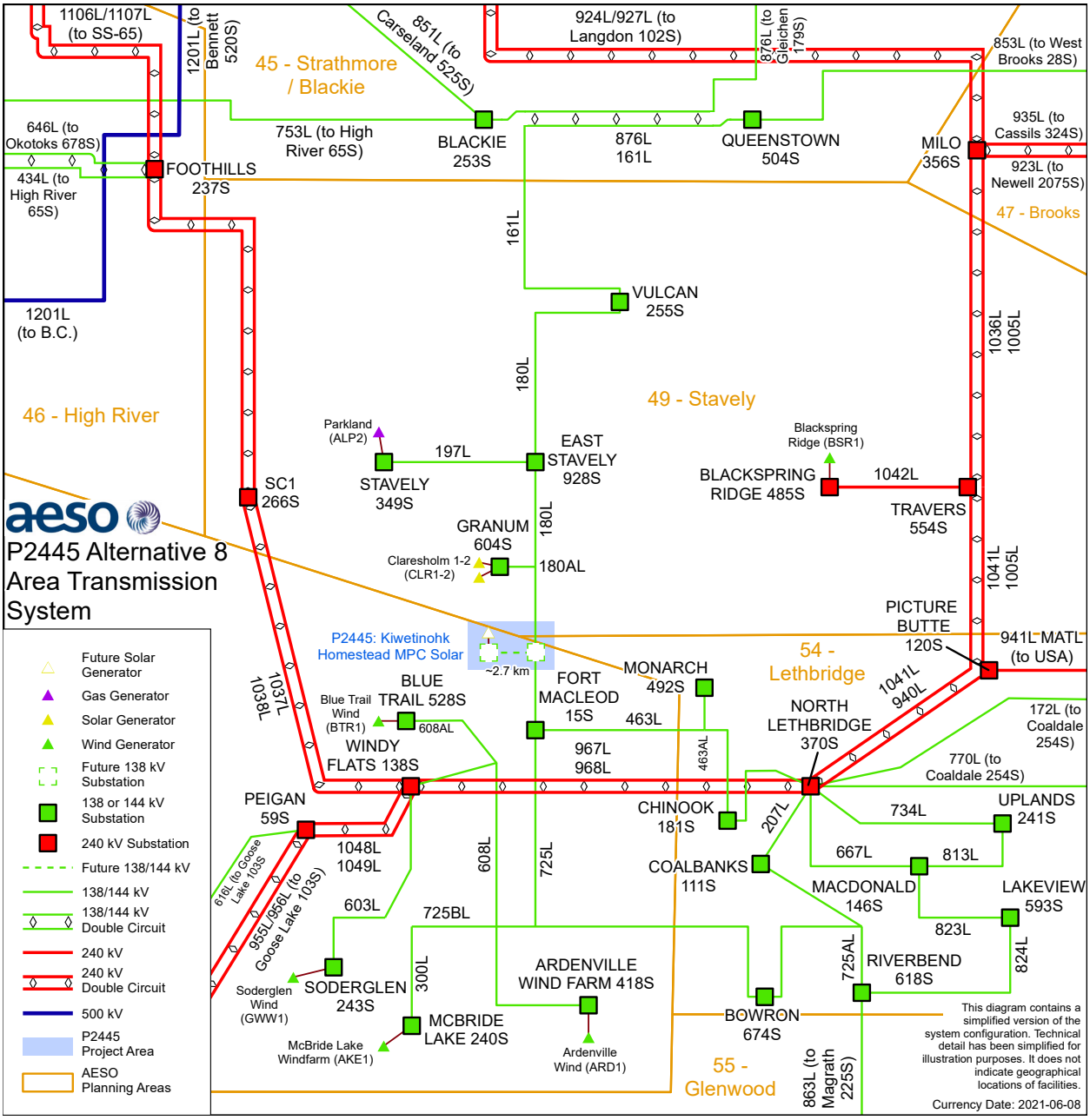
This alternative included the following developments:

- Add a new 138 kV switching substation including three 138 kV circuit breakers, connected to the existing 138 kV transmission line 180L (between 180AL tap point and Fort Macleod 15S substations) using an in-and-out configuration;
- Add one 138 kV circuit, approximately 2.7 km[8] in length, to connect the Facility to the 138 kV switching substation; and
- Add or modify associated equipment as required for the above transmission developments.

The proposed connection configuration is shown in Figure 3-8.

[8] Exact line length to be determined by TFO

Figure 3-8: Connection Alternative 8



Alternative 9 –T-Tap Connection to the 138 kV Transmission Line 180L

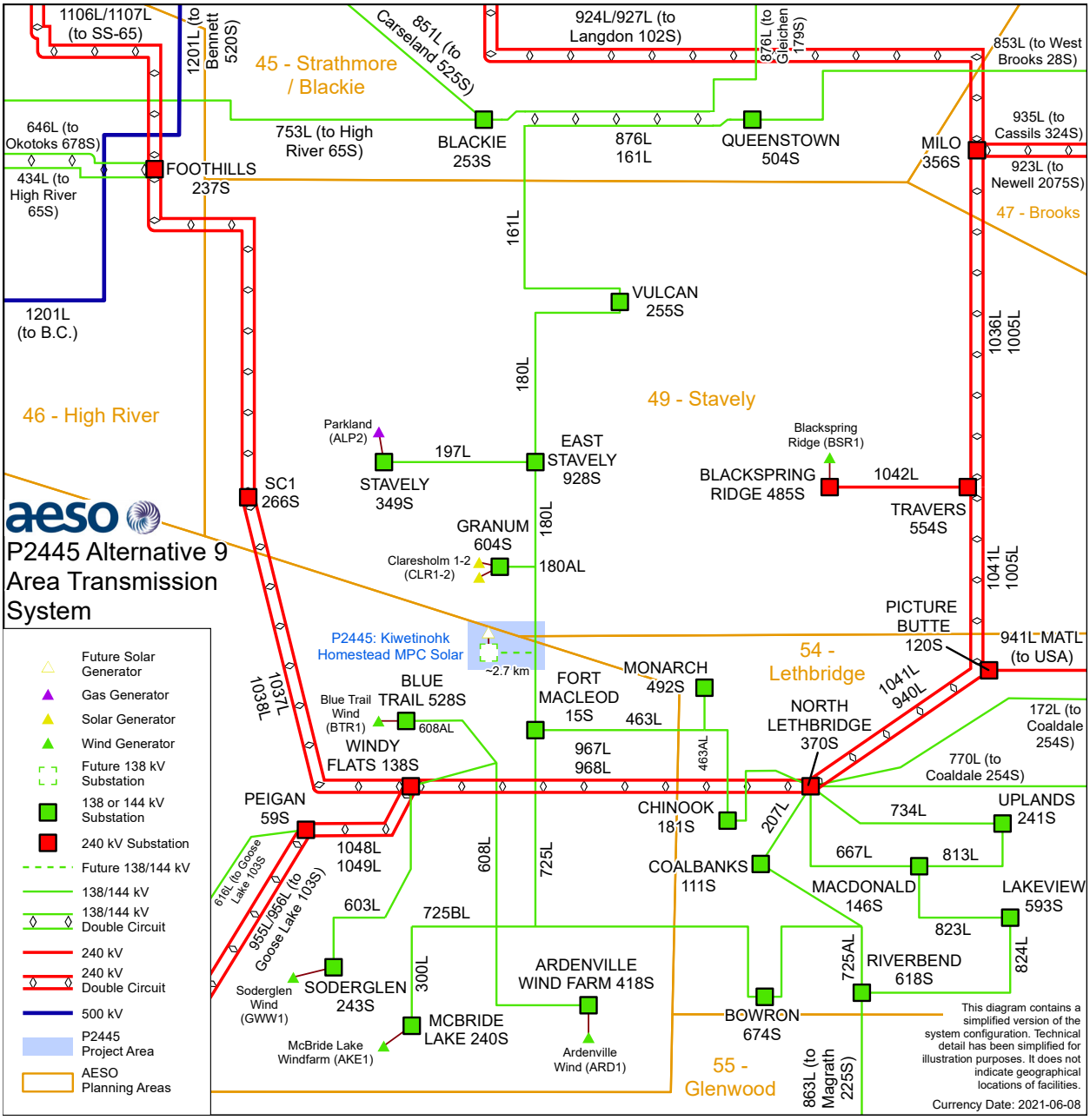
This alternative included the following developments:

- Add one 138 kV circuit, approximately 2.7 km[9] in length, to connect the Facility to the existing 138 kV transmission line 180L (between 180AL tap point and Fort Macleod 15S 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 3-9.

[9] Exact line length to be determined by TFO

Figure 3-9: Connection Alternative 9



3.3 Connection Alternatives Selected for Further Study

Alternative 1 is considered technically feasible and was selected for further study. The connection to the 240 kV transmission line 1038L was ruled out because this connection alternative is offered to another project more advanced in the connection process. Therefore, Alternative 1 is the T-tap connection to the 240 kV Transmission Line 1037L.

3.4 Connection Alternatives Not Selected for Further Study

Alternatives 7, 8, and 9 were ruled out as the available capacity on the 138 kV transmission system would not accommodate an additional 400 MW. Alternative 2 would have similar system impacts and technical performance to Alternative 1 however, Alternative 2 involves increased transmission development and hence, increased cost, compared to Alternative 1. Therefore, Alternative 2 was not selected for further study. Alternatives 3, 4, 5, and 6 involve increased transmission development and hence, increased cost, compared to Alternative 1. Therefore, Alternatives 3, 4, 5, and 6 were not selected for further study.

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

The scheduled ISD for the Project is November 1, 2024. Therefore, studies were performed using scenarios for 2025 Summer Light (SL) and 2025 Summer Peak (SP).

In addition to studying the main scenarios (scenarios 1 to 4), the AESO also chose to run sensitivity studies to include two additional connection projects (i.e., P2373: Kirkcaldy MPC Solar and P2378: RESC Nova MPC Solar) in the Study Area (scenarios 6 to 9).

Short-circuit studies were performed using the 2025 SP pre-Project scenario, 2025 SP and 2031 winter peak (WP) post-Project scenarios.

Table 4-1 lists the study scenarios. Post-Project scenarios reflect the final requested Rate STS contract capacity of 400 MW at the Homestead 1111S 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	2025 SL	High Generation	2025 SL Pre-Project	0	0
2	2025 SP	High Generation	2025 SP Pre-Project	0	0
Post-Project					
3	2025 SL	High Generation	2025 SL Post-Project	1.5	400
4	2025 SP	High Generation	2025 SP Post-Project	1.5	400
5	2031 WP	All machines in study area in service	2031 WP Post -Project	1.5	400
Pre-Project Sensitivity with P2373 and P2378					
6	2025 SL	High Generation	2025 SL Pre-Project Sensitivity	0	0
7	2025 SP	High Generation	2025 SP Pre-Project Sensitivity	0	0
Post-Project Sensitivity with P2373 and P2378					
8	2025 SL	High Generation	2025 SL Post-Project Sensitivity	1.5	400

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
9	2025 SP	High Generation	2025 SP Post-Project Sensitivity	1.5	400

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.[10]

Power flow studies were performed for 2025 SL and 2025 SP pre-Project scenarios, and for 2025 SL and 2025 SP post-Project scenarios.

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.

Transient stability studies were performed for 2025 SL and 2025 SP post-Project scenarios.

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 2025 SP pre-Project scenario, 2025 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 and transient stability 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.

[10] 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.

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 and Category A conditions if required.

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					
2025 Summer Light (Scenario 1 and 3)	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	100L (485S Tilley to 895S Tilley)	Marginally reduces violation	Real-time operational practices (RTOPs)	RTOPs
	None	Thermal - below emergency rating	System Normal (N-0)	916L (5S East Calgary to 42SSarcee)	New violation	None	RTOPs
	Voltage	Voltage	1034L (244S Bowmanton to 324S Cassils)	Voltage Collapse	No impact	RAS 164	RAS 164
	Voltage	Voltage	1035L (244S Bowmanton to 2075S Newell)	Voltage Collapse	No impact	RAS 164	RAS 164
	None	Thermal - above emergency rating	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	New violation	None	Modified planned RAS 193
	None	Thermal - below emergency rating	1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
	Thermal - below emergency rating	Thermal - below emergency rating	1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	Materially reduces violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
	Voltage	Voltage	1114L (520S Bennett to 102S Langdon)	Voltage Collapse	No impact	RTOPs	RTOPs
	Thermal - below emergency rating	None	770L (254S Coaldale to 370S North Lethbridge)	172L (254S Coaldale to 370S North Lethbridge)	Materially reduces violation	RTOPs	None
	None	Thermal - below emergency rating	918L (SS-162 Beddington to 281S Johnson)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	Thermal - above emergency rating	Thermal - above emergency rating	927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	None	Thermal - above emergency rating	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	New violation	None	Modified planned RAS 193
	Voltage	Voltage	EATL	Voltage Collapse	No impact	RTOPs	RTOPs
	None	Thermal - above emergency rating	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	New violation	None	Modified planned RAS 193
	Voltage	Voltage	EATL	Voltage Collapse	No impact	RTOPs	RTOPs
	Voltage	Voltage		Voltage Collapse	No impact	RTOPs	RTOPs
	Voltage	Voltage		Voltage Collapse	No impact	RTOPs	RTOPs
	Thermal - below emergency rating	Voltage	WATL	901L (74S Janet to Cross Field Tap)	New violation	RTOPs	RTOPs
	Thermal - above emergency rating	Voltage		916L (5S East Calgary to 42S Sarcee)	New violation	RTOPs	RTOPs
	Thermal - below emergency rating	Voltage		918L (SS-162 Beddington to 281S Johnson)	New violation	RTOPs	RTOPs
2025 Summer Peak (Scenario 2 and 4)	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	924L (Langdon 102S - P2396 Tap)	No impact	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	100L (485S Tilley to 895S Suffield)	No impact	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	Materially increases violation	Planned RAS 193	Modified planned RAS 193
	Voltage	Voltage	1034L (244S Bowmanton to 324S Cassils)	Voltage Collapse	No impact	RAS 164	RAS 164
	Voltage	Voltage	1035L (244S Bowmanton to 2075S Newell)	Voltage Collapse	No impact	RAS 164	RAS 164
	Thermal - below emergency rating	Thermal - below emergency rating	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	Marginally reduces violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	Materially increases violation	RTOPs	RTOPs
	None	Thermal - below emergency rating		927L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	Materially reduces violation	Planned RAS 197	Planned RAS 197
	None	Thermal - below emergency rating	1106L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating		927L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating	1107L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating		927L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating	1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - below emergency rating	1114L (520S Bennett to 102S Langdon)	412L (396S Pincher Creek to 632S Russell)	Materially reduces violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating		613L (103S Goose Lake to 396S Pincher Creek)	Materially reduces violation	RTOPs	RTOPs
	Thermal - above emergency rating	Thermal - below emergency rating		786L/1L275 (799S Coleman to Natal)	Materially reduces violation	RTOPs	RTOPs
	None	Thermal - below emergency rating		924L (102S Langdon to 356S Milo)	New violation	None	RTOPs

	Thermal - above emergency rating	Thermal - above emergency rating	924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	Thermal - above emergency rating	Thermal - above emergency rating	927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	Thermal - above emergency rating	Thermal - above emergency rating	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	Materially increases violation	Planned RAS 193	Modified planned RAS 193
	Thermal - below emergency rating	Voltage	EATL	916L (5S East Calgary to 42S Sarcee)	New violation	RTOPs	RTOPs
	Thermal - below emergency rating	Voltage		923L (356S Milo to 2075 Newell)	New violation		
	Thermal - above emergency rating	Voltage		924L (102S Langdon to 356S Milo)	New violation		
	Thermal - above emergency rating	Voltage		927L (102S Langdon to 356S Milo)	New violation		
	Thermal - above emergency rating	Thermal - above emergency rating	WATL	916L (5S East Calgary to 42S Sarcee)	Materially increases violation	RTOPs	RTOPs
2025 Summer Light Sensitivity (Scenario 6 and 8)	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	100L (485S Tilley to 895S Tilley)	No impact	RTOPs	RTOPs
	None	Thermal - below emergency rating	System Normal (N-0)	916L (5S East Calgary to 42SSarcee)	New violation	None	RTOPs
	None	Thermal - below emergency rating	System Normal (N-0)	1109L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
	None	Thermal - below emergency rating	System Normal (N-0)	1080L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
	None	Thermal - above emergency rating	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	New violation	None	Modified planned RAS 193
	Voltage	Voltage	1034L (244S Bowmanton to 324S Cassils)	Voltage Collapse	No impact	RAS 164	RAS 164
	Voltage	Voltage	1035L (244S Bowmanton to 2075S Newell)	Voltage Collapse	No impact	RAS 164	RAS 164
	None	Thermal - below emergency rating	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
	Thermal - below emergency rating	Thermal - below emergency rating	1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	Materially reduces violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	1106L (SS-65 to 237S Foothills)	1107L (SS-68 to 237S Foothills)	New violation	None	RTOPs
	None	Thermal - below emergency rating	1107L (SS-65 to 237S Foothills)	1106L (SS-68 to 237S Foothills)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
	Voltage	Voltage	1114L (520S Bennett to 102S Langdon)	Voltage Collapse	No impact	RTOPs	RTOPs
	None	Thermal - below emergency rating	918L (SS-162 Beddington to 281S Johnson)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	Materially increases violation	RTOPs	Planned RAS 175
	Thermal - below emergency rating	Thermal - above emergency rating		927L (P2378 Tap to 356S Milo)	Materially increases violation	RTOPs	Planned RAS 175
	None	Thermal - below emergency rating	925L (63S Red Deer to 74S Janet)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	None	Thermal - below emergency rating	925L (63S Red Deer to 74S Janet)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	Thermal - above emergency rating	Thermal - above emergency rating	927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
	None	Thermal - below emergency rating	929L (74S Janet to 287S Hazelwood)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	None	Thermal - below emergency rating	932L (74S Janet to SS-162 Beddington)	916L (5S East Calgary to 42S Sarcee)	New violation	None	RTOPs
	None	Thermal - above emergency rating	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	New violation	None	Modified planned RAS 193
	Voltage	Voltage	EATL	Voltage Collapse	No impact	RTOPs	RTOPs
	Voltage	Voltage		Voltage Collapse	No impact	RTOPs	RTOPs
	Voltage	Voltage		Voltage Collapse	No impact	RTOPs	RTOPs
	Voltage	Voltage		Voltage Collapse	No impact	RTOPs	RTOPs
	Thermal - above emergency rating	Voltage	WATL	916L (5S East Calgary to 42S Sarcee)	No impact	RTOPs	RTOPs
	Thermal - below emergency rating	Voltage		918L (SS-162 Beddington to 281S Johnson)	No impact	RTOPs	RTOPs
	Thermal - below emergency rating	Voltage		901L (74S Janet to Cross Field Tap)	No impact	RTOPs	RTOPs
2025 Summer Peak Sensitivity (Scenario 7 and 9)	Thermal - above emergency rating	Thermal - above emergency rating	System Normal (N-0)	100L (485S Tilley to 895S Suffield)	Materially reduces violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	924L (102S Langdon to 356S Milo)	Materially increases violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	927L (P2378 Project Tap to 356S Milo)	Marginally reduces violation	RTOPs	RTOPs
	Thermal - below emergency rating	Thermal - below emergency rating	System Normal (N-0)	927L (P2378 Project to 102S Langdon)	Materially increases violation	RTOPs	RTOPs
	Voltage	Voltage	1034L (244S Bowmanton to 324S Cassils)	Voltage Collapse	No impact	RAS 164	RAS 164
	Voltage	Voltage	1035L (244S Bowmanton to 2075S Newell)	Voltage Collapse	No impact	RAS 164	RAS 164
	Thermal - above emergency rating	Thermal - above emergency rating	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	Materially increases violation	Planned RAS 193	Modified planned RAS 193
	Thermal - below emergency rating	Thermal - below emergency rating	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills)	924L (102S Langdon to 356S Milo)	Marginally reduces violation	RTOPs	RTOPs
	None	Thermal - below emergency rating	1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	New violation	None	RTOPs
	None	Thermal - below emergency rating	1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	927L (P2378 Tap to 356S Milo)	New violation	None	RTOPs
	Thermal - below emergency rating	Thermal - above emergency rating	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
	Thermal - above emergency rating	Thermal - below emergency rating	1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	Materially reduces violation	Planned RAS 197	RTOPs

None	Thermal - above emergency rating	1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)	New violation	None	New RAS for 1106L or 1107L
Thermal - below emergency rating	Thermal - below emergency rating		924L (102S Langdon to 356S Milo)	Materially increases violation	RTOPs	RTOPs
None	Thermal - below emergency rating		927L (P2378 Tap to 102S Langdon)	New violation	None	RTOPs
None	Thermal - below emergency rating		927L (P2378 Tap to 356S Milo)	New violation	None	RTOPs
None	Thermal - above emergency rating	1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)	New violation	None	New RAS for 1106L or 1107L
Thermal - below emergency rating	Thermal - below emergency rating		924L (102S Langdon to 356S Milo)	Materially increases violation	RTOPs	RTOPs
None	Thermal - below emergency rating		927L (P2378 Tap to 102S Langdon)	New violation	None	RTOPs
None	Thermal - below emergency rating		927L (P2378 Tap to 356S Milo)	New violation	None	RTOPs
Thermal - below emergency rating	Thermal - above emergency rating	1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	Materially increases violation	RTOPs	Modified planned RAS 193
Thermal - below emergency rating	Thermal - below emergency rating	1114L (520S Bennett to 102S Langdon)	412L (396S Pincher Creek to 632S Russell)	Materially reduces violation	RTOPs	RTOPs
None	Thermal - below emergency rating		924L (102S Langdon to 356S Milo)	New violation	None	RTOPs
Thermal - below emergency rating	None		786L/1L275 (799S Coleman to Natal)	Materially reduces violation	RTOPs	None
Thermal - below emergency rating	None		613L (103S Goose Lake to 396S Pincher Creek)	Materially reduces violation	RTOPs	None
None	Thermal - below emergency rating	924L (102S Langdon to 356S Milo)	1080L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
None	Thermal - below emergency rating		1109L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
Thermal - above emergency rating	Thermal - above emergency rating		927L (P2378 Tap to 102S Langdon)	Materially increases violation	Planned RAS 175	Planned RAS 175
Thermal - above emergency rating	Thermal - above emergency rating		927L (P2378 Tap to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
None	Thermal - below emergency rating	927L (356S Milo to 927AL Tap to 102S Langdon)	1080L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
None	Thermal - below emergency rating		1109L (SS-25 Shepard to SS-65)	New violation	None	RTOPs
Thermal - above emergency rating	Thermal - above emergency rating		924L (102S Langdon to 356S Milo)	Materially increases violation	Planned RAS 175	Planned RAS 175
Thermal - above emergency rating	Thermal - above emergency rating	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	Materially increases violation	Planned RAS 193	Modified planned RAS 193
Voltage	Voltage	EATL	Voltage Collapse	No impact	RTOPs	RTOPs
Thermal – above emergency rating	Thermal - above emergency rating	WATL	916L (5S East Calgary to 42S Sarcee)	Materially increases violation	RTOPs	RTOPs
None	Thermal - below emergency rating		918L (SS-162 Beddington to 281S Johnson)	Materially increases violation	RTOPs	RTOPs
None	Thermal - below emergency rating		901L (74S Janet to Cross Field Tap)	Materially increases 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 No. 197 was proposed for the approved Brooks Solar Farm Connection Needs Identification Document Checklist. This RAS is referred to herein as “Planned RAS 197”.
- Planned RAS No. 175 is a RAS proposed for P1927, P2247, P2378. This project will not be added to RAS 175.
- Planned RAS No. 193 is a RAS proposed for P2373 and P2422, P2503 and P2504.
- RAS No. 164 is an existing RAS.
- New RAS for 1106L and 1107L is expected to trip this project (P2445) when either of 1106L or 1107L overloads are above the emergency rating.
- In this table, “Modify” refers to adding the Project to the logic of the respective RAS.

5.2 Pre-Project Study Results

5.2.1 Category A Conditions

Thermal Reliability Criteria violations under Category A conditions (i.e., all elements in service) were observed on the 138 kV transmission line 100L in both Summer Light and Summer Peak Pre-Project scenarios (scenarios 1 and 2) and on the 240 kV transmission line 924L in Summer Peak 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 and voltage violations under Category B conditions (i.e., loss of a single system element).

Results did not indicate any transient stability concerns, and the system showed acceptable dynamic response to all Category B conditions studied.

5.3 Post-Project Study Results

5.3.1 Category A Conditions

Thermal Reliability Criteria violations under Category A conditions were observed on the 240 kV transmission line 916L and the 138 kV transmission line 100L in the Summer Light Post-Project scenario (scenario 3). In addition, Thermal Reliability Criteria violations under Category A conditions were observed on the 240 kV transmission line 924L and the 138 kV line 100L for the SP Post-Project scenario (scenario 4).

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 and voltage criteria violations.

Results did not indicate any transient stability concerns, and the system showed acceptable dynamic response to all Category B conditions studied.

5.4 Pre-Project Sensitivity Study Results

5.4.1 Category A Conditions

Thermal Reliability Criteria violations under Category A conditions were observed on the 138 kV transmission line 100L in both Summer Light and Summer Peak Pre-Project sensitivity scenarios (scenarios 6 and 7). In addition, Thermal Reliability Criteria violations under the Category A conditions were observed on the 240 kV transmission lines 924L and 927L in the Summer Peak Pre-Project sensitivity scenario (scenario 7).

5.4.2 Category B Conditions

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

Results did not indicate any transient stability concerns, and the system showed acceptable dynamic response to all Category B conditions studied.

5.5 Post-Project Sensitivity Study Results

5.5.1 Category A Conditions

Thermal Reliability Criteria violations under Category A conditions were observed on the 240 kV transmission lines 916L, 1109L, 1080L and the 138 kV transmission line 100L in Summer Light Post-Project sensitivity scenario (scenario 8). In addition, Thermal Reliability Criteria violation under the Category A conditions were observed on the 240 kV transmission lines 924L and 927L and the 138 kV transmission line 100L in the SP Post-Project sensitivity scenario (scenario 9).

5.5.2 Category B Conditions

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

Results did not indicate any transient stability concerns, and the system showed acceptable dynamic response to all Category B conditions studied.

5.6 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.

5.6.1 Pre-Project

Under Category A conditions, Thermal Reliability Criteria violations were observed on the 138 kV transmission line 100L and 240 kV transmission line 924L in the pre-Project scenarios. These Thermal Reliability Criteria violations can be managed by applying the TCM Rule to curtail generation as required until such a time that system developments or other mitigations 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, voltage criteria violations can be managed under Category B conditions using real-time operational practices (RTOPs) and the existing RAS 164. Most of the observed Category B Thermal Reliability Criteria violations can be managed using RTOPs. The remaining Thermal Reliability Criteria violations observed under Category B conditions can be mitigated with the existing planned RAS 193, planned RAS 175 and planned RAS 197.

5.6.2 Post-Project

Under Category A conditions, Thermal Reliability Criteria violations were observed on the 240 kV transmission line 916L and 924L and the 138 kV transmission line 100L in the post-Project scenarios.. These Thermal Reliability Criteria violations can be managed by applying RTOPs as required until such a

time that system developments or other mitigations 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, voltage criteria violations can be managed under Category B conditions using RTOPs and existing RAS 164. Most of the observed Category B Thermal Reliability Criteria violations can be managed using RTOPs. The remaining Thermal Reliability Criteria violations observed under Category B conditions can be mitigated with the planned RAS 175, planned RAS 197, and modified planned RAS 193.

With the addition of the project, the total amount of generation tied to modified RAS 193 exceeds the MSSC limit of 466 MW. The post-Project studies indicate that in order to mitigate the thermal violations following certain contingencies, the actions of RAS 193 may result in generation curtailment in excess of the MSSC limit. Pre-contingency generation curtailment under the Category A condition may be required using real-time operational practices to prevent generation curtailment by RAS action above the MSSC level. The probability of pre-curtailment being required would be dependent on generation profiles and operating conditions.

5.6.3 Pre-Project Sensitivity

Under Category A conditions, Thermal Reliability Criteria violations were observed on the 240 kV transmission lines 924L and 927L and the 138 kV transmission line 100L in the pre-Project Sensitivity scenarios, following the inclusion of two additional projects (P2373 and P2378) planning to connect in the South region. These Thermal Reliability Criteria violations can be managed by applying RTOPs as required until such a time that system projects 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, voltage criteria violations can be managed under Category B conditions using RTOPs and existing RAS 164. Most of the observed Category B Thermal Reliability Criteria violations can be managed using RTOPs. The remaining Thermal Reliability Criteria violations observed under Category B conditions can be mitigated with the planned RAS 175, planned RAS 197, and planned RAS 193.

5.6.4 Post-Project Sensitivity

Under Category A conditions, Thermal Reliability Criteria violations were observed on the 240 kV transmission lines 924L, 927L, 916L, 1109L, 1080L and the 138 kV transmission line 100L in the post-Project Sensitivity scenarios, following the inclusion of two additional projects (P2373 and P2378) planning to connect in the South region. These Thermal Reliability Criteria violations can be managed by applying RTOPs as required until such a time that system projects 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 the connection of the Project, voltage criteria violations can be managed under Category B conditions using RTOPs and existing RAS 164. Most of the observed Category B Thermal Reliability Criteria violations can be managed using RTOPs. The remaining Thermal Reliability Criteria violations observed under Category B conditions can be mitigated with the planned RAS 175, planned RAS 197, modified planned RAS 193, and a new RAS for 1106L or 1107L overload.

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 Reliability Criteria violations were observed under these credible worst-case load and generation forecast conditions. The probability of Category A Thermal Reliability Criteria violations materializing is highly dependent upon the production profile of the Facility and other generation facilities in the area.

Thermal and voltage criteria violations were observed under Category B conditions in pre- and post-Project cases. The identified system performance issues can be mitigated through RAS 164, planned RAS 175, planned RAS 197, planned RAS 193, modified planned RAS 193, new RAS for 1106L or 1107L overload, and real-time operational practices (RTOPs), alone or in combination, 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 total amount of generation tied to modified RAS 193 exceeds the MSSC limit of 466 MW. The post-Project studies indicate that in order to mitigate the thermal violations following certain contingencies, the actions of RAS 193 may result in generation curtailment in excess of the MSSC limit. Pre-contingency generation curtailment under the Category A condition may be required using real-time operational practices to prevent generation curtailment by RAS action above the MSSC level. The probability of pre-curtailment being required would be dependent on generation profiles and operating conditions.

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*.

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 one 240 kV circuit, to connect the Facility to the existing 240 kV transmission line 1037L in a T-tap configuration. The conductor used for the 240 kV circuit shall have the minimum thermal rating no less than 487 MVA which is based on the proposed MARP of the Facility.

Attachment A:
Engineering Connection Assessment Results

Engineering Connection Assessment: Study Results

P2445 Kiwetinohk Homestead MPC Solar

Kiwetinohk Energy Corp.

Date: July 16, 2023

Version: Final

Role	Name	Date	Signature
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PERMIT NUMBER: P7821
The Association of Professional Engineers and Geoscientists of Alberta

Contents

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1 Introduction

This report presents the results of the engineering studies that were completed by Nican International Consulting Ltd. (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: AESO Engineering Connection Assessment: Study Scope, and supplemental guidance, which was prepared by the AESO.

The power system network analysis tool that was used for the studies in this connection assessment was PowerWorld version 22.

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 and Category B conditions are provided in Attachment A2.

2.1.1 Scenario 1: 2025 Summer Light (High Wind Generation) Pre-Project

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, the pre-project generation/intertie dispatches were adjusted to match the post-project dispatch to mitigate the N-0 violations. The following curtailments[1] were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[2]
- For 100 L, dispatch down Dunmore Solar
- For 916L dispatch down Summerview, Old Man and Other Pincher Creek generation

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock	-466.4
Stavely (49)	Buffalo Plains	38.0
Fort Macleod (53)	Old Man River Hydro, Ardenville, Blue Trail, Castle River, Castle Rock Ridge, Cowley Ridge, Kettles Hill, McBride, Soderglen, Summerview, Old Man River Wind, Riverview, Wind Rise.	-93.4
Glenwood (55)	MATL	-300.0
	Total Curtailment	-821.9

[1] A generation rebalance listing and MW summary is provided in Scenario 3 Category A summary.

[2] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 920 MW.

Thermal Criteria Violations

The thermal criteria violations that were observed for certain Category A conditions, prior to generation dispatch down according to AESO's guidance, are shown in Table 2-1.

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results		Post-Adjustment[3] Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	96.4	123.6	16.2	20.8

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[3] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	496.4	101.9
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	627.0	114.6
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	496.1	101.9
770L (254S Coaldale to 370S North Lethbridge)	172L (254S Coaldale to 370S North Lethbridge)	119	131	120.9	101.6
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	698.6	121.3
927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	696.0	127.2
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	646.7	158.5
WATL_CS	918L (SS-162 Beddington to 281S Johnson)	340	408	363.8	107.0
WATL_CS	901L (74S Janet to Cross Field Tap)	337	404	359.9	106.8

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, four (4) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- 1114L (520S Bennett to 102S Langdon)[4]
- EATLP1_NH

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.

[4] The import levels were reduced from 602 MW to 300 MW with a swing bus interchange from (1520) to (258) to test for power flow solution. No power flow solution was achieved.

2.1.2 Scenario 2: 2025 Summer Peak (High Wind Generation) Pre-Project

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, the pre-project generation/intertie dispatches were adjusted to match the post-project dispatch to mitigate the N-0 violations. The following curtailments[5] were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[6]
- For 100 L, dispatch down Dunmore Solar
- For 924L dispatch down Buffalo Plains and Solar Krafte Brooks

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock, Suffield	-270.1
Brooks (47)	Solar Krafte Brooks	-123.7
Stavely (49)	Buffalo Plains	-272.3
Glenwood (55)	MATL	-300.0
	Total Curtailment	-966.1

[5] A generation rebalance listing and MW summary is provided in Scenario 3 Category A summary.

[6] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 960 MW.

Thermal Criteria Violations

The thermal criteria violations that were observed for certain Category A conditions, prior to generation scale down according to AESO's guidance, are shown in Table 2-3.

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results		Post-Adjustment[7] Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	106.2	136.1	16.5	21.2
N-0 (System Normal Conditions)	924L (102S Langdon to 356S Milo)	547	656	558.0	102.0	509.3	93.1

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[7] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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[a] (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1080.3	111.0
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	568.8	104.0
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	568.9	104.0
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	696.3	127.3
1114L (520S Bennett to 102S Langdon) [b]	412L (396S Pincher Creek to 632S Russell)	121	133	137.9	114.0
1114L (520S Bennett to 102S Langdon) [b]	613L (103S Goose Lake to 396S Pincher Creek)	119	131	130.5	109.7
1114L (520S Bennett to 102S Langdon) [b]	786L/1L275 (799S Coleman to Natal)	99	109	112.9	114.0
1114L (520S Bennett to 102S Langdon) [b]	924L (102S Langdon to 356S Milo)	547	656	528.3	96.6
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	748.6	130.0
927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	745.7	136.3
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1079.5	110.9
EATLP1_NH	916L (5S East Calgary to 42S Sarcee)	408	490	462.3	113.3
EATLP1_NH	923L (356S Milo to 2075 Newell)	547	656	574.9	105.1
EATLP1_NH	924L (102S Langdon to 356S Milo)	547	656	722.1	132.0
EATLP1_NH	927L (102S Langdon to 356S Milo)	576	691	726.9	126.2
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	496.0	121.6

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[b] The results presented here are based on a swing bus interchange between (Bus:1520) to (Bus:258) to achieve a power flow solution.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, two (2) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)

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.

2.1.3 Scenario 6: 2025 Summer Light (High Wind Generation) Pre-Project Sensitivity

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, the pre-project generation/intertie dispatches were adjusted to match the post-project dispatch to mitigate the N-0 violations. The following curtailments[8] were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[9]
- For 100 L, dispatch down Dunmore Solar

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock	-466.4
Fort Macleod (53)	Old Man River Hydro, Ardenville, Blue Trail, Castle River, Castle Rock Ridge, Cowley Ridge, Kettles Hill, McBride, Soderglen, Summerview, Old Man River Wind, Riverview, Wind Rise.	-372.0
Glenwood (55)	MATL	-300.0
	Total Curtailment	-1138.4

[8] A generation rebalance listing and MW summary is provided in Scenario 8 Category A summary.

[9] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 920 MW.

Thermal Criteria Violations

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

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results		Post-Adjustment[10] Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	96.3	123.4	16.1	20.6

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[10] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	555.0	114.0
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	620.8	113.5
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	554.6	113.9
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	660.2	114.6
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	664.1	115.3
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	660.9	120.8
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	629.5	154.3
WATL_CS	918L (SS-162 Beddington to 281S Johnson)	340	408	359.0	105.6
WATL_CS	901L (74S Janet to Cross Field Tap)	337	404	356.2	105.7

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, four (4) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- 1114L (520S Bennett to 102S Langdon)[11]
- EATLP1_NH

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.

[11] The import levels were reduced from 602 MW to 300 MW with a swing bus interchange from (1520) to (258) to test for power flow solution. No power flow solution was achieved.

2.1.4 Scenario 7: 2025 Summer Peak (High Wind Generation) Pre-Project Sensitivity

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, the pre-project generation/intertie dispatches were adjusted to match the post-project dispatch to mitigate the N-0 violations. The following curtailments[12] were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[13]
- For 100 L, dispatch down Dunmore Solar
- For 924L and 927L, dispatch down RESC Nova, Buffalo Plains and Solar Krafte Brooks

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock, Suffield	-270.1
Strathmore (45)		-75.0
Brooks (47)	Solar Krafte Brooks	-142.5
Stavely (49)	Buffalo Plains	-313.6
Glenwood (55)	MATL	-300.0
	Total Curtailment	-1101.2

[12] A generation rebalance listing and MW summary is provided in Scenario 9 Category A summary.

[13] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 960 MW.

Thermal Criteria Violations

The thermal criteria violations that were observed for certain Category A conditions, prior to generation scale down according to AESO's guidance, are shown in Table 2-7.

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings[a] (MVA)		Pre-Project Results		Post-Adjustment[14] Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	106.2	136.1	19.1	24.5
N-0 (System Normal Conditions)	924L (102S Langdon to 356S Milo)	547	656	561.8	102.7	510.4	93.3
N-0 (System Normal Conditions)	927L (P2378 Project Tap to 356S Milo)	576	691	593.3	103.0	514.4	89.3

[14] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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[a] (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow (MVA)	% Loading
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1242.2	127.7
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	547	656	569.4	104.1
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	557.1	114.4
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	665.9	121.7
1106L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	549.2	100.4
1107L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	549.2	100.4
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	556.7	114.3
1114L (520S Bennett to 102S Langdon) [b]	412L (396S Pincher Creek to 632S Russell)	121	133	132.5	109.5
1114L (520S Bennett to 102S Langdon) [b]	613L (103S Goose Lake to 396S Pincher Creek)	119	131	124.5	104.6
1114L (520S Bennett to 102S Langdon) [b]	786L/1L275 (799S Coleman to Natal)	99	109	107.2	108.3
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	749.8	130.2
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	752.8	130.7
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	749.5	137.0
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1241.3	127.6
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	549.9	134.8

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[b] Requires swing bus swapping, i.e., from bus (1520) to bus (258), and MATL tripping to solve post-RAS values shown.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, three (3) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- EATLP1_NH

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.

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.

3.1 Power Flow Studies

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

3.1.1 Scenario 3: 2025 Summer Light (High Wind Generation) Post-Project Alternative 1

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, generation/intertie dispatches were adjusted to mitigate the N-0 violations. The following curtailments were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[15]
- For 100 L, dispatch down Dunmore Solar
- For 916L dispatch down Summerview, Old Man and Other Pincher Creek generation

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock	-466.4
Stavely (49)	Buffalo Plains	38.0
Fort Macleod (53)	Old Man River Hydro, Ardenville, Blue Trail, Castle River, Castle Rock Ridge, Cowley Ridge, Kettles Hill, McBride, Soderglen, Summerview, Old Man River Wind, Riverview, Wind Rise.	-93.4
Glenwood (55)	MATL	-300
	Total Curtailment	-821.9

[15] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 920 MW.

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

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Ratings[a] (MVA)	Emergency Rating (MVA)	Post-Project Results		Post-Adjustment[16] Results	
				Observed Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	96.3	123.4	16.3	20.9
N-0 (System Normal Conditions)	916L (5S East Calgary to 42SSarcee)	408	490	412.5	101.1	368.8	90.4

[16] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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

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

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Ratings[a] (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	898.6	92.3	1081	111.0	18.7
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	531.7	97.2	563.2	103.0	5.8
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	496.4	101.9	695	142.8	40.9
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	627.0	114.6	609.5	111.4	-3.2
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	496.1	101.9	695	142.7	40.8
770L (254S Coaldale to 370S North Lethbridge)	172L (254S Coaldale to 370S North Lethbridge)	119	131	120.9	101.6	93.4	92.0	-9.6
918L (SS-162 Beddington to 281S Johnson)	916L (5S East Calgary to 42S Sarcee)	408	490	346.4	84.9	413.1	101.3	16.4
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	698.6	121.3	736.7	127.9	6.6
927L (356S Milo to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	696.0	127.2	733.9	134.2	6.9
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	898.0	92.3	1079.7	111.0	18.7

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, five (5) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- 1114L (520S Bennett to 102S Langdon) [17]
- EATLP1_NH
- WATL_CS

[17] The import levels were reduced from 602 MW to 300 MW with a swing bus interchange from (1520) to (258) to test for power flow solution. No power flow solution was achieved.

POD Bus Voltage Deviations

Several POD bus voltage deviations were observed under certain Category B conditions as shown in Table 3-3.

Table 3-3: Voltage Deviations at POD Low Voltage Busses under Category B Conditions for the Scenario 3

Contingency (System Element Lost)	Voltage Deviation Location Details			Post-Project Results						
					Voltage Deviations at POD Low Voltage Buses					
	Substation Name and Number	Bus No.	Nominal Bus Voltage (kV)	Initial Voltage[a] (kV)	Post Transient (kV)	% Change	Post Auto Control (kV)	% Change	Post Manual (kV)	% Change
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	674S Bowron	36981	13.8	13.553					14.366	6.00
1042L (485S Blackspring Ridge to 554S Travers)	674S Bowron	36981	13.8	13.553					14.338	5.79
EATLP1_NH	674S Bowron	36981	13.8	13.553					14.366	6.00

3.1.2 Scenario 4: 2025 Summer Peak (High Wind Generation) Post-Project Alternative 1

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, generation/intertie dispatches were adjusted to mitigate the N-0 violations. The following curtailments were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[18]
- For 100 L, dispatch down Dunmore Solar
- For 924L dispatch down Buffalo Plains and Solar Krafte Brooks

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock, Suffield	-270.1
Brooks (47)	Solar Krafte Brooks	-123.7
Stavely (49)	Buffalo Plains	-272.3
Glenwood (55)	MATL	-300
	Total Curtailment	-966.1

[18] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 960 MW.

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

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Post-Project Results		Post-Adjustment19 Results	
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	106.2	136.1	16.7	21.4
N-0 (System Normal Conditions)	924L (102S Langdon to 356S Milo)	547	656	558.0	102.0	537.2	98.2

[19] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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 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	
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1080.3	111.0	1270	130.5	19.5
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	547	656	568.8	104.0	553.2	101.1	-2.8
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	568.9	104.0	603.2	110.3	6.3
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	927L (102S Langdon to 356S Milo)	576	691	572.3	99.4	606.9	105.4	6.0
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	396.7	81.5	581.5	119.4	38.0
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	696.3	127.3	677	123.8	-3.5
1106L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	540.2	98.7	578.3	105.7	7.0
1106L (SS-65 to 237S Foothills)	927L (102S Langdon to 356S Milo)	576	691	543.4	94.3	581.8	101.0	6.7
1107L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	540.2	98.7	578.3	105.7	7.0
1107L (SS-65 to 237S Foothills)	927L (102S Langdon to 356S Milo)	576	691	543.4	94.3	581.7	101.0	6.7
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	396.4	81.4	581.1	119.3	37.9
1114L (520S Bennett to 102S Langdon)[b]	412L (396S Pincher Creek to 632S Russell)	121	133	137.9	114.0	129.2	106.8	-7.2
1114L (520S Bennett to 102S Langdon) [b]	613L (103S Goose Lake to 396S Pincher Creek)	119	131	130.5	109.7	121.3	101.9	-7.8
1114L (520S Bennett to 102S Langdon) [b]	786L/1L275 (799S Coleman to Natal)	99	109	112.9	114.0	104.2	105.3	-8.7
1114L (520S Bennett to 102S Langdon) [b]	924L (102S Langdon to 356S Milo)	547	656	528.3	96.6	556.9	101.8	5.2
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	748.6	130.0	791	137.4	7.4
927L (356S Milo p to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	745.7	136.3	788	144.1	7.8
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1079.5	110.9	1269	130.5	19.5
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	496.0	121.6	576.6	141.3	19.8

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

[b] Requires swing bus swapping, i.e., from bus (1520) to bus (258), and MATL tripping to solve post-RAS values shown.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, three (3) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- EATLP1_NH

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.

3.1.3 Scenario 8: 2025 Summer Light (High Wind Generation) Post-Project Alternative 1 Sensitivity

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, generation/intertie dispatches were adjusted to mitigate the N-0 violations. The following curtailments were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[20]
- For 100 L, dispatch down Dunmore Solar
- For 916L dispatch down Summerview, Oldman and Other Pincher Creek generation
- For 1109 and 1080L dispatch down Summerview, Oldman and Other Pincher Creek generation

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock	-466.4
Fort Macleod (53)	Old Man River Hydro, Ardenville, Blue Trail, Castle River, Castle Rock Ridge, Cowley Ridge, Kettles Hill, McBride, Soderglen, Summerview, Old Man River Wind, Riverview, Wind Rise.	-372.0
Glenwood (55)	MATL	-300
	Total Curtailment	-1138.4

[20] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 920 MW.

Table 3-6: Thermal Criteria Violations under Category A Conditions for Scenario 8

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Post-Project Results		Post-Adjustment[21] Results	
				Observed Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (495S Tilley to 895S Suffield)	78	86	96.3	123.4	16.1	20.7
N-0 (System Normal Conditions)	916L (5S East Calgary to 42SSarcee)	408	490	456.1	111.8	375.0	91.9
N-0 (System Normal Conditions)	1109L (SS-25 Shepard to SS-65)	487	584	542.5	111.4	411.5	84.5
N-0 (System Normal Conditions)	1080L (SS-25 Shepard to SS-65)	487	584	540.6	111.0	409.6	84.1

[21] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

Thermal criteria violations were observed under certain Category B conditions as shown in Table 3-7.

Table 3-7: 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	
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	965.4	99.2	1149.1	118.1	18.9
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	916L (5S East Calgary to 42S Sarcee)	408	490	324.2	79.5	408.0	100.0	20.5
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	555.0	114.0	753.8	154.8	40.8
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	620.8	113.5	603.2	110.3	-3.2
1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)	971	1071	789.1	81.3	1011.0	104.1	22.9
1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)	971	1071	789.1	81.3	1011.0	104.1	22.9
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	554.6	113.9	753.3	154.7	40.8
918L (SS-162 Beddington to 281S Johnson)	916L (5S East Calgary to 42S Sarcee)	408	490	353.0	86.5	420.6	103.1	16.6
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	660.2	114.6	699.2	121.4	6.8
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	664.1	115.3	703.2	122.1	6.8
925L (63S Red Deer to 74S Janet)	916L (5S East Calgary to 42S Sarcee)	408	490	347.6	85.2	414.9	101.7	16.5
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	660.9	120.8	700.1	128.0	7.2
929L (74S Janet to 287S Hazelwood)	916L (5S East Calgary to 42S Sarcee)	408	490	348.3	85.4	415.5	101.8	16.5
932L (74S Janet to SS-162 Beddington)	916L (5S East Calgary to 42S Sarcee)	408	490	350.0	85.8	413.4	101.3	15.5
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	964.6	99.1	1148.2	118.0	18.9

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, five (5) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- 1114L (520S Bennett to 102S Langdon)[22]
- EATLP1_NH
- WATL_CS

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.

[22] The import levels were reduced from 602 MW to 300 MW with a swing bus interchange from (1520) to (258) to test for power flow solution. No power flow solution was achieved.

3.1.4 Scenario 9: 2025 Summer Peak (High Wind Generation) Post-Project Alternative 1 Sensitivity

Category A Conditions

Reliability Criteria (as defined in Section 3.1 of Attachment A1) violations were observed under Category A conditions. Following AESO's guidance, generation/intertie dispatches were adjusted to mitigate the N-0 violations. The following curtailments were exercised:

- Reduce the flow on the Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) by curtailing generators connected to the 983L or 964L to 1066MW[23]
- For 100 L, dispatch down Dunmore Solar
- For 916L dispatch down Summerview, Oldman and Other Pincher Creek generation
- For 924L and 927L dispatch down Buffalo Plains and Solar Krafte Brooks

The indicative generation rebalance is as follows:

Planning Area	Curtailed Generation	Curtailment Level (MW)
Medicine Hat (4)	Granlea, Dunmore, Wild Rose 2, EDF Cypress Wind, Shamrock, Suffield	-270.1
Strathmore (45)		-75.0
Brooks (47)	Solar Krafte Brooks	-142.5
Stavely (49)	Buffalo Plains	-313.6
Glenwood (55)	MATL	-300.0
	Total Curtailment	-1101.2

[23] The effective area aggregate generation on 983L & 964L, following AESO's curtailment instructions, is 960 MW.

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

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Post-Project Results		Post-Adjustment[24] Results	
				Observed Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
N-0 (System Normal Conditions)	100L (498S Tilley to 895S Suffield)	78	86	102.9	131.9	20.0	25.7
N-0 (System Normal Conditions)	924L (102S Langdon to 356S Milo)	547	656	600.1	109.7	538.2	98.4
N-0 (System Normal Conditions)	927L (P2378 Project Tap to 356S Milo)	576	691	584.6	101.5	539.1	93.6
N-0 (System Normal Conditions)	927L (P2378 Project Tap to 102S Langdon)	576	691	637.6	110.7	542.6	94.2

[24] Cumulative effect from post-Project curtailment which include rescheduling MATL zero flow (reactive support only), as well as, active power flow and voltage control management for Cassils – Bowmanton – Whitla (CBW) (1034L+1035L) to prevent voltage collapse for contingencies on line 1034L or 1035L.

Category B Conditions

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

Table 3-9: 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	
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1242.2	127.7	1429	146.8	19.2
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	547	656	569.4	104.1	554	101.4	-2.7
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	539.2	98.6	573	104.8	6.2
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	927L (P2378 Tap to 356S Milo)	576	691	543.3	94.3	578	100.3	5.9
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	557.1	114.4	757	155.5	41.1
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	665.9	121.7	647	118.4	-3.4
1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)	971	1071	901.7	92.9	1125	115.9	23.0
1106L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	549.2	100.4	587	107.4	7.0
1106L (SS-65 to 237S Foothills)	927L (P2378 Tap to 102S Langdon)	576	691	550.1	95.5	588	102.1	6.6
1106L (SS-65 to 237S Foothills)	927L (P2378 Tap to 356S Milo)	576	691	553.5	96.1	592	102.8	6.7
1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)	971	1071	901.7	92.9	1125	115.9	23.0
1107L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	547	656	549.2	100.4	587	107.4	7.0
1107L (SS-65 to 237S Foothills)	927L (P2378 Tap to 102S Langdon)	576	691	550.1	95.5	588	102.1	6.6
1107L (SS-65 to 237S Foothills)	927L (P2378 Tap to 356S Milo)	576	691	553.5	96.1	592	102.8	6.7
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	556.7	114.3	757	155.4	41.1
1114L (520S Bennett to 102S Langdon)	*412L (396S Pincher Creek to 632S Russell)	121	133	132.5	109.5	124.0	102.5	-7.0
1114L (520S Bennett to 102S Langdon)	*613L (103S Goose Lake to 396S Pincher Creek)	119	131	124.5	104.6	115.5	97.1	-7.5
1114L (520S Bennett to 102S Langdon)	*786L/1L275 (799S Coleman to Natal)	99	109	107.2	108.3	99.0	100.0	-8.3
1114L (520S Bennett to 102S Langdon)	*924L (102S Langdon to 356S Milo)	547	656	529.6	96.8	558.5	102.1	5.3
924L (102S Langdon to 356S Milo)	1080L (SS-25 Shepard to SS-65)	487	584	381.6	78.4	498	102.3	23.9
924L (102S Langdon to 356S Milo)	1109L (SS-25 Shepard to SS-65)	487	584	383.2	78.7	500	102.7	24.0
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	749.8	130.2	793	137.8	7.6
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	752.8	130.7	797	138.3	7.6
927L (356S Milo to 927AL Tap to 102S Langdon)	1080L (SS-25 Shepard to SS-65)	487	584	382.4	78.5	499	102.4	23.9
927L (356S Milo to 927AL Tap to 102S Langdon)	1109L (SS-25 Shepard to SS-65)	487	584	383.9	78.8	501	102.9	24.0
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	749.5	137.0	793	145.0	8.0
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1241.3	127.6	1428	146.8	19.2
WATL_CS	916L (5S East Calgary to 42S Sarcee)	408	490	549.9	134.8	647.1	158.6	23.8
WATL_CS	901L (74S Janet to Cross Field Tap)	337	404	294.2	87.3	361.6	107.3	20.0
WATL_CS	918L (SS-162 Beddington to 281S Johnson)	340	408	283.4	83.4	355.3	104.5	21.2

Notes:

[a] The facility ratings shown in Attachment A1 have been adjusted from a [72/144] kV voltage base to a [69/138] kV voltage base, as is used by the power system network analysis tool.

* Requires swing bus swapping, i.e., from bus (1520) to bus (258), and MATL tripping to solve post-RAS values shown.

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions for the contingencies that resulted in a stable solution.

However, three (3) contingencies resulted in No Solution; hence, are suspect of initiating a local voltage collapse for the stressed system conditions modelled. AESO is aware of this condition and is investigating with the local TFO the required reactive power support and voltage control strategy to manage the predicted generation and voltage conditions following the identified contingencies. The following contingencies are suspect:

- 1034L (244S Bowmanton to 324S Cassils)
- 1035L (244S Bowmanton to 2075S Newell)
- EATLP1_NH

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.

3.2 Transient Stability Studies

Transient stability studies were completed for *Scenario 3: 2025 Summer Light (High Wind Generation) Post-Project, Scenario 4: 2025 Summer Peak (High Wind Generation) Post-Project, Scenario 8: 2025 Summer Light (High Wind Generation) (Post-Project) Sensitivity and, Scenario 9: 2025 Summer Peak (High Wind Generation) (Post-Project) Sensitivity*.

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. 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.

Table 3-10: Transient Stability Study Results under Category B Conditions for Scenarios 3, 4, 8 and 9

Studied Contingency	Fault Description and Location	Results
00 - NERC Cat A	N-0	Stable
967L (North Lethbridge 370S - Windy Flats 138S)	North Lethbridge 370S	Stable
	Windy Flats 138S	Stable
968L (North Lethbridge 370S - Windy Flats 138S)	North Lethbridge 370S	Stable
	Windy Flats 138S	Stable
1038L (Windy Flats 138S - Foothills 237S)	Windy Flats 138S	Stable
	Foothills 237S	Stable
1037L (Windy Flats 138S - Foothills 237S)	Windy Flats 138S	Stable
	Foothills 237S	Stable
940L (North Lethbridge 370S - Picture Butte 120S)	North Lethbridge 370S	Stable
	Picture Butte 120S	Stable
1041L (Travers 554S - North Lethbridge 370S)	Travers 554S	Stable
	North Lethbridge 370S	Stable
1048L (Windy Flats 138S – Peigan 59S)	Windy Flats 138S	Stable
	Peigan 59S	Stable
1049L (Windy Flats 138S – Peigan 59S)	Windy Flats 138S	Stable
	Peigan 59	Stable
1106L (Foothills 237S –SS 65)	SS 65	Stable
	Foothills 237S	Stable
1107L (Foothills 237S –SS 65)	SS 65	Stable
	Foothills 237S	Stable

4 Short Circuit Studies

4.1 Pre-Project Results

Pre-Project short-circuit current levels are provided in Table 4-1[25].

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)
SC1 266S	240	253.02	10.4	0.00477 + j0.02384	8.1	0.00747 +j0.04438
Foothills 237S	240	250.14	13.0	0.00325 + j0.01908	10.5	0.00392 +j0.03265
Foothills 237S	138	141.71	13.4	0.00415 + j0.03169	12.1	0.00425 +j0.04225
Windy Flats 138S	240	257.20	11.7	0.00374 + j0.02166	10.1	0.00496 +j0.03225
Windy Flats 138S	138	146.61	8.7	0.0037 + j0.05107	8.4	0.00563 +j0.05689
North Lethbridge 370S	240	256.26	11.2	0.00449 + j0.02259	11.1	0.00279 +j0.02307
North Lethbridge	138	139.84	13.5	0.00705 + j0.03071	14.7	0.00305 +j0.02313
SS 65	240	251.51	20.1	0.00258 + j0.01229	18.8	0.00143 +j0.01501
SS 65	138	140.49	23.3	0.00366 + j0.01795	18.2	0.0039 +j0.03357
Peigan 59S	240	257.89	11.1	0.00396 + j0.02299	9.4	0.00557 +j0.03578
Peigan 59S	138	143.16	7.8	0.0082 + j0.05529	6.9	0.01 +j0.07717
Picture Butte 120S	240	259.03	9.0	0.00495 + j0.0285	8.2	0.00429 +j0.03749
Traverse 554S	240	256.34	8.1	0.00543 + j0.03139	6.1	0.00914 +j0.0617

[25] 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 4:2025 Summer Peak, High Wind Generation, Post-Project

Post-Project short-circuit current levels for Scenario 4are 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)
Homestead 1111S	240	256.03	8.0	0.00421 + j0.03167	5.8	0.01049 +j0.06901
SC1 266S	240	250.96	11.2	0.0042 + j0.02203	8.5	0.00737 +j0.04328
Foothills 237S	240	246.99	13.6	0.00297 + j0.0179	10.8	0.00408 +j0.03222
Foothills 237S	138	143.31	13.7	0.00402 + j0.03146	12.2	0.00459 +j0.04324
Windy Flats 138S	240	257.04	12.7	0.00328 + j0.02007	10.6	0.00504 +j0.03211
Windy Flats 138S	138	146.54	8.9	0.0033 + j0.04969	8.5	0.00565 +j0.05675
North Lethbridge 370S	240	256.32	11.6	0.00423 + j0.0218	11.3	0.00302 +j0.02363
North Lethbridge	138	140.07	13.7	0.00679 + j0.03023	14.9	0.00331 +j0.02361
SS 65	240	249.64	20.4	0.00249 + j0.012	18.9	0.00155 +j0.01514
SS 65	138	140.42	23.3	0.00362 + j0.01788	18.1	0.00403 +j0.03384
Peigan 59S	240	257.75	11.9	0.00352 + j0.02148	9.7	0.00565 +j0.03565
Peigan 59S	138	143.21	7.9	0.0078 + j0.05412	7.0	0.01004 +j0.07704
Picture Butte 120S	240	259.20	9.2	0.00474 + j0.02787	8.2	0.0045 +j0.03802
Traverse 554S	240	256.26	8.2	0.00529 + j0.031	6.1	0.00929 +j0.06206

4.2.1 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)
Homestead 1111S	240	253.56	8.2	0.00386 + j0.03057	5.8	0.01086 +j0.06801
SC1 266S	240	251.21	11.7	0.00385 + j0.02115	7.9	0.00934 +j0.05142
Foothills 237S	240	249.12	14.4	0.00266 + j0.01711	10.6	0.00833 +j0.03515
Foothills 237S	138	139.36	14.2	0.00361 + j0.02961	11.7	0.00872 +j0.04749
Windy Flats 138S	240	247.70	13.8	0.00265 + j0.01782	12.8	0.00428 +j0.02175
Windy Flats 138S	138	138.86	8.9	0.00268 + j0.04709	8.4	0.00542 +j0.05492
North Lethbridge 370S	240	247.90	11.4	0.00413 + j0.02138	11.0	0.00411 +j0.02408
North Lethbridge	138	143.64	12.3	0.00761 + j0.03462	13.5	0.00417 +j0.0253
SS 65	240	250.35	21.9	0.00214 + j0.01126	17.8	0.00427 +j0.01896
SS 65	138	138.67	24.4	0.0032 + j0.0169	15.1	0.00952 +j0.04842
Peigan 59S	240	247.59	12.9	0.00283 + j0.01901	11.4	0.00619 +j0.02634
Peigan 59S	138	139.32	8.0	0.0072 + j0.05222	7.3	0.00859 +j0.06718
Picture Butte 120S	240	249.66	8.7	0.00489 + j0.02847	7.1	0.00939 +j0.04743
Traverse 554S	240	250.09	8.2	0.00491 + j0.03004	5.3	0.01751 +j0.07791
Homestead 1111S	240	253.56	8.2	0.00386 + j0.03057	5.8	0.01086 +j0.06801

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.

As part of this Project, mitigation measures will not be specifically developed for the POD bus voltage deviations observed under certain Category B conditions during pre-Project and post-Project scenarios.[26]

5.1 Pre-Project

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

Table 5-1: Pre-Project Mitigation Measures

Mitigation Measure	Location of Observed Violation	Contingency
Planned RAS 193	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)
	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard - SS-65)
	1109L (SS-25 Shepard to SS-65)	1080L (SS-25 Shepard to SS-65)
	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)
Planned RAS 175	924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)
	927L (102S Langdon to 356S Milo)	924L (102S Langdon to 356S Milo)
Planned RAS 197	1087L (324S Cassils to 2075S Newell)	1088L (324S Cassils to 2075S Newell)
RAS 164 (Logic 2)	Voltage Collapse	1034L (244S Bowmanton to 324S Cassils)
		1035L (244S Bowmanton to 2075S Newell)
Real Time Operating Practices	412L (396S Pincher Creek to 632S Russell)	1114L (520S Bennett to 102S Langdon)
	901L (74S Janet to Cross Field Tap)	WATL_CS
	918L (SS-162 Beddington to 281S Johnson)	WATL_CS
	923L (356S Milo to 2075 Newell)	EATLP1_NH
	1087L (324S Cassils to 2075S Newell)	1088L (324S Cassils to 2075S Newell)
	172L (254S Coaldale to 370S North Lethbridge)	770L (254S Coaldale to 370S North Lethbridge)
	916L (5S East Calgary to 42S Sarcee)	918L (SS-162 Beddington to 281S Johnson)
		EATLP1_NH
		WATL_CS
	924L (102S Langdon to 356S Milo)	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))
		1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)
		1106L (SS-65 to 237S Foothills)
		1107L (SS-65 to 237S Foothills)
		EATLP1_NH
		EATLP1_NH
RAS 136	**No Solution**[27]	1114L (520S Bennett to 102S Langdon)
	170L (632S Russel to 799S Coleman)	
	412L (396S Pincher Creek to 632S Russell)	
	613L (103S Goose Lake to 396S Pincher Creek)	
	786L/1L275 (799S Coleman to Natal)	

Notes:

- Planned RAS 193: Monitors 985L , 1003L, 1109L, 1080L , (1080L & 1109L LTO)
- Planned RAS 175: 924L or 927L >=100 of line continuous seasonal rating for 10 secs with direction into 102S
- Planned RAS 197: Monitor loading on 1087L at Cassils
- RAS 164: Monitor1034L AND 1035L tripped (Logic 1, Logic 2 or Logic 3)
- RAS 136: Transfer trip MATL under loss of 1201L/1114L

5.2 Post-Project

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

[26] 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.

[27] For some scenarios, this contingency may results in (or remain) a non-solution.

Table 5-2: Post-Project Mitigation Measures

Mitigation Measure	Location of Observed Violation	Contingency
Modified planned RAS 193	1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)
	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard - SS-65)
	1109L (SS-25 Shepard to SS-65)	1080L (SS-25 Shepard to SS-65)
	985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)
Planned RAS 175	924L (102S Langdon to 356S Milo)	927L (356S Milo to 927AL Tap to 102S Langdon)
	927L (P2378 Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)
	927L (P2378 Tap to 356S Milo)	
New RAS for 1106L or 1107L	1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)
	1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)
Planned RAS 197	1087L (324S Cassils to 2075S Newell)	1088L (324S Cassils to 2075S Newell)
RAS 164 (Logic 2)	Voltage Collapse	1034L (244S Bowmanton to 324S Cassils)
		1035L (244S Bowmanton to 2075S Newell)
Real Time Operating Practices	1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard - SS-65)
		924L (102S Langdon to 356S Milo)
		927L (356S Milo to 927AL Tap to 102S Langdon)
	1087L (324S Cassils to 2075S Newell)	1088L (324S Cassils to 2075S Newell)
	1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)
	1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)
	1109L (SS-25 Shepard to SS-65)	1080L (SS-25 Shepard to SS-65)
		924L (102S Langdon to 356S Milo)
		927L (356S Milo to 927AL Tap to 102S Langdon)
	916L (5S East Calgary to 42S Sarcee)	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills)
		918L (SS-162 Beddington to 281S Johnson)
		925L (63S Red Deer to 74S Janet)
		929L (74S Janet to 287S Hazelwood)
		932L (74S Janet to SS-162 Beddington)
		EATLP1_NH
		WATL_CS
	924L (102S Langdon to 356S Milo)	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills)
		1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)
		1106L (SS-65 to 237S Foothills)
		1107L (SS-65 to 237S Foothills)
		EATLP1_NH
	927L (P2378 Tap to 102S Langdon)	1106L (SS-65 to 237S Foothills)
		1107L (SS-65 to 237S Foothills)
		EATLP1_NH
	927L (P2378 Tap to 356S Milo)	1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)
		1106L (SS-65 to 237S Foothills)
		1107L (SS-65 to 237S Foothills)
		EATLP1_NH
RAS 136	170L (632S Russel to 799S Coleman)	1114L (520S Bennett to 102S Langdon)
	412L (396S Pincher Creek to 632S Russell)	
	613L (103S Goose Lake to 396S Pincher Creek)	
	786L/1L275 (799S Coleman to Natal)	
	924L (102S Langdon to 356S Milo)	
	No Solution[28]	

Notes:

- Modified Planned RAS 193: Monitors 985L , 1003L, 1109L, 1080L , (1080L & 1109L LTO)
- Planned RAS 175: 924L or 927L >=100 of line continuous seasonal rating for 10 secs with direction into 102S.
- New RAS for 1106L or 1107L: Monitors 1106L or 1107L line loading ,
- Planned RAS 197: Monitor loading on 1087L at Cassils,
- RAS 164: Monitor1034L AND 1035L tripped (Logic 1, Logic 2 or Logic 3).
- RAS 136: Transfer trip MATL under loss of 1201L/1114L

[28] For some scenarios, this contingency may result in (or remain) a non-solution.

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 *Scenario 3: 2025 Summer Light (High Wind Generation) Post-Project Alternative 1, Scenario 4: 2025 Summer Peak (High Wind Generation) Post-Project Alternative 1, Scenario 8: Summer Light (High Wind Generation) Post-Project Alternative 1 (Sensitivity) and Scenario 9: Summer Peak (High Wind Generation) Post-Project Alternative 1 (Sensitivity) and 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: 2025 Summer Light (High Wind Generation) Post-Project Alternative 1

Category B Conditions

Thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RASs 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
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1080.6	111.0	898	92.3
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	695.4	142.8	501	102.9 [a]
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	694.9	142.7	501	102.8 [a]
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	736.7	127.9	531.7	92.3
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	733.9	134.2	529.8	96.9
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1079.7	111.0	897	92.2
1034L (244S Bowmanton to 324S Cassils)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations
1035L (244S Bowmanton to 2075S Newell)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations

Notes:

[a] Lines1080L & 1109L (SS-25 Shepard to SS-65) will have a minor residual thermal violations following RAS which will be mitigated via Real Time Operating Practices.

5.3.2 Scenario 4: 2025 Summer Peak (High Wind Generation) Post-Project Alternative 1

Category B Conditions

Thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RASs 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
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1270.3	130.5	1084	111.4
1088L (324S Cassils to 2075S Newell)	1087L (324S Cassils to 2075S Newell)	547	656	677.3	123.8	659	120.5
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	576	691	791.2	137.4	704.7	122.3
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	788.1	144.1	702.0	128.3
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1269.4	130.5	1083	111.3
1114L (520S Bennett to 102S Langdon)	412L (396S Pincher Creek to 632S Russell)	121	133	-	No Solution	129.2	106.8
1114L (520S Bennett to 102S Langdon)	613L (103S Goose Lake to 396S Pincher Creek)	119	131	-	No Solution	121.3	101.9
1114L (520S Bennett to 102S Langdon)	786L/1L275 (799S Coleman to Natal)	99	109	-	No Solution	104.2	105.3
1114L (520S Bennett to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	-	No Solution	556.9	101.8
1034L (244S Bowmanton to 324S Cassils)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations
1035L (244S Bowmanton to 2075S Newell)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations

Notes:

[a] Violation remained after RAS actions were complete, the following lines will require Real Time Operating Practice:

- 985L (SS-25 Shepard to 74S Janet)
- 1087L (324S Cassils to 2075S Newell)
- 927L (102S Langdon to 356S Milo)
- 924L (102S Langdon to 356S Milo)
- 1003L (SS-25 Shepard to 74S Janet)
- 412L (396S Pincher Creek to 632S Russell)
- 613L (103S Goose Lake to 396S Pincher Creek)
- 786L/1L275 (799S Coleman to Natal)

5.3.1 Scenario 8: 2025 Summer Light (High Wind Generation) Post-Project Alternative 1(Sensitivity)

Category B Conditions

Thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RASs 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
1003L (SS-25 Shepard to 74S Janet) [b]	985L (SS-25 Shepard to 74S Janet)	973	1017	1149.1	118.1	778.2	80.0
1080L (SS-25 Shepard to SS-65) [b]	1109L (SS-25 Shepard to SS-65)	487	584	753.8	154.8	380.5	78.1
1109L (SS-25 Shepard - SS-65) [b]	1080L (SS-25 Shepard to SS-65)	487	584	753.3	154.7	380.2	78.1
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	699.2	121.4	515.0	89.4
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	703.2	122.1	517.8	89.9
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	700.1	128.0	515.5	94.2
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1148.2	118.0	777.5	79.9
1034L (244S Bowmanton to 324S Cassils)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations
1035L (244S Bowmanton to 2075S Newell)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations

Notes:

[a] Power flow No Solution conditions occurred following RAS actions. Real Time Operational Practices will be required to the thermal violations on lines:

- 985L (SS-25 Shepard to 74S Janet)
- 1109L (SS-25 Shepard to SS-65)
- 1080L (SS-25 Shepard to SS-65)
- 927L (P2378 Tap to 102S Langdon)
- 927L (P2378 Tap to 356S Milo)
- 924L (102S Langdon to 356S Milo)
- 1003L (SS-25 Shepard to 74S Janet)
- BC-Imports may require curtailment

[b] Modified RAS 193 triggered a non-solution to the power flow. For these contingencies, the RAS was divided in two components (a) for the first part of the RAS project P2445 was tripped and swing bus 1520 allowed to provide the make-up power difference, (b) for the second component on the RAS, a bus swap from 1520 to bus 258 (located in central Alberta) was required, followed by tripping P2373 where new swing bus 258 provides the make-up power.

5.3.1 Scenario 9: 2025 Summer Peak High Wind Post-Project Alternative 1(Sensitivity)

Category B Conditions

Thermal criteria violations observed under certain Category B conditions in the post-Project studies were mitigated by RASs 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
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	973	1017	1429.0	146.8	1060	108.9
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	487	584	757.4	155.5	386	79.2
1106L (SS-65 to 237S Foothills)	1107L (SS-65 to 237S Foothills)	971	1071	1125.3	115.9	906	93.3
1107L (SS-65 to 237S Foothills)	1106L (SS-65 to 237S Foothills)	971	1071	1125.3	115.9	906	93.3
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	487	584	756.9	155.4	385	79.1
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	576	691	793.5	137.8	731.3	127.0
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	576	691	796.5	138.3	734.8	127.6
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	793.0	145.0	731.6	133.7
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	973	1017	1427.9	146.8	1059	108.8
1114L (520S Bennett to 102S Langdon)	412L (396S Pincher Creek to 632S Russell)	121	133	-	No Solution	124.0	102.5
1114L (520S Bennett to 102S Langdon)	924L (102S Langdon to 356S Milo)	547	656	-	No Solution	558.5	102.1
1114L (520S Bennett to 102S Langdon)	786L/1L275 (799S Coleman to Natal)	99	109	-	No Solution	99.0	100.0
1114L (520S Bennett to 102S Langdon)	613L (103S Goose Lake to 396S Pincher Creek)	119	131	-	No Solution	115.5	97.1
1034L (244S Bowmanton to 324S Cassils)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations
1035L (244S Bowmanton to 2075S Newell)	The previous Non-Solution, Solved. No thermal Violations (RAS 164 – Logic 2)	-	-	-	No Solution	-	No Thermal Violations

Notes:

[a] Violation remained after RAS actions were complete, the following lines will require Real Time Operating Practice:

- 985L (SS-25 Shepard to 74S Janet)
- 927L (P2378 Tap to 102S Langdon)
- 927L (P2378 Tap to 356S Milo)
- 924L (102S Langdon to 356S Milo)
- 1003L (SS-25 Shepard to 74S Janet)
- 412L (396S Pincher Creek to 632S Russell)
- 786L/1L275 (799S Coleman to Natal)

5.4 Constraint Effective Factor Studies

Constraint effective factor studies were conducted for all post-Project scenarios. 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
Engineering Connection Assessment: Study Scope

Study Scope

P2445 Kiwetinohk Homestead MPC Solar

Kiwetinohk Resources Corp.

Date: Jan 18, 2023

Version: V1

Classification: Public

Company Name	Name and Credentials	Date	Signature
NICAN International Consulting Ltd.	Pablo Argeñal, P. Eng.	Jan. 19, 2023	
AESO	Mahmoud Ahmed, P.Eng.	Jan. 23, 2023	Mahmoud Ahmed
Market Participant	Dobromir Filip, P.Eng.	Jan. 19, 2023	

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Tables

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1 Introduction

This Study Scope provides an overview of the engineering studies to be completed by NICAN International Consulting Ltd. (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

Kiwetinohk Resources Corp. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its proposed Kiwetinohk Homestead MPC 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 400 MW and a Rate DTS, *Demand Transmission Service*, contract capacity of 1.5 MW; and a request for transmission development (collectively, the Project).

The Project in-service date (ISD) used for the purpose of the studies is November, 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	1.5 MW
	Type	Station service
	Motors (number and size)	N/A
	Power factor	0.9
	Future load expansion plans	No
Generation	Generation type	Solar
	Existing Rate STS, *Supply Transmission Service,* contract capacity	No existing contract
	Requested Rate STS	400 MW
	Number and size of generating units	Number of Inverters
	Maximum authorized real power (MARP)	400 MW
	Maximum capability (MC)	400 MW
	Reactive power capability	0.95 pf absorbing
		0.9 pf producing

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 Fort Macleod (Area 53).

The Study Area consists of the AESO planning areas of Stavely (Area 49), Brooks (Area 47), Lethbridge (Area 54), and Fort Macleod (Area 53) including the tie lines connecting these planning areas to the rest of the AIES. Also, the 240 kV system in Calgary (Area 6) will be included as part of the study area.

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 37: Peigan 59s - 616L Overload Mitigation Scheme

RAS 40: Coleman 799s - 786L Overload Mitigation Scheme

RAS 129: Goose Lake 103s 613L Overload Mitigation Scheme

RAS 136: Direct Transfer Trip to MATL on Loss of 1201L

RAS 137: MATL Local Detection Scheme

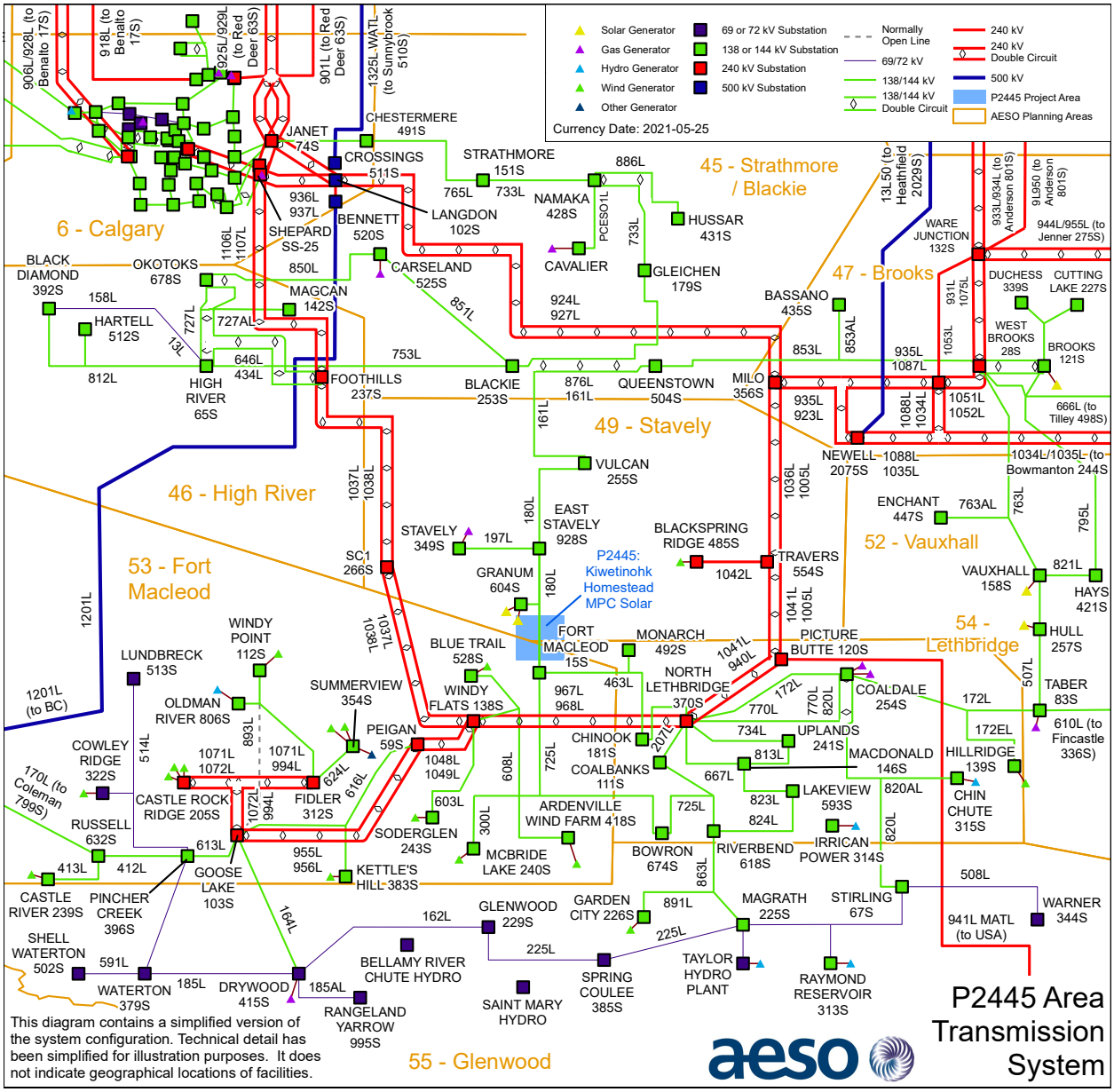
RAS 141: 498S Voltage Instability Mitigation

RAS 157: Chestermere 419S Overload and Voltage Stability Mitigation

RAS 604: Windy Point/Oldman River Tripping Scheme

RAS 605: Summerview Tripping Scheme

Figure 1-1: Existing Transmission System in the Study Area



2 Connection Alternative to be Studied

The following alternative will be studied.

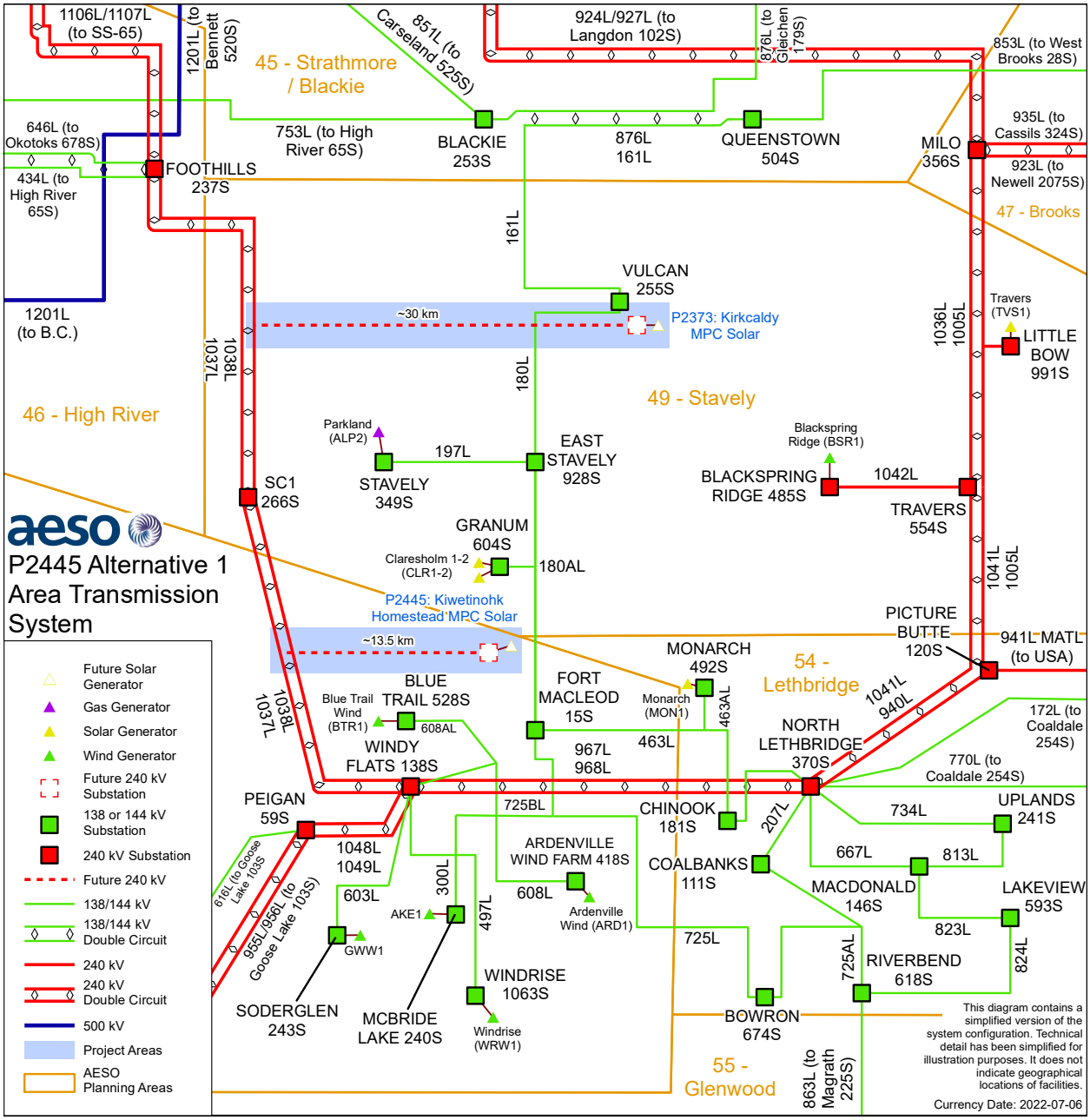
2.1 Alternative 1 – T-tap connection to the 240 kV transmission line 1037L

This alternative included the following developments:

- Connect the Market Participant's proposed facility to the existing 240 kV transmission line 1037L through a T-Tap configuration between the existing Windy Flats 138S and SC1 266S substations;
- Add one (1) 240 kV circuit, approximately 13.5 km in length to connect the Facility to the T-Tap junction; and
- Add or modify associated equipment as required for the above developments

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

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, 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 conditions: 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	2025 Summer Light (SL)	High Generation	2025 SL Pre-Project	0	0
2	2025 Summer Peak (SP)	High Generation	2025 SP Pre-Project	0	0
Post-Project					
3	2025 Summer Light (SL)	High Generation	2025 SL Post-Project	1.5	400
4	2025 Summer Peak (SP)	High Generation	2025 SP Post-Project	1.5	400
5	2031 Winter Peak (WP)	All machines in study area in service	2031 WP Post -Project	1.5	400
Pre-Project Sensitivity - with P2373, P2378 In Service					
6	2025 Summer Light (SL)	High Generation	2025 SL Pre-Project Sensitivity	0	0
7	2025 Summer Peak (SP)	High Generation	2025 SP Pre-Project Sensitivity	0	0
Post-Project Sensitivity - with P2373, P2378 In Service					
8	2025 Summer Light (SL)	High Generation	2025 SL Post-Project Sensitivity	1.5	400
9	2025 Summer Peak (SP)	High Generation	2025 SP Post-Project Sensitivity	1.5	400

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 as a sensitivity analysis in the studies in addition to the planned renewable projects listed in Table 4-2.

Table 4-2: Planned Connection Projects Included in the Studies

AESO Project No.	AESO Project Name	AESO Planning Area No.	Generation (MW)	Load (MW)	Scheduled ISD
P2373	Kirkcaldy MPC Solar	49-Stavely	350	2	ISD Under Review
P2378	RESC Nova MPC Solar	45-Strathmore/Blackie	150	1	July 14, 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)[1] 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 Area / Region Name	Forecast Peak Load by Year/Season (MW)	
	2025 SL	2025 SP
South Planning Region[1]	891.3	1,614.5

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

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 generation dispatch conditions. Additional studies may be required in the event of changes to the AESO's corporate forecast.

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

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

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

Facility Name	Bus No.	MC (MW)	AESO Planning Area No.	Unit Net Generation[a] (MW) by Scenario (High Wind)	
				2025 SL	2025 SL
Chin Chute (CHIN)	407	15	54	8.0	9.4
Irrican Hydro (ICP1)	450	7	54	4.6	6.4
Bantry (ALP1)	4275	7	47	0	5.1
Parkland (ALP2)	4235	10	49	0	9.1
Lethbridge Coaldale (ME04)	4690	6	54	0	5.8
Coaldale (COD1)	557690	5	54	1.5	5.1

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 the high wind dispatch scenario presented in Table 4-5 ,Table 4-6, Table 4-7 and Table 4-8. The Pre-Project dispatch scenarios for the existing wind and solar generation facilities are shown in Table 4-5 and **Error! Reference source not found.**

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 HW	SP HW
Ardenville Wind (ARD1)	4735, 4740	53	68	62.6	57.8
Fortis Bull Creek Phases 1 and 2 (BUL1 & BUL2)	550003, 550004	37	29	26.7	24.7
Blackspring Ridge (BSR1)	61736, 61737	49	300	276.0	255.0
Blue Trail Wind (BTR1)	66328, 67328	53	66	60.7	56.1
Castle River #1 (CR1)	2234, 3234	53	39	35.9	33.2
Castle Rock Ridge 2 (CRR2)	567221	53	30.6	28.2	26.0
Castle Rock Wind Farm (CRR1)	67221	53	77	70.8	65.5
Cowley Ridge (CRE3)	4264	53	20	18.4	17.0
Enmax Taber (TAB1)	15343, 16343	52	81	74.5	68.9
Ghost Pine (NEP1)	2621, 2622, 2623, 2624, 2625	42	82	75.4	69.7
Halkirk (HAL1)	66435, 67435	42	150	138.0	127.5
Kettles Hill (KHW1)	2402, 3402	53	63	58.0	53.6

McBride Lake Windfarm (AKE1)	2901, 3901, 4901	53	73	67.2	62.1
Old Man River Wind (OWF1)	61543	53	46	42.3	39.1
Rattlesnake Ridge Wind (RTL1)	60873	4	130	119.6	110.5
Riverview Wind (RIV1)	69221	53	115	105.8	97.8
Soderglen Wind (GWW1)	12358, 13358	53	71	65.3	60.4
Summerview 1 (IEW1)	2338, 3338	53	66	60.7	56.1
Summerview 2 (IEW2)	4339, 5337	53	66	60.7	56.1
Suncor Chin Chute (SCR3)	2389	54	30	27.6	25.5
Suncor Magrath (SCR2)	11002	53	30	27.6	25.5
Wheatland Wind (WHE1)	61632, 60632	43	120	110.4	102.0
Capital Power Whitla Wind Power Facility Phase 1 (WHT1)	60990	4	201.6	201.6	201.6
Capital Power Whitla Wind Power Facility Phase 2 & 3 (WHT2)	61990	4	151	151	151
TransAlta Windrise (WRW1)	567031	53	207	190.4	176.0
Suncor Wintering Hills (SCR4)	60789, 60791, 60793, 60846, 60848, 60850	43	88	81.0	74.8

Table 4-6: Dispatch Conditions for Existing and Under Construction Solar Generation Facilities

Facility Name and Code	Bus No.	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
				SL HW	SP HW
Burdett (BRD1)	2269	52	10.5	0	5.25
Burdett (BUR1)	557269	52	20	0	10
Brooks Solar (BSC1)	553257	47	15	0	7.5
Brooks Solar 1 (BRK1)	553256	47	13	0	6.5
Brooks Solar 2 (BRK2)	554257	47	14	0	7
Coaldale Solar (COL1)	554691	54	22	0	11
Claresholm 1 (CLR1)	60894	49	58	0	29
Claresholm 2 (CLR2)	61894	49	75	0	37.5
Conrad 1 (CRD1)	554291	52	23	0	11.5
Conrad 2 (CRD2)	553291	52	18	0	9
East Strathmore Namaka (NMK1)	553340	45	20	0	10
Hays (HYS1)	554401	52	24	0	12

Hull (HUL1)	2401	52	24.5	0	12.25
Innisfail Solar (INF1)	557120	39	22	0	11
Jenner (JER1)	554986	48	21	0	10.5
Monarch (MON1)	554400	54	24	0	12
Strathmore 1 (STR1)	557259	45	18	0	9
Strathmore 2 (STR2)	558259	45	23	0	11.5
Suffield (SUF1)	3270	52	23	0	11.5
Travers (TVS1)	560026, 561026, 562026	49	400	0	200
Vauxhall Solar (VXH1)	4274	52	22	0	11
Westfield Yellow Lake (WEF1)	557277	52	19	0	9.5
Kisikaw-pisim 1&2 (KKP1& KKP2)	995214, 995220	60	14	0	7

Table 4-7and **Error! Reference source not found.** list the pre-Project dispatch levels for the planned wind and solar generation projects in the AESO South and Central planning regions that are included in the study scenarios.

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 HW	SP HW
P0693	Wild Rose 2 Wind Farm	15-Aug-2022	3462, 3463	4	192	192	192
P1250	Wild Run Grizzly Bear Wind	1-Oct-2022	67308	13	120	110.4	102.0
P1533	Joss MPC WAGF	30-Jun-2022	60798, 60799	47	122.4	112.6	104.0
P1698	Joss Jenner WAGF - Phase 2	30-Jun-2022	61798	47	71.4	65.7	60.7
P1704	Paintearth Wind Power	1-Jul-2023	61418	42	150	138.0	127.5
P1719	Stirling WAGF Project	30-Jun-2023	61630	54	113	104.0	96.1
P1812	Suncor Forty Mile Granlea WAGF	2-May-2022	61994, 62994	4	200	200	200
P1853	Fortis Buffalo Atlee Cluster 1 WAGF	1-Sep-2022	553260	47	17.25	15.9	14.7
P1892	Fortis Buffalo Atlee Cluster 3 WAGF	1-Sep-2022	552260	47	17.25	15.9	14.7

P1898	Pattern Lanfine North Wind	30-Sep-2022	60996	42	145	133.4	123.3
P1909	TransAlta Garden Plain Wind	30-Jun-2022	565002	42	130	119.6	110.5
P2065	Wild Run Grizzly Bear Wind Phase 2	1-Oct-2022	67308	13	24	22.1	20.4
P2122	EDF Cypress Wind	1-Nov-2022	560003, 561003	4	195.9	195.9	195.9
P2199	Buffalo Atlee Wind Farm 2	1-Sep-2022	557261	47	13.8	12.7	11.7
P2234	Joss Jenner WAGF - Phase 3	30-Jun-2022	61799	47	111.2	102.3	94.5
P2247	Buffalo Plains MPC Wind	17-Apr-2023	560041, 560042	47	466	428.7	396.1
P2263	BER Hand Hills MPC Wind	1-Sep-2022	560045	42	145	133.4	123.3
P2413	EDF Cypress Wind 2	Aug 31 2022	560003, 561003	4	45.8	45.8	45.8

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 HW	SP HW
P1831	Fortis 255S Vulcan Faribault Farms DG PV	1-Sep-2022	4244	49	22	0.0	11.0
P1862	Fortis Spring Coulee 385S Solar DG	15-Oct-2021	553246, 554246	55	29.5	0.0	14.8
P1870	Fortis Stavely 349S DER Solar	24-May-2021	2004	49	16.5	0.0	8.3
P1927	Solar Krafte Brooks	1-Feb-2023	60434, 61434	47	360	0.0	180.0
P1978	ATCO Michichi DER Solar	1-Nov-2022	552448, 553448, 552450	42	75	0.0	37.5
P2059	ATCO Three Hills 770S DER Solar	1-May-2022	552433	42	25	0.0	12.5
P2061	ATCO Michichi Creek 802S DER Solar	1-May-2022	554448	42	25	0.0	12.5
P2194	FortisAlberta East Crossifield 64S DER Solar	1-Apr-2022	994312	57	5.65	0.0	2.8
P2195	FortisAlberta Bassano 435S DER Solar	1-Feb-2023	557399	47	9.25	0.0	4.6
P2249	FortisAlberta Empress 394S DER Solar 1	1-May-2022	557316	48	22.5	0.0	11.3
P2250	FortisAlberta Empress 394S DER Solar 2	1-May-2022	557016	48	16	0.0	8.0

P2254	RESC Hilda MPC Wind	7-Oct-2023	567004	48	100	0.0	50.0
P2300	RESC Enterprise MPC Solar	1-Apr-2022	563070	49	65	0.0	32.5
P2335	FortisAlberta Vulcan 255S DER Solar	1-May-2022	990003	52	15	0.0	7.5
P2337	Dunmore Solar	1-Apr-2023	560044	4	216	216	216
P2341	Greengate Travers Solar Phase 2	24-Mar-2022	560026, 561026, 562026	49	65	0.0	32.5
P2347	Forty Mile Granlea Solar Phase 2	17-Nov-2023	65994	4	220	220	220
P2362	FortisAlberta Enchant 447S DER Solar	8-Jul-2022	993286	52	23	0.0	11.5
P2363	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	993288	52	17.9	0.0	9.0
P2364	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	994286	52	10	0.0	5.0
P2365	FortisAlberta Enchant 447S DER Solar	17-Jun-2022	994288	52	24	0.0	12.0
P2424	ATCO Oyen 767S DER Solar	1-Dec-2022	88888	42	15	0.0	7.5
P2459	ENMAX Barlow Park DER Solar	8-Dec-2022	4590	6	27	0.0	13.5
P2475	EPC SS-24 DER Solar	22-Dec-2022	4590, 3590	6	37	0.0	18.5

The post-Project scenario wind and solar generation dispatch levels are identical to the pre-Project scenario dispatch levels shown in Table 4-5, Table 4-6, Table 4-7and Table 4-8. The Facility is dispatched to 400 MW in all post-Project scenarios. In the sensitivity studies, projects included for sensitivity will be dispatched as shown in Table 4-9 in all pre- and post-Project scenarios.

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

AESO Project No.	AESO Project Name	AESO Planning Area No.	MC (MW)	Unit Net Generation Dispatch (MW)	
				SL HW	SP HW
P2373	Kirkcaldy MPC Solar	49-Stavely	350	350	350
P2378	RESC Nova MPC Solar	45-Strathmore/Blackie	150	0	75

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.

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

Table 4-10: Intertie Flows by Scenario

Scenario Number	Scenario Name	Import (-) / Export (+) (MW) by Intertie		
		High Wind		
		AB-BC	AB-SK	MATL
1	2025 SL Pre-Project	-602	0	-300
2	2025 SP Pre-Project	-181	0	-300
3	2025 SL Post-Project	-602	0	-300
4	2025 SP Post -Project	-181	0	-300
6	2025 SL Pre-Project Sensitivity	-602	0	-300
7	2025 SP Pre-Project Sensitivity	-181	0	-300
8	2025 SL Post -Project Sensitivity	-602	0	-300
9	2025 SP Post -Project Sensitivity	-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 as shown in Table 4-11. For the 2031 WP scenario, the HVDC power order should be as per the AESO base cases and will not be adjusted.

Table 4-11: HVDC Power Order by Scenario

Scenario Number	Scenario Name	WATL (MW)*	EATL (MW)*
1	2023 SL Pre-Project	TBD	TBD
2	2023 SP Pre-Project	TBD	TBD
3	2023 SL Post-Project	TBD	TBD
4	2023 SP Post-Project	TBD	TBD
6	2023 SL Pre-Project Sensitivity	TBD	TBD
7	2023 SP Pre-Project Sensitivity	TBD	TBD
8	2023 SL Post-Project Sensitivity	TBD	TBD
9	2023 SP Post-Project Sensitivity	TBD	TBD

N → S: HVDC flow direction is North to South
S → N: HVDC flow direction is South to North

.

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 4-12. These limits must be maintained when performing the studies.

Table 4-12: 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(s) of transmission facilities (TFO(s)) provided the thermal ratings assumptions for the existing transmission lines in the Study Area. Table 4-13 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 4-13: Thermal Rating Assumptions for Key Transmission Lines in the Study Area

Line ID	Line Description	Voltage Class (kV)	Summer Normal Rating (MVA)	Summer Emergency Rating (MVA)
1042L	Travers 554S - Blackspring Ridge 485S	240	488	586
1036L	Travers 554S - Milo 356S	240	481	577
1041L	North Lethbridge 370S - Travers 554S	240	444 TD-L	533 TD-L
1005L	Milo 356S - Picture Butte 120S	240	490	588
940L	North Lethbridge 370S - Picture Butte 120S	240	481	577
935L	Milo 356S - Cassils 324S	240	547	656
923L	Milo 356S - Newell 2075S	240	547	656
924L	Milo 356S - Langdon 102S	240	547	656
927L	Milo 356S - Langdon 102S	240	576	691
853L	Queenstown 504S - Bassano 432S - West Brooks 28S	138	121	133
161L	Vulcan 255S - Queenstown 504S	138	117	129
180L	Vulcan 255S - East Stavely 928S	138	118	130
180L	East Stavely 928S - Fort Macleod 15S	138	120	132
725AL	Riverbend 618S - 725L	138	120	132
725L	Bowron 674S - 725AL tap	138	122	134
725L	725AL tap - Coalbanks 111S	138	122	134
725L	McBride tap - Fort Macleod 15S	138	119	131
725L	McBride tap - Bowron 674S	138	118	130
207L	Coalbanks 111S - N. Leth 370S	138	120	132
734L	Uplands 241S t - N. Leth 370S	138	167M	184M
824L	Lakeview 593S - Riverbend 618S	138	167	184M

Line ID	Line Description	Voltage Class (kV)	Summer Normal Rating (MVA)	Summer Emergency Rating (MVA)
823L	Macdonald 146S - Lakeview 593S	138	142	142
667L	Macdonald 146S - N. Leth 370S	138	174	191
820L	Stirling 67S - Coaldale 254S	138	120	132
770L	N. Leth 370S - Coaldale 254S	138	120	132
892L	Suffield 895S - Bowmanton 244S	138	80	88
1034L	Bowmanton 244S - Cassils 324S	240	931M	1024M
1035L	Bowmanton 244S - Newell 2075S	240	952M	1047M
507L	Hull 257S - Taber 83S	138	120	132
172L	North Lethbridge 370S - Coaldale 254S	138	119	131
172L	Chinook 181S - North Lethbridge 370S	138	85	94
172L	Coaldale 254S - Taber 83S	138	119	131
100L	Tilley 498S - Suffield 895S	138	78	86
612L	Fincastle 336S - Burdett 368S	138	85	94
610L	Taber 83S - Fincastle 336S	138	85	94
763L	West Brooks 28S - Vauxhall 158S	138	120	132
763L	Vauxhall 158S - Hull 257S	138	120	132
821L	Hays 421S - Vauxhall 158S	138	85	94
795L	Hays 421S - Brooks 121S	138	119	131
814L	Brooks 121S - West Brooks 28S	138	167M	184M
879L	Burdett 368S - Bowmanton 244S	138	85	94
1087L	Cassils 324S - Newell 2075S	240	547	656
197L	East Stavely 928S to Stavely 349S	138	112M	124M
463L	Lethbridge 463L - Jct. 463AL, Jct. 464AL - Monarch 492S	138	107	118
608L	Windy Flats 138S - Jct. 608AL	138	172	189
608L	Jct. 608AL - Ardenville 418S	138	119	131
603L	Windy Flats 138S - Soderglen 243S	138	121	133
616L	Goose Lake 103S - Jct. 616AL	138	153	168
616L	Jct. 616AL - Peigan 59S	138	111 TD-L	122 TD-L
613L	Goose Lake 103S - Pincher Creek 396S	138	119	131
412L	Russell 632S - Pincher Creek 396S	138	121	133
170L	Coleman 799S - Russell 632S	138	121	133

Line ID	Line Description	Voltage Class (kV)	Summer Normal Rating (MVA)	Summer Emergency Rating (MVA)
786L	BCH 1L275 - Cloeman 799S	138	99	109
666L	West Brooks 28 S - Tilley 498S	138	120CT	133
1053L	Cassils 324S - Ware Junction 132S	240	831CT	1047M
931L	West Brooks 28S - Ware Junction 132S	240	592	654M
1075L	West Brooks 28S - Ware Junction 132S	240	592	654M
967L	Windy Flats 138S - North Lethbridge 370S	240	499M	599M
968L	Windy Flats 138S - North Lethbridge 370S	240	499CT	733
1037L	Foothills 237S-SC1 266S - Windy Flats 138S	240	973	1071M
1038L	Foothills 237S-SC1 266S - Windy Flats 138S	240	973	1071M
1048L	Peigan 59S - Windy Flats 138S	240	611	751
1049L	Peigan 59S - Windy Flats 138S	240	611	751
955L	Peigan 59S - Goose Lake 103S	240	611	751
956L	Peigan 59S - Goose Lake 103S	240	611	751
1071L	Fidler 312S - Castle Rock Ridge 205S	240	952M	1047M
1072L	Goose Lake 103S - Castle Rock Ridge 205S	240	967	1160
994L	Goose Lake 103S - Fidler 312S	240	831CT	1047M
1106L	Foothills 237S - ENMAX #65 Sub	240	971	1071M
1107L	Foothills 237S - ENMAX #65 Sub	240	971	1071M
646L	Foothills 237S – Okotoks 678S	138	280	308
434L	Foothills 237S - High River 65S	138	279	307
812L	High River 65S - JCT 812AL	138	48CT	72CT
812L	Black Diamond 392S - JCT 812AL	138	85	94
753L	High River 65S - Blackie 253S	138	121	133
727L	Foothills 237S - JCT 727AL	138	119	131
727L	Okotoks 678S - JCT 727AL	138	119	131
876L	Blackie 253S - Gleichen 179S	138	110	121
851L	Blackie 253S - Carseland 525S	138	85	94
850L	Okotoks 678S - Carseland 525S	138	89	98

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

“P” indicates that the transmission line rating is limited by protection equipment

“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.

"TD-L" temporarily derated from LiDAR surveys.

The TFO(s) provided the details of the substation transformers in the Study Area. The key transformers in the Study Area are shown in Table 4-14.

Table 4-14: Summary of Key Transformer Ratings in the Study Area

Substation Name and Number	Transformer ID	Transformer Voltages (kV)	Transformer Normal Rating (MVA)	
			Summer	Winter
Fort Macleod – 15S	T1	138/25	25	25
	T2	138/25	25	25
Windy Flats – 138S	T2	240/138	400	400
Foothills – 237S	T1	240/138	400	400
	T2	240/138	400	400
West Brooks – 28S	T1	240/138	400	400
	T2	240/138	400	400
	T3	138/25	25	25
Vulcan – 255S	T1	138/25	20	20
	T2	138/25	25	25
North Lethbridge – 370S	T1	138/25	30.3	36.4
	T3	240/138	193.6	224
	T4	138/25	25	25
	T5	240/138	200	200
	T6	240/138	200	200
Goose Lake – 103S	T1	240/138	400	400
Peigan – 59S	T1	240/138	179	179

The TFO(s) provided the details of the shunt elements in the Study Area. The key shunt elements in the Study Area are shown in Table 4-15.

Table 4-15: 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)
Hillridge - 139S	25	1	1.8	-	-
West Brooks - 28S	240	-	-	1	50
Strathmore - 151S	138	1	24.35	-	-

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)
Blackie - 253S	138	1	24.46	-	-
Hussar - 431S	138	1	9.17	-	-
Magcan - 142S	138	1	24.46	-	-
Tilley - 498S	138	1	27.17	-	-
Burdett - 368S	138	1	24.46	-	-
		1	24.5	-	-
Hays - 421S	138	1	22.96	-	-
Taber - 83S	138	1	24.46	-	-
		1	24.5	-	-

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(s) and as shown in Table 4-16. Only those contingencies shown in Table 4-16 will be studied for transient stability studies. If the TFO(s) 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 4-16: Protection Fault Clearing Times

Contingency (System Element Lost)	Fault Location	Clearing Times (Cycles)	
		Near End	Far End
967L (North Lethbridge 370S - Windy Flats 138S)	North Lethbridge 370S	5.5	6.5
967L (North Lethbridge 370S - Windy Flats 138S)	Windy Flats 138S	5.5	6.5
968L (North Lethbridge 370S - Windy Flats 138S)	North Lethbridge 370S	5.5	6.5
968L (North Lethbridge 370S - Windy Flats 138S)	Windy Flats 138S	5.5	6.5
1038L (Windy Flats 138S - Foothills 237S)	Windy Flats 138S	5.5	6.5
1038L (Windy Flats 138S - Foothills 237S)	Foothills 237S	5.5	6.5
1037L (Windy Flats 138S - Foothills 237S)	Windy Flats 138S	5.5	6.5
1037L (Windy Flats 138S - Foothills 237S)	Foothills 237S	5.5	6.5
940L (North Lethbridge 370S - Picture Butte 120S)	North Lethbridge 370S	5.5	6.5
940L (North Lethbridge 370S - Picture Butte 120S)	Picture Butte 120S	5.5	6.5

1041L (Travers 554S - North Lethbridge 370S)	Travers 554S	5.5	6.5
1041L (Travers 554S - North Lethbridge 370S)	North Lethbridge 370S	5.5	6.5
1048L (Windy Flats 138S – Peigan 59S)	Windy Flats 138S	5.5	6.5
1048L (Windy Flats 138S - Peigan 59S)	Peigan 59S	5.5	6.5
1049L (Windy Flats 138S – Peigan 59S)	Windy Flats 138S	5.5	6.5
1049L (Windy Flats 138S - Peigan 59S)	Peigan 59S	5.5	6.5
1106L (Foothills 237S –SS 65)	SS 65	5.5	6.5
1106L (Foothills 237S –SS 65)	Foothills 237S	5.5	6.5
1107L (Foothills 237S –SS 65)	SS 65	5.5	6.5
1107L (Foothills 237S –SS 65)	Foothills 237S	5.5	6.5

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	2025 SL Pre-Project	X	X			X*	X*			
2	2025 SP Pre-Project	X	X			X*	X*			X
Post-Project										
3	2025 SL Post-Project	X	X			X	X			
4	2025 SP Post-Project	X	X			X	X			X
5	2031 WP Post-Project									X
Pre-Project Sensitivity										
6	2025 SL Sensitivity Pre-Project	X	X			X*	X*			
7	2025 SP Sensitivity Pre-Project	X	X			X*	X*			
Post-Project Sensitivity										
8	2025 SL Sensitivity Post-Project	X	X			X	X			
9	2025 SP Sensitivity Post-Project	X	X			X	X			

*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 neighbouring 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 conditions in the Study Area. EATL and WATL outage will be carried out as well.

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 generating 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 4-16

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.

Winter peak scenarios will be used for the short-circuit studies because winter peak scenarios generally produce higher short-circuit current levels than summer peak scenarios.

Estimated maximum three-phase faults and single line-to-ground short-circuit current levels will be reported for the following substations:

- The proposed collector substation of the Facility (Homestead 1111S substation)
- SC1 266S
- FootHills 237S
- Windy flats 138S
- North Lethbridge 370S
- SS 65
- Peigan 59S
- Picture Butte 120S
- Travers 554S

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.

5.5 Sub-Synchronous Interaction (SSI) Studies

The proposed Project is in the electrical vicinity of an HVDC converter station and the series capacitors connected to the 240 kV transmission lines 1037L and 1038L. Once the type and model of the generation units are known, a detailed assessment will be carried out by the Market Participant to address the potential for sub-synchronous interaction (SSI) between the Project and the HVDC converter station and the series

compensated transmission lines. This assessment will determine if any mitigation and/or protection is required to protect the facility and avoid negative impact on the AIES.

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[2] 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.

[2] 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

Alberta Electric System Operator

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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

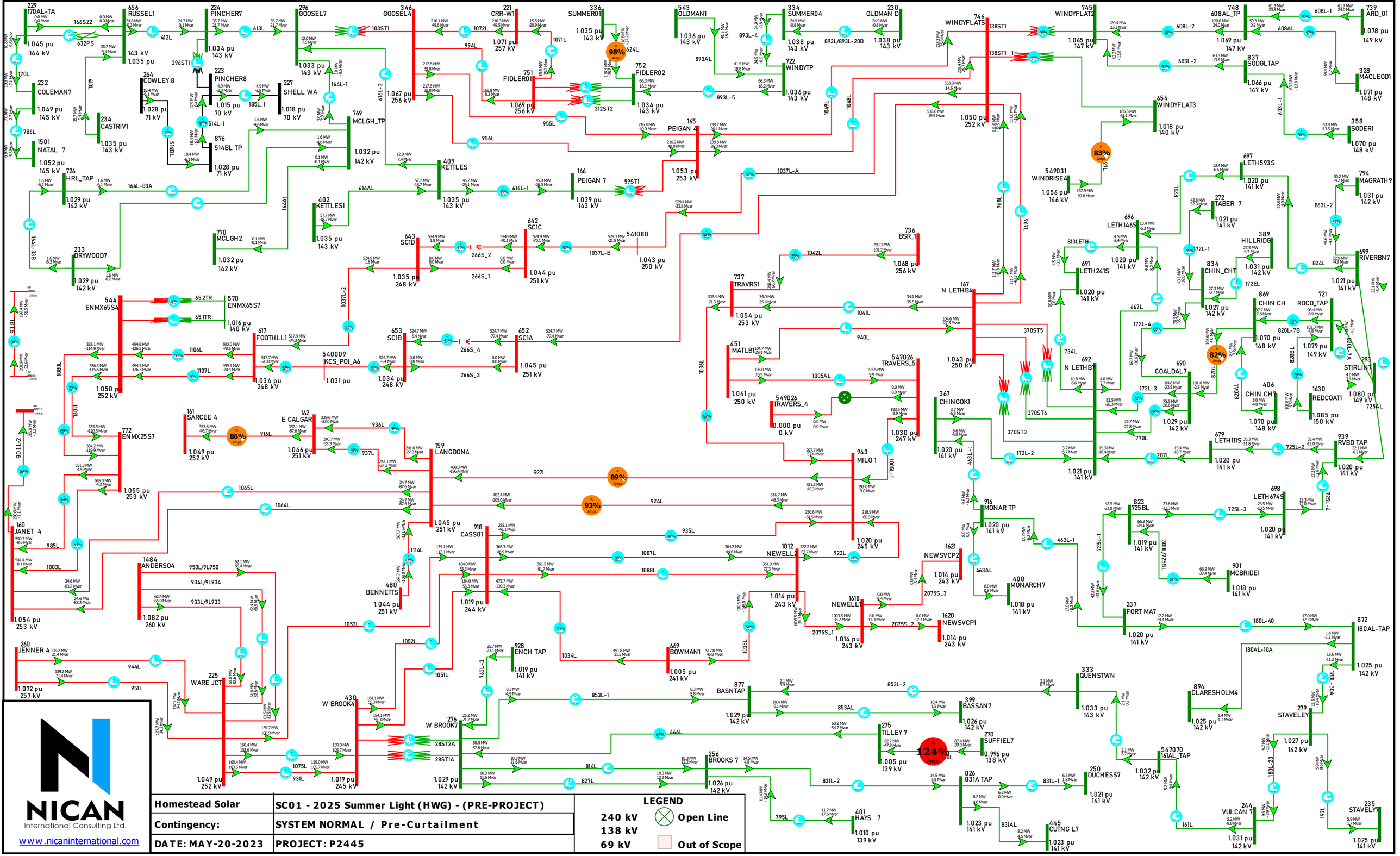
Voltage (kV)	Fault Location	Fault Clearing Times (Cycles)		
		High Side	Low Side	2nd Ckt (breaker fail)
240/138	240 kV side	12	6	14
	138 kV side	5	15	24
500/240	500 kV side	9	5	11
	240 kV side	4	12	14

Attachment A2
Pre-Project Power Flow Diagrams

2025 SUMMER LIGHT

Single Line Diagrams
P2445 - PRE-PROJECT
POWER FLOW SC01

NICAN



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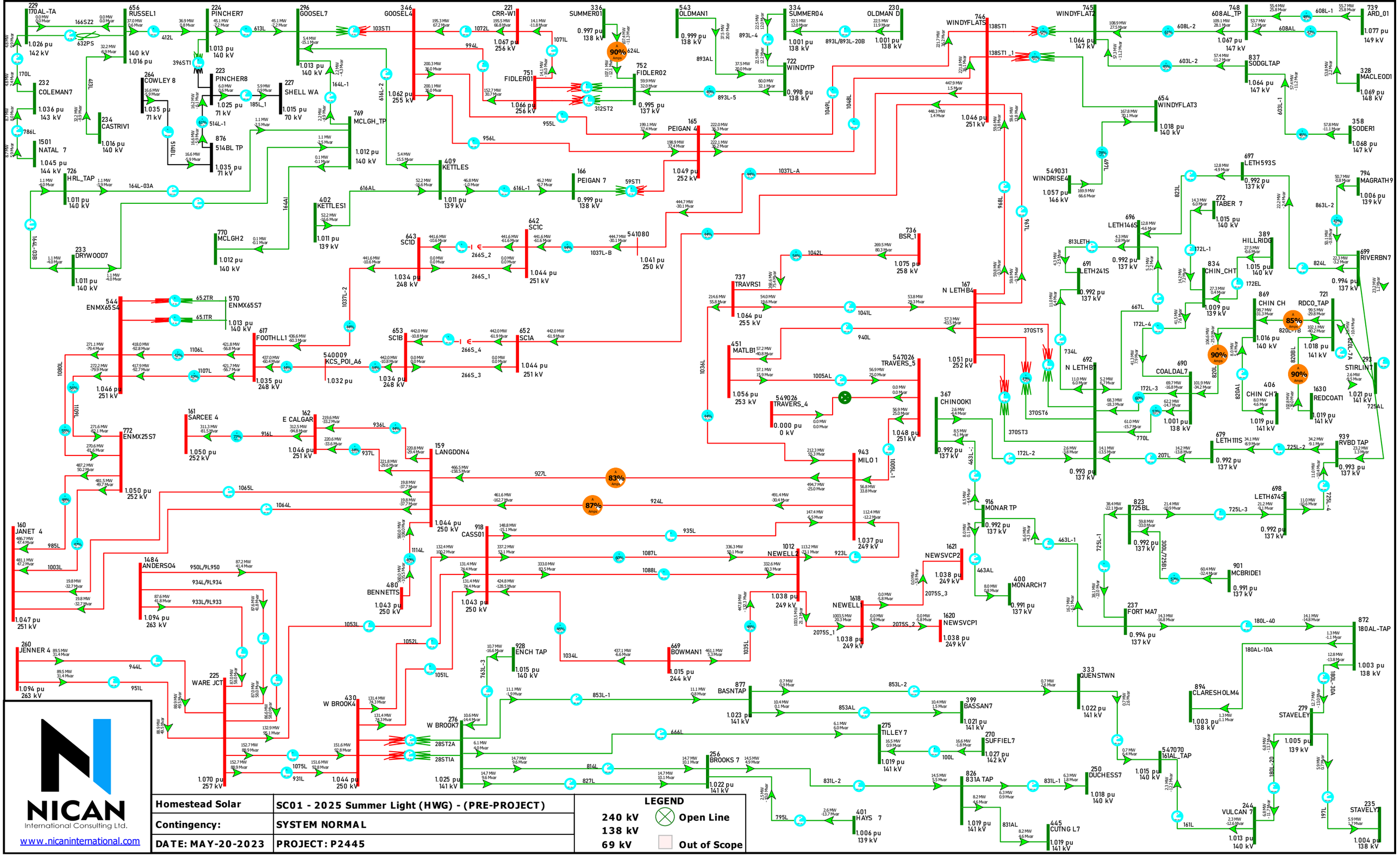
Homestead Solar	SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:	SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV	⊗ Open Line
138 kV	
69 kV	☐ Out of Scope


229
170AL-TA
1.026 pu
142 kV
166SZ2
632PS
656
RUSSEL1
140 kV
1.016 pu
412L
224
PINCHER7
1.013 pu
140 kV
396ST1
223
PINCHER8
1.025 pu
71 kV
613L
296
GOOSEL7
1.013 pu
140 kV
103ST1
346
GOOSEL4
1.062 pu
255 kV
6161-2
195.3 MW
67.2 Mvar
1072L
221
CRR-W1
1.067 pu
256 kV
1071L
994L
200.3 MW
36.0 Mvar
200.1 MW
36.0 Mvar
152.7 MW
30.7 Mvar
751
FIDLER01
1.066 pu
256 kV
955L
312ST2
336
SUMMER01
0.997 pu
138 kV
90%
624L
543
OLDMAN1
0.999 pu
138 kV
893L-4
334
SUMMER04
1.001 pu
138 kV
893L/893L-20B
230
OLDMAN D
1.001 pu
138 kV
893AL
722
WINDYTP
0.998 pu
138 kV
752
FIDLER02
0.995 pu
137 kV
893L-5
746
WINDYFLATS
138ST1
138ST1_1
1.046 pu
251 kV
745
WINDYFLAT2
1.064 pu
147 kV
748
608AL_TP
1.067 pu
147 kV
608L-1
608L-2
608AL
739
ARD_01
1.077 pu
149 kV
603L-2
837
SODGLTAP
1.064 pu
147 kV
328
MACLEOD1
1.069 pu
148 kV
603L-1
358
SODER1
1.068 pu
147 kV
654
WINDYFLAT3
1.018 pu
140 kV
1049L
1048L
1046L
1047L
549031
WINDRISE4
1.057 pu
146 kV
169.9 MW
66.6 Mvar
697
LETH593S
0.992 pu
137 kV
794
MAGRATH9
1.006 pu
139 kV
863L-2
699
RIVERBN7
0.996 pu
137 kV
824L
272
TABER 7
1.015 pu
140 kV
823L
696
LETH146S
0.992 pu
137 kV
813LETH
691
LETH241S
0.992 pu
137 kV
172L-1
834
CHIN_CHT
1.009 pu
139 kV
389
HILLRIDG
1.015 pu
140 kV
172EL
667L
172L-4
869
CHIN CH
1.016 pu
140 kV
820L-7B
820L-7A
721
RDCO_TAP
1.018 pu
141 kV
293
STIRLIN7
1.021 pu
141 kV
725AL
820BL
820AL
406
CHIN CH7
1.019 pu
141 kV
1630
REDCOAT1
1.019 pu
141 kV
690
COALDAL7
1.001 pu
138 kV
172L-3
770L
679
LETH111S
0.992 pu
137 kV
207L
939
RVBD TAP
0.993 pu
137 kV
725L-2
698
LETH674S
0.992 pu
137 kV
725L-4
823
725BL
0.992 pu
137 kV
725L-3
725L-1
3001/7258L
901
MCBRIDE1
0.991 pu
137 kV
237
FORT MA7
0.994 pu
137 kV
180L-40
872
180AL-TAP
1.003 pu
138 kV
180AL-10A
894
CLARESHOLM4
1.003 pu
138 kV
180L-30A
279
STAVELEY
1.005 pu
139 kV
180L-20
197L
235
STAVELY7
1.004 pu
138 kV
244
VULCAN 7
1.013 pu
140 kV
2.3 MW
-12.6 Mvar
161L
547070
161AL_TAP
1.015 pu
140 kV
250
DUCHESS7
1.018 pu
140 kV
831L-1
831L-2
826
831A TAP
1.019 pu
141 kV
831AL
445
CUTNG L7
1.019 pu
141 kV
795L
401
HAYS 7
1.006 pu
139 kV
2.6 MW
-13.7 Mvar
1050L-1
943
MILO 1
1.037 pu
249 kV
923L
1012
NEWELL2
1.038 pu
249 kV
1087L
1088L
1618
NEWELL
1.038 pu
249 kV
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1.038 pu
249 kV
1621
NEWSVCP2
1.038 pu
249 kV
463AL
400
MONARCH7
0.991 pu
137 kV
463L-1
916
MONAR TP
0.992 pu
137 kV
463L-2
165
PEIGAN 4
1.049 pu
252 kV
222.0 MW
36.3 Mvar
222.1 MW
36.2 Mvar
198.9 MW
37.4 Mvar
199.1 MW
37.4 Mvar
956L
409
KETTLES
1.011 pu
139 kV
616L-1
166
PEIGAN 7
0.999 pu
138 kV
59ST1
616AL
402
KETTLES1
1.011 pu
139 kV
1037L-A
1037L-B
541080
1.041 pu
250 kV
444.7 MW
-30.1 Mvar
444.7 MW
-30.0 Mvar
642
SCIC
1.044 pu
251 kV
441.6 MW
-61.6 Mvar
643
SCID
1.034 pu
248 kV
441.6 MW
-10.6 Mvar
266S_2
266S_1
1037L-2
652
SC1A
1.044 pu
251 kV
442.0 MW
-61.9 Mvar
653
SC1B
1.034 pu
248 kV
442.0 MW
-10.8 Mvar
266S_4
266S_3
540009
KCS_POI_A6
1.032 pu
617
FOOTHLL1
1.035 pu
248 kV
436.6 MW
-60.3 Mvar
437.0 MW
-60.4 Mvar
1106L
1107L
544
ENMX65S4
1.046 pu
251 kV
65.2TR
65.1TR
570
ENMX65S7
1.013 pu
140 kV
1080L
1041L
772
ENMX25S7
1.050 pu
252 kV
1065L
1064L
160
JANET 4
1.047 pu
251 kV
985L
1003L
1484
ANDERSO4
1.094 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
944L
951L
260
JENNER 4
1.094 pu
263 kV
225
WARE JCT
1.070 pu
257 kV
1075L
931L
1044 pu
250 kV
92.8 Mvar
430
W BROOK4
1.044 pu
250 kV
1053L
1052L
1051L
276
W BROOK7
1.025 pu
141 kV
28ST2A
28ST1A
763L-3
928
ENCH TAP
1.015 pu
140 kV
1034L
669
BOWMAN1
1.015 pu
244 kV
461.1 MW
5.3 Mvar
1035L
877
BASNTAP
1.023 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.021 pu
141 kV
333
QUENSTWN
1.022 pu
141 kV
666L
275
TILLEY 7
1.019 pu
141 kV
100L
270
SUFFIEL7
1.027 pu
142 kV
256
BROOKS 7
1.022 pu
141 kV
814L
827L
1042L
1041L
940L
1005AL
736
BSR_1
1.075 pu
258 kV
737
TRAVRS1
1.064 pu
255 kV
451
MATLBI
1.056 pu
253 kV
547026
TRAVERS_5
1.048 pu
251 kV
549026
TRAVERS_4
0.000 pu
0 kV
167
N LETHB4
1.051 pu
252 kV
370ST5
370ST6
370ST3
734L
692
N LETHB
0.992 pu
137 kV
367
CHINOOK1
0.992 pu
137 kV
463L-3
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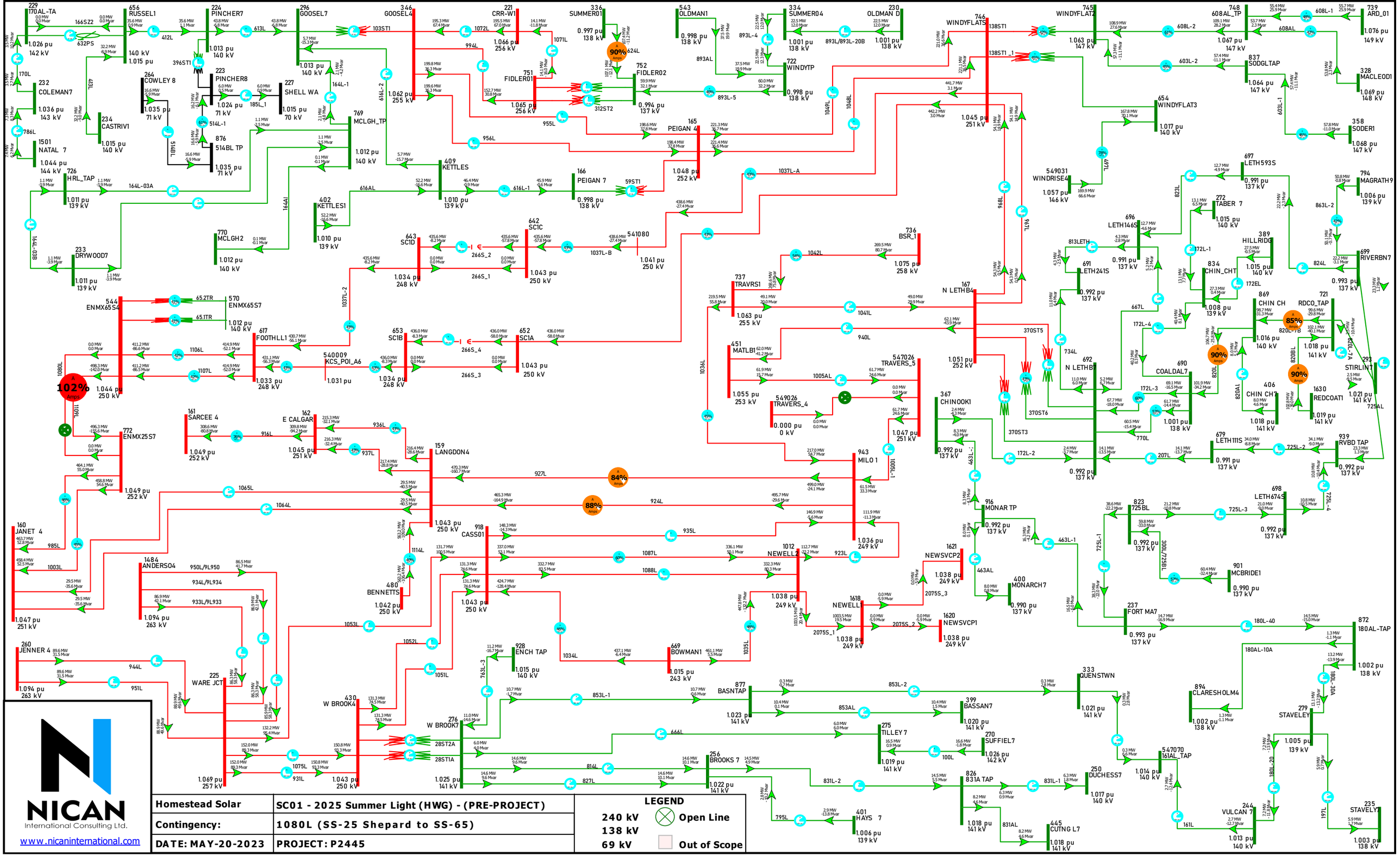
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:
SYSTEM NORMAL
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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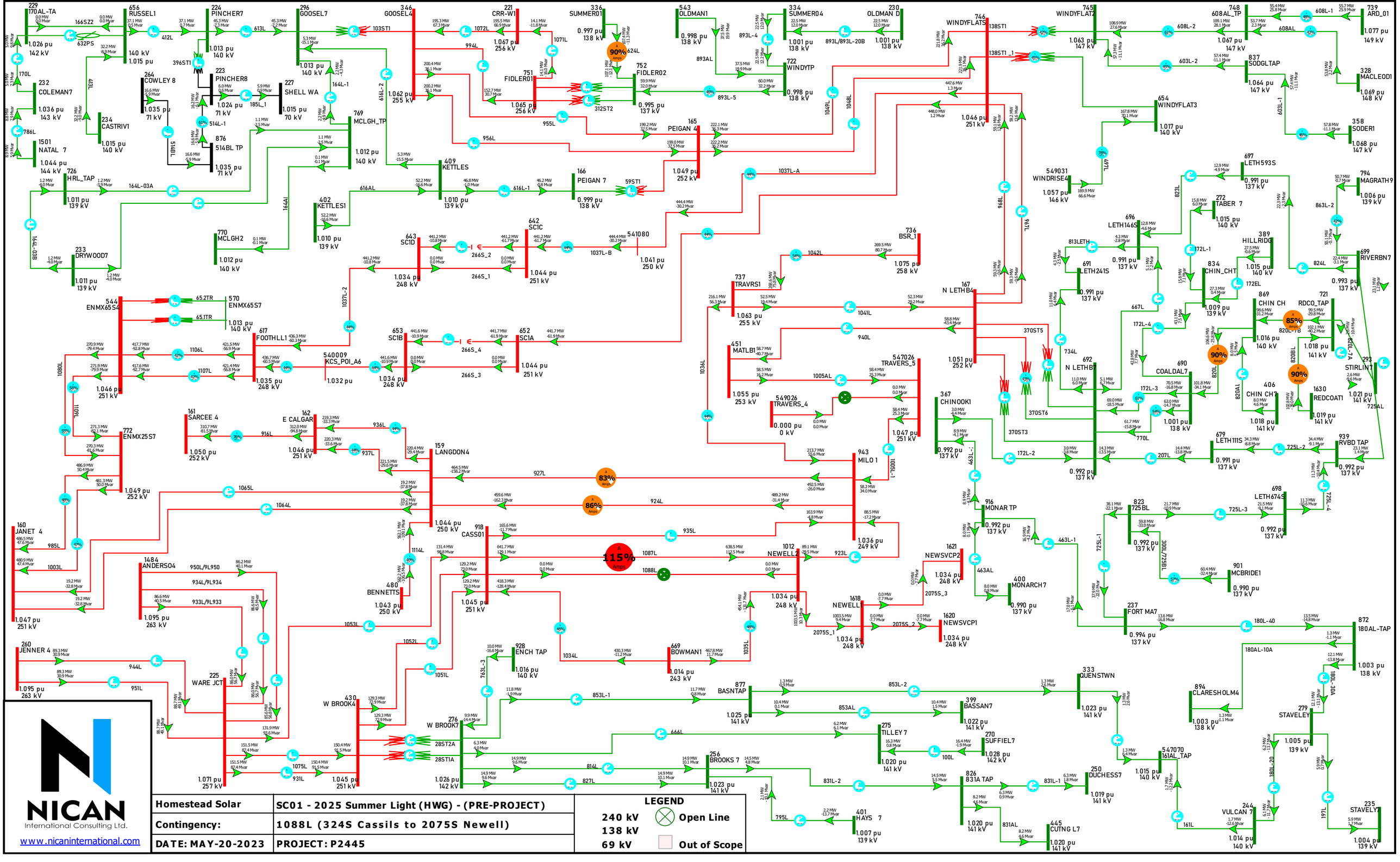
Homestead Solar	SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:	1080L (SS-25 Shepard to SS-65)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

⊗	Open Line
☐	Out of Scope



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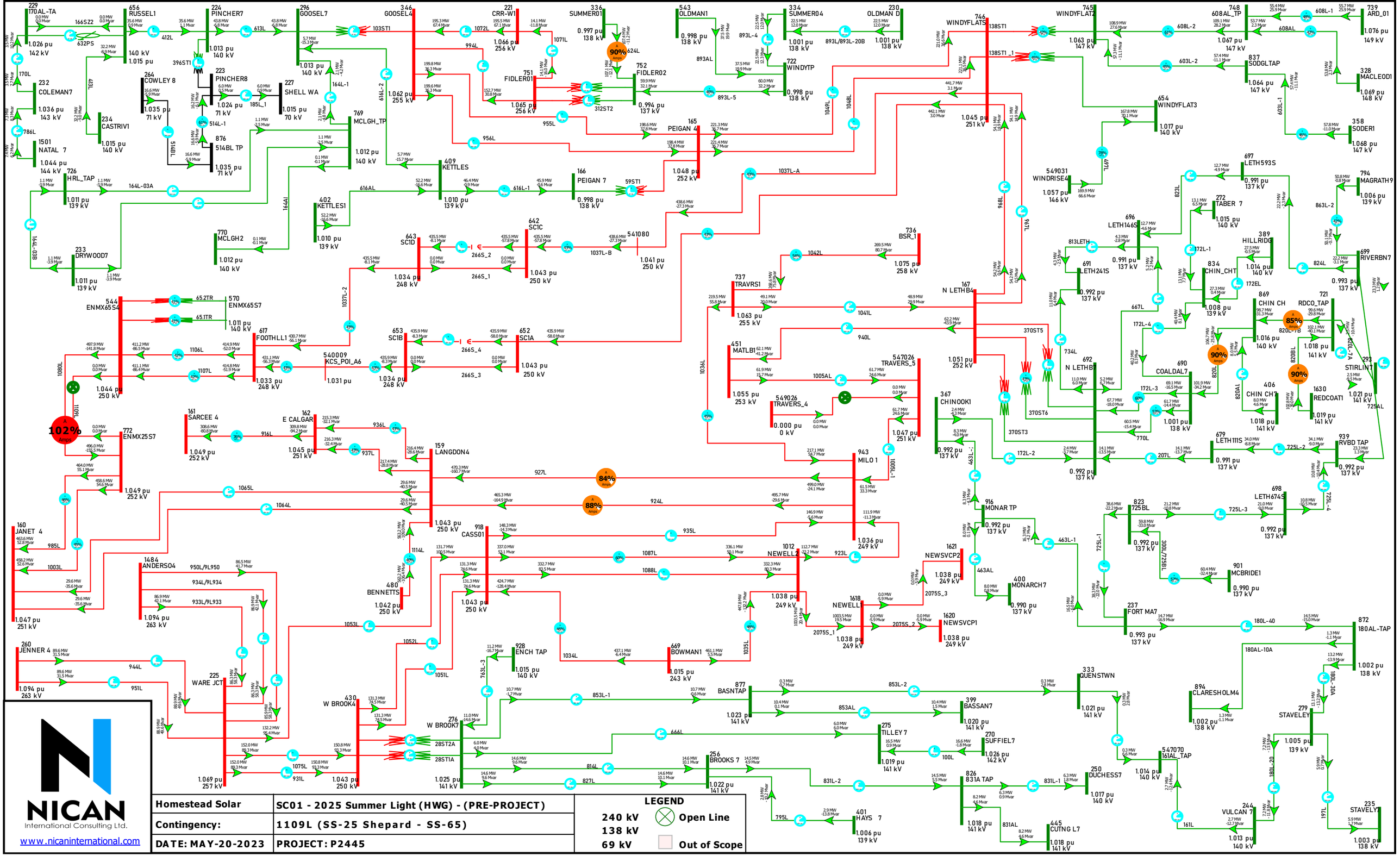
Homestead Solar	**SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)**	**LEGEND**	
Contingency:	**1088L (324S Cassils to 2075S Newell)**	**240 kV**	⊗ **Open Line**
DATE: MAY-20-2023	**PROJECT: P2445**	**138 kV** **69 kV**	☐ **Out of Scope**


229
170AL-TA
1.026 pu
142 kV
656
RUSSEL1
140 kV
1.015 pu
632PS
166SZ2
412L
224
PINCHER7
1.013 pu
140 kV
396ST1
223
PINCHER8
1.024 pu
71 kV
264
COWLEY 8
1.035 pu
71 kV
227
SHELL WA
1.015 pu
70 kV
185L_1
514L-1
514BL TP
1.035 pu
71 kV
514BL
296
GOOSEL7
1.013 pu
140 kV
164L-1
769
MCLGH_TP
1.012 pu
140 kV
346
GOOSEL4
103ST1
1.062 pu
255 kV
616L-2
994L
956L
955L
221
CRR-W1
1.066 pu
256 kV
1071L
751
FIDLER01
1.065 pu
256 kV
312ST2
336
SUMMER01
0.997 pu
138 kV
90%
624L
752
FIDLER02
0.994 pu
137 kV
893L-5
543
OLDMAN1
0.998 pu
138 kV
893L-4
893AL
334
SUMMER04
1.001 pu
138 kV
893L/893L-20B
230
OLDMAN D
1.001 pu
138 kV
722
WINDYTP
0.998 pu
138 kV
746
WINDYFLATS
138ST1
138ST1_1
1.045 pu
251 kV
1040L
1048L
654
WINDYFLAT3
1.017 pu
140 kV
549031
WINDRISE4
1.057 pu
146 kV
1497L
745
WINDYFLAT2
1.063 pu
147 kV
608AL_TP
1.067 pu
147 kV
608AL
608L-1
608L-2
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
739
ARD_01
1.076 pu
149 kV
328
MACLEOD1
1.069 pu
148 kV
358
SODER1
1.068 pu
147 kV
165
PEIGAN 4
1.048 pu
252 kV
198.6 MW
37.8 Mvar
198.4 MW
37.8 Mvar
221.3 MW
36.7 Mvar
221.4 MW
36.7 Mvar
166
PEIGAN 7
0.998 pu
138 kV
59ST1
409
KETTLES
1.010 pu
139 kV
616L-1
616AL
402
KETTLES1
1.010 pu
139 kV
52.2 MW
-16.6 Mvar
46.4 MW
-0.9 Mvar
45.9 MW
-0.6 Mvar
5.7 MW
-15.7 Mvar
1037L-A
438.6 MW
-27.3 Mvar
541080
1.041 pu
250 kV
1037L-B
642
SCIC
1.043 pu
250 kV
643
SCID
1.034 pu
248 kV
266S_2
266S_1
435.5 MW
-6.1 Mvar
435.5 MW
-57.8 Mvar
0.0 MW
0.0 Mvar
1037L-2
1042L
736
BSR_1
1.075 pu
258 kV
269.5 MW
80.7 Mvar
737
TRAVRS1
1.063 pu
255 kV
288.6 MW
-43.9 Mvar
219.5 MW
55.8 Mvar
49.1 MW
20.0 Mvar
48.9 MW
29.9 Mvar
1041L
940L
1030L
451
MATLBT
1.055 pu
253 kV
62.1 MW
-41.2 Mvar
61.9 MW
15.7 Mvar
1005AL
547026
TRAVERS_5
1.047 pu
251 kV
61.7 MW
24.6 Mvar
549026
TRAVERS_4
0.000 pu
0 kV
943
MILO 1
1050L-1
217.1 MW
-54.7 Mvar
499.0 MW
-24.1 Mvar
61.5 MW
33.3 Mvar
167
N LETHB4
1.051 pu
252 kV
62.2 MW
-43.9 Mvar
542.7 MW
0.6 Mvar
542.7 MW
0.4 Mvar
370ST5
370ST6
370ST3
734L
692
N LETHB
11.0 MW
6.0 Mvar
5.2 MW
6.7 Mvar
67.7 MW
-18.0 Mvar
60.5 MW
-15.4 Mvar
367
CHINOOK1
2.4 MW
-4.3 Mvar
8.3 MW
-4.0 Mvar
0.992 pu
137 kV
463L-2
916
MONAR TP
0.992 pu
137 kV
463L-1
463AL
1621
NEWSVCP2
1.038 pu
249 kV
2075S_3
400
MONARCH7
0.990 pu
137 kV
1618
NEWELL
1.038 pu
249 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.038 pu
249 kV
1012
NEWELL2
1.038 pu
249 kV
1087L
1088L
923L
1036 pu
249 kV
918
CASS01
1.043 pu
250 kV
148.3 MW
-14.3 Mvar
337.0 MW
53.1 Mvar
131.7 MW
100.5 Mvar
131.3 MW
74.6 Mvar
332.7 MW
83.5 Mvar
424.7 MW
-128.4 Mvar
336.1 MW
50.1 Mvar
332.3 MW
80.3 Mvar
112.7 MW
-22.2 Mvar
935L
924L
927L
1114L
480
BENNETTS
1.042 pu
250 kV
1053L
1052L
1051L
1035L
1034L
669
BOWMAN1
1.015 pu
243 kV
437.1 MW
6.4 Mvar
461.1 MW
5.5 Mvar
447.8 MW
-2.2 Mvar
1003.5 MW
20.4 Mvar
1003.5 MW
19.5 Mvar
0.0 MW
-5.9 Mvar
0.0 MW
-5.9 Mvar
1484
ANDERSO4
1.094 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
86.5 MW
41.7 Mvar
86.9 MW
42.1 Mvar
85.9 MW
41.8 Mvar
1047 pu
251 kV
29.6 MW
-35.6 Mvar
458.2 MW
52.6 Mvar
463.6 MW
52.8 Mvar
160
JANET 4
985L
1003L
260
JENNER 4
1.094 pu
263 kV
944L
951L
89.6 MW
31.5 Mvar
225
WARE JCT
1.069 pu
257 kV
88.9 MW
49.6 Mvar
86.3 MW
58.3 Mvar
85.9 MW
58.3 Mvar
132.2 MW
95.4 Mvar
152.0 MW
89.3 Mvar
150.8 MW
93.3 Mvar
1075L
931L
430
W BROOK4
1.043 pu
250 kV
131.3 MW
74.5 Mvar
763L-3
928
ENCH TAP
1.015 pu
140 kV
11.2 MW
-16.7 Mvar
276
W BROOK7
1.025 pu
141 kV
11.0 MW
14.6 Mvar
28ST2A
28ST1A
6.0 MW
4.0 Mvar
666L
853L-1
877
BASNTAP
1.023 pu
141 kV
10.7 MW
-1.7 Mvar
10.7 MW
-0.6 Mvar
0.3 MW
4.7 Mvar
10.4 MW
0.1 Mvar
853L-2
853AL
399
BASSAN7
1.020 pu
141 kV
10.4 MW
1.5 Mvar
333
QUENSTWN
1.021 pu
141 kV
0.3 MW
2.8 Mvar
894
CLARESHOLM4
1.002 pu
138 kV
1.3 MW
-1.1 Mvar
180AL-10A
180L-30A
872
180AL-TAP
1.002 pu
138 kV
1.3 MW
-1.1 Mvar
13.2 MW
-13.9 Mvar
279
STAVELEY
1.005 pu
139 kV
275
TILLEY 7
1.019 pu
141 kV
16.5 MW
0.9 Mvar
6.0 MW
6.0 Mvar
270
SUFFIEL7
1.026 pu
142 kV
16.6 MW
-1.8 Mvar
100L
0.3 MW
6.6 Mvar
547070
161AL_TAP
1.014 pu
140 kV
2.7 MW
-13.9 Mvar
180L-20
1971L
235
STAVELY7
1.003 pu
138 kV
5.9 MW
1.7 Mvar
826
831A TAP
1.018 pu
141 kV
14.5 MW
5.5 Mvar
831L-2
831L-1
6.3 MW
1.8 Mvar
831AL
8.2 MW
4.6 Mvar
445
CUTNG L7
1.018 pu
141 kV
250
DUCHESS7
1.017 pu
140 kV
244
VULCAN 7
1.013 pu
140 kV
2.7 MW
-12.7 Mvar
2.7 MW
-13.8 Mvar
161L
795L
401
HAYS 7
1.006 pu
139 kV
2.9 MW
-13.8 Mvar
2.9 MW
-12.7 Mvar
1630
REDCOAT1
1.019 pu
141 kV
406
CHIN CH7
1.018 pu
141 kV
8.0 MW
4.6 Mvar
820AL
820BL
820L-7B
820L-7A
90%
85%
869
CHIN CH
1.016 pu
140 kV
98.7 MW
-31.3 Mvar
99.6 MW
-29.8 Mvar
721
RDCO_TAP
1.018 pu
141 kV
102.1 MW
-40.1 Mvar
293
STIRLIN7
1.021 pu
141 kV
725AL
690
COALDAL7
1.001 pu
138 kV
69.1 MW
-16.5 Mvar
101.9 MW
-34.2 Mvar
61.7 MW
-14.4 Mvar
172L-3
172L-4
667L
696
LETH146S
0.991 pu
137 kV
12.7 MW
-4.6 Mvar
4.3 MW
-2.8 Mvar
813LETH
691
LETH241S
0.992 pu
137 kV
4.3 MW
-2.5 Mvar
11.0 MW
6.4 Mvar
823L
272
TABER 7
1.015 pu
140 kV
13.1 MW
6.5 Mvar
172L-1
834
CHIN_CHT
1.008 pu
139 kV
27.3 MW
0.4 Mvar
389
HILLRIDG
1.014 pu
140 kV
27.5 MW
-9.5 Mvar
172EL
697
LETH593S
0.991 pu
137 kV
794
MAGRATH9
1.006 pu
139 kV
863L-2
699
RIVERBN7
0.993 pu
137 kV
824L
22.2 MW
-3.1 Mvar
50.8 MW
-0.8 Mvar
50.1 MW
-0.8 Mvar
22.3 MW
-2.3 Mvar
23.3 MW
-1.5 Mvar
698
LETH674S
0.992 pu
137 kV
21.0 MW
-9.0 Mvar
10.8 MW
-10.5 Mvar
725L-4
725L-3
823
725BL
0.992 pu
137 kV
38.6 MW
-22.2 Mvar
21.2 MW
-10.8 Mvar
59.8 MW
-33.0 Mvar
3001/725BL
901
MCBRIDE1
0.990 pu
137 kV
60.4 MW
-32.4 Mvar
725L-1
237
FORT MA7
0.993 pu
137 kV
38.3 MW
-23.0 Mvar
14.7 MW
-16.9 Mvar
180L-40
939
RVBD TAP
0.992 pu
137 kV
23.3 MW
1.3 Mvar
10.8 MW
-10.5 Mvar
739
ARD_01
1.076 pu
149 kV
55.7 MW
25.9 Mvar
55.4 MW
25.9 Mvar
53.7 MW
2.3 Mvar
57.4 MW
-11.1 Mvar
109.1 MW
28.2 Mvar
108.9 MW
27.6 Mvar
57.4 MW
-11.1 Mvar
53.8 MW
2.3 Mvar
57.4 MW
-11.1 Mvar
748
608AL_TP
1.067 pu
147 kV
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
739
ARD_01
1.076 pu
149 kV
328
MACLEOD1
1.069 pu
148 kV
358
SODER1
1.068 pu
147 kV
608L-1
608L-2
603L-2
1497L
1496L
1040L
1048L
1037L-A
1037L-B
1042L
1041L
940L
1030L
1005AL
1050L-1
1035L
1034L
1053L
1052L
1051L
1087L
1088L
923L
935L
924L
927L
1114L
1064L
1065L
1003L
985L
944L
951L
1080L
1106L
1107L
1075L
931L
763L-3
853L-1
853L-2
853AL
666L
816L
827L
795L
1971L
180L-40
180AL-10A
180L-30A
180L-20
180AL-TAP
725L-1
725L-2
725L-3
725L-4
3001/725BL
820L
820AL
820BL
820L-7B
820L-7A
725AL
1496L
1497L
1971L
1040L
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1080L
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1050L-1
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763L-3
853L-1
853L-2
853AL
666L
816L
827L
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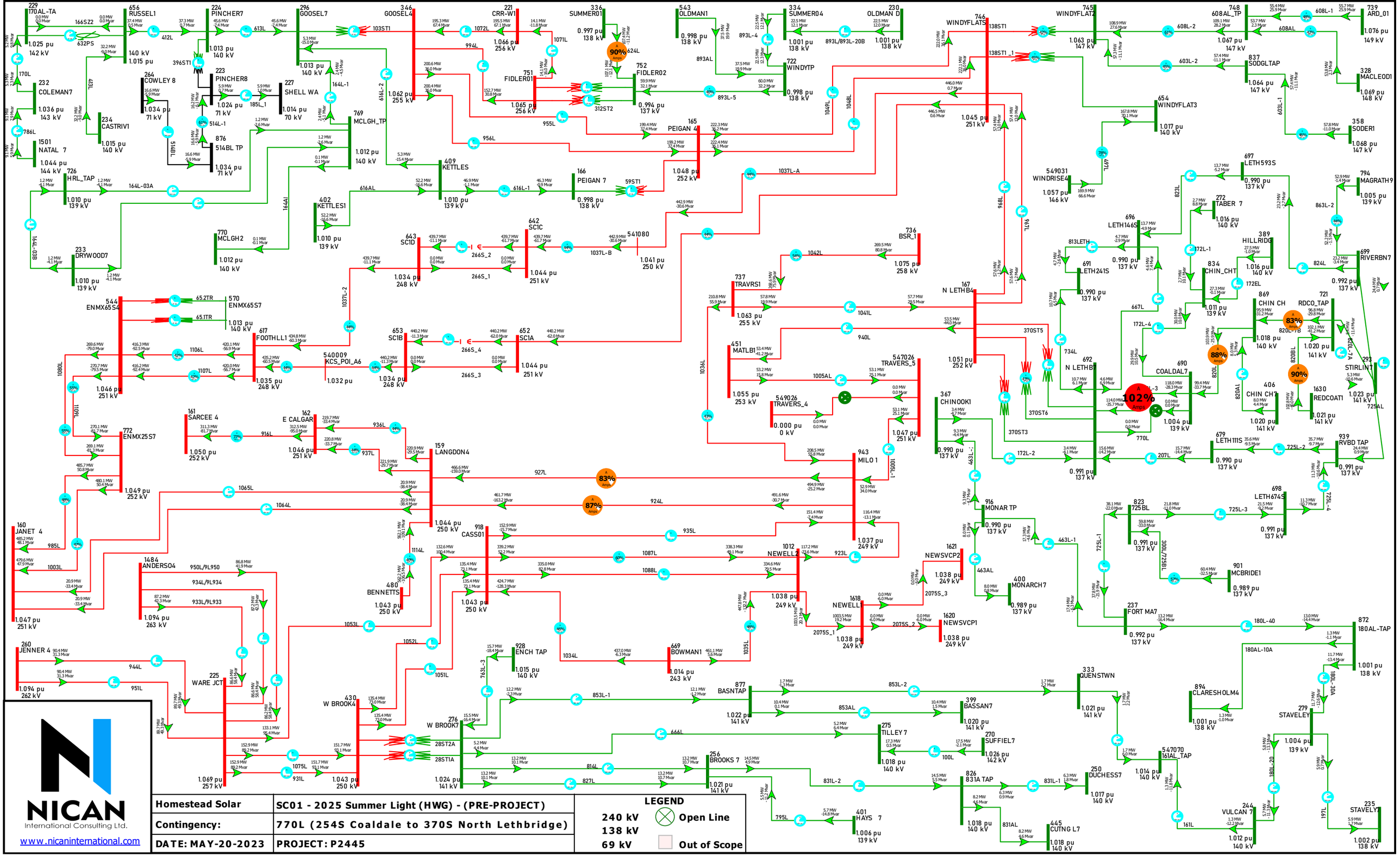
1971L
180L-40
180AL-10A
180L-30A
180L-20
180AL-TAP
725L-1
725L-2
725L-3
725L-4
3001/725BL
820L
820AL
820BL
820L-7B
820L-7A
725AL
102%
84%
88%
Amps
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:
1109L (SS-25 Shepard - SS-65)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.025 pu
142 kV
166SZ2
632PS
656
RUSSEL1
140 kV
1.015 pu
412L
226
PINCHER7
1.013 pu
140 kV
396ST1
223
PINCHER8
1.024 pu
71 kV
1.034 pu
71 kV
264
COWLEY 8
170L
232
COLEMAN7
1.036 pu
143 kV
234
CASTRIV1
1.015 pu
140 kV
786L
1501
NATAL 7
1.044 pu
144 kV
726
HRL_TAP
1.010 pu
139 kV
164L-03A
164L-03B
233
DRYWOOD7
1.010 pu
139 kV
514L-1
514BL TP
1.034 pu
71 kV
514BL
185L_1
227
SHELL WA
1.014 pu
70 kV
296
GOOSEL7
1.013 pu
140 kV
164L-1
164L-2
769
MCLGH_TP
1.012 pu
140 kV
770
MCLGH2
1.012 pu
140 kV
164L41
346
GOOSEL4
103ST1
1.062 pu
255 kV
994L
956L
955L
409
KETTLES
1.010 pu
139 kV
616L-1
616AL
402
KETTLES1
1.010 pu
139 kV
166
PEIGAN 7
0.998 pu
138 kV
59ST1
221
CRR-W1
1.066 pu
256 kV
1071L
751
FIDLER01
1.065 pu
256 kV
312ST2
336
SUMMER01
0.997 pu
138 kV
624L
752
FIDLER02
0.994 pu
137 kV
893L-5
543
OLDMAN1
0.998 pu
138 kV
893L-4
893AL
334
SUMMER04
1.001 pu
138 kV
893L/893L-20B
230
OLDMAN D
1.001 pu
138 kV
722
WINDYTP
0.998 pu
138 kV
165
PEIGAN 4
1.048 pu
252 kV
1037L-A
1037L-B
541080
1.041 pu
250 kV
642
SC1C
643
SC1D
266S_2
266S_1
1.034 pu
248 kV
1.044 pu
251 kV
1037L-2
653
SC1B
652
SC1A
266S_4
266S_3
1.034 pu
248 kV
1.044 pu
251 kV
540009
KCS_POI_A6
1.032 pu
617
FOOTHLL1
1.035 pu
248 kV
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1.013 pu
140 kV
1.046 pu
251 kV
1106L
1107L
1080L
1104L
772
ENMX25S7
1.049 pu
252 kV
1065L
1064L
160
JANET 4
1.047 pu
251 kV
985L
1003L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.094 pu
263 kV
260
JENNER 4
1.094 pu
262 kV
944L
951L
225
WARE JCT
1.069 pu
257 kV
1075L
931L
161
SARCEE 4
1.050 pu
252 kV
916L
162
E CALGAR
1.046 pu
251 kV
936L
937L
159
LANGDON4
1.044 pu
250 kV
927L
924L
935L
1087L
1088L
1114L
480
BENNETTS
1.043 pu
250 kV
918
CASS01
1.043 pu
250 kV
1053L
1052L
1051L
928
ENCH TAP
1.015 pu
140 kV
763L-3
763L-2
430
W BROOK4
276
W BROOK7
28ST2A
28ST1A
1.024 pu
141 kV
1.043 pu
250 kV
853L-1
853L-2
877
BASNTAP
1.022 pu
141 kV
669
BOWMAN1
1.014 pu
243 kV
1034L
1035L
1042L
1041L
940L
1005AL
666L
814L
827L
795L
736
BSR_1
1.075 pu
258 kV
737
TRAVRS1
1.063 pu
255 kV
451
MATLBT
1.055 pu
253 kV
547026
TRAVERS_5
549026
TRAVERS_4
0.000 pu
0 kV
1047 pu
251 kV
256
BROOKS 7
1.021 pu
141 kV
943
MILO 1
1.037 pu
249 kV
1050L-1
401
HAYS 7
1.006 pu
139 kV
1621
NEWSVCP2
1.038 pu
249 kV
2075S_3
1618
NEWELL
1.038 pu
249 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.038 pu
249 kV
746
WINDYFLATS
138ST1
138ST1_1
1.045 pu
251 kV
1049L
1048L
1047L
1046L
654
WINDYFLAT3
1.017 pu
140 kV
549031
WINDRISE4
1.057 pu
146 kV
745
WINDYFLAT2
1.063 pu
147 kV
608AL_TP
608AL-1
608AL-2
608AL
748
1.067 pu
147 kV
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
739
ARD_01
1.076 pu
149 kV
328
MACLEOD1
1.069 pu
148 kV
358
SODER1
1.068 pu
147 kV
697
LETH593S
0.990 pu
137 kV
794
MAGRATH9
1.005 pu
139 kV
863L-2
699
RIVERBN7
0.992 pu
137 kV
824L
823L
272
TABER 7
1.016 pu
140 kV
696
LETH146S
0.990 pu
137 kV
813LETH
691
LETH241S
0.990 pu
137 kV
172L-1
834
CHIN_CHT
1.011 pu
139 kV
172EL
389
HILLRIDG
1.016 pu
140 kV
869
CHIN CH
1.018 pu
140 kV
820L-7B
820L-7A
721
RDCO_TAP
1.020 pu
141 kV
293
STIRLIN7
1.023 pu
141 kV
725AL
172L-4
667L
370ST5
370ST6
370ST3
172L-2
207L
734L
692
N LETHB
1.051 pu
252 kV
690
COALDAL7
1.004 pu
139 kV
820AL
820BL
406
CHIN CH7
1.020 pu
141 kV
1630
REDCOAT1
1.021 pu
141 kV
679
LETH111S
0.990 pu
137 kV
725L-2
939
RVBD TAP
0.991 pu
137 kV
725L-4
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LETH674S
0.991 pu
137 kV
725L-1
725L-3
3001/7258L
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137 kV
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MCBRIDE1
0.989 pu
137 kV
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FORT MA7
0.992 pu
137 kV
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180AL-TAP
1.001 pu
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180AL-10A
180L-30A
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CLARESHOLM4
1.001 pu
138 kV
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1.004 pu
139 kV
180L-20
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161AL_TAP
1.014 pu
140 kV
161L
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VULCAN 7
1.012 pu
140 kV
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STAVELY7
1.002 pu
138 kV
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QUENSTWN
1.021 pu
141 kV
399
BASSAN7
1.020 pu
141 kV
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SUFFIEL7
1.026 pu
142 kV
100L
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TILLEY 7
1.018 pu
140 kV
826
831A TAP
1.018 pu
140 kV
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445
CUTNG L7
1.018 pu
140 kV
250
DUCHESS7
1.017 pu
140 kV
831L-1
831L-2
367
CHINOOK1
0.990 pu
137 kV
463L-1
463L-2
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MONAR TP
0.990 pu
137 kV
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MONARCH7
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137 kV
370L
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83%
87%
90%
102%
88%
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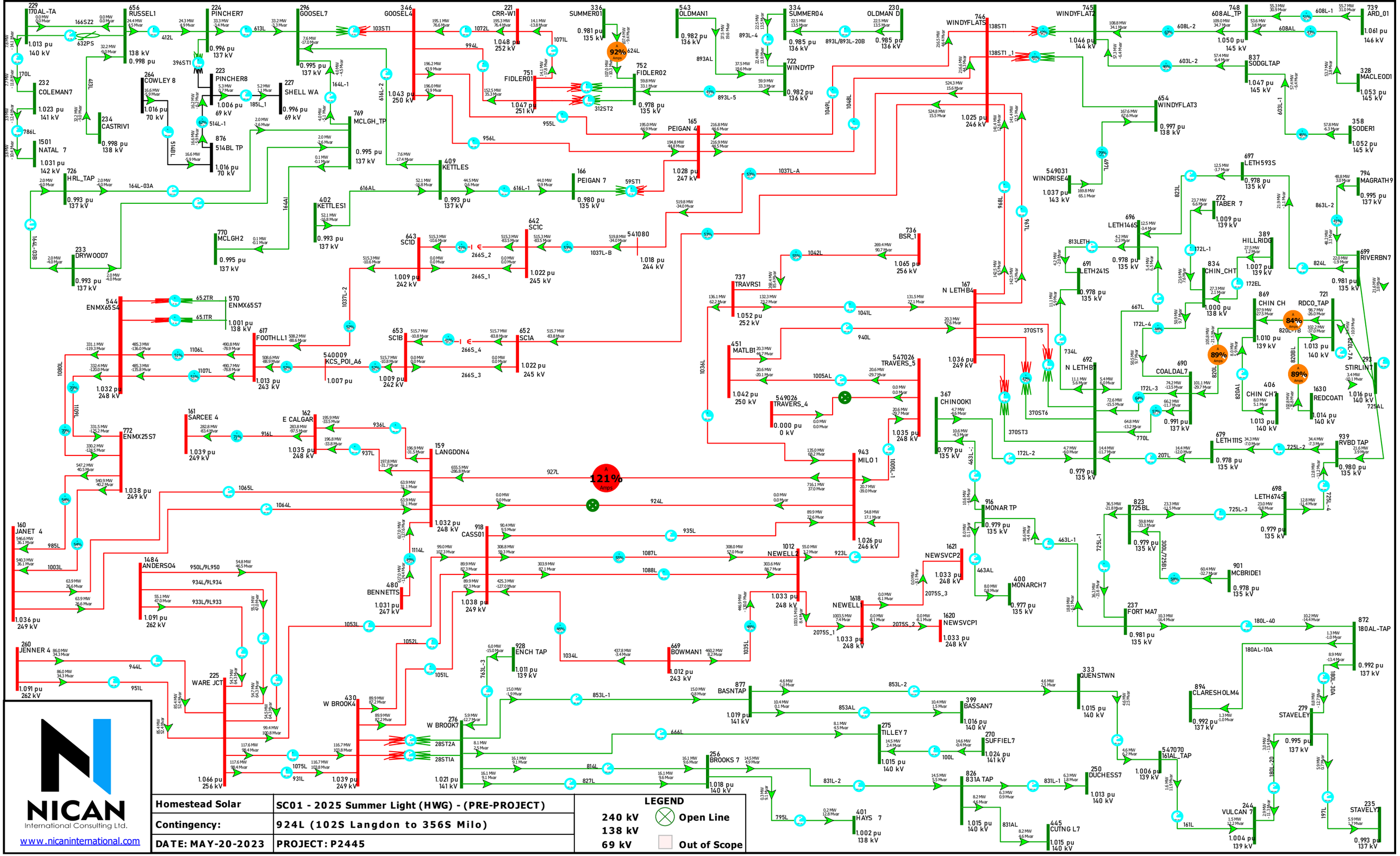
Homestead Solar
SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:
770L (254S Coaldale to 370S North Lethbridge)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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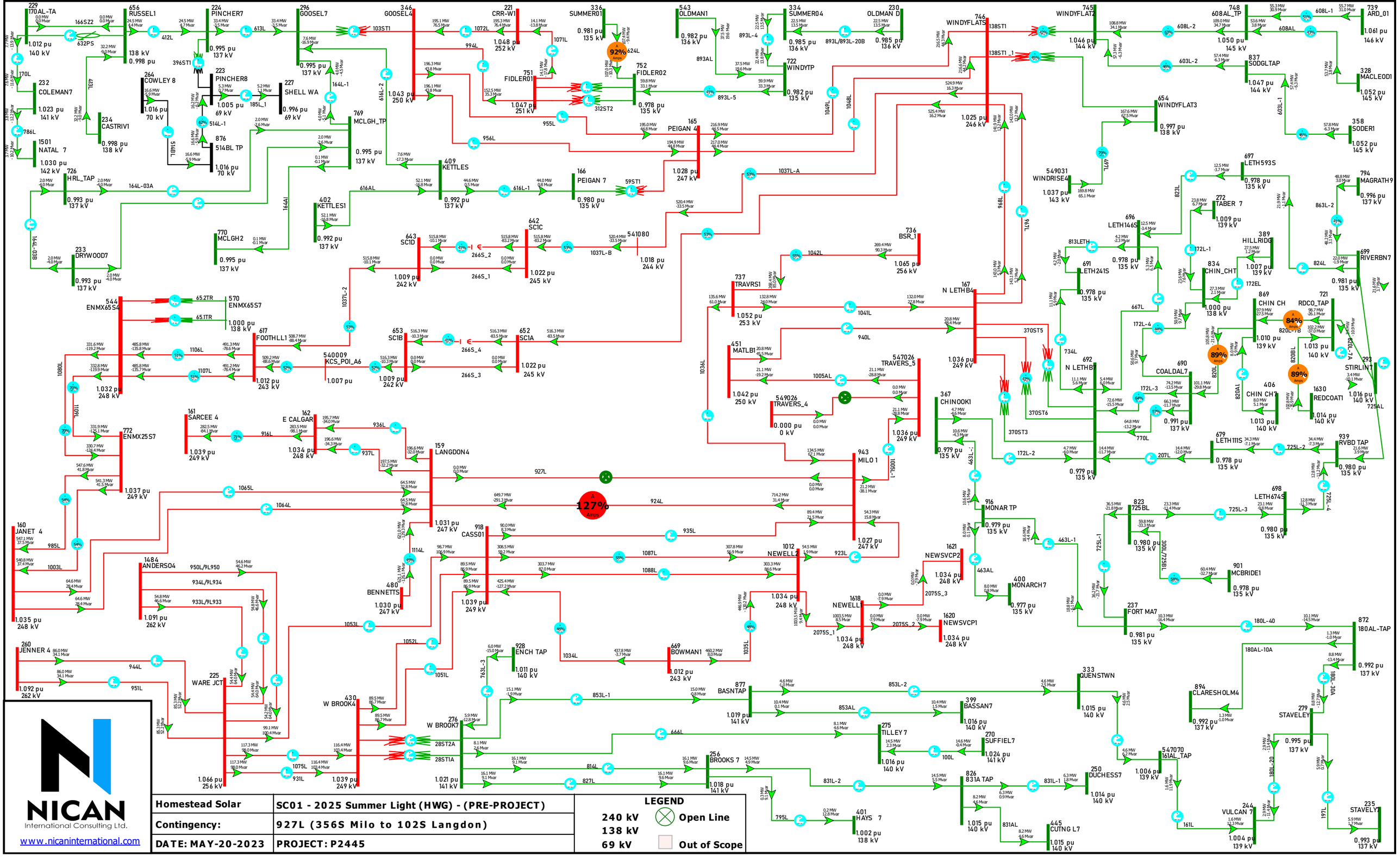
Homestead Solar	**SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)**
Contingency:	**924L (102S Langdon to 356S Milo)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV — Open Line

138 kV

69 kV — Out of Scope



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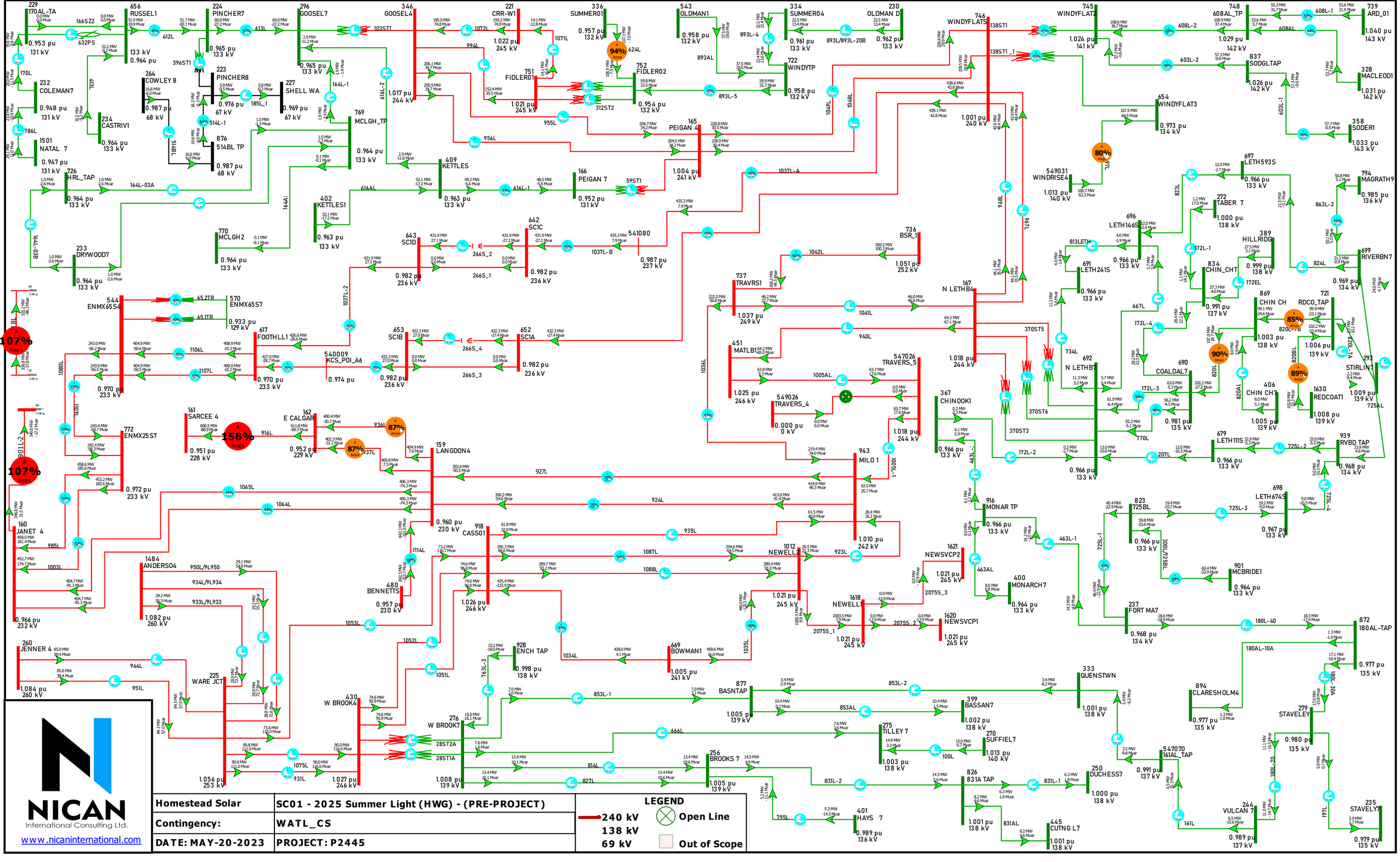
Homestead Solar	**SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)**
Contingency:	**927L (356S Milo to 102S Langdon)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV ⊗ **Open Line**

138 kV

69 kV **Out of Scope**


229
170AL_TA
0.953 pu
131 kV
166SZ2
632PS
656
RUSSEL1
133 kV
0.964 pu
412L
224
PINCHER7
0.965 pu
133 kV
396ST1
223
PINCHER8
0.976 pu
67 kV
264
COWLEY 8
0.987 pu
68 kV
514L
514L-1
876
514BL TP
0.987 pu
68 kV
227
SHELL WA
0.969 pu
67 kV
185L_1
296
GOOSEL7
0.965 pu
133 kV
164L-1
410L
170L
232
COLEMAN7
0.948 pu
131 kV
234
CASTRIV1
0.964 pu
133 kV
786L
1501
NATAL 7
0.947 pu
131 kV
769
MCLGH_TP
0.964 pu
133 kV
726
HRL_TAP
0.964 pu
133 kV
164L-03A
164L-03B
233
DRYWOOD7
0.964 pu
133 kV
770
MCLGH2
0.964 pu
133 kV
164AL
346
GOOSEL4
1.017 pu
244 kV
103ST1
616L-2
994L
955L
956L
221
CRR-W1
1.022 pu
245 kV
1072L
1071L
751
FIDLER01
1.021 pu
245 kV
152.4 MW
35.5 Mvar
141.1 MW
-7.9 Mvar
312ST2
336
SUMMER01
0.957 pu
132 kV
94%
Amps
624L
752
FIDLER02
0.954 pu
132 kV
543
OLDMAN1
0.958 pu
132 kV
893L-4
893AL
893L-5
334
SUMMER04
0.961 pu
133 kV
722
WINDYTP
0.958 pu
132 kV
893L/893L-20B
230
OLDMAN D
0.962 pu
133 kV
746
WINDYFLATS
138ST1
138ST1_1
1049L
1048L
1.001 pu
240 kV
745
WINDYFLAT2
1.024 pu
141 kV
608L-2
603L-2
748
608AL_TP
1.029 pu
142 kV
608AL
837
SODGLTAP
1.026 pu
142 kV
603L-1
739
ARD_01
1.040 pu
143 kV
328
MACLEOD1
1.031 pu
142 kV
654
WINDYFLAT3
0.973 pu
134 kV
358
SODER1
1.033 pu
143 kV
165
PEIGAN 4
1.004 pu
241 kV
228.8 MW
30.5 Mvar
204.7 MW
34.2 Mvar
166
PEIGAN 7
0.952 pu
131 kV
59ST1
409
KETTLES
0.963 pu
133 kV
616AL
616L-1
402
KETTLES1
0.963 pu
133 kV
642
SC1C
643
SC1D
0.982 pu
236 kV
266S_2
266S_1
541080
0.987 pu
237 kV
1037L-B
1037L-A
653
SC1B
652
SC1A
0.982 pu
236 kV
266S_4
266S_3
540009
KCS_POI_A6
0.974 pu
1037L-2
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
0.933 pu
129 kV
617
FOOTHLL1
0.970 pu
233 kV
1106L
1107L
1080L
1101L
772
ENMX25S7
0.972 pu
233 kV
1065L
1064L
160
JANET 4
0.966 pu
232 kV
985L
1003L
1484
ANDERSO4
1.082 pu
260 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.084 pu
260 kV
944L
951L
225
WARE JCT
1.056 pu
253 kV
1053L
1052L
1051L
1075L
931L
430
W BROOK4
1.027 pu
246 kV
276
W BROOK7
1.008 pu
139 kV
28ST2A
28ST1A
161
SARCEE 4
0.951 pu
228 kV
158%
Amps
162
E CALGAR
0.952 pu
229 kV
916L
936L
737L
87%
Amps
159
LANGDON4
0.960 pu
230 kV
927L
924L
935L
1087L
1088L
1114L
918
CASS01
1.026 pu
246 kV
480
BENNETTS
0.957 pu
230 kV
1034L
928
ENCH TAP
0.998 pu
138 kV
763L-3
669
BOWMAN1
1.005 pu
241 kV
1035L
1036L
853L-1
877
BASNTAP
1.005 pu
139 kV
666L
814L
827L
256
BROOKS 7
1.005 pu
139 kV
275
TILLEY 7
1.003 pu
138 kV
100L
270
SUFFIEL7
1.013 pu
140 kV
853L-2
853AL
399
BASSAN7
1.002 pu
138 kV
333
QUENSTWN
1.001 pu
138 kV
831L-2
831L-1
826
831A TAP
1.001 pu
138 kV
831AL
445
CUTNG L7
1.001 pu
138 kV
250
DUCHESS7
1.000 pu
138 kV
547070
161AL_TAP
0.991 pu
137 kV
161L
244
VULCAN 7
0.989 pu
137 kV
180L-20
180L-30
180L-40
180AL-10A
894
CLARESHOLM4
0.977 pu
135 kV
872
180AL-TAP
0.977 pu
135 kV
279
STAVELEY
0.980 pu
135 kV
235
STAVELY7
0.979 pu
135 kV
179L
725L-4
698
LETH674S
0.967 pu
133 kV
725L-3
725L-1
823
725BL
0.966 pu
133 kV
3100/7259L
901
MCBRIDE1
0.964 pu
133 kV
237
FORT MA7
0.968 pu
134 kV
463L-1
916
MONAR TP
0.966 pu
133 kV
463AL
400
MONARCH7
0.964 pu
133 kV
1621
NEWSVCP2
1.021 pu
245 kV
2075S_3
1618
NEWELL1
1.021 pu
245 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.021 pu
245 kV
1012
NEWELL2
1.021 pu
245 kV
549031
WINDRISE4
1.013 pu
140 kV
169L
80%
Amps
736
BSR_1
1.051 pu
252 kV
737
TRAVRS1
1.037 pu
249 kV
1042L
1041L
940L
451
MATLBI1
1.025 pu
246 kV
1005AL
547026
TRAVERS_5
1.018 pu
244 kV
549026
TRAVERS_4
0.000 pu
0 kV
943
MILO 1
1.010 pu
242 kV
1005L-1
401
HAYS 7
0.989 pu
136 kV
795L
167
N LETHB4
1.018 pu
244 kV
370ST5
370ST6
370ST3
692
N LETHBT
734L
367
CHINOOK1
0.966 pu
133 kV
736L-1
172L-2
691
LETH241S
0.966 pu
133 kV
813LETH
696
LETH146S
0.966 pu
133 kV
667L
172L-4
690
COALDAL7
0.981 pu
135 kV
172L-3
770L
207L
679
LETH111S
0.966 pu
133 kV
725L-2
939
RVBD TAP
0.968 pu
134 kV
698
LETH674S
0.967 pu
133 kV
272
TABER 7
1.000 pu
138 kV
172L-1
834
CHIN_CHT
0.991 pu
137 kV
172EL
389
HILLRIDG
0.999 pu
138 kV
824L
699
RIVERBN7
0.969 pu
134 kV
863L-2
794
MAGRATH9
0.985 pu
136 kV
697
LETH593S
0.966 pu
133 kV
823L
869
CHIN CH
1.003 pu
138 kV
820L-7B
85%
Amps
820BL
89%
Amps
820AL
406
CHIN CH7
1.005 pu
139 kV
721
RDCO_TAP
1.006 pu
139 kV
1630
REDCOAT1
1.008 pu
139 kV
293
STIRLIN7
1.009 pu
139 kV
725AL
107%
Amps
901L-2
107%
Amps
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Homestead Solar
SC01 - 2025 Summer Light (HWG) - (PRE-PROJECT)
Contingency:
WATL_CS
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

2025 SUMMER PEAK

Single Line Diagrams
P2445 - PRE-PROJECT
POWER FLOW SC02

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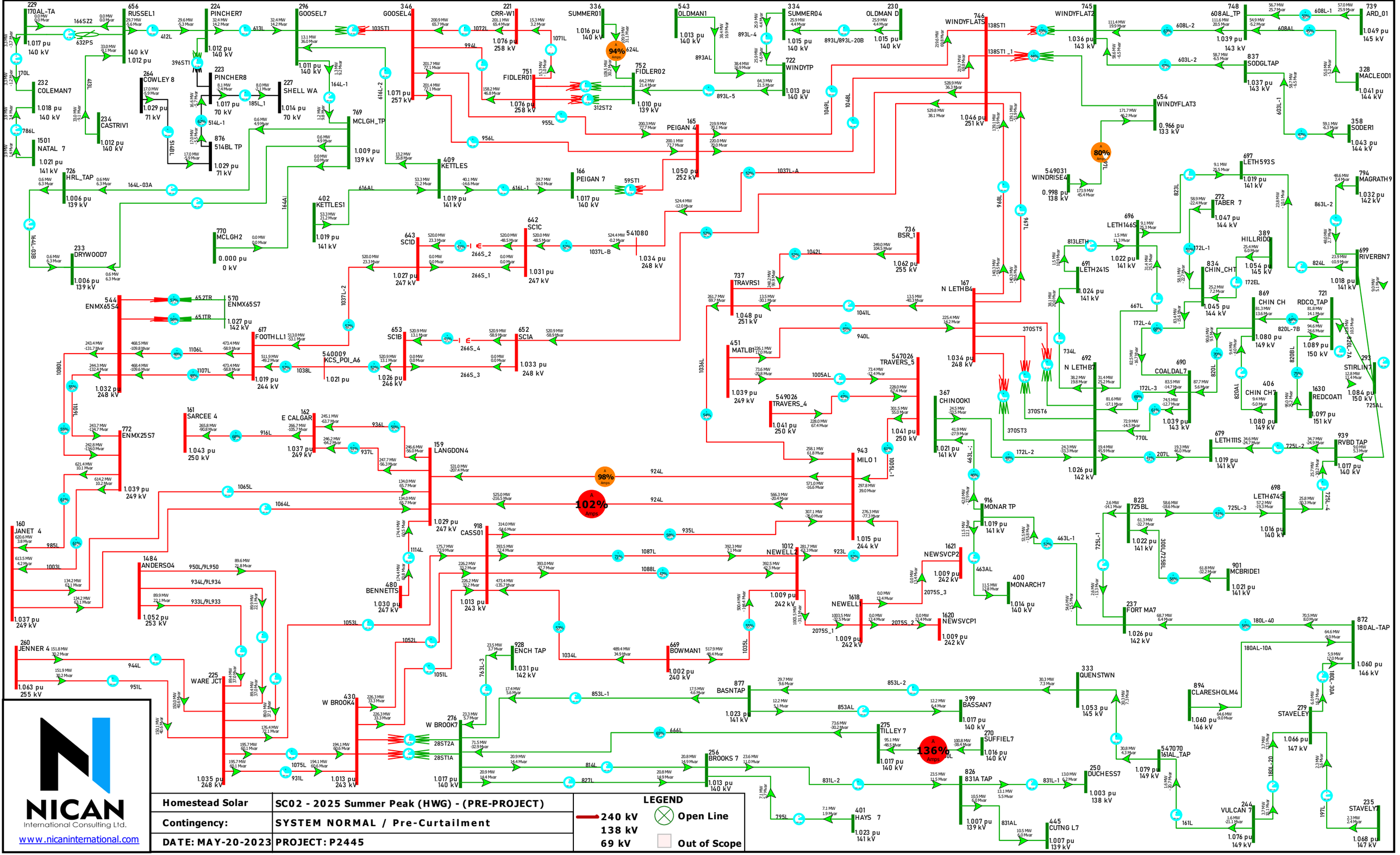

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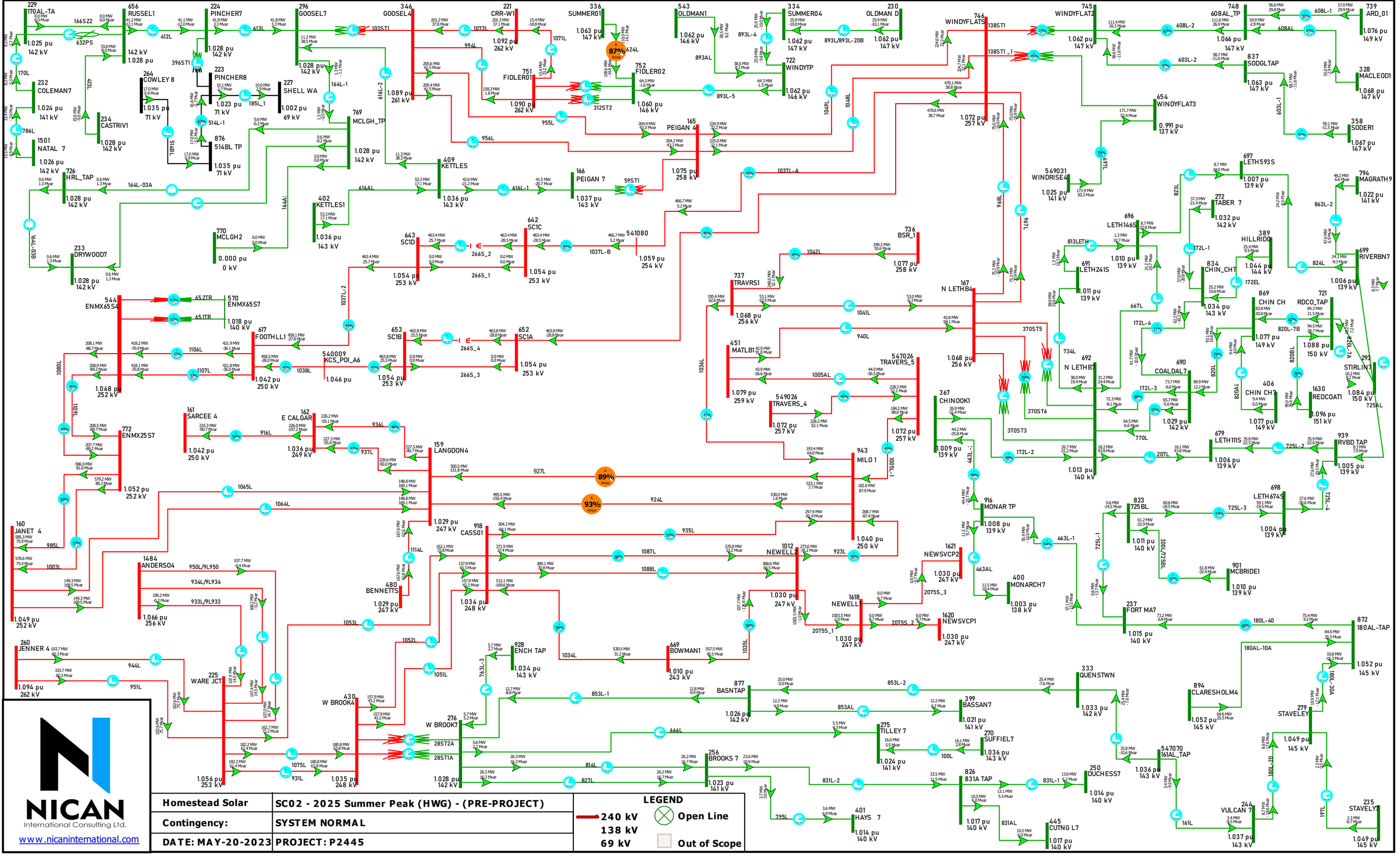
Homestead Solar	SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)
Contingency:	SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV	138 kV	69 kV	
⊗	Open Line	☐	Out of Scope



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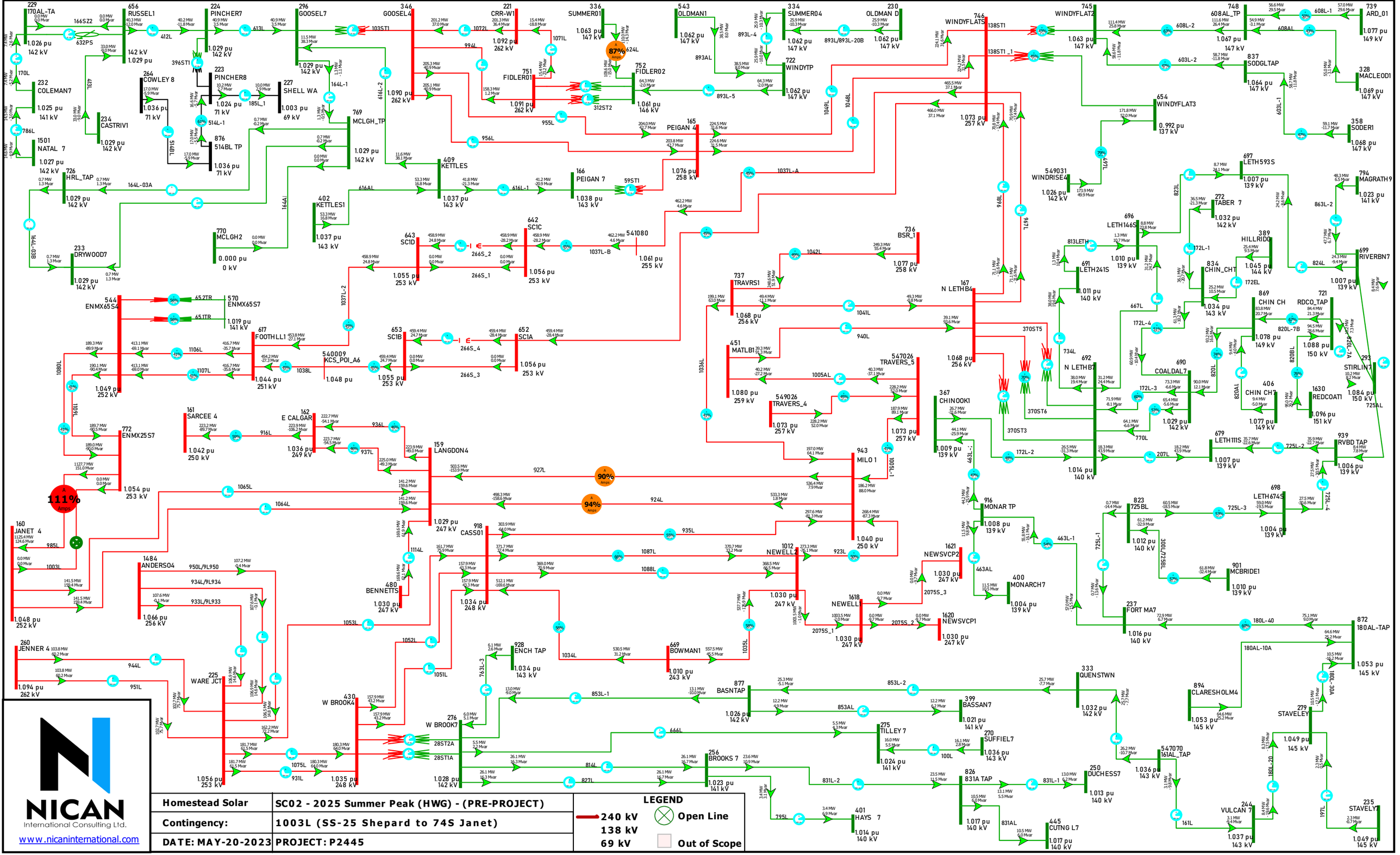
Homestead Solar	**SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)**
Contingency:	**SYSTEM NORMAL**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
⊗ **Open Line**
☐ **Out of Scope**


229
170AL-TA
1.026 pu
142 kV
166SZ2
632PS
656
RUSSEL1
142 kV
1.029 pu
412L
224
PINCHER7
1.029 pu
142 kV
396ST1
613L
296
GOOSEL7
1.029 pu
142 kV
164L-1
346
GOOSEL4
1.090 pu
262 kV
103ST1
616L-2
201.2 MW
37.0 Mvar
1072L
221
CRR-W1
201.3 MW
36.4 Mvar
1.092 pu
262 kV
15.4 MW
-18.8 Mvar
1071L
994L
158.3 MW
1.2 Mvar
751
FIDLER01
1.091 pu
262 kV
205.3 MW
40.9 Mvar
205.1 MW
40.9 Mvar
955L
956L
336
SUMMER01
1.063 pu
147 kV
87%
624L
312ST2
752
FIDLER02
1.061 pu
146 kV
543
OLDMAN1
1.062 pu
147 kV
893L-4
893L-5
334
SUMMER04
1.062 pu
147 kV
893L/893L-20B
230
OLDMAN D
1.062 pu
147 kV
893AL
722
WINDYTP
1.062 pu
147 kV
746
WINDYFLATS
138ST1
138ST1_1
1.073 pu
257 kV
745
WINDYFLAT2
1.063 pu
147 kV
748
608AL_TP
1.067 pu
147 kV
608L-2
603L-2
837
SODGLTAP
1.064 pu
147 kV
739
ARD_01
1.077 pu
149 kV
328
MACLEOD1
1.069 pu
147 kV
603L-1
358
SODER1
1.068 pu
147 kV
654
WINDYFLAT3
0.992 pu
137 kV
1040L
1048L
1047L
1046L
1037L-A
1037L-B
1.076 pu
258 kV
165
PEIGAN 4
1.061 pu
255 kV
541080
462.2 MW
4.6 Mvar
166
PEIGAN 7
1.038 pu
143 kV
59ST1
409
KETTLES
1.037 pu
143 kV
616L-1
616AL
402
KETTLES1
1.037 pu
143 kV
770
MCLGH2
0.000 pu
0 kV
769
MCLGH_TP
1.029 pu
142 kV
164L-03A
164AL
1501
NATAL 7
1.027 pu
142 kV
726
HRL_TAP
1.029 pu
142 kV
786L
232
COLEMAN7
1.025 pu
141 kV
170L
264
COWLEY 8
1.036 pu
71 kV
223
PINCHER8
1.024 pu
71 kV
185L_1
227
SHELL WA
1.003 pu
69 kV
514L-1
876
514BL TP
1.036 pu
71 kV
514AL
234
CASTRIV1
1.029 pu
142 kV
1.048 pu
252 kV
233
DRYWOOD7
1.029 pu
142 kV
164AL
1644L
1641L
1643L
1645L
1646L
1647L
1648L
1649L
1650L
1651L
1652L
1653L
1654L
1655L
1656L
1657L
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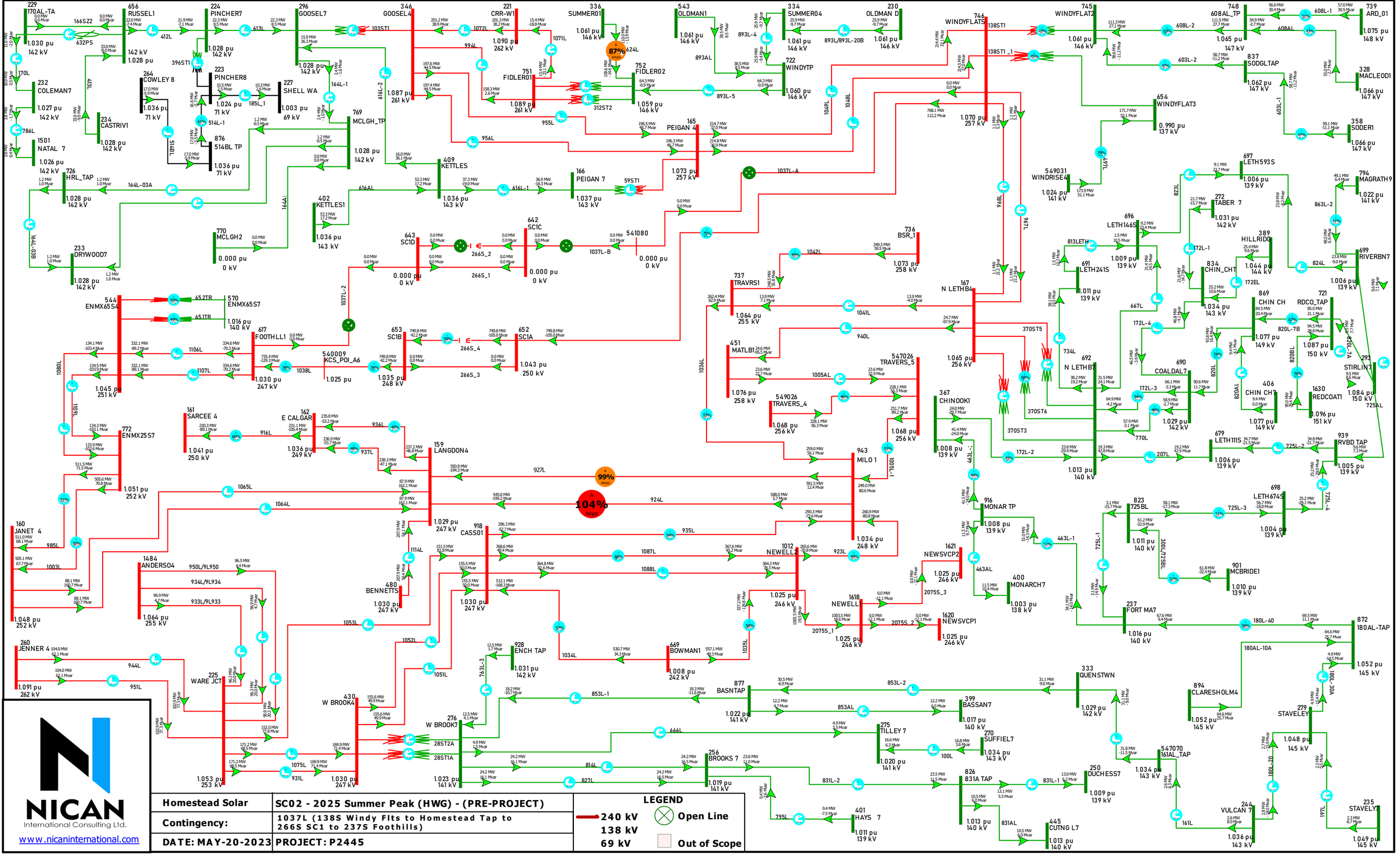
1684L


229
170AL-TA
1.030 pu
142 kV
656
RUSSEL1
1.028 pu
142 kV
224
PINCHER7
1.028 pu
142 kV
296
GOOSEL7
1.028 pu
142 kV
346
GOOSEL4
1.087 pu
261 kV
221
CRR-W1
1.090 pu
262 kV
336
SUMMER01
1.061 pu
146 kV
543
OLDMAN1
1.061 pu
146 kV
334
SUMMER04
1.061 pu
146 kV
230
OLDMAN D
1.061 pu
146 kV
746
WINDYFLATS
1.070 pu
257 kV
745
WINDYFLAT2
1.061 pu
146 kV
748
608AL_TP
1.065 pu
147 kV
739
ARD_01
1.075 pu
148 kV
608L-1
608L-2
603L-2
603L-1
608AL
837
SODGLTAP
1.062 pu
147 kV
328
MACLEOD1
1.066 pu
147 kV
358
SODER1
1.066 pu
147 kV
654
WINDYFLAT3
0.990 pu
137 kV
549031
WINDRISE4
1.024 pu
141 kV
697
LETH593S
1.006 pu
139 kV
794
MAGRATH9
1.022 pu
141 kV
863L-2
823L
272
TABER 7
1.031 pu
142 kV
696
LETH146S
1.009 pu
139 kV
813LETH
691
LETH241S
1.011 pu
139 kV
172L-1
834
CHIN_CHT
1.034 pu
143 kV
389
HILLRIDG
1.044 pu
144 kV
824L
699
RIVERBN7
1.006 pu
139 kV
172EL
869
CHIN CH
1.077 pu
149 kV
820L-7B
721
RDCO_TAP
1.087 pu
150 kV
820L-7A
293
STIRLIN7
1.084 pu
150 kV
725AL
667L
172L-4
690
COALDAL7
1.029 pu
142 kV
820L
820AL
406
CHIN CH7
1.077 pu
149 kV
1630
REDCOAT1
1.096 pu
151 kV
172L-3
734L
692
N LETHB7
1.013 pu
140 kV
370ST5
370ST6
370ST3
172L-2
207L
679
LETH111S
1.006 pu
139 kV
725L-2
939
RVBD TAP
1.005 pu
139 kV
698
LETH674S
1.004 pu
139 kV
725L-3
725L-4
823
725BL
1.011 pu
140 kV
3001/7258L
901
MCBRIDE1
1.010 pu
139 kV
725L-1
237
FORT MA7
1.016 pu
140 kV
180L-40
872
180AL-TAP
1.052 pu
145 kV
180AL-10A
894
CLARESHOLM4
1.052 pu
145 kV
180L-30A
279
STAVELEY
1.048 pu
145 kV
180L-20
244
VULCAN 7
1.036 pu
143 kV
235
STAVELY7
1.049 pu
145 kV
197L
161L
547070
161AL_TAP
1.034 pu
143 kV
250
DUCHESS7
1.009 pu
139 kV
831L-1
831L-2
826
831A TAP
1.013 pu
140 kV
831AL
445
CUTNG L7
1.013 pu
140 kV
1621
NEWSVCP2
1.025 pu
246 kV
463L-1
463L-2
463AL
916
MONAR TP
1.008 pu
139 kV
400
MONARCH7
1.003 pu
138 kV
1618
NEWELL1
1.025 pu
246 kV
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1.025 pu
246 kV
923L
1012
NEWELL2
1.025 pu
246 kV
1087L
1088L
935L
918
CASS01
1.030 pu
247 kV
480
BENNETTS
1.030 pu
247 kV
1114L
1053L
1052L
1051L
1034L
1035L
669
BOWMAN1
1.008 pu
242 kV
928
ENCH TAP
1.031 pu
142 kV
763L-3
430
W BROOK4
1.030 pu
247 kV
276
W BROOK7
1.023 pu
141 kV
28ST2A
28ST1A
666L
814L
827L
256
BROOKS 7
1.019 pu
141 kV
877
BASNTAP
1.022 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.017 pu
140 kV
275
TILLEY 7
1.020 pu
141 kV
100L
270
SUFFIEL7
1.034 pu
143 kV
333
QUENSTWN
1.029 pu
142 kV
927L
924L
943
MILO 1
1.034 pu
248 kV
1005L-1
401
HAYS 7
1.011 pu
139 kV
795L
225
WARE JCT
1.053 pu
253 kV
1065L
1064L
1075L
931L
1030L
1029L
1080L
1106L
1107L
1038L
540009
KCS_POI_A6
1.025 pu
653
SC1B
1.035 pu
248 kV
652
SC1A
1.043 pu
250 kV
266S_3
266S_4
544
ENMX65S4
570
ENMX65S7
1.016 pu
140 kV
65.2TR
65.1TR
617
FOOTHLL1
1.030 pu
247 kV
1038L
772
ENMX25S7
1.051 pu
252 kV
1109L
160
JANET 4
1.048 pu
252 kV
985L
1003L
1484
ANDERS04
1.064 pu
255 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.091 pu
262 kV
944L
951L
161
SARCEE 4
1.041 pu
250 kV
916L
162
E CALGAR
1.036 pu
249 kV
936L
937L
159
LANGDON4
1.029 pu
247 kV
1064L
1065L
1037L-2
1037L-A
1037L-B
541080
0.000 pu
0 kV
642
SC1C
0.000 pu
0 kV
266S_1
266S_2
643
SC1D
0.000 pu
0 kV
770
MCLGH2
0.000 pu
0 kV
1644L
1644L1
1648L
1648L1
1649L
1649L1
1649L2
1649L3
1649L4
1649L5
1649L6
1649L7
1649L8
1649L9
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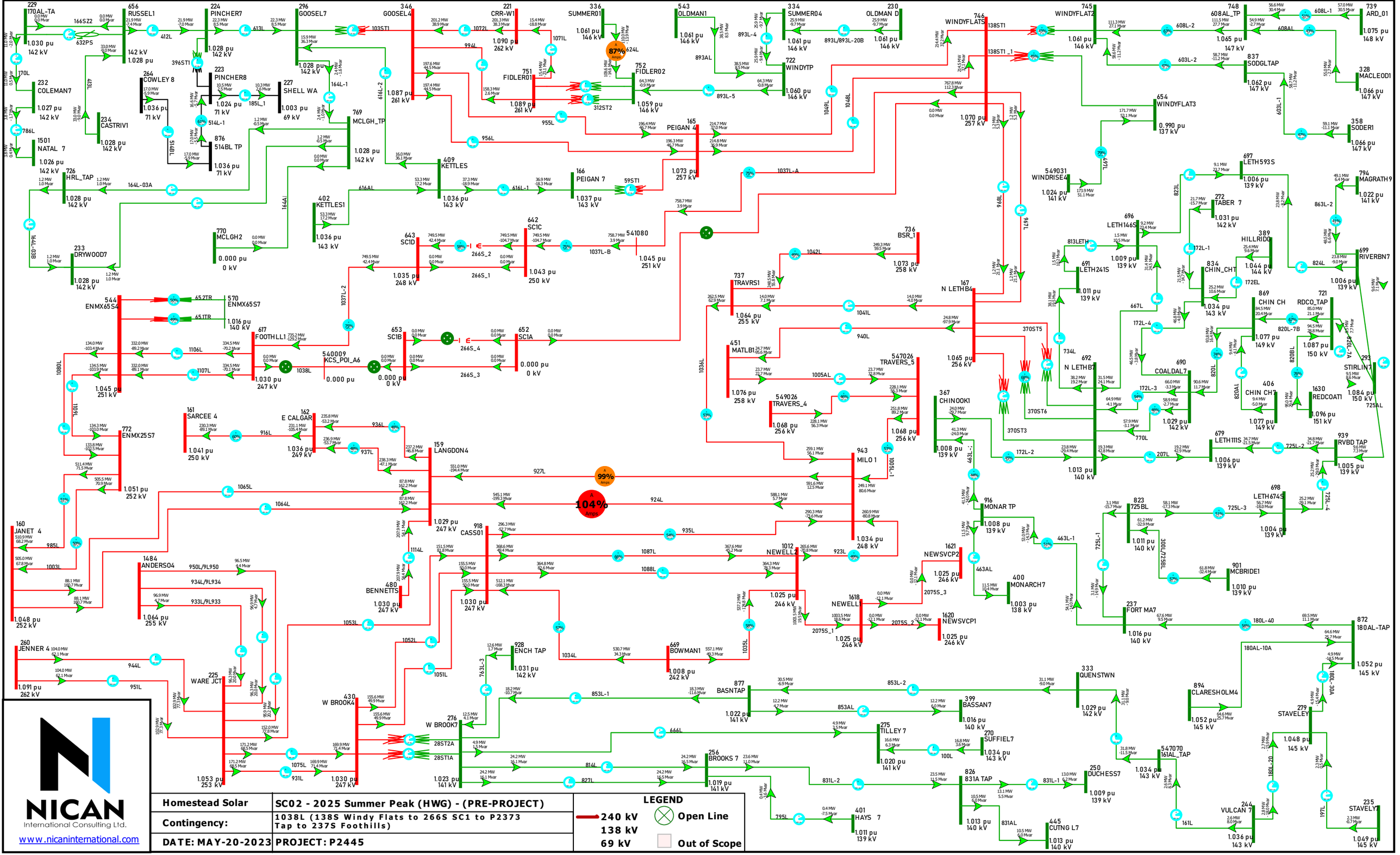
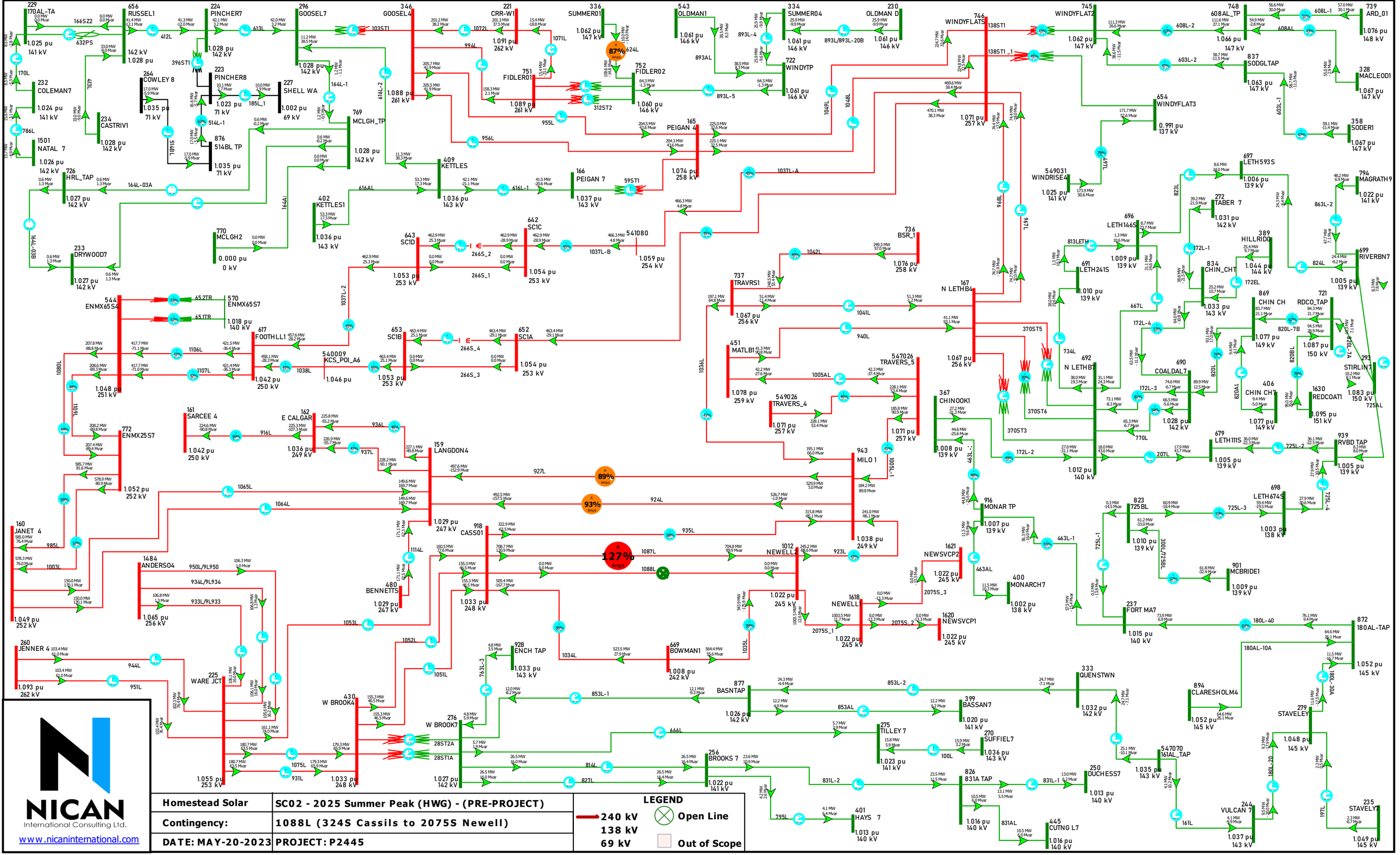

229 170AL-TA
1.030 pu 142 kV
166S2
632PS
656 RUSSEL1
142 kV 1.028 pu
412L
224 PINCHER7
1.028 pu 142 kV
613L
296 GOOSEL7
1.028 pu 142 kV
396ST1
223 PINCHER8
1.024 pu 71 kV
185L_1
227 SHELL WA
1.003 pu 69 kV
264 COWLEY 8
1.036 pu 71 kV
514L-1
876 514BL TP
1.036 pu 71 kV
769 MCLGH_TP
1.028 pu 142 kV
164L-1
616L-2
346 GOOSEL4
1.087 pu 261 kV
103ST1
201.2 MW 38.9 Mvar
1072L
221 CRR-W1
201.3 MW 38.3 Mvar
1.090 pu 262 kV
15.4 MW -18.8 Mvar
1071L
994L
197.6 MW 44.5 Mvar
197.4 MW 44.5 Mvar
158.3 MW 2.6 Mvar
751 FIDLER01
1.089 pu 261 kV
955L
336 SUMMER01
1.061 pu 146 kV
87% Amps
624L
312ST2
752 FIDLER02
64.3 MW -0.9 Mvar
1.059 pu 146 kV
543 OLDMAN1
1.061 pu 146 kV
893L-4
893AL
893L-5
334 SUMMER04
1.061 pu 146 kV
893L/893L-20B
230 OLDMAN D
1.061 pu 146 kV
722 WINDYTP
1.060 pu 146 kV
956L
165 PEIGAN 4
1.073 pu 257 kV
214.7 MW 37.0 Mvar
214.8 MW 36.9 Mvar
196.4 MW 46.7 Mvar
196.3 MW 46.7 Mvar
1037L-A
758.7 MW 3.9 Mvar
409 KETTLES
1.036 pu 143 kV
53.3 MW 17.2 Mvar
37.3 MW -18.9 Mvar
616L-1
36.9 MW -18.3 Mvar
166 PEIGAN 7
1.037 pu 143 kV
59ST1
402 KETTLES1
1.036 pu 143 kV
616AL
164L-03A
164AL
164L-03B
233 DRYWOOD7
1.028 pu 142 kV
726 HRL_TAP
1.028 pu 142 kV
1501 NATAL 7
1.026 pu 142 kV
786L
232 COLEMAN7
1.027 pu 142 kV
170L
234 CASTRIV1
1.028 pu 142 kV
514AL
770 MCLGH2
0.000 pu 0 kV
642 SC1C
643 SC1D
1.035 pu 248 kV
266S_2
266S_1
1.043 pu 250 kV
1037L-B
541080
1.045 pu 251 kV
653 SC1B
652 SC1A
266S_4
266S_3
0.000 pu 0 kV
1037L-2
544 ENMX65S4
570 ENMX65S7
1.016 pu 140 kV
65.2TR
65.1TR
1.045 pu 251 kV
617 FOOTHLL1
1.030 pu 247 kV
1038L
540009 KCS_POI_A6
1106L
1107L
1080L
1094L
772 ENMX25S7
1.051 pu 252 kV
1065L
1064L
161 SARCEE 4
1.041 pu 250 kV
916L
162 E CALGAR
1.036 pu 249 kV
936L
937L
159 LANGDON4
1.029 pu 247 kV
927L
99% Amps
924L
104% Amps
1114L
480 BENNETT8
1.030 pu 247 kV
160 JANET 4
1.048 pu 252 kV
985L
1003L
1484 ANDERS04
1.064 pu 255 kV
950L/9L950
934L/9L934
933L/9L933
260 JENNER 4
1.091 pu 262 kV
944L
951L
225 WARE JCT
1.053 pu 253 kV
1053L
1052L
1051L
1075L
931L
430 W BROOK4
1.030 pu 247 kV
276 W BROOK7
28ST2A
28ST1A
1.023 pu 141 kV
763L-3
928 ENCH TAP
1.031 pu 142 kV
669 BOWMAN1
1.008 pu 242 kV
1034L
1035L
877 BASNTAP
1.022 pu 141 kV
853L-1
853L-2
853AL
666L
814L
827L
256 BROOKS 7
1.019 pu 141 kV
831L-2
795L
401 HAYS 7
1.011 pu 139 kV
1042L
737 TRAVRS1
1.064 pu 255 kV
1041L
451 MATLB1
1.076 pu 258 kV
940L
1005AL
549026 TRAVERS_4
1.068 pu 256 kV
547026 TRAVERS_5
1.068 pu 256 kV
1005L-1
943 MILO 1
1.034 pu 248 kV
736 BSR_1
1.073 pu 258 kV
1040L
1048L
746 WINDYFLATS
1.070 pu 257 kV
138ST1
138ST1_1
767.8 MW 112.3 Mvar
2075S_3
1621 NEWSVCP2
1.025 pu 246 kV
463AL
400 MONARCH7
1.003 pu 138 kV
1618 NEWELL
2075S_1
2075S_2
1620 NEWSVCP1
1.025 pu 246 kV
1012 NEWELL7
1.025 pu 246 kV
923L
1087L
1088L
935L
918 CASS01
1.030 pu 247 kV
1034.7 MW 3.9 Mvar
1167L
1168L
167 N LETHB4
1.065 pu 256 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7
1.008 pu 139 kV
463L-1
916 MONAR TP
1.008 pu 139 kV
367 CHINOOK1
1.008 pu 139 kV
172L-2
207L
1.013 pu 140 kV
745 WINDYFLAT2
1.061 pu 146 kV
608AL_TP
1.065 pu 147 kV
608L-2
603L-2
837 SODGLTAP
1.062 pu 147 kV
603L-1
608L-1
608AL
739 ARD_01
1.075 pu 148 kV
328 MACLEOD1
1.066 pu 147 kV
358 SODER1
1.066 pu 147 kV
654 WINDYFLAT3
0.990 pu 137 kV
549031 WINDRISE4
1.024 pu 141 kV
697 LETH593S
1.006 pu 139 kV
794 MAGRATH9
1.022 pu 141 kV
863L-2
272 TABER 7
1.031 pu 142 kV
823L
172L-1
696 LETH146S
1.009 pu 139 kV
813LETH
691 LETH241S
1.011 pu 139 kV
834 CHIN_CHT
1.034 pu 143 kV
389 HILLRIDG
1.044 pu 144 kV
824L
699 RIVERBN7
1.006 pu 139 kV
172EL
172L-4
667L
172L-3
690 COALDAL7
1.029 pu 142 kV
820L
820L-7B
869 CHIN CH
1.077 pu 149 kV
406 CHIN CH7
1.077 pu 149 kV
820AL
820BL
721 RDCO_TAP
1.087 pu 150 kV
1630 REDCOAT1
1.096 pu 151 kV
820L-7A
293 STIRLIN7
1.084 pu 150 kV
725AL
679 LETH111S
1.006 pu 139 kV
725L-2
939 RVBD TAP
1.005 pu 139 kV
698 LETH674S
1.004 pu 139 kV
725L-4
725L-3
725L-1
823 725BL
1.011 pu 140 kV
730L/736L
901 MCBRIDE1
1.010 pu 139 kV
237 FORT MA7
1.016 pu 140 kV
180L-40
872 180AL-TAP
1.052 pu 145 kV
180AL-10A
894 CLARESHOLM4
1.052 pu 145 kV
180L-30A
279 STAVELEY
1.048 pu 145 kV
180L-20
197L
235 STAVELY7
1.049 pu 145 kV
333 QUENSTWN
1.029 pu 142 kV
399 BASSAN7
1.016 pu 140 kV
275 TILLEY 7
1.020 pu 141 kV
100L
270 SUFFIEL7
1.034 pu 143 kV
547070 161AL_TAP
1.034 pu 143 kV
161L
250 DUCHESS7
1.009 pu 139 kV
826 831A TAP
1.013 pu 140 kV
831L-1
831AL
445 CUTNG L7
1.013 pu 140 kV
244 VULCAN 7
1.036 pu 143 kV
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)
Contingency:
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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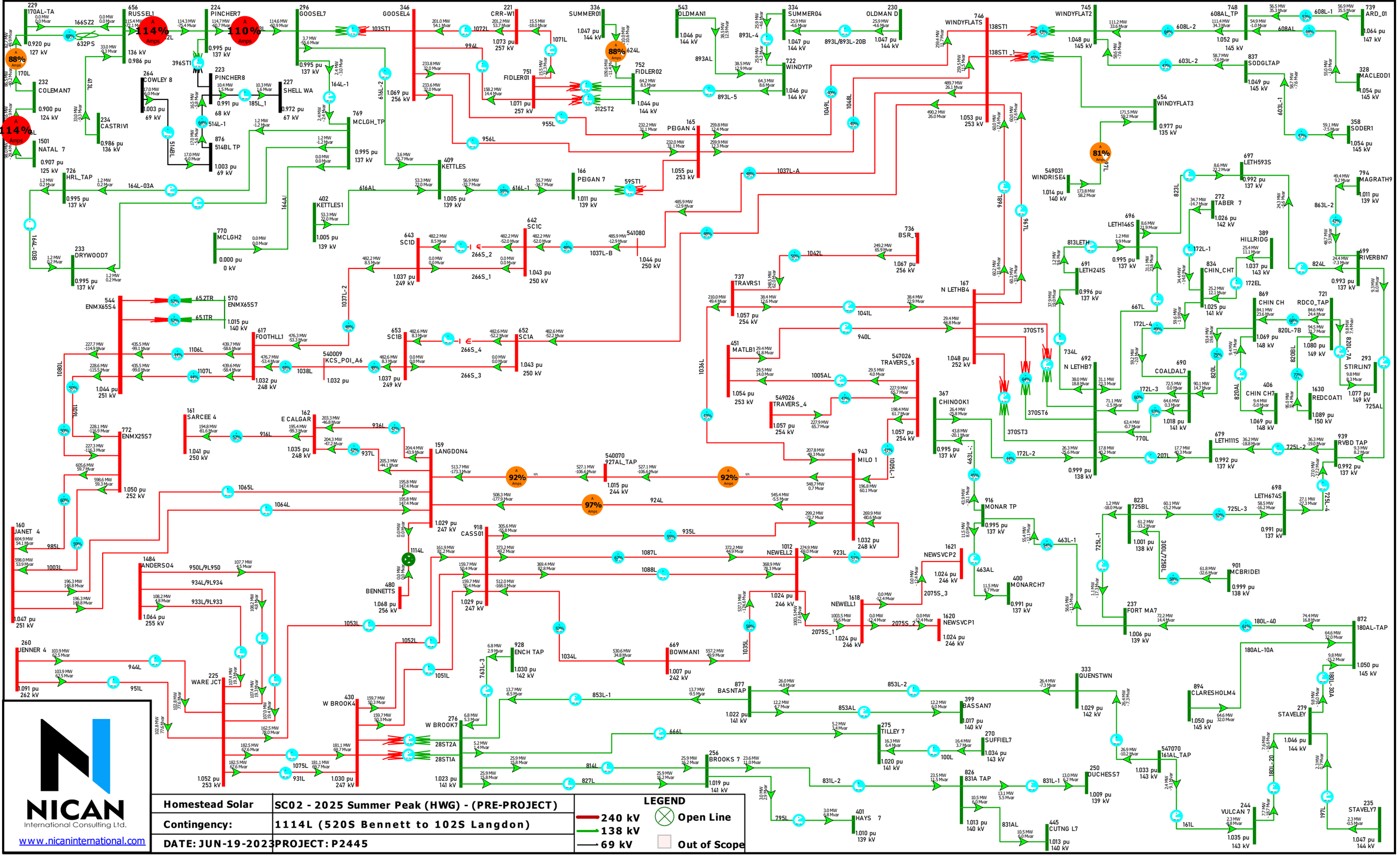
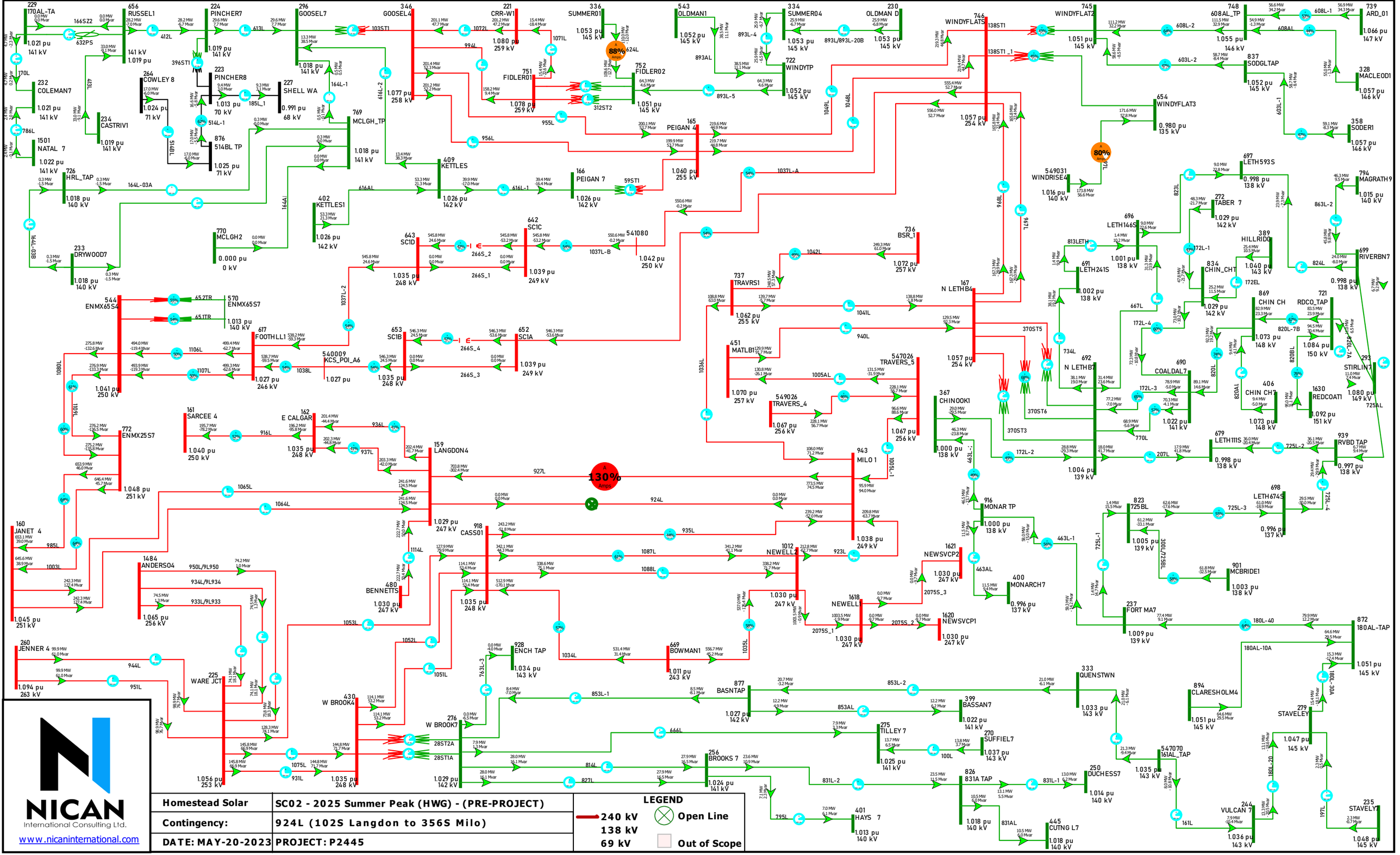
Homestead Solar	**SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)**
Contingency:	**1088L (324S Cassils to 2075S Newell)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV	⊗ Open Line
138 kV	
69 kV	☐ Out of Scope


NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)
Contingency:
1114L (520S Bennett to 102S Langdon)
DATE: JUN-19-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


170AL-TA
166S2
632PS
656 RUSSEL1
412L
224 PINCHER7
613L
396ST1
223 PINCHER8
185L_1
227 SHELL WA
264 COWLEY 8
514L-1
876 514BL TP
514BL
296 GOOSEL7
103ST1
346 GOOSEL4
1072L
994L
1071L
221 CRR-W1
751 FIDLER01
312ST2
752 FIDLER02
624L
336 SUMMER01
543 OLDMAN1
893L-4
893AL
893L-5
334 SUMMER04
893L/893L-20
230 OLDMAN D
722 WINDYTP
746 WINDYFLATS
138ST1
138ST1_1
745 WINDYFLAT2
608AL_TP
608L-1
608AL
608L-2
603L-2
837 SODGLTAP
603L-1
739 ARD_01
328 MACLEOD1
654 WINDYFLAT3
358 SODER1
232 COLEMAN7
234 CASTRIV1
786L
1501 NATAL 7
726 HRL_TAP
164L-03A
164L-1
769 MCLGH_TP
409 KETTLES
402 KETTLES1
616AL
616L-1
616L-2
166 PEIGAN 7
59ST1
165 PEIGAN 4
1037L-A
1037L-B
1040L
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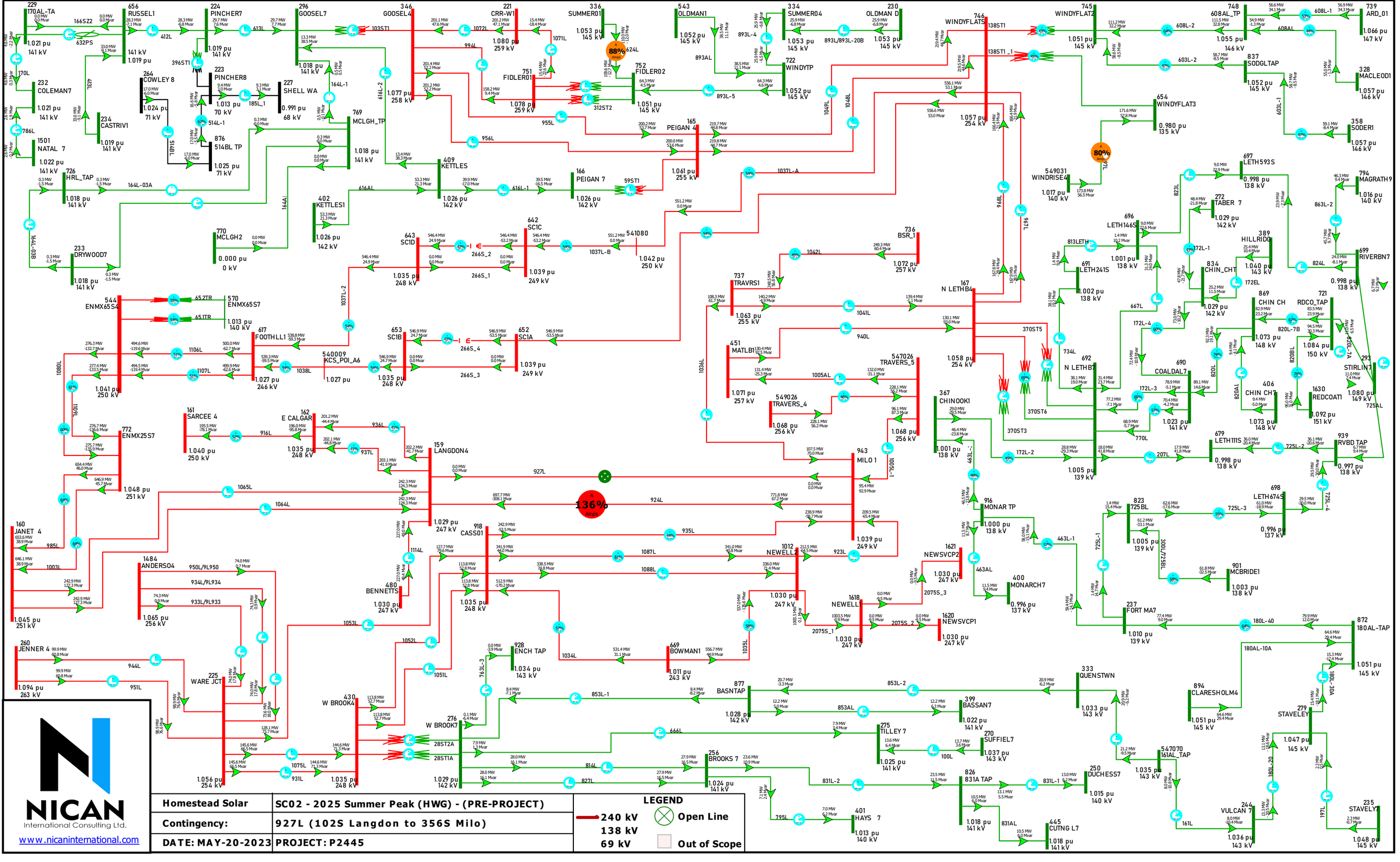
1103L


229
170AL-TA
1.021 pu
141 kV
656
RUSSEL1
141 kV
1.019 pu
224
PINCHER7
1.019 pu
141 kV
296
GOOSEL7
1.018 pu
141 kV
346
GOOSEL4
1.077 pu
258 kV
221
CRR-W1
1.080 pu
259 kV
336
SUMMER01
1.053 pu
145 kV
543
OLDMAN1
1.052 pu
145 kV
334
SUMMER04
1.053 pu
145 kV
230
OLDMAN D
1.053 pu
145 kV
745
WINDYFLAT2
1.051 pu
145 kV
748
608AL_TP
1.055 pu
146 kV
739
ARD_01
1.066 pu
147 kV
746
WINDYFLATS
1.057 pu
254 kV
654
WINDYFLAT3
0.980 pu
135 kV
837
SODGLTAP
1.052 pu
145 kV
328
MACLEOD1
1.057 pu
146 kV
358
SODER1
1.057 pu
146 kV
549031
WINDRISE4
1.017 pu
140 kV
80%
Amps
264
COWLEY 8
1.024 pu
71 kV
223
PINCHER8
1.013 pu
70 kV
227
SHELL WA
0.991 pu
68 kV
232
COLEMAN7
1.021 pu
141 kV
234
CASTRIV1
1.019 pu
141 kV
1501
NATAL 7
1.022 pu
141 kV
726
HRL_TAP
1.018 pu
141 kV
769
MCLGH_TP
1.018 pu
141 kV
876
514BL TP
1.025 pu
71 kV
233
DRYWOOD7
1.018 pu
141 kV
770
MCLGH2
0.000 pu
0 kV
409
KETTLES
1.026 pu
142 kV
402
KETTLES1
1.026 pu
142 kV
165
PEIGAN 4
1.061 pu
255 kV
166
PEIGAN 7
1.026 pu
142 kV
752
FIDLER02
1.051 pu
145 kV
751
FIDLER01
1.078 pu
259 kV
88%
Amps
642
SC1C
1.039 pu
249 kV
643
SC1D
1.035 pu
248 kV
541080
1.042 pu
250 kV
652
SC1A
1.039 pu
249 kV
653
SC1B
1.035 pu
248 kV
540009
KCS_POI_A6
1.027 pu
544
ENMX65S4
1.041 pu
250 kV
570
ENMX65S7
1.013 pu
140 kV
617
FOOTHLL1
1.027 pu
246 kV
772
ENMX25S7
1.048 pu
251 kV
161
SARCEE 4
1.040 pu
250 kV
162
E CALGAR
1.035 pu
248 kV
159
LANGDON4
1.029 pu
247 kV
160
JANET 4
1.045 pu
251 kV
1484
ANDERSO4
1.065 pu
256 kV
480
BENNETTS
1.030 pu
247 kV
918
CASS01
1.035 pu
248 kV
1012
NEWELL2
1.030 pu
247 kV
1618
NEWELL
1.030 pu
247 kV
1621
NEWSVCP2
1.030 pu
247 kV
1620
NEWSVCP1
1.030 pu
247 kV
2075S_1
2075S_2
2075S_3
260
JENNER 4
1.094 pu
263 kV
225
WARE JCT
430
W BROOK4
1.056 pu
254 kV
276
W BROOK7
1.029 pu
142 kV
28ST2A
28ST1A
928
ENCH TAP
1.034 pu
143 kV
669
BOWMAN1
1.011 pu
243 kV
877
BASNTAP
1.028 pu
142 kV
737
TRAVRS1
1.063 pu
255 kV
736
BSR_1
1.072 pu
257 kV
451
MATLB1
1.071 pu
257 kV
547026
TRAVERS_5
1.068 pu
256 kV
549026
TRAVERS_4
1.068 pu
256 kV
167
N LETHB4
1.058 pu
254 kV
370ST5
370ST6
370ST3
692
N LETHB7
1.005 pu
139 kV
734L
367
CHINOOK1
1.001 pu
138 kV
916
MONAR TP
1.000 pu
138 kV
400
MONARCH7
0.996 pu
137 kV
463L-1
463L-2
463AL
943
MILO 1
1.039 pu
249 kV
401
HAYS 7
1.013 pu
140 kV
795L
831L-2
831L-1
826
831A TAP
1.018 pu
141 kV
831AL
445
CUTNG L7
1.018 pu
141 kV
250
DUCHESS7
1.015 pu
140 kV
333
QUENSTWN
1.033 pu
143 kV
399
BASSAN7
1.022 pu
141 kV
275
TILLEY 7
1.025 pu
141 kV
270
SUFFIEL7
1.037 pu
143 kV
100L
547070
161AL_TAP
1.035 pu
143 kV
161L
244
VULCAN 7
1.036 pu
143 kV
894
CLARESHOLM4
1.051 pu
145 kV
696
LETH146S
1.001 pu
138 kV
691
LETH241S
1.002 pu
138 kV
813LETH
272
TABER 7
1.029 pu
142 kV
834
CHIN_CHT
1.029 pu
142 kV
172EL
172L-1
172L-2
172L-3
172L-4
667L
690
COALDAL7
1.023 pu
141 kV
697
LETH593S
0.998 pu
138 kV
794
MAGRATH9
1.016 pu
140 kV
863L-2
824L
699
RIVERBN7
0.998 pu
138 kV
389
HILLRIDG
1.040 pu
143 kV
869
CHIN CH
1.073 pu
148 kV
406
CHIN CH7
1.073 pu
148 kV
820L-7B
820L-7A
820L
820AL
820BL
721
RDCO_TAP
1.084 pu
150 kV
1630
REDCOAT1
1.092 pu
151 kV
293
STIRLIN7
1.080 pu
149 kV
725AL
679
LETH111S
0.998 pu
138 kV
939
RVBD TAP
0.997 pu
138 kV
725L-2
698
LETH674S
0.996 pu
137 kV
725L-3
725L-4
823
725BL
1.005 pu
139 kV
3001/2384L
901
MCBRIDE1
1.003 pu
138 kV
237
FORT MA7
1.010 pu
139 kV
180L-40
180AL-10A
872
180AL-TAP
1.051 pu
145 kV
180L-30A
180L-10A
180L-20
279
STAVELEY
1.047 pu
145 kV
235
STAVELY7
1.048 pu
145 kV
197L
1080L
1094L
1064L
1065L
1075L
931L
1038L
1106L
1107L
1037L-1
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1005L-1
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312ST2
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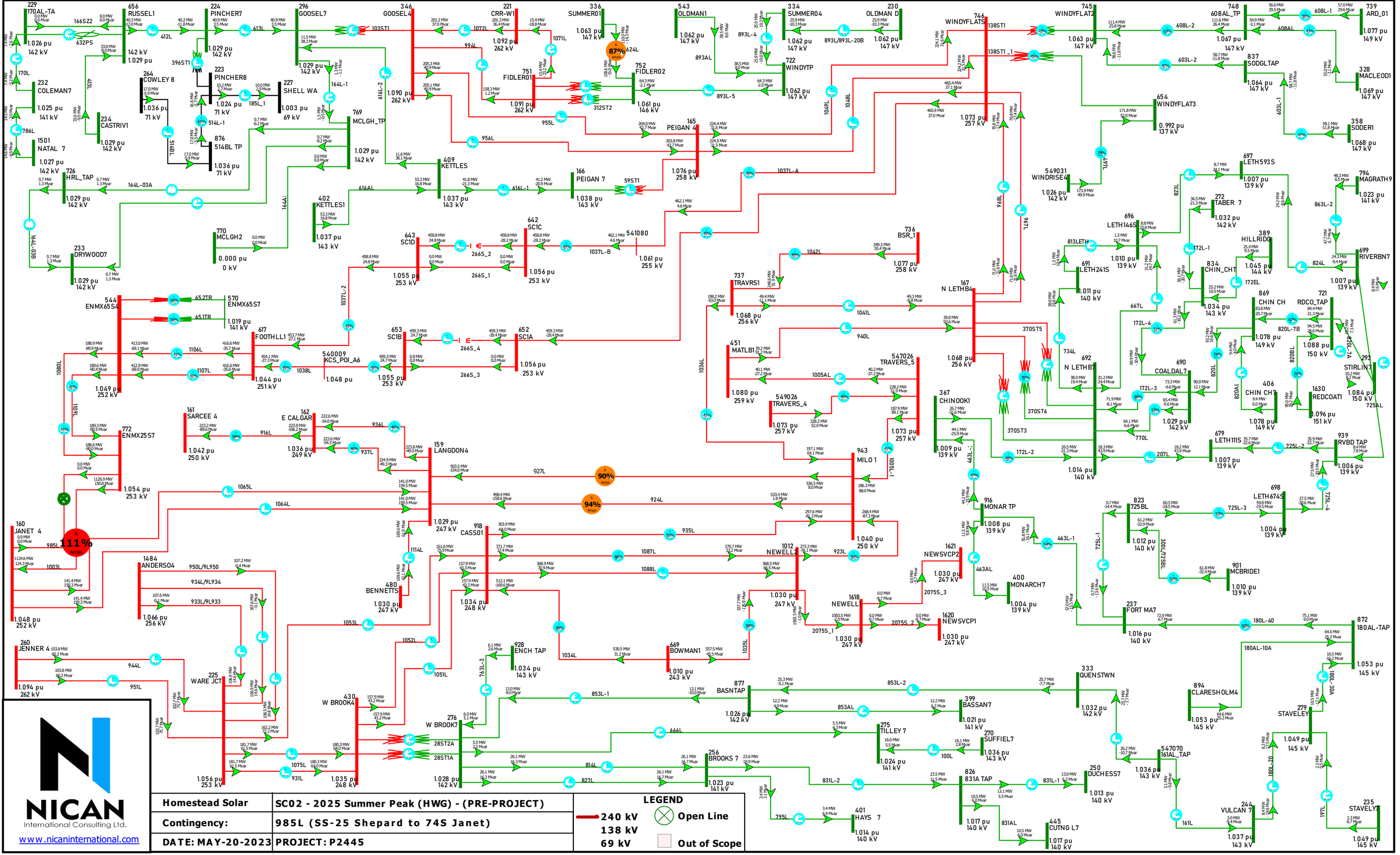
370ST6
370ST3
138ST1
138ST1_1
2075S_1
2075S_2
2075S_3
A
136%
Amps
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)
Contingency:
927L (102S Langdon to 356S Milo)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



Homestead Solar	**SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)**
Contingency:	**985L (SS-25 Shepard to 74S Janet)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV

138 kV

69 kV

Open Line

Out of Scope

NICAN

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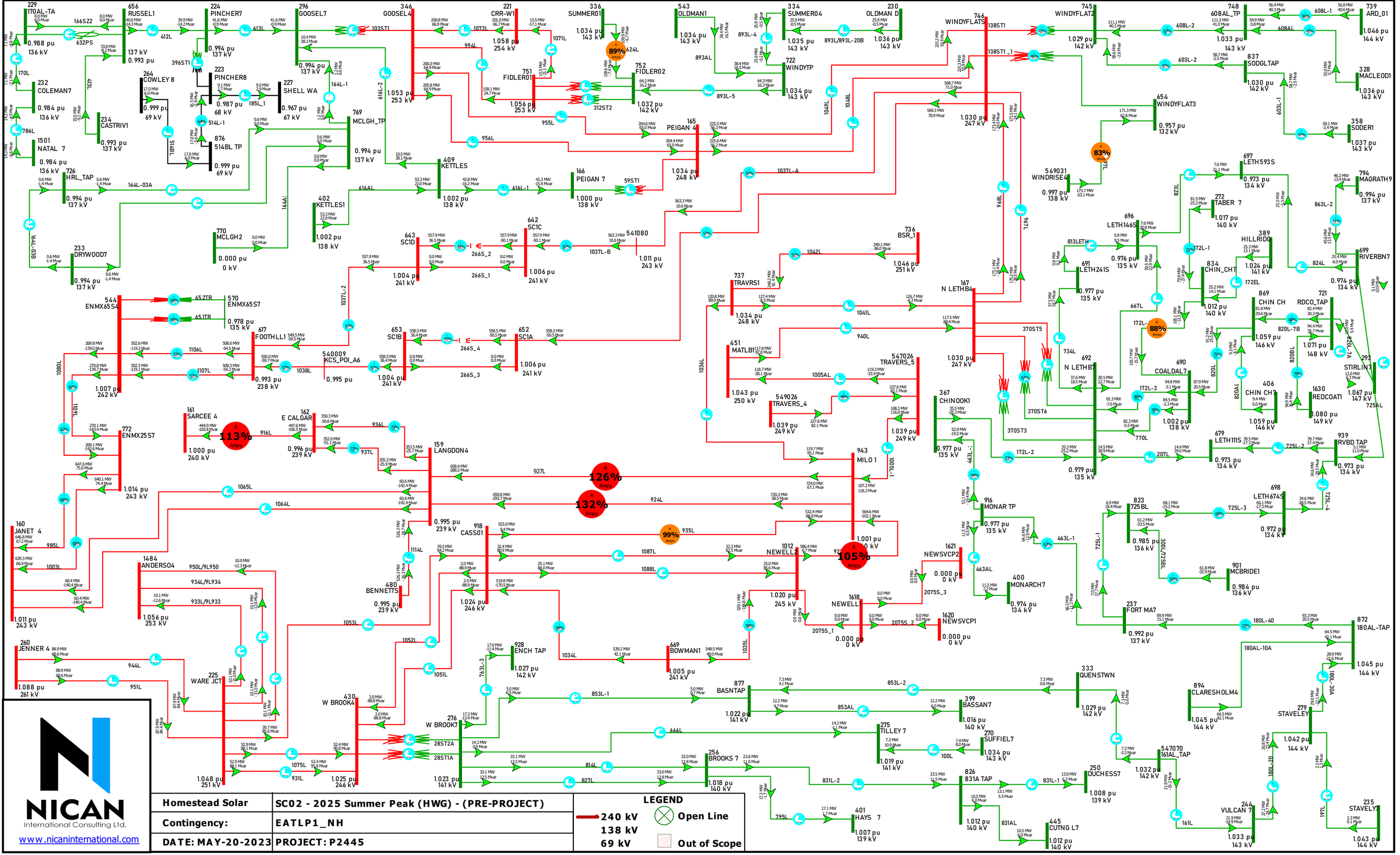

Homestead Solar | **SC02 - 2025 Summer Peak (HWG) - (PRE-PROJECT)**

Contingency: | **EATLP1_NH**

DATE: MAY-20-2023 | **PROJECT: P2445**

LEGEND

240 kV

138 kV

69 kV

⊗ Open Line

☐ Out of Scope

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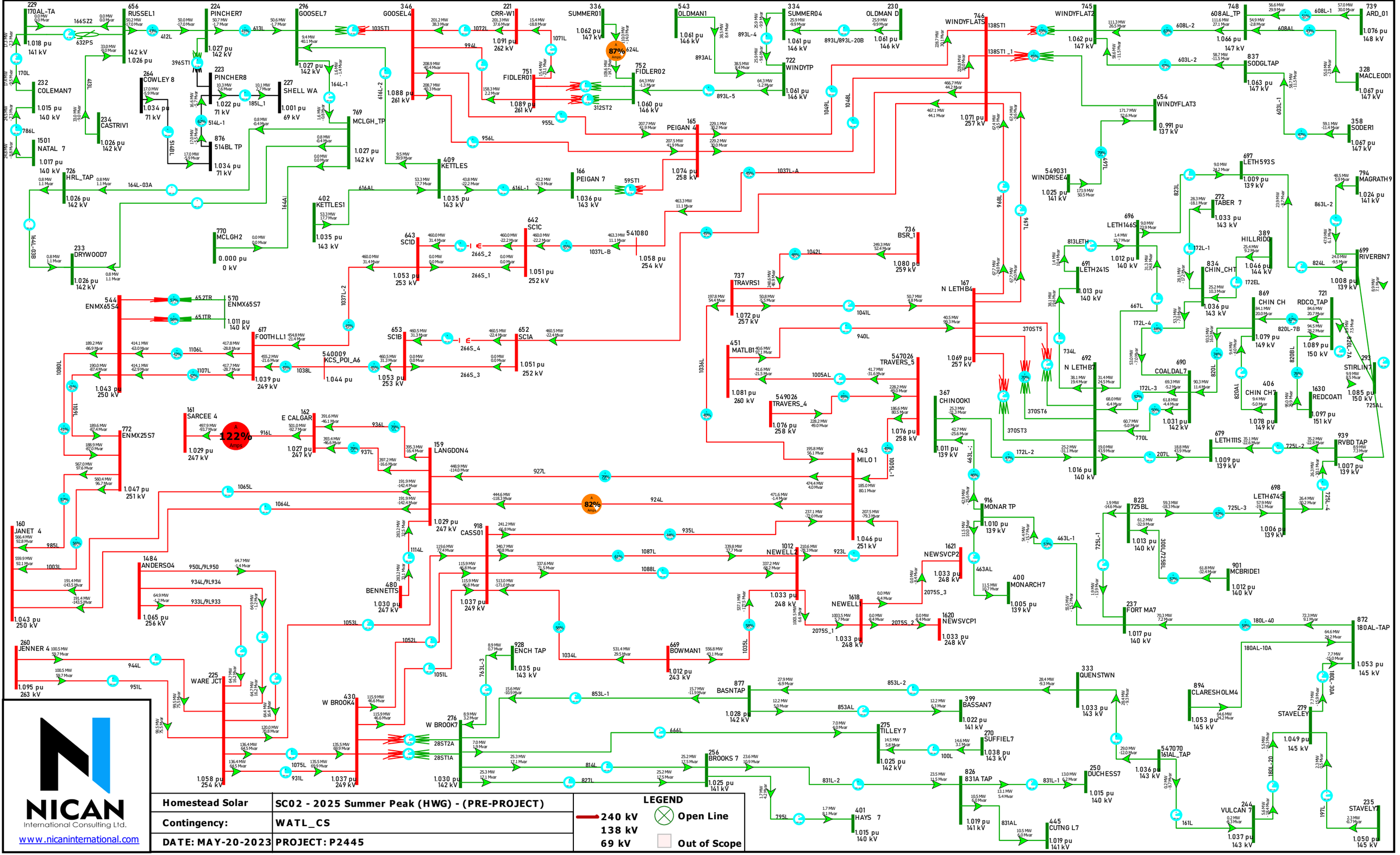
170AL-TA
166S2
632PS
656 RUSSEL1
412L
396ST1
224 PINCHER7
613L
223 PINCHER8
185L_1
227 SHELL WA
514L-1
876 514BL TP
514BL-1
296 GOOSEL7
103ST1
346 GOOSEL4
1072L
994L
956L
955L
221 CRR-W1
1071L
751 FIDLER01
312ST2
336 SUMMER01
624L
752 FIDLER02
543 OLDMAN1
893L-5
334 SUMMER04
893L-4
893L/893L-20
230 OLDMAN D
722 WINDYTP
893AL
746 WINDYFLATS
138ST1
138ST1_1
745 WINDYFLAT2
608AL_TP
608L-1
608L-2
608AL
739 ARD_01
603L-2
837 SODGLTAP
603L-1
328 MACLEOD1
358 SODER1
654 WINDYFLAT3
549031 WINDRISE4
747L
748L
165 PEIGAN 4
1037L-A
1074 pu 258 kV
166 PEIGAN 7
59ST1
1036 pu 143 kV
409 KETTLES
616L-1
616L-2
1035 pu 143 kV
402 KETTLES1
616AL
1035 pu 143 kV
769 MCLGH_TP
1027 pu 142 kV
770 MCLGH2
0.000 pu 0 kV
164L-03A
164AL
164L-1
1501 NATAL 7
1017 pu 140 kV
726 HRL_TAP
1026 pu 142 kV
786L
232 COLEMAN7
1015 pu 140 kV
170L
234 CASTRIV1
1026 pu 142 kV
264 COWLEY 8
1034 pu 71 kV
233 DRYWOOD7
1026 pu 142 kV
964L-03AL
642 SC1C
643 SC1D
266S_2
266S_1
1053 pu 253 kV
1051 pu 252 kV
541080
1037L-B
1058 pu 254 kV
736 BSR_1
1080 pu 259 kV
1042L
737 TRAVRS1
1072 pu 257 kV
1041L
940L
451 MATLB1
1081 pu 260 kV
1005AL
547026 TRAVERS_5
549026 TRAVERS_4
1076 pu 258 kV
1076 pu 258 kV
1036L
1069 pu 257 kV
167 N LETHB4
370ST5
370ST6
370ST3
734L
692 N LETHB7
367 CHINOOK1
1011 pu 139 kV
463L-1
916 MONAR TP
1010 pu 139 kV
463AL
1621 NEWSVCP2
1033 pu 248 kV
2075S_3
400 MONARCH7
1005 pu 139 kV
1618 NEWELL1
2075S_1
2075S_2
1620 NEWSVCP1
1033 pu 248 kV
1033 pu 257 kV
1016 pu 140 kV
1686L
1687L
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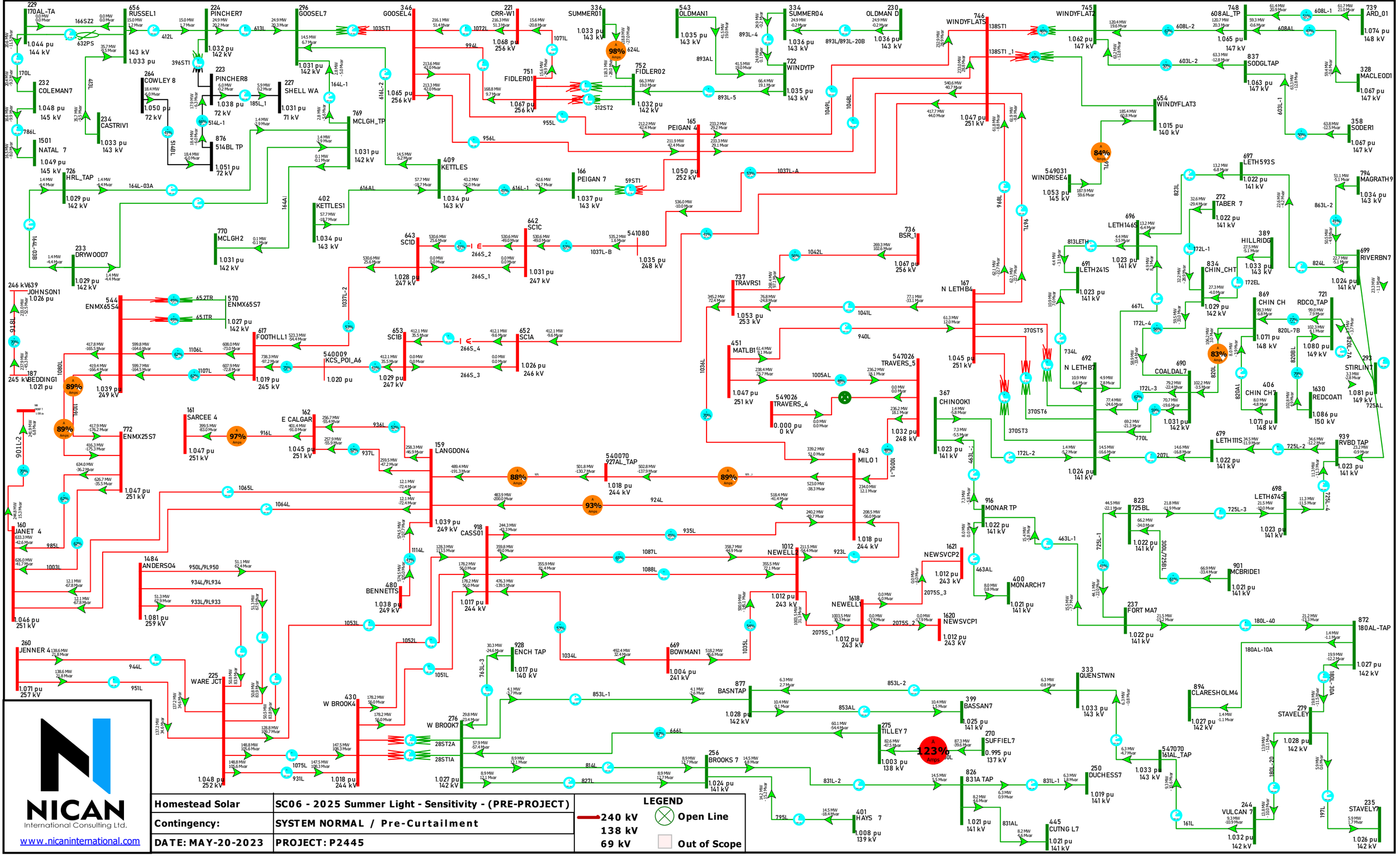
2025 SUMMER LIGHT SENSITIVITY

Single Line Diagrams
P2445 - PRE-PROJECT
POWER FLOW SC06

NICAN


229 170AL-TA 1.044 pu 144 kV
656 RUSSEL1 143 kV 1.033 pu
224 PINCHER7 1.032 pu 142 kV
223 PINCHER8 1.038 pu 72 kV
264 COWLEY 8 1.050 pu 72 kV
227 SHELL WA 1.031 pu 71 kV
296 GOOSEL7 1.031 pu 142 kV
346 GOOSEL4 1.065 pu 256 kV
221 CRR-W1 1.068 pu 256 kV
336 SUMMER01 1.033 pu 143 kV
543 OLDMAN1 1.035 pu 143 kV
334 SUMMER04 1.036 pu 143 kV
230 OLDMAN D 1.036 pu 143 kV
751 FIDLER01 1.067 pu 256 kV
752 FIDLER02 1.032 pu 142 kV
722 WINDYTP 1.035 pu 143 kV
746 WINDYFLATS
745 WINDYFLAT2 1.062 pu 147 kV
748 608AL_TP 1.065 pu 147 kV
608L-1
608L-2
603L-2
739 ARD_01 1.074 pu 148 kV
837 SODGLTAP 1.063 pu 147 kV
328 MACLEOD1 1.067 pu 147 kV
603L-1
358 SODER1 1.067 pu 147 kV
654 WINDYFLAT3 1.015 pu 140 kV
232 COLEMAN7 1.048 pu 145 kV
234 CASTRIV1 1.033 pu 143 kV
1501 NATAL 7 1.049 pu 145 kV
726 HRL_TAP 1.029 pu 142 kV
233 DRYWOOD7 1.029 pu 142 kV
769 MCLGH_TP 1.031 pu 142 kV
770 MCLGH2 1.031 pu 142 kV
402 KETTLES1 1.034 pu 143 kV
409 KETTLES 1.034 pu 143 kV
165 PEIGAN 4 1.050 pu 252 kV
166 PEIGAN 7 1.037 pu 143 kV
59ST1
642 SC1C
643 SC1D 1.028 pu 247 kV
652 SC1A 1.026 pu 246 kV
653 SC1B 1.029 pu 247 kV
541080 1.035 pu 248 kV
736 BSR_1 1.067 pu 256 kV
737 TRAVRS1 1.053 pu 253 kV
451 MATLBT 1.047 pu 251 kV
547026 TRAVERS_5 1.032 pu 248 kV
549026 TRAVERS_4 0.000 pu 0 kV
943 MILO 1 1.018 pu 244 kV
540070 927AL_TAP 1.018 pu 244 kV
246 kV639 JOHNSON1 1.026 pu
544 ENMX65S4
570 ENMX65S7 1.027 pu 142 kV
617 FOOTHLL1 1.019 pu 245 kV
540009 KCS_POI_A6 1.020 pu
245 kV187 BEDDING1 1.021 pu
1.039 pu 249 kV
772 ENMX25S7 1.047 pu 251 kV
161 SARCEE 4 1.047 pu 251 kV
162 E CALGAR 1.045 pu 251 kV
159 LANGDON4 1.039 pu 249 kV
160 JANET 4 1.046 pu 251 kV
1484 ANDERSO4 1.081 pu 259 kV
480 BENNETTS 1.038 pu 249 kV
918 CASS01 1.017 pu 244 kV
1012 NEWELL2 1.012 pu 243 kV
1618 NEWELL1 1.012 pu 243 kV
1621 NEWSVCP2 1.012 pu 243 kV
1620 NEWSVCP1 1.012 pu 243 kV
549031 WINDRISE4 1.053 pu 145 kV
167 N LETHB4 1.045 pu 251 kV
367 CHINOOK1 1.023 pu 141 kV
916 MONAR TP 1.022 pu 141 kV
400 MONARCH7 1.021 pu 141 kV
463AL
463L-1
823 725BL 1.022 pu 141 kV
698 LETH6745 1.023 pu 141 kV
901 MCBRIDE1 1.021 pu 141 kV
237 FORT MA7 1.022 pu 141 kV
697 LETH593S 1.022 pu 141 kV
794 MAGRATH9 1.034 pu 143 kV
863L-2
699 RIVERBN7 1.024 pu 141 kV
824L
272 TABER 7 1.022 pu 141 kV
696 LETH146S 1.023 pu 141 kV
691 LETH241S 1.023 pu 141 kV
813LETH
389 HILLRIDG 1.033 pu 143 kV
834 CHIN_CHT 1.029 pu 142 kV
869 CHIN CH 1.071 pu 148 kV
406 CHIN CH7 1.071 pu 148 kV
721 RDCO_TAP 1.080 pu 149 kV
820L-7B
820L-7A
293 STIRLIN7 1.081 pu 149 kV 725AL
1630 REDCOAT1 1.086 pu 150 kV
692 N LETHB7
734L
690 COALDAL7 1.031 pu 142 kV
679 LETH111S 1.022 pu 141 kV
939 RVBD TAP 1.023 pu 141 kV
725L-2
725L-4
725L-3
698 LETH6745 1.023 pu 141 kV
823 725BL 1.022 pu 141 kV
3001/725BL
901 MCBRIDE1 1.021 pu 141 kV
237 FORT MA7 1.022 pu 141 kV
180L-40
872 180AL-TAP 1.027 pu 142 kV
180AL-10A
894 CLARESHOLM4 1.027 pu 142 kV
180L-30A
279 STAVELEY 1.028 pu 142 kV
180L-20
244 VULCAN 7 1.032 pu 142 kV
235 STAVELY7 1.026 pu 142 kV
197L
161L
547070 161AL_TAP 1.033 pu 143 kV
250 DUCHESS7 1.019 pu 141 kV
826 831A TAP 1.021 pu 141 kV
831L-1
831L-2
831AL
445 CUTNG L7 1.021 pu 141 kV
401 HAYS 7 1.008 pu 139 kV
795L
256 BROOKS 7 1.024 pu 141 kV
814L
827L
276 W BROOK7 1.027 pu 142 kV
28ST2A
28ST1A
430 W BROOK4 1.018 pu 244 kV
1075L
931L
1.048 pu 252 kV
225 WARE JCT
260 JENNER 4 1.071 pu 257 kV
877 BASNTAP 1.028 pu 142 kV
853L-1
853L-2
853AL
399 BASSAN7 1.025 pu 141 kV
333 QUENSTWN 1.033 pu 143 kV
275 TILLEY 7 1.003 pu 138 kV
270 SUFFIEL7 0.995 pu 137 kV
666L
669 BOWMAN1 1.004 pu 241 kV
928 ENCH TAP 1.017 pu 140 kV
763L-3
1034L
1035L
1037L-A
1037L-B
1037L-2
1042L
1041L
940L
1005AL
1005L-1
1003L
985L
1064L
1065L
1114L
935L
1087L
1088L
924L
923L
936L
955L
994L
1071L
1072L
624L
312ST2
893L-4
893L/893L-20B
893L-5
893AL
1047L
1048L
984L
697L
370ST5
370ST6
370ST3
667L
172L-1
172L-2
172L-3
172L-4
172EL
820L
820AL
820BL
1071L
1072L
1073L
1074L
1075L
1076L
1077L
1078L
1079L
1080L
1081L
1082L
1083L
1084L
1085L
1086L
1087L
1088L
1089L
1090L
1091L
1092L
1093L
1094L
1095L
1096L
1097L
1098L
1099L
1100L
1101L
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1103L
1104L
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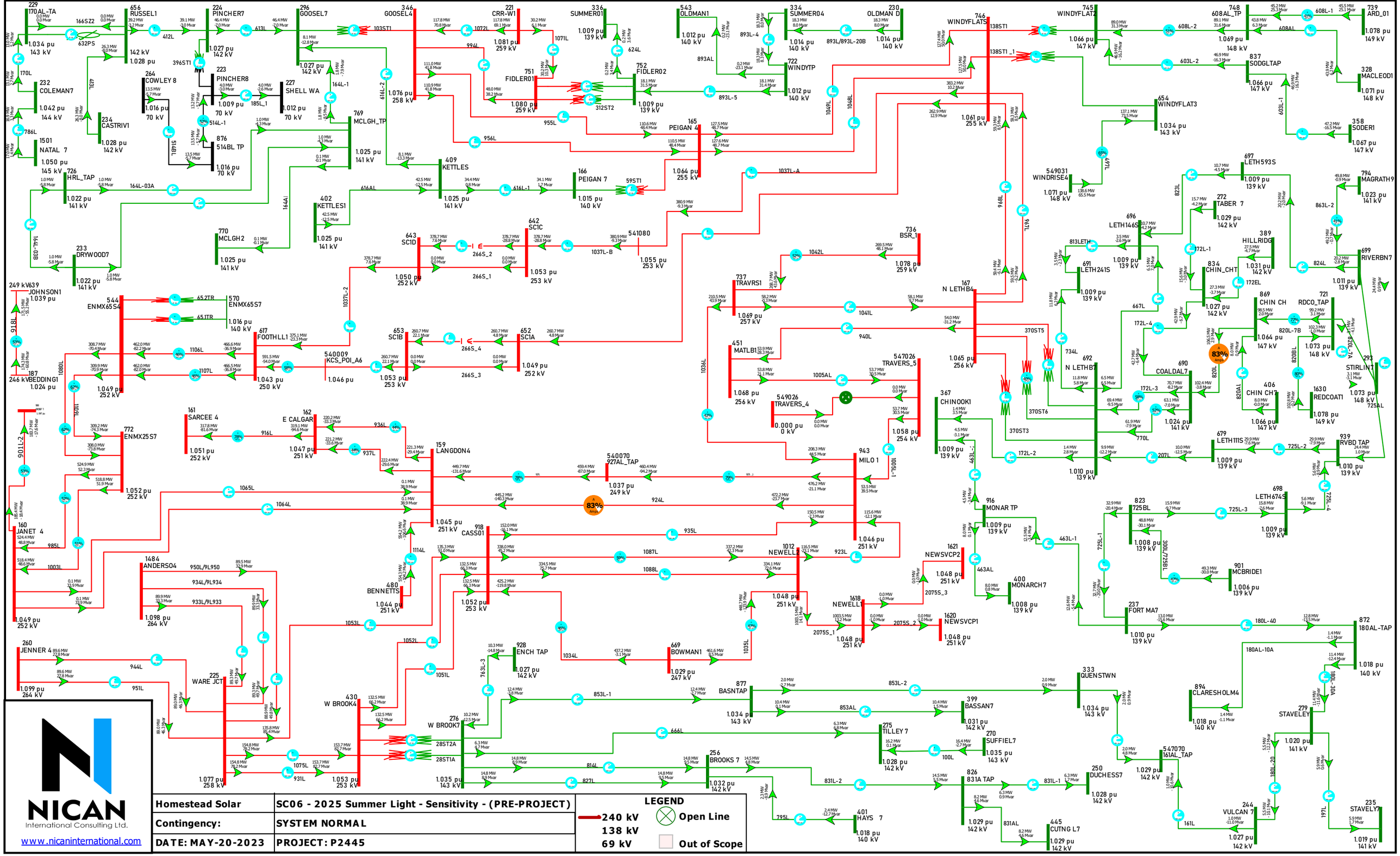
1106L
1107L
1108L
1109L
1110L


229
170AL_TA
1.034 pu
143 kV
656
RUSSEL1
142 kV
1.028 pu
224
PINCHER7
1.027 pu
142 kV
296
GOOSEL7
1.027 pu
142 kV
346
GOOSEL4
1.076 pu
258 kV
221
CRR-W1
1.081 pu
259 kV
336
SUMMER01
1.009 pu
139 kV
543
OLDMAN1
1.012 pu
140 kV
334
SUMMER04
1.014 pu
140 kV
230
OLDMAN D
1.014 pu
140 kV
746
WINDYFLATS
745
WINDYFLAT2
1.066 pu
147 kV
748
608AL_TP
1.069 pu
148 kV
739
ARD_01
1.078 pu
149 kV
608AL
608L-1
608L-2
603L-2
603L-1
837
SODGLTAP
1.066 pu
147 kV
328
MACLEOD1
1.071 pu
148 kV
358
SODER1
1.067 pu
147 kV
654
WINDYFLAT3
1.034 pu
143 kV
1.061 pu
255 kV
223
PINCHER8
1.009 pu
70 kV
264
COWLEY 8
1.016 pu
70 kV
227
SHELL WA
1.012 pu
70 kV
876
514BL TP
1.016 pu
70 kV
232
COLEMAN7
1.042 pu
144 kV
234
CASTRIV1
1.028 pu
142 kV
1501
NATAL 7
1.050 pu
145 kV
769
MCLGH_TP
1.025 pu
141 kV
726
HRL_TAP
1.022 pu
141 kV
233
DRYWOOD7
1.022 pu
141 kV
770
MCLGH2
1.025 pu
141 kV
402
KETTLES1
1.025 pu
141 kV
409
KETTLES
1.025 pu
141 kV
165
PEIGAN 4
1.064 pu
255 kV
166
PEIGAN 7
1.015 pu
140 kV
59ST1
752
FIDLER02
1.009 pu
139 kV
751
FIDLER01
1.080 pu
259 kV
312ST2
722
WINDYTP
1.012 pu
140 kV
893L-4
893L-5
893L/893L-20B
893AL
624L
955L
956L
994L
1071L
1072L
1076L-2
1049L
1048L
1037L-A
1037L-B
1064L
1644L-03A
1644L-038
1644L
1646L
1645L
1644L-1
616AL
616L-1
1025L
514L-1
514AL
185L_1
164L-1
164L-2
786L
170L
410L
396ST1
412L
613L
166SZ2
632PS
249 kV639
JOHNSON1
1.039 pu
544
ENMX65S4
570
ENMX65S7
1.016 pu
140 kV
65.2TR
65.1TR
617
FOOTHLL1
1.043 pu
250 kV
187
BEDDING1
1.024 pu
246 kV
918L
1080L
1106L
1107L
1101L
1037L-2
540009
KCS_POI_A6
1.046 pu
653
SC1B
1.053 pu
253 kV
652
SC1A
1.049 pu
252 kV
643
SC1D
1.050 pu
252 kV
642
SCIC
1.053 pu
253 kV
266S_1
266S_2
266S_3
266S_4
541080
1.055 pu
253 kV
737
TRAVRS1
1.069 pu
257 kV
736
BSR_1
1.078 pu
259 kV
451
MATLB1
1.068 pu
256 kV
547026
TRAVERS_5
1.058 pu
254 kV
549026
TRAVERS_4
0.000 pu
0 kV
1042L
1041L
940L
1005AL
1005L-1
1036L
167
N LETHB4
1.065 pu
256 kV
370ST5
370ST6
370ST3
734L
692
N LETHB1
1.010 pu
139 kV
367
CHINOOK1
1.009 pu
139 kV
1363L-1
172L-2
207L
690
COALDAL7
1.024 pu
141 kV
172L-3
172L-4
667L
770L
820L
820AL
820BL
820L-7B
820L-7A
691
LETH241S
1.009 pu
139 kV
813LETH
696
LETH146S
1.009 pu
139 kV
172L-1
834
CHIN_CHT
1.027 pu
142 kV
172EL
389
HILLRIDG
1.031 pu
142 kV
272
TABER 7
1.029 pu
142 kV
823L
697
LETH593S
1.009 pu
139 kV
824L
699
RIVERBN7
1.011 pu
139 kV
794
MAGRATH9
1.023 pu
141 kV
863L-2
869
CHIN CH
1.064 pu
147 kV
721
RDCO_TAP
1.073 pu
148 kV
406
CHIN CH7
1.066 pu
147 kV
1630
REDCOAT1
1.078 pu
149 kV
293
STIRLIN7
1.073 pu
148 kV
725AL
679
LETH111S
1.009 pu
139 kV
725L-2
939
RVBD TAP
1.010 pu
139 kV
698
LETH674S
1.009 pu
139 kV
725L-3
725L-4
823
725BL
1.008 pu
139 kV
300L/725BL
901
MCBRIDE1
1.006 pu
139 kV
237
FORT MA7
1.010 pu
139 kV
180L-40
872
180AL-TAP
1.018 pu
140 kV
180AL-10A
894
CLARESHOLM4
1.018 pu
140 kV
180L-30A
279
STAVELEY
1.020 pu
141 kV
180L-20
244
VULCAN 7
1.027 pu
142 kV
235
STAVELY7
1.019 pu
141 kV
197L
549031
WINDRISE4
1.071 pu
148 kV
697L
1621
NEWSVCP2
1.048 pu
251 kV
463AL
463L-1
916
MONAR TP
1.009 pu
139 kV
400
MONARCH7
1.008 pu
139 kV
1620
NEWSVCP1
1.048 pu
251 kV
2075S_1
2075S_2
2075S_3
1618
NEWELL1
1.048 pu
251 kV
1012
NEWELL2
1.048 pu
251 kV
923L
1087L
1088L
1035L
669
BOWMAN1
1.029 pu
247 kV
1034L
928
ENCH TAP
1.027 pu
142 kV
763L-3
877
BASNTAP
1.034 pu
143 kV
853L-1
853L-2
853AL
399
BASSAN7
1.031 pu
142 kV
333
QUENSTWN
1.034 pu
143 kV
275
TILLEY 7
1.028 pu
142 kV
270
SUFFIEL7
1.035 pu
143 kV
100L
666L
826
831A TAP
1.029 pu
142 kV
831L-1
831L-2
831AL
250
DUCHESS7
1.028 pu
142 kV
445
CUTNG L7
1.029 pu
142 kV
547070
161AL_TAP
1.029 pu
142 kV
161L
256
BROOKS 7
1.032 pu
142 kV
795L
401
HAYS 7
1.018 pu
140 kV
943
MILO 1
1.053 pu
253 kV
1053L
1052L
1051L
1034L
1035L
1114L
480
BENNETTS
1.044 pu
251 kV
918
CASS01
1.052 pu
253 kV
935L
924L
1045 pu
251 kV
1037L-2
540070
927AL_TAP
1.037 pu
249 kV
159
LANGDON4
1.047 pu
251 kV
936L
937L
916L
161
SARCEE 4
1.051 pu
252 kV
162
E CALGAR
1.047 pu
251 kV
772
ENMX25S7
1.052 pu
252 kV
1065L
1064L
160
JANET 4
1.049 pu
252 kV
985L
1003L
1484
ANDERSO4
1.098 pu
264 kV
950L/9L950
934L/9L934
933L/9L933
944L
951L
260
JENNER 4
1.099 pu
264 kV
225
WARE JCT
1.077 pu
258 kV
1075L
931L
430
W BROOK4
1.053 pu
253 kV
276
W BROOK7
1.035 pu
143 kV
28ST2A
28ST1A
814L
827L
763L-2
1053L-1
1053L-2
1053L-3
1053L-4
1053L-5
1053L-6
1053L-7
1053L-8
1053L-9
1053L-10
1053L-11
1053L-12
1053L-13
1053L-14
1053L-15
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1053L-17
1053L-18
1053L-19
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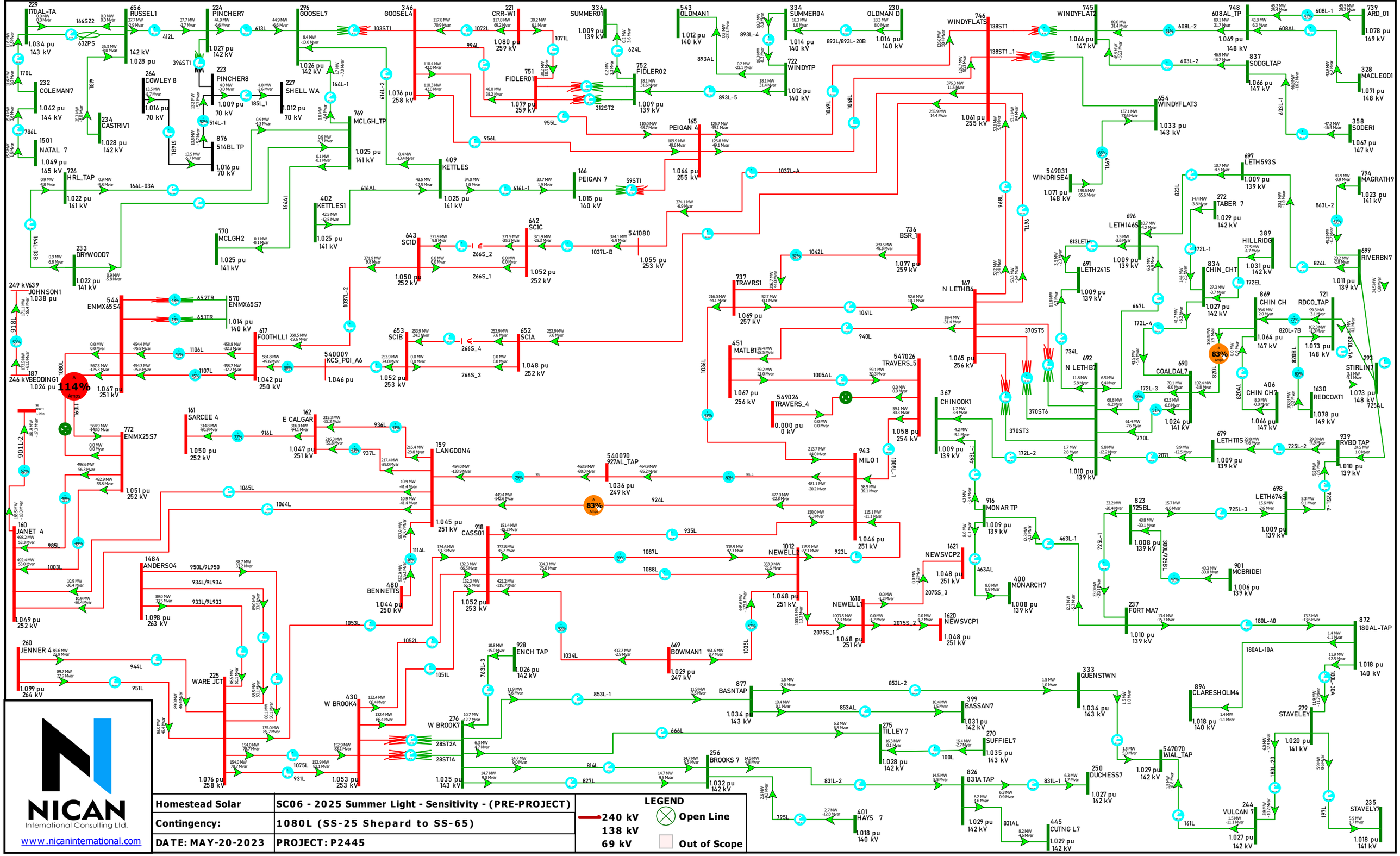
1053L-39
1053L-40



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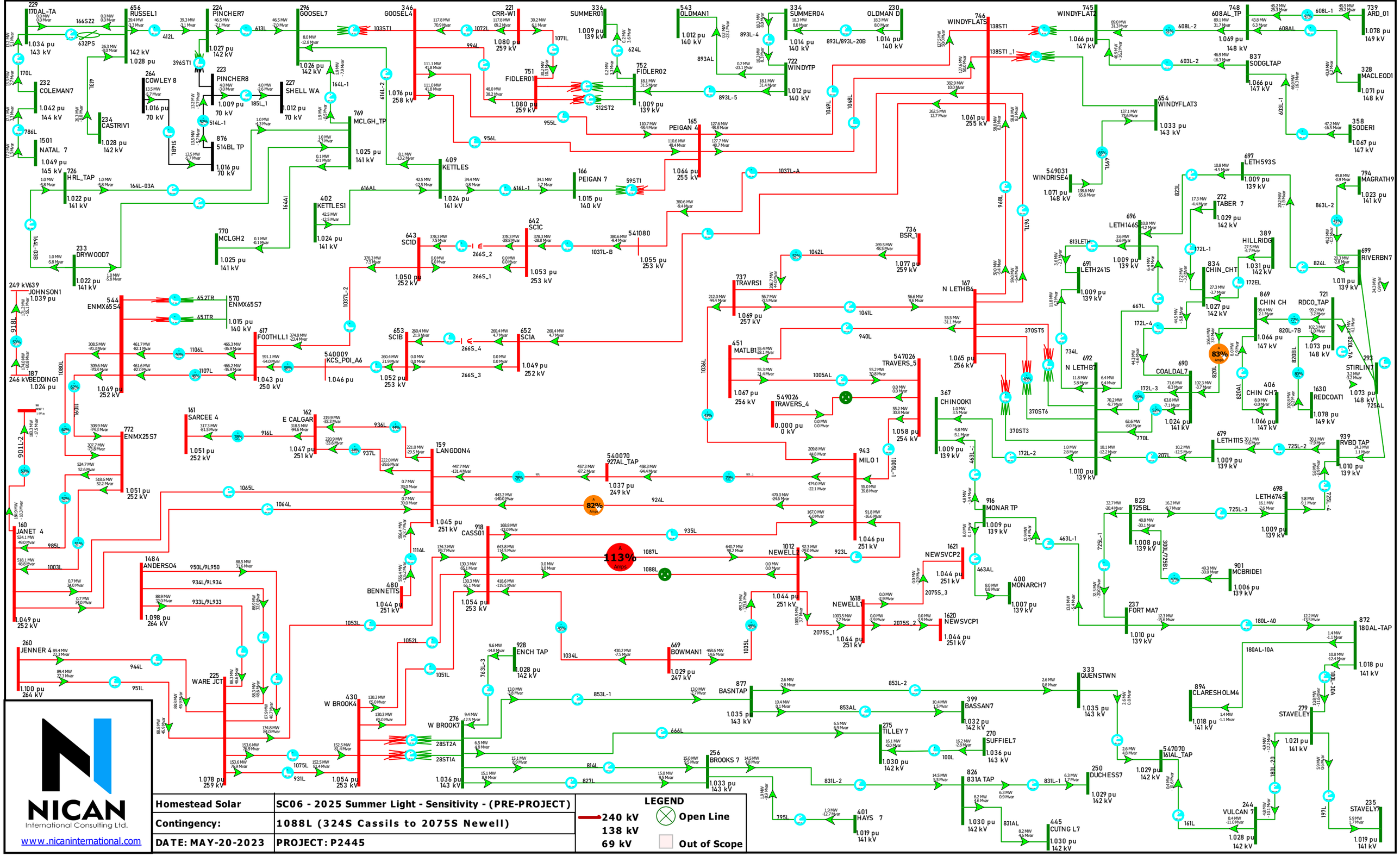
Homestead Solar	**SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)**
Contingency:	**1080L (SS-25 Shepard to SS-65)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

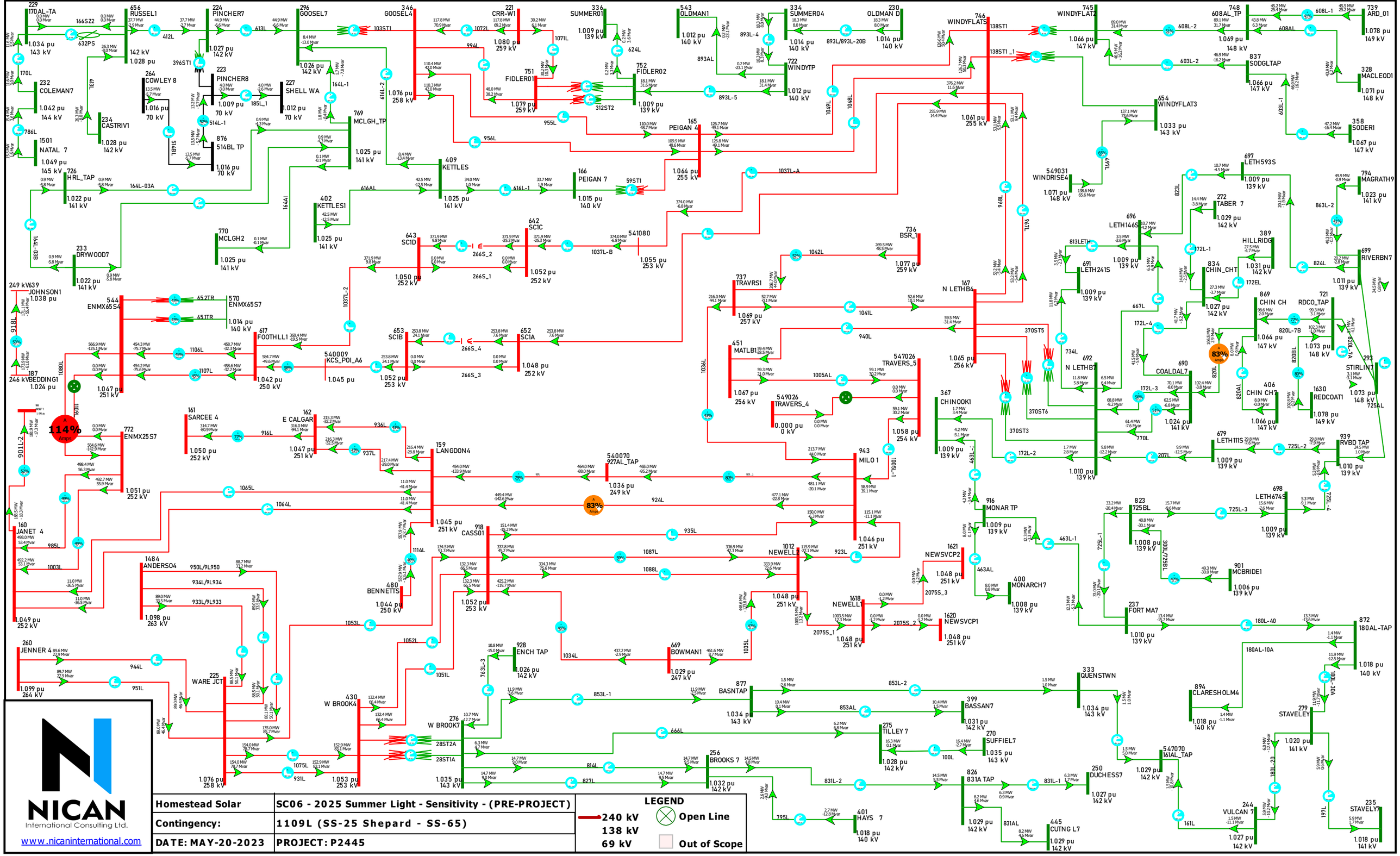
Homestead Solar	**SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)**
Contingency:	**1088L (324S Cassils to 2075S Newell)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

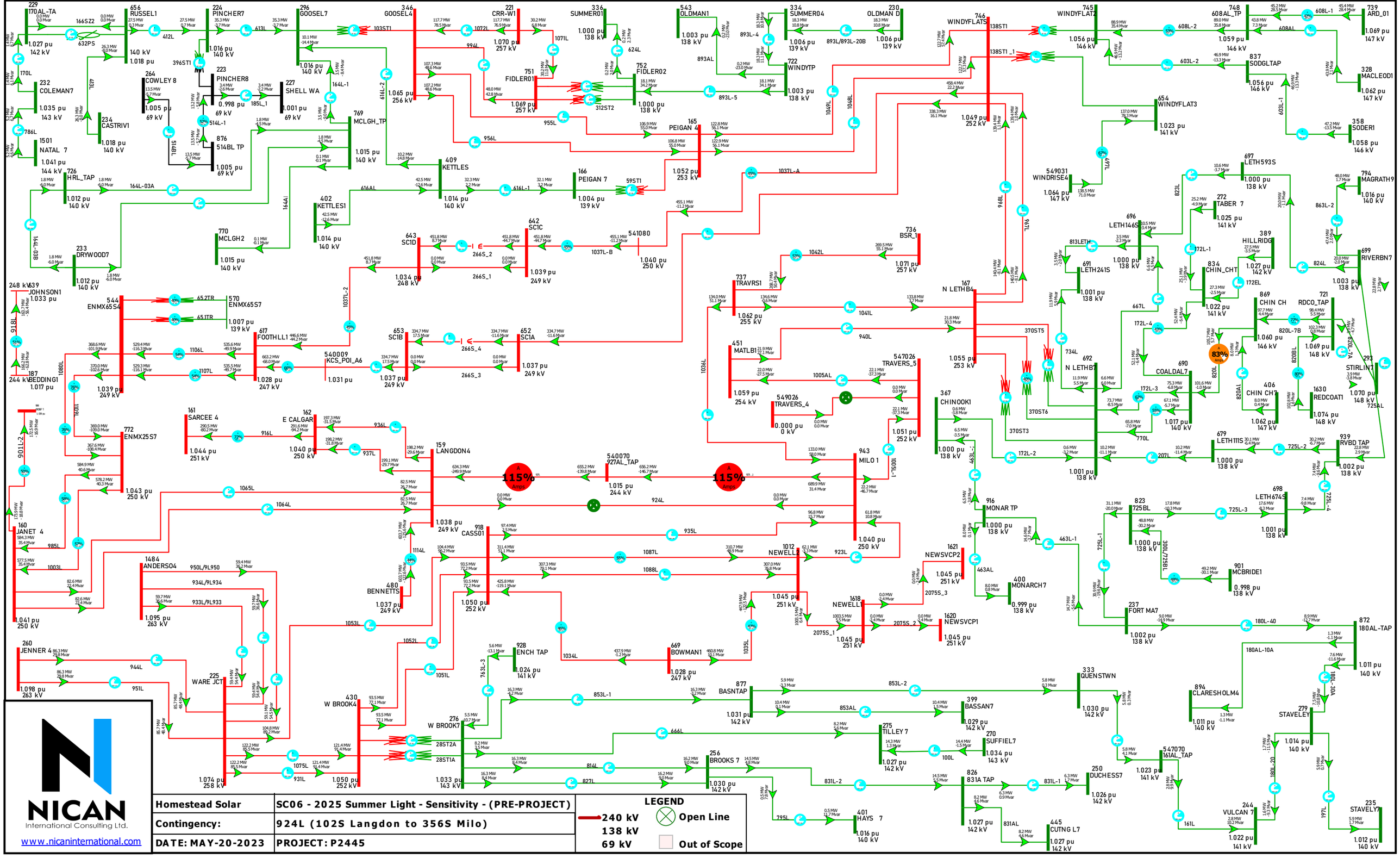
Homestead Solar	SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)
Contingency:	1109L (SS-25 Shepard - SS-65)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope


229
170AL_TA
1.027 pu
142 kV
166SZ2
632PS
656
RUSSEL1
140 kV
1.018 pu
412L
224
PINCHER7
1.016 pu
140 kV
613L
396ST1
223
PINCHER8
0.998 pu
69 kV
185L_1
227
SHELL WA
1.001 pu
69 kV
264
COWLEY 8
1.005 pu
69 kV
514L-1
514BL
876
514BL TP
1.005 pu
69 kV
296
GOOSEL7
1.016 pu
140 kV
164L-1
161L-2
346
GOOSEL4
1.065 pu
256 kV
103ST1
117.7 MW
78.5 Mvar
1072L
221
CRR-W1
1.070 pu
257 kV
1071L
994L
751
FIDLER01
1.069 pu
257 kV
955L
956L
336
SUMMER01
1.000 pu
138 kV
624L
312ST2
752
FIDLER02
1.000 pu
138 kV
543
OLDMAN1
1.003 pu
138 kV
893L-4
893AL
893L-5
334
SUMMER04
1.006 pu
139 kV
893L/893L-20B
230
OLDMAN D
1.006 pu
139 kV
722
WINDYTP
1.003 pu
138 kV
746
WINDYFLATS
138ST1
138ST1_1
1049L
1048L
1.049 pu
252 kV
745
WINDYFLAT2
1.056 pu
146 kV
608L-2
603L-2
748
608AL_TP
1.059 pu
146 kV
608L-1
608AL
739
ARD_01
1.069 pu
147 kV
837
SODGLTAP
1.056 pu
146 kV
603L-1
328
MACLEOD1
1.062 pu
147 kV
358
SODER1
1.058 pu
146 kV
654
WINDYFLAT3
1.023 pu
141 kV
549031
WINDRISE4
1.064 pu
147 kV
697L
697
LETH593S
1.000 pu
138 kV
794
MAGRATH9
1.016 pu
140 kV
863L-2
699
RIVERBN7
1.003 pu
138 kV
824L
272
TABER 7
1.025 pu
141 kV
823L
696
LETH146S
1.000 pu
138 kV
813LETH
691
LETH241S
1.001 pu
138 kV
389
HILLRIDG
1.027 pu
142 kV
834
CHIN_CHT
1.022 pu
141 kV
172L-1
172EL
667L
172L-4
690
COALDAL7
1.017 pu
140 kV
172L-3
869
CHIN CH
1.060 pu
146 kV
820L-7B
721
RDCO_TAP
1.069 pu
148 kV
820BL
406
CHIN CH7
1.062 pu
147 kV
820AL
1630
REDCOAT1
1.074 pu
148 kV
293
STIRLIN7
1.070 pu
148 kV
725AL
679
LETH111S
1.000 pu
138 kV
725L-2
939
RVBD TAP
1.002 pu
138 kV
725L-4
698
LETH674S
1.001 pu
138 kV
725L-3
823
725BL
1.000 pu
138 kV
300L/725BL
901
MCBRIDE1
0.998 pu
138 kV
725L-1
237
FORT MA7
1.002 pu
138 kV
180L-40
872
180AL-TAP
1.011 pu
140 kV
180AL-10A
180L-30A
894
CLARESHOLM4
1.011 pu
140 kV
279
STAVELEY
1.014 pu
140 kV
180L-20
244
VULCAN 7
1.022 pu
141 kV
235
STAVELY7
1.012 pu
140 kV
197L
161L
547070
161AL_TAP
1.023 pu
141 kV
250
DUCHESS7
1.026 pu
142 kV
831L-1
831AL
445
CUTNG L7
1.027 pu
142 kV
826
831A TAP
1.027 pu
142 kV
831L-2
333
QUENSTWN
1.030 pu
142 kV
399
BASSAN7
1.029 pu
142 kV
853L-2
853AL
275
TILLEY 7
1.027 pu
142 kV
100L
270
SUFFIEL7
1.034 pu
143 kV
877
BASNTAP
1.031 pu
142 kV
853L-1
666L
814L
827L
256
BROOKS 7
1.030 pu
142 kV
276
W BROOK7
1.033 pu
143 kV
28ST2A
28ST1A
430
W BROOK4
1.074 pu
258 kV
1050 pu
252 kV
1075L
931L
225
WARE JCT
1037L-2
1036L
1035L
1034L
1042L
1041L
940L
1005AL
1005L-1
1037L-A
1037L-B
1040 pu
250 kV
1039 pu
249 kV
1034 pu
248 kV
642
SCIC
643
SC1D
266S_2
266S_1
652
SC1A
653
SC1B
266S_4
266S_3
541080
455.1 MW
-11.2 Mvar
165
PEIGAN 4
1.052 pu
253 kV
166
PEIGAN 7
1.004 pu
139 kV
59ST1
409
KETTLES
1.014 pu
140 kV
616AL
616L-1
402
KETTLES1
1.014 pu
140 kV
769
MCLGH_TP
1.015 pu
140 kV
770
MCLGH2
1.015 pu
140 kV
164L-03A
164L-108
164L-1
233
DRYWOOD7
1.012 pu
140 kV
726
HRL_TAP
1.012 pu
140 kV
1501
NATAL 7
1.041 pu
144 kV
232
COLEMAN7
1.035 pu
143 kV
234
CASTRIV1
1.018 pu
140 kV
786L
170L
410L
639
JOHNSON1
1.033 pu
248 kV
918L
187
BEDDING1
1.017 pu
244 kV
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1.007 pu
139 kV
617
FOOTHLL1
1.028 pu
247 kV
1106L
1107L
540009
KCS_POI_A6
1.031 pu
1080L
1091L
772
ENMX25S7
1.043 pu
250 kV
1091L-2
161
SARCEE 4
1.044 pu
251 kV
916L
162
E CALGAR
1.040 pu
250 kV
936L
937L
159
LANGDON4
1.038 pu
249 kV
1065L
1064L
540070
927AL_TAP
1.015 pu
244 kV
924L
943
MILO 1
1.040 pu
250 kV
1005L-1
160
JANET 4
1.041 pu
250 kV
985L
1003L
1484
ANDERSO4
1.095 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
480
BENNETTS
1.037 pu
249 kV
1053L
1052L
1051L
1114L
918
CASS01
1.050 pu
252 kV
935L
1087L
1088L
1012
NEWELL2
1.045 pu
251 kV
923L
1621
NEWSVCP2
1.045 pu
251 kV
463AL
400
MONARCH7
0.999 pu
138 kV
2075S_3
1618
NEWELL1
1.045 pu
251 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.045 pu
251 kV
916
MONAR TP
1.000 pu
138 kV
463L-1
463L-2
260
JENNER 4
1.098 pu
263 kV
944L
951L
928
ENCH TAP
1.024 pu
141 kV
763L-3
669
BOWMAN1
1.028 pu
247 kV
1035L
737
TRAVRS1
1.062 pu
255 kV
736
BSR_1
1.071 pu
257 kV
451
MATLBI1
1.059 pu
254 kV
547026
TRAVERS_5
1.051 pu
252 kV
549026
TRAVERS_4
0.000 pu
0 kV
167
N LETHB4
1.055 pu
253 kV
370ST5
370ST6
370ST3
734L
692
N LETHB1
1.001 pu
138 kV
367
CHINOOK1
1.000 pu
138 kV
943L-1
172L-2
207L
770L
Homestead Solar
SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)
Contingency:
924L (102S Langdon to 356S Milo)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
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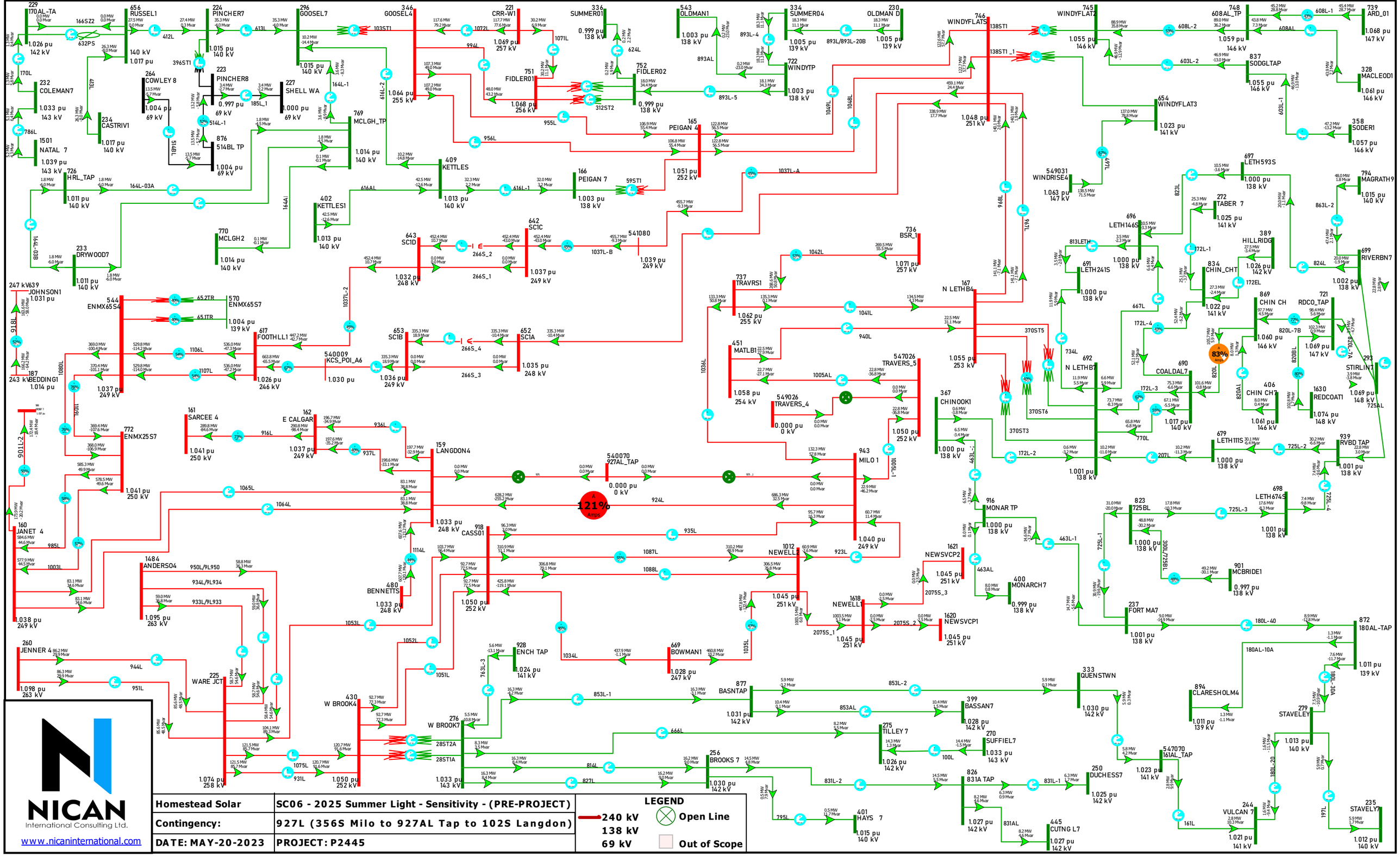

Homestead Solar	**SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)**
Contingency:	**927L (356S Milo to 927AL Tap to 102S Langdon)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV	Open Line
138 kV	
69 kV	Out of Scope

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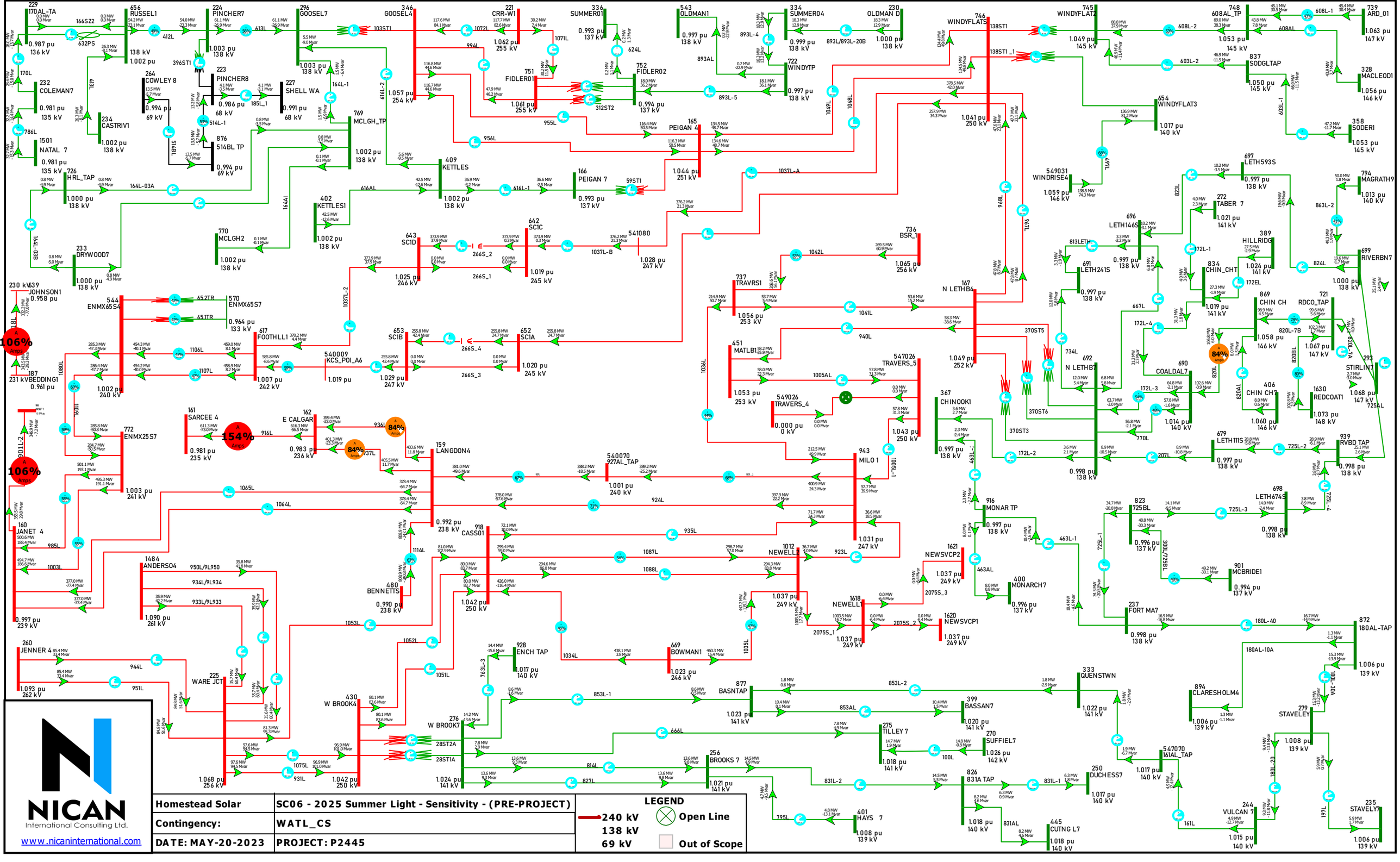
170AL_TA
166SZ2
632PS
656
RUSSEL1
412L
224
PINCHER7
613L
396ST1
223
PINCHER8
514L-1
514AL
876
514BL TP
264
COWLEY 8
185L_1
227
SHELL WA
296
GOOSEL7
103ST1
346
GOOSEL4
1072L
1071L
221
CRR-W1
751
FIDLER01
312ST2
752
FIDLER02
624L
336
SUMMER01
543
OLDMAN1
893L-4
334
SUMMER04
893L/893L-20B
230
OLDMAN D
722
WINDYTP
893L-5
893AL
994L
956L
955L
1049L
1048L
746
WINDYFLATS
138ST1
138ST1_1
745
WINDYFLAT2
608L-2
748
608AL_TP
608AL
608L-1
739
ARD_01
603L-2
837
SODGLTAP
603L-1
328
MACLEOD1
654
WINDYFLAT3
358
SODER1
1501
NATAL 7
786L
232
COLEMAN7
170L
234
CASTRIV1
769
MCLGH_TP
165
PEIGAN 4
1037L-A
409
KETTLES
616L-1
166
PEIGAN 7
59ST1
726
HRL_TAP
164L-03A
164L-03B
164AL
616AL
402
KETTLES1
770
MCLGH2
233
DRYWOOD7
549031
WINDRISE4
697
LETH593S
794
MAGRATH9
863L-2
823L
272
TABER 7
696
LETH146S
813LETH
691
LETH241S
834
CHIN_CHT
172EL
172L-1
389
HILLRIDG
824L
699
RIVERBN7
667L
172L-4
869
CHIN CH
820L-7B
721
RDCO_TAP
820L-7A
293
STIRLIN7
725AL
820BL
820AL
406
CHIN CH7
1630
REDCOAT1
690
COALDAL7
172L-3
692
N LETHB7
734L
370ST5
370ST6
370ST3
172L-2
207L
679
LETH111S
939
RVBD TAP
725L-2
698
LETH674S
725L-4
823
725BL
725L-3
725L-1
300L/725BL
901
MCBRIDE1
237
FORT MA7
180L-40
180AL-10A
872
180AL-TAP
180L-10B
180L-30A
894
CLARESHOLM4
333
QUENSTWN
1621
NEWSVCP2
463AL
463L-1
400
MONARCH7
916
MONAR TP
1618
NEWELL1
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1012
NEWELL2
923L
1087L
1088L
1035L
669
BOWMAN1
928
ENCH TAP
763L-3
480
BENNETTS
1053L
1052L
1051L
1034L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
944L
951L
225
WARE JCT
430
W BROOK4
276
W BROOK7
28ST2A
28ST1A
814L
827L
666L
877
BASNTAP
853L-1
853L-2
853AL
399
BASSAN7
275
TILLEY 7
100L
270
SUFFIEL7
256
BROOKS 7
831L-2
831L-1
826
831A TAP
831AL
445
CUTNG L7
250
DUCHESS7
547070
161AL_TAP
161L
244
VULCAN 7
235
STAVELY7
197L
279
STAVELEY
180L-20
180L-30B
795L
401
HAYS 7
943
MILO 1
1005L-1
1005L-2
1005AL
547026
TRAVERS_5
549026
TRAVERS_4
451
MATLBI1
737
TRAVRS1
1042L
1041L
940L
736
BSR_1
167
N LETHB4
1049L
1048L
367
CHINOOK1
763L-1
916
MONAR TP
642
SCIC
643
SCI1D
2665_2
2665_1
652
SCI1A
653
SCI1B
2665_4
2665_3
541080
1037L-B
1037L-2
540009
KCS_POI_A6
1080L
1010L
1101L
1106L
1107L
639
JOHNSON1
187
231 kVBEDDING1
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
617
FOOTHLL1
1007L
772
ENMX25S7
1003L
985L
160
JANET 4
1065L
1064L
161
SARCEE 4
162
E CALGAR
916L
936L
937L
159
LANGDON4
540070
927AL_TAP
924L
935L
1114L
1075L
931L
1042L
1041L
940L
1036L
1042L
1037L-A
1037L-B
1037L-2
1049L
1048L
9.68L
967L
1037L-A
1037L-B
1037L-2
1049L
1048L
1036L
1035L
1034L
1087L
1088L
1051L
1052L
1053L
1064L
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1080L
1010L
1101L
1106L
1107L
985L
1003L
1114L
935L
924L
936L
937L
916L
1005L-1
1005L-2
1005AL
795L
763L-3
666L
814L
827L
853L-1
853L-2
853AL
831L-2
831L-1
831AL
725L-4
725L-3
725L-2
725L-1
300L/725BL
180L-40
180AL-10A
180L-10B
180L-30A
180L-20
197L
161L
100L
207L
820L-7B
820L-7A
820BL
820AL
667L
172L-4
172L-3
172L-2
172L-1
172EL
824L
823L
813LETH
734L
370ST5
370ST6
370ST3
207L
463L-1
463AL
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1621
NEWSVCP2
1618
NEWELL1
1012
NEWELL2
923L
1087L
1088L
1035L
669
BOWMAN1
928
ENCH TAP
763L-3
480
BENNETTS
1053L
1052L
1051L
1034L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
944L
951L
225
WARE JCT
430
W BROOK4
276
W BROOK7
28ST2A
28ST1A
814L
827L
666L
877
BASNTAP
853L-1
853L-2
853AL
399
BASSAN7
275
TILLEY 7
100L
270
SUFFIEL7
256
BROOKS 7
831L-2
831L-1
826
831A TAP
831AL
445
CUTNG L7
250
DUCHESS7
547070
161AL_TAP
161L
244
VULCAN 7
235
STAVELY7
197L
279
STAVELEY
180L-20
180L-30B
795L
401
HAYS 7
943
MILO 1
1005L-1
1005L-2
1005AL
547026
TRAVERS_5
549026
TRAVERS_4
451
MATLBI1
737
TRAVRS1
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1041L
940L
736
BSR_1
167
N LETHB4
1049L
1048L
367
CHINOOK1
763L-1
916
MONAR TP
642
SCIC
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SCI1D
2665_2
2665_1
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SCI1A
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SCI1B
2665_4
2665_3
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1107L
639
JOHNSON1
187
231 kVBEDDING1
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ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
617
FOOTHLL1
1007L
772
ENMX25S7
1003L
985L
160
JANET 4
1065L
1064L
161
SARCEE 4
162
E CALGAR
916L
936L
937L
159
LANGDON4
540070
927AL_TAP
924L
935L
1114L
1075L
931L
1042L
1041L
940L
1036L
1042L
1037L-A
1037L-B
1037L-2
1049L
1048L
9.68L
967L
0.987 pu
136 kV
1.002 pu
138 kV
0.994 pu
69 kV
0.981 pu
135 kV
1.000 pu
138 kV
0.961 pu
1.003 pu
241 kV
1.002 pu
240 kV
0.997 pu
239 kV
1.093 pu
262 kV
1.090 pu
261 kV
0.990 pu
238 kV
1.068 pu
256 kV
1.042 pu
250 kV
0.992 pu
238 kV
1.001 pu
240 kV
0.983 pu
236 kV
0.981 pu
235 kV
1.057 pu
254 kV
1.062 pu
255 kV
1.061 pu
255 kV
0.993 pu
137 kV
0.997 pu
138 kV
0.999 pu
138 kV
1.000 pu
138 kV
1.049 pu
145 kV
1.053 pu
145 kV
1.050 pu
145 kV
1.063 pu
147 kV
1.056 pu
146 kV
1.053 pu
145 kV
1.041 pu
250 kV
1.017 pu
140 kV
1.059 pu
146 kV
1.021 pu
141 kV
1.024 pu
141 kV
1.000 pu
138 kV
1.013 pu
140 kV
1.006 pu
139 kV
0.997 pu
138 kV
1.056 pu
253 kV
1.065 pu
256 kV
1.053 pu
253 kV
0.000 pu
0 kV
1.043 pu
250 kV
1.049 pu
252 kV
1.058 pu
146 kV
1.067 pu
147 kV
1.068 pu
147 kV
1.073 pu
148 kV
1.060 pu
146 kV
1.014 pu
140 kV
0.997 pu
138 kV
0.998 pu
138 kV
1.031 pu
247 kV
1.037 pu
249 kV
1.023 pu
246 kV
1.020 pu
245 kV
1.019 pu
245 kV
1.028 pu
247 kV
1.025 pu
246 kV
1.029 pu
247 kV
1.007 pu
242 kV
1.019 pu
1.022 pu
141 kV
1.020 pu
141 kV
1.026 pu
142 kV
1.018 pu
141 kV
1.021 pu
141 kV
1.024 pu
141 kV
1.042 pu
250 kV
1.017 pu
140 kV
1.018 pu
140 kV
1.015 pu
140 kV
1.008 pu
139 kV
1.006 pu
139 kV
1.008 pu
139 kV
1.018 pu
140 kV
1.037 pu
249 kV
1.037 pu
249 kV
1.037 pu
249 kV
1.031 pu
247 kV
1.001 pu
240 kV
0.998 pu
138 kV
0.996 pu
137 kV
0.994 pu
137 kV
0.996 pu
137 kV
0.998 pu
138 kV
0.997 pu
138 kV
0.998 pu
138 kV
1.017 pu
140 kV
1.017 pu
140 kV
1.006 pu
139 kV
106%
Amps
154%
Amps
84%
Amps
84%
Amps
84%
Amps
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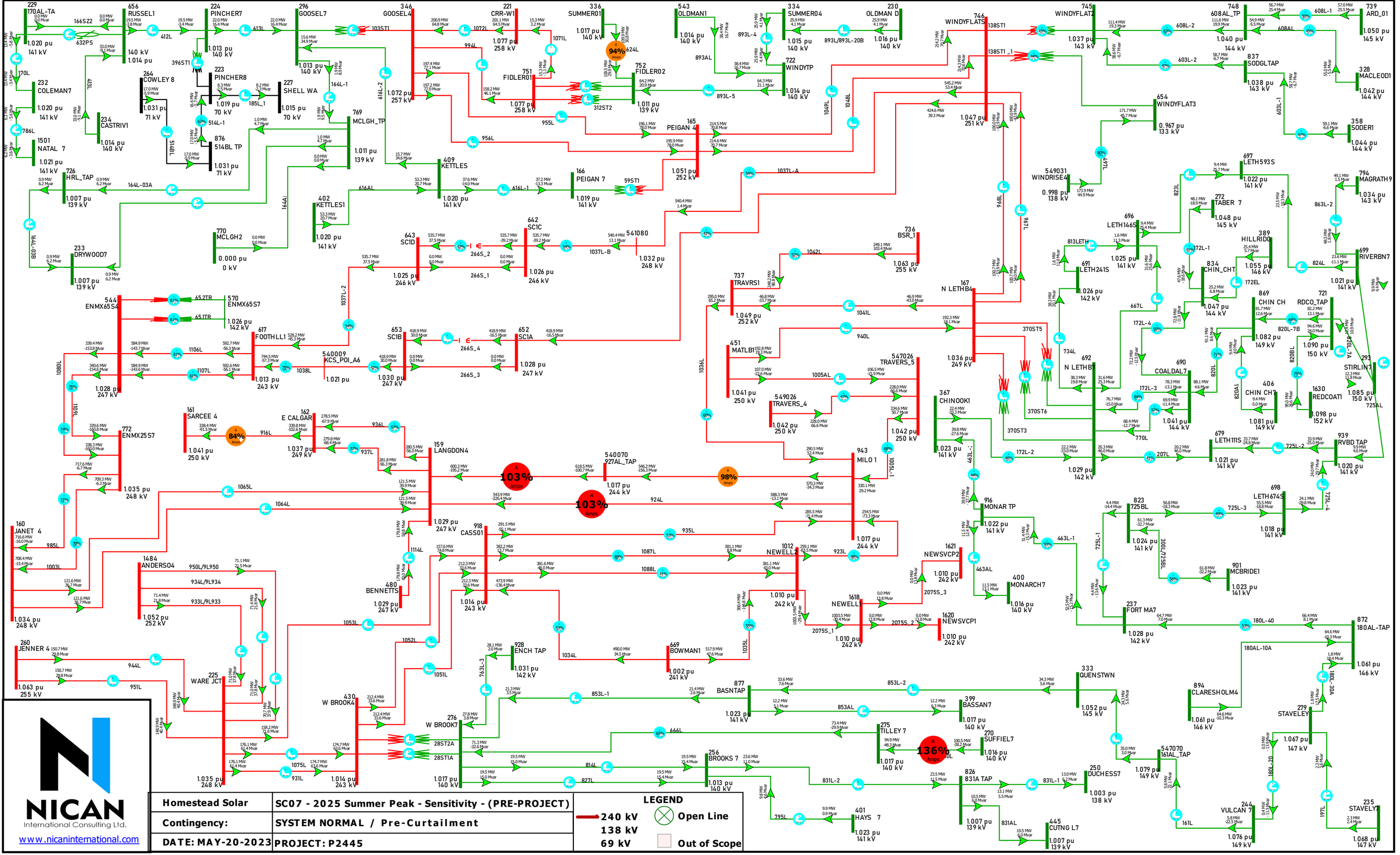
Homestead Solar
SC06 - 2025 Summer Light - Sensitivity - (PRE-PROJECT)
Contingency:
WATL_CS
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

2025 SUMMER PEAK SENSITIVITY

Single Line Diagrams
P2445 - PRE-PROJECT
POWER FLOW SC07

NICAN



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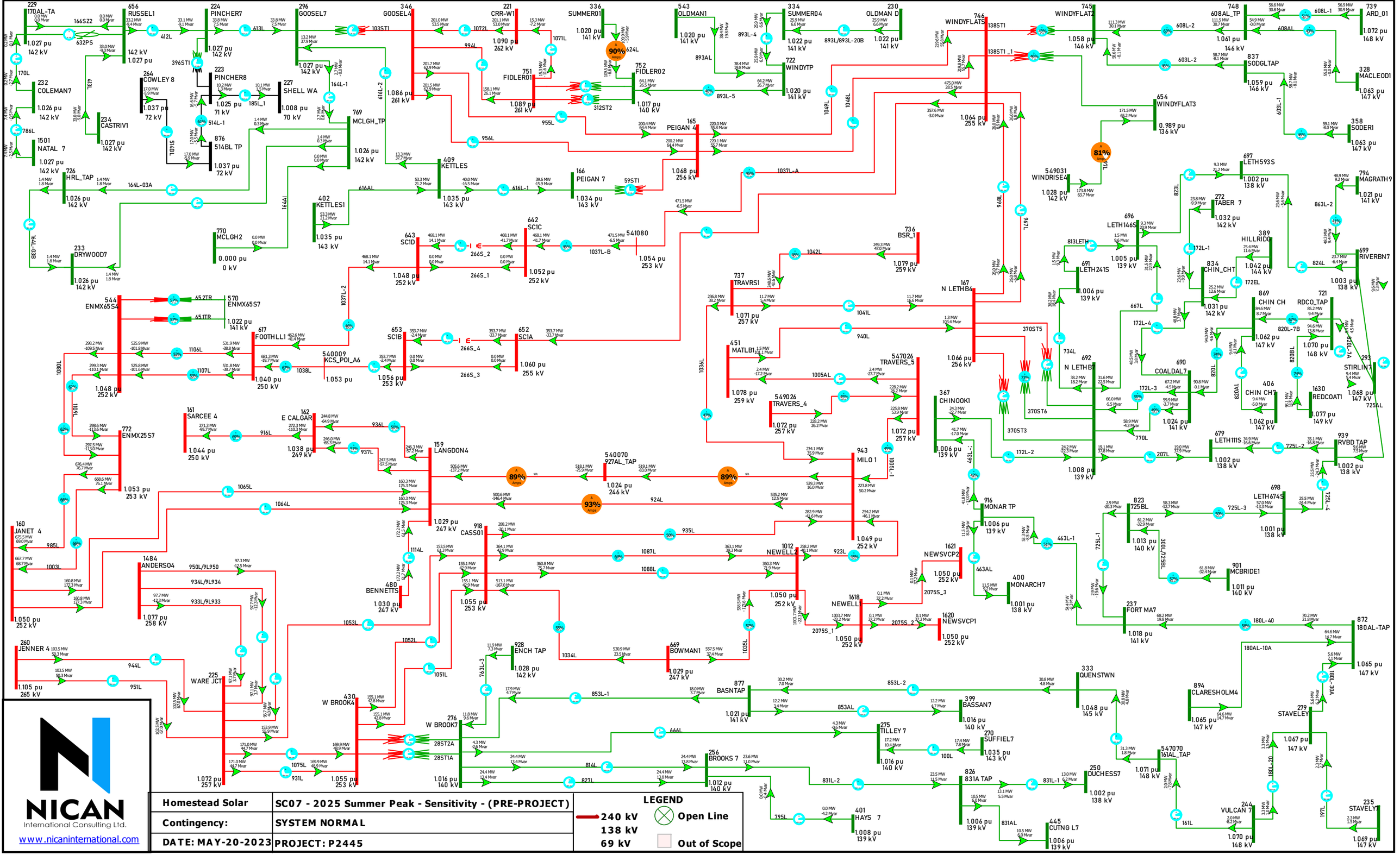
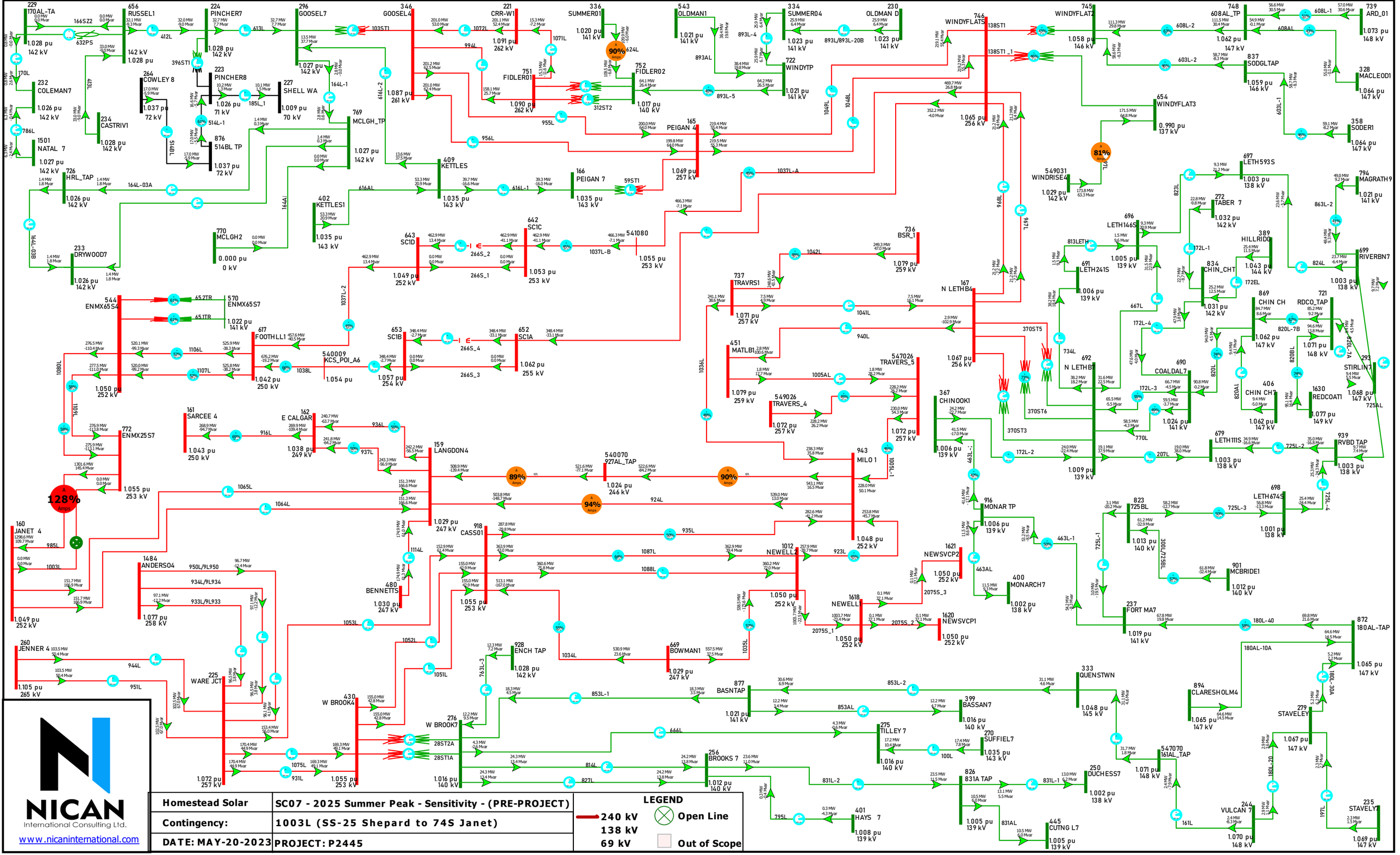
Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-20-2023	PROJECT: P2445


229 170AL-TA 1.027 pu 142 kV
166S2
632PS
656 RUSSEL1 142 kV 1.027 pu
412L
224 PINCHER7 1.027 pu 142 kV
613L
296 GOOSEL7 1.027 pu 142 kV
396ST1
223 PINCHER8 1.025 pu 71 kV
185L_1
227 SHELL WA 1.008 pu 70 kV
264 COWLEY 8 1.037 pu 72 kV
514L-1
876 514BL TP 1.037 pu 72 kV
164L-1
769 MCLGH_TP 1.026 pu 142 kV
170L
232 COLEMAN7 1.026 pu 142 kV
234 CASTRIV1 1.027 pu 142 kV
786L
1501 NATAL 7 1.027 pu 142 kV
726 HRL_TAP 1.026 pu 142 kV
164L-03A
233 DRYWOOD7 1.026 pu 142 kV
164L-03B
770 MCLGH2 0.000 pu 0 kV
164AL
346 GOOSEL4 1.086 pu 261 kV
103ST1
616L-2
409 KETTLES 1.035 pu 143 kV
616AL
402 KETTLES1 1.035 pu 143 kV
616L-1
166 PEIGAN 7 1.034 pu 143 kV
59ST1
221 CRR-W1 1.090 pu 262 kV
1072L
994L
1071L
751 FIDLER01 1.089 pu 261 kV
955L
956L
336 SUMMER01 1.020 pu 141 kV
624L
312ST2
752 FIDLER02 1.017 pu 140 kV
543 OLDMAN1 1.020 pu 141 kV
893L-4
893AL
893L-5
334 SUMMER04 1.022 pu 141 kV
893L/893L-20B
230 OLDMAN D 1.022 pu 141 kV
722 WINDYTP 1.020 pu 141 kV
165 PEIGAN 4 1.068 pu 256 kV
1037L-A
1040L
746 WINDYFLATS 1.064 pu 255 kV
138ST1
138ST1_1
745 WINDYFLAT2 1.058 pu 146 kV
608L-2
603L-2
748 608AL_TP 1.061 pu 146 kV
608L-1
608AL
739 ARD_01 1.072 pu 148 kV
837 SODGLTAP 1.059 pu 146 kV
328 MACLEOD1 1.063 pu 147 kV
654 WINDYFLAT3 0.989 pu 136 kV
603L-1
358 SODER1 1.063 pu 147 kV
549031 WINDRISE4 1.028 pu 142 kV
197L
81% Amps
697 LETH593S 1.002 pu 138 kV
794 MAGRATH9 1.021 pu 141 kV
863L-2
272 TABER 7 1.032 pu 142 kV
823L
172L-1
696 LETH146S 1.005 pu 139 kV
813LETH
691 LETH241S 1.006 pu 139 kV
834 CHIN_CHT 1.042 pu 144 kV
389 HILLRIDG 1.042 pu 144 kV
824L
699 RIVERBN7 1.003 pu 138 kV
172EL
667L
172L-4
869 CHIN CH 1.062 pu 147 kV
820L-7B
721 RDCO_TAP 1.070 pu 148 kV
820L-7A
293 STIRLIN7 1.068 pu 147 kV
725AL
820BL
820L
820AL
406 CHIN CH7 1.062 pu 147 kV
1630 REDCOAT1 1.077 pu 149 kV
690 COALDAL7 1.024 pu 141 kV
172L-3
770L
207L
679 LETH111S 1.002 pu 138 kV
725L-2
939 RVBD TAP 1.002 pu 138 kV
725L-4
698 LETH674S 1.001 pu 138 kV
725L-3
823 725BL 1.013 pu 140 kV
3001/7298L
901 MCBRIDE1 1.011 pu 140 kV
725L-1
237 FORT MA7 1.018 pu 141 kV
180L-40
872 180AL-TAP 1.065 pu 147 kV
180AL-10A
894 CLARESHOLM4 1.065 pu 147 kV
180L-30A
279 STAVELEY 1.067 pu 147 kV
180L-20
197L
235 STAVELY7 1.069 pu 147 kV
725L-2
698 LETH674S 1.001 pu 138 kV
725L-4
544 ENMX65S4 1.048 pu 252 kV
65.2TR
65.1TR
570 ENMX65S7 1.022 pu 141 kV
1106L
1107L
1080L
617 FOOTHLL1 1.040 pu 250 kV
1038L
540009 KCS_POI_A6 1.053 pu
1037L-2
653 SC1B 1.056 pu 253 kV
266S_4
266S_3
652 SC1A 1.060 pu 255 kV
643 SC1D 1.048 pu 252 kV
266S_2
266S_1
642 SC1C 1.052 pu 252 kV
1037L-B
541080 1.054 pu 253 kV
736 BSR_1 1.079 pu 259 kV
1042L
737 TRAVRS1 1.071 pu 257 kV
1041L
940L
451 MATLB1 1.078 pu 259 kV
1005AL
547026 TRAVERS_5 1.072 pu 257 kV
549026 TRAVERS_4 1.072 pu 257 kV
1005L-1
943 MILO 1 1.049 pu 252 kV
1036L
167 N LETHB4 1.066 pu 256 kV
370ST5
370ST6
370ST3
692 N LETHB7 1.008 pu 139 kV
734L
172L-2
367 CHINOOK1 1.006 pu 139 kV
463L-1
916 MONAR TP 1.006 pu 139 kV
463AL
400 MONARCH7 1.001 pu 138 kV
1621 NEWSVCP2 1.050 pu 252 kV
2075S_3
1618 NEWELL 1.050 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1 1.050 pu 252 kV
1012 NEWELL2 1.050 pu 252 kV
923L
1049 pu 252 kV
1087L
1088L
935L
918 CASS01 1.055 pu 253 kV
1114L
480 BENNETTS 1.030 pu 247 kV
1053L
1052L
1051L
1034L
1035L
669 BOWMAN1 1.029 pu 247 kV
928 ENCH TAP 1.028 pu 142 kV
763L-3
877 BASNTAP 1.021 pu 141 kV
853L-1
853L-2
853AL
399 BASSAN7 1.016 pu 140 kV
333 QUENSTWN 1.048 pu 145 kV
275 TILLEY 7 1.016 pu 140 kV
666L
100L
270 SUFFIEL7 1.035 pu 143 kV
547070 161AL_TAP 1.071 pu 148 kV
161L
244 VULCAN 7 1.070 pu 148 kV
250 DUCHESS7 1.002 pu 138 kV
831L-1
831L-2
826 831A TAP 1.006 pu 139 kV
831AL
445 CUTNG L7 1.006 pu 139 kV
401 HAYS 7 1.008 pu 139 kV
795L
827L
814L
256 BROOKS 7 1.012 pu 140 kV
276 W BROOK7 1.016 pu 140 kV
28ST2A
28ST1A
430 W BROOK4 1.055 pu 253 kV
1075L
931L
1072 pu 257 kV
1044 pu 250 kV
161 SARCEE 4
162 E CALGAR 1.038 pu 249 kV
936L
937L
772 ENMX25S7 1.053 pu 253 kV
1065L
1064L
160 JANET 4 1.050 pu 252 kV
985L
1003L
1484 ANDERS04 1.077 pu 258 kV
950L/9L950
934L/9L934
933L/9L933
225 WARE JCT 1.105 pu 265 kV
944L
951L
159 LANGDON4 1.029 pu 247 kV
924L
540070 927AL_TAP 1.024 pu 246 kV
89% Amps
93% Amps
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:
SYSTEM NORMAL
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229 170AL-TA
1.028 pu 142 kV
166S2
632PS
656 RUSSEL1
142 kV 1.028 pu
412L
224 PINCHER7
1.028 pu 142 kV
613L
396ST1
223 PINCHER8
1.026 pu 71 kV
185L_1
227 SHELL WA
1.009 pu 70 kV
264 COWLEY 8
1.037 pu 72 kV
514L-1
876 514BL TP
1.037 pu 72 kV
514BL
419L
170L
232 COLEMAN7
1.026 pu 142 kV
234 CASTRIV1
1.028 pu 142 kV
786L
1501 NATAL 7
1.027 pu 142 kV
726 HRL_TAP
1.026 pu 142 kV
164L-03A
164L-04B
233 DRYWOOD7
1.026 pu 142 kV
296 GOOSEL7
1.027 pu 142 kV
103ST1
164L-1
769 MCLGH_TP
1.027 pu 142 kV
770 MCLGH2
0.000 pu 0 kV
346 GOOSEL4
1.087 pu 261 kV
616L-2
409 KETTLES
1.035 pu 143 kV
402 KETTLES1
1.035 pu 143 kV
616AL
616L-1
166 PEIGAN 7
1.035 pu 143 kV
59ST1
221 CRR-W1
1.091 pu 262 kV
1072L
994L
1071L
751 FIDLER01
1.090 pu 262 kV
955L
312ST2
336 SUMMER01
1.020 pu 141 kV
624L
752 FIDLER02
1.017 pu 140 kV
543 OLDMAN1
1.021 pu 141 kV
893L-4
893AL
893L-5
334 SUMMER04
1.023 pu 141 kV
893L/893L-20B
230 OLDMAN D
1.023 pu 141 kV
722 WINDYTP
1.021 pu 141 kV
956L
165 PEIGAN 4
1.069 pu 257 kV
1037L-A
1040L
1048L
746 WINDYFLATS
1.065 pu 256 kV
138ST1
138ST1_1
745 WINDYFLAT2
1.058 pu 146 kV
608L-2
603L-2
748 608AL_TP
1.062 pu 147 kV
608AL
608L-1
739 ARD_01
1.073 pu 148 kV
837 SODGLTAP
1.059 pu 146 kV
603L-1
328 MACLEOD1
1.064 pu 147 kV
654 WINDYFLAT3
0.990 pu 137 kV
358 SODER1
1.064 pu 147 kV
549031 WINDRISE4
1.029 pu 142 kV
197L
697 LETH593S
1.003 pu 138 kV
794 MAGRATH9
1.021 pu 141 kV
863L-2
272 TABER 7
1.032 pu 142 kV
823L
172L-1
696 LETH146S
1.005 pu 139 kV
813LETH
691 LETH241S
1.006 pu 139 kV
834 CHIN_CHT
1.031 pu 142 kV
389 HILLRIDG
1.043 pu 144 kV
824L
699 RIVERBN7
1.003 pu 138 kV
172L-4
667L
172L-3
690 COALDAL7
1.024 pu 141 kV
770L
820L
820AL
820BL
869 CHIN CH
1.062 pu 147 kV
820L-7B
820L-7A
721 RDCO_TAP
1.071 pu 148 kV
406 CHIN CH7
1.062 pu 147 kV
1630 REDCOAT1
1.077 pu 149 kV
293 STIRLIN7
1.068 pu 147 kV
725AL
679 LETH111S
1.003 pu 138 kV
725L-2
939 RVBD TAP
1.003 pu 138 kV
698 LETH674S
1.001 pu 138 kV
725L-4
725L-3
725L-1
823 725BL
1.013 pu 140 kV
730L/730AL
901 MCBRIDE1
1.012 pu 140 kV
237 FORT MA7
1.019 pu 141 kV
180L-40
872 180AL-TAP
1.065 pu 147 kV
180L-10A
894 CLARESHOLM4
1.065 pu 147 kV
180L-30A
279 STAVELEY
1.067 pu 147 kV
180L-20
197L
235 STAVELY7
1.069 pu 147 kV
244 VULCAN 7
1.070 pu 148 kV
161L
547070 161AL_TAP
1.071 pu 148 kV
1041L
737 TRAVRS1
1.071 pu 257 kV
736 BSR_1
1.079 pu 259 kV
167 N LETHB4
1.067 pu 256 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7
1.009 pu 139 kV
172L-2
207L
367 CHINOOK1
1.006 pu 139 kV
463L-1
463L-2
916 MONAR TP
1.006 pu 139 kV
463AL
400 MONARCH7
1.002 pu 138 kV
1621 NEWSVCP2
1.050 pu 252 kV
2075S_3
1618 NEWELL
1.050 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1
1.050 pu 252 kV
1042L
451 MATLB1
1.079 pu 259 kV
1005AL
549026 TRAVERS_4
1.072 pu 257 kV
547026 TRAVERS_5
1.072 pu 257 kV
1005L-1
943 MILO 1
1.008 pu 139 kV
940L
1036L
1037L-B
541080
1.055 pu 253 kV
642 SC1C
1.053 pu 253 kV
643 SC1D
1.049 pu 252 kV
266S_2
266S_1
653 SC1B
1.057 pu 254 kV
652 SC1A
1.062 pu 255 kV
266S_4
266S_3
540009 KCS_POI_A6
1.054 pu
1038L
1037L-2
570 ENMX65S7
1.022 pu 141 kV
65.2TR
65.1TR
544 ENMX65S4
1.050 pu 252 kV
1080L
1106L
1107L
617 FOOTHLL1
1.042 pu 250 kV
1109L
772 ENMX25S7
1.055 pu 253 kV
128%
1065L
1064L
160 JANET 4
1.049 pu 252 kV
985L
1003L
1484 ANDERS04
1.077 pu 258 kV
950L/9L950
934L/9L934
933L/9L933
260 JENNER 4
1.105 pu 265 kV
944L
951L
225 WARE JCT
1.072 pu 257 kV
1075L
931L
1055L
1053L
1052L
1051L
1034L
1035L
430 W BROOK4
1.055 pu 253 kV
276 W BROOK7
1.016 pu 140 kV
28ST2A
28ST1A
763L-3
928 ENCH TAP
1.028 pu 142 kV
669 BOWMAN1
1.029 pu 247 kV
530.9 MW 23.6 Mvar
1087L
1088L
1114L
480 BENNETT5
1.030 pu 247 kV
918 CASS01
1.055 pu 253 kV
1012 NEWELL7
1.050 pu 252 kV
923L
935L
924L
1.048 pu 252 kV
1.029 pu 247 kV
159 LANGDON4
1.016 pu 140 kV
540070 927AL_TAP
1.024 pu 246 kV
936L
937L
161 SARCEE 4
1.043 pu 250 kV
162 E CALGAR
1.038 pu 249 kV
916L
666L
814L
827L
795L
877 BASNTAP
1.021 pu 141 kV
853L-1
853L-2
853AL
399 BASSAN7
1.016 pu 140 kV
333 QUENSTWN
1.048 pu 145 kV
275 TILLEY 7
1.016 pu 140 kV
100L
270 SUFFIEL7
1.035 pu 143 kV
256 BROOKS 7
1.012 pu 140 kV
831L-2
831L-1
826 831A TAP
1.005 pu 139 kV
831AL
445 CUTNG L7
1.005 pu 139 kV
250 DUCHESS7
1.002 pu 138 kV
401 HAYS 7
1.008 pu 139 kV
795L
90%
89%
94%
Homestead Solar
SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-20-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
NICAN
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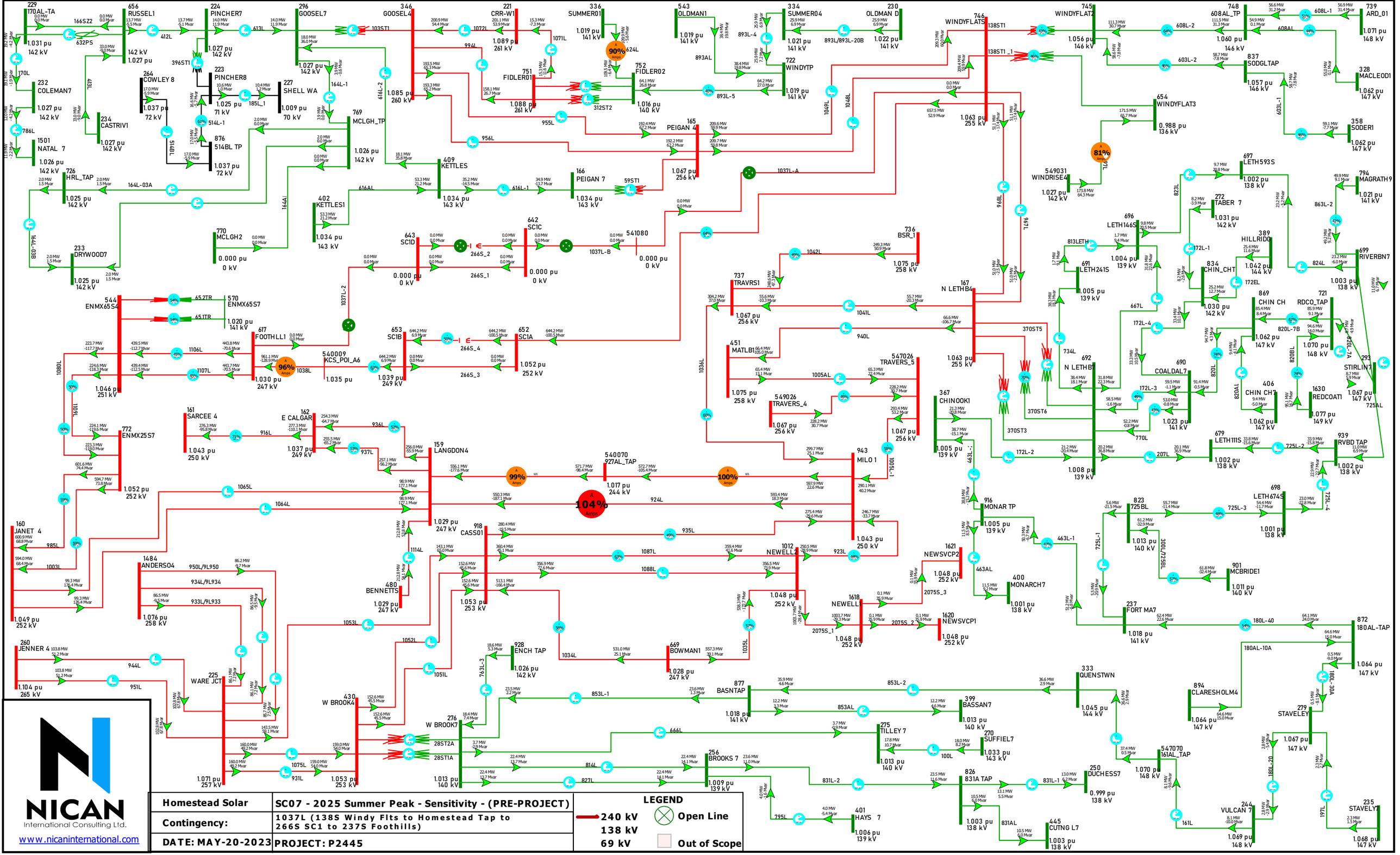
www.nicaninternational.com



NICAN
International Consulting Ltd.
www.nicaninternational.com

Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

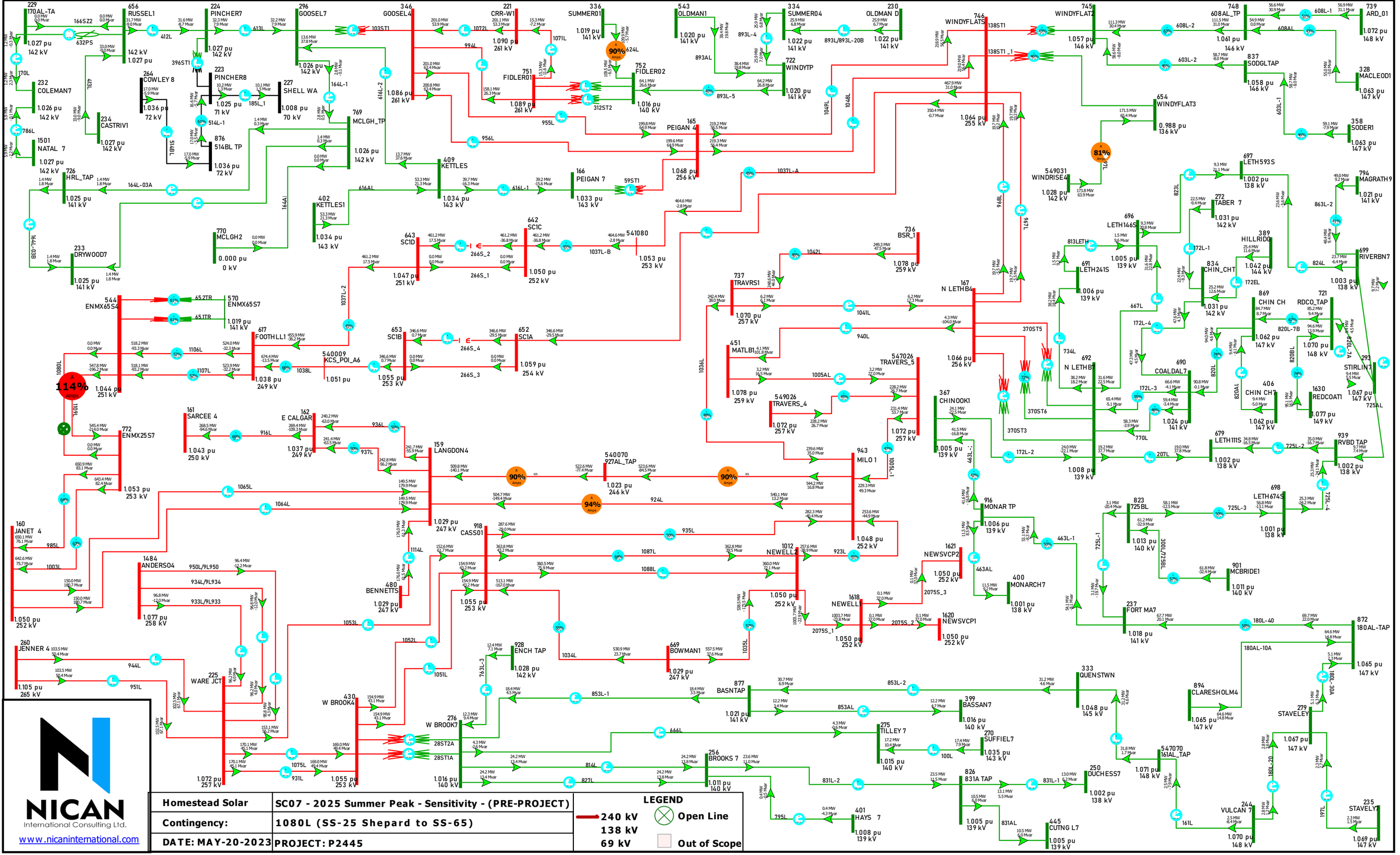
240 kV

138 kV

69 kV

Open Line

Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

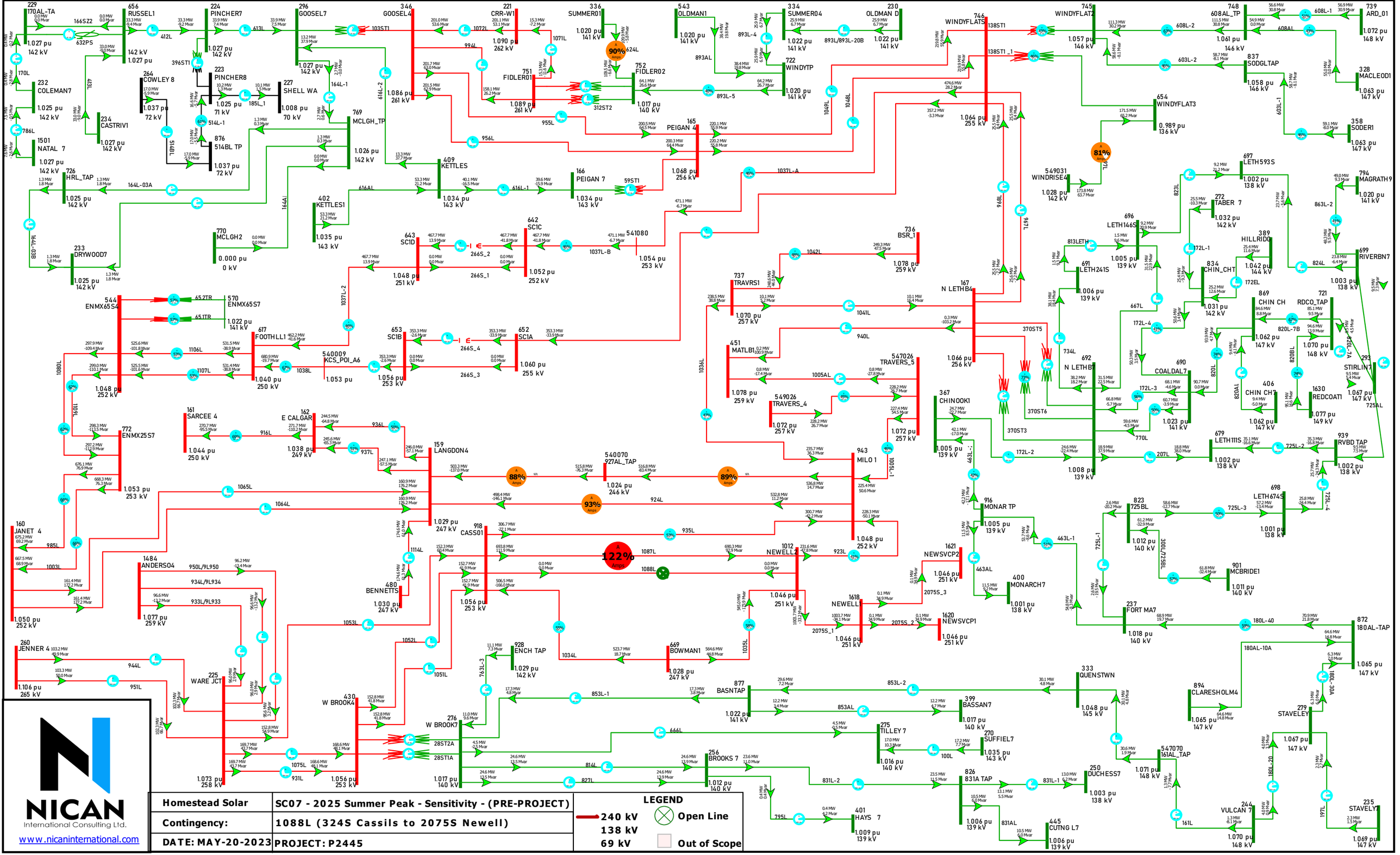
Homestead Solar	**SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)**
Contingency:	**1080L (SS-25 Shepard to SS-65)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

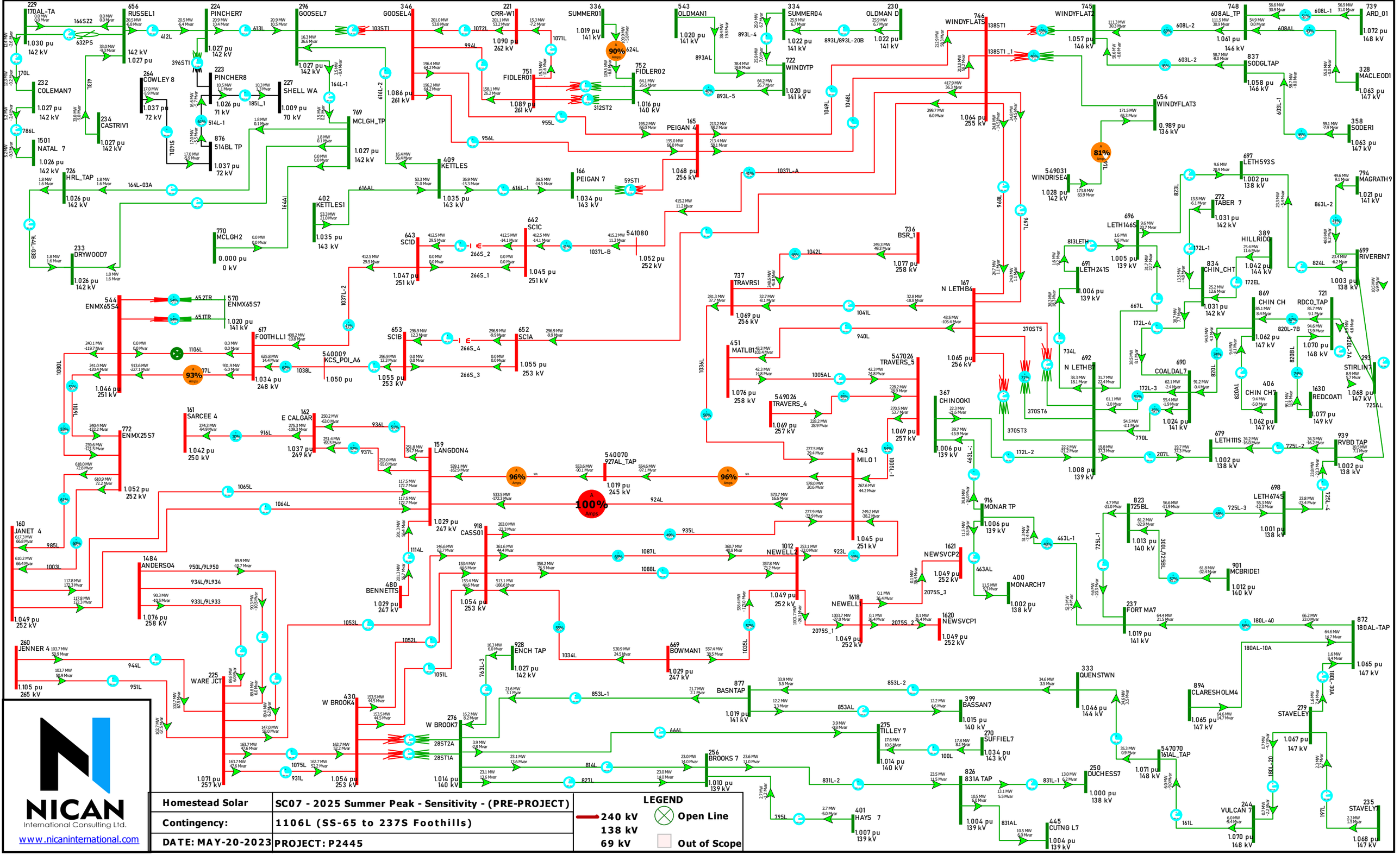
Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	1088L (324S Cassils to 2075S Newell)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND
- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope



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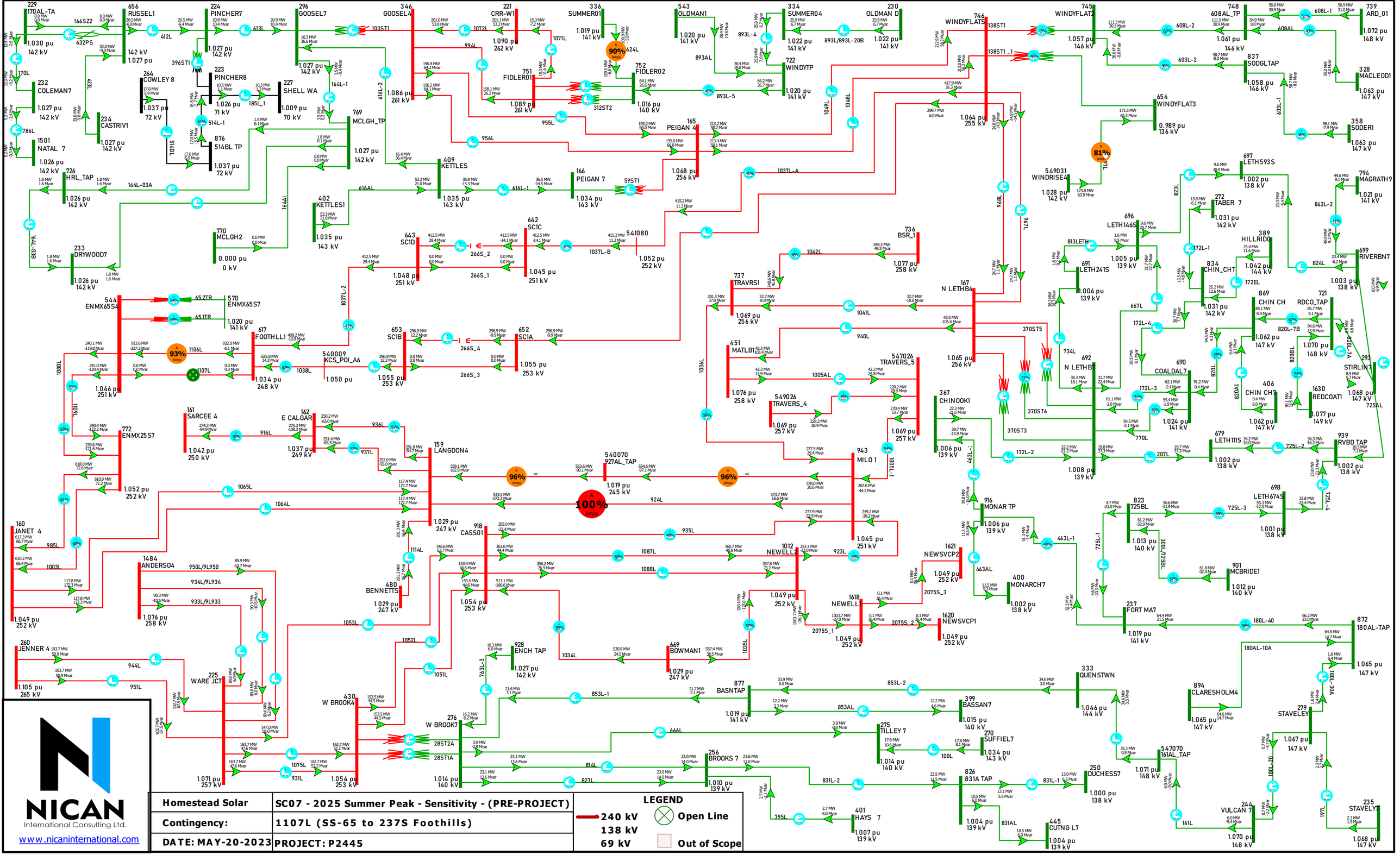
Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	1106L (SS-65 to 237S Foothills)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



NICAN
International Consulting Ltd.
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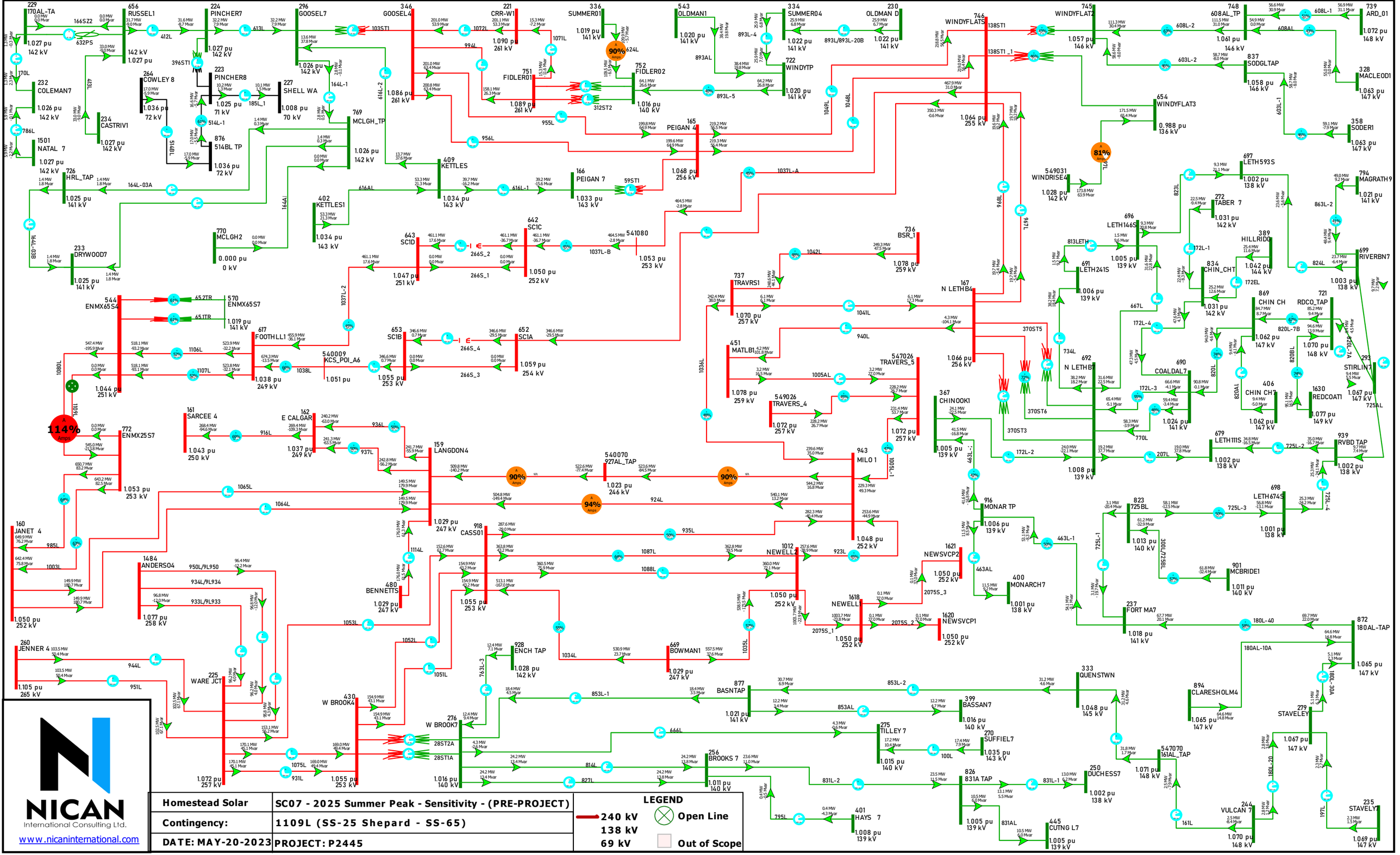
Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	1107L (SS-65 to 237S Foothills)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line
Out of Scope



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International Consulting Ltd.
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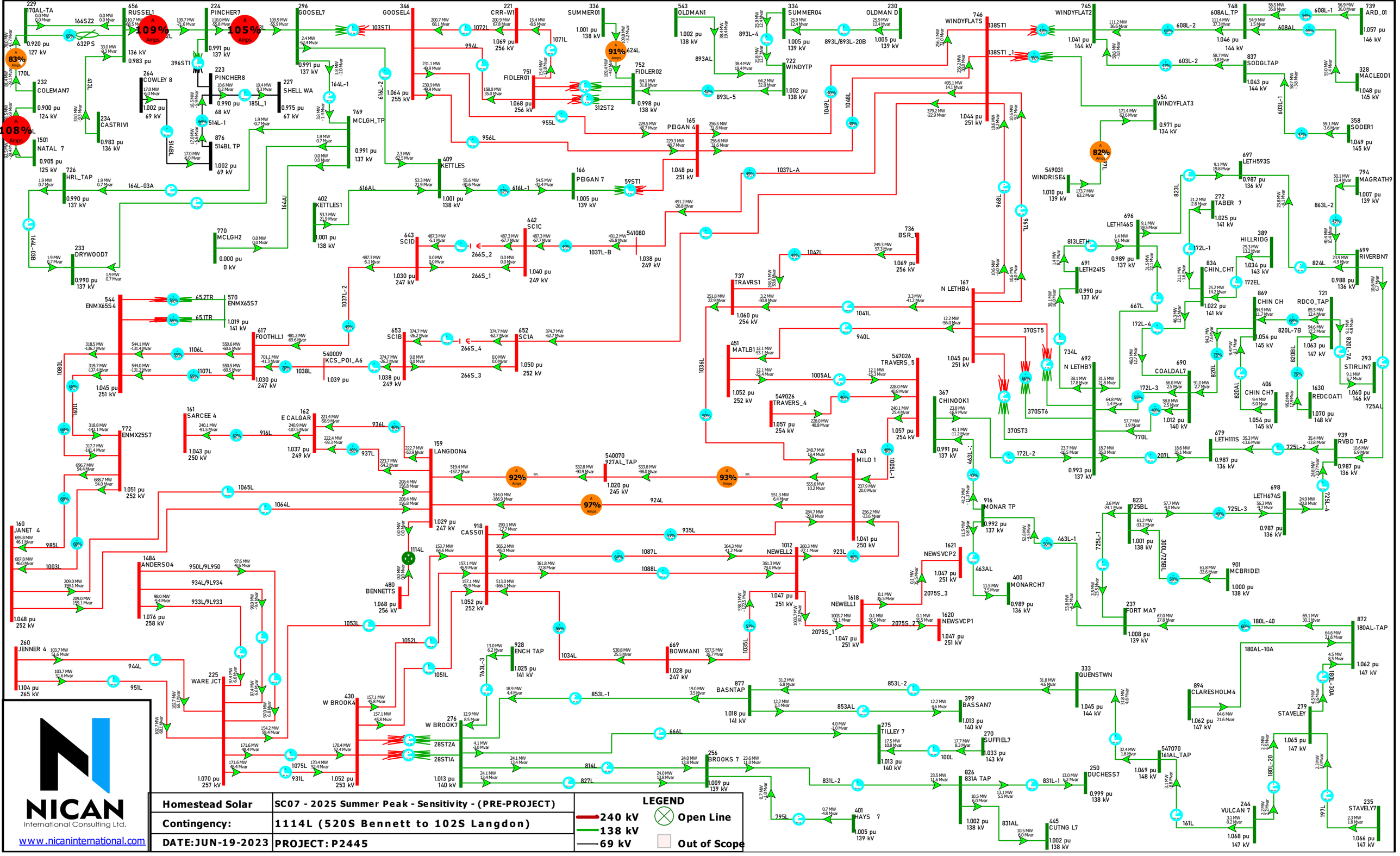
Homestead Solar	**SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)**
Contingency:	**1109L (SS-25 Shepard - SS-65)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
166SZ2
656
RUSSEL1
109%
632PS
0.920 pu
127 kV
136 kV
0.983 pu
224
PINCHER7
105%
0.991 pu
137 kV
396ST1
223
PINCHER8
0.990 pu
68 kV
185L_1
227
SHELL WA
0.975 pu
67 kV
264
COWLEY 8
1.002 pu
69 kV
514L-1
876
514BL TP
1.002 pu
69 kV
296
GOOSEL7
0.991 pu
137 kV
164L-1
769
MCLGH_TP
0.991 pu
137 kV
170L
232
COLEMAN7
0.900 pu
124 kV
234
CASTRIVI
0.983 pu
136 kV
1501
NATAL 7
0.905 pu
125 kV
726
HRL_TAP
0.990 pu
137 kV
233
DRYWOOD7
0.990 pu
137 kV
770
MCLGH2
0.000 pu
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402
KETTLES1
1.001 pu
138 kV
409
KETTLES
1.001 pu
138 kV
346
GOOSEL4
103ST1
1.064 pu
255 kV
994L
956L
955L
221
CRR-W1
1.069 pu
256 kV
1071L
751
FIDLER01
1.068 pu
256 kV
336
SUMMER01
1.001 pu
138 kV
91%
624L
312ST2
752
FIDLER02
0.998 pu
138 kV
543
OLDMAN1
1.002 pu
138 kV
893L-4
893AL
893L-5
334
SUMMER04
1.005 pu
139 kV
893L/893L-20B
230
OLDMAN D
1.005 pu
139 kV
722
WINDYTP
1.002 pu
138 kV
746
WINDYFLATS
138ST1
138ST1_1
1.044 pu
251 kV
1048L
1040L
1037L-A
1037L-B
1038 pu
249 kV
541080
165
PEIGAN 4
1.048 pu
251 kV
166
PEIGAN 7
1.005 pu
139 kV
59ST1
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1042L
1005AL
940L
1036L
1034L
1035L
1034L
1030 pu
247 kV
643
SC1D
642
SC1C
1040 pu
249 kV
266S_2
266S_1
653
SC1B
652
SC1A
1050 pu
252 kV
266S_4
266S_3
1038 pu
249 kV
540009
KCS_POI_A6
1039 pu
1038L
1037L-2
1080L
1109L
1045 pu
251 kV
544
ENMX65S4
65.2TR
65.1TR
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ENMX65S7
1.019 pu
141 kV
617
FOOTHLL1
1106L
1107L
1030 pu
247 kV
772
ENMX25S7
1.051 pu
252 kV
1065L
1064L
1085L
1043 pu
250 kV
161
SARCEE 4
916L
1037 pu
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162
E CALGAR
936L
937L
159
LANGDON4
1029 pu
247 kV
92%
93%
97%
540070
927AL_TAP
1.020 pu
245 kV
1114L
480
BENNETTS
1.068 pu
256 kV
1053L
1052L
1051L
1076 pu
258 kV
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
160
JANET 4
985L
1003L
1048 pu
252 kV
260
JENNER 4
944L
951L
1104 pu
265 kV
225
WARE JCT
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257 kV
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931L
1052 pu
253 kV
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W BROOK4
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W BROOK7
28ST2A
28ST1A
1013 pu
140 kV
1051 pu
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139 kV
1005L-1
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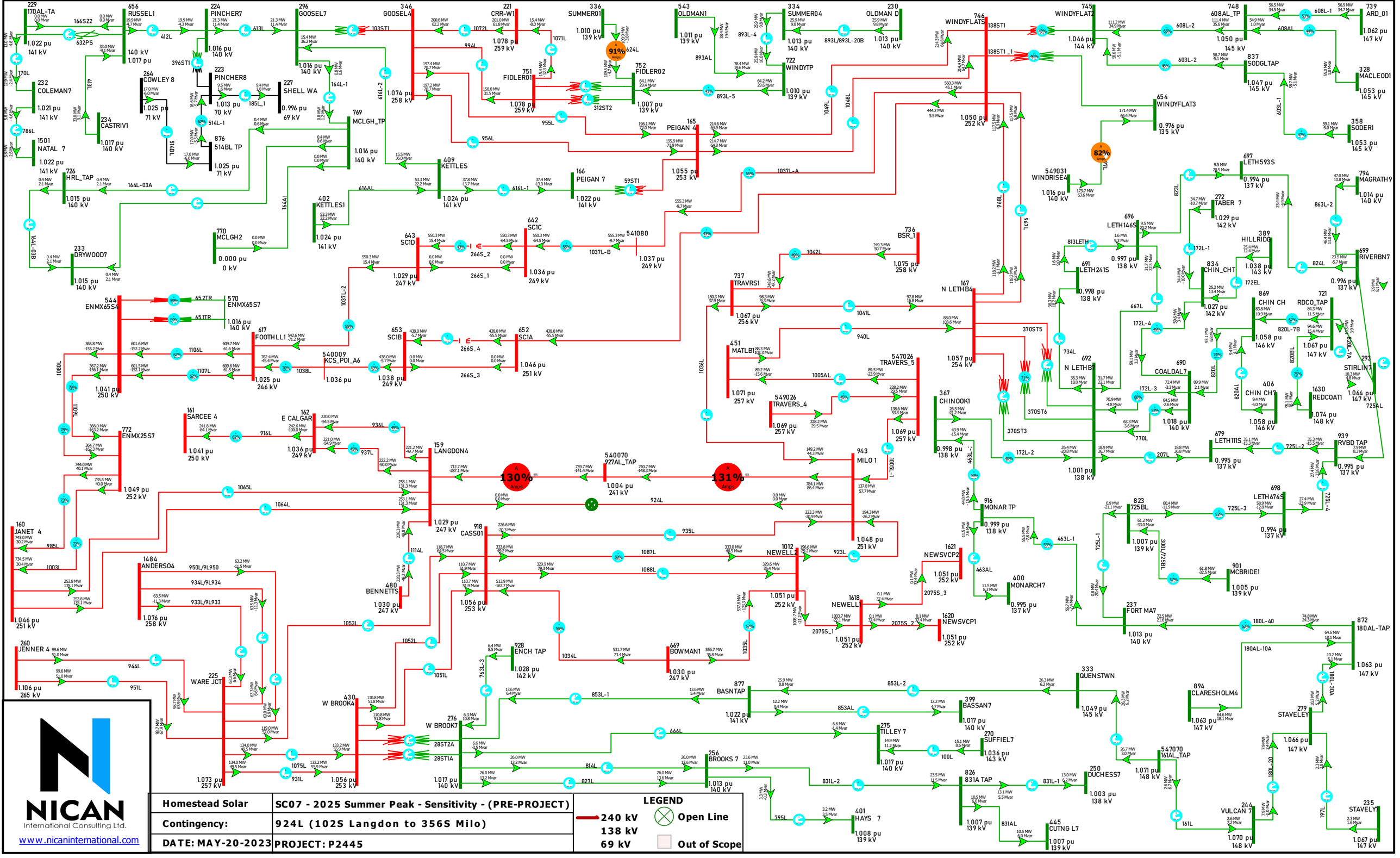
Homestead Solar
SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:
1114L (520S Bennett to 102S Langdon)
DATE:JUN-19-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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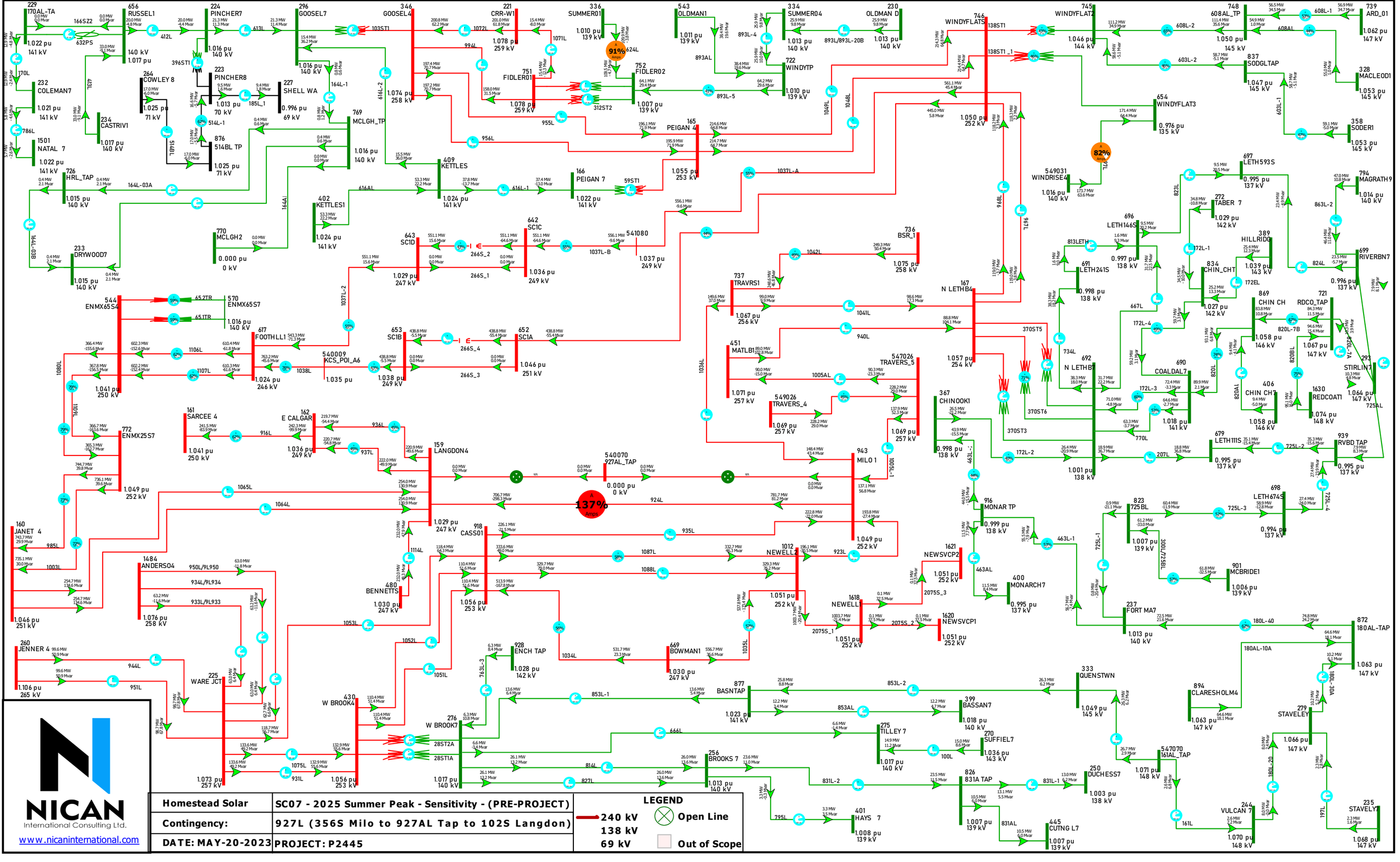
Homestead Solar	SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:	924L (102S Langdon to 356S Milo)
DATE: MAY-20-2023	PROJECT: P2445

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229 170AL-TA
1.022 pu 141 kV
166S2
632PS
656 RUSSEL1
140 kV 1.017 pu
412L
224 PINCHER7
1.016 pu 140 kV
613L
296 GOOSEL7
1.016 pu 140 kV
346 GOOSEL4
1.074 pu 258 kV
103ST1
396ST1
223 PINCHER8
1.013 pu 70 kV
185L_1
227 SHELL WA
0.996 pu 69 kV
264 COWLEY 8
1.025 pu 71 kV
514L-1
876 514BL TP
1.025 pu 71 kV
514BL
769 MCLGH_TP
1.016 pu 140 kV
164L-1
616L-2
170L
232 COLEMAN7
1.021 pu 141 kV
786L
1501 NATAL 7
1.022 pu 141 kV
234 CASTRIV1
1.017 pu 140 kV
726 HRL_TAP
1.015 pu 140 kV
164L-03A
164L-1
233 DRYWOOD7
1.015 pu 140 kV
194L-03B
770 MCLGH2
0.000 pu 0 kV
409 KETTLES
1.024 pu 141 kV
402 KETTLES1
1.024 pu 141 kV
616AL
616L-1
166 PEIGAN 7
1.022 pu 141 kV
59ST1
165 PEIGAN 4
1.055 pu 253 kV
221 CRR-W1
1.078 pu 259 kV
1072L
994L
956L
955L
751 FIDLER01
1.078 pu 259 kV
312ST2
336 SUMMER01
1.010 pu 139 kV
624L
91% Amps
752 FIDLER02
1.007 pu 139 kV
543 OLDMAN1
1.011 pu 139 kV
893L-4
893AL
893L-5
334 SUMMER04
1.013 pu 140 kV
893L/893L-20B
230 OLDMAN D
1.013 pu 140 kV
722 WINDYTP
1.010 pu 139 kV
746 WINDYFLATS
138ST1
138ST1_1
1.050 pu 252 kV
1037L-A
1048L
1040L
1037L-B
541080
1.037 pu 249 kV
642 SC1C
1.036 pu 249 kV
643 SC1D
1.029 pu 247 kV
266S_2
266S_1
653 SC1B
1.038 pu 249 kV
652 SC1A
1.046 pu 251 kV
266S_4
266S_3
540009 KCS_POI_A6
1.035 pu
1038L
617 FOOTHLL1
1.024 pu 246 kV
1106L
1107L
1037L-2
544 ENMX65S4
570 ENMX65S7
1.016 pu 140 kV
65.2TR
65.1TR
1.041 pu 250 kV
1080L
1109L
772 ENMX25S7
1.049 pu 252 kV
1065L
1064L
161 SARCEE 4
1.041 pu 250 kV
916L
162 E CALGAR
1.036 pu 249 kV
936L
937L
159 LANGDON4
1.029 pu 247 kV
540070 927AL_TAP
0.000 pu 0 kV
924L
1114L
160 JANET 4
1.046 pu 251 kV
985L
1003L
1484 ANDERSO4
1.076 pu 258 kV
950L/9L950
934L/9L934
933L/9L933
480 BENNETTS
1.030 pu 247 kV
232.0 MW 50.0 Mvar
1053L
1052L
1051L
260 JENNER 4
1.106 pu 265 kV
944L
951L
225 WARE JCT
1.073 pu 257 kV
1075L
931L
430 W BROOK4
1.056 pu 253 kV
276 W BROOK7
1.017 pu 140 kV
28ST2A
28ST1A
763L-3
928 ENCH TAP
1.028 pu 142 kV
1034L
669 BOWMAN1
1.030 pu 247 kV
1035L
918 CASS01
1.056 pu 253 kV
1087L
1088L
1012 NEWELL2
1.051 pu 252 kV
923L
1618 NEWELL
1.051 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1
1.051 pu 252 kV
1621 NEWSVCP2
1.051 pu 252 kV
2075S_3
463AL
400 MONARCH7
0.995 pu 137 kV
916 MONAR TP
0.999 pu 138 kV
463L-1
463L-2
1042L
1041L
940L
1005AL
1005L-1
737 TRAVRS1
1.067 pu 256 kV
451 MATLB1
1.071 pu 257 kV
547026 TRAVERS_5
549026 TRAVERS_4
1.069 pu 257 kV
943 MILO 1
1.049 pu 252 kV
795L
401 HAYS 7
1.008 pu 139 kV
736 BSR_1
1.075 pu 258 kV
167 N LETHB4
1.057 pu 254 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7
690 COALDAL7
667L
172L-1
172L-2
172L-3
172L-4
172L-5
172L-6
172L-7
172L-8
172L-9
172L-10
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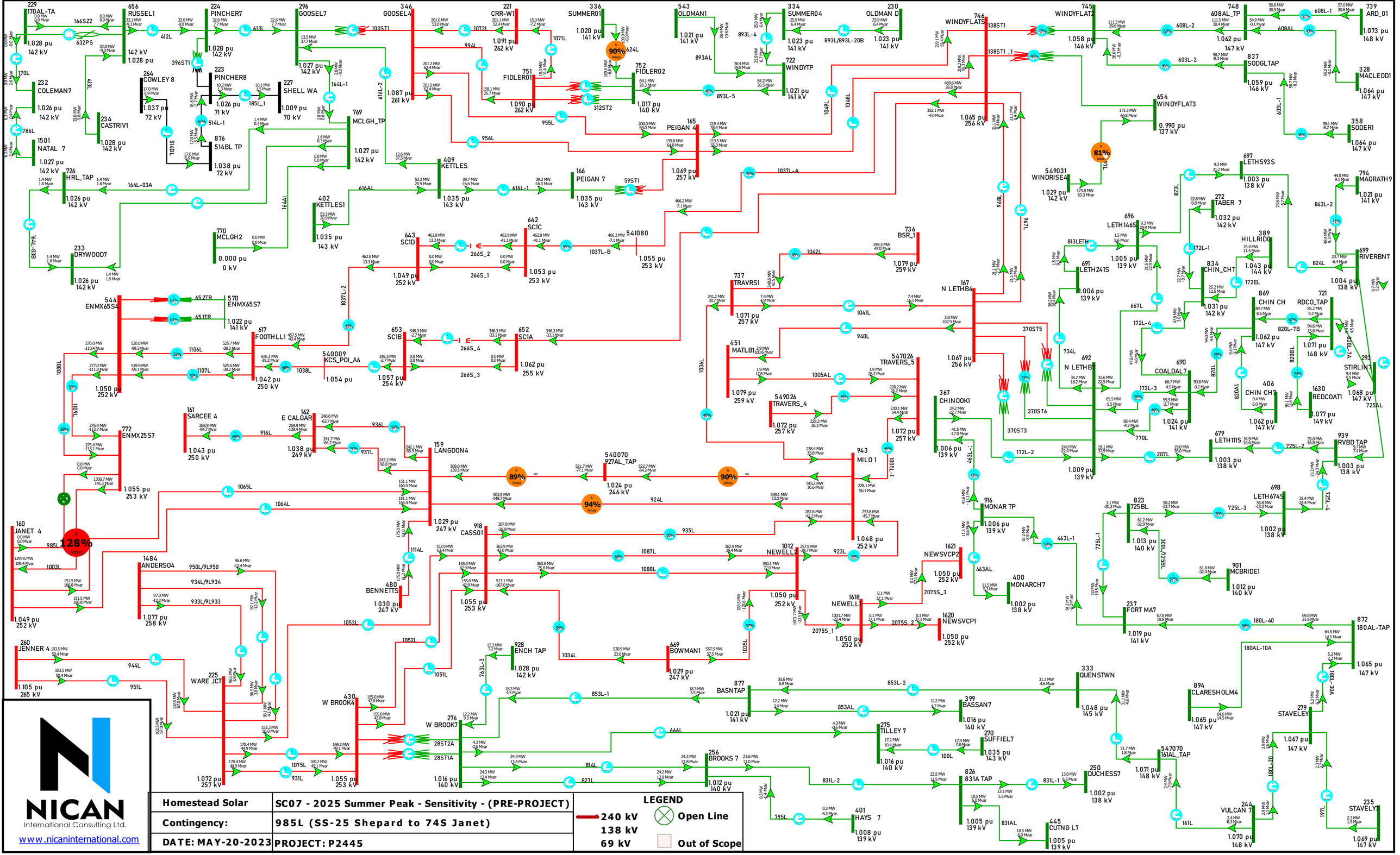
172L-40



Homestead Solar	**SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)**
Contingency:	**985L (SS-25 Shepard to 74S Janet)**
DATE: MAY-20-2023	**PROJECT: P2445**

LEGEND

- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope

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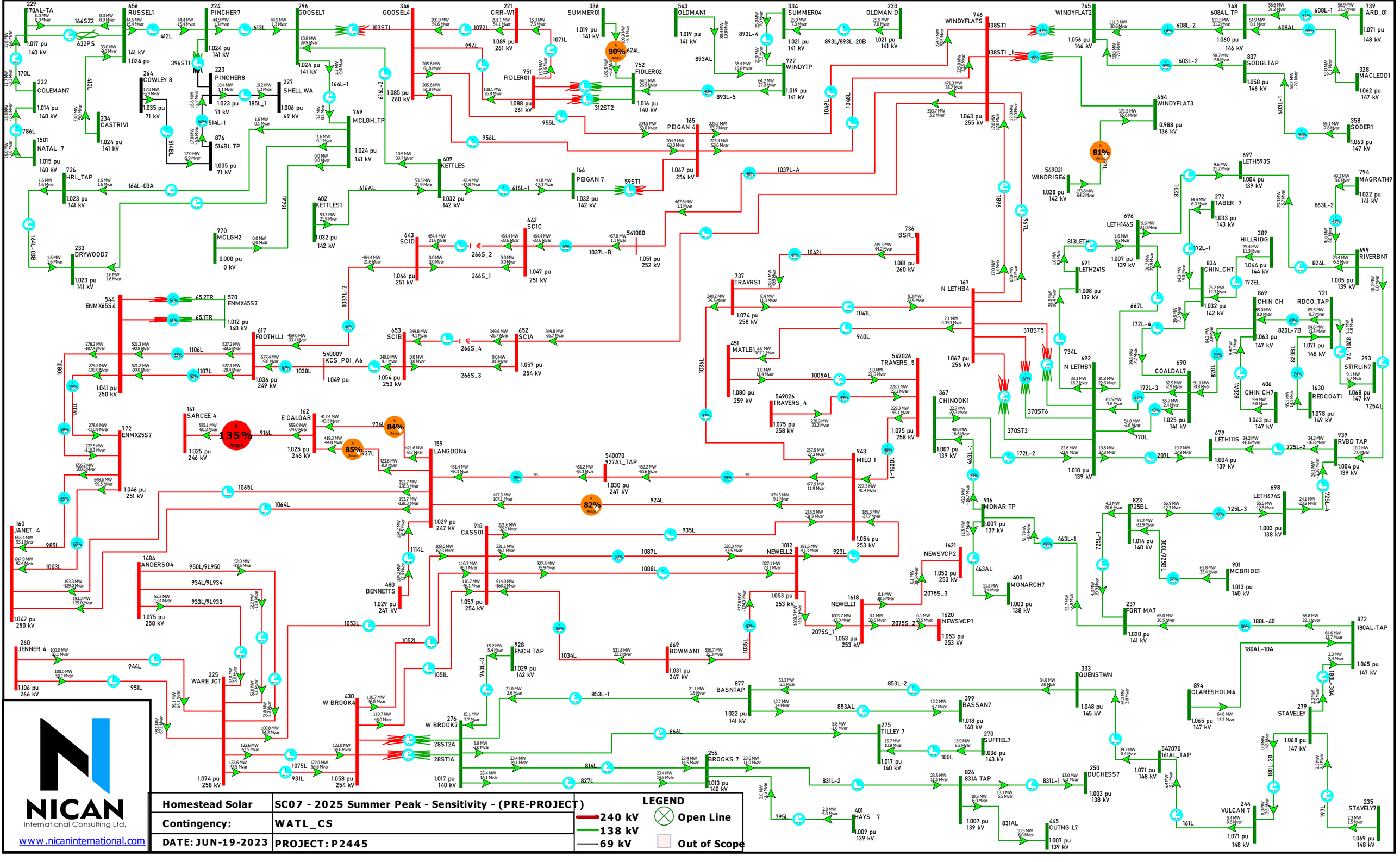
170AL-TA
166SZ2
632PS
RUSSEL1
412L
PINCHER7
613L
GOOSEL7
103ST1
GOOSEL4
1072L
CRR-W1
1071L
SUMMER01
624L
90%
Amps
FIDLER01
312ST2
FIDLER02
OLDMAN1
893L-4
SUMMER04
893L/893L-20
OLDMAN D
893AL
893L-5
WINDYFLATS
138ST1
138ST1_1
WINDYFLAT2
608AL_TP
608L-1
608L-2
608AL
603L-2
SODGLTAP
ARD_01
MACLEOD1
WINDYFLAT3
SODER1
609L-1
COWLEY 8
PINCHER8
185L_1
SHELL WA
396ST1
164L-1
616L-2
514L-1
514BL TP
514BL
MCLGH_TP
955L
956L
PEIGAN 4
1070L
1040L
1037L-A
PEIGAN 7
59ST1
616L-1
616AL
KETTLES
KETTLES1
MCLGH2
164L-03A
164AL
164L-03B
DRYWOOD7
HRL_TAP
NATAL 7
COLEMAN7
CASTRIVI
170L
786L
WINDRISE4
697L
LETH593S
TABER 7
823L
LETH146S
813LETH
LETH241S
667L
172L-1
172L-4
CHIN_CHT
172EL
HILLRIDG
MAGRATH9
863L-2
RIVERBN7
824L
RDCO_TAP
820L-7A
820L-7B
CHIN CH
CHIN CH7
820BL
820AL
COALDAL7
172L-3
REDCOAT1
725AL
STIRLIN7
RVBD TAP
725L-2
LETH111S
207L
LETH674S
725L-3
725L-4
725BL
300L/725BL
MCBRIDE1
463L-1
MONAR TP
463AL
MONARCH7
NEWSVCP2
NEWSVCP1
2075S_3
2075S_2
2075S_1
NEWELL1
NEWELL2
923L
CASS01
BENNETTS
1087L
1088L
1053L
1052L
1051L
1034L
1035L
763L-3
ENCH TAP
BOWMAN1
BASNTAP
853L-1
853L-2
853AL
BASSAN7
QUENSTWN
CLARESHOLM4
180AL-10A
180AL-TAP
180L-30A
180L-20
STAVELEY
STAVELY7
197L
VULCAN 7
161L
161AL_TAP
DUCHESS7
831A TAP
831L-1
831L-2
CUTNG L7
HAYS 7
MILO 1
1051L-1
795L
BSR_1
1042L
TRAVRS1
1041L
940L
MATLB1
1005AL
TRAVERS_4
TRAVERS_5
N LETHB4
N LETHB7
370ST5
370ST6
370ST3
734L
CHINOOK1
770L
100L
SUFFIEL7
TILLEY 7
666L
814L
827L
256
BROOKS 7
ENMX65S4
ENMX65S7
65.2TR
65.1TR
1106L
1107L
1080L
1109L
FOOTHLL1
KCS_POI_A6
1038L
SC1B
SC1A
SC1C
SC1D
266S_1
266S_2
266S_3
266S_4
541080
1037L-B
SARCEE 4
ECALGAR
916L
936L
937L
ENMX25S7
1065L
1064L
985L
1003L
JANET 4
1134L
1114L
950L/9L950
934L/9L934
933L/9L933
ANDERS04
JENNER 4
944L
951L
WARE JCT
W BROOK4
W BROOK7
28ST2A
28ST1A
1075L
931L
LANGDON4
927AL_TAP
924L
935L
1065L
1064L
1029 pu 247 kV
1030 pu 247 kV
1057 pu 254 kV
1017 pu 140 kV
1074 pu 258 kV
1058 pu 254 kV
1031 pu 247 kV
1022 pu 141 kV
1048 pu 145 kV
1065 pu 147 kV
1007 pu 139 kV
1010 pu 139 kV
1003 pu 138 kV
1004 pu 139 kV
1071 pu 148 kV
1068 pu 147 kV
1069 pu 148 kV
1078 pu 149 kV
1063 pu 147 kV
1044 pu 144 kV
1005 pu 139 kV
1062 pu 147 kV
1033 pu 143 kV
1036 pu 143 kV
1025 pu 141 kV
1060 pu 146 kV
1058 pu 146 kV
1056 pu 146 kV
1063 pu 255 kV
1067 pu 256 kV
1074 pu 258 kV
1075 pu 258 kV
1080 pu 259 kV
1081 pu 260 kV
1085 pu 260 kV
1088 pu 261 kV
1089 pu 261 kV
1046 pu 251 kV
1047 pu 251 kV
1051 pu 252 kV
1042 pu 250 kV
1041 pu 250 kV
1054 pu 253 kV
1053 pu 253 kV
1049 pu
1025 pu 246 kV
1029 pu 247 kV
1106 pu 266 kV
1023 pu 141 kV
1024 pu 141 kV
1021 pu 141 kV
1019 pu 141 kV
1032 pu 142 kV
1033 pu 142 kV
1034 pu 142 kV
1035 pu 71 kV
1023 pu 71 kV
1006 pu 69 kV
1000 pu 136 kV
1028 pu 142 kV
1063 pu 147 kV
1007 pu 139 kV
1008 pu 139 kV
1009 pu 139 kV
1013 pu 140 kV
1020 pu 141 kV
1036 pu 249 kV
1038L
135%
Amps
84%
Amps
85%
Amps
82%
Amps
81%
Amps
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Homestead Solar
SC07 - 2025 Summer Peak - Sensitivity - (PRE-PROJECT)
Contingency:
WATL_CS
DATE: JUN-19-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

Attachment A3
Post-Project Power Flow Diagrams

2025 SUMMER LIGHT

Single Line Diagrams
P2445 - POST-PROJECT
POWER FLOW SC03

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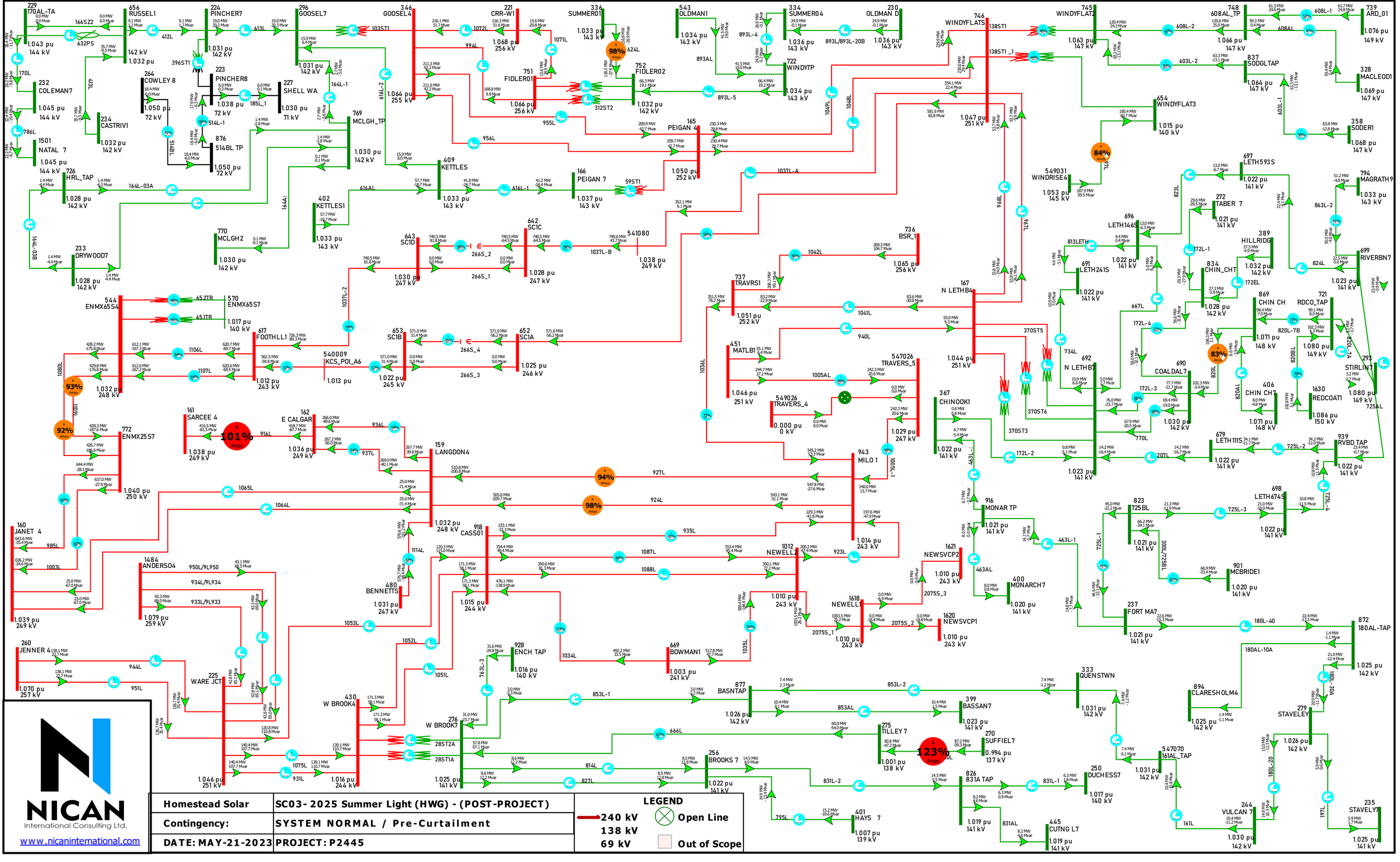
229
170AL-TA
1.043 pu
144 kV
632PS
166SZ2
656
RUSSEL1
1.032 pu
142 kV
412L
224
PINCHER7
1.031 pu
142 kV
613L
396ST1
223
PINCHER8
1.038 pu
72 kV
264
COWLEY 8
1.050 pu
72 kV
227
SHELL WA
1.030 pu
71 kV
185L_1
410L
170L
232
COLEMAN7
1.045 pu
144 kV
234
CASTRIV1
1.032 pu
142 kV
786L
1501
NATAL 7
1.045 pu
144 kV
514BL TP
1.050 pu
72 kV
514L-1
514BL
296
GOOSEL7
1.031 pu
142 kV
164L-1
346
GOOSEL4
1.064 pu
255 kV
103ST1
616L-2
769
MCLGH_TP
1.030 pu
142 kV
726
HRL_TAP
1.028 pu
142 kV
164L-03A
164L-03B
233
DRYWOOD7
1.028 pu
142 kV
164AL
770
MCLGH2
1.030 pu
142 kV
402
KETTLES1
1.033 pu
143 kV
616AL
409
KETTLES
1.033 pu
143 kV
616L-1
166
PEIGAN 7
1.037 pu
143 kV
59ST1
165
PEIGAN 4
1.050 pu
252 kV
1037L-A
1037L-B
541080
1.038 pu
249 kV
642
SC1C
643
SC1D
1.030 pu
247 kV
266S_2
266S_1
1.028 pu
247 kV
653
SC1B
652
SC1A
266S_4
266S_3
1.025 pu
246 kV
1.022 pu
245 kV
617
FOOTHLL1
1.012 pu
243 kV
540009
KCS_POI_A6
1.013 pu
1037L-2
544
ENMX65S4
570
ENMX65S7
1.017 pu
140 kV
1.032 pu
248 kV
1080L
1106L
1107L
1091L
772
ENMX25S7
1.040 pu
250 kV
1065L
1064L
160
JANET 4
1.039 pu
249 kV
985L
1003L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.079 pu
259 kV
260
JENNER 4
1.070 pu
257 kV
944L
951L
225
WARE JCT
1.046 pu
251 kV
1053L
1052L
1051L
430
W BROOK4
1.016 pu
244 kV
1075L
931L
276
W BROOK7
28ST2A
28ST1A
1.025 pu
141 kV
928
ENCH TAP
1.016 pu
140 kV
763L-3
161
SARCEE 4
1.038 pu
249 kV
162
E CALGAR
1.036 pu
249 kV
916L
936L
937L
159
LANGDON4
1.032 pu
248 kV
927L
924L
935L
1087L
1088L
1114L
480
BENNETTS
1.031 pu
247 kV
918
CASS01
1.015 pu
244 kV
1034L
669
BOWMAN1
1.003 pu
241 kV
1035L
877
BASNTAP
1.026 pu
142 kV
853L-1
853L-2
853AL
666L
814L
827L
256
BROOKS 7
1.022 pu
141 kV
795L
401
HAYS 7
1.007 pu
139 kV
1042L
737
TRAVRS1
1.051 pu
252 kV
1041L
451
MATLBT
1.046 pu
251 kV
1005AL
547026
TRAVERS_5
1.029 pu
247 kV
549026
TRAVERS_4
0.000 pu
0 kV
940L
1034L
943
MILO 1
1.014 pu
243 kV
1005L-1
1048L
1049L
543
OLDMAN1
1.034 pu
143 kV
893L-4
893L-5
893AL
334
SUMMER04
1.036 pu
143 kV
893L/893L-20B
230
OLDMAN D
1.036 pu
143 kV
336
SUMMER01
1.033 pu
143 kV
1071L
624L
752
FIDLER02
1.032 pu
142 kV
751
FIDLER01
1.066 pu
256 kV
312ST2
955L
956L
994L
1072L
221
CRR-W1
1.068 pu
256 kV
1071L
736
BSR_1
1.065 pu
256 kV
746
WINDYFLATS
1.044 pu
251 kV
138ST1
138ST1_1
1047L
1046L
722
WINDYTP
1.034 pu
143 kV
893L-5
1.047 pu
251 kV
654
WINDYFLAT3
1.015 pu
140 kV
745
WINDYFLAT2
1.063 pu
147 kV
549031
WINDRISE4
1.053 pu
145 kV
697L
698L
167
N LETHBR4
1.044 pu
251 kV
370ST5
370ST6
370ST3
734L
692
N LETHBR7
1.030 pu
142 kV
690
COALDAL7
1.030 pu
142 kV
667L
172L-1
172L-2
172L-3
172L-4
813LETH
691
LETH241S
1.022 pu
141 kV
696
LETH146S
1.022 pu
141 kV
748
608AL_TP
1.066 pu
147 kV
608L-1
608L-2
608AL
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
739
ARD_01
1.076 pu
149 kV
328
MACLEOD1
1.069 pu
147 kV
358
SODER1
1.068 pu
147 kV
697
LETH593S
1.022 pu
141 kV
823L
272
TABER 7
1.021 pu
141 kV
834
CHIN_CHT
1.028 pu
142 kV
172L-1
172EL
389
HILLRIDG
1.032 pu
142 kV
824L
794
MAGRATH9
1.033 pu
143 kV
863L-2
699
RIVERBN7
1.023 pu
141 kV
869
CHIN CH
1.071 pu
148 kV
820L-7B
820L-7A
721
RDCO_TAP
1.080 pu
149 kV
293
STIRLIN7
1.080 pu
149 kV
725AL
820BL
820AL
406
CHIN CH7
1.071 pu
148 kV
1630
REDCOATI
1.086 pu
150 kV
679
LETH111S
1.022 pu
141 kV
725L-2
939
RVBD TAP
1.022 pu
141 kV
698
LETH674S
1.022 pu
141 kV
725L-3
725L-4
823
725BL
1.021 pu
141 kV
3001/725BL
901
MCBRIDE1
1.020 pu
141 kV
725L-1
237
FORT MA7
1.021 pu
141 kV
180L-40
872
180AL-TAP
1.025 pu
142 kV
180AL-10A
894
CLARESHOLM4
1.025 pu
142 kV
180L-30A
279
STAVELEY
1.026 pu
142 kV
180L-20
547070
161AL_TAP
1.031 pu
142 kV
161L
244
VULCAN 7
1.030 pu
142 kV
235
STAVELY7
1.025 pu
141 kV
197L
333
QUENSTWN
1.031 pu
142 kV
399
BASSAN7
1.023 pu
141 kV
275
TILLEY 7
1.001 pu
138 kV
270
SUFFIEL7
0.994 pu
137 kV
250
DUCHESS7
1.017 pu
140 kV
826
831A TAP
1.019 pu
141 kV
831L-1
831L-2
831AL
445
CUTNG L7
1.019 pu
141 kV
367
CHINOOK1
1.022 pu
141 kV
463L-1
463L-2
916
MONAR TP
1.021 pu
141 kV
463AL
400
MONARCH7
1.020 pu
141 kV
1621
NEWSVCP2
1.010 pu
243 kV
2075S_3
1618
NEWELL1
1.010 pu
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2075S_1
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1620
NEWSVCP1
1.010 pu
243 kV
1012
NEWELL2
1.010 pu
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923L
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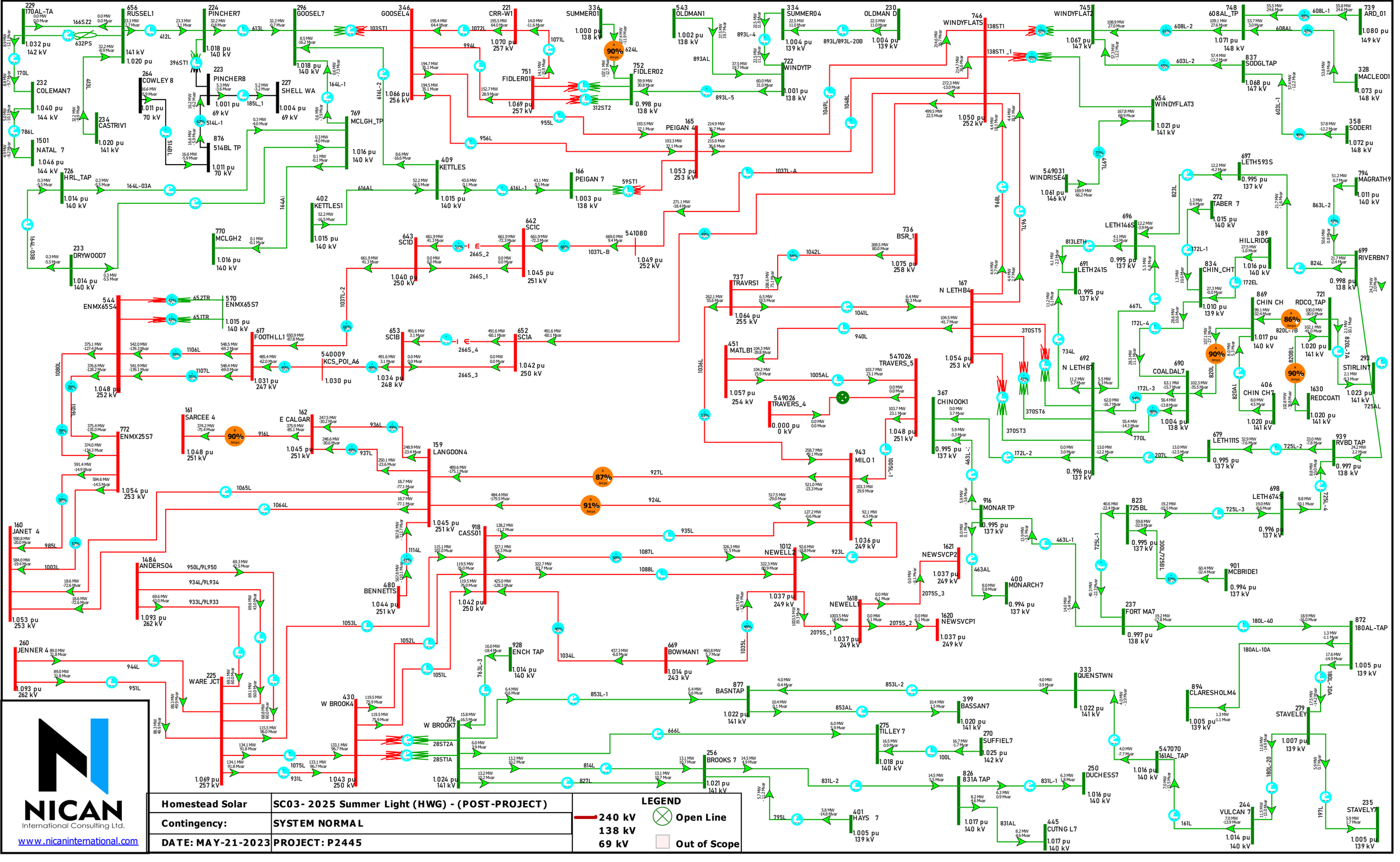
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:
SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**SYSTEM NORMAL**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

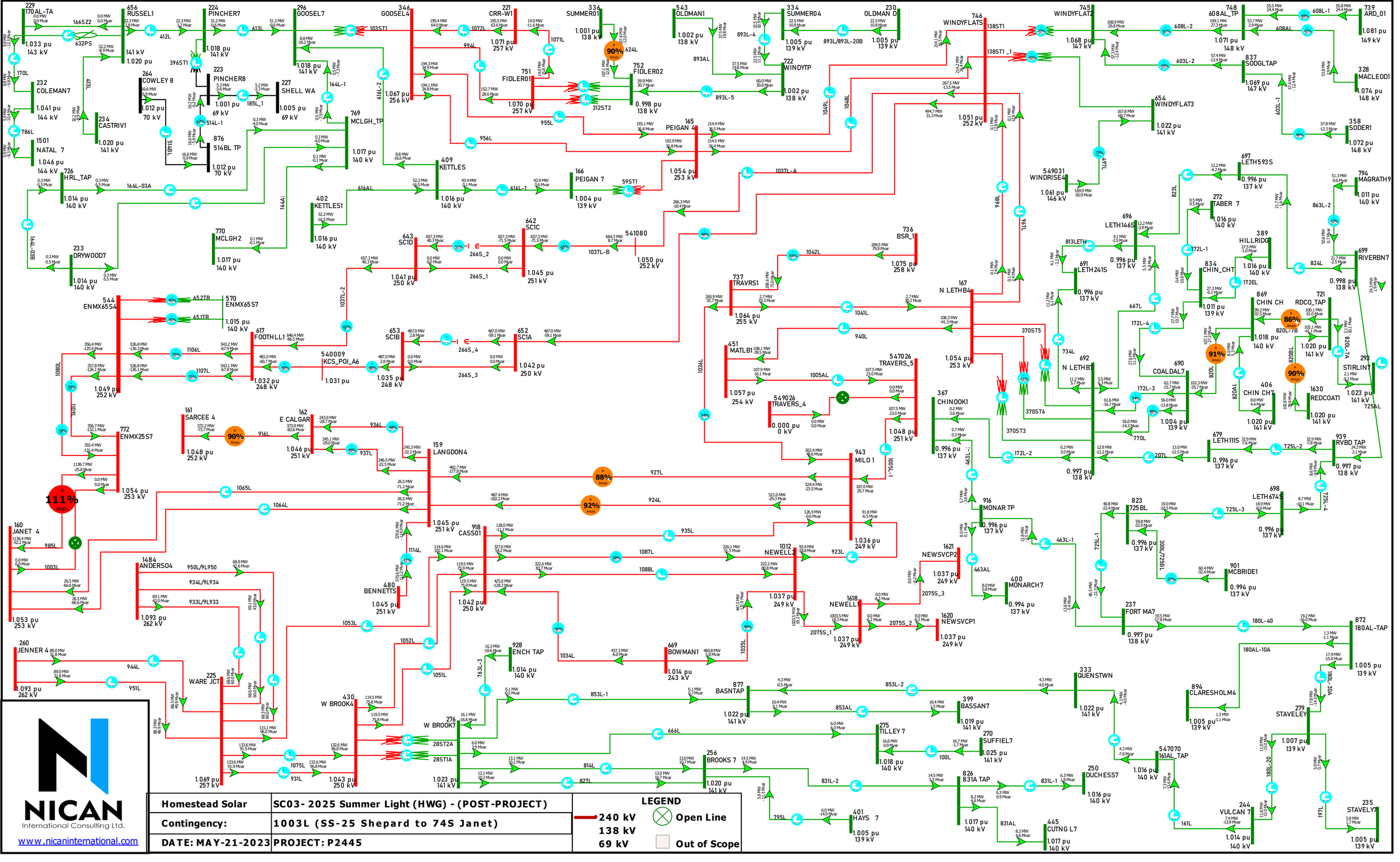
240 kV

138 kV

69 kV

ⓧ **Open Line**

☐ **Out of Scope**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170AL_TA
1.033 pu
143 kV
166SZ2
632PS
656
RUSSEL1
141 kV
1.020 pu
412L
224
PINCHER7
1.018 pu
141 kV
613L
296
GOOSEL7
1.018 pu
141 kV
396ST1
223
PINCHER8
1.001 pu
69 kV
185L_1
227
SHELL WA
1.005 pu
69 kV
264
COWLEY 8
1.012 pu
70 kV
514L
514L-1
876
514BL TP
1.012 pu
70 kV
164L-1
769
MCLGH_TP
1.017 pu
140 kV
346
GOOSEL4
103ST1
1.067 pu
256 kV
616L-2
995L
956L
955L
221
CRR-W1
1.071 pu
257 kV
1071L
751
FIDLER01
1.070 pu
257 kV
312ST2
336
SUMMER01
1.001 pu
138 kV
90%
624L
752
FIDLER02
0.998 pu
138 kV
543
OLDMAN1
1.002 pu
138 kV
893L-5
893AL
334
SUMMER04
1.005 pu
139 kV
893L-4
230
OLDMAN D
1.005 pu
139 kV
893L/893L-20B
722
WINDYTP
1.002 pu
138 kV
165
PEIGAN 4
1.054 pu
253 kV
1049L
1048L
746
WINDYFLATS
138ST1
138ST1 _1
1.051 pu
252 kV
654
WINDYFLAT3
1.022 pu
141 kV
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WINDYFLAT2
1.068 pu
147 kV
608L-2
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1.071 pu
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MACLEOD1
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697L
549031
WINDRISE4
1.061 pu
146 kV
169.9 MW
65.9 Mvar
697
LETH593S
0.996 pu
137 kV
794
MAGRATH9
1.011 pu
140 kV
863L-2
823L
272
TABER 7
1.016 pu
140 kV
172L-1
696
LETH146S
0.996 pu
137 kV
813LETH
691
LETH241S
0.996 pu
137 kV
389
HILLRIDG
1.016 pu
140 kV
824L
699
RIVERBN7
0.998 pu
138 kV
834
CHIN_CHT
1.011 pu
139 kV
172EL
869
CHIN CH
1.018 pu
140 kV
820L-7B
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406
CHIN CH7
1.020 pu
141 kV
721
RDCO_TAP
1.020 pu
141 kV
820L-7A
293
STIRLIN7
1.023 pu
141 kV
725AL
1630
REDCOAT1
1.020 pu
141 kV
667L
172L-4
690
COALDAL7
1.004 pu
139 kV
172L-3
820L
1020L
172L-2
207L
770L
679
LETH111S
0.996 pu
137 kV
725L-2
939
RVBD_TAP
0.997 pu
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LETH674S
0.996 pu
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0.996 pu
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901
MCBRIDE1
0.994 pu
137 kV
400
MONARCH7
0.994 pu
137 kV
463L-1
463AL
1621
NEWSVCP2
1.037 pu
249 kV
2075S_3
916
MONAR TP
0.996 pu
137 kV
463L-;
367
CHINOOK1
0.996 pu
137 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.054 pu
253 kV
167
N LETHB4
1041L
940L
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736
BSR_1
1.075 pu
258 kV
737
TRAVRS1
1.064 pu
255 kV
451
MATLB1
1.057 pu
254 kV
1005AL
547026
TRAVERS_5
1.048 pu
251 kV
549026
TRAVERS_4
0.000 pu
0 kV
943
MILO 1
1.036 pu
249 kV
1005L-1
1037L-A
1037L-B
541080
1.050 pu
252 kV
642
SC1C
643
SC1D
1.045 pu
251 kV
266S_2
266S_1
653
SC1B
652
SC1A
1.042 pu
250 kV
266S_4
266S_3
1.035 pu
248 kV
540009
KCS_POI_A6
1.031 pu
617
FOOTHLL1
1.032 pu
248 kV
1037L-2
544
ENMX65S4
570
ENMX65S7
1.015 pu
140 kV
65.2TR
65.1TR
1106L
1107L
1080L
1049 pu
252 kV
1091L
772
ENMX25S7
1.054 pu
253 kV
111%
985L
1003L
160
JANET 4
1.053 pu
253 kV
1065L
1064L
1045 pu
251 kV
1114L
918
CASS01
1.042 pu
250 kV
480
BENNETS
1.045 pu
251 kV
1053L
1052L
1051L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.093 pu
262 kV
260
JENNER 4
1.093 pu
262 kV
944L
951L
225
WARE JCT
1.069 pu
257 kV
1075L
931L
430
W BROOK4
1.043 pu
250 kV
276
W BROOK7
1.023 pu
141 kV
28ST2A
28ST1A
763L-3
928
ENCH TAP
1.014 pu
140 kV
1034L
1035L
669
BOWMAN1
1.014 pu
243 kV
877
BASNTAP
1.022 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.019 pu
141 kV
333
QUENSTWN
1.022 pu
141 kV
894
CLARESHOLM4
1.005 pu
139 kV
180AL-10A
872
180AL-TAP
1.005 pu
139 kV
180L-40
180L-30A
279
STAVELEY
1.007 pu
139 kV
180L-20
197L
235
STAVELY7
1.005 pu
139 kV
275
TILLEY 7
1.018 pu
140 kV
666L
100L
270
SUFFIEL7
1.025 pu
141 kV
547070
161AL_TAP
1.016 pu
140 kV
161L
244
VULCAN 7
1.014 pu
140 kV
826
831A TAP
1.017 pu
140 kV
831L-2
831L-1
250
DUCHESS7
1.016 pu
140 kV
831AL
445
CUTNG L7
1.017 pu
140 kV
795L
401
HAYS 7
1.005 pu
139 kV
1618
NEWELL1
1.037 pu
249 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.037 pu
249 kV
1012
NEWELL2
1.037 pu
249 kV
923L
935L
1087L
1088L
927L
924L
88%
92%
1072L
994L
1071L
1070 pu
257 kV
955L
956L
1037L-A
1037L-B
1049L
1048L
1041L
940L
1042L
1034L
1035L
1053L
1052L
1051L
1087L
1088L
927L
924L
935L
1005L-1
1036L
1037L
1038L
1039L
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1069L
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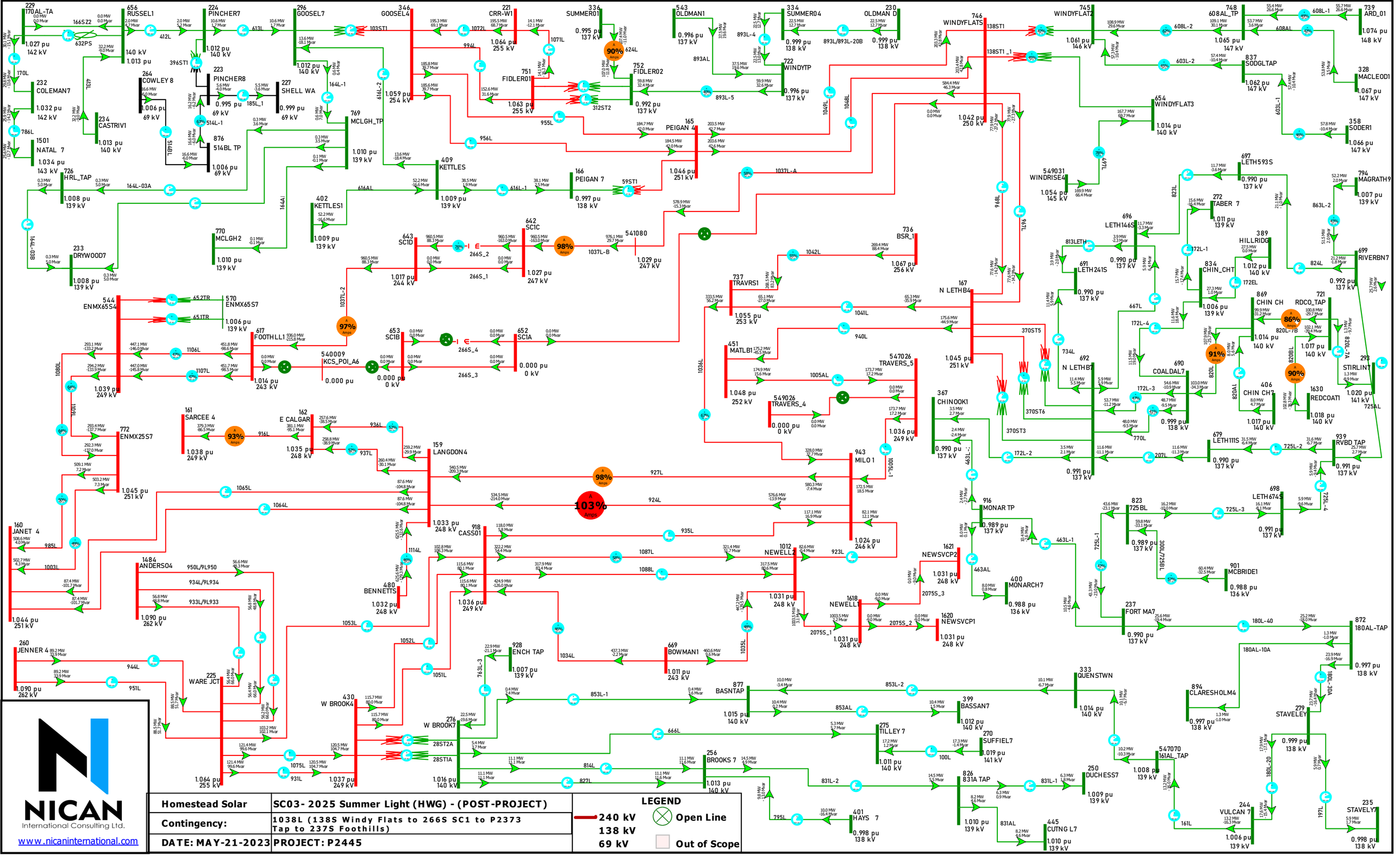
1082L



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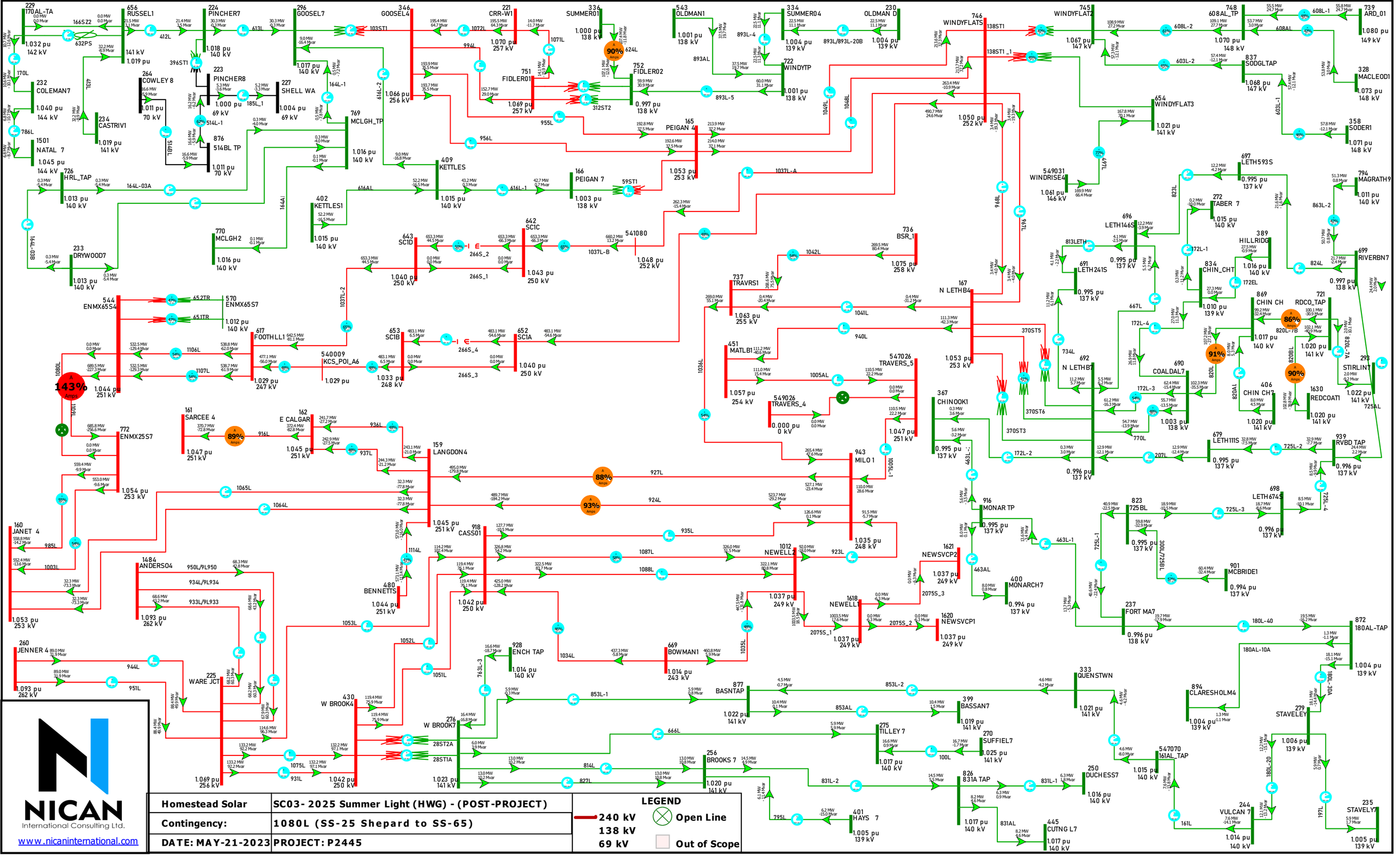
Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



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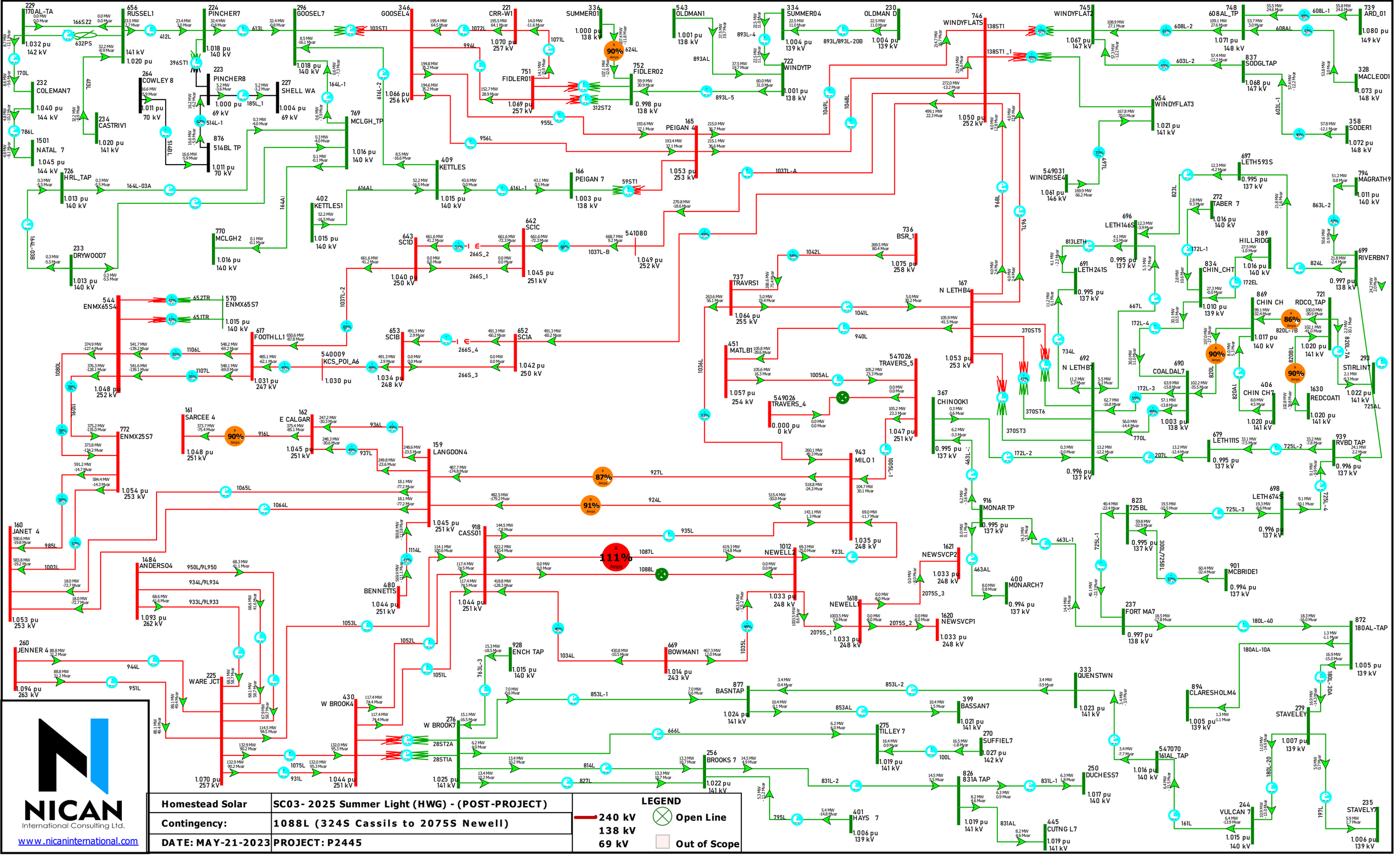
Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**1080L (SS-25 Shepard to SS-65)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



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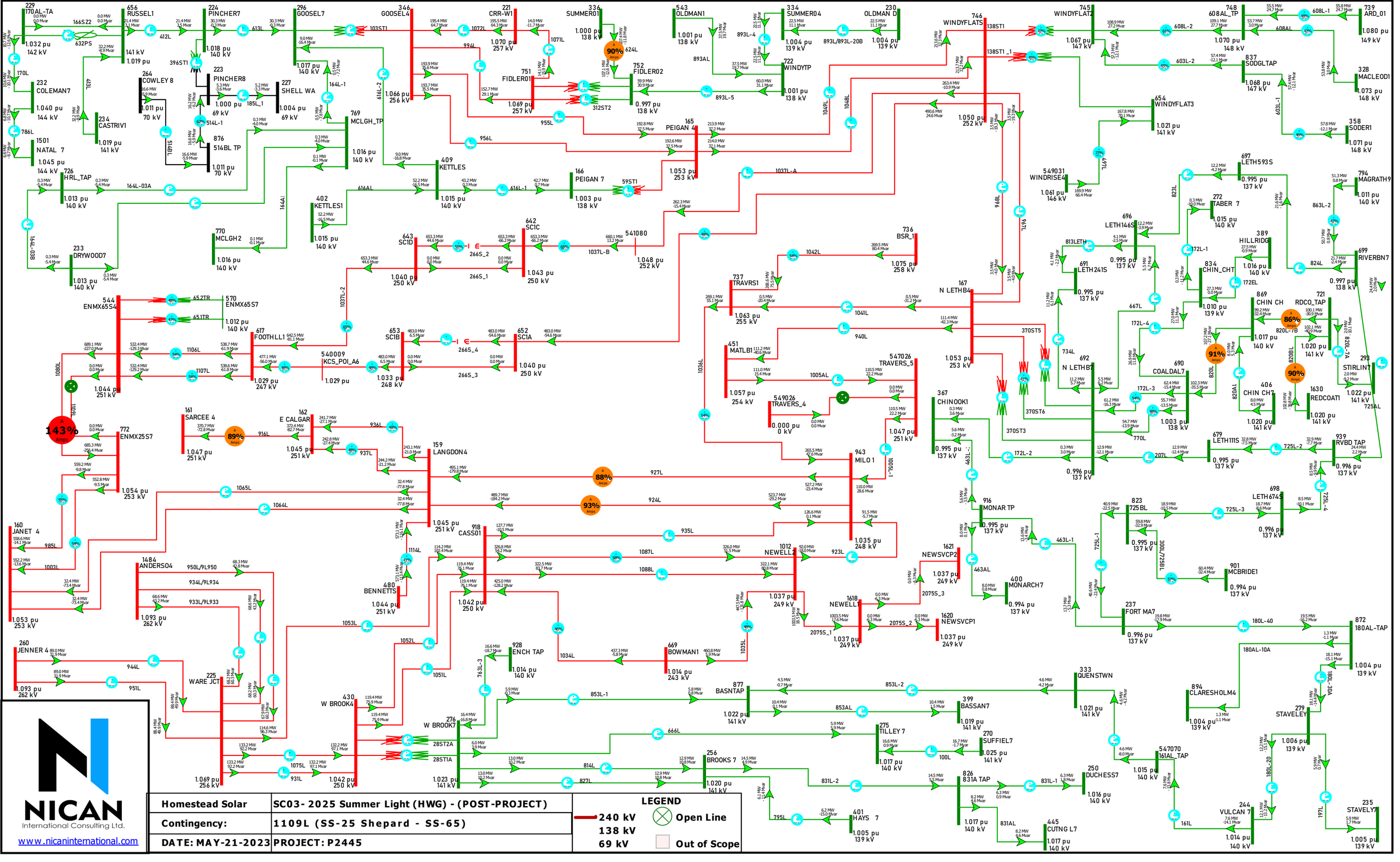
Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**1088L (324S Cassils to 2075S Newell)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope



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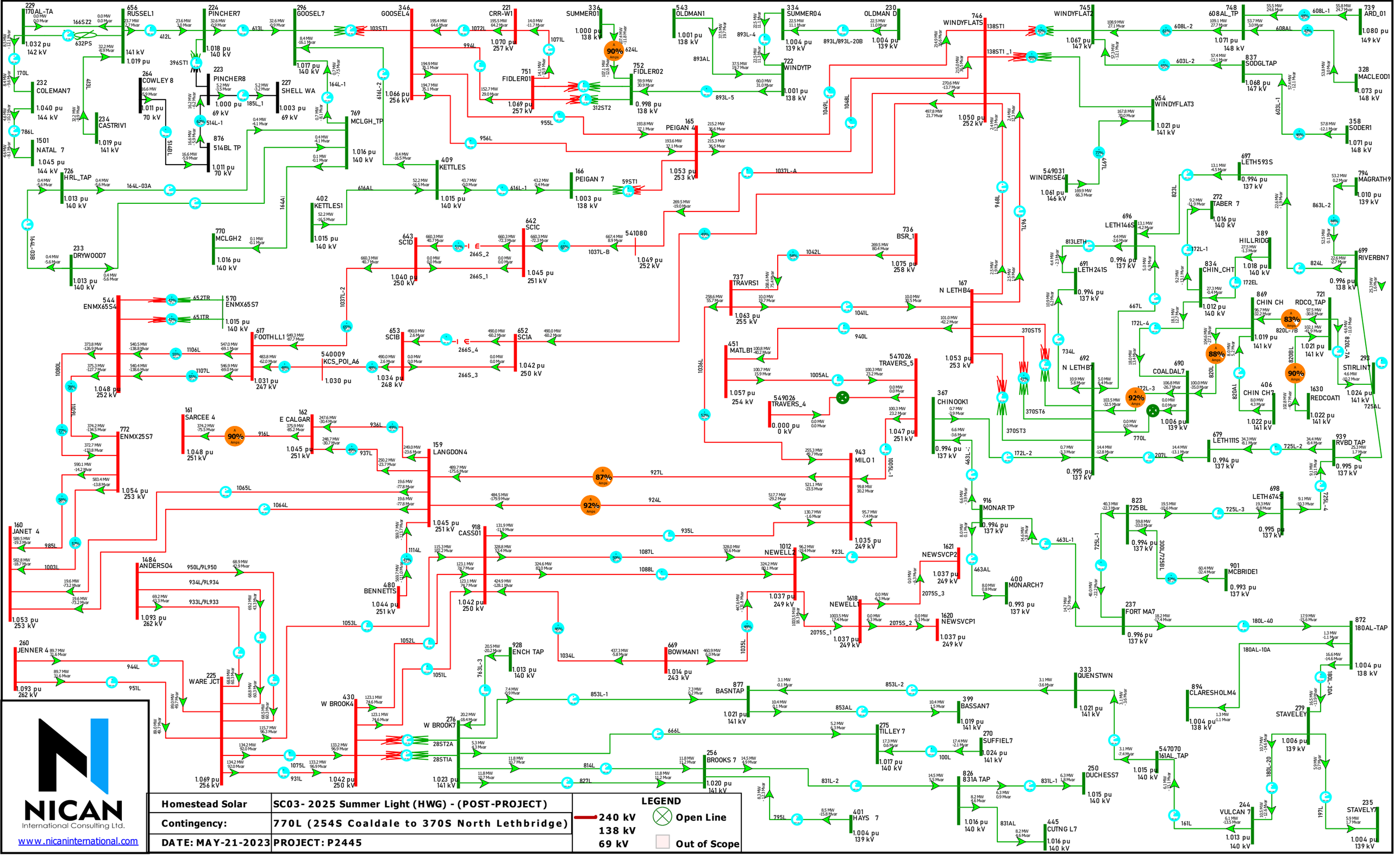
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	1109L (SS-25 Shepard - SS-65)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV
Open Line
Out of Scope



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Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**770L (254S Coaldale to 370S North Lethbridge)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

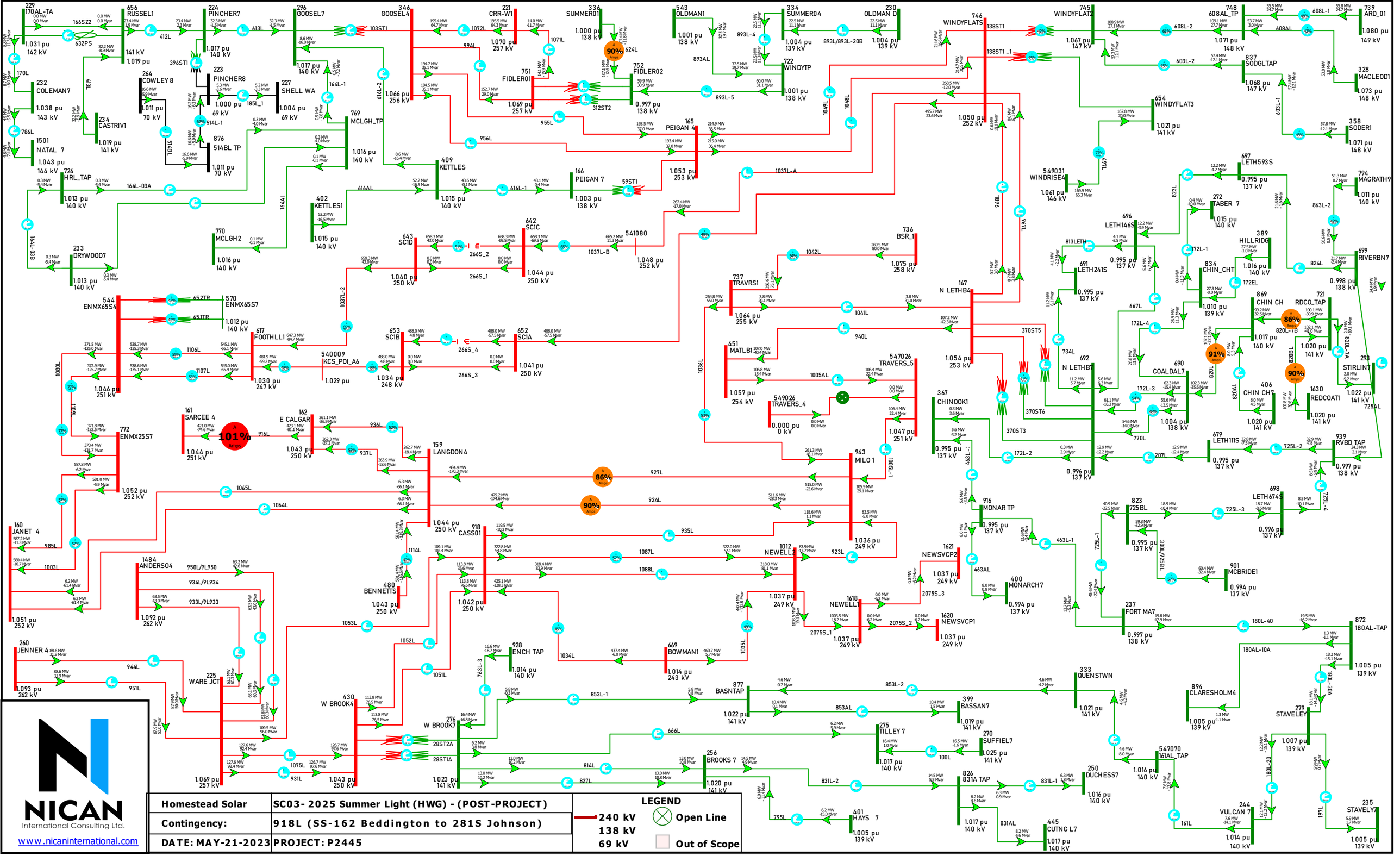
240 kV

138 kV

69 kV

○ Open Line

☐ Out of Scope



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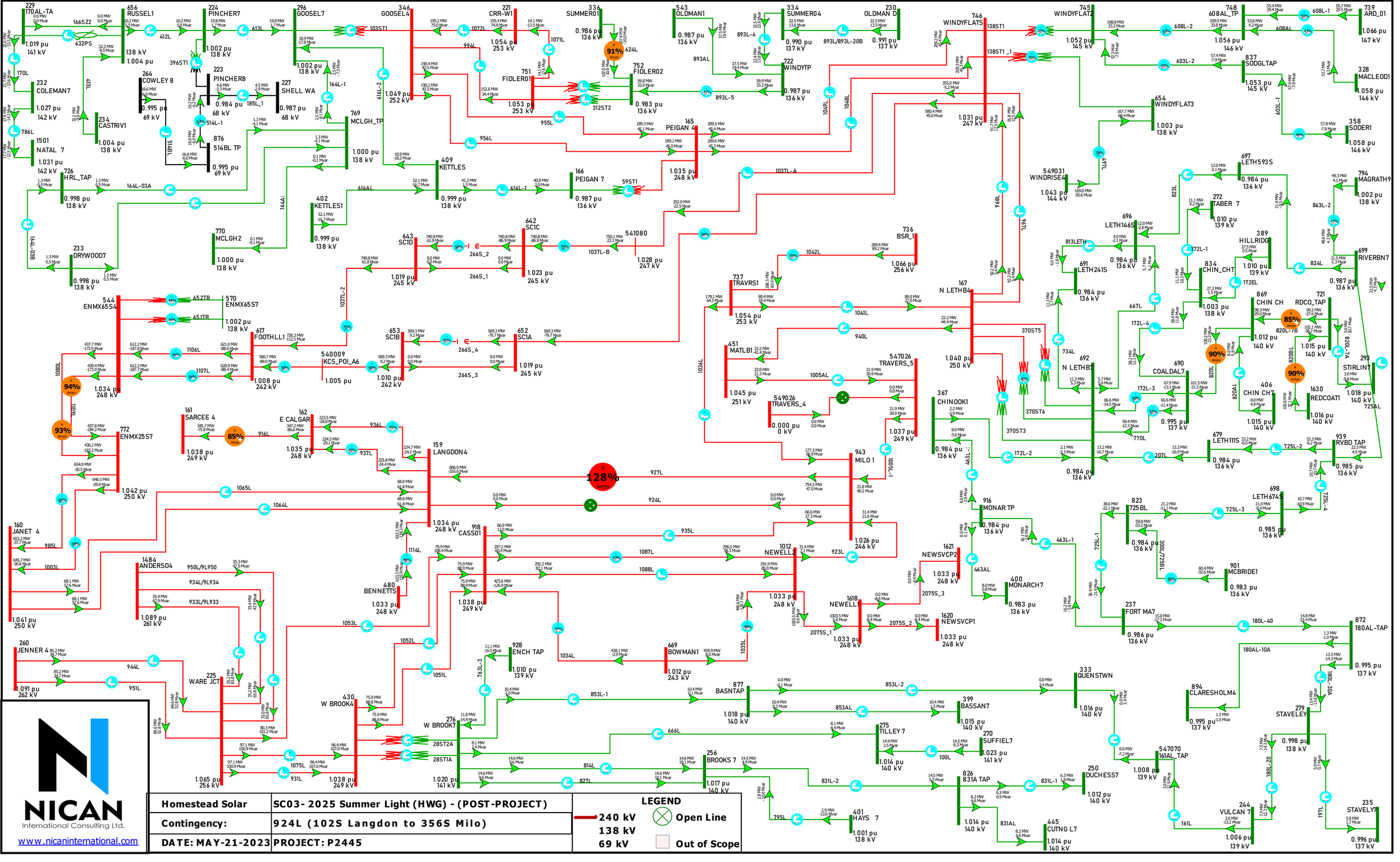
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	918L (SS-162 Beddington to 281S Johnson)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND
240 kV
138 kV
69 kV
⊗ Open Line
☐ Out of Scope



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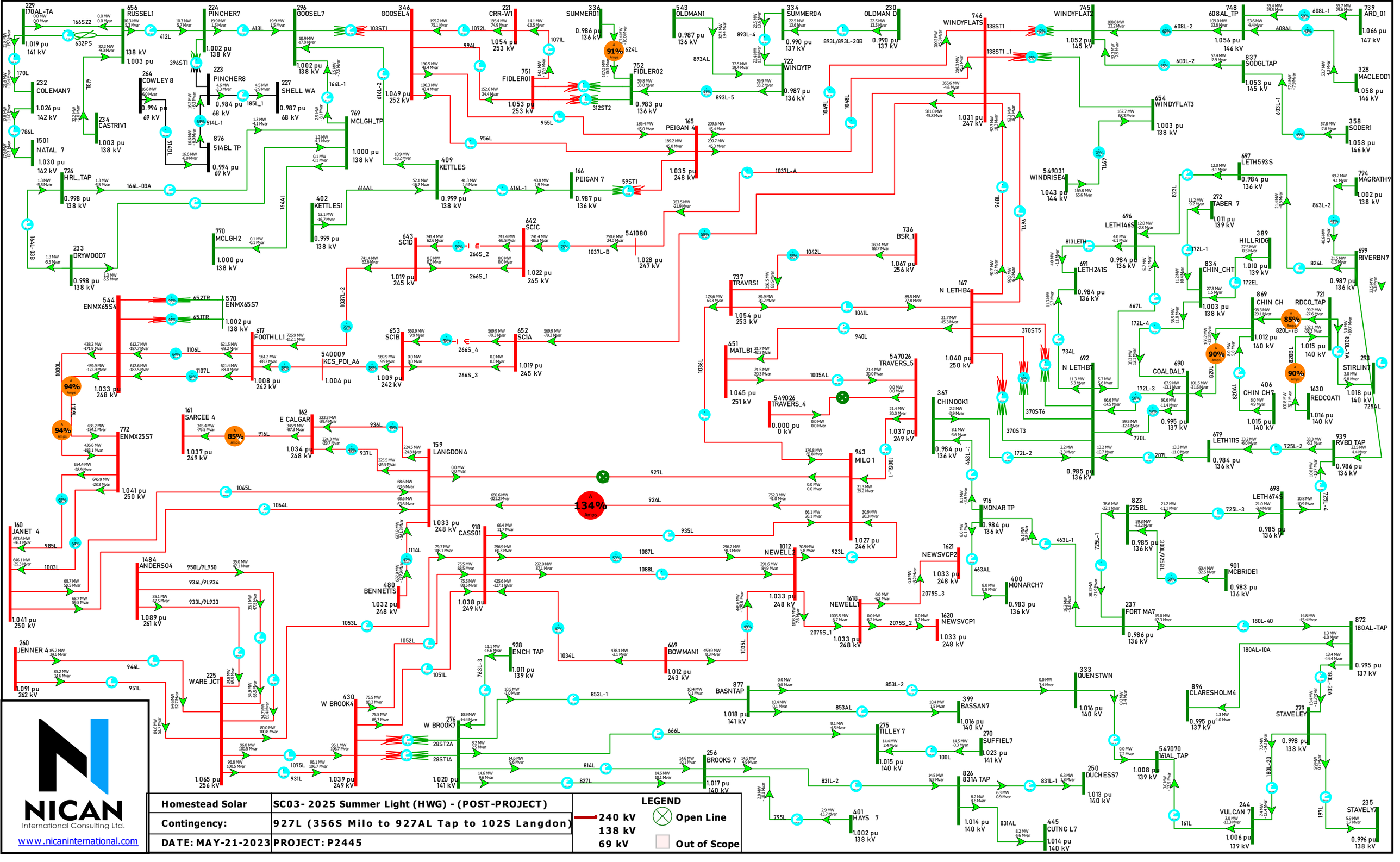
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	924L (102S Langdon to 356S Milo)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV	Open Line
138 kV	
69 kV	Out of Scope



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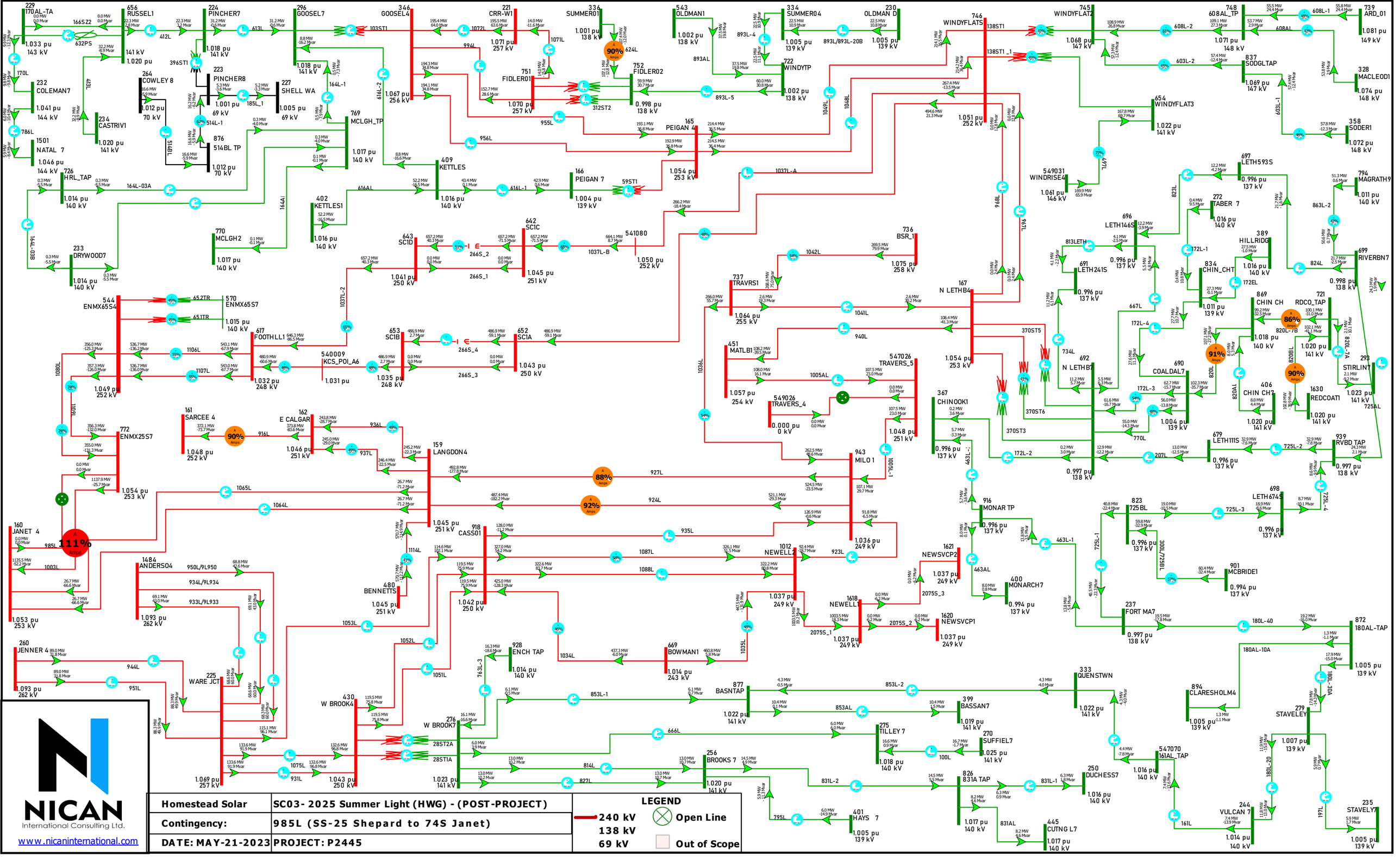
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	985L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023	PROJECT: P2445

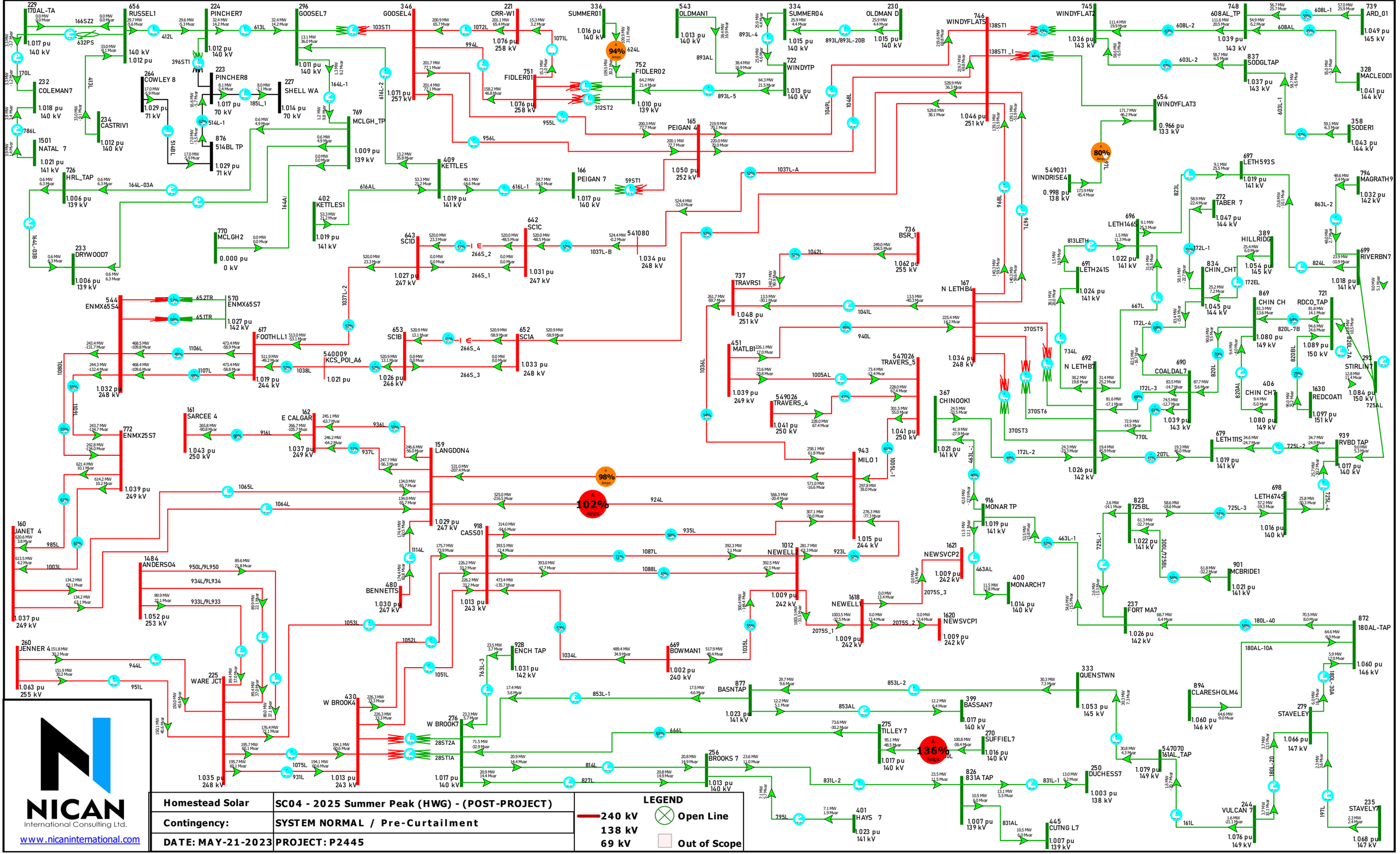
LEGEND

240 kV	⊗ Open Line
138 kV	
69 kV	☐ Out of Scope

2025 SUMMER PEAK

Single Line Diagrams
P2445 - POST-PROJECT
POWER FLOW SC04

NICAN



Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**	
Contingency:	**SYSTEM NORMAL / Pre-Curtailment**	
DATE: MAY-21-2023	**PROJECT: P2445**	

LEGEND

240 kV	⊗ Open Line
138 kV	
69 kV	☐ Out of Scope

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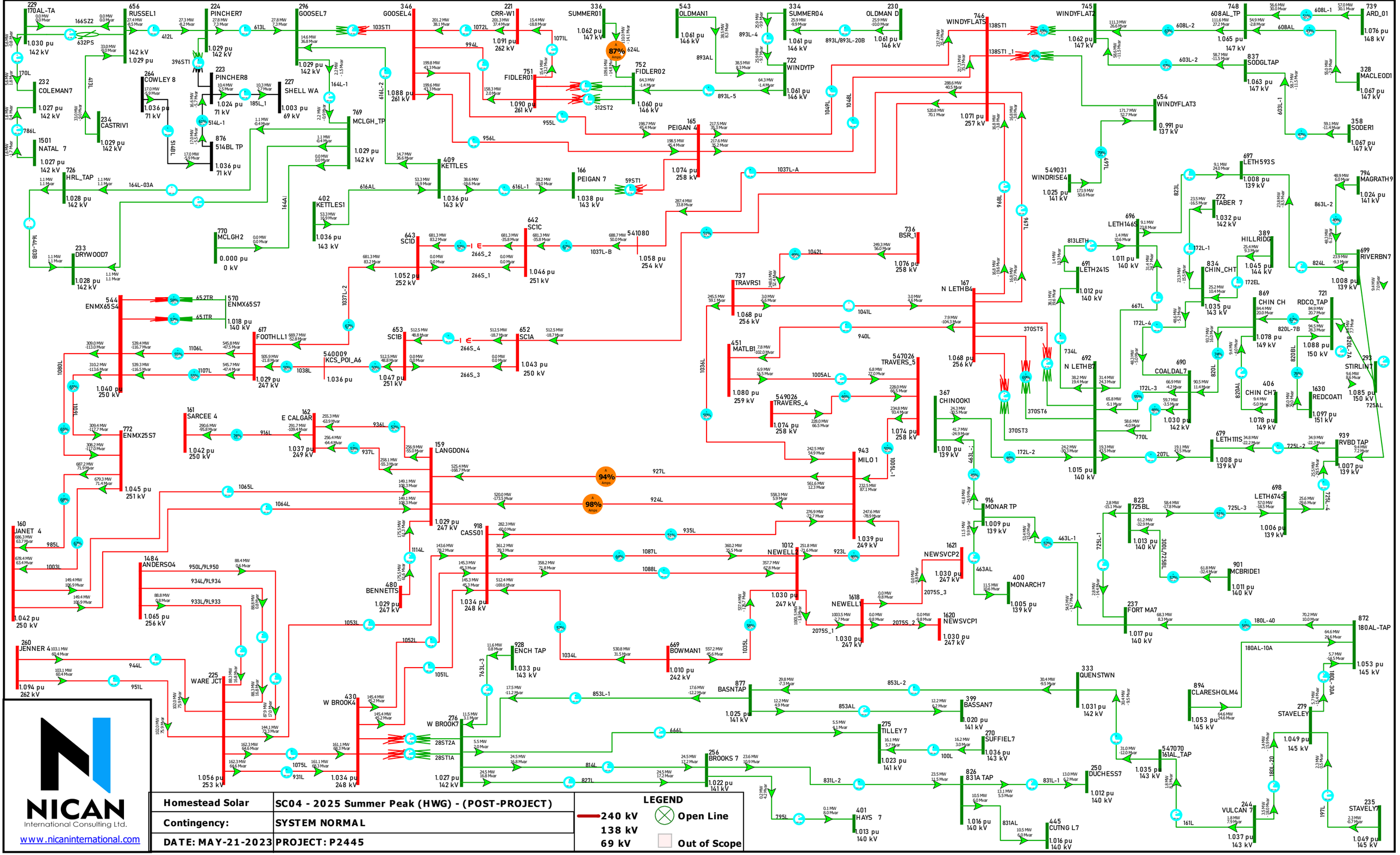

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Homestead Solar	SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:	SYSTEM NORMAL
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

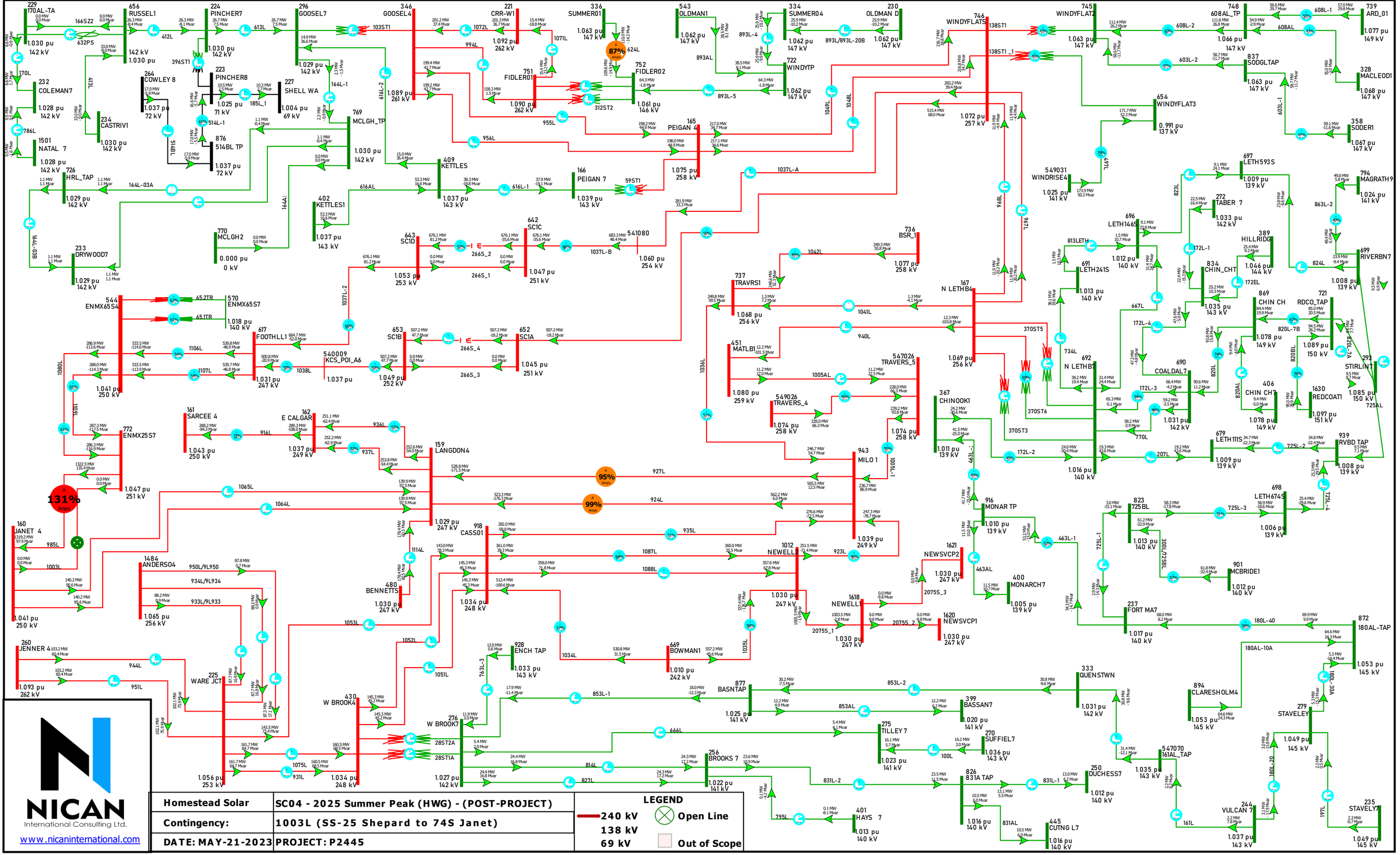
240 kV

138 kV

69 kV

⊗ Open Line

▢ Out of Scope


229
170AL-TA
1.030 pu
142 kV
656
RUSSEL1
142 kV
1.030 pu
224
PINCHER7
1.030 pu
142 kV
296
GOOSEL7
1.029 pu
142 kV
346
GOOSEL4
1.089 pu
261 kV
221
CRR-W1
1.092 pu
262 kV
336
SUMMER01
1.063 pu
147 kV
87%
624L
543
OLDMAN1
1.062 pu
147 kV
334
SUMMER04
1.062 pu
147 kV
230
OLDMAN D
1.062 pu
147 kV
745
WINDYFLAT2
1.063 pu
147 kV
748
608AL_TP
1.066 pu
147 kV
739
ARD_01
1.077 pu
149 kV
608AL
608L-2
608L-1
603L-2
603L-1
837
SODGLTAP
1.063 pu
147 kV
328
MACLEOD1
1.068 pu
147 kV
358
SODER1
1.067 pu
147 kV
654
WINDYFLAT3
0.991 pu
137 kV
746
WINDYFLAT1
1.072 pu
257 kV
138ST1
138ST1_1
722
WINDYTP
1.062 pu
147 kV
752
FIDLER02
1.061 pu
146 kV
751
FIDLER01
1.090 pu
262 kV
312ST2
893L-4
893L/893L-20B
893L-5
893AL
264
COWLEY 8
1.037 pu
72 kV
223
PINCHER8
1.025 pu
71 kV
227
SHELL WA
1.004 pu
69 kV
185L_1
396ST1
232
COLEMAN7
1.028 pu
142 kV
234
CASTRIV1
1.030 pu
142 kV
1501
NATAL 7
1.028 pu
142 kV
786L
514L-1
514AL
876
514BL TP
1.037 pu
72 kV
769
MCLGH_TP
1.030 pu
142 kV
770
MCLGH2
0.000 pu
0 kV
726
HRL_TAP
1.029 pu
142 kV
233
DRYWOOD7
1.029 pu
142 kV
164L-03A
164L-03B
164AL
165
PEIGAN 4
1.075 pu
258 kV
166
PEIGAN 7
1.039 pu
143 kV
59ST1
409
KETTLES
1.037 pu
143 kV
402
KETTLES1
1.037 pu
143 kV
616AL
616L-1
616L-2
955L
956L
994L
1071L
1072L
1037L-A
1037L-B
1048L
1049L
1070L
1086L
1067L
541080
1.060 pu
254 kV
642
SC1C
1.047 pu
251 kV
643
SC1D
1.053 pu
253 kV
266S_1
266S_2
736
BSR_1
1.077 pu
258 kV
1042L
737
TRAVRS1
1.068 pu
256 kV
1041L
940L
451
MATLBI
1.080 pu
259 kV
547026
TRAVERS_5
1.074 pu
258 kV
1005AL
549026
TRAVERS_4
1.074 pu
258 kV
167
N LETHB4
1.069 pu
256 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.016 pu
140 kV
367
CHINOOK1
1.011 pu
139 kV
463L-1
916
MONAR TP
1.010 pu
139 kV
1621
NEWSVCP2
1.030 pu
247 kV
2075S_3
463AL
400
MONARCH7
1.005 pu
139 kV
549031
WINDRISE4
1.025 pu
141 kV
697
LETH593S
1.009 pu
139 kV
794
MAGRATH9
1.024 pu
141 kV
863L-2
272
TABER 7
1.033 pu
142 kV
823L
172L-1
696
LETH146S
1.012 pu
140 kV
813LETH
691
LETH241S
1.013 pu
140 kV
834
CHIN_CHT
1.035 pu
143 kV
389
HILLRIDG
1.046 pu
144 kV
824L
699
RIVERBN7
1.008 pu
139 kV
172EL
667L
172L-4
172L-3
690
COALDAL7
1.031 pu
142 kV
869
CHIN CH
1.078 pu
149 kV
820L-7B
820L-7A
721
RDCO_TAP
1.089 pu
150 kV
820BL
820L
820AL
406
CHIN CH7
1.078 pu
149 kV
1630
REDCOAT1
1.097 pu
151 kV
293
STIRLIN7
1.085 pu
150 kV
725AL
770L
207L
679
LETH111S
1.009 pu
139 kV
939
RVBD TAP
1.008 pu
139 kV
725L-2
698
LETH674S
1.006 pu
139 kV
725L-3
725L-4
823
725BL
1.013 pu
140 kV
3001/725BL
725L-1
901
MCBRIDE1
1.012 pu
140 kV
237
FORT MA7
1.017 pu
140 kV
180L-40
872
180AL-TAP
1.053 pu
145 kV
180AL-10A
894
CLARESHOLM4
1.053 pu
145 kV
180L-30A
279
STAVELEY
1.049 pu
145 kV
180L-20
197L
235
STAVELY7
1.049 pu
145 kV
547070
161AL_TAP
1.035 pu
143 kV
161L
244
VULCAN 7
1.037 pu
143 kV
544
ENMX65S4
1.041 pu
250 kV
65.2TR
65.1TR
570
ENMX65S7
1.018 pu
140 kV
1080L
1090L
1091L
1106L
1107L
617
FOOTHLL1
1.031 pu
247 kV
1038L
540009
KCS_POI_A6
1.037 pu
653
SC1B
1.049 pu
252 kV
652
SC1A
1.045 pu
251 kV
266S_3
266S_4
1037L-2
772
ENMX25S7
1.047 pu
251 kV
161
SARCEE 4
1.043 pu
250 kV
162
E CALGAR
1.037 pu
249 kV
936L
937L
159
LANGDON4
1.029 pu
247 kV
927L
924L
95%
99%
131%
160
JANET 4
1.041 pu
250 kV
985L
1003L
1064L
1065L
1484
ANDERSO4
1.065 pu
256 kV
950L/9L950
934L/9L934
933L/9L933
944L
951L
260
JENNER 4
1.093 pu
262 kV
225
WARE JCT
1.056 pu
253 kV
1053L
1052L
1051L
1114L
480
BENNETTS
1.030 pu
247 kV
1034L
1035L
763L-3
928
ENCH TAP
1.033 pu
143 kV
669
BOWMAN1
1.010 pu
242 kV
430
W BROOK4
1.034 pu
248 kV
276
W BROOK7
1.027 pu
142 kV
28ST2A
28ST1A
1075L
931L
666L
814L
827L
877
BASNTAP
1.025 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.020 pu
141 kV
333
QUENSTWN
1.031 pu
142 kV
275
TILLEY 7
1.023 pu
141 kV
100L
270
SUFFIEL7
1.036 pu
143 kV
256
BROOKS 7
1.022 pu
141 kV
831L-2
831L-1
826
831A TAP
1.016 pu
140 kV
831AL
445
CUTNG L7
1.016 pu
140 kV
250
DUCHESS7
1.012 pu
140 kV
795L
401
HAYS 7
1.013 pu
140 kV
943
MILO 1
1.039 pu
249 kV
1005L-1
1035L-1
1018L
1018L-1
1018L-2
1018L-3
1018L-4
1018L-5
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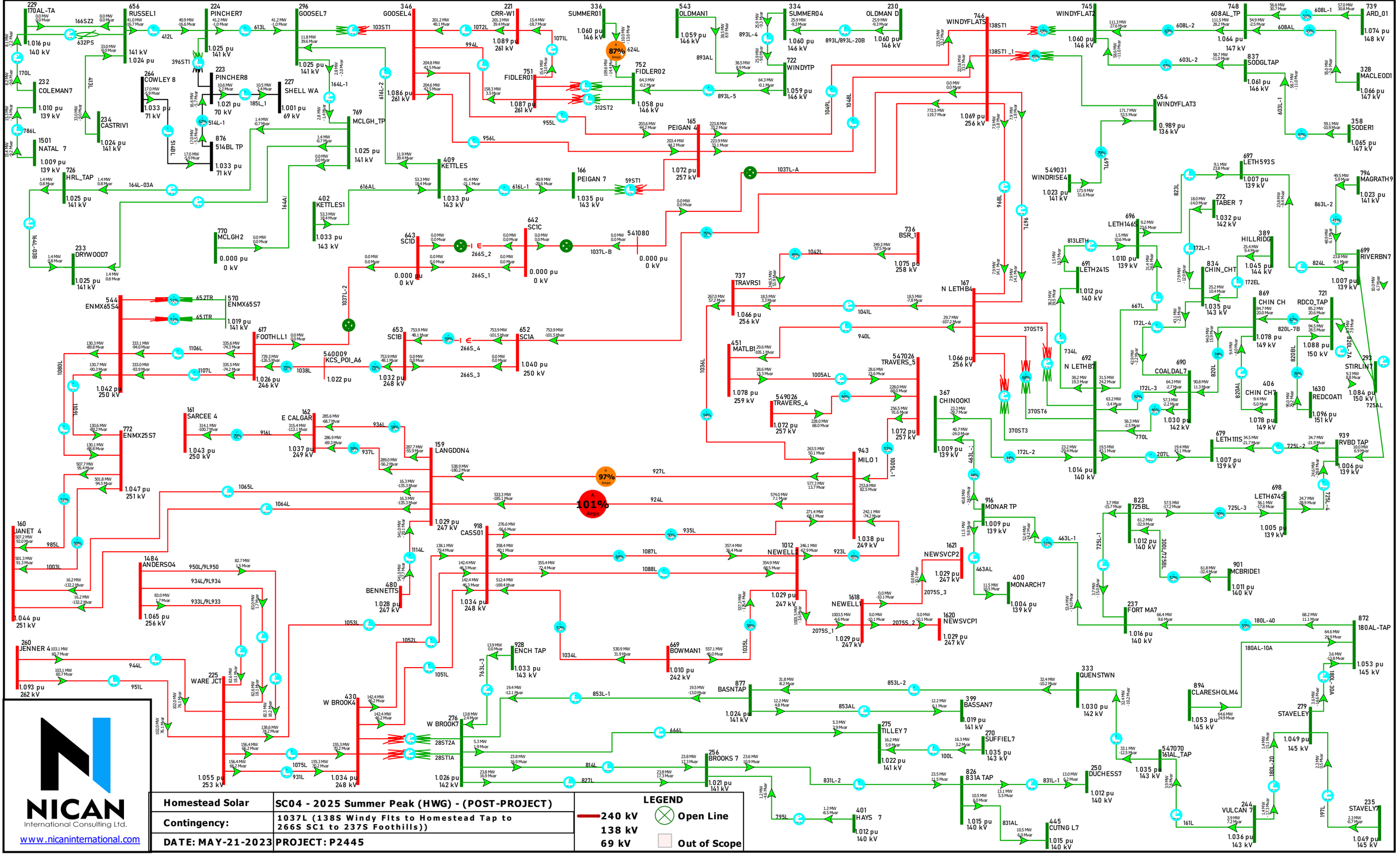
1018L-40



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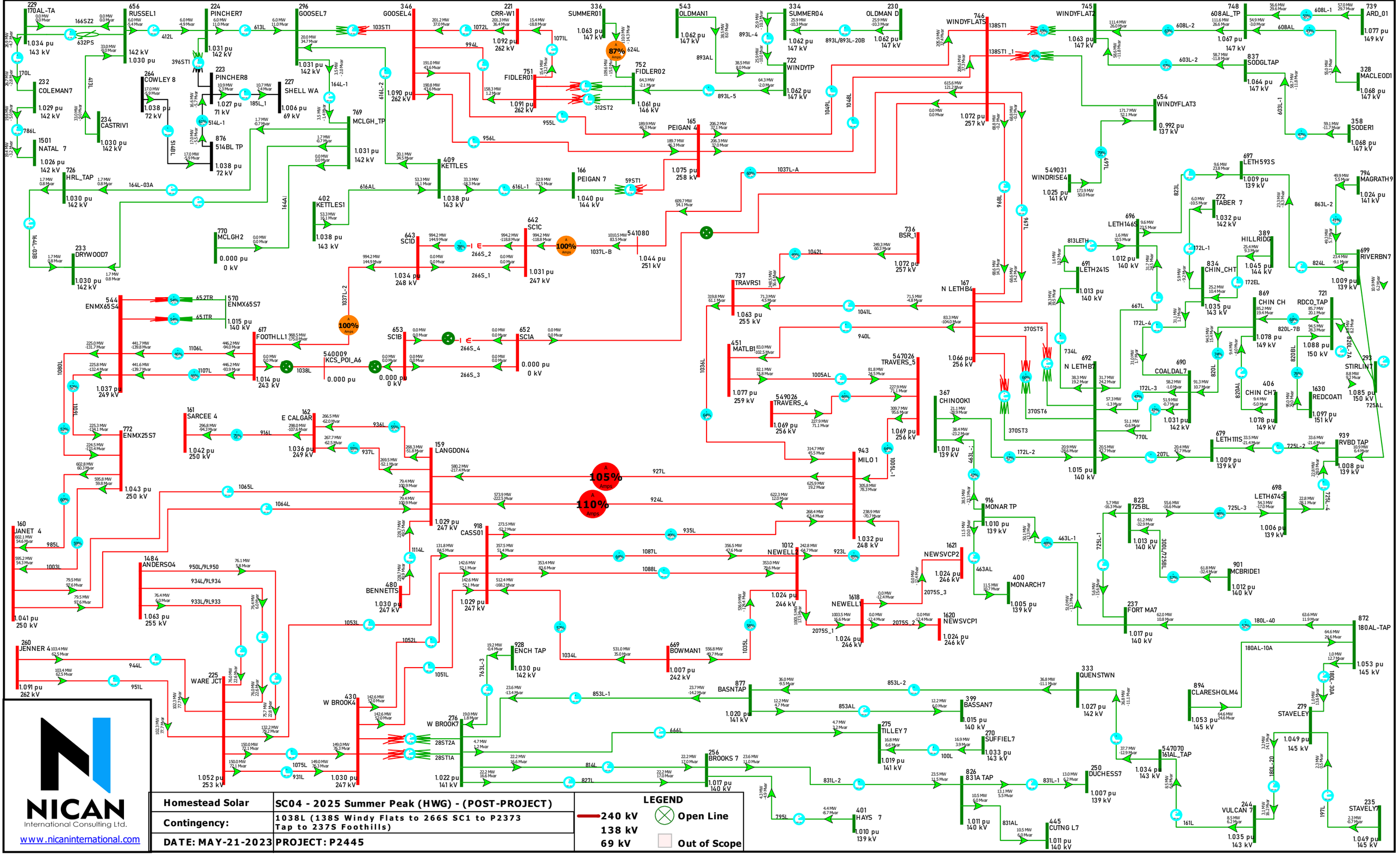
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
Open Line
Out of Scope



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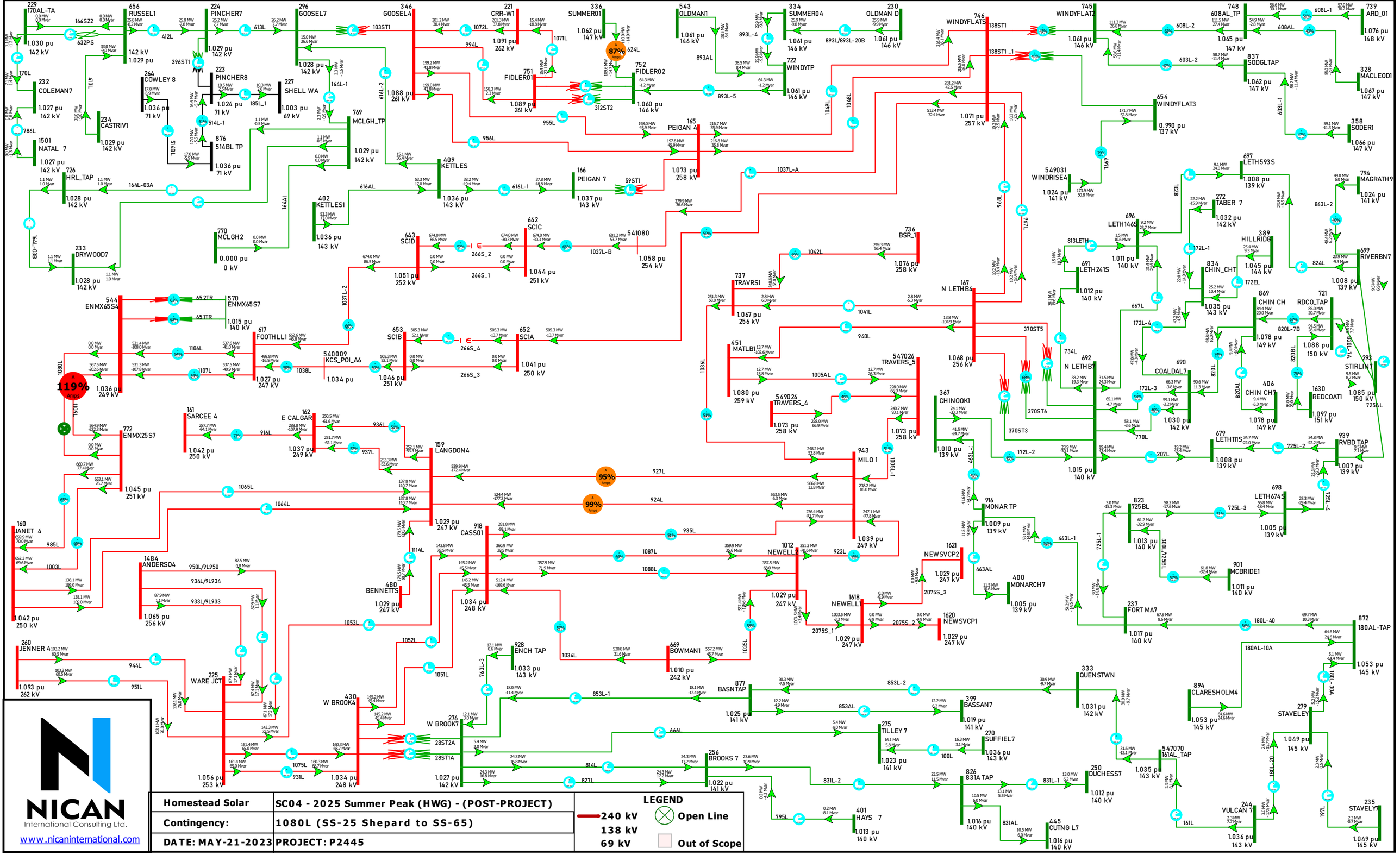
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV	Open Line
138 kV	
69 kV	▢ Out of Scope


170AL-TA
166SZ2
632PS
RUSSEL1
412L
PINCHER7
613L
396ST1
PINCHER8
514L-1
514BL TP
185L_1
SHELL WA
COWLEY 8
COLEMAN7
CASTRIV1
786L
NATAL 7
HRL_TAP
164L-03A
DRYWOOD7
GOOSEL7
103ST1
GOOSEL4
1072L
CRR-W1
1071L
FIDLER01
312ST2
FIDLER02
624L
SUMMER01
OLDMAN1
893L-4
893AL
893L-5
SUMMER04
893L/893L-20
OLDMAN D
746
WINDYFLATS
138ST1
138ST1 _1
1071L
1048L
WINDYFLAT2
608AL_TP
608L-1
608AL
608L-2
603L-2
SODGLTAP
603L-1
ARD_01
MACLEOD1
SODER1
654
WINDYFLAT3
549031
WINDRISE4
1697L
1686L
LETH593S
MAGRATH9
TABER 7
863L-2
RIVERBN7
LETH146S
813LETH
LETH241S
823L
172L-1
CHIN_CHT
HILLRIDG
824L
172EL
667L
172L-4
RDCO_TAP
CHIN CH
820L-7B
820L-7A
820L
820AL
CHIN CH7
REDCOAT1
STIRLIN7
725AL
COALDAL7
172L-3
N LETHB4
N LETHB7
370ST5
370ST6
370ST3
734L
CHINOOK1
631L
770L
172L-2
207L
LETH111S
RVBD TAP
725L-2
725L-4
LETH674S
725L-3
725BL
3001/725BL
FORT MA7
180L-40
180AL-TAP
180AL-10A
180L-30A
180L-20
CLARESHOLM4
STAVELEY
197L
VULCAN 7
161L
MONAR TP
MONARCH7
NEWSVCP2
NEWSVCP1
2075S_3
2075S_2
2075S_1
NEWELL2
NEWELL1
923L
1087L
1088L
1012
CASS01
935L
1034L
1035L
1051L
1052L
1053L
763L-3
BOWMAN1
669
ENCH TAP
928
BENNETT8
480
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
944L
951L
JENNER 4
WARE JCT
225
W BROOK4
430
W BROOK7
276
28ST2A
28ST1A
666L
814L
827L
795L
BASNTAP
877
853L-1
853L-2
853AL
399
BASSAN7
QUENSTWN
333
CLARESHOLM4
894
TILLEY 7
275
SUFFIEL7
270
100L
BROOKS 7
256
831L-2
831L-1
831A TAP
826
DUCHESS7
250
831AL
CUTNG L7
445
MILO 1
943
1005L-1
HAYS 7
401
1042L
1041L
940L
1005AL
MATLBI
451
TRAVRS1
737
TRAVERS_4
549026
TRAVERS_5
547026
BSR_1
736
1037L-A
1037L-B
541080
SC1C
642
SC1D
643
SC1B
653
SC1A
652
266S_1
266S_2
266S_3
266S_4
1037L-2
1036L
1038L
1080L
1101L
1106L
1107L
ENMX65S4
ENMX65S7
570
65.2TR
65.1TR
617
FOOTHLL1
540009
KCS_POI_A6
ENMX25S7
772
1045L
1065L
1064L
1003L
985L
JANET 4
160
SARCEE 4
161
E CALGAR
162
936L
937L
916L
159
LANGDON4
927L
924L
1114L
ALBERTA
119%
95%
99%
87%
NICAN
International Consulting Ltd.
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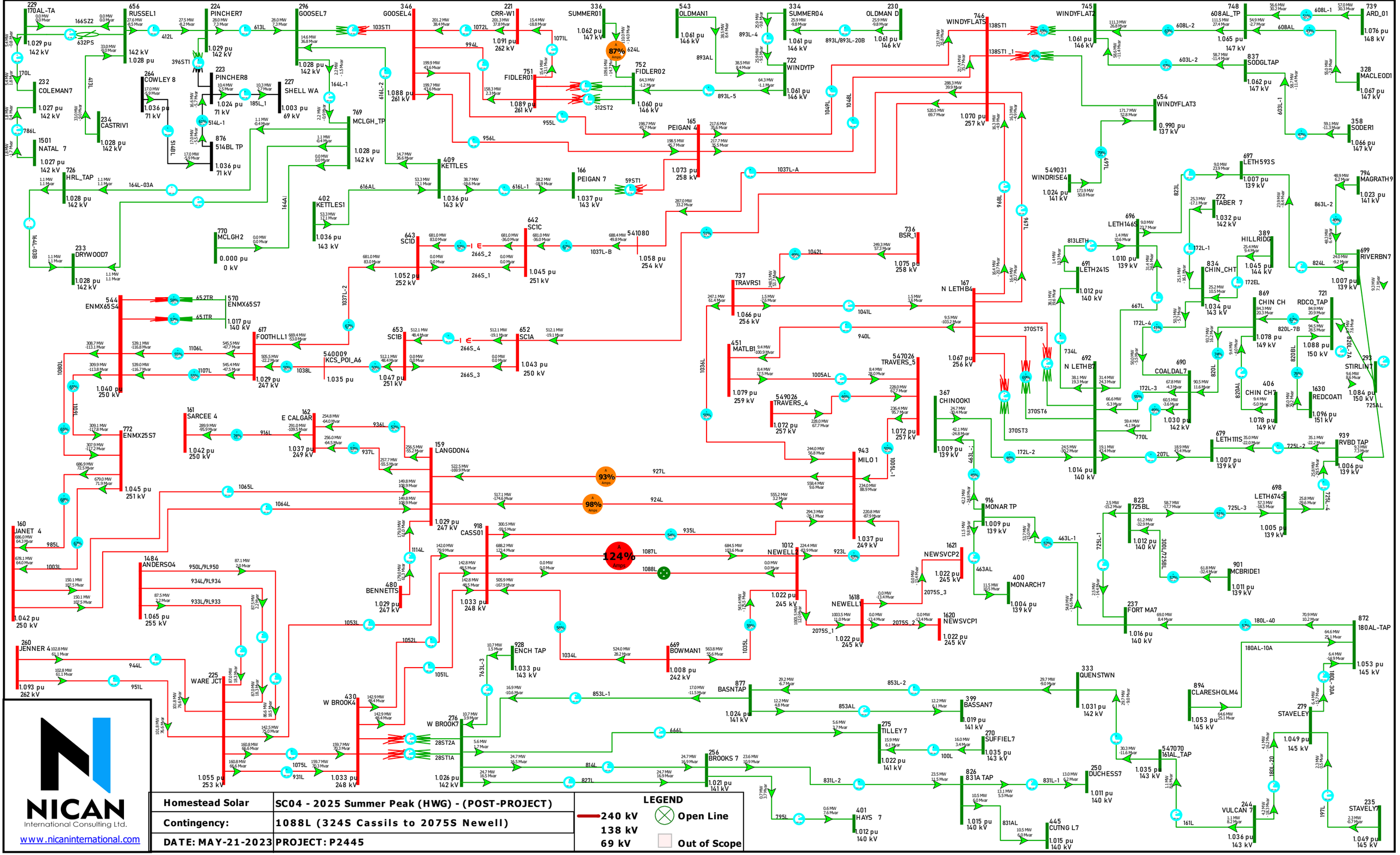
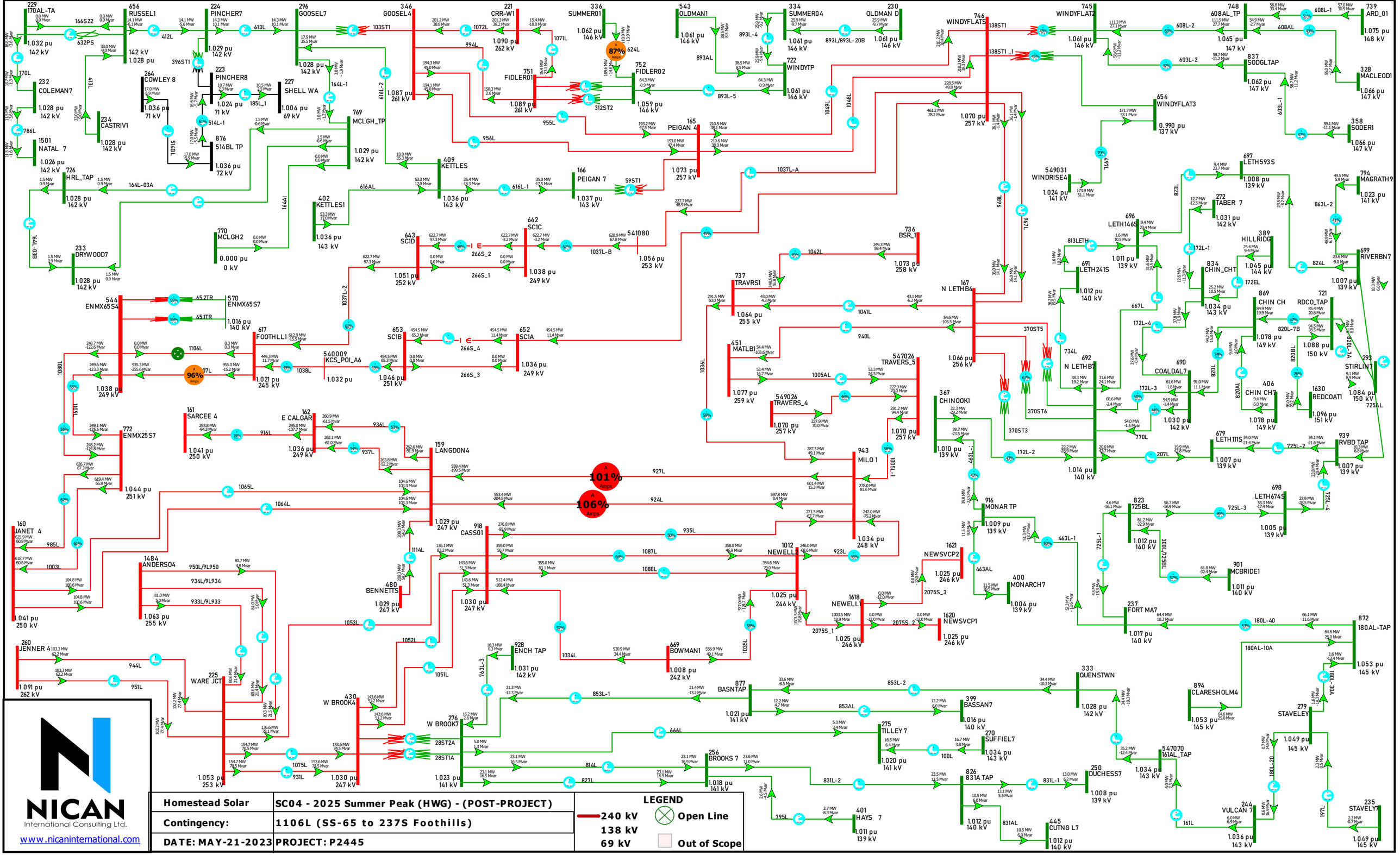
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
1080L (SS-25 Shepard to SS-65)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.029 pu
142 kV
166SZ2
632PS
656
RUSSEL1
142 kV
1.028 pu
412L
224
PINCHER7
1.029 pu
142 kV
613L
296
GOOSEL7
1.028 pu
142 kV
346
GOOSEL4
1.088 pu
261 kV
103ST1
396ST1
223
PINCHER8
1.024 pu
71 kV
264
COWLEY 8
1.036 pu
71 kV
227
SHELL WA
1.003 pu
69 kV
185L_1
164L-1
164L-2
616L-2
514L-1
514AL
876
514BL TP
1.036 pu
71 kV
170L
232
COLEMAN7
1.027 pu
142 kV
234
CASTRIV1
1.028 pu
142 kV
786L
1501
NATAL 7
1.027 pu
142 kV
769
MCLGH_TP
1.028 pu
142 kV
726
HRL_TAP
1.028 pu
142 kV
164L-03A
164AL
164L-1
1941
GB1-GB2
233
DRYWOOD7
1.028 pu
142 kV
770
MCLGH2
0.000 pu
0 kV
402
KETTLES1
1.036 pu
143 kV
616AL
409
KETTLES
1.036 pu
143 kV
616L-1
166
PEIGAN 7
1.037 pu
143 kV
59ST1
165
PEIGAN 4
1.073 pu
258 kV
955L
956L
994L
1072L
221
CRR-W1
1.091 pu
262 kV
1071L
336
SUMMER01
1.062 pu
147 kV
87%
624L
751
FIDLER01
1.089 pu
261 kV
312ST2
752
FIDLER02
1.060 pu
146 kV
543
OLDMAN1
1.061 pu
146 kV
893L-4
893L-5
893AL
334
SUMMER04
1.061 pu
146 kV
893L/893L-20B
230
OLDMAN D
1.061 pu
146 kV
722
WINDYTP
1.061 pu
146 kV
746
WINDYFLAT5
1.070 pu
257 kV
138ST1
138ST1_1
1040L
1048L
1037L-A
1037L-B
541080
1.058 pu
254 kV
287.0 MW
33.2 Mvar
642
SC1C
1.045 pu
251 kV
643
SC1D
1.052 pu
252 kV
266S_2
266S_1
736
BSR_1
1.075 pu
258 kV
1042L
737
TRAVRS1
1.066 pu
256 kV
1041L
940L
451
MATLBT
1.079 pu
259 kV
1005AL
549026
TRAVERS_4
1.072 pu
257 kV
547026
TRAVERS_5
1.072 pu
257 kV
1005L-1
943
MILO 1
1.037 pu
249 kV
927L
924L
935L
1087L
1088L
124%
1012
NEWELL2
1.022 pu
245 kV
923L
1618
NEWELL1
1.022 pu
245 kV
2075S_1
2075S_2
2075S_3
1621
NEWSVCP2
1.022 pu
245 kV
463AL
1620
NEWSVCP1
1.022 pu
245 kV
167
N LETHB4
1.067 pu
256 kV
370ST5
370ST6
370ST3
367
CHINOOK1
1.009 pu
139 kV
916
MONAR TP
1.009 pu
139 kV
400
MONARCH7
1.004 pu
139 kV
463L-1
463L-2
745
WINDYFLAT2
1.061 pu
146 kV
608AL_TP
1.065 pu
147 kV
608L-1
608L-2
608AL
748
603L-2
837
SODGLTAP
1.062 pu
147 kV
603L-1
739
ARD_01
1.076 pu
148 kV
328
MACLEOD1
1.067 pu
147 kV
358
SODER1
1.066 pu
147 kV
654
WINDYFLAT3
0.990 pu
137 kV
1697
1698
549031
WINDRISE4
1.024 pu
141 kV
697
LETH593S
1.007 pu
139 kV
794
MAGRATH9
1.023 pu
141 kV
863L-2
824L
699
RIVERBN7
1.007 pu
139 kV
823L
272
TABER 7
1.032 pu
142 kV
172L-1
834
CHIN_CHT
1.034 pu
143 kV
172EL
389
HILLRIDG
1.045 pu
144 kV
696
LETH146S
1.010 pu
139 kV
813LETH
691
LETH241S
1.012 pu
140 kV
667L
172L-4
172L-3
690
COALDAL7
1.030 pu
142 kV
820L-7B
820L-7A
820L
820BL
869
CHIN CH
1.078 pu
149 kV
406
CHIN CH7
1.078 pu
149 kV
721
RDCO_TAP
1.088 pu
150 kV
293
STIRLIN7
1.084 pu
150 kV
725AL
692
N LETHB7
1.014 pu
140 kV
734L
1630
REDCOAT1
1.096 pu
151 kV
679
LETH111S
1.007 pu
139 kV
207L
725L-2
939
RVBD TAP
1.006 pu
139 kV
725L-1
725L-3
725L-4
823
725BL
1.012 pu
140 kV
3001L/7258L
698
LETH674S
1.005 pu
139 kV
901
MCBRIDE1
1.011 pu
139 kV
237
FORT MA7
1.016 pu
140 kV
180L-40
872
180AL-TAP
1.053 pu
145 kV
180AL-10A
180L-30A
894
CLARESHOLM4
1.053 pu
145 kV
279
STAVELEY
1.049 pu
145 kV
180L-20
197L
235
STAVELY7
1.049 pu
145 kV
244
VULCAN 7
1.036 pu
143 kV
161L
547070
161AL_TAP
1.035 pu
143 kV
270
SUFFIEL7
1.035 pu
143 kV
100L
399
BASSAN7
1.019 pu
141 kV
853L-2
853L-1
853AL
877
BASNTAP
1.024 pu
141 kV
333
QUENSTWN
1.031 pu
142 kV
826
831A TAP
1.015 pu
140 kV
831L-2
831L-1
831AL
250
DUCHESS7
1.011 pu
140 kV
445
CUTNG L7
1.015 pu
140 kV
544
ENMX65S4
1.040 pu
250 kV
65.2TR
65.1TR
570
ENMX65S7
1.017 pu
140 kV
1106L
1107L
1080L
1109L
617
FOOTHLL1
1.029 pu
247 kV
1038L
540009
KCS_POI_A6
1.035 pu
1037L-2
653
SC1B
1.047 pu
251 kV
266S_4
266S_3
652
SC1A
1.043 pu
250 kV
772
ENMX25S7
1.045 pu
251 kV
1065L
1064L
161
SARCEE 4
1.042 pu
250 kV
162
E CALGAR
1.037 pu
249 kV
936L
937L
159
LANGDON4
1.029 pu
247 kV
1065L
1064L
160
JANET 4
1.042 pu
250 kV
985L
1003L
1484
ANDERS04
1.065 pu
255 kV
950L/9L950
934L/9L934
933L/9L933
1053L
1052L
1051L
1114L
480
BENNETTS
1.029 pu
247 kV
918
CASS01
1.033 pu
248 kV
669
BOWMAN1
1.008 pu
242 kV
1034L
1035L
763L-3
928
ENCH TAP
1.033 pu
143 kV
260
JENNER 4
1.093 pu
262 kV
944L
951L
225
WARE JCT
1.055 pu
253 kV
430
W BROOK4
1.033 pu
248 kV
276
W BROOK7
1.026 pu
142 kV
28ST2A
28ST1A
1075L
931L
666L
814L
827L
795L
256
BROOKS 7
1.021 pu
141 kV
275
TILLEY 7
1.022 pu
141 kV
401
HAYS 7
1.012 pu
140 kV
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
1088L (324S Cassils to 2075S Newell)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.032 pu
142 kV
656
RUSSEL1
142 kV
1.028 pu
224
PINCHER7
1.029 pu
142 kV
296
GOOSEL7
1.028 pu
142 kV
346
GOOSEL4
1.087 pu
261 kV
221
CRR-W1
1.090 pu
262 kV
336
SUMMER01
1.062 pu
146 kV
543
OLDMAN1
1.061 pu
146 kV
334
SUMMER04
1.061 pu
146 kV
230
OLDMAN D
1.061 pu
146 kV
745
WINDYFLAT2
1.061 pu
146 kV
748
608AL_TP
1.065 pu
147 kV
739
ARD_01
1.075 pu
148 kV
608AL
608L-1
608L-2
603L-2
603L-1
837
SODGLTAP
1.062 pu
147 kV
328
MACLEOD1
1.066 pu
147 kV
358
SODER1
1.066 pu
147 kV
654
WINDYFLAT3
0.990 pu
137 kV
746
WINDYFLAT1
1.070 pu
257 kV
752
FIDLER02
1.059 pu
146 kV
751
FIDLER01
1.089 pu
261 kV
722
WINDYTP
1.061 pu
146 kV
165
PEIGAN 4
1.073 pu
257 kV
166
PEIGAN 7
1.037 pu
143 kV
409
KETTLES
1.036 pu
143 kV
769
MCLGH_TP
1.029 pu
142 kV
402
KETTLES1
1.036 pu
143 kV
770
MCLGH2
0.000 pu
0 kV
541080
1.056 pu
253 kV
642
SC1C
1.038 pu
249 kV
643
SC1D
1.051 pu
252 kV
653
SC1B
1.046 pu
251 kV
652
SC1A
1.036 pu
249 kV
540009
KCS_POI_A6
1.032 pu
617
FOOTHLL1
1.021 pu
245 kV
544
ENMX65S4
1.038 pu
249 kV
570
ENMX65S7
1.016 pu
140 kV
772
ENMX25S7
1.044 pu
251 kV
161
SARCEE 4
1.041 pu
250 kV
162
E CALGAR
1.036 pu
249 kV
159
LANGDON4
1.029 pu
247 kV
160
JANET 4
1.041 pu
250 kV
1484
ANDERS04
1.063 pu
255 kV
480
BENNETT5
1.029 pu
247 kV
260
JENNER 4
1.091 pu
262 kV
225
WARE JCT
1.053 pu
253 kV
430
W BROOK4
1.030 pu
247 kV
276
W BROOK7
1.023 pu
141 kV
928
ENCH TAP
1.031 pu
142 kV
669
BOWMAN1
1.008 pu
242 kV
877
BASNTAP
1.021 pu
141 kV
1012
NEWELL 7
1.025 pu
246 kV
1618
NEWELL1
1.025 pu
246 kV
1621
NEWSVCP2
1.025 pu
246 kV
1620
NEWSVCP1
1.025 pu
246 kV
737
TRAVRS1
1.064 pu
255 kV
451
MATLBI1
1.077 pu
259 kV
549026
TRAVERS_4
1.070 pu
257 kV
547026
TRAVERS_5
1.070 pu
257 kV
943
MILO 1
1.034 pu
248 kV
736
BSR_1
1.073 pu
258 kV
167
N LETHB4
1.066 pu
256 kV
549031
WINDRISE4
1.024 pu
141 kV
697
LETH593S
1.008 pu
139 kV
794
MAGRATH9
1.023 pu
141 kV
272
TABER 7
1.031 pu
142 kV
696
LETH146S
1.011 pu
139 kV
691
LETH241S
1.012 pu
140 kV
834
CHIN_CHT
1.034 pu
143 kV
389
HILLRIDG
1.045 pu
144 kV
699
RIVERBN7
1.007 pu
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869
CHIN CH
1.078 pu
149 kV
721
RDCO_TAP
1.088 pu
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STIRLIN7
1.084 pu
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690
COALDAL7
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N LETHB7
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CHIN CH7
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REDCOAT1
1.096 pu
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679
LETH111S
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RVBD TAP
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698
LETH674S
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367
CHINOOK1
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MONAR TP
1.009 pu
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MONARCH7
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1.011 pu
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FORT MA7
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275
TILLEY 7
1.020 pu
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270
SUFFIEL7
1.034 pu
143 kV
547070
161AL_TAP
1.034 pu
143 kV
279
STAVELEY
1.049 pu
145 kV
250
DUCHESS7
1.008 pu
139 kV
826
831A TAP
1.012 pu
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445
CUTNG L7
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244
VULCAN 7
1.036 pu
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STAVELY7
1.049 pu
145 kV
401
HAYS 7
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1106L
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940L
1005AL
1005L-1
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1035L-2
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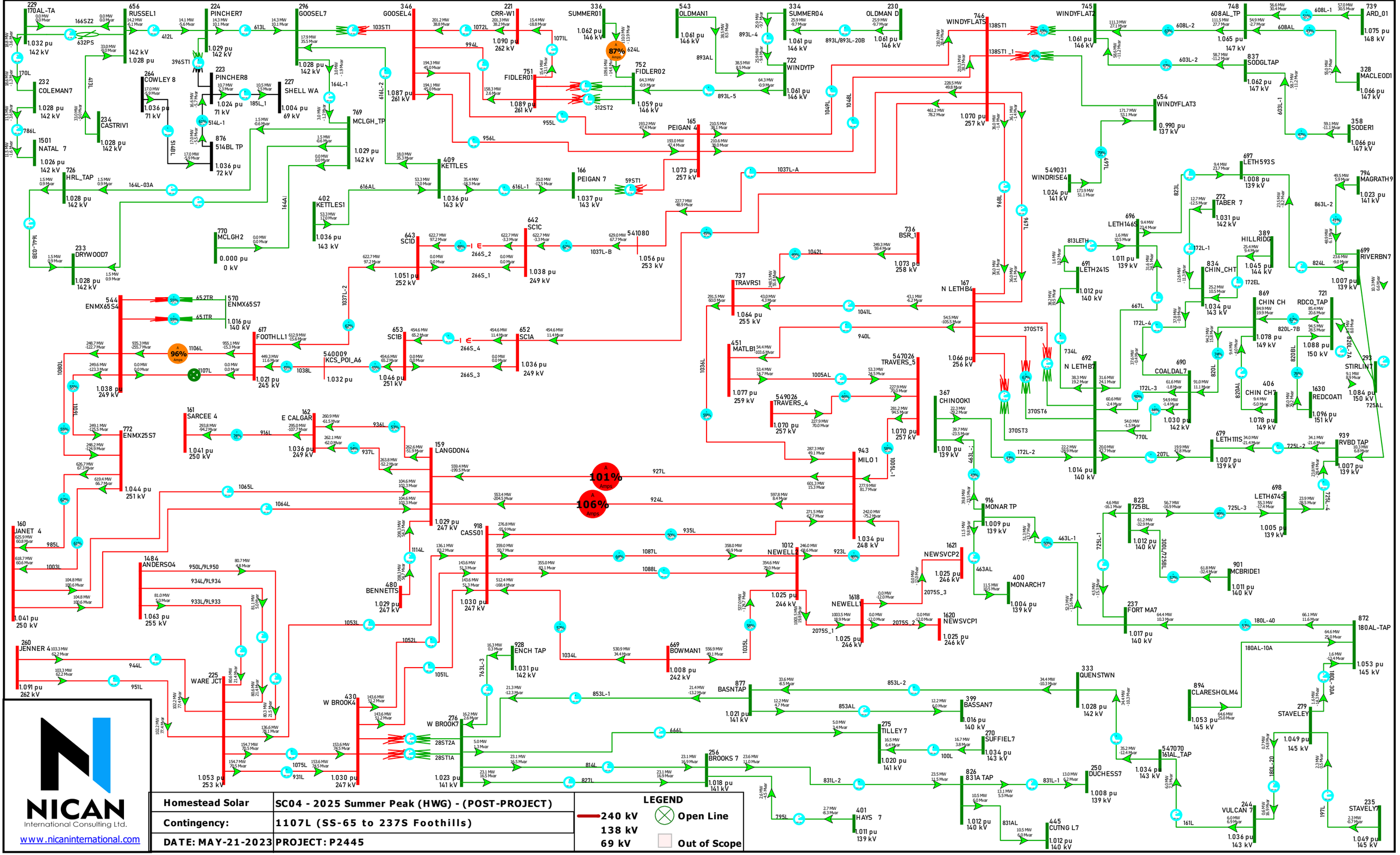
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
1106L (SS-65 to 237S Foothills)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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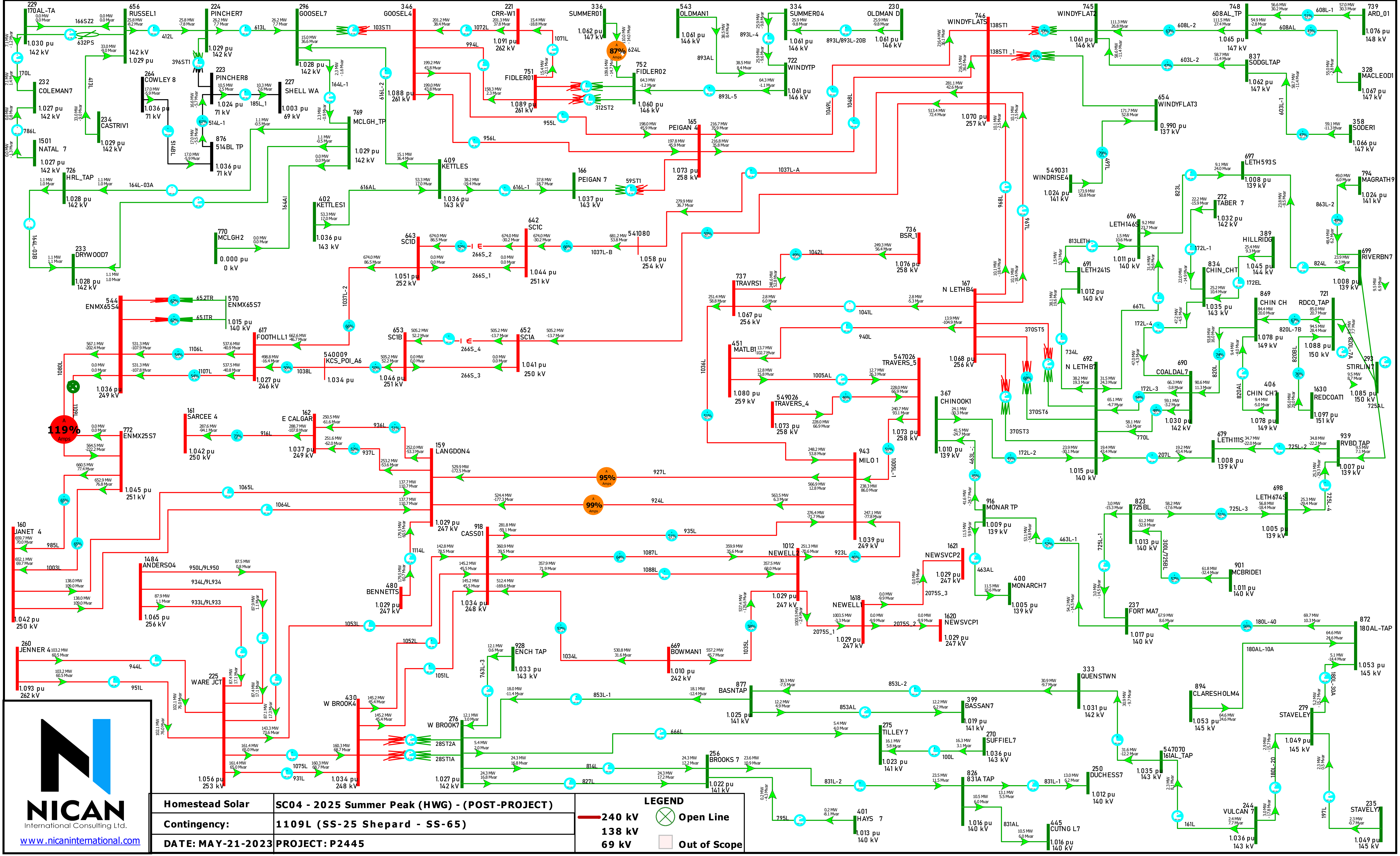
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1107L (SS-65 to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
Open Line
Out of Scope



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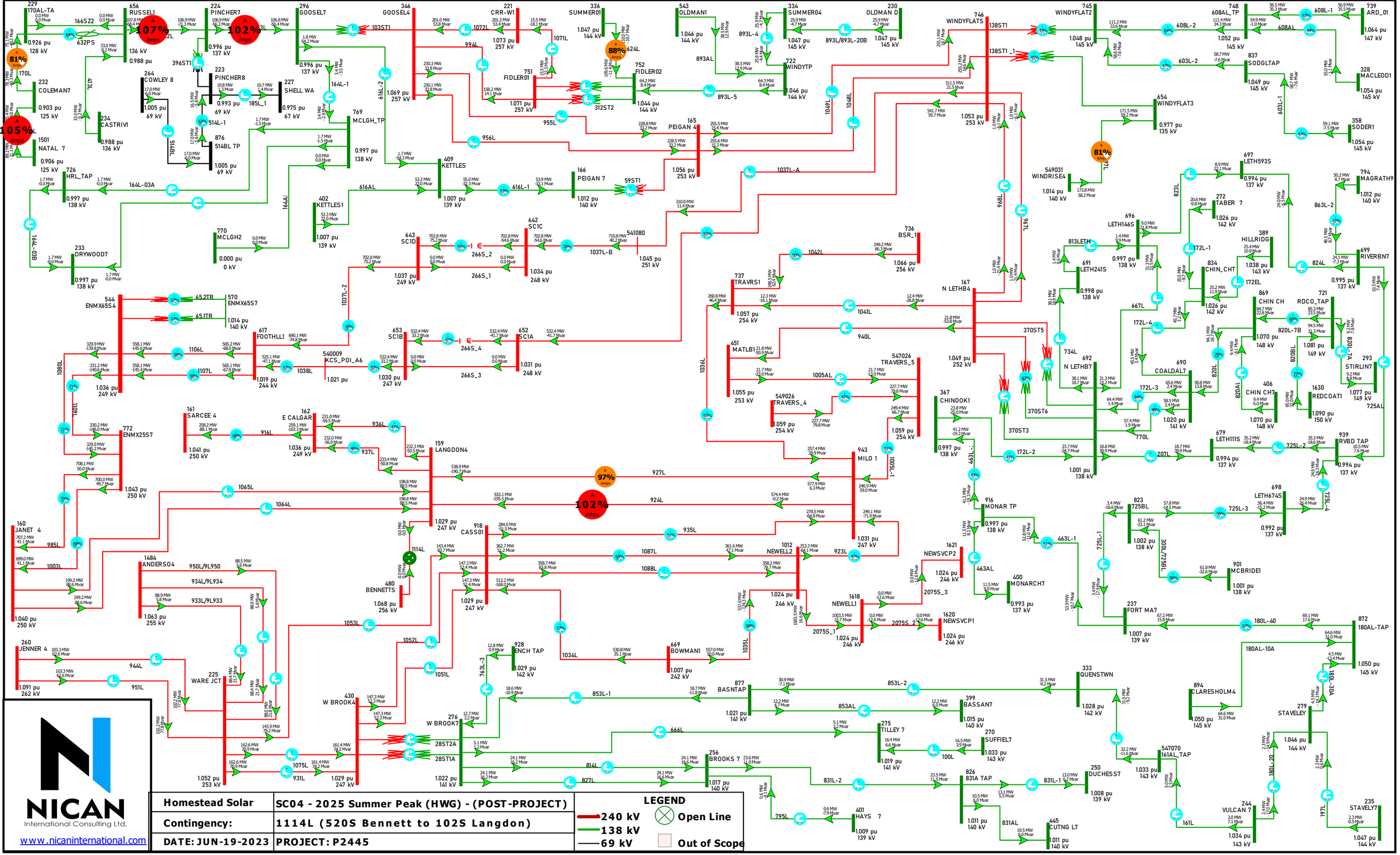
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1109L (SS-25 Shepard - SS-65)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV	Open Line
138 kV	
69 kV	Out of Scope



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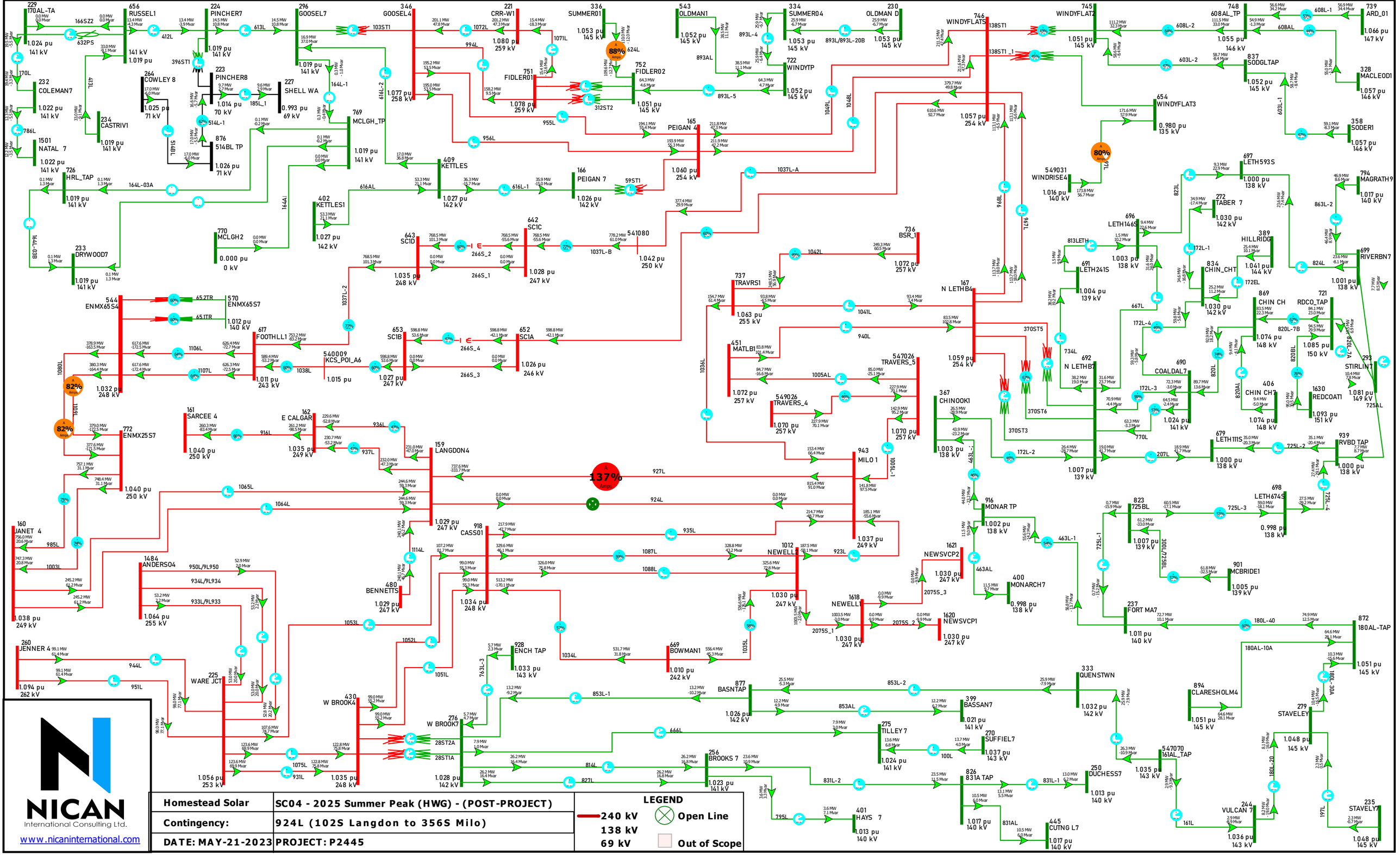
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1114L (520S Bennett to 102S Langdon)**
DATE: JUN-19-2023	**PROJECT: P2445**

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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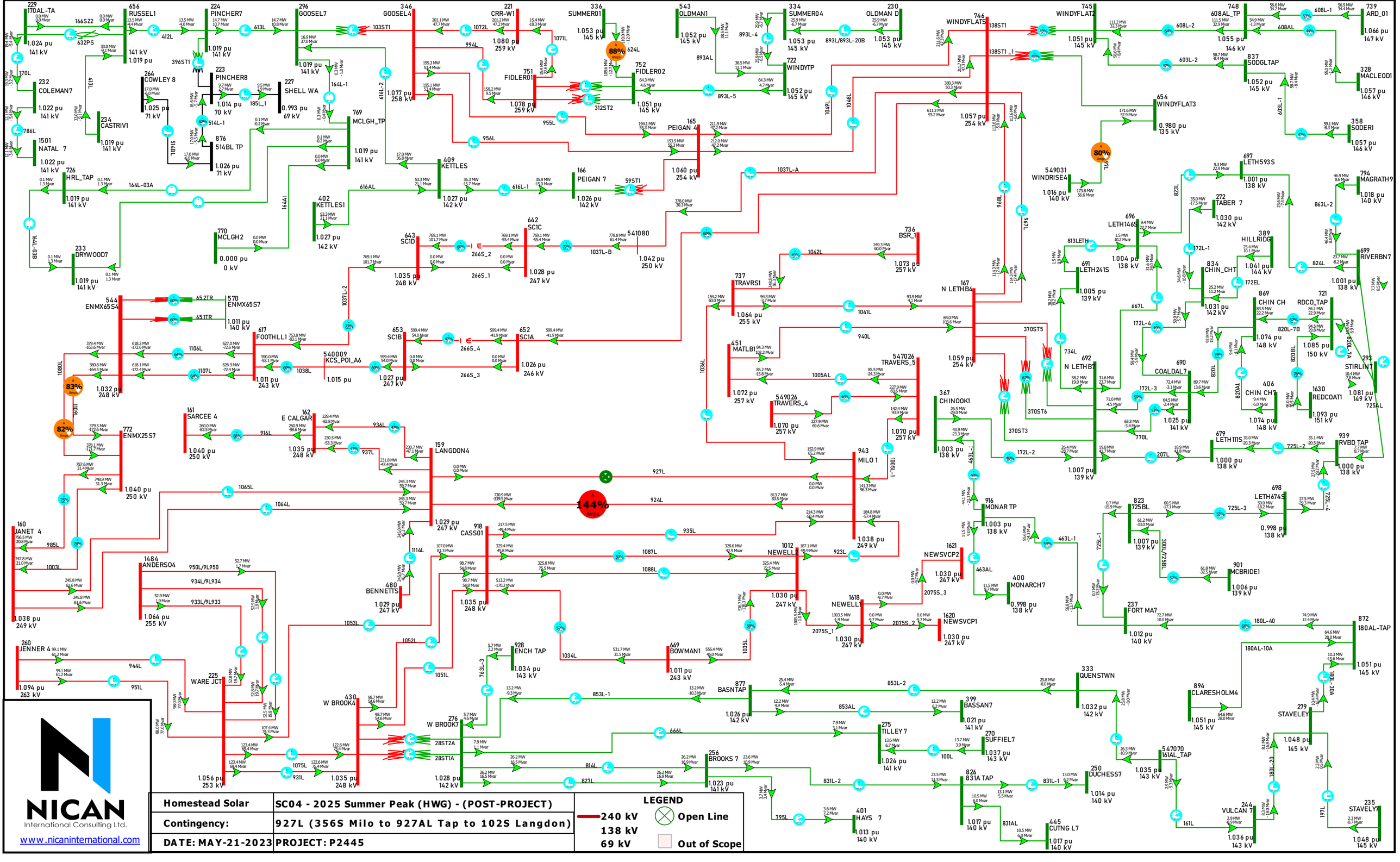
Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**924L (102S Langdon to 356S Milo)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
⊗ **Open Line**
☐ **Out of Scope**


144%
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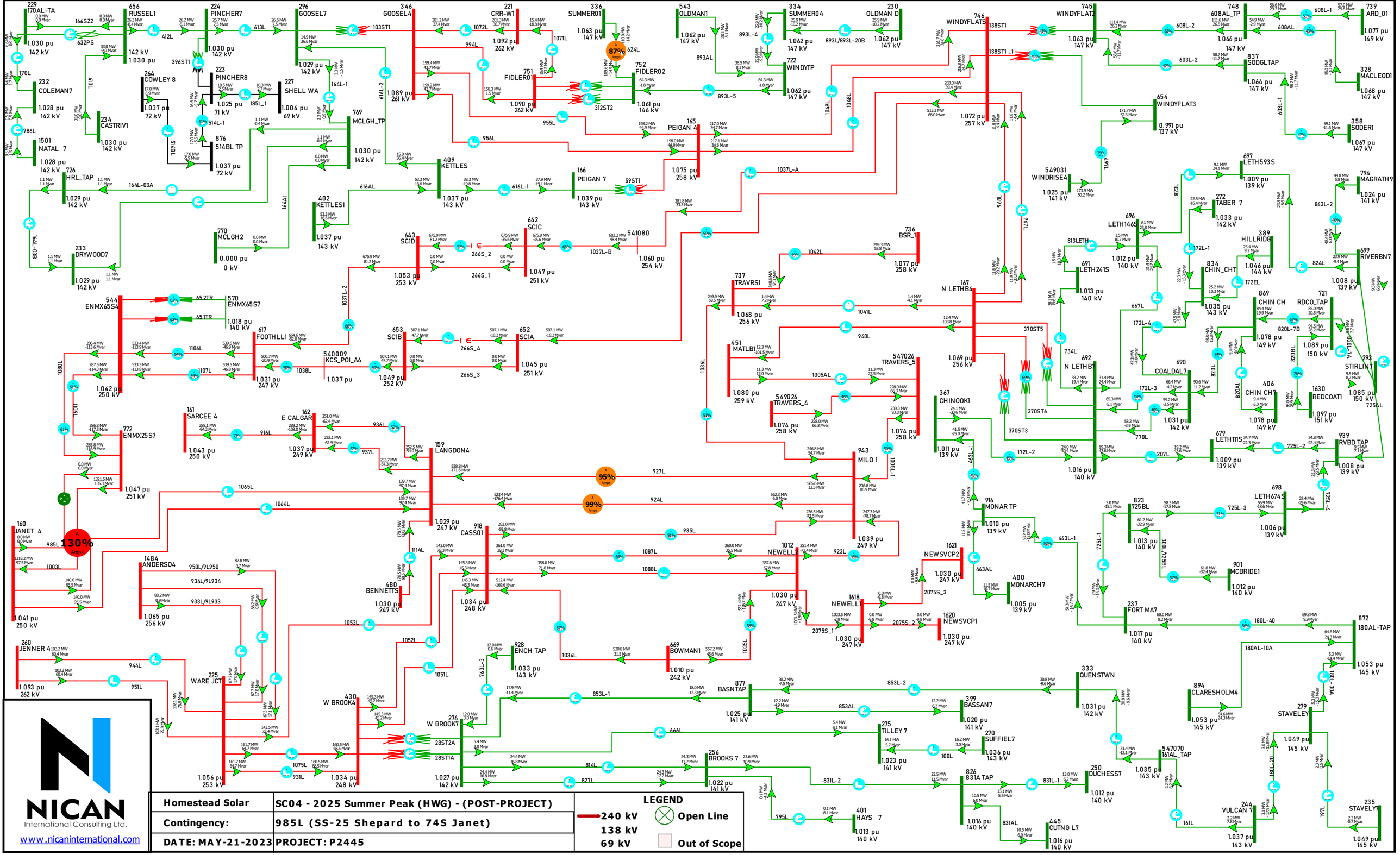
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.030 pu
142 kV
656
RUSSEL1
142 kV
1.030 pu
224
PINCHER7
1.030 pu
142 kV
296
GOOSEL7
1.029 pu
142 kV
346
GOOSEL4
1.089 pu
261 kV
221
CRR-W1
1.092 pu
262 kV
336
SUMMER01
1.063 pu
147 kV
87%
543
OLDMAN1
1.062 pu
147 kV
334
SUMMER04
1.062 pu
147 kV
230
OLDMAN D
1.062 pu
147 kV
745
WINDYFLAT2
1.063 pu
147 kV
748
608AL_TP
1.066 pu
147 kV
739
ARD_01
1.077 pu
149 kV
608AL
328
MACLEOD1
1.068 pu
147 kV
837
SODGLTAP
1.064 pu
147 kV
358
SODER1
1.067 pu
147 kV
654
WINDYFLAT3
0.991 pu
137 kV
746
WINDYFLAT1
1.072 pu
257 kV
549031
WINDRISE4
1.025 pu
141 kV
697
LETH593S
1.009 pu
139 kV
794
MAGRATH9
1.024 pu
141 kV
272
TABER 7
1.033 pu
142 kV
696
LETH146S
1.012 pu
140 kV
691
LETH241S
1.013 pu
140 kV
834
CHIN_CHT
1.035 pu
143 kV
389
HILLRIDG
1.046 pu
144 kV
699
RIVERBN7
1.008 pu
139 kV
869
CHIN CH
1.078 pu
149 kV
721
RDCO_TAP
1.089 pu
150 kV
293
STIRLIN7
1.085 pu
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COALDAL7
1.031 pu
142 kV
692
N LETHB7
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140 kV
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CHIN CH7
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1630
REDCOAT1
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151 kV
679
LETH111S
1.009 pu
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RVBD TAP
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LETH674S
1.006 pu
139 kV
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725BL
1.013 pu
140 kV
901
MCBRIDE1
1.012 pu
140 kV
237
FORT MA7
1.017 pu
140 kV
872
180AL-TAP
1.053 pu
145 kV
894
CLARESHOLM4
1.053 pu
145 kV
333
QUENSTWN
1.031 pu
142 kV
399
BASSAN7
1.020 pu
141 kV
547070
161AL_TAP
1.035 pu
143 kV
270
SUFFIEL7
1.036 pu
143 kV
279
STAVELEY
1.049 pu
145 kV
250
DUCHESS7
1.012 pu
140 kV
244
VULCAN 7
1.037 pu
143 kV
235
STAVELY7
1.049 pu
145 kV
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1.016 pu
140 kV
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831A TAP
1.016 pu
140 kV
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CHINOOK1
1.011 pu
139 kV
916
MONAR TP
1.010 pu
139 kV
400
MONARCH7
1.005 pu
139 kV
1621
NEWSVCP2
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NEWSVCP1
1.030 pu
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1618
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1069 pu
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142 kV
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142 kV
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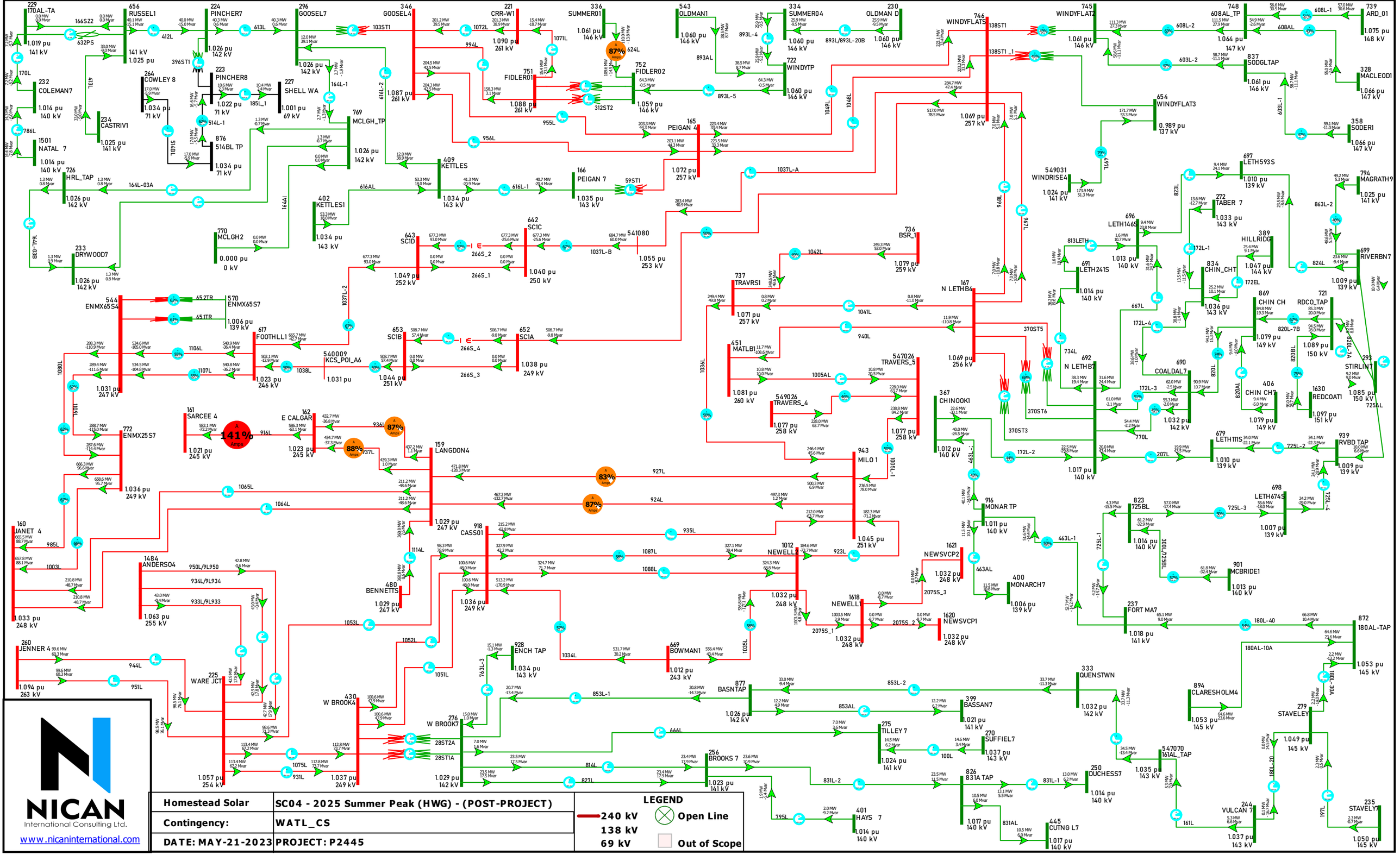

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Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**	**LEGEND**
Contingency:	**WATL_CS**	🟥 240 kV 138 kV 69 kV ⊗ Open Line ☐ Out of Scope
DATE: MAY-21-2023	**PROJECT: P2445**	

2025 SUMMER LIGHT SENSITIVITY

Single Line Diagrams
P2445 - POST-PROJECT
POWER FLOW SC08

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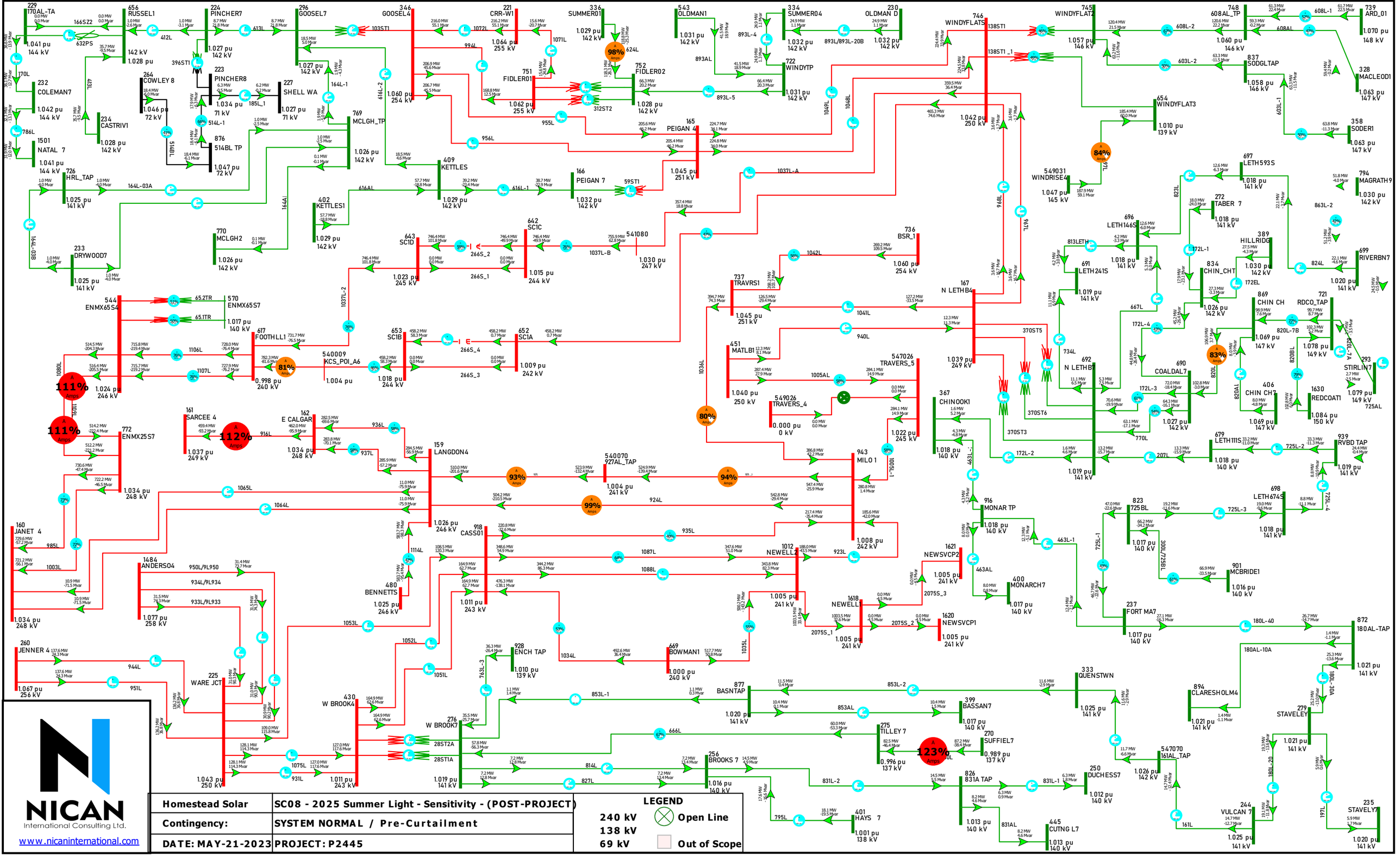

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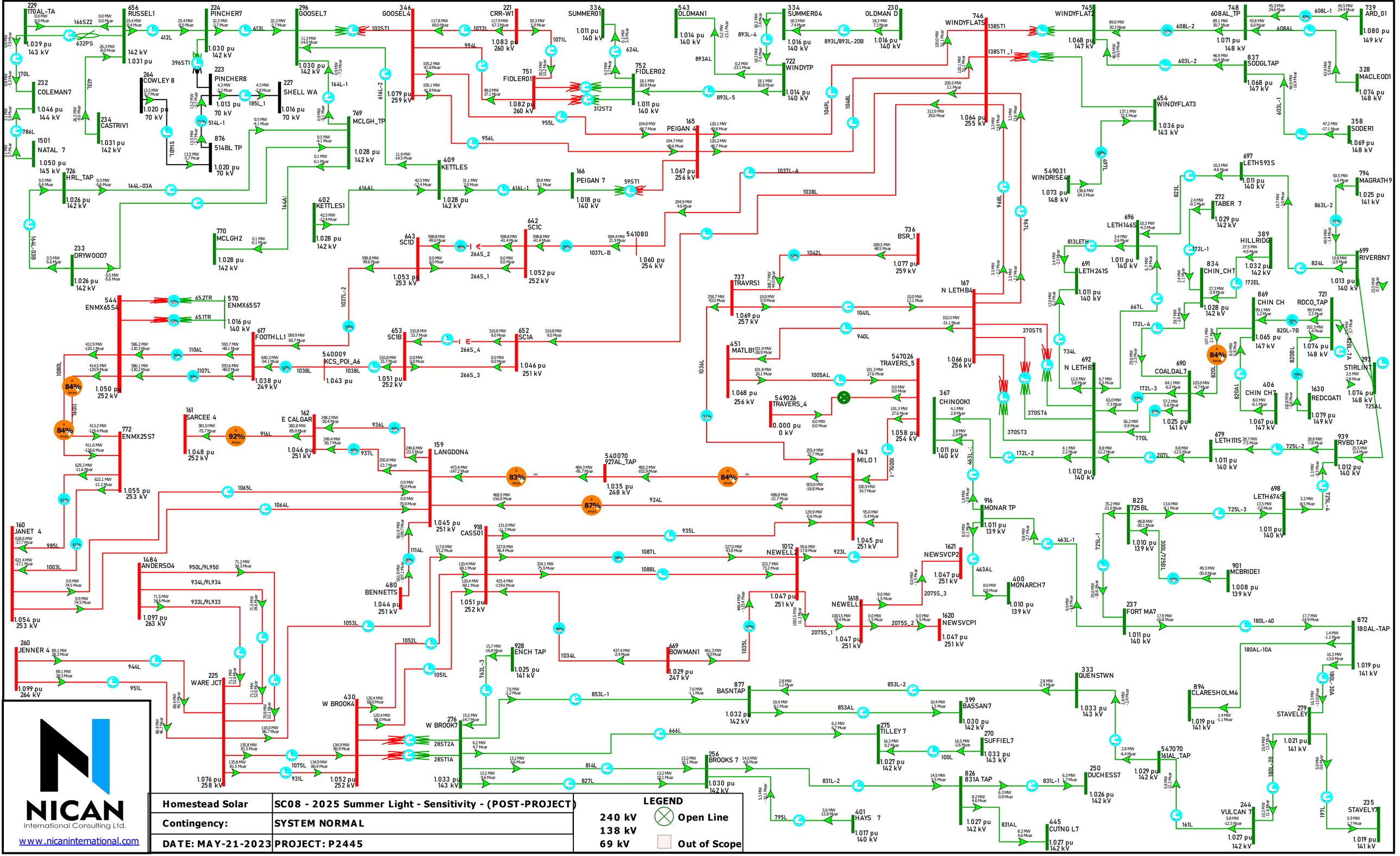
Homestead Solar	SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:	SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-21-2023	PROJECT: P2445


170AL-TA
1.039 pu
143 kV
166SZ2
632PS
656
RUSSEL1
142 kV
1.031 pu
412L
224
PINCHER7
1.030 pu
142 kV
613L
296
GOOSEL7
1.030 pu
142 kV
396ST1
223
PINCHER8
1.013 pu
70 kV
264
COWLEY 8
1.020 pu
70 kV
185L_1
227
SHELL WA
1.016 pu
70 kV
164L-1
616L-2
346
GOOSEL4
1.079 pu
259 kV
103ST1
1072L
221
CRR-W1
1.083 pu
260 kV
1071L
994L
336
SUMMER01
1.011 pu
140 kV
624L
543
OLDMAN1
1.014 pu
140 kV
893L-4
336
SUMMER04
1.016 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.016 pu
140 kV
893AL
722
WINDYTP
1.014 pu
140 kV
893L-5
751
FIDLER01
1.082 pu
260 kV
312ST2
752
FIDLER02
1.011 pu
140 kV
955L
956L
165
PEIGAN 4
1.067 pu
256 kV
104L
104BL
746
WINDYFLATS
138ST1
138ST1_1
1.064 pu
255 kV
745
WINDYFLAT2
1.068 pu
147 kV
608AL_TP
608L-1
739
ARD_01
1.080 pu
149 kV
608L-2
608AL
1.071 pu
148 kV
603L-2
837
SODGLTAP
1.068 pu
147 kV
328
MACLEOD1
1.074 pu
148 kV
603L-1
358
SODER1
1.069 pu
148 kV
654
WINDYFLAT3
1.036 pu
143 kV
549031
WINDRISE4
1.073 pu
148 kV
697
LETH593S
1.011 pu
140 kV
794
MAGRATH9
1.025 pu
141 kV
863L-2
272
TABER 7
1.029 pu
142 kV
696
LETH146S
1.011 pu
140 kV
813LETH
691
LETH241S
1.011 pu
140 kV
172L-1
834
CHIN_CHT
1.028 pu
142 kV
389
HILLRIDG
1.032 pu
142 kV
824L
699
RIVERBN7
1.013 pu
140 kV
172EL
869
CHIN CH
1.065 pu
147 kV
721
RDCO_TAP
1.074 pu
148 kV
820L-7B
820L-7A
293
STIRLIN7
1.074 pu
148 kV
725AL
667L
172L-4
690
COALDAL7
1.025 pu
141 kV
820L
406
CHIN CH7
1.067 pu
147 kV
1630
REDCOAT1
1.079 pu
149 kV
820AL
820BL
172L-3
770L
679
LETH111S
1.011 pu
140 kV
725L-2
939
RVBD TAP
1.012 pu
140 kV
207L
172L-2
1.012 pu
140 kV
698
LETH674S
1.011 pu
140 kV
725L-3
725L-4
823
725BL
1.010 pu
139 kV
3001/725BL
901
MCBRIDE1
1.008 pu
139 kV
725L-1
237
FORT MA7
1.011 pu
140 kV
180L-40
872
180AL-TAP
1.019 pu
141 kV
180AL-10A
894
CLARESHOLM4
1.019 pu
141 kV
180L-30A
180L-30
279
STAVELEY
1.021 pu
141 kV
547070
161AL_TAP
1.029 pu
142 kV
250
DUCHESS7
1.026 pu
142 kV
831L-1
831L-2
826
831A TAP
1.027 pu
142 kV
831AL
445
CUTNG L7
1.027 pu
142 kV
161L
244
VULCAN 7
1.027 pu
142 kV
235
STAVELY7
1.019 pu
141 kV
197L
916
MONAR TP
1.011 pu
139 kV
463L-1
463L-2
463AL
400
MONARCH7
1.010 pu
139 kV
1621
NEWSVCP2
1.047 pu
251 kV
2075S_3
1618
NEWELL
1.047 pu
251 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.047 pu
251 kV
1012
NEWELL2
1.047 pu
251 kV
923L
935L
1087L
1088L
918
CASS01
1.045 pu
251 kV
1114L
480
BENNETTS
1.044 pu
251 kV
1053L
1052L
1051L
1034L
669
BOWMAN1
1.029 pu
247 kV
1035L
928
ENCH TAP
1.025 pu
141 kV
763L-3
430
W BROOK4
1.052 pu
252 kV
276
W BROOK7
1.033 pu
143 kV
28ST2A
28ST1A
1484
ANDERSO4
1.097 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
1053L
160
JANET 4
1.054 pu
253 kV
985L
1003L
260
JENNER 4
1.099 pu
264 kV
944L
951L
225
WARE JCT
1.076 pu
258 kV
1075L
931L
1.052 pu
252 kV
544
ENMX65S4
570
ENMX65S7
1.016 pu
140 kV
65.2TR
65.1TR
617
FOOTHLL1
1.038 pu
249 kV
1038L
540009
KCS_POI_A6
1.043 pu
1037L-2
1106L
1107L
1080L
1081L
1050 pu
252 kV
772
ENMX25S7
1.055 pu
253 kV
1065L
1064L
161
SARCEE 4
1.048 pu
252 kV
162
E CALGAR
1.046 pu
251 kV
916L
936L
937L
159
LANGDON4
1.045 pu
251 kV
540070
927AL_TAP
1.035 pu
248 kV
924L
1045L-1
943
MILO 1
1.045 pu
251 kV
1045L-2
1046L
1047L
1048L
1049L
1037L-A
1038L
1037L-B
541080
1.060 pu
254 kV
642
SC1C
643
SC1D
1.053 pu
253 kV
266S_2
266S_1
1.052 pu
252 kV
653
SC1B
652
SC1A
266S_4
266S_3
1.051 pu
252 kV
1.046 pu
251 kV
166
PEIGAN 7
1.018 pu
140 kV
59ST1
409
KETTLES
1.028 pu
142 kV
616AL
616L-1
402
KETTLES1
1.028 pu
142 kV
164L-03A
164L-03B
164AL
164L
770
MCLGH2
1.028 pu
142 kV
769
MCLGH_TP
1.028 pu
142 kV
514L-1
514BL TP
1.020 pu
70 kV
514BL
1501
NATAL 7
1.050 pu
145 kV
786L
232
COLEMAN7
1.046 pu
144 kV
170L
234
CASTRIV1
1.031 pu
142 kV
233
DRYWOOD7
1.026 pu
142 kV
736
BSR_1
1.077 pu
259 kV
1042L
737
TRAVRS1
1.069 pu
257 kV
1041L
940L
451
MATLBI1
1.068 pu
256 kV
1005AL
547026
TRAVERS_5
1.058 pu
254 kV
549026
TRAVERS_4
0.000 pu
0 kV
1005L-1
1036L
167
N LETHB4
1.066 pu
256 kV
370ST5
370ST6
370ST3
734L
692
N LETHB1
1.012 pu
140 kV
367
CHINOOK1
1.011 pu
140 kV
463L-3
877
BASNTAP
1.032 pu
142 kV
853L-1
853L-2
853AL
399
BASSAN7
1.030 pu
142 kV
333
QUENSTWN
1.033 pu
143 kV
275
TILLEY 7
1.027 pu
142 kV
100L
270
SUFFIEL7
1.033 pu
143 kV
666L
814L
827L
256
BROOKS 7
1.030 pu
142 kV
795L
401
HAYS 7
1.017 pu
140 kV
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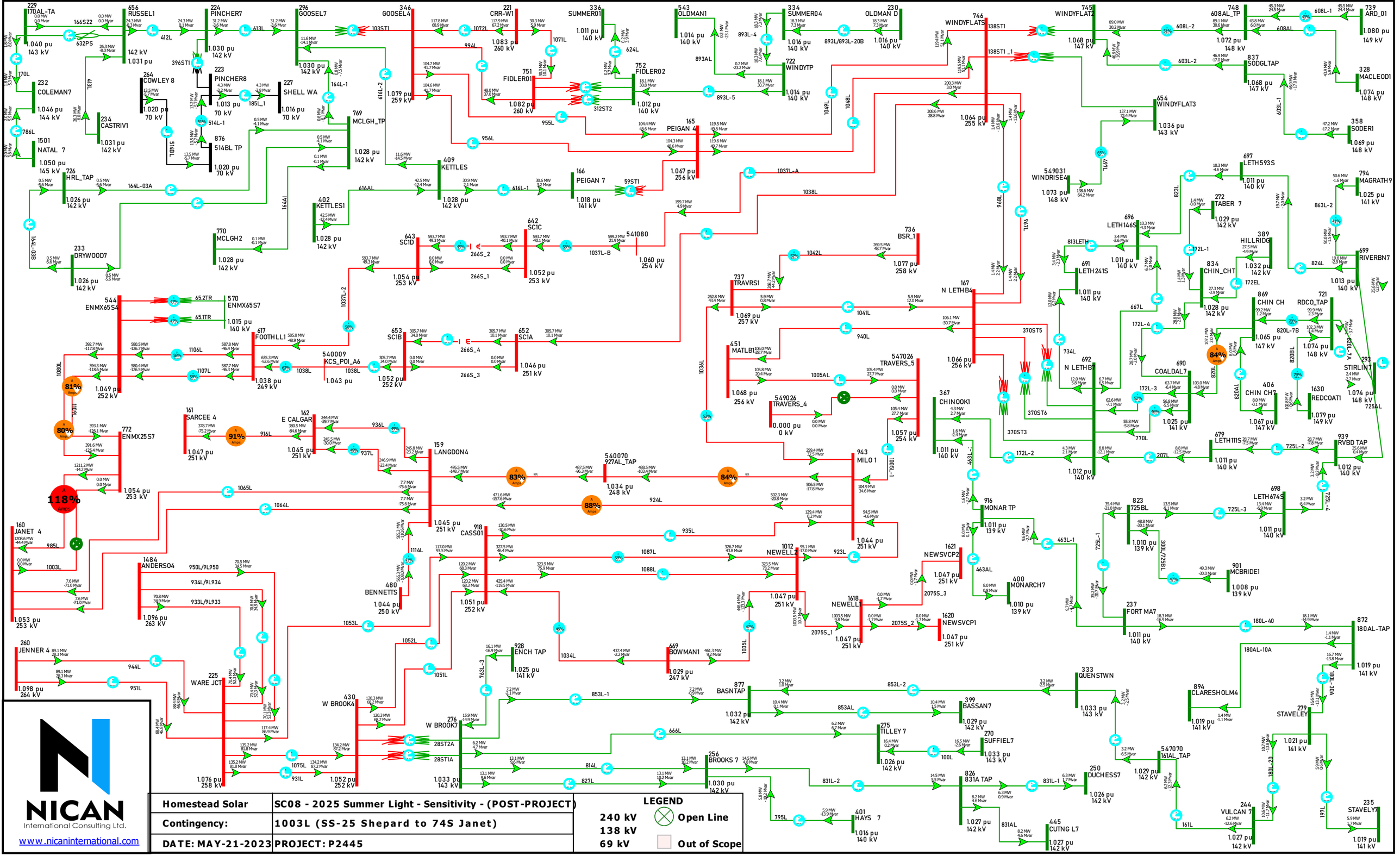
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
SYSTEM NORMAL
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.040 pu
143 kV
632PS
166SZ2
656
RUSSEL1
142 kV
1.031 pu
412L
224
PINCHER7
1.030 pu
142 kV
613L
396ST1
223
PINCHER8
1.013 pu
70 kV
185L_1
227
SHELL WA
1.016 pu
70 kV
264
COWLEY 8
1.020 pu
70 kV
296
GOOSEL7
1.030 pu
142 kV
164L-1
616L-2
346
GOOSEL4
1.079 pu
259 kV
103ST1
994L
956L
955L
221
CRR-W1
1.083 pu
260 kV
1071L
751
FIDLER01
1.082 pu
260 kV
48.0 MW
37.0 Mvar
312ST2
336
SUMMER01
1.011 pu
140 kV
624L
752
FIDLER02
1.012 pu
140 kV
893L-5
543
OLDMAN1
1.014 pu
140 kV
893L-4
893AL
336
SUMMER04
1.016 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.016 pu
140 kV
722
WINDYTP
1.014 pu
140 kV
746
WINDYFLATS
138ST1
138ST1 _1
1.064 pu
255 kV
1049L
1048L
745
WINDYFLAT2
1.068 pu
147 kV
608AL_TP
608AL
608L-1
608L-2
603L-2
739
ARD_01
1.080 pu
149 kV
837
SODGLTAP
1.068 pu
147 kV
328
MACLEOD1
1.074 pu
148 kV
603L-1
358
SODER1
1.069 pu
148 kV
654
WINDYFLAT3
1.036 pu
143 kV
549031
WINDRISE4
1.073 pu
148 kV
697
LETH593S
1.011 pu
140 kV
794
MAGRATH9
1.025 pu
141 kV
863L-2
272
TABER 7
1.029 pu
142 kV
823L
696
LETH146S
1.011 pu
140 kV
813LETH
691
LETH241S
1.011 pu
140 kV
172L-1
834
CHIN_CHT
1.028 pu
142 kV
389
HILLRIDG
1.032 pu
142 kV
824L
699
RIVERBN7
1.013 pu
140 kV
172EL
869
CHIN CH
1.065 pu
147 kV
721
RDCO_TAP
1.074 pu
148 kV
820L-7B
820L-7A
293
STIRLIN7
1.074 pu
148 kV
725AL
820BL
820L
820AL
406
CHIN CH7
1.067 pu
147 kV
1630
REDCOAT1
1.079 pu
149 kV
172L-4
667L
690
COALDAL7
1.025 pu
141 kV
172L-3
734L
692
N LETHB1
1.011 pu
140 kV
370ST5
370ST6
370ST3
172L-2
207L
770L
679
LETH111S
1.011 pu
140 kV
725L-2
939
RVBD TAP
1.012 pu
140 kV
725L-4
698
LETH674S
1.011 pu
140 kV
725L-3
823
725BL
1.010 pu
139 kV
3001/725BL
901
MCBRIDE1
1.008 pu
139 kV
237
FORT MA7
1.011 pu
140 kV
180L-40
872
180AL-TAP
1.019 pu
141 kV
180AL-10A
894
CLARESHOLM4
1.019 pu
141 kV
180L-30A
180L-30
279
STAVELEY
1.021 pu
141 kV
180L-20
244
VULCAN 7
1.027 pu
142 kV
235
STAVELY7
1.019 pu
141 kV
191L
1621
NEWSVCP2
1.047 pu
251 kV
2075S_3
463L-1
463AL
400
MONARCH7
1.010 pu
139 kV
916
MONAR TP
1.011 pu
139 kV
1620
NEWSVCP1
1.047 pu
251 kV
2075S_2
1618
NEWELL
1.047 pu
251 kV
2075S_1
1012
NEWELL2
1.047 pu
251 kV
923L
935L
1087L
1088L
1034L
1035L
669
BOWMAN1
1.029 pu
247 kV
928
ENCH TAP
1.025 pu
141 kV
763L-3
763L-2
918
CASS01
1.045 pu
251 kV
1114L
480
BENNETTS
1.044 pu
250 kV
1053L
1052L
1051L
1484
ANDERS04
1.096 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
1053 pu
253 kV
1003L
985L
160
JANET 4
1208.6 MW
-44.4 Mvar
1064L
1065L
1045 pu
251 kV
1054 pu
253 kV
260
JENNER 4
1.098 pu
264 kV
944L
951L
225
WARE JCT
1076 pu
258 kV
1075L
931L
1052 pu
252 kV
430
W BROOK4
276
W BROOK7
1033 pu
143 kV
28ST2A
28ST1A
666L
814L
827L
853L-1
877
BASNTAP
1.032 pu
142 kV
853AL
853L-2
399
BASSAN7
1.029 pu
142 kV
275
TILLEY 7
1.026 pu
142 kV
100L
270
SUFFIEL7
1.033 pu
143 kV
333
QUENSTWN
1.033 pu
143 kV
547070
161AL_TAP
1.029 pu
142 kV
161L
826
831A TAP
1.027 pu
142 kV
831L-2
831L-1
831AL
250
DUCHESS7
1.026 pu
142 kV
445
CUTNG L7
1.027 pu
142 kV
256
BROOKS 7
1.030 pu
142 kV
795L
401
HAYS 7
1.016 pu
140 kV
1005L-1
943
MILO 1
1.044 pu
251 kV
1036L
1037L-A
1038L
1037L-B
541080
1.060 pu
254 kV
1037L-2
642
SC1C
1.052 pu
253 kV
266S_2
266S_1
643
SC1D
1.054 pu
253 kV
652
SC1A
1.046 pu
251 kV
266S_4
266S_3
653
SC1B
1.052 pu
252 kV
540009
KCS_POI_A6
1.043 pu
1038L
617
FOOTHLL1
1.038 pu
249 kV
544
ENMX65S4
1.049 pu
252 kV
570
ENMX65S7
1.015 pu
140 kV
65.2TR
65.1TR
1106L
1107L
1080L
1081L
772
ENMX25S7
1.054 pu
253 kV
1064L
1065L
161
SARCEE 4
1.047 pu
251 kV
162
E CALGAR
1.045 pu
251 kV
916L
936L
937L
159
LANGDON4
540070
927AL_TAP
1.034 pu
248 kV
924L
1042L
1041L
940L
1005AL
451
MATLBI1
1.068 pu
256 kV
547026
TRAVERS_5
549026
TRAVERS_4
0.000 pu
0 kV
737
TRAVRS1
1.069 pu
257 kV
736
BSR_1
1.077 pu
258 kV
167
N LETHB4
1.066 pu
256 kV
367
CHINOOK1
1.011 pu
140 kV
463L-2
402
KETTLES1
1.028 pu
142 kV
616AL
409
KETTLES
1.028 pu
142 kV
616L-1
166
PEIGAN 7
1.018 pu
141 kV
59ST1
165
PEIGAN 4
1.067 pu
256 kV
1037L-A
1038L
1048L
1049L
1037L-B
541080
1.060 pu
254 kV
199.7 MW
4.9 Mvar
770
MCLGH2
1.028 pu
142 kV
769
MCLGH_TP
1.028 pu
142 kV
164L-03A
164L-03B
164AL
164L
514L-1
514BL TP
1.020 pu
70 kV
876
1501
NATAL 7
1.050 pu
145 kV
726
HRL_TAP
1.026 pu
142 kV
233
DRYWOOD7
1.026 pu
142 kV
786L
232
COLEMAN7
1.046 pu
144 kV
234
CASTRIV1
1.031 pu
142 kV
170L
413L
396ST1
118%
Amps
81%
Amps
80%
Amps
91%
Amps
83%
Amps
84%
Amps
88%
Amps
84%
Amps
NICAN
International Consulting Ltd.
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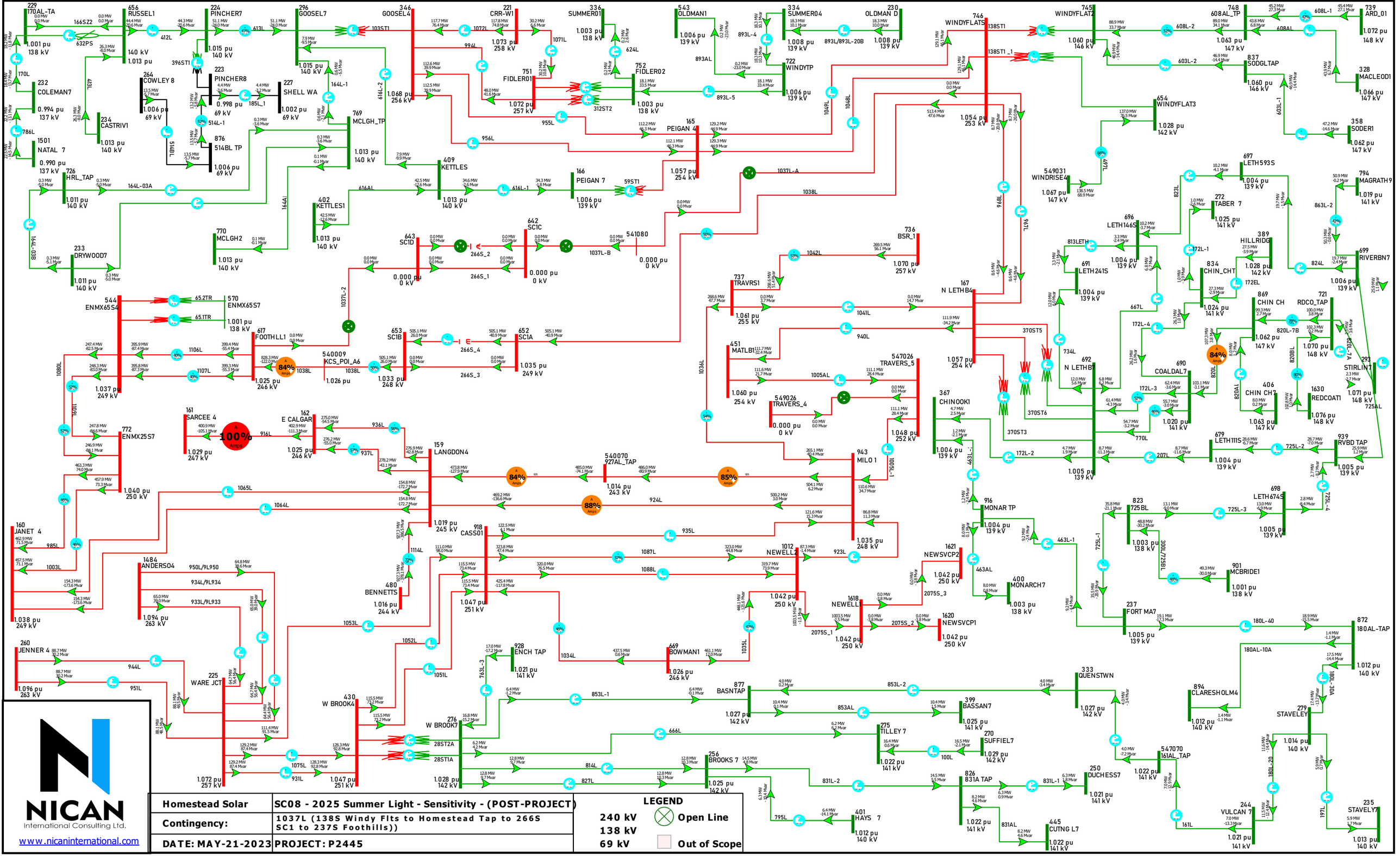
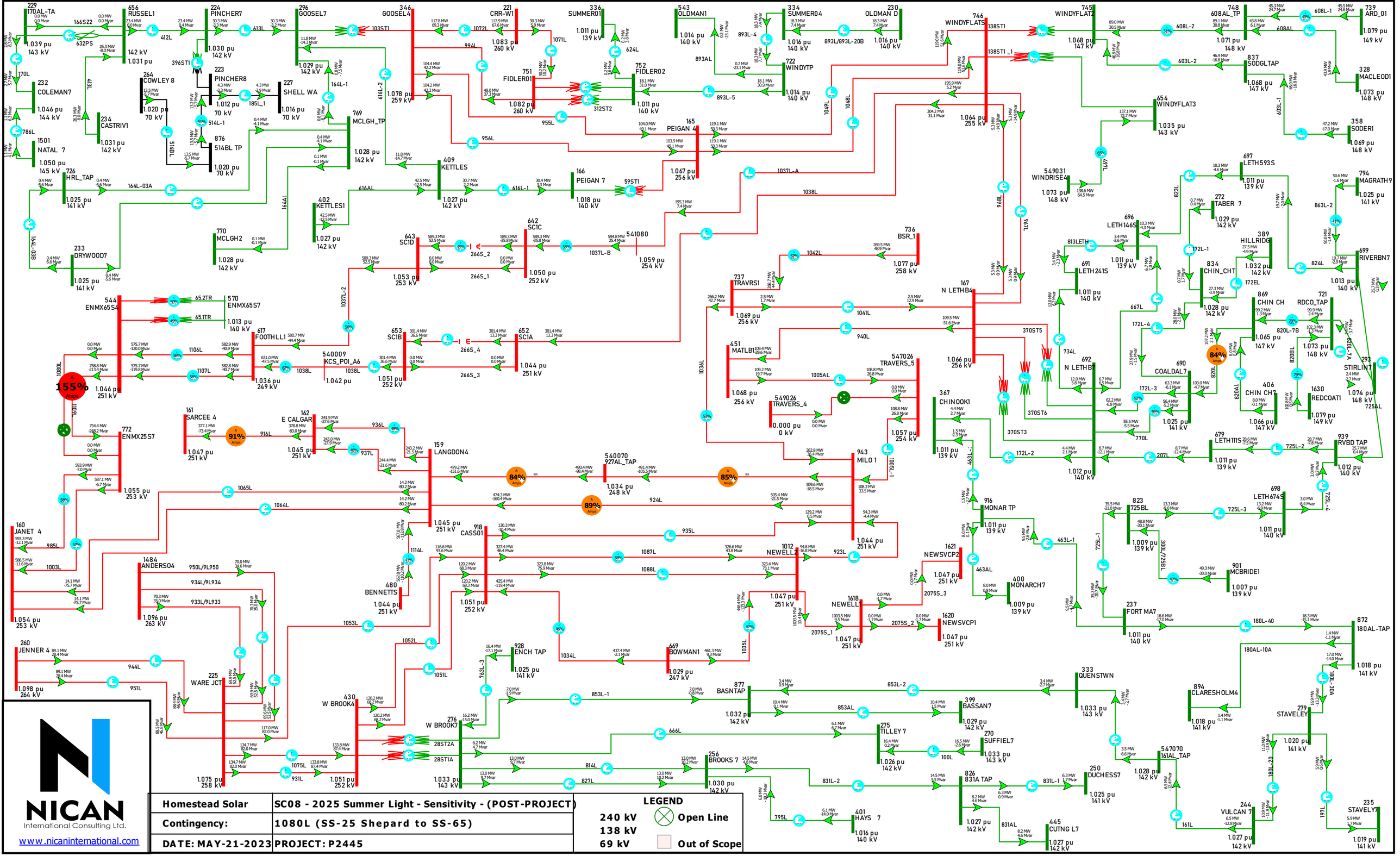
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229 170AL-TA 1.001 pu 138 kV
656 RUSSEL1 1.013 pu 140 kV
224 PINCHER7 1.015 pu 140 kV
296 GOOSEL7 1.015 pu 140 kV
346 GOOSEL4 1.068 pu 256 kV
221 CRR-W1 1.073 pu 258 kV
336 SUMMER01 1.003 pu 138 kV
543 OLDMAN1 1.006 pu 139 kV
336 SUMMER04 1.008 pu 139 kV
230 OLDMAN D 1.008 pu 139 kV
746 WINDYFLATS 1.054 pu 253 kV
745 WINDYFLAT2 1.060 pu 146 kV
748 608AL_TP 1.063 pu 147 kV
739 ARD_01 1.072 pu 148 kV
654 WINDYFLAT3 1.028 pu 142 kV
549031 WINDRISE4 1.067 pu 147 kV
697 LETH593S 1.004 pu 139 kV
794 MAGRATH9 1.019 pu 141 kV
837 SODGLTAP 1.060 pu 146 kV
328 MACLEOD1 1.066 pu 147 kV
358 SODER1 1.062 pu 147 kV
232 COLEMAN7 0.994 pu 137 kV
264 COWLEY 8 1.006 pu 69 kV
223 PINCHER8 0.998 pu 69 kV
227 SHELL WA 1.002 pu 69 kV
234 CASTRIV1 1.013 pu 140 kV
876 514BL TP 1.006 pu 69 kV
769 MCLGH_TP 1.013 pu 140 kV
1501 NATAL 7 0.990 pu 137 kV
726 HRL_TAP 1.011 pu 140 kV
233 DRYWOOD7 1.011 pu 140 kV
770 MCLGH2 1.013 pu 140 kV
402 KETTLES1 1.013 pu 140 kV
409 KETTLES 1.013 pu 140 kV
165 PEIGAN 4 1.057 pu 254 kV
166 PEIGAN 7 1.006 pu 139 kV
752 FIDLER02 1.003 pu 138 kV
751 FIDLER01 1.072 pu 257 kV
272 TABER 7 1.025 pu 141 kV
696 LETH146S 1.004 pu 139 kV
691 LETH241S 1.004 pu 139 kV
834 CHIN_CHT 1.024 pu 141 kV
389 HILLRIDG 1.028 pu 142 kV
699 RIVERBN7 1.006 pu 139 kV
869 CHIN CH 1.062 pu 147 kV
721 RDCO_TAP 1.070 pu 148 kV
690 COALDAL7 1.020 pu 141 kV
406 CHIN CH7 1.063 pu 147 kV
1630 REDCOAT1 1.076 pu 148 kV
293 STIRLIN7 1.071 pu 148 kV
725AL
679 LETH111S 1.004 pu 139 kV
939 RVBD TAP 1.005 pu 139 kV
725L-2
1005 pu 139 kV
736 BSR_1 1.070 pu 257 kV
737 TRAVRS1 1.061 pu 255 kV
451 MATLB1 1.060 pu 254 kV
547026 TRAVERS_5 1.048 pu 252 kV
549026 TRAVERS_4 0.000 pu 0 kV
167 N LETHB4 1.057 pu 254 kV
692 N LETHB1 1.004 pu 139 kV
734L
370ST5
370ST6
370ST3
367 CHINOOK1 1.004 pu 139 kV
943 MILO 1 1.035 pu 248 kV
1005L-1
1005L-2
1005 pu 139 kV
1004 pu 139 kV
1012 NEWELL2 1.042 pu 250 kV
1621 NEWSVCP2 1.042 pu 250 kV
1618 NEWELL1 1.042 pu 250 kV
1620 NEWSVCP1 1.042 pu 250 kV
400 MONARCH7 1.003 pu 138 kV
916 MONAR TP 1.004 pu 139 kV
823 725BL 1.003 pu 138 kV
698 LETH674S 1.005 pu 139 kV
901 MCBRIDE1 1.001 pu 138 kV
237 FORT MA7 1.005 pu 139 kV
872 180AL-TAP 1.012 pu 140 kV
894 CLARESHOLM4 1.012 pu 140 kV
333 QUENSTWN 1.027 pu 142 kV
279 STAVELEY 1.014 pu 140 kV
244 VULCAN 7 1.021 pu 141 kV
235 STAVELY7 1.013 pu 140 kV
445 CUTNG L7 1.022 pu 141 kV
826 831A TAP 1.022 pu 141 kV
250 DUCHESS7 1.021 pu 141 kV
547070 161AL_TAP 1.022 pu 141 kV
270 SUFFIEL7 1.029 pu 142 kV
275 TILLEY 7 1.022 pu 141 kV
399 BASSAN7 1.025 pu 141 kV
877 BASNTAP 1.027 pu 142 kV
669 BOWMAN1 1.026 pu 246 kV
928 ENCH TAP 1.021 pu 141 kV
430 W BROOK4 1.047 pu 251 kV
276 W BROOK7 1.028 pu 142 kV
28ST2A
28ST1A
256 BROOKS 7 1.025 pu 142 kV
401 HAYS 7 1.012 pu 140 kV
795L
831L-2
831L-1
831AL
853L-1
853L-2
853AL
666L
814L
827L
1075L
931L
1072 pu 257 kV
1160 JANET 4 1.038 pu 249 kV
1484 ANDERS04 1.094 pu 263 kV
950L/9L950
934L/9L934
933L/9L933
480 BENNETTS 1.016 pu 244 kV
1114L
1019 pu 245 kV
918 CASS01 1.047 pu 251 kV
1087L
1088L
1053L
1052L
1051L
1034L
1035L
1260 JENNER 4 1.096 pu 263 kV
944L
951L
225 WARE JCT
1080L
1101L
1106L
1107L
1037 pu 249 kV
544 ENMX65S4
570 ENMX65S7 1.001 pu 138 kV
65.2TR
65.1TR
617 FOOTHLL1 1.025 pu 246 kV
540009 KCS_POI_A6 1.026 pu
1038L
653 SC1B 1.033 pu 248 kV
652 SC1A 1.035 pu 249 kV
266S_4
266S_3
643 SC1D 0.000 pu 0 kV
642 SC1C 0.000 pu 0 kV
266S_2
266S_1
1037L-2
1037L-B
541080 0.000 pu 0 kV
1037L-A
1038L
1042L
1041L
940L
1005AL
1036L
1040L
1048L
1049L
1054L
1055L
956L
994L
1071L
624L
893L-4
893L/893L-20B
893AL
893L-5
312ST2
959L
1072L
1073L
772 ENMX25S7 1.040 pu 250 kV
1065L
1064L
161 SARCEE 4 1.029 pu 247 kV
916L
162 E CALGAR 1.025 pu 246 kV
936L
937L
159 LANGDON4
540070 927AL_TAP 1.014 pu 243 kV
924L
935L
923L
1042L
1035L-1
1035L-2
1035L-3
1035L-4
1035L-5
1035L-6
1035L-7
1035L-8
1035L-9
1035L-10
1035L-11
1035L-12
1035L-13
1035L-14
1035L-15
1035L-16
1035L-17
1035L-18
1035L-19
1035L-20
1035L-21
1035L-22
1035L-23
1035L-24
1035L-25
1035L-26
1035L-27
1035L-28
1035L-29
1035L-30
1035L-31
1035L-32
1035L-33
1035L-34
1035L-35
1035L-36
1035L-37
1035L-38
1035L-39
1035L-40



Homestead Solar	SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:	1080L (SS-25 Shepard to SS-65)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV — Open Line

138 kV

69 kV — Out of Scope

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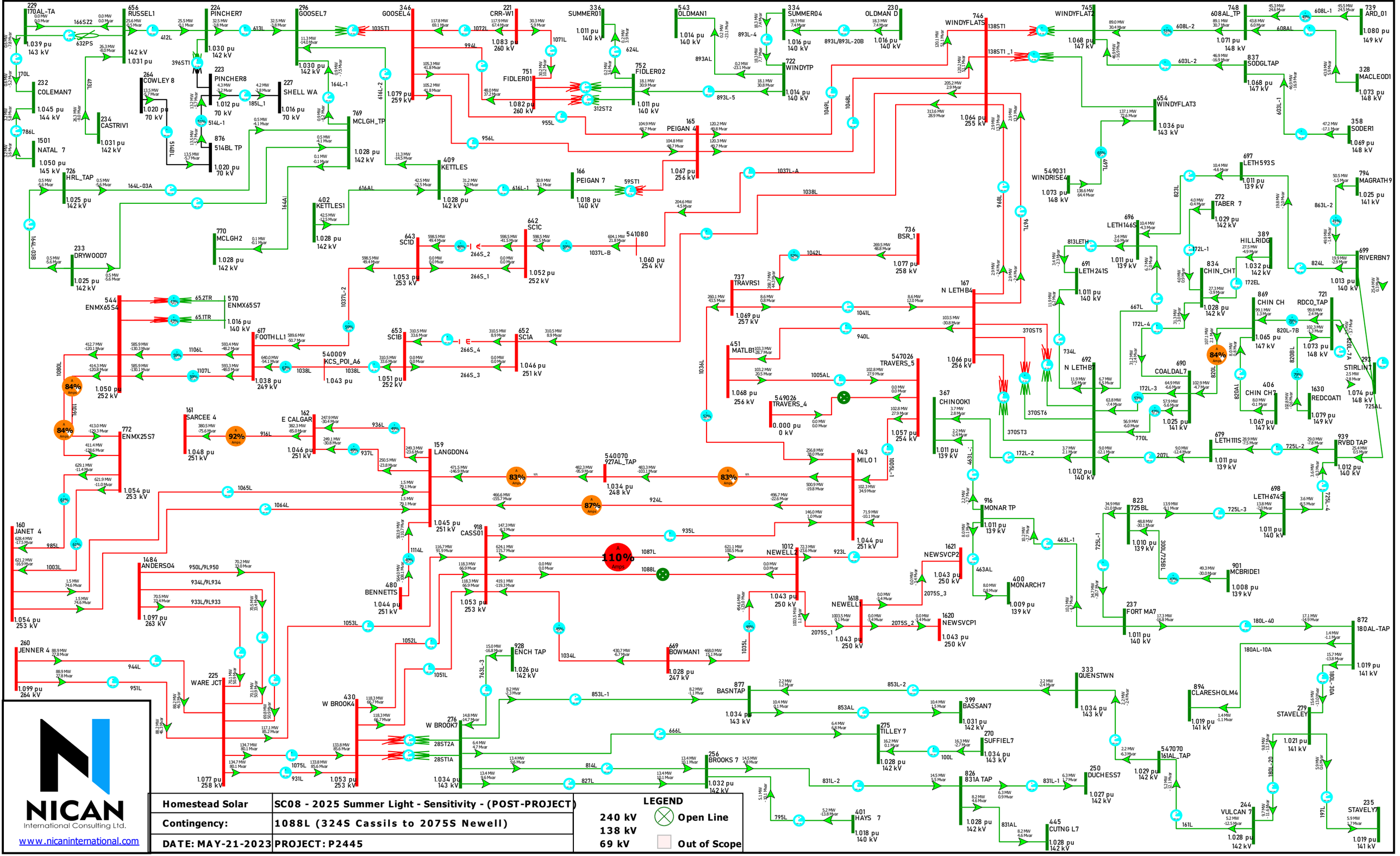

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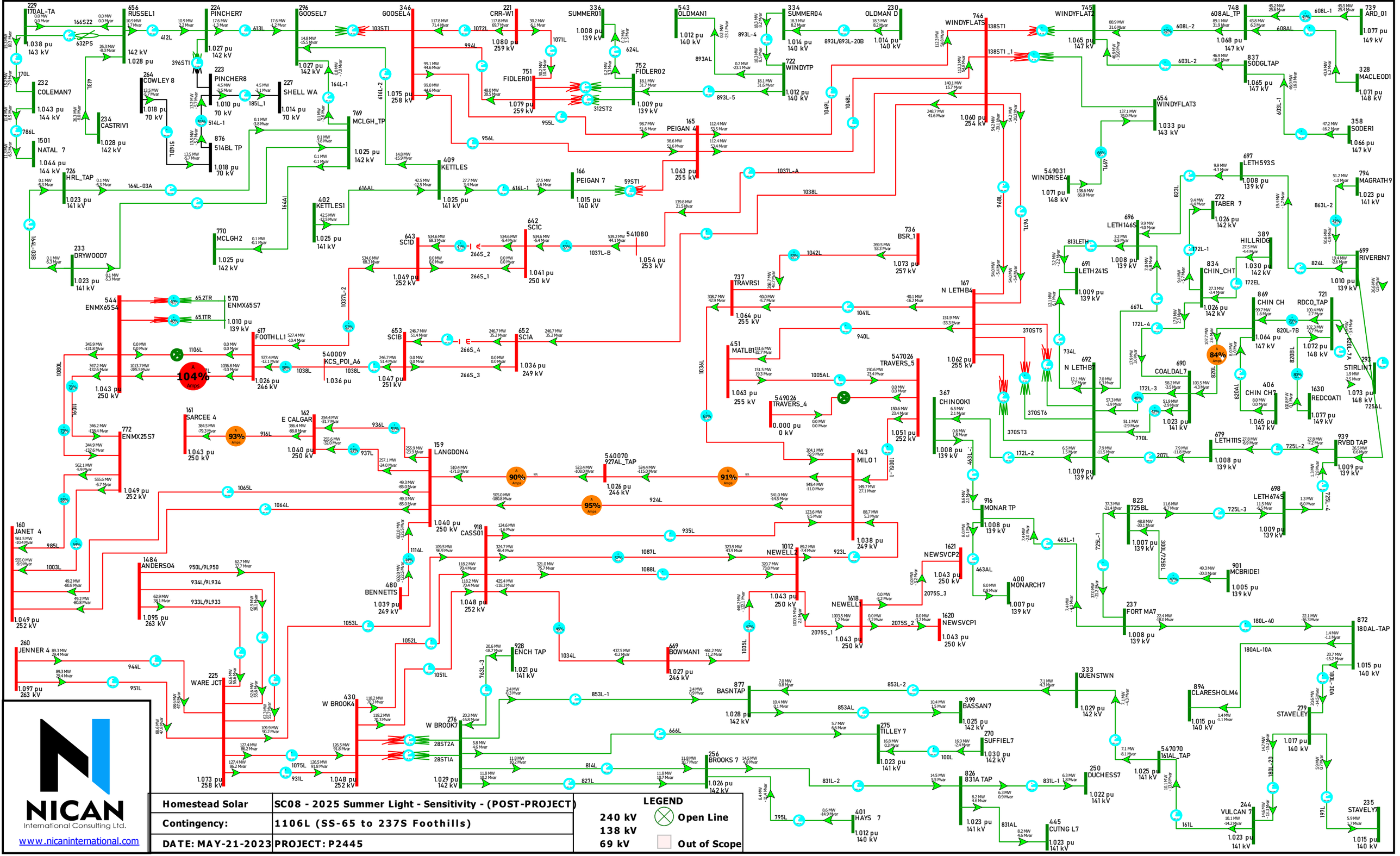
Homestead Solar	**SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)**
Contingency:	**1088L (324S Cassils to 2075S Newell)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
⊗ **Open Line**
☐ **Out of Scope**


229
170AL-TA
1.038 pu
143 kV
632PS
166SZ2
656
RUSSEL1
142 kV
1.028 pu
412L
224
PINCHER7
1.027 pu
142 kV
396ST1
613L
296
GOOSEL7
1.027 pu
142 kV
164L-1
223
PINCHER8
1.010 pu
70 kV
185L_1
227
SHELL WA
1.014 pu
70 kV
264
COWLEY 8
1.018 pu
70 kV
514L-1
876
514BL TP
1.018 pu
70 kV
769
MCLGH_TP
1.025 pu
142 kV
616L-2
346
GOOSEL4
103ST1
1.075 pu
258 kV
994L
956L
955L
221
CRR-W1
1.080 pu
259 kV
1071L
751
FIDLER01
1.079 pu
259 kV
312ST2
336
SUMMER01
1.008 pu
139 kV
624L
752
FIDLER02
1.009 pu
139 kV
543
OLDMAN1
1.012 pu
140 kV
893L-4
893AL
893L-5
336
SUMMER04
1.014 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.014 pu
140 kV
722
WINDYTP
1.012 pu
140 kV
746
WINDYFLATS
138ST1
138ST1_1
1.060 pu
254 kV
1049L
1048L
654
WINDYFLAT3
1.033 pu
143 kV
697L
549031
WINDRISE4
1.071 pu
148 kV
745
WINDYFLAT2
1.065 pu
147 kV
608AL_TP
1.068 pu
147 kV
608L-2
603L-2
837
SODGLTAP
1.065 pu
147 kV
608L-1
608AL
739
ARD_01
1.077 pu
149 kV
328
MACLEOD1
1.071 pu
148 kV
603L-1
358
SODER1
1.066 pu
147 kV
165
PEIGAN 4
1.063 pu
255 kV
1037L-A
1038L
166
PEIGAN 7
1.015 pu
140 kV
59ST1
409
KETTLES
1.025 pu
141 kV
616L-1
616AL
402
KETTLES1
1.025 pu
141 kV
164L-03A
164AL
164BL
726
HRL_TAP
1.023 pu
141 kV
1501
NATAL 7
1.044 pu
144 kV
786L
232
COLEMAN7
1.043 pu
144 kV
170L
234
CASTRIV1
1.028 pu
142 kV
514BL
233
DRYWOOD7
1.023 pu
141 kV
770
MCLGH2
1.025 pu
142 kV
541080
1.054 pu
253 kV
1037L-B
642
SC1C
1.041 pu
250 kV
643
SC1D
1.049 pu
252 kV
266S_2
266S_1
736
BSR_1
1.073 pu
257 kV
1042L
737
TRAVRS1
1.064 pu
255 kV
1041L
940L
451
MATLB1
1.063 pu
255 kV
1005AL
549026
TRAVERS_4
0.000 pu
0 kV
547026
TRAVERS_5
1.051 pu
252 kV
943
MILO 1
1.012 pu
140 kV
1005L-1
167
N LETHB4
1.062 pu
255 kV
370ST5
370ST6
370ST3
734L
692
N LETHB1
1.009 pu
139 kV
367
CHINOOK1
1.008 pu
139 kV
463L-1
916
MONAR TP
1.008 pu
139 kV
463AL
400
MONARCH7
1.007 pu
139 kV
1621
NEWSVCP2
1.043 pu
250 kV
2075S_3
1618
NEWELL
1.043 pu
250 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.043 pu
250 kV
1012
NEWELL2
1.043 pu
250 kV
923L
1087L
1088L
935L
924L
918
CASS01
1.040 pu
250 kV
1114L
480
BENNETTS
1.039 pu
249 kV
1053L
1052L
1051L
1034L
669
BOWMAN1
1.027 pu
246 kV
1035L
928
ENCH TAP
1.021 pu
141 kV
763L-3
430
W BROOK4
1.048 pu
252 kV
931L
1075L
276
W BROOK7
1.029 pu
142 kV
28ST2A
28ST1A
877
BASNTAP
1.028 pu
142 kV
853L-1
853L-2
853AL
666L
814L
827L
399
BASSAN7
1.025 pu
142 kV
275
TILLEY 7
1.023 pu
141 kV
100L
270
SUFFIEL7
1.030 pu
142 kV
256
BROOKS 7
1.026 pu
142 kV
831L-2
826
831A TAP
1.023 pu
141 kV
831L-1
831AL
445
CUTNG L7
1.023 pu
141 kV
250
DUCHESS7
1.022 pu
141 kV
333
QUENSTWN
1.029 pu
142 kV
547070
161AL_TAP
1.025 pu
141 kV
161L
244
VULCAN 7
1.023 pu
141 kV
894
CLARESHOLM4
1.015 pu
140 kV
180L-40
180L-10A
180L-30A
872
180AL-TAP
1.015 pu
140 kV
279
STAVELEY
1.017 pu
140 kV
191L
235
STAVELY7
1.015 pu
140 kV
401
HAYS 7
1.012 pu
140 kV
795L
544
ENMX65S4
1.043 pu
250 kV
65.2TR
65.1TR
570
ENMX65S7
1.010 pu
139 kV
617
FOOTHLL1
1.026 pu
246 kV
1106L
1038L
540009
KCS_POI_A6
1.036 pu
653
SC1B
1.047 pu
251 kV
652
SC1A
1.036 pu
249 kV
266S_4
266S_3
1080L
1101L
772
ENMX25S7
1.049 pu
252 kV
1065L
1064L
985L
1003L
160
JANET 4
1.049 pu
252 kV
1484
ANDERS04
1.095 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.097 pu
263 kV
944L
951L
225
WARE JCT
1.073 pu
258 kV
161
SARCEE 4
1.043 pu
250 kV
162
E CALGAR
1.040 pu
250 kV
936L
937L
159
LANGDON4
1.040 pu
250 kV
540070
927AL_TAP
1.026 pu
246 kV
1065L
1064L
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
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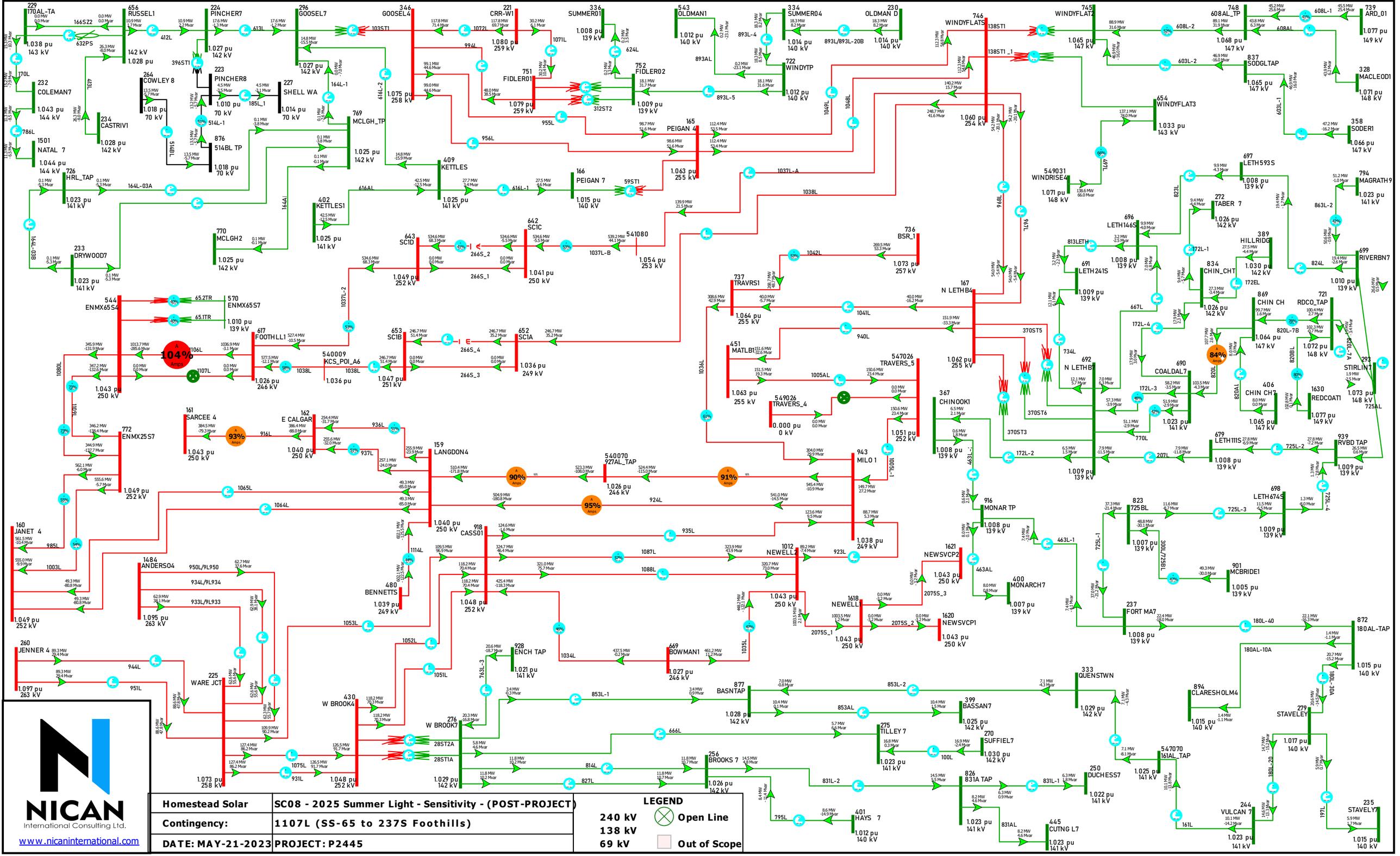
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1106L (SS-65 to 237S Foothills)
DATE: MAY-21-2023
PROJECT: P2445


229 170AL-TA
1.038 pu 143 kV
166S2
632PS
656 RUSSEL1
142 kV 1.028 pu
412L
224 PINCHER7
1.027 pu 142 kV
613L
296 GOOSEL7
1.027 pu 142 kV
396ST1
223 PINCHER8
1.010 pu 70 kV
185L_1
227 SHELL WA
1.014 pu 70 kV
264 COWLEY 8
1.018 pu 70 kV
164L-1
769 MCLGH_TP
1.025 pu 142 kV
514L-1
876 514BL TP
1.018 pu 70 kV
514BL
170L
232 COLEMAN7
1.043 pu 144 kV
419L
234 CASTRIV1
1.028 pu 142 kV
786L
1501 NATAL 7
1.044 pu 144 kV
726 HRL_TAP
1.023 pu 141 kV
164L-03A
164L-03B
233 DRYWOOD7
1.023 pu 141 kV
164AL
770 MCLGH2
1.025 pu 142 kV
402 KETTLES1
1.025 pu 141 kV
616AL
616L-2
346 GOOSEL4
103ST1
1.075 pu 258 kV
616L-1
409 KETTLES
1.025 pu 141 kV
166 PEIGAN 7
1.015 pu 140 kV
59ST1
165 PEIGAN 4
1.063 pu 255 kV
1037L-A
1038L
1037L-B
541080
1.054 pu 253 kV
642 SC1C
643 SC1D
1.049 pu 252 kV
266S_2
266S_1
1.041 pu 250 kV
1037L-2
653 SC1B
652 SC1A
266S_4
266S_3
1.036 pu 249 kV
1.047 pu 251 kV
540009 KCS_POI_A6
1.036 pu
1038L
544 ENMX65S4
570 ENMX65S7
1.010 pu 139 kV
65.2TR
65.1TR
617 FOOTHLL1
1.026 pu 246 kV
1106L
1107L
104% Amps
1080L
1.043 pu 250 kV
1101L
772 ENMX25S7
1.049 pu 252 kV
1065L
1064L
985L
1003L
160 JANET 4
1.049 pu 252 kV
1484 ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.095 pu 263 kV
260 JENNER 4
944L
951L
1.097 pu 263 kV
225 WARE JCT
1.073 pu 258 kV
1075L
931L
1.048 pu 252 kV
430 W BROOK4
1.036 pu
1053L
1052L
1051L
1039L-2
276 W BROOK7
28ST2A
28ST1A
1.029 pu 142 kV
763L-3
928 ENCH TAP
1.021 pu 141 kV
1034L
669 BOWMAN1
1.027 pu 246 kV
1035L
161 SARCEE 4
1.043 pu 250 kV
93% Amps
916L
162 E CALGAR
1.040 pu 250 kV
936L
937L
159 LANGDON4
1.040 pu 250 kV
1114L
480 BENNETTS
1.039 pu 249 kV
540070 927AL_TAP
1.026 pu 246 kV
90% Amps
95% Amps
91% Amps
918 CASS01
1.048 pu 252 kV
1087L
1088L
935L
924L
1012 NEWELL2
1.043 pu 250 kV
923L
1618 NEWELL
1.043 pu 250 kV
2075S_1
2075S_2
2075S_3
1621 NEWSVCP2
1.043 pu 250 kV
1620 NEWSVCP1
1.043 pu 250 kV
943 MILO 1
1.038 pu 249 kV
1005L-1
1.012 pu 140 kV
401 HAYS 7
795L
853L-1
853L-2
853AL
877 BASNTAP
1.028 pu 142 kV
399 BASSAN7
1.025 pu 142 kV
275 TILLEY 7
1.023 pu 141 kV
100L
270 SUFFIEL7
1.030 pu 142 kV
666L
814L
827L
256 BROOKS 7
1.026 pu 142 kV
831L-2
831L-1
826 831A TAP
1.023 pu 141 kV
831AL
445 CUTNG L7
1.023 pu 141 kV
250 DUCHESS7
1.022 pu 141 kV
333 QUENSTWN
1.029 pu 142 kV
894 CLARESHOLM4
1.015 pu 140 kV
547070 161AL_TAP
1.025 pu 141 kV
161L
244 VULCAN 7
1.023 pu 141 kV
279 STAVELEY
1.017 pu 140 kV
235 STAVELY7
1.015 pu 140 kV
1971L
872 180AL-TAP
1.015 pu 140 kV
180L-40
180AL-10A
180L-30A
180L-20
725L-2
725L-4
725AL
939 RVBD TAP
1.009 pu 139 kV
679 LETH111S
1.008 pu 139 kV
698 LETH674S
1.009 pu 139 kV
725L-3
823 725BL
1.007 pu 139 kV
3001L/725BL
725L-1
901 MCBRIDE1
1.005 pu 139 kV
237 FORT MA7
1.008 pu 139 kV
1630 REDCOAT1
1.077 pu 149 kV
406 CHIN CH7
1.065 pu 147 kV
820L-7A
820L-7B
820BL
869 CHIN CH
1.064 pu 147 kV
721 RDCO_TAP
1.072 pu 148 kV
293 STIRLIN7
1.073 pu 148 kV
725AL
820L
820AL
690 COALDAL7
1.023 pu 141 kV
172L-3
172L-4
667L
834 CHIN_CHT
1.026 pu 142 kV
172L-1
172EL
389 HILLRIDG
1.030 pu 142 kV
824L
699 RIVERBN7
1.010 pu 139 kV
863L-2
794 MAGRATH9
1.023 pu 141 kV
823L
697 LETH593S
1.008 pu 139 kV
272 TABER 7
1.026 pu 142 kV
696 LETH146S
1.008 pu 139 kV
691 LETH241S
1.009 pu 139 kV
813LETH
172L-2
207L
679 LETH111S
1.008 pu 139 kV
1.009 pu 139 kV
745 WINDYFLAT2
1.065 pu 147 kV
608L-2
603L-2
748 608AL_TP
1.068 pu 147 kV
608AL
608L-1
739 ARD_01
1.077 pu 149 kV
837 SODGLTAP
1.065 pu 147 kV
603L-1
328 MACLEOD1
1.071 pu 148 kV
358 SODER1
1.066 pu 147 kV
654 WINDYFLAT3
1.033 pu 143 kV
549031 WINDRISE4
1.071 pu 148 kV
1497L
746 WINDYFLATS
1.060 pu 254 kV
138ST1
138ST1_1
1049L
1048L
336 SUMMER04
1.014 pu 140 kV
893L-4
893L/893L-20B
230 OLDMAN D
1.014 pu 140 kV
543 OLDMAN1
1.012 pu 140 kV
893AL
722 WINDYTP
1.012 pu 140 kV
893L-5
752 FIDLER02
1.009 pu 139 kV
312ST2
336 SUMMER01
1.008 pu 139 kV
624L
221 CRR-W1
1.080 pu 259 kV
1072L
1071L
994L
751 FIDLER01
1.079 pu 259 kV
955L
956L
736 BSR_1
1.073 pu 257 kV
1042L
737 TRAVRS1
1.064 pu 255 kV
1041L
940L
451 MATLB1
1.063 pu 255 kV
1005AL
547026 TRAVERS_5
1.051 pu 252 kV
549026 TRAVERS_4
0.000 pu 0 kV
167 N LETHB4
1.062 pu 255 kV
370ST5
370ST6
370ST3
692 N LETHB7
734L
367 CHINOOK1
1.008 pu 139 kV
463L-1
916 MONAR TP
1.008 pu 139 kV
463AL
400 MONARCH7
1.007 pu 139 kV
1497L
1496L
1048L
1049L
1040L
1037L-A
1038L
1042L
1041L
940L
1005AL
1005L-1
1035L
1034L
1039L-2
1037L-2
1036L
1080L
1101L
1064L
1065L
1003L
985L
1114L
1053L
1052L
1051L
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1088L
935L
924L
923L
853L-1
853L-2
853AL
666L
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831L-1
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1971L
1972L
1975L
1976L
1977L
1978L
1979L
1980L
1981L
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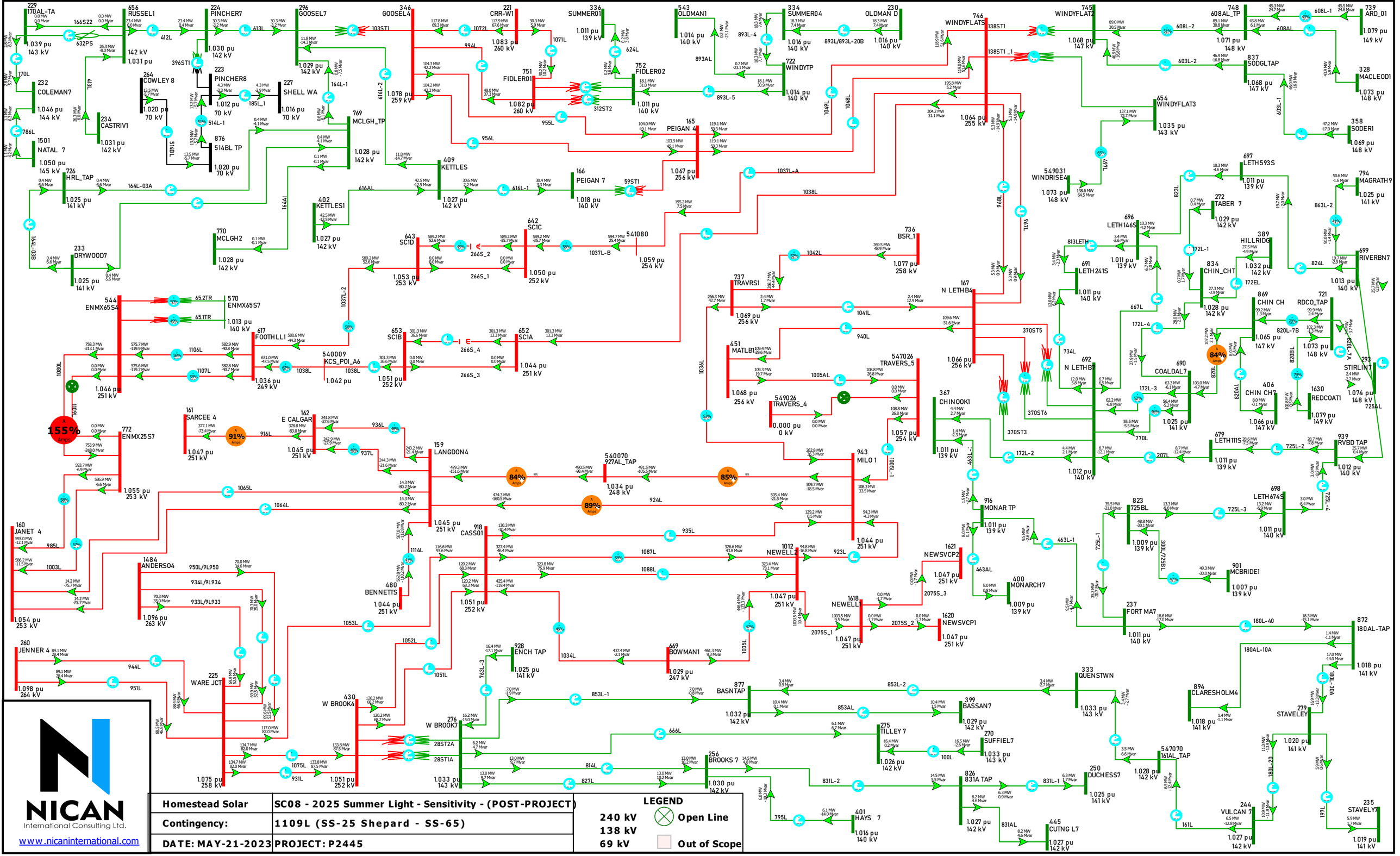

Homestead Solar	**SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)**
Contingency:	**1109L (SS-25 Shepard - SS-65)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

⊗ Open Line
▢ Out of Scope

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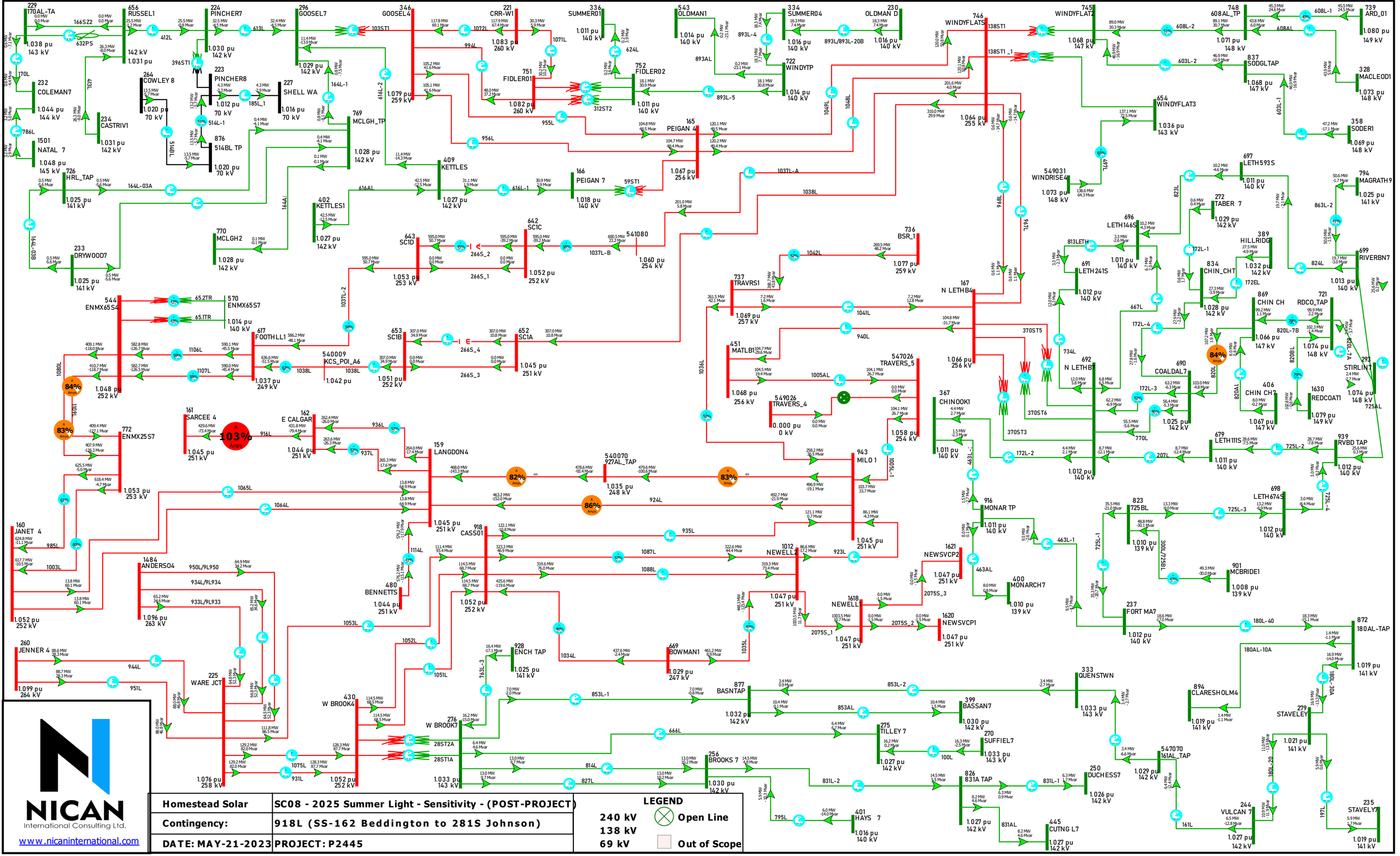
229
170AL-TA
1.038 pu
143 kV
632PS
166SZ2
656
RUSSEL1
142 kV
1.031 pu
412L
224
PINCHER7
1.030 pu
142 kV
396ST1
613L
296
GOOSEL7
1.029 pu
142 kV
346
GOOSEL4
103ST1
1.079 pu
259 kV
221
CRR-W1
1.083 pu
260 kV
1072L
994L
1071L
336
SUMMER01
1.011 pu
140 kV
624L
543
OLDMAN1
1.014 pu
140 kV
893L-4
893L/893L-20B
893AL
893L-5
336
SUMMER04
1.016 pu
140 kV
230
OLDMAN D
1.016 pu
140 kV
722
WINDYTP
1.014 pu
140 kV
752
FIDLER02
1.011 pu
140 kV
751
FIDLER01
1.082 pu
260 kV
312ST2
955L
956L
746
WINDYFLATS
138ST1
138ST1_1
1.064 pu
255 kV
1040L
1048L
745
WINDYFLAT2
1.068 pu
147 kV
608AL_TP
1.071 pu
148 kV
608L-1
608L-2
608AL
603L-2
837
SODGLTAP
1.068 pu
147 kV
739
ARD_01
1.080 pu
149 kV
328
MACLEOD1
1.073 pu
148 kV
603L-1
358
SODER1
1.069 pu
148 kV
654
WINDYFLAT3
1.036 pu
143 kV
549031
WINDRISE4
1.073 pu
148 kV
1497L
1498L
697
LETH593S
1.011 pu
140 kV
794
MAGRATH9
1.025 pu
141 kV
863L-2
824L
699
RIVERBN7
1.013 pu
140 kV
272
TABER 7
1.029 pu
142 kV
823L
696
LETH146S
1.011 pu
140 kV
813LETH
691
LETH241S
1.012 pu
140 kV
172L-1
834
CHIN_CHT
1.028 pu
142 kV
389
HILLRIDG
1.032 pu
142 kV
172EL
667L
172L-4
869
CHIN CH
1.066 pu
147 kV
820L-7B
721
RDCO_TAP
1.074 pu
148 kV
820L-7A
293
STIRLIN7
1.074 pu
148 kV
725AL
820BL
820L
820AL
406
CHIN CH7
1.067 pu
147 kV
1630
REDCOAT1
1.079 pu
149 kV
690
COALDAL7
1.025 pu
142 kV
172L-3
734L
692
N LETHB1
1.012 pu
140 kV
370ST5
370ST6
370ST3
172L-2
207L
770L
679
LETH111S
1.011 pu
140 kV
725L-2
939
RVBD TAP
1.012 pu
140 kV
1037L-A
1038L
1036L
1037L-2
1037L-B
1053L
1052L
1051L
1035L
1034L
1042L
1041L
940L
1005AL
1005L-1
1064L
1065L
985L
1003L
1114L
1087L
1088L
935L
924L
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1075L
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927AL_TAP
1027AL_TAP
1161L
1971L
725L-1
725L-3
725L-4
3001/725BL
180L-40
180AL-10A
180L-30A
180AL-TAP
763L-3
666L
814L
827L
795L
853L-1
853L-2
853AL
1005L-2
1100L
463L-1
463AL
831L-2
831L-1
831AL
1621
NEWSVCP2
1.047 pu
251 kV
2075S_3
400
MONARCH7
1.010 pu
139 kV
1618
NEWELL
1.047 pu
251 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.047 pu
251 kV
1012
NEWELL2
1.047 pu
251 kV
918
CASS01
1.052 pu
252 kV
1.045 pu
251 kV
1.044 pu
251 kV
480
BENNETTS
1.044 pu
251 kV
1484
ANDERS04
1.096 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
160
JANET 4
1.052 pu
252 kV
260
JENNER 4
1.099 pu
264 kV
944L
951L
225
WARE JCT
1.076 pu
258 kV
430
W BROOK4
1.052 pu
252 kV
276
W BROOK7
1.033 pu
143 kV
28ST2A
28ST1A
928
ENCH TAP
1.025 pu
141 kV
669
BOWMAN1
1.029 pu
247 kV
877
BASNTAP
1.032 pu
142 kV
399
BASSAN7
1.030 pu
142 kV
275
TILLEY 7
1.027 pu
142 kV
270
SUFFIEL7
1.033 pu
143 kV
256
BROOKS 7
1.030 pu
142 kV
333
QUENSTWN
1.033 pu
143 kV
894
CLARESHOLM4
1.019 pu
141 kV
547070
161AL_TAP
1.029 pu
142 kV
826
831A TAP
1.027 pu
142 kV
250
DUCHESS7
1.026 pu
142 kV
445
CUTNG L7
1.027 pu
142 kV
244
VULCAN 7
1.027 pu
142 kV
235
STAVELY7
1.019 pu
141 kV
279
STAVELEY
1.021 pu
141 kV
898
180AL-TAP
1.019 pu
141 kV
180L-30
180L-20
180L-10
401
HAYS 7
1.016 pu
140 kV
943
MILO 1
1.045 pu
251 kV
1.035 pu
248 kV
540070
927AL_TAP
159
LANGDON4
1.045 pu
251 kV
1.044 pu
251 kV
162
E CALGAR
1.044 pu
251 kV
161
SARCEE 4
1.045 pu
251 kV
772
ENMX25S7
1.053 pu
253 kV
544
ENMX65S4
570
ENMX65S7
1.014 pu
140 kV
617
FOOTHLL1
1.037 pu
249 kV
540009
KCS_POI_A6
1.042 pu
1038L
1106L
1107L
1080L
1081L
653
SC1B
1.051 pu
252 kV
652
SC1A
1.045 pu
251 kV
266S_4
266S_3
643
SC1D
1.053 pu
253 kV
642
SC1C
1.052 pu
252 kV
266S_2
266S_1
541080
1.060 pu
254 kV
1037L-B
737
TRAVRS1
1.069 pu
257 kV
736
BSR_1
1.077 pu
259 kV
451
MATLB1
1.068 pu
256 kV
549026
TRAVERS_4
0.000 pu
0 kV
547026
TRAVERS_5
1.058 pu
254 kV
167
N LETHB4
1.066 pu
256 kV
367
CHINOOK1
1.011 pu
140 kV
916
MONAR TP
1.011 pu
140 kV
237
FORT MA7
1.012 pu
140 kV
901
MCBRIDE1
1.008 pu
139 kV
1.010 pu
139 kV
823
725BL
1.010 pu
139 kV
698
LETH674S
1.012 pu
140 kV
165
PEIGAN 4
1.067 pu
256 kV
166
PEIGAN 7
1.018 pu
140 kV
59ST1
409
KETTLES
1.027 pu
142 kV
402
KETTLES1
1.027 pu
142 kV
616L-1
616L-2
616AL
769
MCLGH_TP
1.028 pu
142 kV
770
MCLGH2
1.028 pu
142 kV
1501
NATAL 7
1.048 pu
145 kV
726
HRL_TAP
1.025 pu
141 kV
233
DRYWOOD7
1.025 pu
141 kV
232
COLEMAN7
1.044 pu
144 kV
234
CASTRIV1
1.031 pu
142 kV
264
COWLEY 8
1.020 pu
70 kV
223
PINCHER8
1.012 pu
70 kV
227
SHELL WA
1.016 pu
70 kV
876
514BL TP
1.020 pu
70 kV
514L-1
514L-2
185L_1
164L-1
164L-2
164L-03A
164L-03B
164AL
786L
170L
84%
83%
103%
82%
86%
83%
Amps
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
918L (SS-162 Beddington to 281S Johnson)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
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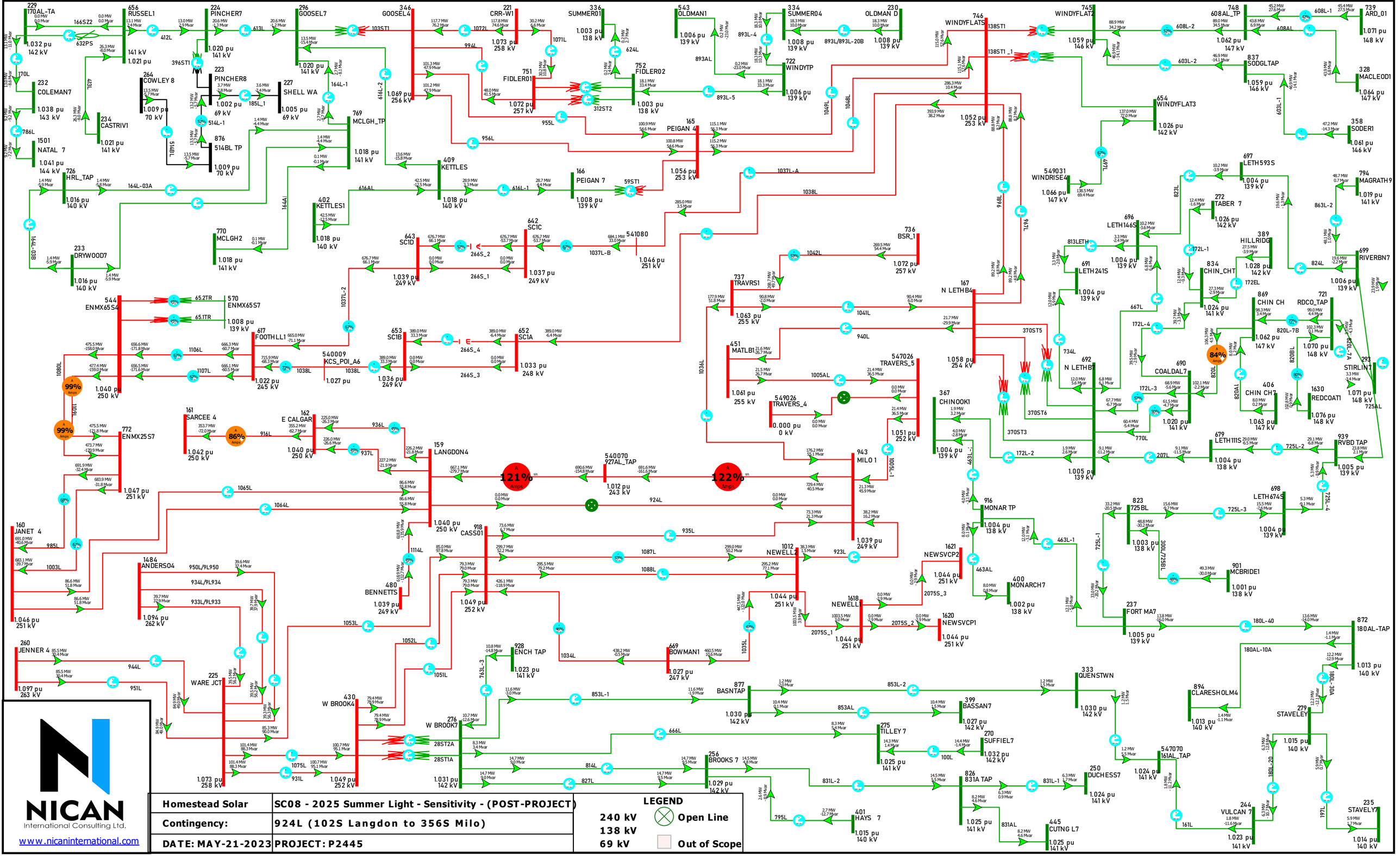

Homestead Solar	SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:	924L (102S Langdon to 356S Milo)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV

138 kV

69 kV

ⓧ Open Line

▢ Out of Scope

NICAN
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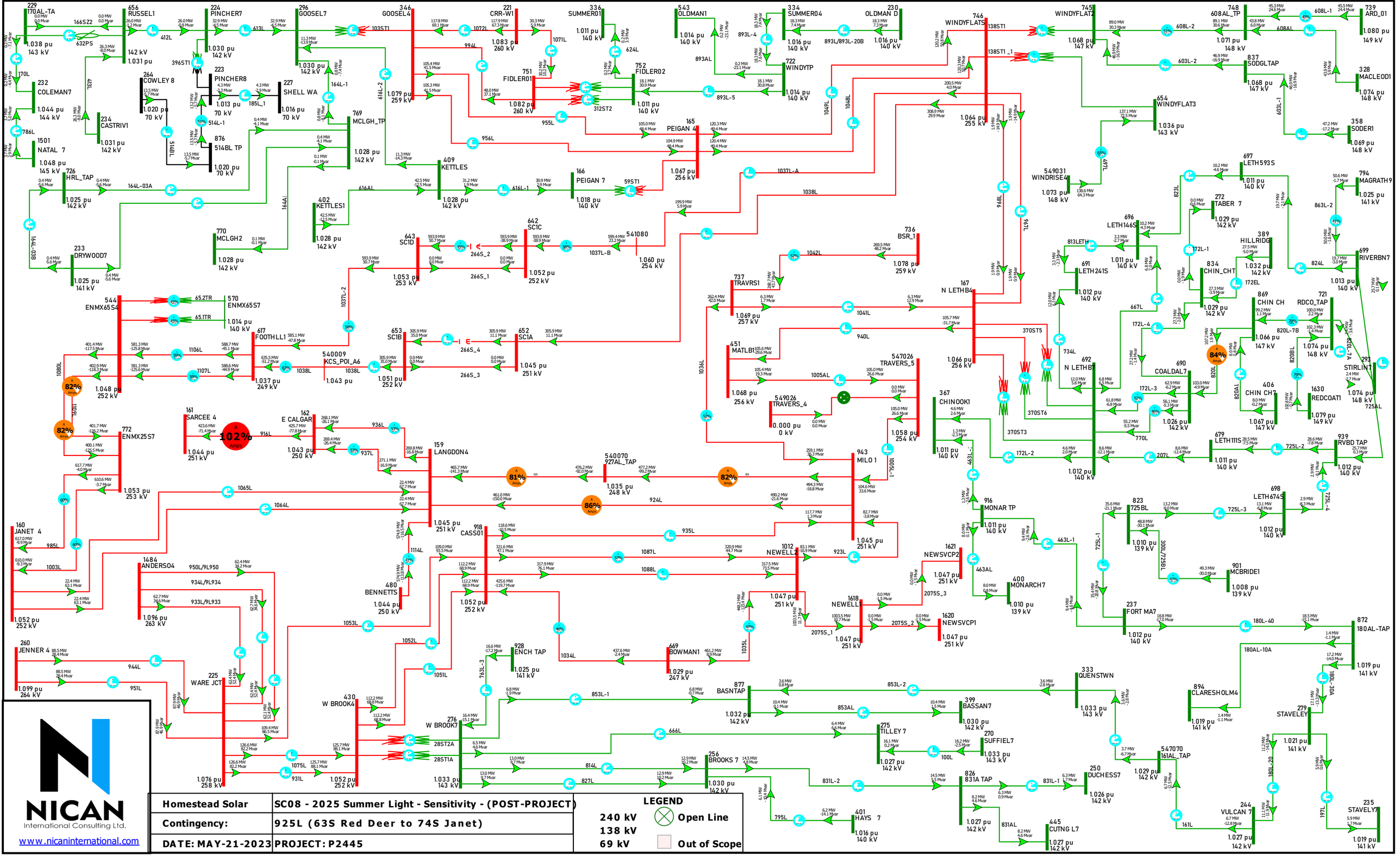
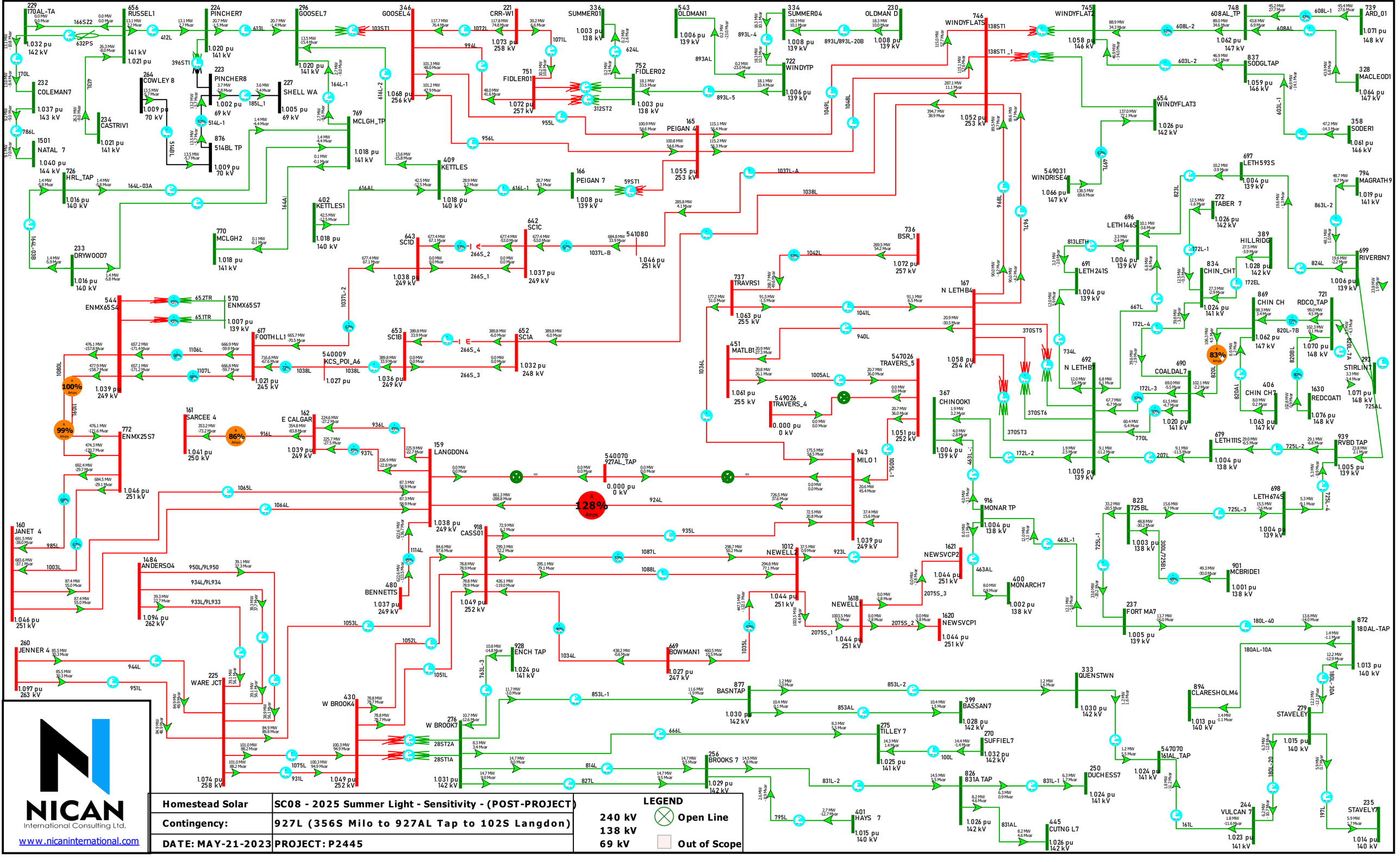

229 170AL-TA 1.038 pu 143 kV
656 RUSSEL1 142 kV 1.031 pu
224 PINCHER7 1.030 pu 142 kV
296 GOOSEL7 1.030 pu 142 kV
346 GOOSEL4 1.079 pu 259 kV
221 CRR-W1 1.083 pu 260 kV
336 SUMMER01 1.011 pu 140 kV
543 OLDMAN1 1.014 pu 140 kV
336 SUMMER04 1.016 pu 140 kV
230 OLDMAN D 1.016 pu 140 kV
746 WINDYFLATS 138ST1 1.064 pu 255 kV
745 WINDYFLAT2 1.068 pu 147 kV
748 608AL_TP 1.071 pu 148 kV
739 ARD_01 1.080 pu 149 kV
608L-2
608L-1
608AL
603L-2
837 SODGLTAP 1.068 pu 147 kV
328 MACLEOD1 1.074 pu 148 kV
603L-1
358 SODER1 1.069 pu 148 kV
654 WINDYFLAT3 1.036 pu 143 kV
549031 WINDRISE4 1.073 pu 148 kV
697 LETH593S 1.011 pu 140 kV
794 MAGRATH9 1.025 pu 141 kV
863L-2
699 RIVERBN7 1.013 pu 140 kV
824L
272 TABER 7 1.029 pu 142 kV
823L
696 LETH146S 1.011 pu 140 kV
813LETH
691 LETH241S 1.012 pu 140 kV
389 HILLRIDG 1.032 pu 142 kV
834 CHIN_CHT 1.029 pu 142 kV
172L-1
172EL
869 CHIN CH 1.066 pu 147 kV
721 RDCO_TAP 1.074 pu 148 kV
820L-7B
820L-7A
293 STIRLIN7 1.074 pu 148 kV
725AL
690 COALDAL7 1.026 pu 142 kV
84% Amps
172L-4
172L-3
667L
820L
820AL
406 CHIN CH7 1.067 pu 147 kV
1630 REDCOAT1 1.079 pu 149 kV
679 LETH111S 1.011 pu 140 kV
939 RVBD TAP 1.012 pu 140 kV
725L-2
207L
172L-2
1.012 pu 140 kV
692 N LETHB1 1.066 pu 147 kV
734L
370ST5
370ST6
370ST3
770L
463L-1
463L-2
916 MONAR TP 1.011 pu 140 kV
463AL
400 MONARCH7 1.010 pu 139 kV
1621 NEWSVCP2 1.047 pu 251 kV
2075S_3
1618 NEWELL1 1.047 pu 251 kV
2075S_1
2075S_2
1620 NEWSVCP1 1.047 pu 251 kV
1012 NEWELL2 1.047 pu 251 kV
923L
935L
924L
1087L
1088L
1114L
1053L
1052L
1051L
1034L
1035L
669 BOWMAN1 1.029 pu 247 kV
928 ENCH TAP 1.025 pu 141 kV
763L-3
480 BENNETTS 1.044 pu 250 kV
1484 ANDERS04 1.096 pu 263 kV
950L/9L950
934L/9L934
933L/9L933
430 W BROOK4 1.076 pu 258 kV
225 WARE JCT 1.048 pu 252 kV
1075L
931L
276 W BROOK7 1.033 pu 143 kV
28ST2A
28ST1A
666L
814L
827L
853L-1
853L-2
853AL
877 BASNTAP 1.032 pu 142 kV
399 BASSAN7 1.030 pu 142 kV
333 QUENSTWN 1.033 pu 143 kV
180AL-10A
180L-40
180L-30A
894 CLARESHOLM4 1.019 pu 141 kV
872 180AL-TAP 1.019 pu 141 kV
275 TILLEY 7 1.027 pu 142 kV
100L
270 SUFFIEL7 1.033 pu 143 kV
547070 161AL_TAP 1.029 pu 142 kV
826 831A TAP 1.027 pu 142 kV
831L-1
831L-2
831AL
250 DUCHESS7 1.026 pu 142 kV
445 CUTNG L7 1.027 pu 142 kV
244 VULCAN 7 1.027 pu 142 kV
180L-20
180L-10
279 STAVELEY 1.021 pu 141 kV
197L
235 STAVELY7 1.019 pu 141 kV
1042L
1041L
940L
1005AL
451 MATLBI1 1.068 pu 256 kV
547026 TRAVERS_5 1.058 pu 254 kV
549026 TRAVERS_4 0.000 pu 0 kV
737 TRAVRS1 1.069 pu 257 kV
736 BSR_1 1.078 pu 259 kV
167 N LETHB4 1.066 pu 256 kV
367 CHINOOK1 1.011 pu 140 kV
463L-3
943 MILO 1 1.045 pu 251 kV
1005L-1
401 HAYS 7 1.016 pu 140 kV
795L
259 MW 36.3 Mvar
494.3 MW -18.8 Mvar
1037L-A
1038L
1037L-B
1037L-2
1036L
1064L
1065L
1080L
1081L
1106L
1107L
1038L
1043 pu
617 FOOTHLL1 1.037 pu 249 kV
544 ENMX65S4 1.048 pu 252 kV
570 ENMX65S7 1.014 pu 140 kV
65.2TR
65.1TR
772 ENMX25S7 1.053 pu 253 kV
161 SARCEE 4 1.044 pu 251 kV
102% Amps
162 E CALGAR 1.043 pu 250 kV
916L
936L
937L
159 LANGDON4 1.045 pu 251 kV
540070 927AL_TAP 1.035 pu 248 kV
86% Amps
81% Amps
82% Amps
82% Amps
160 JANET 4 1.052 pu 252 kV
1003L
985L
260 JENNER 4 1.099 pu 264 kV
944L
951L
918 CASS01 1.052 pu 252 kV
1114L
1053 pu 253 kV
1044 pu
1045 pu
1046L
1047L
1048L
1049L
1050L
1051L
1052L
1053L
1054L
1055L
1056L
1057L
1058L
1059L
1060L
1061L
1062L
1063L
1064L
1065L
1066L
1067L
1068L
1069L
1070L
1071L
1072L
1073L
1074L
1075L
1076L
1077L
1078L
1079L
1080L
1081L
1082L
1083L
1084L
1085L



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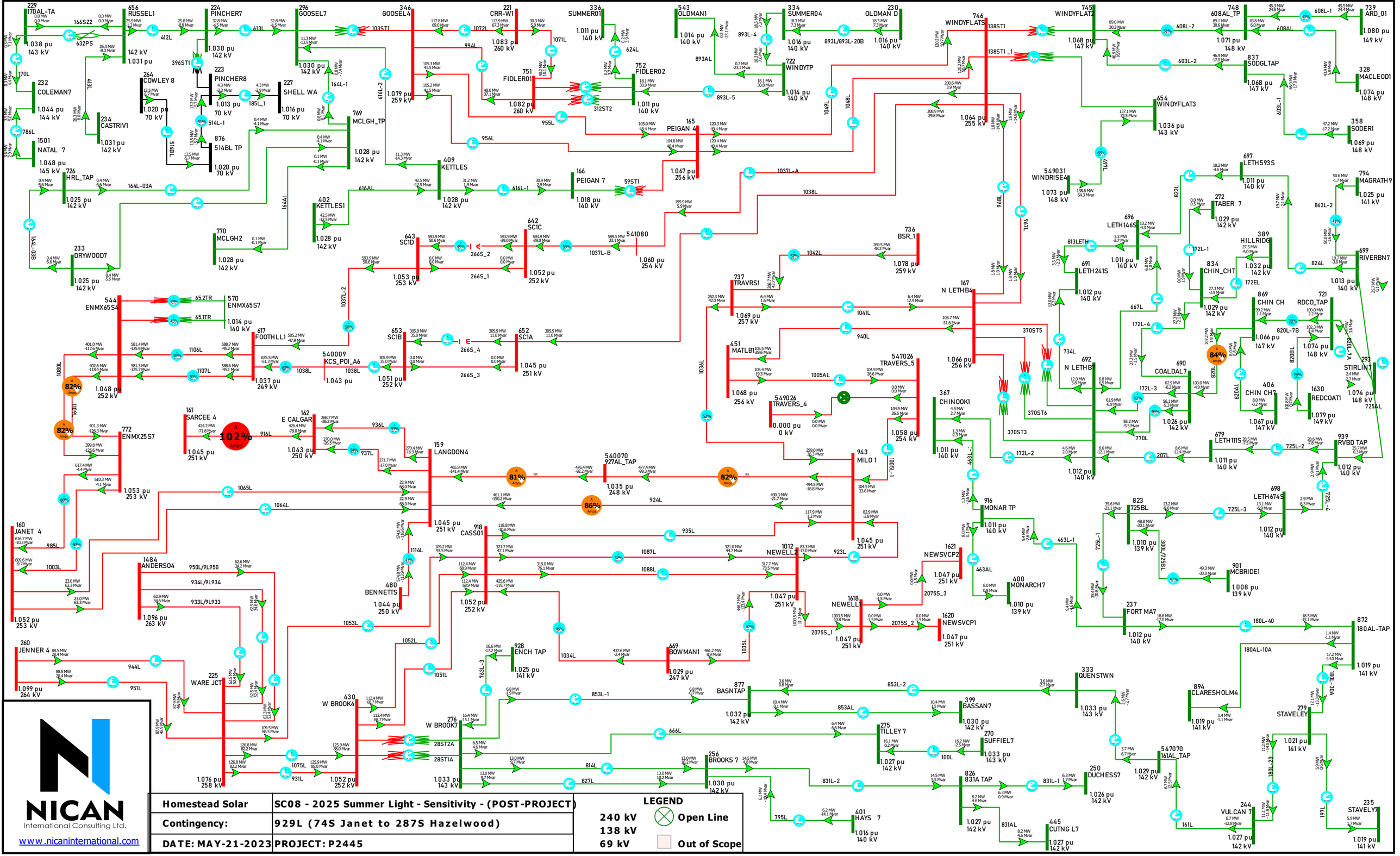
Homestead Solar	SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:	927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



Homestead Solar	**SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)**
Contingency:	**929L (74S Janet to 287S Hazelwood)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Ⓧ **Open Line**
☐ **Out of Scope**

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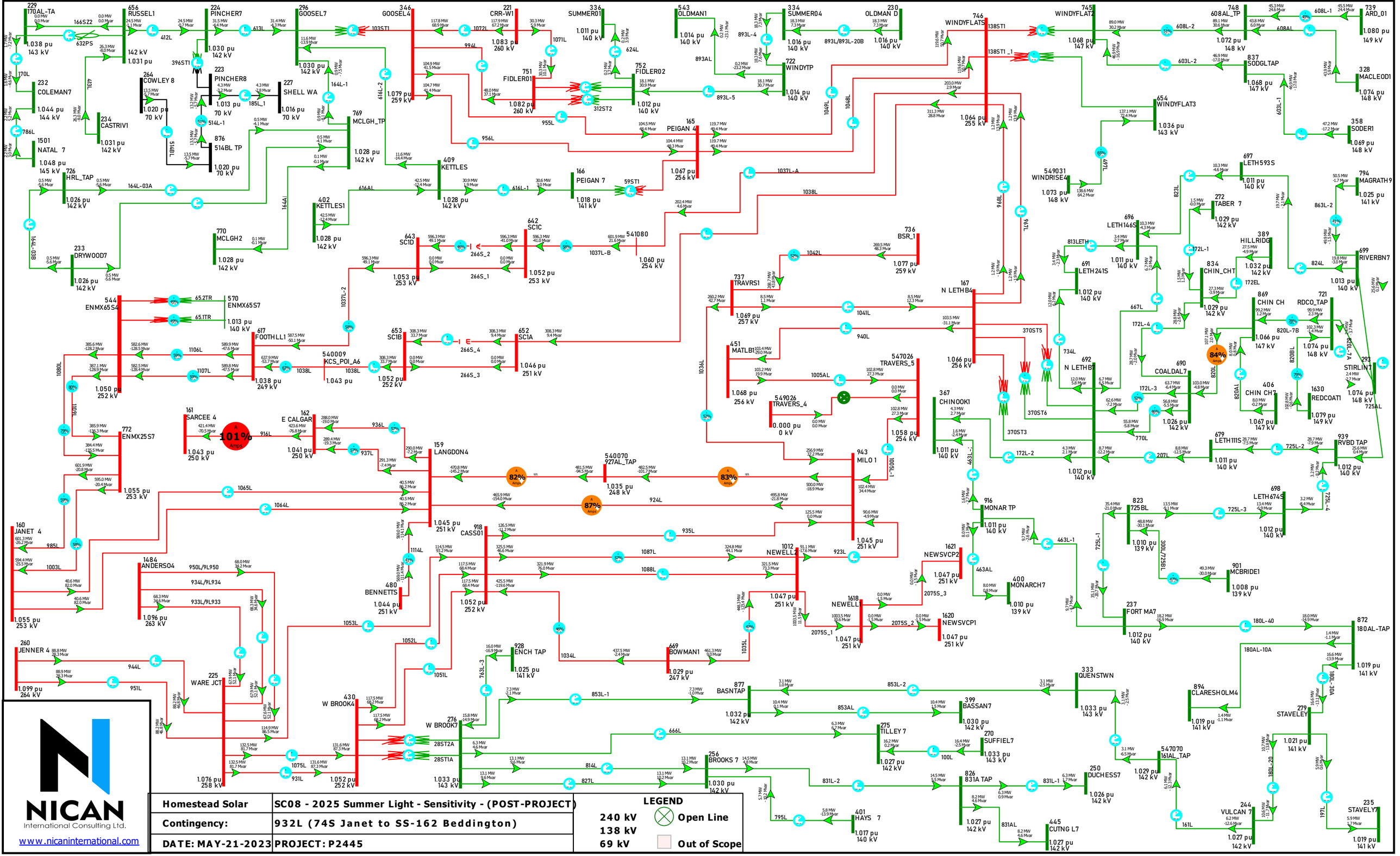
101%
Amps
82%
Amps
83%
Amps
87%
Amps
84%
Amps
NICAN
International Consulting Ltd.
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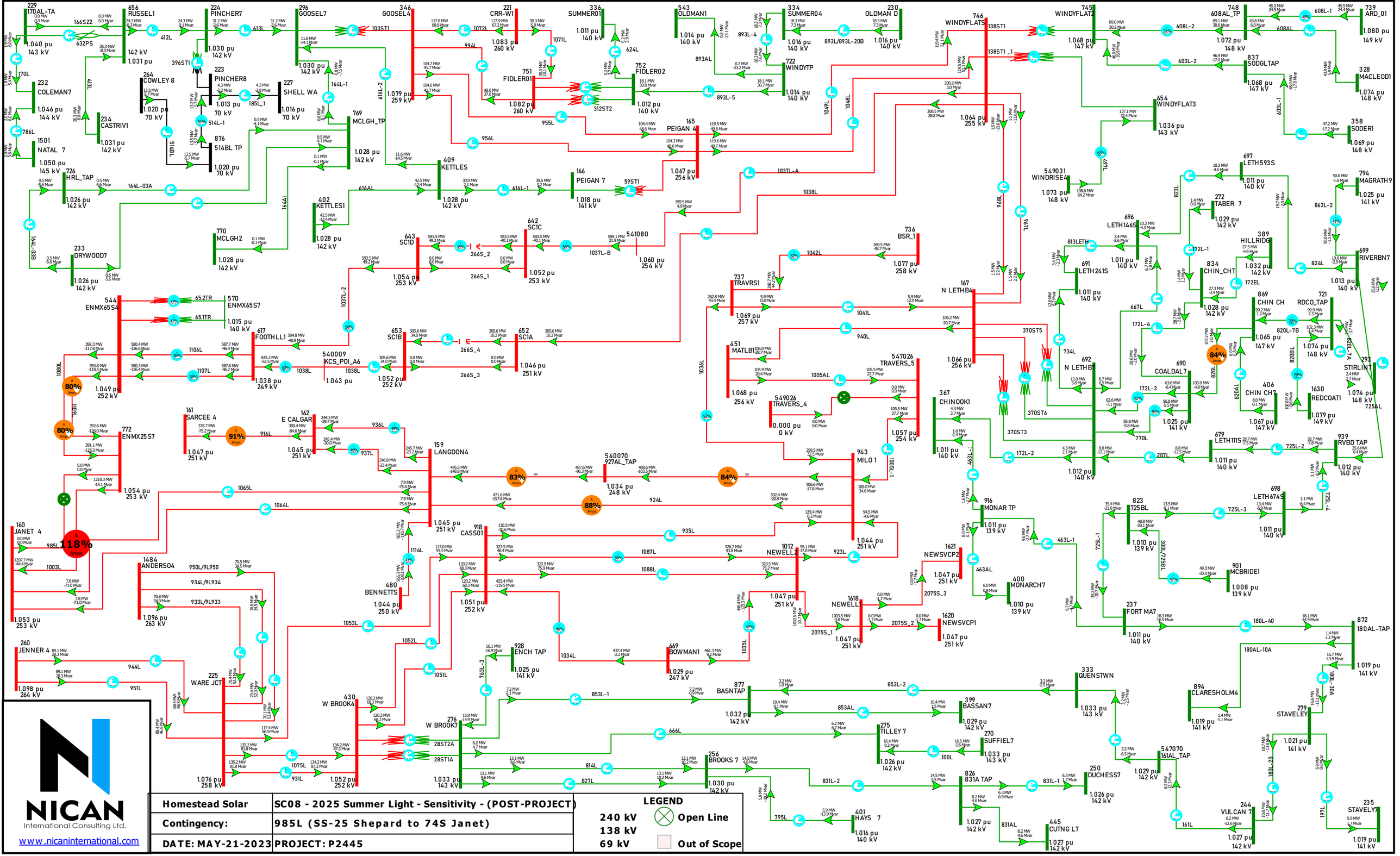
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
932L (74S Janet to SS-162 Beddington)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



Homestead Solar	SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:	985L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV

138 kV

69 kV

⊗ Open Line

☐ Out of Scope

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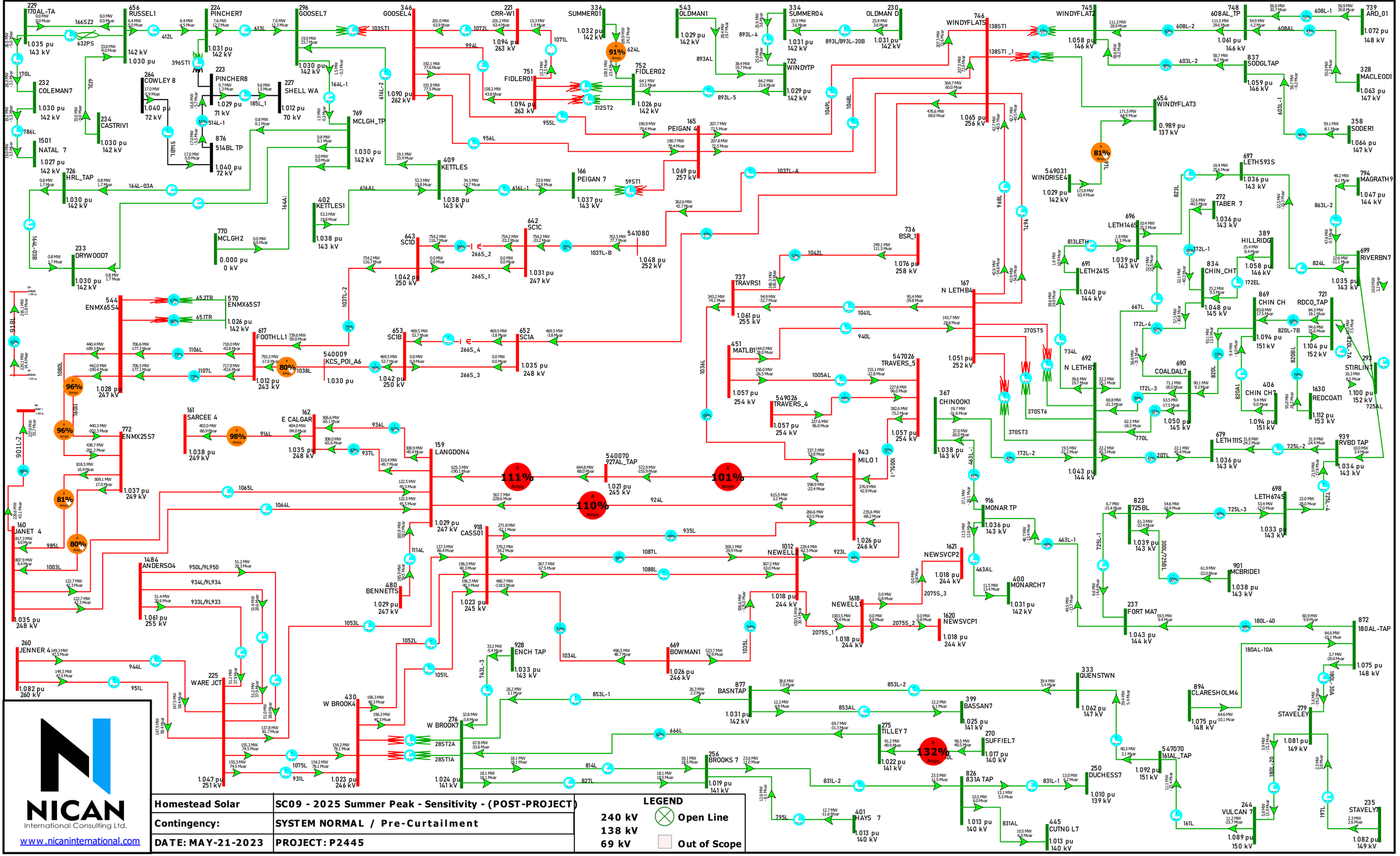
2025 SUMMER PEAK SENSITIVITY

Single Line Diagrams
P2445 - POST-PROJECT
POWER FLOW SC09

NICAN


229
170AL-TA
1.035 pu
143 kV
656
RUSSEL1
142 kV
1.030 pu
166SZ2
632PS
412L
224
PINCHER7
1.031 pu
142 kV
613L
296
GOOSEL7
1.030 pu
142 kV
346
GOOSEL4
103ST1
1.090 pu
262 kV
221
CRR-W1
1.094 pu
263 kV
1072L
1071L
336
SUMMER01
1.032 pu
142 kV
91%
624L
543
OLDMAN1
1.029 pu
142 kV
893L-4
334
SUMMER04
1.031 pu
142 kV
893L/893L-20B
230
OLDMAN D
1.031 pu
142 kV
722
WINDYTP
1.029 pu
142 kV
893L-5
752
FIDLER02
1.026 pu
142 kV
751
FIDLER01
1.094 pu
263 kV
312ST2
994L
955L
956L
396ST1
223
PINCHER8
1.029 pu
71 kV
264
COWLEY 8
1.040 pu
72 kV
227
SHELL WA
1.012 pu
70 kV
185L_1
514L-1
514AL
876
514BL TP
1.040 pu
72 kV
164L-1
769
MCLGH_TP
1.030 pu
142 kV
161L-2
409
KETTLES
1.038 pu
143 kV
616AL
616L-1
402
KETTLES1
1.038 pu
143 kV
165
PEIGAN 4
1.069 pu
257 kV
166
PEIGAN 7
1.037 pu
143 kV
59ST1
1037L-A
746
WINDYFLATS
138ST1
138ST1_1
1.065 pu
256 kV
1048L
1049L
745
WINDYFLAT2
1.058 pu
146 kV
748
608AL_TP
1.061 pu
146 kV
608AL
608L-1
608L-2
739
ARD_01
1.072 pu
148 kV
603L-2
837
SODGLTAP
1.059 pu
146 kV
603L-1
328
MACLEOD01
1.063 pu
147 kV
654
WINDYFLAT3
0.989 pu
137 kV
358
SODER1
1.064 pu
147 kV
549031
WINDRISE4
1.029 pu
142 kV
81%
697L
697
LETH593S
1.036 pu
143 kV
794
MAGRATH9
1.047 pu
144 kV
863L-2
824L
699
RIVERBN7
1.035 pu
143 kV
823L
272
TABER 7
1.036 pu
143 kV
696
LETH146S
1.039 pu
143 kV
813LETH
691
LETH241S
1.040 pu
144 kV
172L-1
834
CHIN_CHT
1.048 pu
146 kV
389
HILLRIDG
1.058 pu
146 kV
172EL
869
CHIN CH
1.094 pu
151 kV
820L-7B
721
RDCO_TAP
1.104 pu
152 kV
820L-7A
293
STIRLIN7
1.100 pu
152 kV
725AL
172L-4
667L
690
COALDAL7
1.050 pu
145 kV
172L-3
820L
820AL
406
CHIN CH7
1.094 pu
151 kV
1630
REDCOAT1
1.112 pu
153 kV
692
N LETHB7
1.043 pu
144 kV
734L
370ST5
370ST6
370ST3
172L-2
207L
679
LETH111S
1.036 pu
143 kV
939
RVBD TAP
1.034 pu
143 kV
725L-2
167
N LETHB4
1.051 pu
252 kV
1041L
940L
1005AL
1042L
736
BSR_1
1.076 pu
258 kV
737
TRAVRS1
1.061 pu
255 kV
451
MATLBI
1.057 pu
254 kV
547026
TRAVERS_5
1.057 pu
254 kV
549026
TRAVERS_4
1.057 pu
254 kV
1005L-1
943
MILO 1
1.013 pu
140 kV
367
CHINOOK1
1.038 pu
143 kV
463L-1
916
MONAR TP
1.036 pu
143 kV
463AL
1621
NEWSVCP2
1.018 pu
244 kV
2075S_3
400
MONARCH7
1.031 pu
142 kV
1618
NEWELL1
1.018 pu
244 kV
2075S_1
0.0 MW
-0.8 Mvar
2075S_2
1620
NEWSVCP1
1.018 pu
244 kV
1012
NEWELL2
1.018 pu
244 kV
923L
1087L
1088L
935L
924L
1034L
1035L
669
BOWMAN1
1.026 pu
246 kV
823
725BL
1.039 pu
143 kV
725L-1
725L-3
725L-4
698
LETH674S
1.033 pu
143 kV
730L/735L
901
MCBRIDE1
1.038 pu
143 kV
237
FORT MA7
1.043 pu
144 kV
180L-40
872
180AL-TAP
1.075 pu
148 kV
180L-10A
180L-30A
894
CLARESHOLM4
1.075 pu
148 kV
333
QUENSTWN
1.062 pu
147 kV
399
BASSAN7
1.025 pu
141 kV
877
BASNTAP
1.031 pu
142 kV
853L-2
853L-1
853AL
666L
275
TILLEY 7
1.022 pu
141 kV
270
SUFFIEL7
1.017 pu
140 kV
547070
161AL_TAP
1.092 pu
151 kV
161L
250
DUCHESS7
1.010 pu
139 kV
826
831A TAP
1.013 pu
140 kV
831L-2
831L-1
831AL
445
CUTNG L7
1.013 pu
140 kV
244
VULCAN 7
1.089 pu
150 kV
279
STAVELEY
1.081 pu
149 kV
235
STAVELY7
1.082 pu
149 kV
191L
544
ENMX65S4
570
ENMX65S7
1.026 pu
142 kV
65.2TR
65.1TR
617
FOOTHLL1
1.012 pu
243 kV
80%
1038L
540009
KCS_POI_A6
1.030 pu
653
SC1B
1.042 pu
250 kV
266S_4
266S_3
652
SC1A
1.035 pu
248 kV
643
SC1D
1.042 pu
250 kV
266S_2
266S_1
642
SC1C
1.031 pu
247 kV
1037L-B
541080
1.048 pu
252 kV
1037L-2
1106L
1107L
1080L
1091L
1081L
1028 pu
247 kV
96%
1.037 pu
249 kV
772
ENMX25S7
1065L
1064L
1.038 pu
249 kV
161
SARCEE 4
98%
916L
162
E CALGAR
1.035 pu
248 kV
936L
937L
159
LANGDON4
1.029 pu
247 kV
540070
927AL_TAP
1.021 pu
245 kV
111%
110%
101%
1114L
1053L
1052L
1051L
480
BENNETTS
1.029 pu
247 kV
1484
ANDERSO4
1.061 pu
255 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.082 pu
260 kV
944L
951L
225
WARE JCT
1.047 pu
251 kV
947L
948L
430
W BROOK4
1.023 pu
246 kV
1075L
931L
276
W BROOK7
1.024 pu
141 kV
28ST2A
28ST1A
814L
827L
763L-3
928
ENCH TAP
1.033 pu
143 kV
256
BROOKS 7
1.019 pu
141 kV
795L
401
HAYS 7
1.013 pu
140 kV
132%
1022L
1.022 pu
141 kV
918
CASS01
1.023 pu
245 kV
1029 pu
247 kV
160
JANET 4
1.035 pu
248 kV
985L
1003L
786L
1501
NATAL 7
1.027 pu
142 kV
726
HRL_TAP
1.030 pu
142 kV
164L-03A
164L-03B
233
DRYWOOD7
1.030 pu
142 kV
164AL
770
MCLGH2
0.000 pu
0 kV
541
1.030 pu
142 kV
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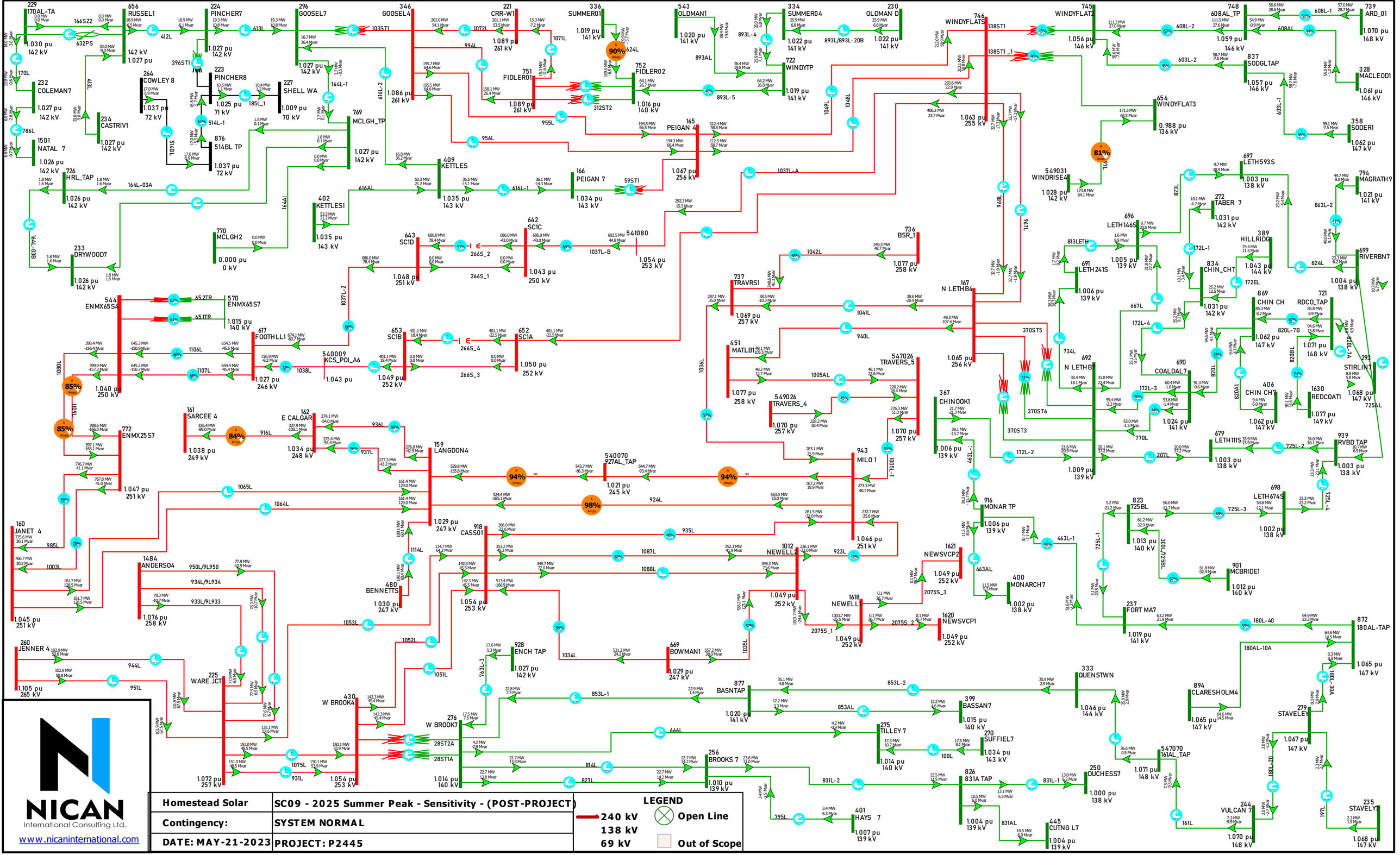
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
SYSTEM NORMAL / Pre-Curtailment
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.030 pu
142 kV
656
RUSSEL1
142 kV
1.027 pu
224
PINCHER7
1.027 pu
142 kV
296
GOOSEL7
1.027 pu
142 kV
346
GOOSEL4
1.086 pu
261 kV
221
CRR-W1
1.089 pu
261 kV
336
SUMMER01
1.019 pu
141 kV
543
OLDMAN1
1.020 pu
141 kV
334
SUMMER04
1.022 pu
141 kV
230
OLDMAN D
1.022 pu
141 kV
745
WINDYFLAT2
1.056 pu
146 kV
748
608AL_TP
1.059 pu
146 kV
739
ARD_01
1.070 pu
148 kV
264
COWLEY 8
1.037 pu
72 kV
223
PINCHER8
1.025 pu
71 kV
227
SHELL WA
1.009 pu
70 kV
752
FIDLER02
1.016 pu
140 kV
751
FIDLER01
1.089 pu
261 kV
722
WINDYTP
1.019 pu
141 kV
746
WINDYFLATS
1.063 pu
255 kV
654
WINDYFLAT3
0.988 pu
136 kV
837
SODGLTAP
1.057 pu
146 kV
328
MACLEOD1
1.061 pu
146 kV
358
SODER1
1.062 pu
147 kV
232
COLEMAN7
1.027 pu
142 kV
234
CASTRIV1
1.027 pu
142 kV
1501
NATAL 7
1.026 pu
142 kV
769
MCLGH_TP
1.027 pu
142 kV
876
514BL TP
1.037 pu
72 kV
165
PEIGAN 4
1.067 pu
256 kV
166
PEIGAN 7
1.034 pu
143 kV
409
KETTLES
1.035 pu
143 kV
402
KETTLES1
1.035 pu
143 kV
726
HRL_TAP
1.026 pu
142 kV
233
DRYWOOD7
1.026 pu
142 kV
770
MCLGH2
0.000 pu
0 kV
642
SC1C
1.043 pu
250 kV
643
SC1D
1.048 pu
251 kV
541080
1.054 pu
253 kV
736
BSR_1
1.077 pu
258 kV
737
TRAVRS1
1.069 pu
257 kV
451
MATLBI1
1.077 pu
258 kV
547026
TRAVERS_5
1.070 pu
257 kV
549026
TRAVERS_4
1.070 pu
257 kV
167
N LETHB4
1.065 pu
256 kV
549031
WINDRISE4
1.028 pu
142 kV
697
LETH593S
1.003 pu
138 kV
794
MAGRATH9
1.021 pu
141 kV
272
TABER 7
1.031 pu
142 kV
696
LETH146S
1.005 pu
139 kV
691
LETH241S
1.006 pu
139 kV
834
CHIN_CHT
1.043 pu
144 kV
389
HILLRIDG
1.004 pu
138 kV
699
RIVERBN7
1.004 pu
138 kV
869
CHIN CH
1.062 pu
147 kV
721
RDCO_TAP
1.071 pu
148 kV
692
N LETHB7
1.024 pu
141 kV
690
COALDAL7
1.062 pu
147 kV
406
CHIN CH7
1.062 pu
147 kV
1630
REDCOAT1
1.077 pu
149 kV
293
STIRLIN7
1.068 pu
147 kV
725AL
544
ENMX65S4
1.040 pu
250 kV
570
ENMX65S7
1.015 pu
140 kV
617
FOOTHLL1
1.027 pu
246 kV
540009
KCS_POI_A6
1.043 pu
1.049 pu
252 kV
652
SC1A
1.050 pu
252 kV
772
ENMX25S7
1.047 pu
251 kV
161
SARCEE 4
1.038 pu
249 kV
162
E CALGAR
1.034 pu
248 kV
159
LANGDON4
1.029 pu
247 kV
540070
927AL_TAP
1.021 pu
245 kV
943
MILO 1
1.046 pu
251 kV
160
JANET 4
1.045 pu
251 kV
1484
ANDERS04
1.076 pu
258 kV
480
BENNETTS
1.030 pu
247 kV
918
CASS01
1.054 pu
253 kV
1012
NEWELL2
1.049 pu
252 kV
1621
NEWSVCP2
1.049 pu
252 kV
1618
NEWELL
1.049 pu
252 kV
1620
NEWSVCP1
1.049 pu
252 kV
400
MONARCH7
1.002 pu
138 kV
916
MONAR TP
1.006 pu
139 kV
367
CHINOOK1
1.006 pu
139 kV
823
725BL
1.013 pu
140 kV
901
MCBRIDE1
1.012 pu
140 kV
237
FORT MA7
1.019 pu
141 kV
698
LETH674S
1.002 pu
138 kV
260
JENNER 4
1.105 pu
265 kV
225
WARE JCT
1.072 pu
257 kV
430
W BROOK4
1.054 pu
253 kV
276
W BROOK7
1.014 pu
140 kV
928
ENCH TAP
1.027 pu
142 kV
669
BOWMAN1
1.029 pu
247 kV
877
BASNTAP
1.020 pu
141 kV
399
BASSAN7
1.015 pu
140 kV
275
TILLEY 7
1.014 pu
140 kV
270
SUFFIEL7
1.034 pu
143 kV
256
BROOKS 7
1.010 pu
139 kV
333
QUENSTWN
1.046 pu
144 kV
894
CLARESHOLM4
1.065 pu
147 kV
547070
161AL_TAP
1.071 pu
148 kV
250
DUCHESS7
1.000 pu
138 kV
826
831A TAP
1.004 pu
139 kV
401
HAYS 7
1.007 pu
139 kV
445
CUTNG L7
1.004 pu
139 kV
244
VULCAN 7
1.070 pu
148 kV
279
STAVELY7
1.067 pu
147 kV
235
STAVELY7
1.068 pu
147 kV
872
180AL-TAP
1.065 pu
147 kV
NICAN
International Consulting Ltd.
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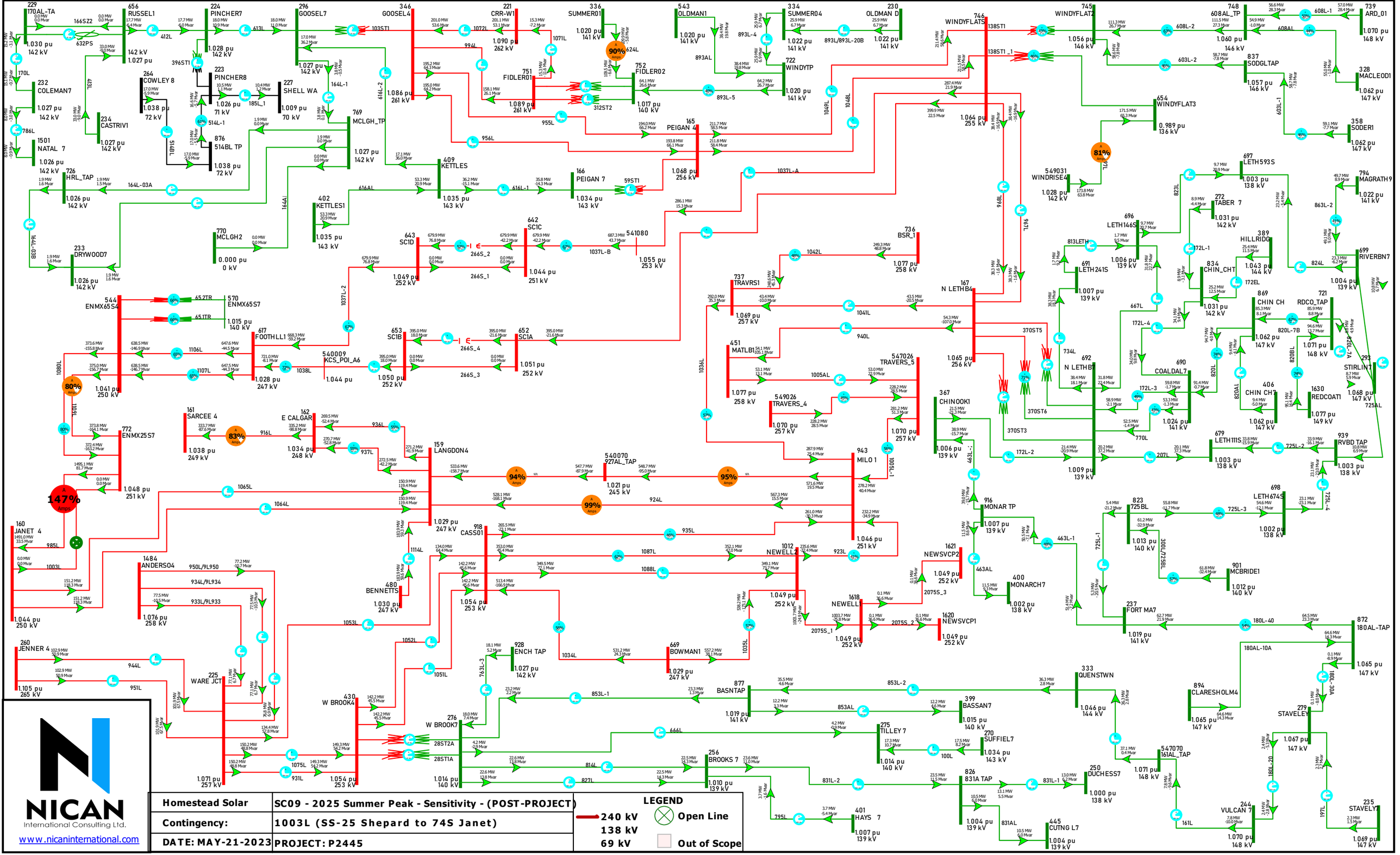
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
SYSTEM NORMAL
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.030 pu
142 kV
632PS
166S2
656
RUSSEL1
142 kV
1.027 pu
412L
224
PINCHER7
1.028 pu
142 kV
613L
296
GOOSEL7
1.027 pu
142 kV
346
GOOSEL4
1.086 pu
261 kV
103ST1
221
CRR-W1
1.090 pu
262 kV
1072L
994L
1071L
336
SUMMER01
1.020 pu
141 kV
90%
624L
543
OLDMAN1
1.020 pu
141 kV
893L-4
334
SUMMER04
1.022 pu
141 kV
893L/893L-20B
230
OLDMAN D
1.022 pu
141 kV
893AL
722
WINDYTP
1.020 pu
141 kV
893L-5
752
FIDLER02
1.017 pu
140 kV
312ST2
751
FIDLER01
1.089 pu
261 kV
955L
956L
165
PEIGAN 4
1.068 pu
256 kV
1037L-A
746
WINDYFLATS
138ST1
138ST1_1
1.064 pu
255 kV
745
WINDYFLAT2
1.056 pu
146 kV
748
608AL_TP
1.060 pu
146 kV
608L-2
603L-2
608L-1
608AL
739
ARD_01
1.070 pu
148 kV
837
SODGLTAP
1.057 pu
146 kV
328
MACLEOD1
1.062 pu
147 kV
603L-1
654
WINDYFLAT3
0.989 pu
136 kV
358
SODER1
1.062 pu
147 kV
1048L
1049L
264
COWLEY 8
1.038 pu
72 kV
223
PINCHER8
1.026 pu
71 kV
227
SHELL WA
1.009 pu
70 kV
185L_1
396ST1
514L-1
514BL
876
514BL TP
1.038 pu
72 kV
769
MCLGH_TP
1.027 pu
142 kV
232
COLEMAN7
1.027 pu
142 kV
234
CASTRIV1
1.027 pu
142 kV
786L
1501
NATAL 7
1.026 pu
142 kV
726
HRL_TAP
1.026 pu
142 kV
164L-03A
164AL
233
DRYWOOD7
1.026 pu
142 kV
164L-1
164L-2
409
KETTLES
1.035 pu
143 kV
402
KETTLES1
1.035 pu
143 kV
616AL
616L-1
166
PEIGAN 7
1.034 pu
143 kV
59ST1
770
MCLGH2
0.000 pu
0 kV
642
SC1C
643
SC1D
1.049 pu
252 kV
266S_2
266S_1
1.044 pu
251 kV
541080
1037L-B
1.055 pu
253 kV
1037L-2
736
BSR_1
1.077 pu
258 kV
1042L
737
TRAVRS1
1.069 pu
257 kV
1041L
940L
451
MATLB1
1.077 pu
258 kV
1005AL
547026
TRAVERS_5
1.070 pu
257 kV
549026
TRAVERS_4
1.070 pu
257 kV
1036L
167
N LETHB4
1.065 pu
256 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.006 pu
139 kV
367
CHINOOK1
1.006 pu
139 kV
463L-1
463L-2
916
MONAR TP
1.007 pu
139 kV
463AL
400
MONARCH7
1.002 pu
138 kV
1621
NEWSVCP2
1.049 pu
252 kV
2075S_3
1618
NEWELL
1.049 pu
252 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.049 pu
252 kV
1012
NEWELL2
1.049 pu
252 kV
923L
1087L
1088L
935L
918
CASS01
1.054 pu
253 kV
1053L
1052L
1051L
1034L
1035L
669
BOWMAN1
1.029 pu
247 kV
928
ENCH TAP
1.027 pu
142 kV
763L-3
480
BENNETTS
1.030 pu
247 kV
1114L
1029 pu
247 kV
159
LANGDON4
540070
927AL_TAP
1.021 pu
245 kV
943
MILO 1
1.046 pu
251 kV
1005L-1
1064L
1065L
1048 pu
251 kV
147%
Amps
160
JANET 4
1.044 pu
250 kV
985L
1003L
1484
ANDERSO4
1.076 pu
258 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.105 pu
265 kV
944L
951L
225
WARE JCT
1.071 pu
257 kV
1075L
931L
1.054 pu
253 kV
430
W BROOK4
276
W BROOK7
1.014 pu
140 kV
28ST2A
28ST1A
666L
814L
827L
853L-1
853L-2
853AL
877
BASNTAP
1.019 pu
141 kV
399
BASSAN7
1.015 pu
140 kV
275
TILLEY 7
1.014 pu
140 kV
270
SUFFIEL7
1.034 pu
143 kV
100L
256
BROOKS 7
1.010 pu
139 kV
831L-2
831L-1
826
831A TAP
1.004 pu
139 kV
831AL
445
CUTNG L7
1.004 pu
139 kV
250
DUCHESS7
1.000 pu
138 kV
333
QUENSTWN
1.046 pu
144 kV
894
CLARESHOLM4
1.065 pu
147 kV
547070
161AL_TAP
1.071 pu
148 kV
161L
279
STAVELEY
1.067 pu
147 kV
180L-20
180L-30A
180L-40
872
180AL-TAP
1.065 pu
147 kV
180AL-10A
244
VULCAN 7
1.070 pu
148 kV
235
STAVELY7
1.069 pu
147 kV
719L
725AL
725L-1
725L-2
725L-3
725L-4
823
725BL
1.013 pu
140 kV
698
LETH674S
1.002 pu
138 kV
3001/725BL
901
MCBRIDE1
1.012 pu
140 kV
237
FORT MA7
1.019 pu
141 kV
180L-40
549031
WINDRISE4
1.028 pu
142 kV
197L
81%
Amps
697
LETH593S
1.003 pu
138 kV
794
MAGRATH9
1.022 pu
141 kV
863L-2
824L
699
RIVERBN7
1.004 pu
139 kV
272
TABER 7
1.031 pu
142 kV
823L
172L-1
389
HILLRIDG
1.043 pu
144 kV
834
CHIN_CHT
1.031 pu
142 kV
172EL
696
LETH146S
1.006 pu
139 kV
813LETH
691
LETH241S
1.007 pu
139 kV
667L
172L-4
172L-3
1.024 pu
141 kV
690
COALDAL7
1.062 pu
147 kV
820L-7B
820L-7A
820L
820AL
820BL
869
CHIN CH
1.062 pu
147 kV
406
CHIN CH7
1.062 pu
147 kV
721
RDCO_TAP
1.071 pu
148 kV
1630
REDCOAT1
1.077 pu
149 kV
293
STIRLIN7
1.068 pu
147 kV
725AL
679
LETH111S
1.003 pu
138 kV
939
RVBD TAP
1.003 pu
138 kV
207L
172L-2
1.009 pu
139 kV
161
SARCEE 4
1.038 pu
249 kV
83%
Amps
162
E CALGAR
1.034 pu
248 kV
916L
936L
937L
540009
KCS_POA6
1.044 pu
617
FOOTHLL1
1.028 pu
247 kV
1038L
1106L
1107L
1080L
1101L
544
ENMX65S4
1.041 pu
250 kV
570
ENMX65S7
1.015 pu
140 kV
65.2TR
65.1TR
772
ENMX25S7
1.048 pu
251 kV
1037L-2
653
SC1B
1.050 pu
252 kV
266S_4
266S_3
652
SC1A
1.051 pu
252 kV
1044 pu
252 kV
94%
Amps
95%
Amps
99%
Amps
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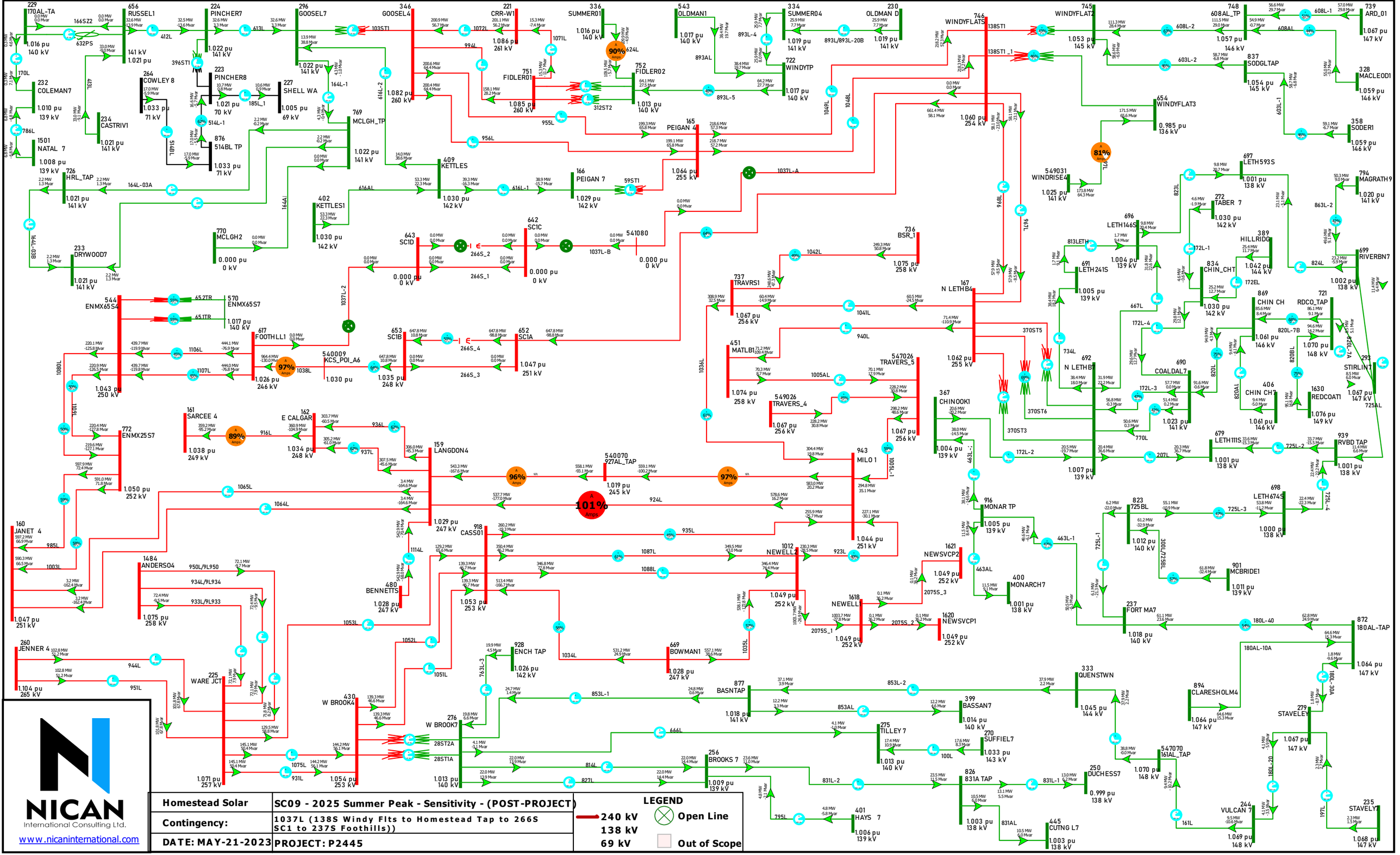
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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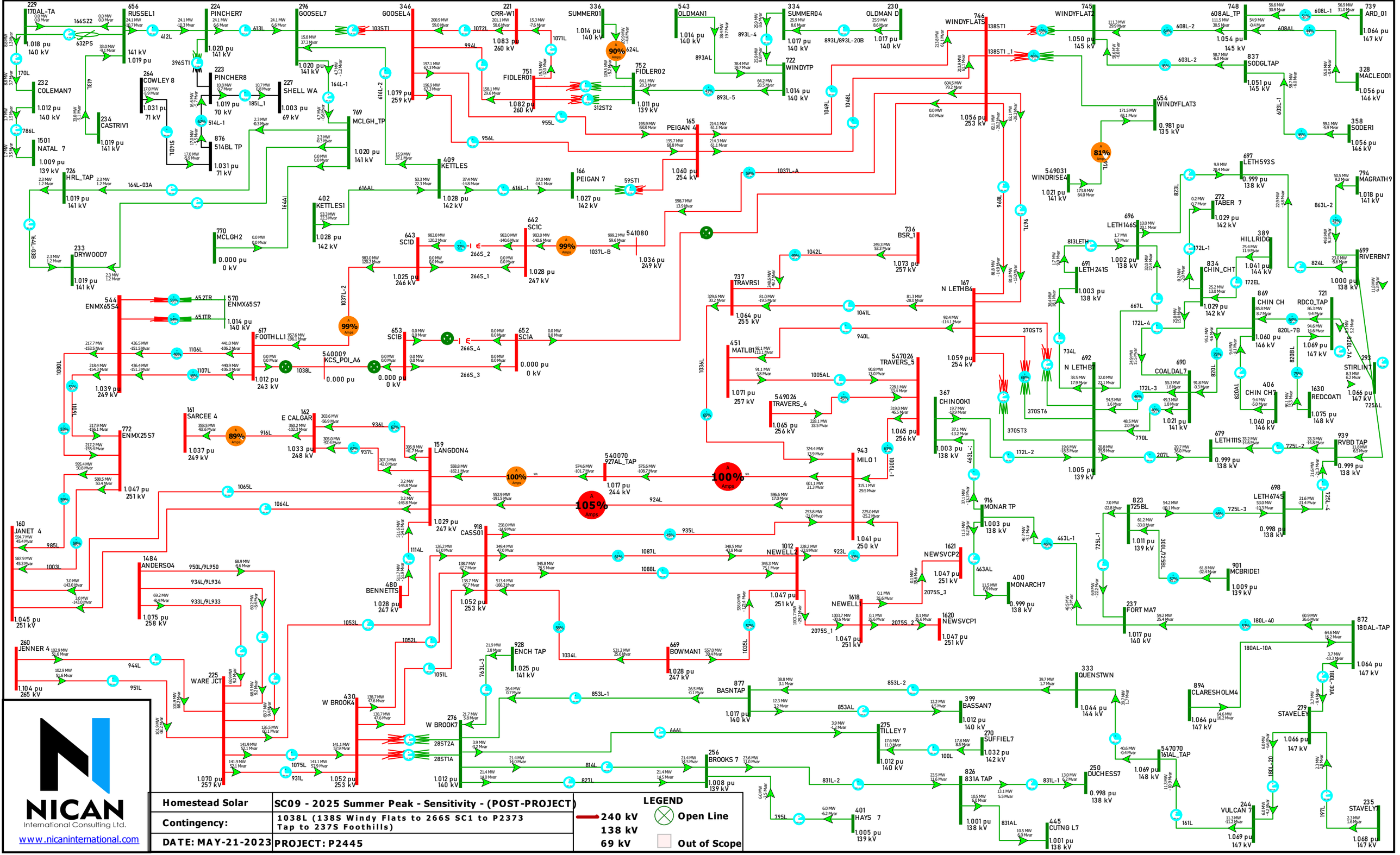
Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



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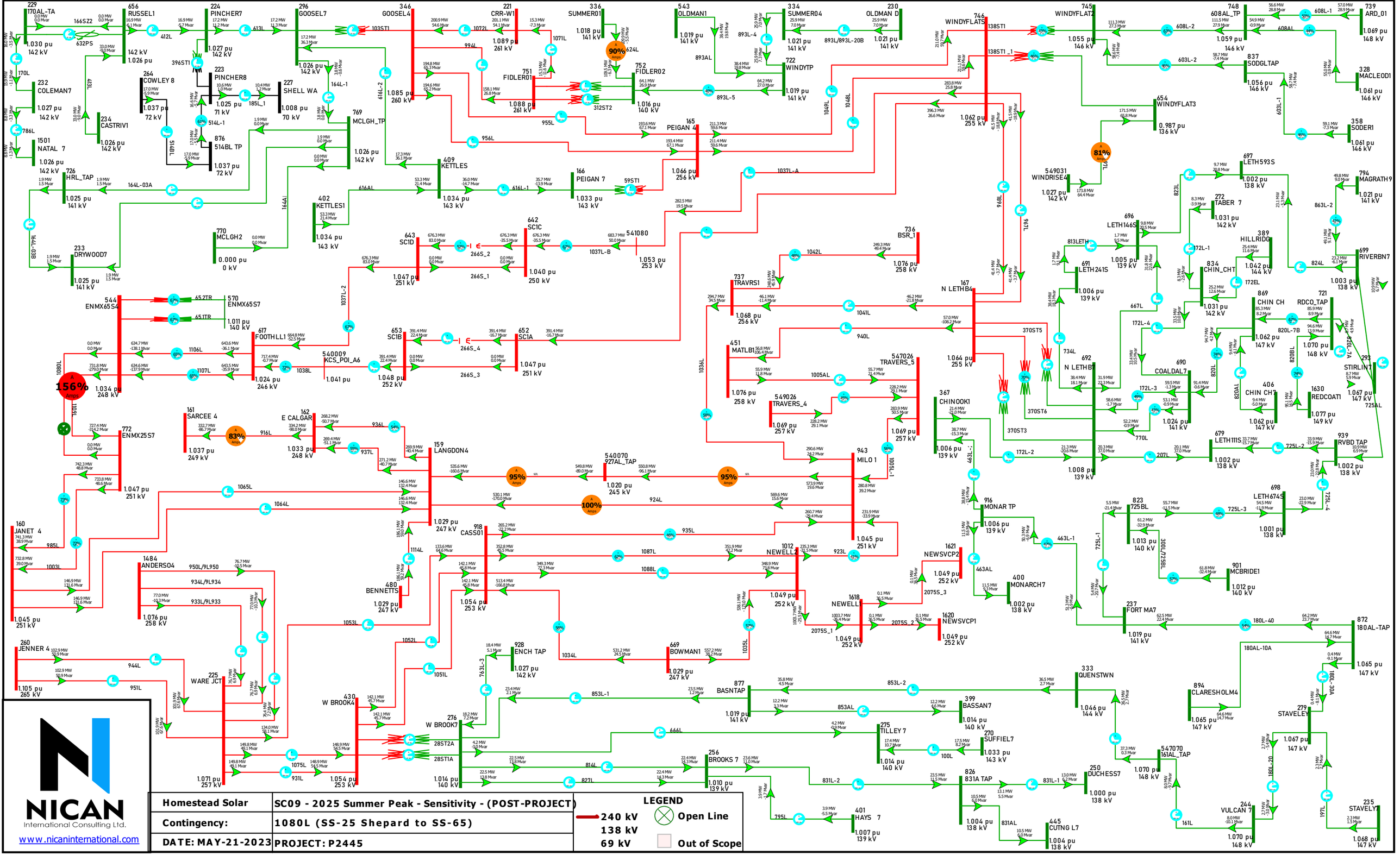
Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

240 kV
138 kV
69 kV
⊗ Open Line
☐ Out of Scope



NICAN
International Consulting Ltd.
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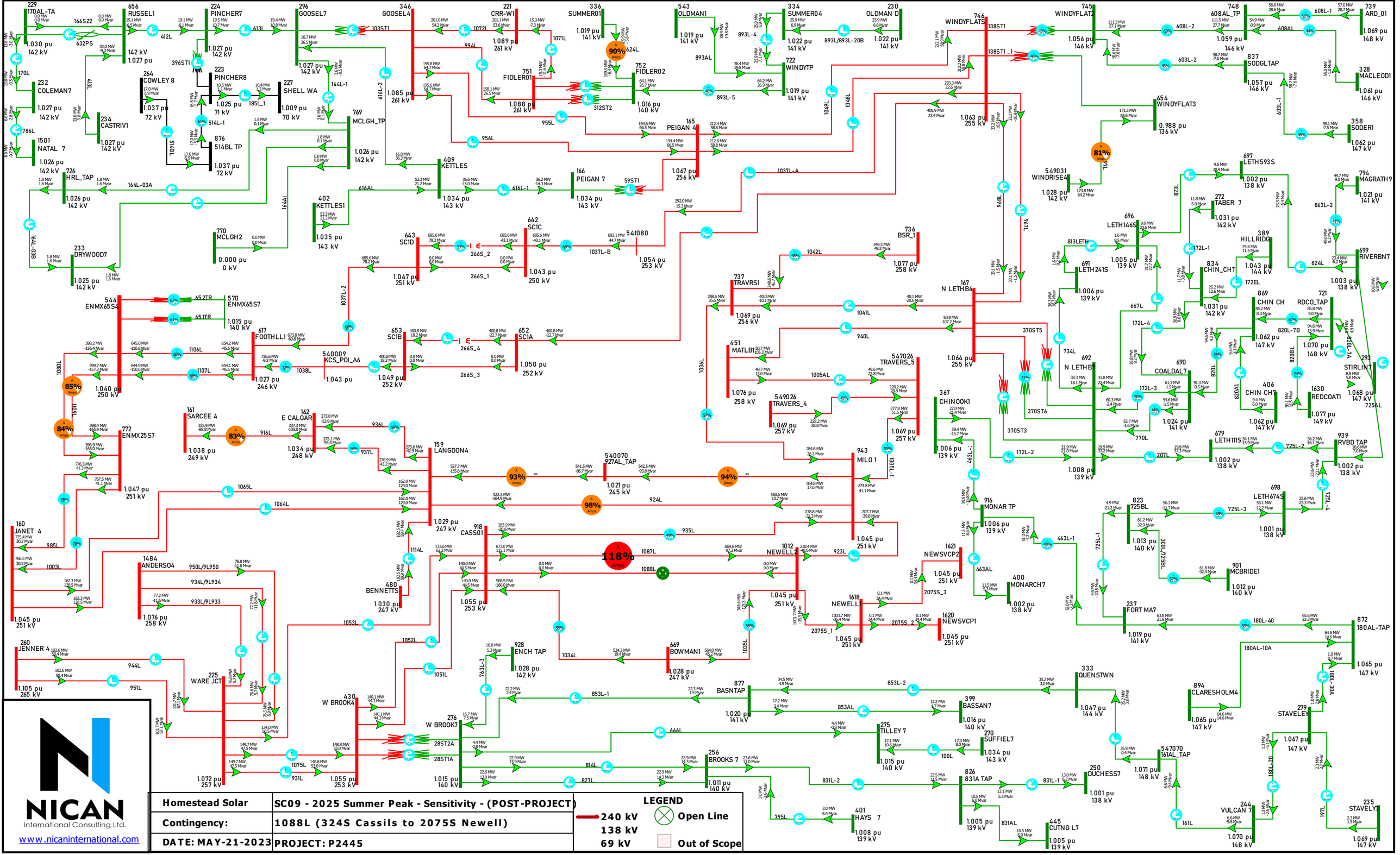
Homestead Solar	SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:	1080L (SS-25 Shepard to SS-65)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope



Homestead Solar | **SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**

Contingency: | **1088L (324S Cassils to 2075S Newell)**

DATE: MAY-21-2023 | **PROJECT: P2445**

LEGEND

240 kV

138 kV

69 kV

Open Line

Out of Scope

NICAN
International Consulting Ltd.
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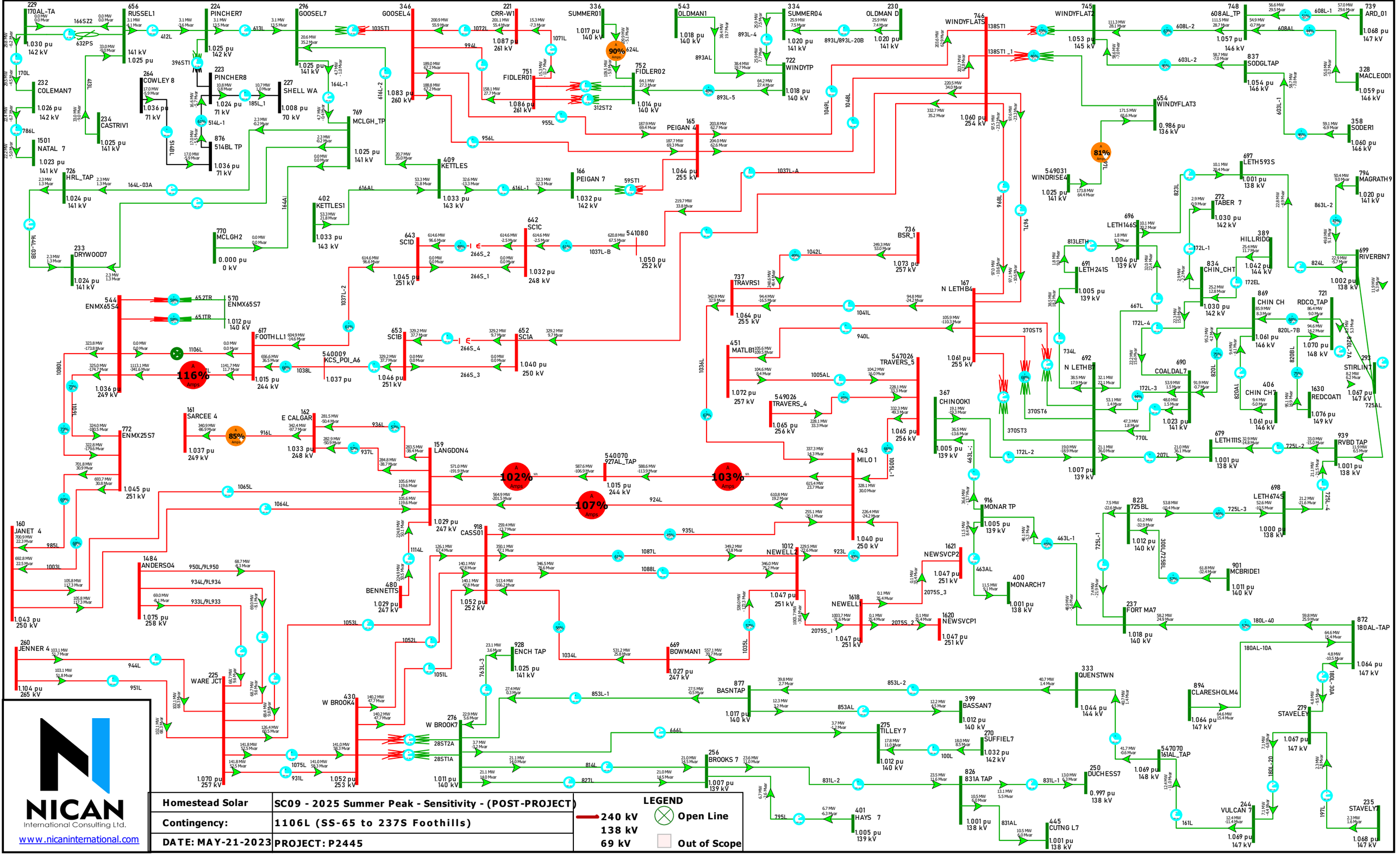
229
170AL-TA
1.030 pu
142 kV
632PS
166S2
656
RUSSEL1
141 kV
1.025 pu
412L
224
PINCHER7
1.025 pu
142 kV
613L
296
GOOSEL7
1.025 pu
141 kV
164L-1
346
GOOSEL4
1.083 pu
260 kV
103ST1
200.9 MW
55.9 Mvar
1072L
221
CRR-W1
201.1 MW
55.4 Mvar
1.087 pu
261 kV
15.3 MW
-7.3 Mvar
1071L
336
SUMMER01
1.017 pu
140 kV
624L
90%
Amps
543
OLDMAN1
1.018 pu
140 kV
334
SUMMER04
1.020 pu
141 kV
893L-4
893L/893L-20B
230
OLDMAN D
1.020 pu
141 kV
746
WINDYFLATS
138ST1
138ST1_1
745
WINDYFLAT2
1.053 pu
145 kV
748
608AL_TP
1.057 pu
146 kV
608L-1
608AL
608L-2
603L-2
739
ARD_01
1.068 pu
147 kV
837
SODGLTAP
1.054 pu
146 kV
328
MACLEOD1
1.059 pu
146 kV
603L-1
358
SODER1
1.060 pu
146 kV
654
WINDYFLAT3
0.986 pu
136 kV
722
WINDYTP
1.018 pu
140 kV
893L-5
752
FIDLER02
1.014 pu
140 kV
312ST2
751
FIDLER01
1.086 pu
261 kV
955L
956L
994L
1071L
165
PEIGAN 4
1.064 pu
255 kV
1037L-A
1064L
1074L
1060 pu
254 kV
1086L
1084L
1087L
1088L
1037L-B
541080
1.050 pu
252 kV
642
SC1C
643
SC1D
1.045 pu
251 kV
266S_2
266S_1
1032 pu
248 kV
614.6 MW
96.6 Mvar
620.8 MW
67.5 Mvar
219.7 MW
33.8 Mvar
1037L-2
616AL
616L-1
53.3 MW
21.8 Mvar
32.6 MW
-13.3 Mvar
32.3 MW
-12.3 Mvar
409
KETTLES
1.033 pu
143 kV
166
PEIGAN 7
1.032 pu
142 kV
59ST1
402
KETTLES1
1.033 pu
143 kV
616L-2
616L-3
770
MCLGH2
0.000 pu
0 kV
769
MCLGH_TP
1.025 pu
141 kV
514L-1
876
514BL TP
1.036 pu
71 kV
185L_1
227
SHELL WA
1.008 pu
70 kV
223
PINCHER8
1.024 pu
71 kV
264
COWLEY 8
1.036 pu
71 kV
396ST1
224L-1
514BL-1
514BL-2
232
COLEMAN7
1.026 pu
142 kV
170L
234
CASTRIV1
1.025 pu
141 kV
786L
1501
NATAL 7
1.023 pu
141 kV
222L
726
HRL_TAP
1.024 pu
141 kV
164L-03A
164AL
233
DRYWOOD7
1.024 pu
141 kV
164L-03B
736
BSR_1
1.073 pu
257 kV
1042L
1041L
737
TRAVRS1
1.064 pu
255 kV
940L
451
MATLB1
1.072 pu
257 kV
1005AL
547026
TRAVERS_5
1.065 pu
256 kV
549026
TRAVERS_4
1.065 pu
256 kV
1005L-1
943
MILO 1
1.040 pu
250 kV
1005L-2
167
N LETHB4
1.061 pu
255 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.007 pu
139 kV
172L-2
207L
367
CHINOOK1
1.005 pu
139 kV
463L-2
463L-1
916
MONAR TP
1.005 pu
139 kV
463AL
400
MONARCH7
1.001 pu
138 kV
1621
NEWSVCP2
1.047 pu
251 kV
2075S_3
1618
NEWELL
1.047 pu
251 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.047 pu
251 kV
1012
NEWELL2
1.047 pu
251 kV
923L
935L
918
CASS01
1.029 pu
247 kV
1052 pu
252 kV
1053L
1052L
1051L
1034L
1035L
480
BENNETTS
1.029 pu
247 kV
1114L
159
LANGDON4
1.029 pu
247 kV
1065L
1064L
540070
927AL_TAP
1.015 pu
244 kV
587.6 MW
-106.9 Mvar
588.6 MW
-113.9 Mvar
564.9 MW
-201.5 Mvar
610.8 MW
19.2 Mvar
924L
102%
Amps
107%
Amps
103%
Amps
669
BOWMAN1
1.027 pu
247 kV
557.1 MW
39.7 Mvar
531.2 MW
25.8 Mvar
928
ENCH TAP
1.025 pu
141 kV
763L-3
763L-2
877
BASNTAP
1.017 pu
140 kV
853L-2
853L-1
853AL
399
BASSAN7
1.012 pu
140 kV
275
TILLEY 7
1.012 pu
140 kV
100L
270
SUFFIEL7
1.032 pu
142 kV
666L
276
W BROOK7
1.011 pu
140 kV
28ST2A
28ST1A
256
BROOKS 7
1.007 pu
139 kV
814L
827L
831L-2
831L-1
826
831A TAP
1.001 pu
138 kV
831AL
445
CUTNG L7
1.001 pu
138 kV
250
DUCHESS7
0.997 pu
138 kV
401
HAYS 7
1.005 pu
139 kV
795L
430
W BROOK4
1.052 pu
253 kV
1075L
931L
1070 pu
257 kV
937L
936L
161
SARCEE 4
1.037 pu
249 kV
85%
Amps
162
E CALGAR
1.033 pu
248 kV
916L
772
ENMX25S7
1.045 pu
251 kV
1065L
1064L
544
ENMX65S4
570
ENMX65S7
1.012 pu
140 kV
65.2TR
65.1TR
617
FOOTHLL1
1.015 pu
244 kV
1038L
1106L
116%
Amps
1108L
1109L
540009
KCS_POI_A6
1.037 pu
653
SC1B
652
SC1A
1.040 pu
250 kV
1.046 pu
251 kV
266S_4
266S_3
1037L-2
1036L
1080L
1.036 pu
249 kV
160
JANET 4
1.043 pu
250 kV
985L
1003L
1484
ANDERSO4
1.075 pu
258 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.104 pu
265 kV
944L
951L
225
WARE JCT
1.070 pu
257 kV
1053L
1075L
1484
ANDERSO4
1.075 pu
258 kV
549031
WINDRISE4
1.025 pu
141 kV
697L
697
LETH593S
1.001 pu
138 kV
794
MAGRATH9
1.020 pu
141 kV
863L-2
863L-1
824L
699
RIVERBN7
1.002 pu
138 kV
823L
272
TABER 7
1.030 pu
142 kV
696
LETH146S
1.004 pu
139 kV
813LETH
691
LETH241S
1.005 pu
139 kV
172L-1
834
CHIN_CHT
1.030 pu
142 kV
172EL
389
HILLRIDG
1.042 pu
144 kV
667L
172L-4
869
CHIN CH
1.061 pu
146 kV
820L-7B
820L-7A
721
RDCO_TAP
1.070 pu
148 kV
293
STIRLIN7
1.067 pu
147 kV
725AL
690
COALDAL7
1.023 pu
141 kV
172L-3
820L
820AL
820BL
406
CHIN CH7
1.061 pu
146 kV
1630
REDCOAT1
1.076 pu
149 kV
679
LETH111S
1.001 pu
138 kV
725L-2
939
RVBD TAP
1.001 pu
138 kV
725L-3
725L-4
698
LETH674S
1.000 pu
138 kV
823
725BL
1.012 pu
140 kV
3003L/725BL
901
MCBRIDE1
1.011 pu
140 kV
237
FORT MA7
1.018 pu
140 kV
180L-40
872
180AL-TAP
1.064 pu
147 kV
180AL-10A
180L-30A
180L-20
894
CLARESHOLM4
1.064 pu
147 kV
333
QUENSTWN
1.044 pu
144 kV
547070
161AL_TAP
1.069 pu
148 kV
161L
244
VULCAN 7
1.069 pu
147 kV
235
STAVELY7
1.068 pu
147 kV
279
STAVELEY
1.067 pu
147 kV
180L-1
180L-2
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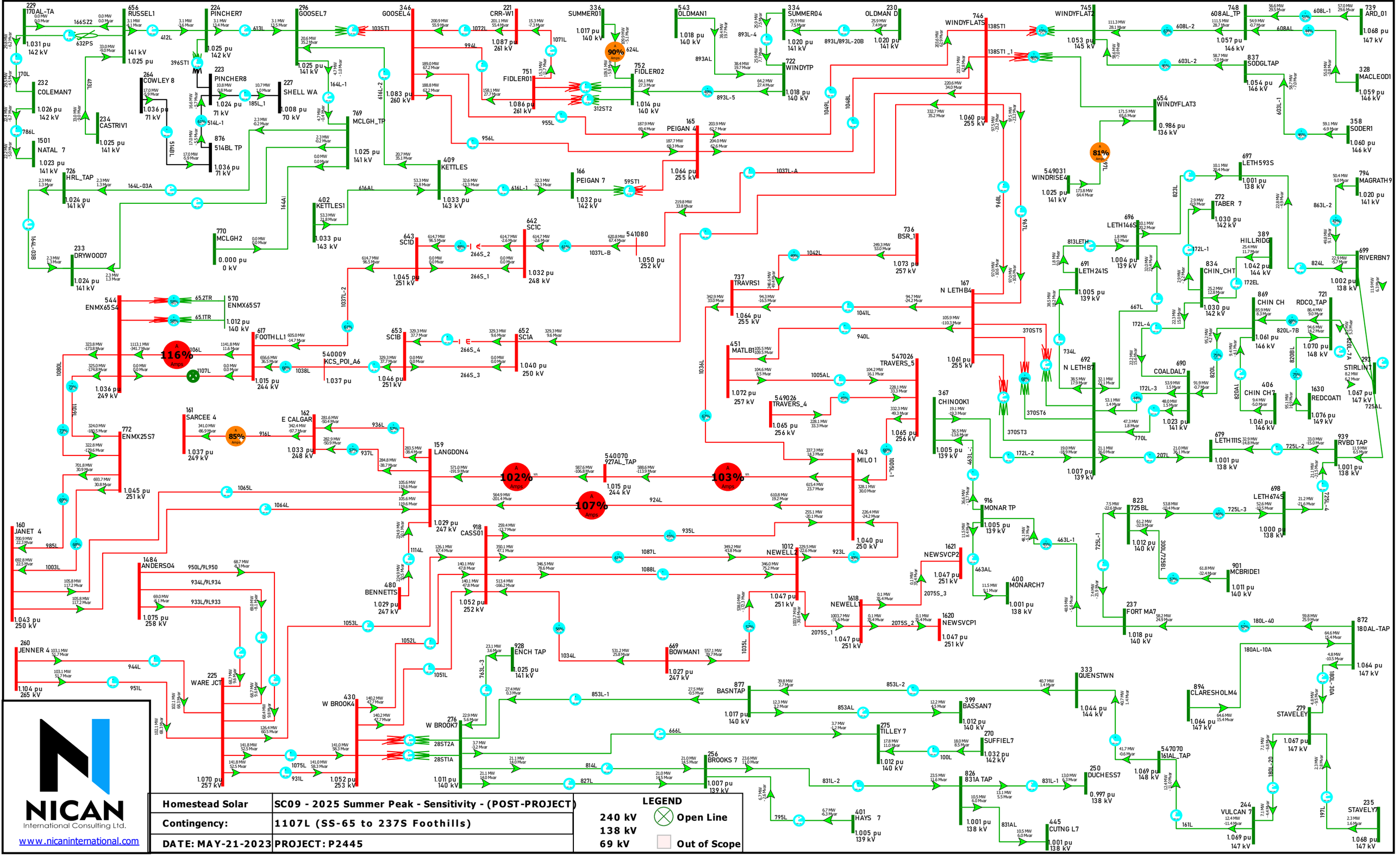
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1106L (SS-65 to 237S Foothills)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1107L (SS-65 to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445**

LEGEND

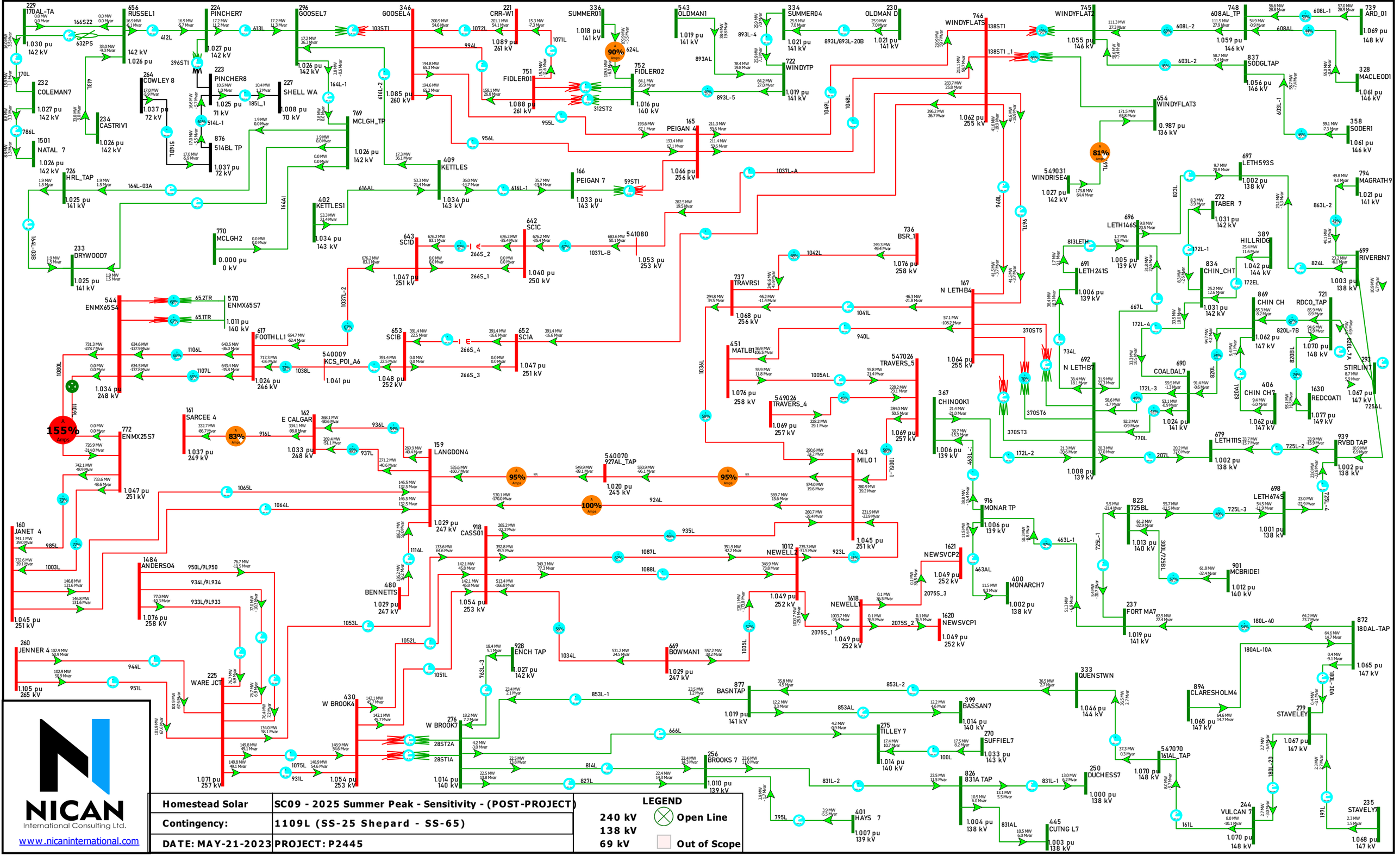
240 kV

138 kV

69 kV

Ⓧ Open Line

▢ Out of Scope



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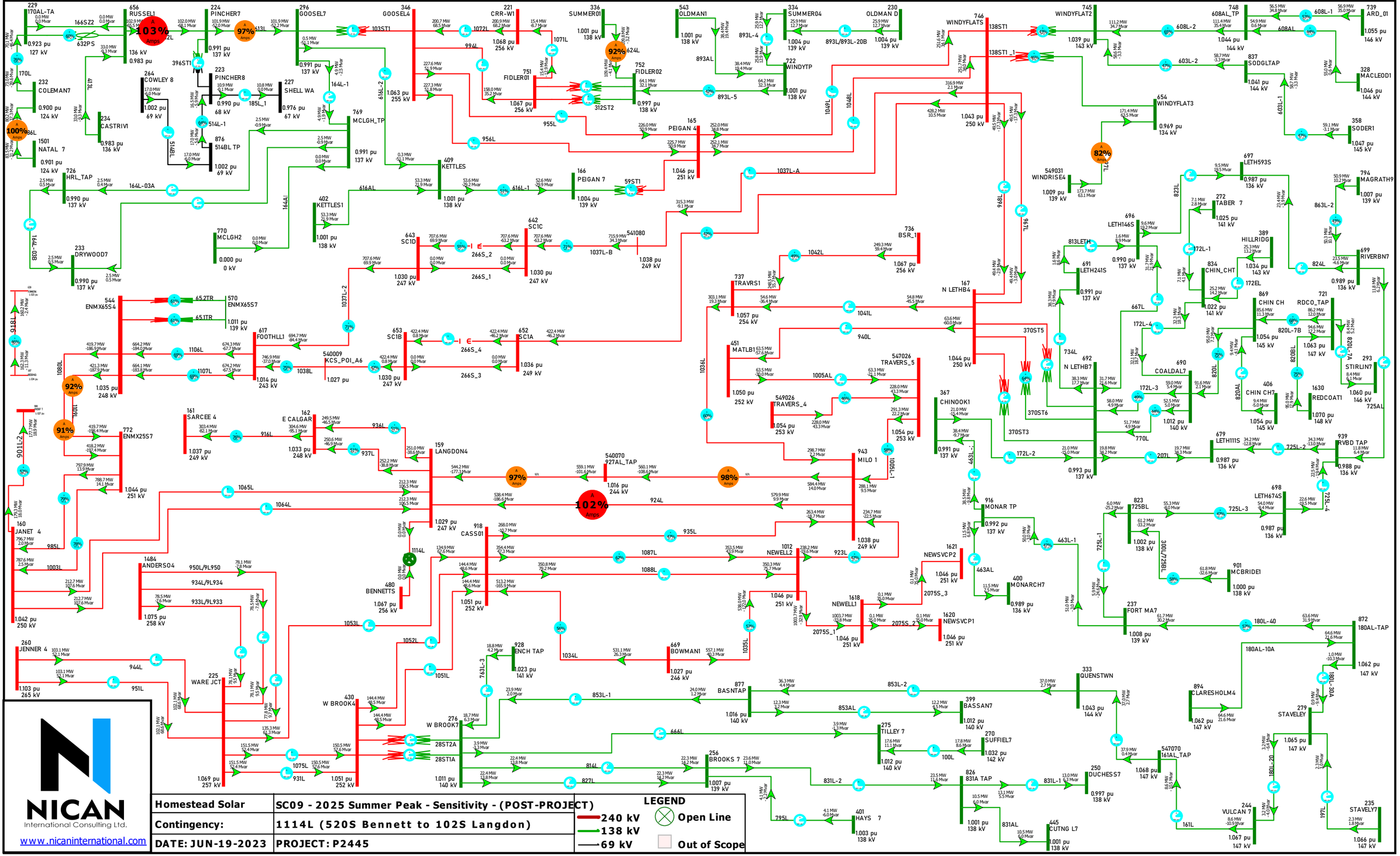
Homestead Solar	SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:	1109L (SS-25 Shepard - SS-65)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV — Open Line

138 kV

69 kV — Out of Scope


229
170AL-TA
0.0 MW
0.0 Mvar
0.923 pu
127 kV
166SZ2
656
RUSSEL1
102.9 MW
-65.5 Mvar
103%
Amps
136 kV
0.983 pu
632PS
224
PINCHER7
101.9 MW
-52.0 Mvar
97%
Amps
0.991 pu
137 kV
396ST1
223
PINCHER8
10.9 MW
-0.1 Mvar
0.990 pu
68 kV
264
COWLEY 8
17.0 MW
-6.0 Mvar
1.002 pu
69 kV
227
SHELL WA
10.8 MW
0.0 Mvar
0.976 pu
67 kV
185L_1
514L-1
876
514BL TP
17.0 MW
-6.0 Mvar
1.002 pu
69 kV
514L
170L
232
COLEMAN7
0.900 pu
124 kV
234
CASTRIVI
0.983 pu
136 kV
1501
NATAL 7
0.901 pu
124 kV
726
HRL_TAP
0.990 pu
137 kV
233
DRYWOOD7
0.990 pu
137 kV
164L-03A
164L-03B
164AL
164L-1
769
MCLGH_TP
0.991 pu
137 kV
770
MCLGH2
0.000 pu
0 kV
296
GOOSEL7
0.5 MW
-54.1 Mvar
0.991 pu
137 kV
513L
103ST1
346
GOOSEL4
1.063 pu
255 kV
616L-2
616AL
402
KETTLES1
53.3 MW
21.9 Mvar
1.001 pu
138 kV
409
KETTLES
53.3 MW
21.9 Mvar
53.6 MW
-29.2 Mvar
1.001 pu
138 kV
616L-1
166
PEIGAN 7
1.004 pu
139 kV
59ST1
200.7 MW
68.5 Mvar
1072L
994L
227.6 MW
51.9 Mvar
227.3 MW
51.8 Mvar
158.0 MW
35.2 Mvar
221
CRR-W1
200.9 MW
68.2 Mvar
15.4 MW
-8.7 Mvar
1.068 pu
256 kV
1071L
751
FIDLER01
15.4 MW
-1.5 Mvar
1.067 pu
256 kV
955L
956L
336
SUMMER01
1.001 pu
138 kV
92%
Amps
624L
312ST2
752
FIDLER02
64.1 MW
32.1 Mvar
0.997 pu
138 kV
543
OLDMAN1
1.001 pu
138 kV
893L-4
893AL
893L-5
334
SUMMER04
25.9 MW
12.7 Mvar
1.004 pu
139 kV
893L/893L-20B
230
OLDMAN D
25.9 MW
12.7 Mvar
1.004 pu
139 kV
722
WINDYTP
1.001 pu
138 kV
746
WINDYFLATS
138ST1
138ST1 _1
1.043 pu
250 kV
1049L
1048L
745
WINDYFLAT2
1.039 pu
143 kV
608AL_TP
608AL
608L-1
608L-2
1.044 pu
144 kV
739
ARD_01
1.055 pu
146 kV
603L-2
837
SODGLTAP
1.041 pu
144 kV
328
MACLEOD1
1.046 pu
144 kV
603L-1
654
WINDYFLAT3
0.969 pu
134 kV
358
SODER1
1.047 pu
145 kV
165
PEIGAN 4
252.0 MW
34.8 Mvar
225.7 MW
50.9 Mvar
252.1 MW
34.7 Mvar
1.046 pu
251 kV
1037L-A
1037L-B
1038 pu
249 kV
315.3 MW
-9.1 Mvar
82%
Amps
549031
WINDRISE4
1.009 pu
139 kV
697
LETH593S
0.987 pu
136 kV
794
MAGRATH9
1.007 pu
139 kV
863L-2
699
RIVERBN7
0.989 pu
136 kV
824L
823L
272
TABER 7
1.025 pu
141 kV
696
LETH146S
9.6 MW
19.2 Mvar
0.990 pu
137 kV
813LETH
691
LETH241S
0.991 pu
137 kV
389
HILLRIDG
1.034 pu
143 kV
834
CHIN_CHT
1.022 pu
141 kV
172L-1
172EL
869
CHIN CH
1.054 pu
145 kV
721
RDCO_TAP
1.063 pu
147 kV
820L-7A
820L-7B
820BL
820AL
406
CHIN CH7
1.054 pu
145 kV
293
STIRLIN7
1.060 pu
146 kV
725AL
1630
REDCOAT1
1.070 pu
148 kV
679
LETH111S
0.987 pu
136 kV
939
RVBD TAP
0.988 pu
136 kV
725L-2
725L-4
698
LETH674S
0.987 pu
136 kV
725L-3
823
725BL
1.002 pu
138 kV
3001/7258L
901
MCBRIDE1
1.000 pu
138 kV
237
FORT MA7
1.008 pu
139 kV
180L-40
872
180AL-TAP
1.062 pu
147 kV
180AL-10A
180L-30A
894
CLARESHOLM4
1.062 pu
147 kV
279
STAVELEY
1.065 pu
147 kV
180L-20
244
VULCAN 7
1.067 pu
147 kV
235
STAVELY7
1.066 pu
147 kV
167
N LETHB4
1.044 pu
250 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
690
COALDAL7
667L
172L-4
172L-3
1.012 pu
140 kV
770L
207L
172L-2
0.993 pu
137 kV
916
MONAR TP
0.992 pu
137 kV
463L-1
463L-2
463AL
1621
NEWSVCP2
1.046 pu
251 kV
2075S_3
400
MONARCH7
0.989 pu
136 kV
1618
NEWELL1
1.046 pu
251 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.046 pu
251 kV
1012
NEWELL2
1.046 pu
251 kV
923L
1087L
1088L
935L
918
CASS01
1.051 pu
252 kV
1114L
480
BENNETTS
1.067 pu
256 kV
1053L
1052L
1051L
1034L
1035L
928
BENCH TAP
1.023 pu
141 kV
743L-3
669
BOWMANI
1.027 pu
246 kV
877
BASNTAP
1.016 pu
140 kV
853L-1
853L-2
853AL
399
BASSAN7
1.012 pu
140 kV
333
QUENSTWN
1.043 pu
144 kV
275
TILLEY 7
1.012 pu
140 kV
666L
814L
827L
256
BROOKS 7
1.007 pu
139 kV
831L-2
831A TAP
831L-1
831AL
250
DUCHESS7
0.997 pu
138 kV
445
CUTNG L7
1.001 pu
138 kV
270
SUFFIEL7
1.032 pu
142 kV
100L
547070
161AL_TAP
1.068 pu
147 kV
161L
430
W BROOK4
276
W BROOK7
28ST2A
28ST1A
1.011 pu
140 kV
1.051 pu
252 kV
1.069 pu
257 kV
1075L
931L
225
WARE JCT
1.075 pu
258 kV
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.042 pu
250 kV
160
JANET 4
1003L
985L
260
JENNER 4
944L
951L
1.103 pu
265 kV
1064L
1065L
1.044 pu
251 kV
772
ENMX25S7
1.037 pu
249 kV
161
SARCEE 4
916L
936L
937L
1.033 pu
248 kV
162
E CALGAR
159
LANGDON4
1.029 pu
247 kV
540070
927AL_TAP
1.016 pu
244 kV
1.035 pu
248 kV
1080L
1109L
1106L
1107L
1038L
617
FOOTHLL1
1.014 pu
243 kV
540009
KCS_POI_A6
1.027 pu
653
SC1B
1.030 pu
247 kV
266S_4
266S_3
652
SC1A
1.036 pu
249 kV
642
SC1C
1.030 pu
247 kV
643
SC1D
1.030 pu
247 kV
266S_2
266S_1
1037L-2
541080
1.038 pu
249 kV
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1.011 pu
139 kV
1106L
1107L
1038L
1036L
1042L
1041L
940L
1005AL
736
BSR_1
1.067 pu
256 kV
737
TRAVRS1
1.057 pu
254 kV
451
MATLB1
1.050 pu
252 kV
547026
TRAVERS_5
1.054 pu
253 kV
549026
TRAVERS_4
1.054 pu
253 kV
943
MILO 1
1.003 pu
138 kV
1005L-1
401
HAYS 7
1.003 pu
138 kV
795L
367
CHINOOK1
0.991 pu
137 kV
463L-3
NICAN
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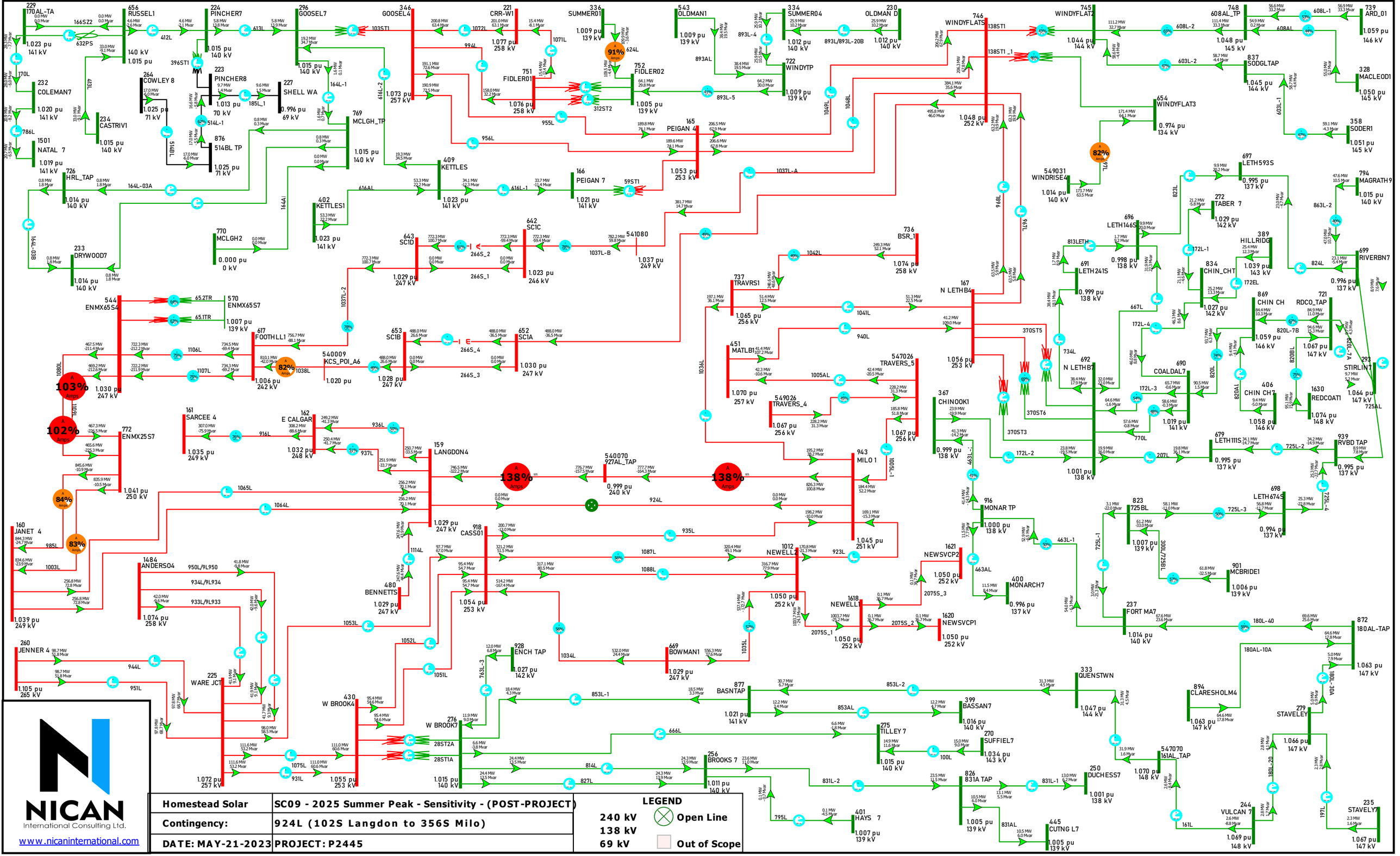
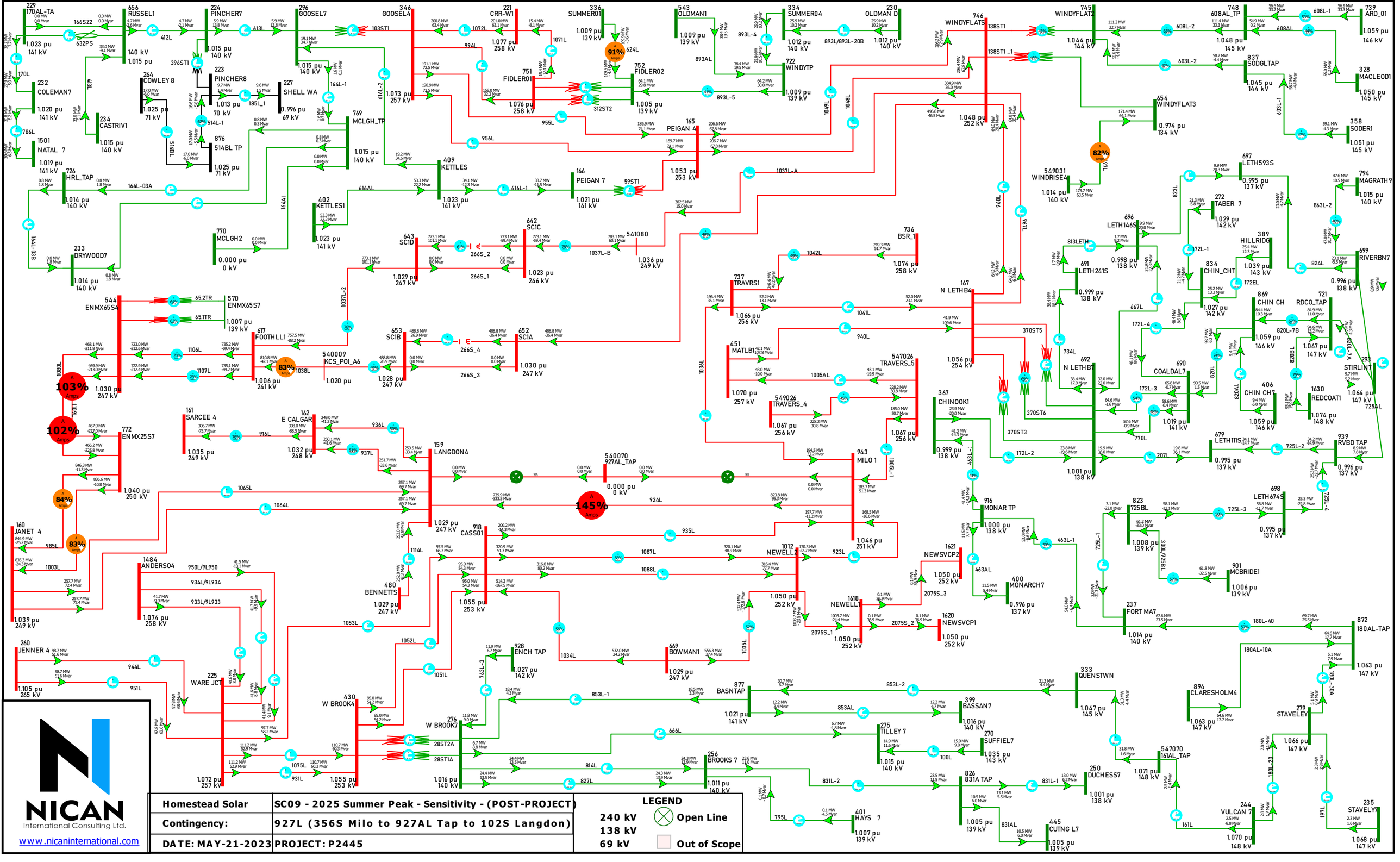
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1114L (520S Bennett to 102S Langdon)
DATE: JUN-19-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.023 pu
141 kV
632PS
166SZ2
656
RUSSEL1
140 kV
1.015 pu
412L
224
PINCHER7
1.015 pu
140 kV
613L
296
GOOSEL7
1.015 pu
140 kV
396ST1
223
PINCHER8
1.013 pu
70 kV
185L_1
227
SHELL WA
0.996 pu
69 kV
264
COWLEY 8
1.025 pu
71 kV
514L-1
876
514BL TP
1.025 pu
71 kV
164L-1
769
MCLGH_TP
1.015 pu
140 kV
170L
232
COLEMAN7
1.020 pu
141 kV
4191
234
CASTRIV1
1.015 pu
140 kV
786L
1501
NATAL 7
1.019 pu
141 kV
1484L
726
HRL_TAP
1.014 pu
140 kV
164L-03A
164L-03B
233
DRYWOOD7
1.014 pu
140 kV
164AL
770
MCLGH2
0.000 pu
0 kV
402
KETTLES1
1.023 pu
141 kV
616AL
346
GOOSEL4
1.073 pu
257 kV
103ST1
616L-2
409
KETTLES
1.023 pu
141 kV
616L-1
166
PEIGAN 7
1.021 pu
141 kV
59ST1
221
CRR-W1
1.077 pu
258 kV
1071L
751
FIDLER01
1.076 pu
258 kV
955L
994L
956L
336
SUMMER01
1.009 pu
139 kV
91%
624L
312ST2
752
FIDLER02
1.005 pu
139 kV
543
OLDMAN1
1.009 pu
139 kV
893L-4
893AL
893L-5
336
SUMMER04
1.012 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.012 pu
140 kV
722
WINDYTP
1.009 pu
139 kV
165
PEIGAN 4
1.053 pu
253 kV
1037L-A
1048L
1049L
746
WINDYFLATS
138ST1
138ST1_1
1.048 pu
252 kV
745
WINDYFLAT2
1.044 pu
144 kV
608L-2
603L-2
748
608AL_TP
1.048 pu
145 kV
608L-1
608AL
739
ARD_01
1.059 pu
146 kV
837
SODGLTAP
1.045 pu
144 kV
328
MACLEOD1
1.050 pu
145 kV
603L-1
358
SODER1
1.051 pu
145 kV
654
WINDYFLAT3
0.974 pu
134 kV
549031
WINDRISE4
1.014 pu
140 kV
697L
697
LETH593S
0.995 pu
137 kV
794
MAGRATH9
1.015 pu
140 kV
863L-2
823L
272
TABER 7
1.029 pu
142 kV
172L-1
834
CHIN_CHT
1.039 pu
143 kV
389
HILLRIDG
1.039 pu
143 kV
824L
699
RIVERBN7
0.996 pu
137 kV
696
LETH146S
0.998 pu
138 kV
813LETH
691
LETH241S
0.999 pu
138 kV
667L
172L-4
869
CHIN CH
1.059 pu
146 kV
820L-7B
721
RDCO_TAP
1.067 pu
147 kV
1042L
737
TRAVRS1
1.065 pu
256 kV
736
BSR_1
1.074 pu
258 kV
1041L
940L
451
MATLB1
1.070 pu
257 kV
1005AL
547026
TRAVERS_5
1.067 pu
256 kV
549026
TRAVERS_4
1.067 pu
256 kV
167
N LETH84
1.056 pu
253 kV
370ST5
370ST6
370ST3
734L
692
N LETH87
1.001 pu
138 kV
172L-2
172L-3
690
COALDAL7
1.019 pu
141 kV
820L
406
CHIN CH7
1.058 pu
146 kV
820AL
1630
REDCOAT1
1.074 pu
148 kV
820BL
293
STIRLIN7
1.064 pu
147 kV
725AL
367
CHINOOK1
0.999 pu
138 kV
463L-1
916
MONAR TP
1.000 pu
138 kV
463AL
400
MONARCH7
0.996 pu
137 kV
1621
NEWSVCP2
1.050 pu
252 kV
2075S_3
1618
NEWELL1
1.050 pu
252 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.050 pu
252 kV
1012
NEWELL2
1.050 pu
252 kV
923L
943
MILO 1
1.007 pu
139 kV
1005L-1
1035L
669
BOWMAN1
1.029 pu
247 kV
1034L
928
ENCH TAP
1.027 pu
142 kV
763L-3
1052L
1051L
1053L
1114L
480
BENNETTS
1.029 pu
247 kV
1087L
1088L
918
CASS01
1.054 pu
253 kV
935L
924L
540070
927AL_TAP
0.999 pu
240 kV
159
LANGDON4
1.029 pu
247 kV
1064L
1065L
1041L
1484
ANDERS04
1.074 pu
258 kV
950L/9L950
934L/9L934
933L/9L933
160
JANET 4
1.039 pu
249 kV
985L
1003L
260
JENNER 4
1.105 pu
265 kV
944L
951L
225
WARE JCT
1.072 pu
257 kV
1075L
931L
430
W BROOK4
1.055 pu
253 kV
276
W BROOK7
1.015 pu
140 kV
28ST2A
28ST1A
161
SARCEE 4
1.035 pu
249 kV
916L
162
E CALGAR
1.032 pu
248 kV
936L
937L
772
ENMX25S7
1.041 pu
250 kV
1080L
1079L
544
ENMX65S4
1.030 pu
247 kV
65.2TR
65.1TR
570
ENMX65S7
1.007 pu
139 kV
617
FOOTHLL1
1.006 pu
242 kV
1106L
1107L
1038L
540009
KCS_POI_A6
1.020 pu
1037L-2
643
SC1D
1.029 pu
247 kV
266S_2
266S_1
662
SC1C
1.023 pu
246 kV
541080
1.037 pu
249 kV
1037L-B
653
SC1B
1.028 pu
247 kV
266S_4
266S_3
652
SC1A
1.030 pu
247 kV
1036L
877
BASNTAP
1.021 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.016 pu
140 kV
275
TILLEY 7
1.015 pu
140 kV
100L
270
SUFFIEL7
1.034 pu
143 kV
666L
814L
827L
256
BROOKS 7
1.011 pu
140 kV
831L-2
831L-1
826
831A TAP
1.005 pu
139 kV
831AL
445
CUTNG L7
1.005 pu
139 kV
250
DUCHESS7
1.001 pu
138 kV
401
HAYS 7
1.007 pu
139 kV
795L
333
QUENSTWN
1.047 pu
144 kV
894
CLARESHOLM4
1.063 pu
147 kV
180L-10A
180L-40
872
180AL-TAP
1.063 pu
147 kV
180L-30A
547070
161AL_TAP
1.070 pu
148 kV
161L
244
VULCAN 7
1.069 pu
148 kV
679
LETH111S
0.995 pu
137 kV
725L-2
939
RVBD TAP
0.995 pu
137 kV
725L-3
725L-4
823
725BL
1.007 pu
139 kV
3001/725BL
698
LETH674S
0.994 pu
137 kV
901
MCBRIDE1
1.006 pu
139 kV
237
FORT MA7
1.014 pu
140 kV
180L-20
191L
235
STAVELY7
1.067 pu
147 kV
279
STAVELEY
1.066 pu
147 kV
103%
102%
84%
83%
82%
138%
138%
Amps
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
924L (102S Langdon to 356S Milo)
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



NICAN
International Consulting Ltd.
www.nicaninternational.com

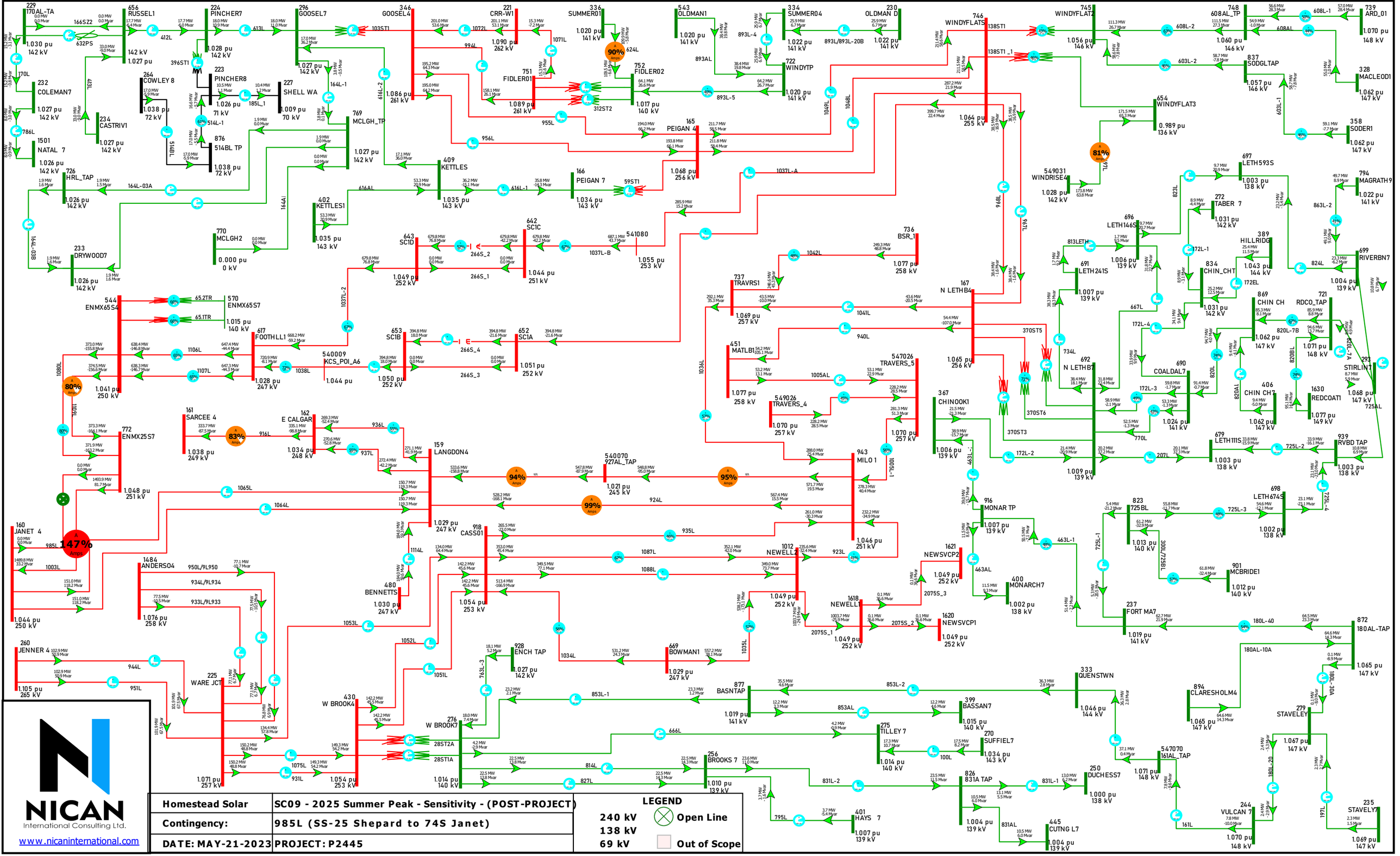
Homestead Solar	SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:	927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

⊗ Open Line

▢ Out of Scope



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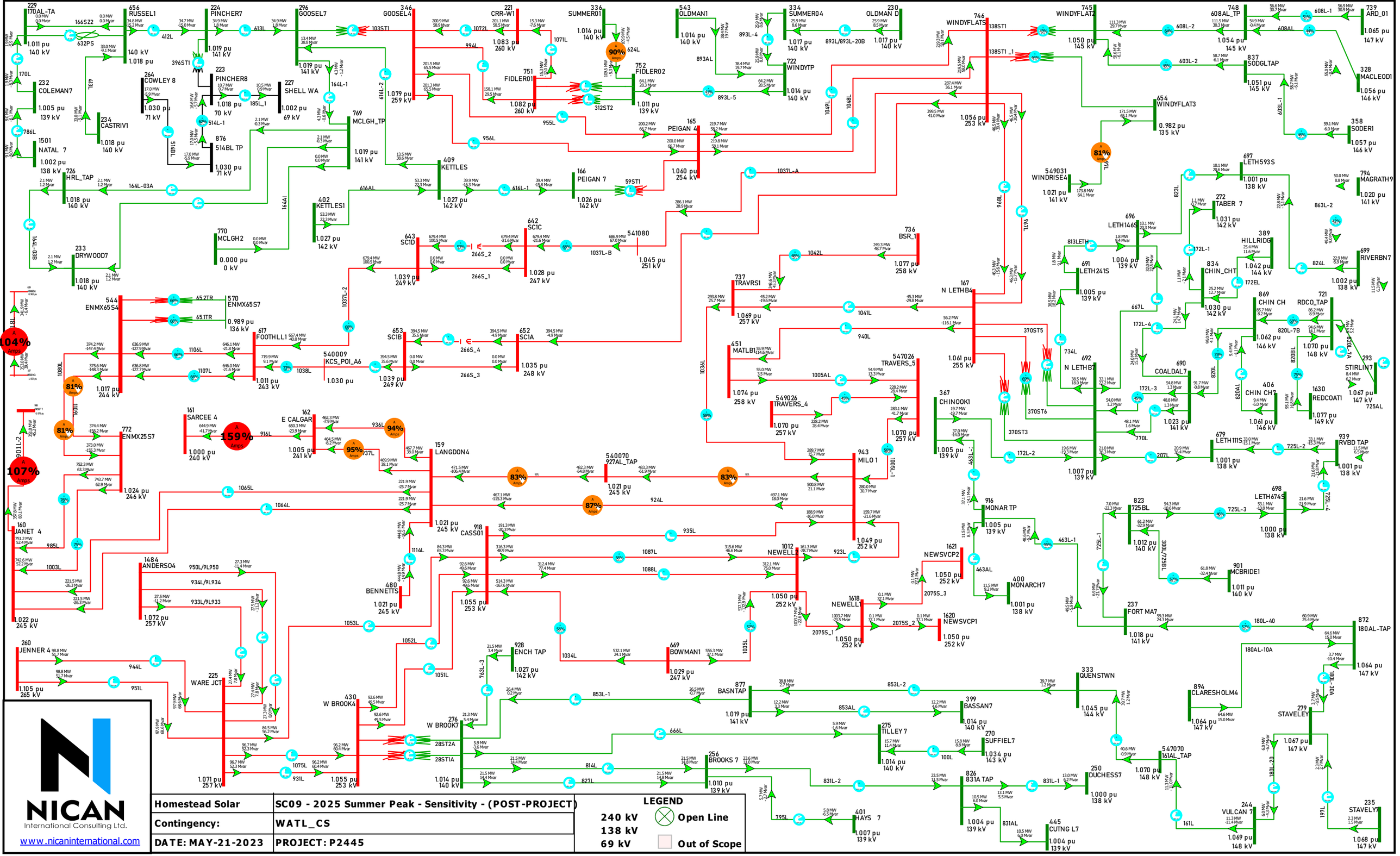
Homestead Solar	SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:	985L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023	PROJECT: P2445

LEGEND

240 kV
138 kV
69 kV

Open Line
Out of Scope


NICAN
International Consulting Ltd.
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Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
WATL_CS
DATE: MAY-21-2023
PROJECT: P2445
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

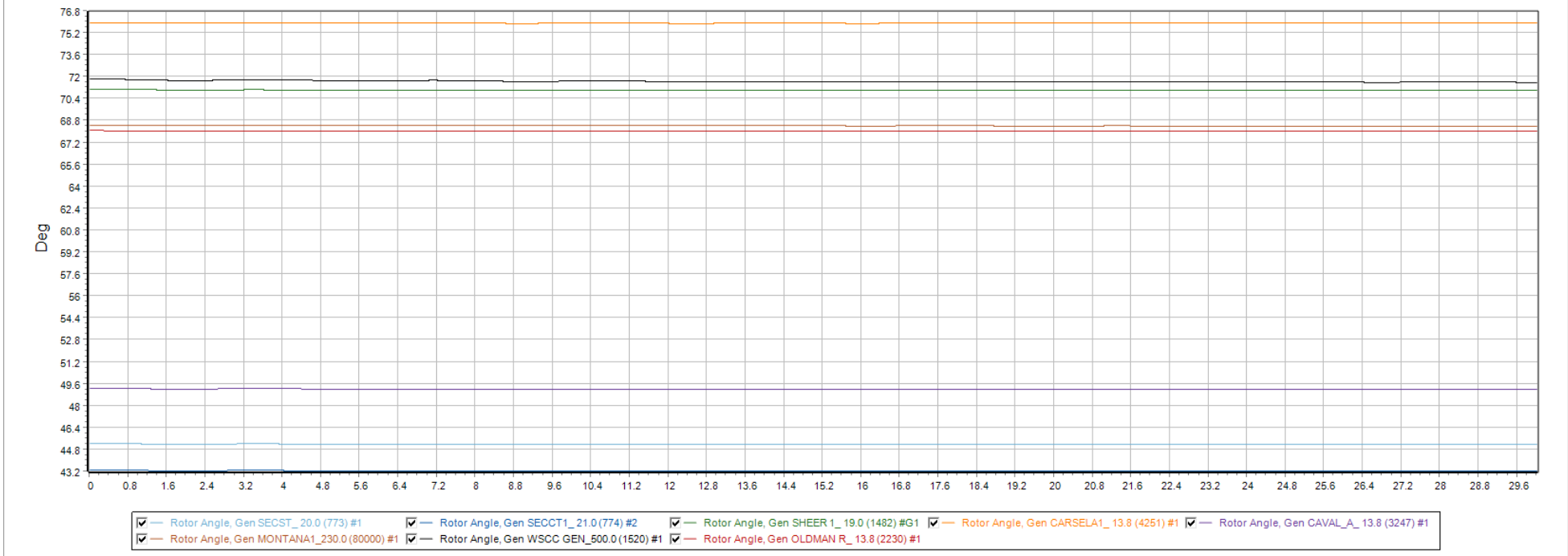
Attachment A4
Post-Project Transient Stability Diagrams

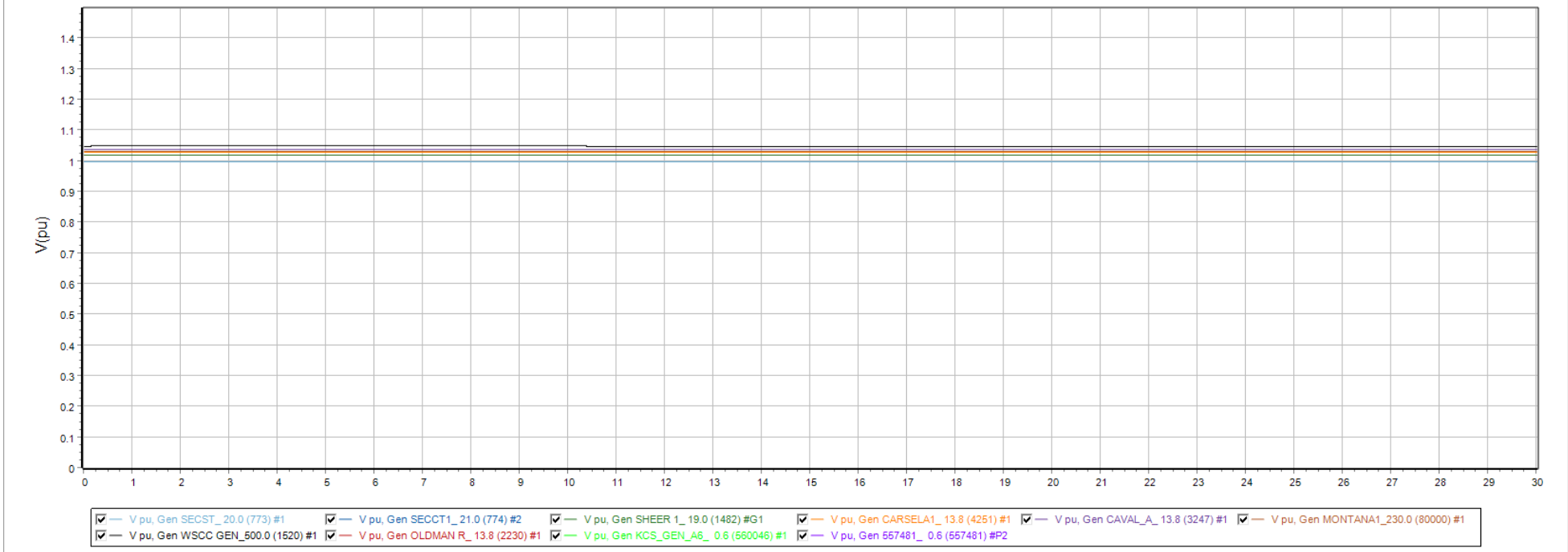
2025 SUMMER LIGHT

Single Line Diagrams
P2445 - POST-PROJECT
Transient Stability Response
SC03

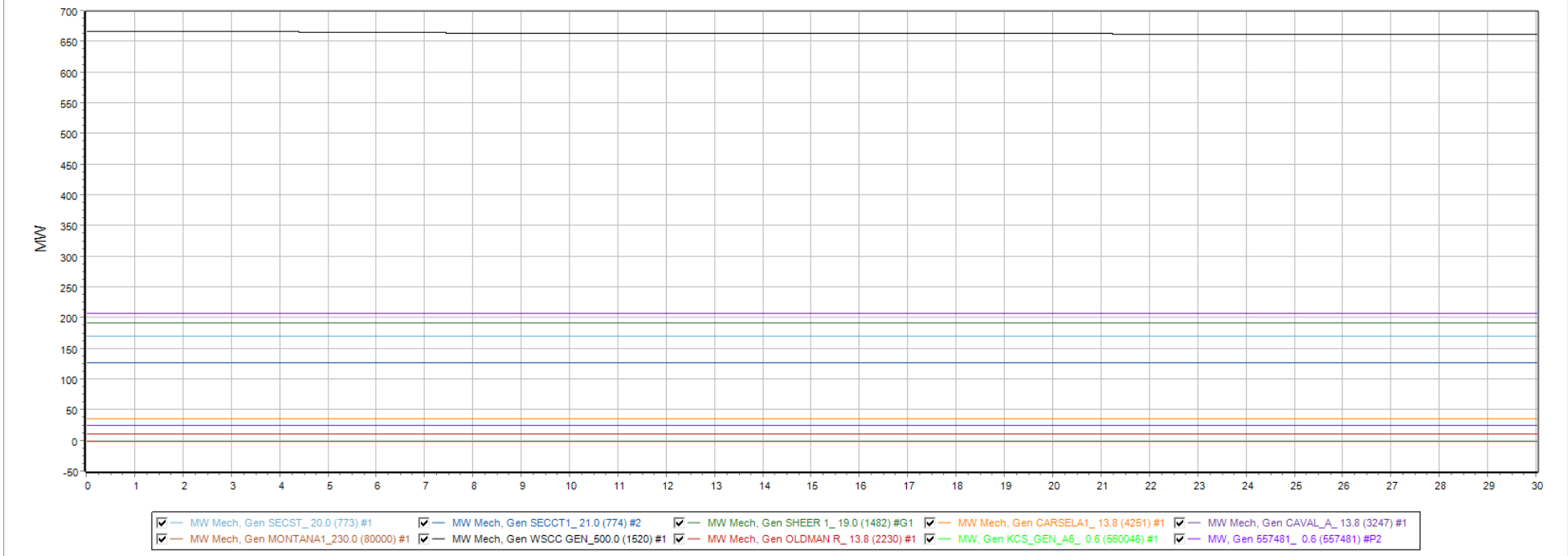
NICAN

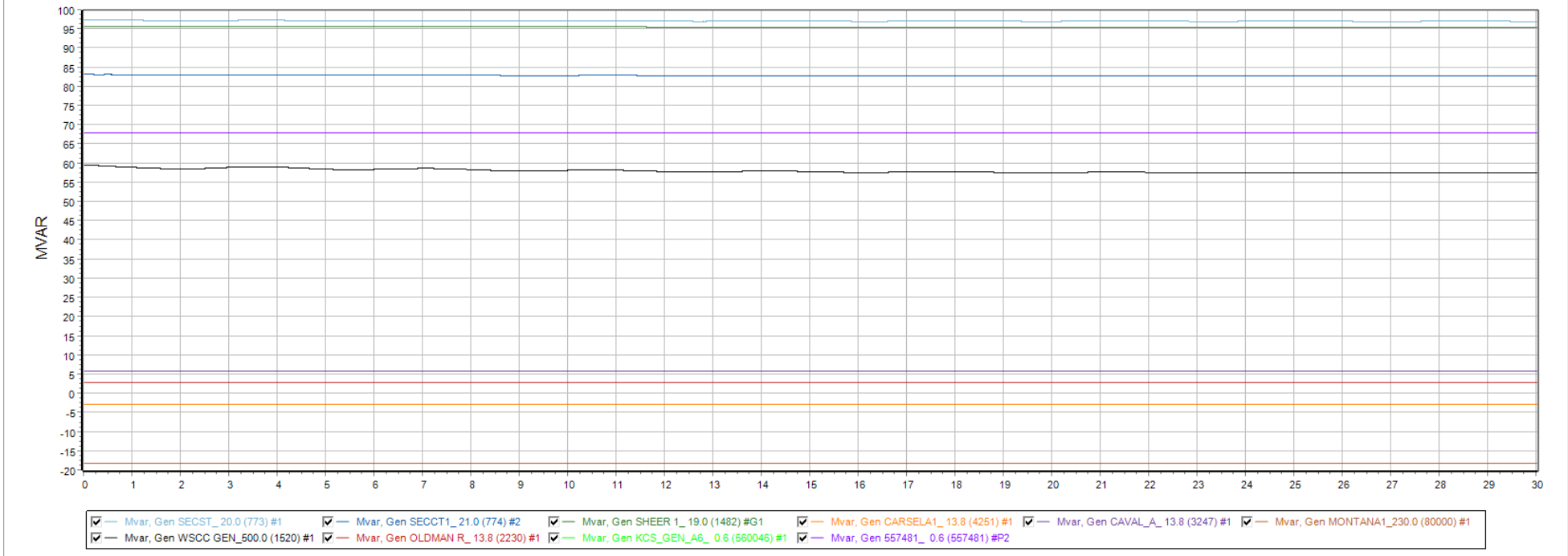
Monitor Gens. Q1



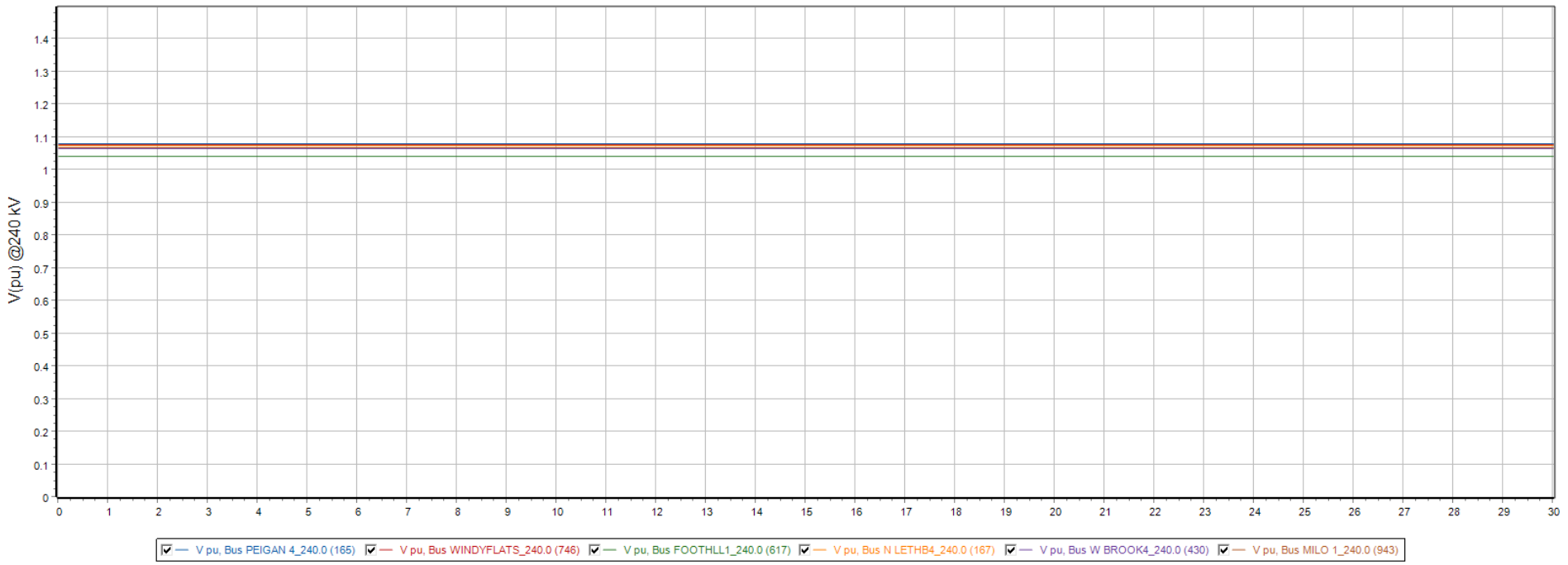


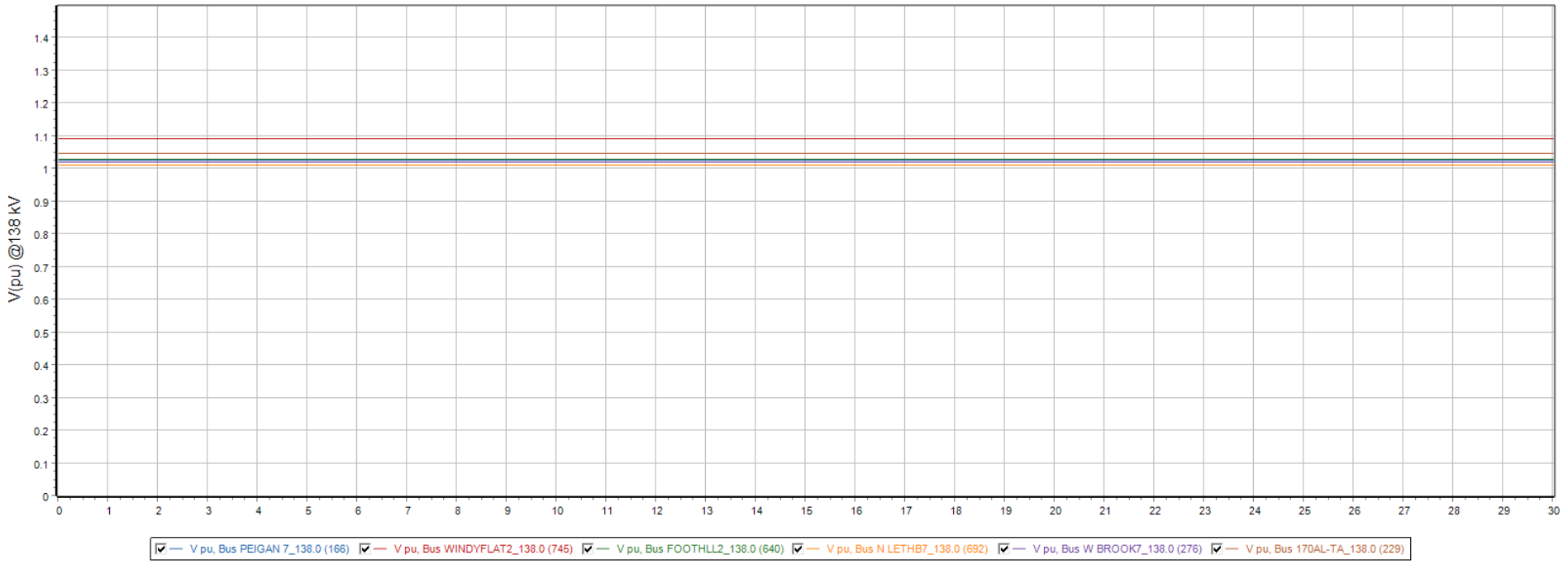
Monitor Gens. Q2



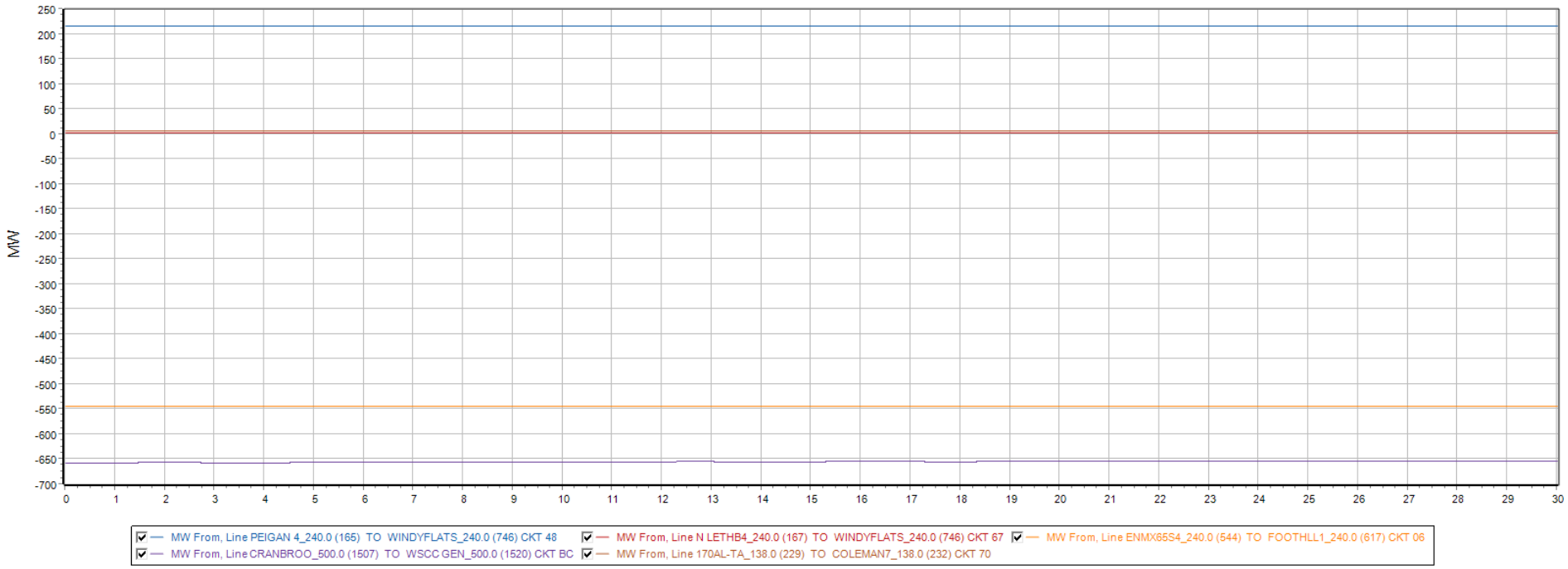


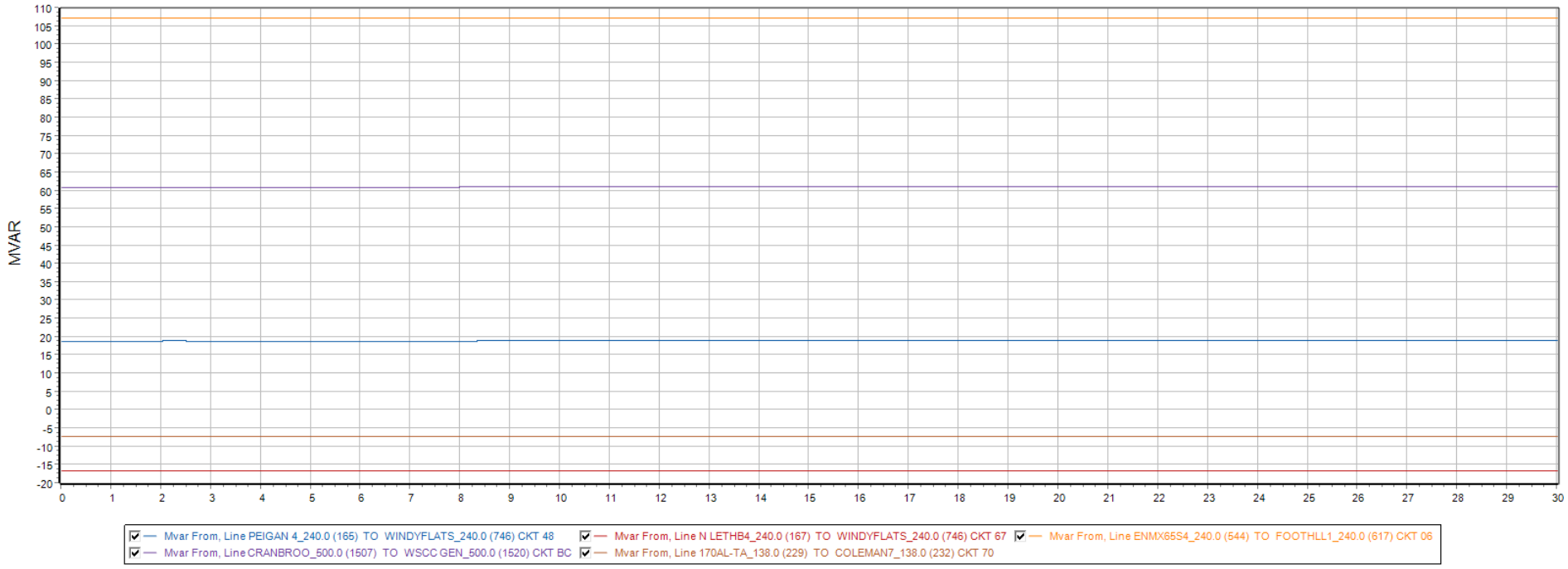
Monitor Bus Volts Q3



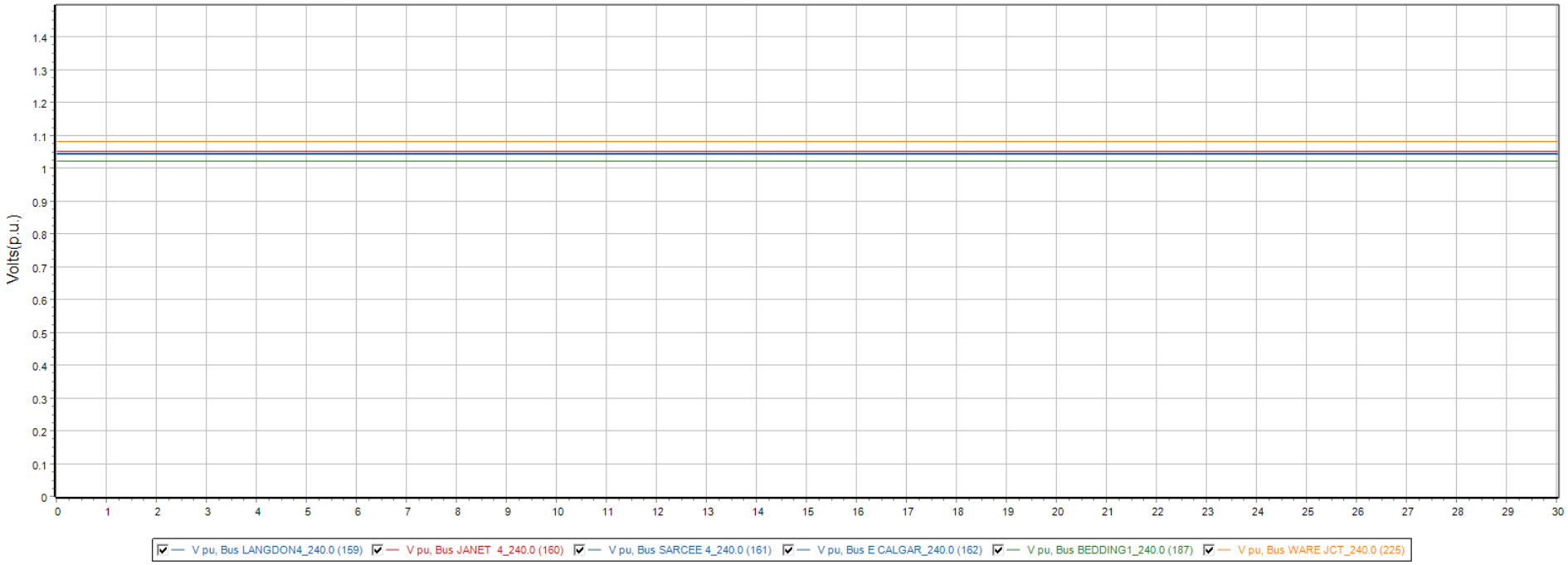


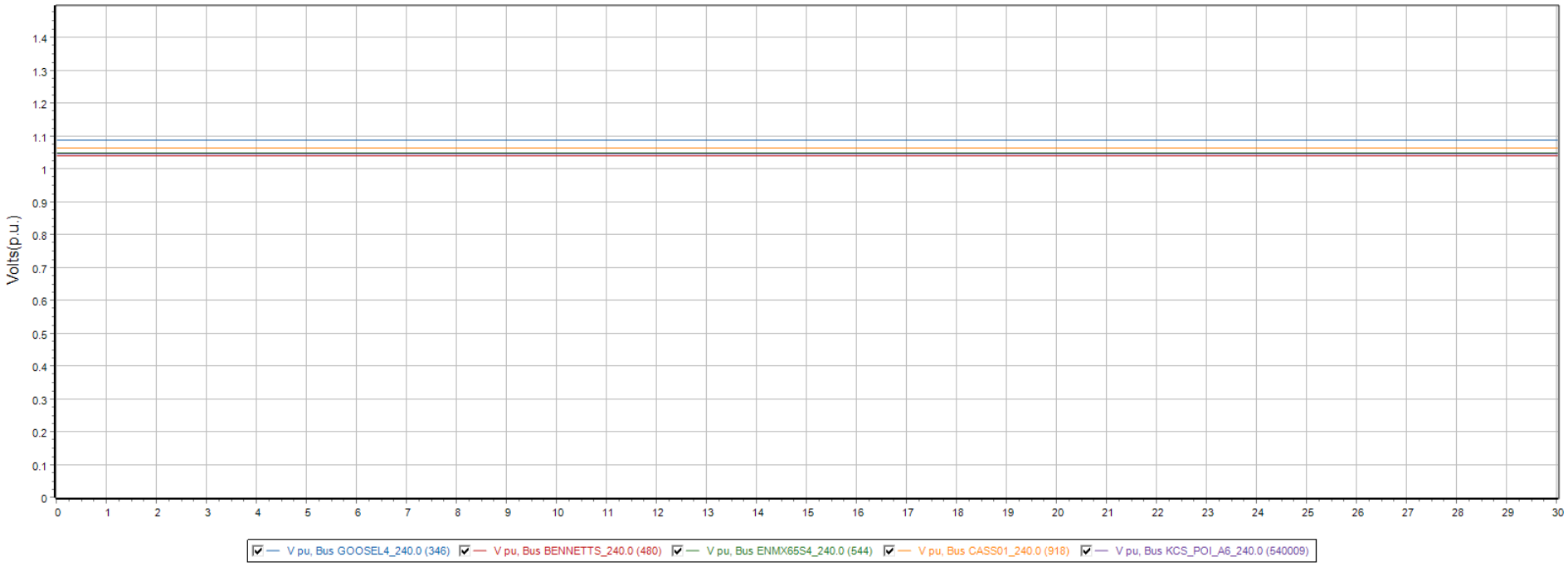
Monitor Line MW & MVAR. Q4



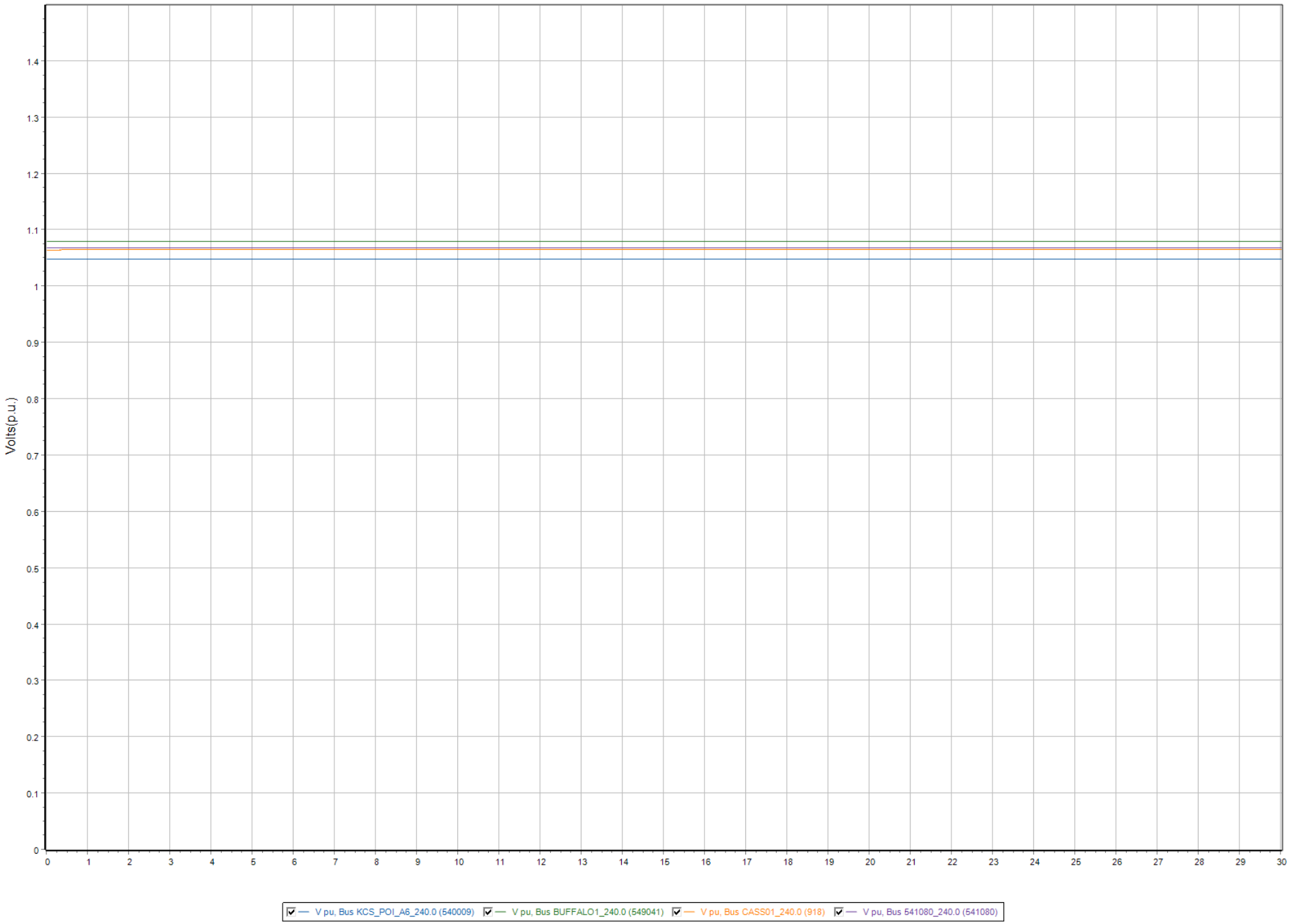


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 00 - NERC Cat A

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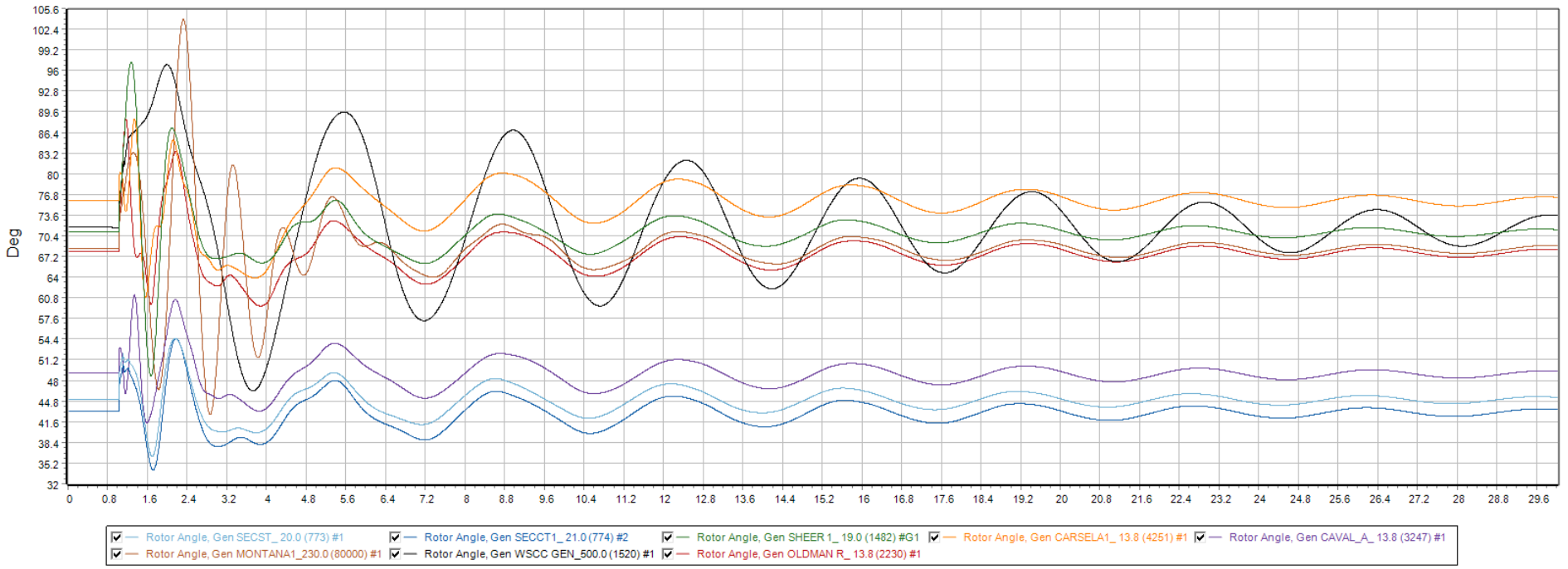
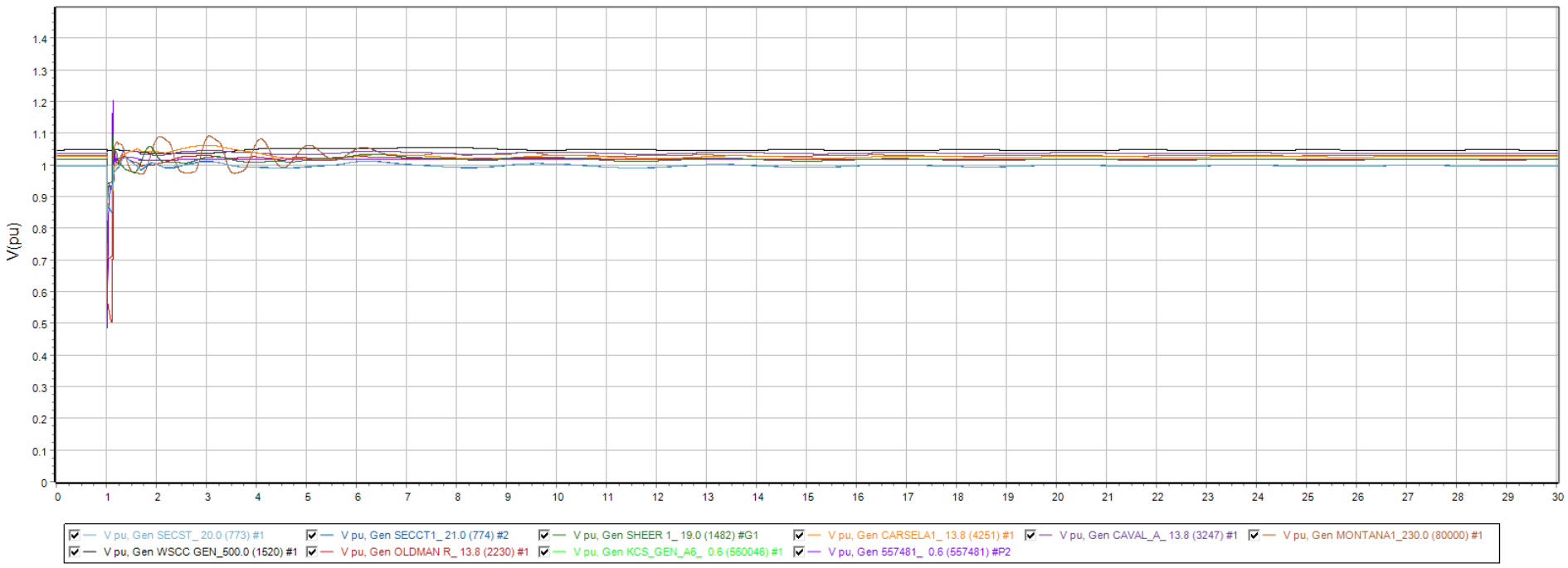
May 16, 2023 23:08:45

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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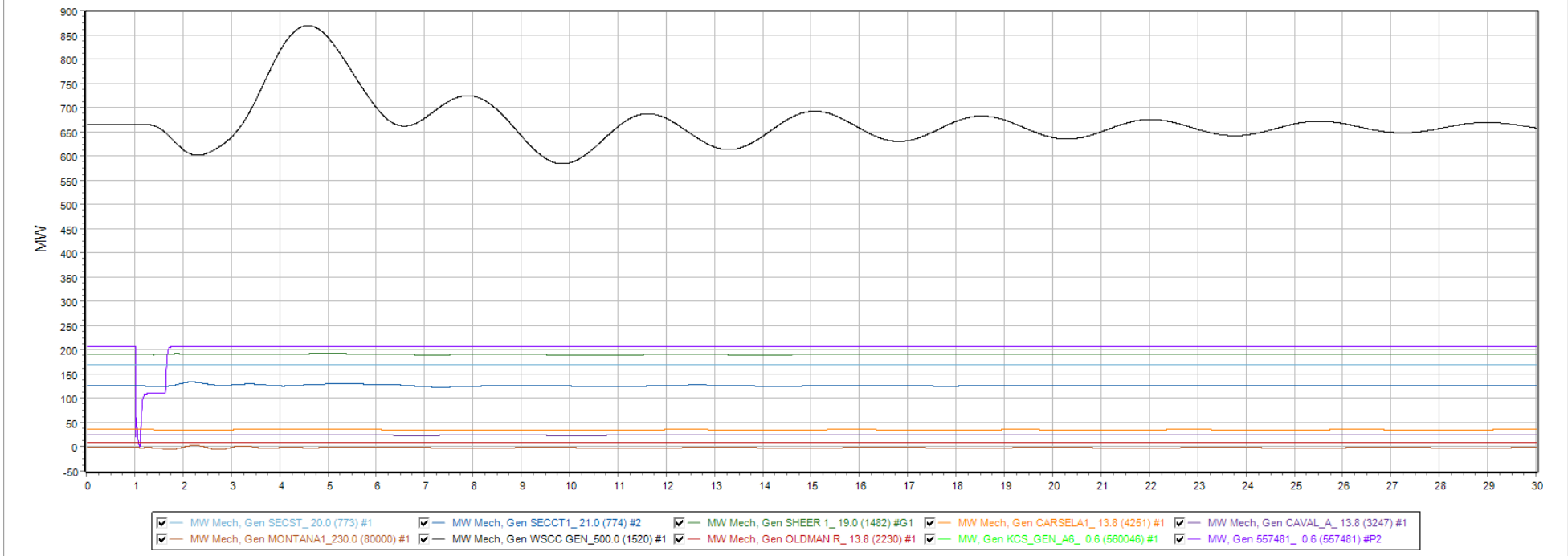
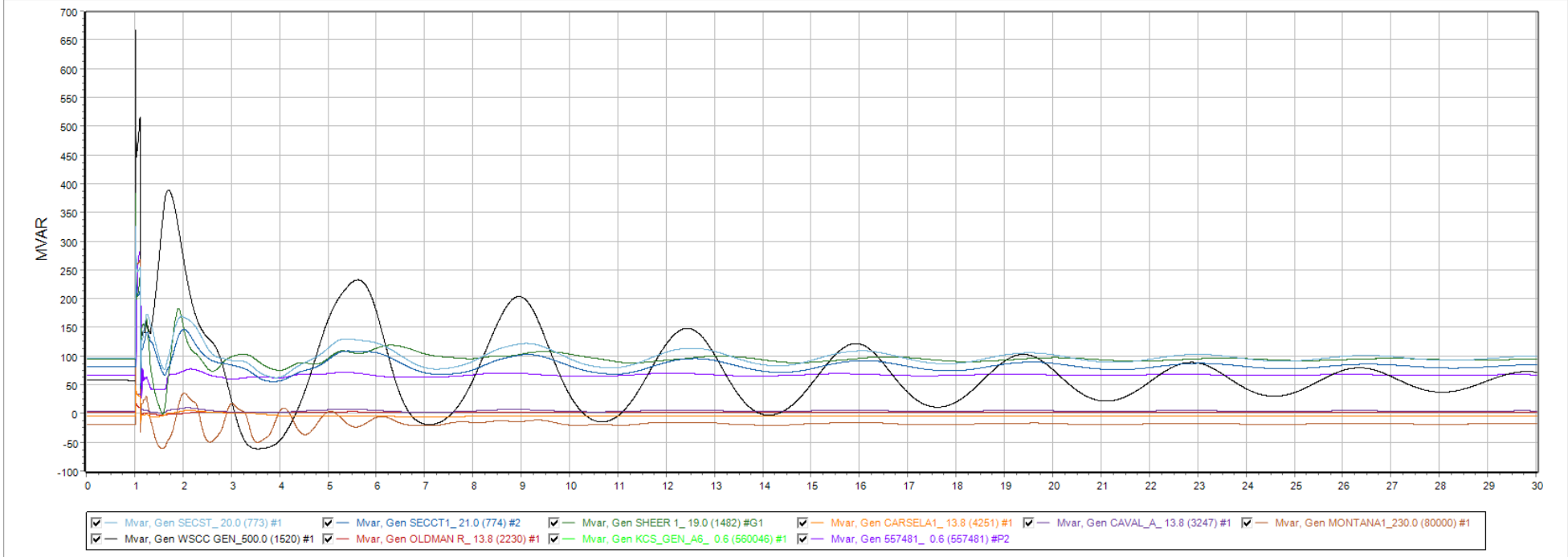
May 16, 2023 20:27:15

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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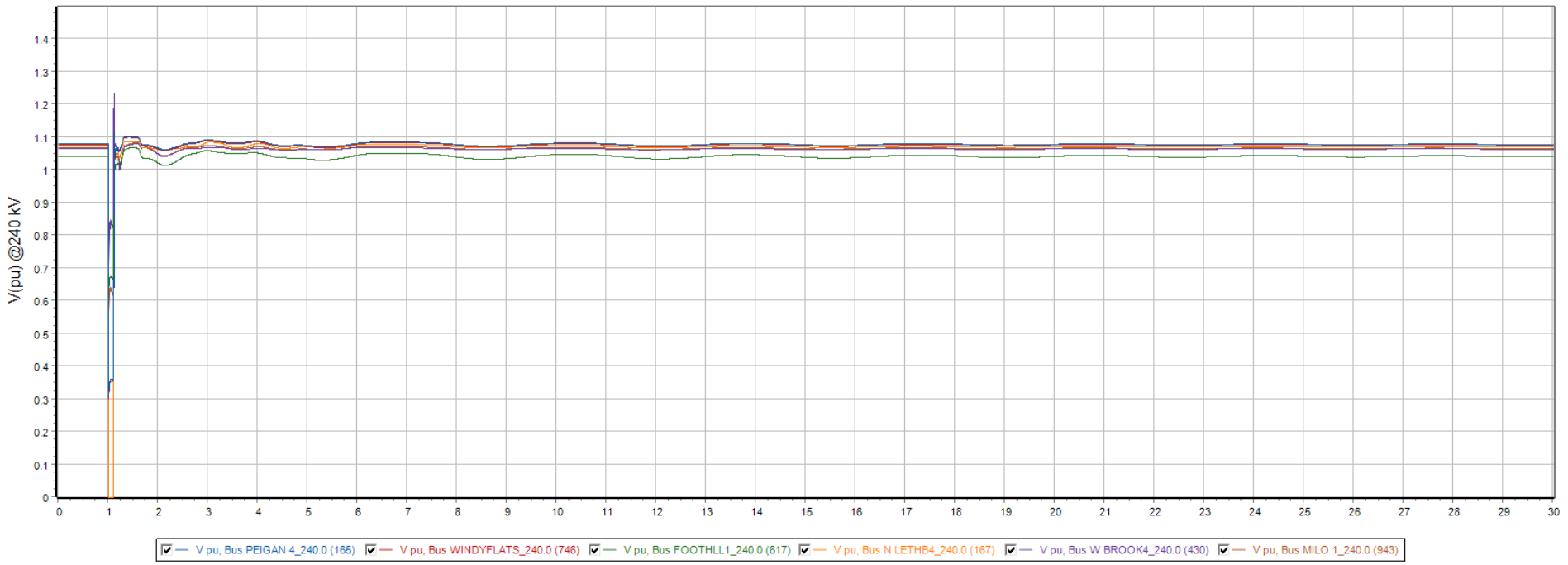
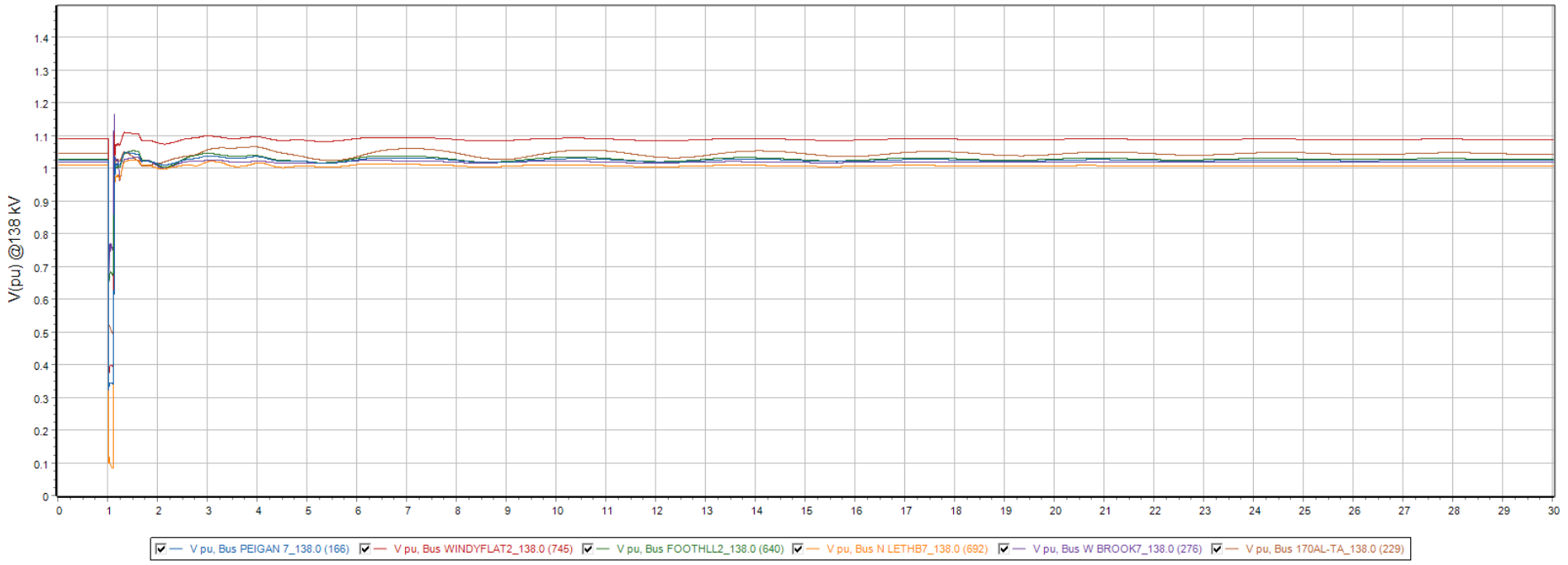
May 16, 2023 20:27:16

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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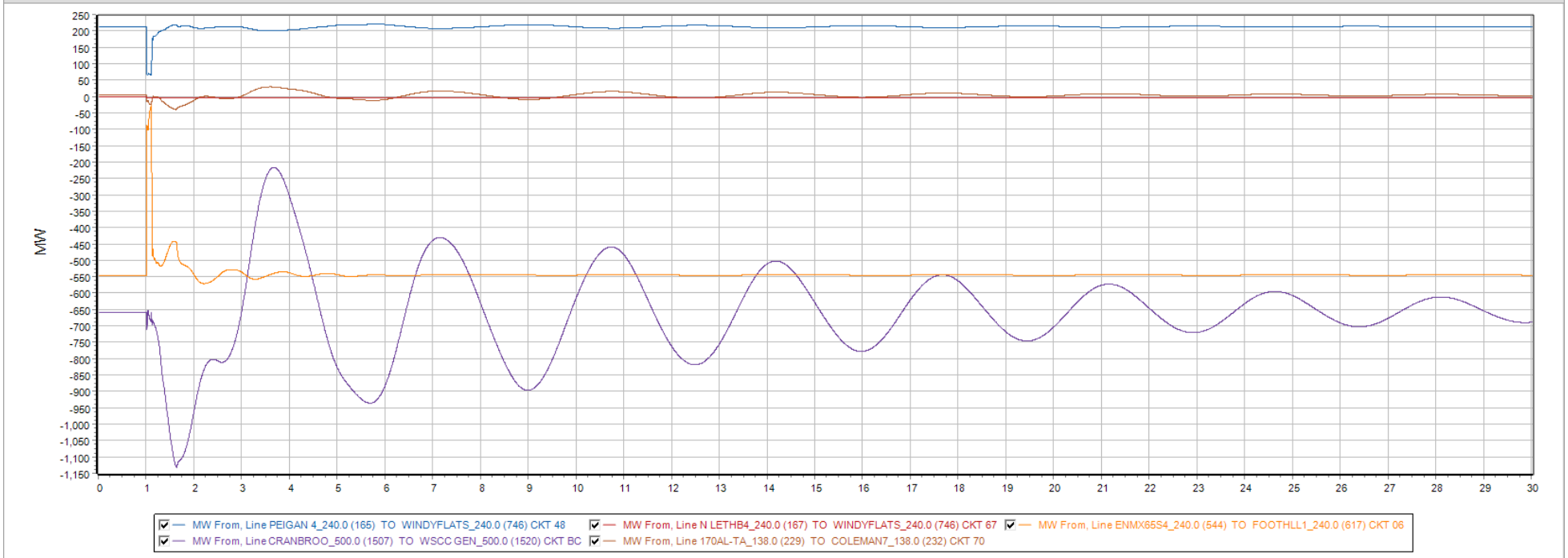
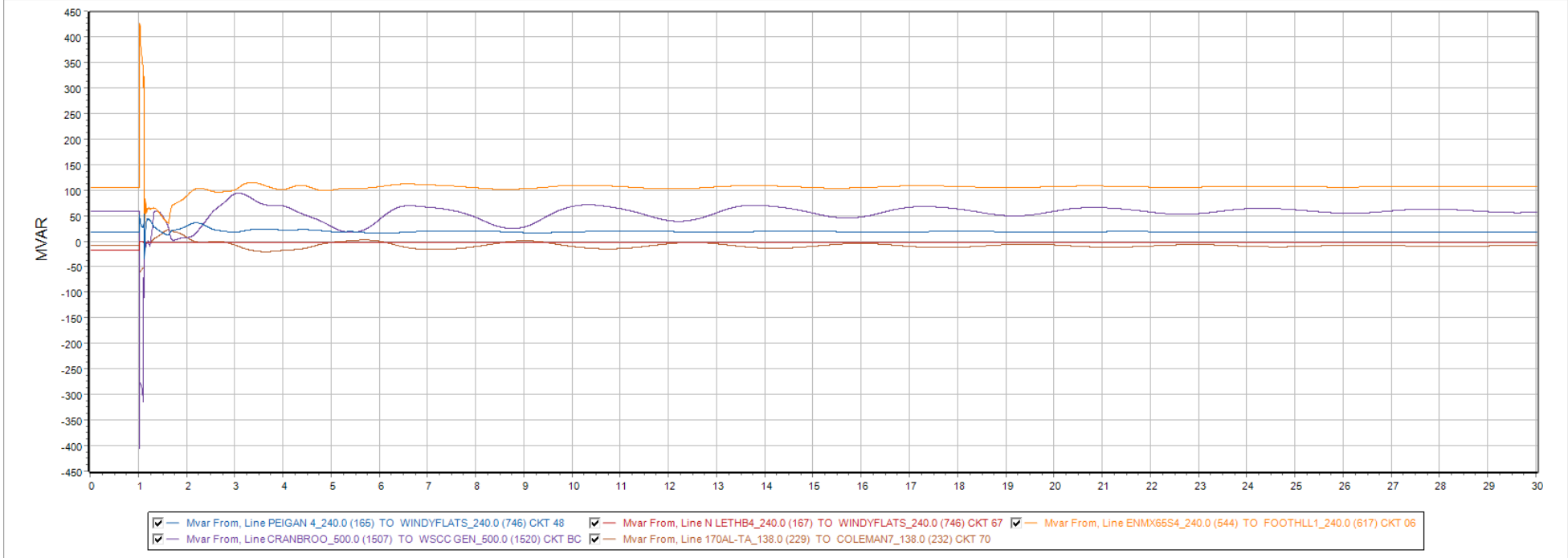
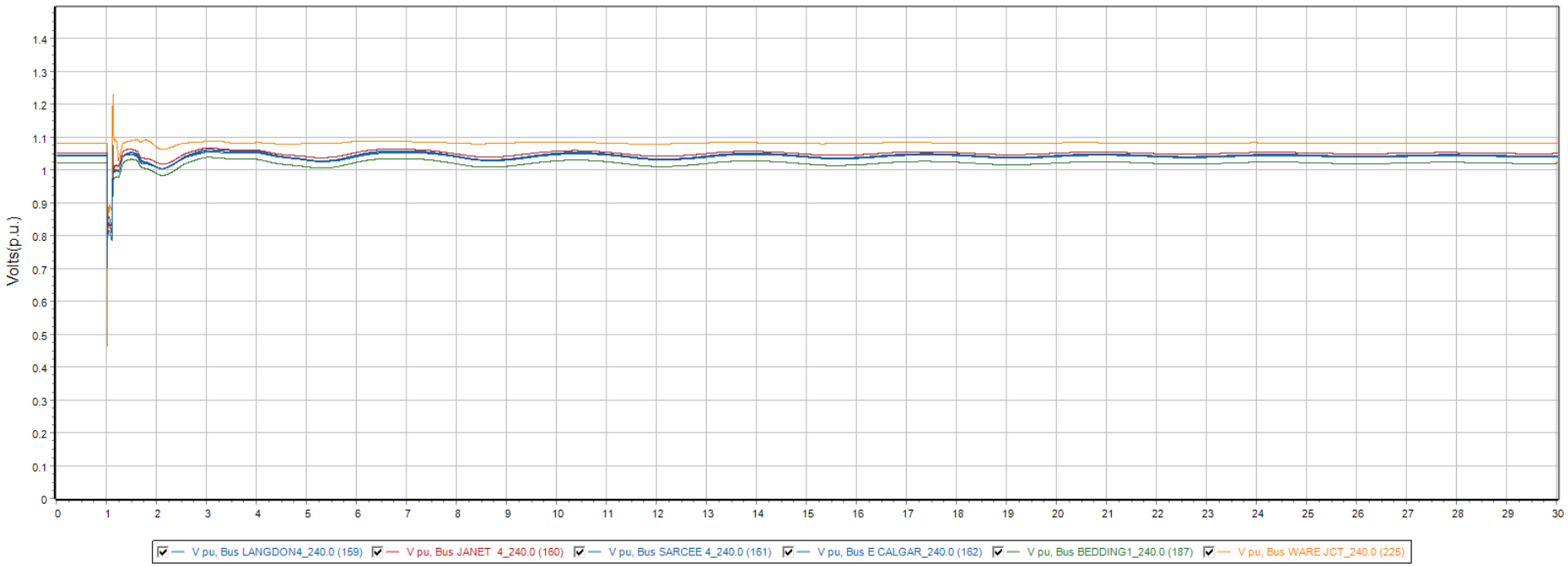
May 16, 2023 20:27:17

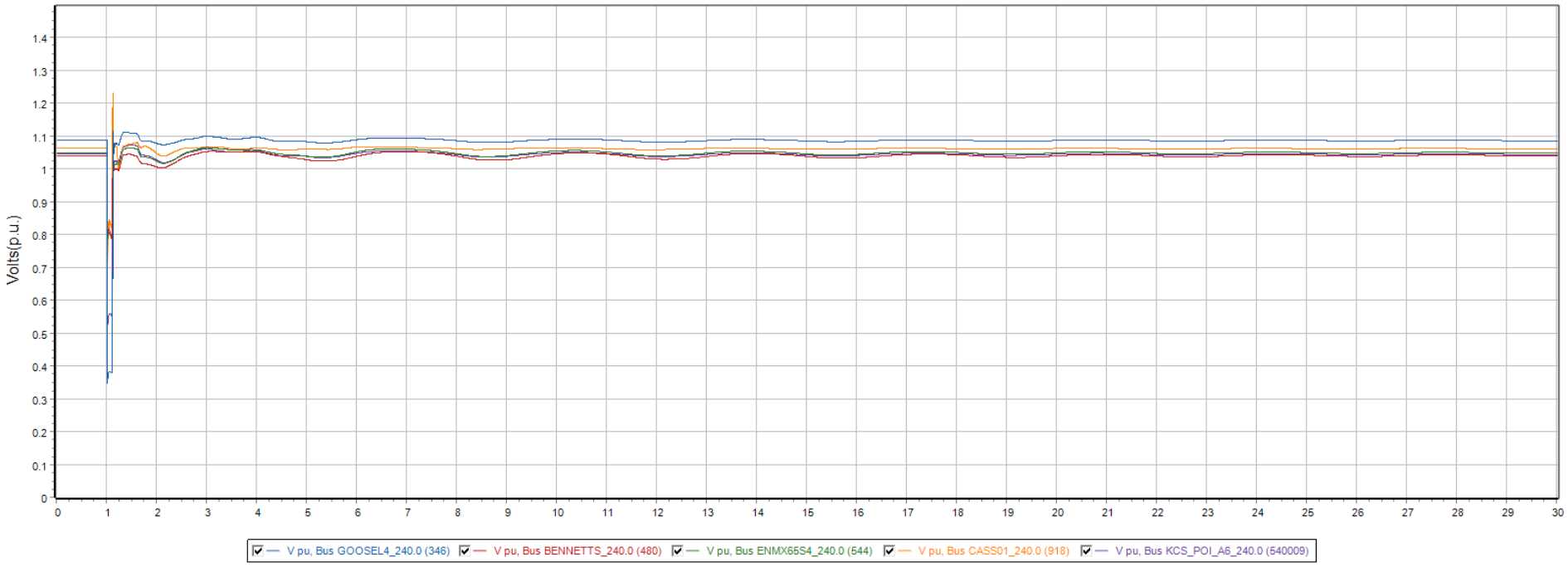
Monitor Line MW & MVAR. Q4



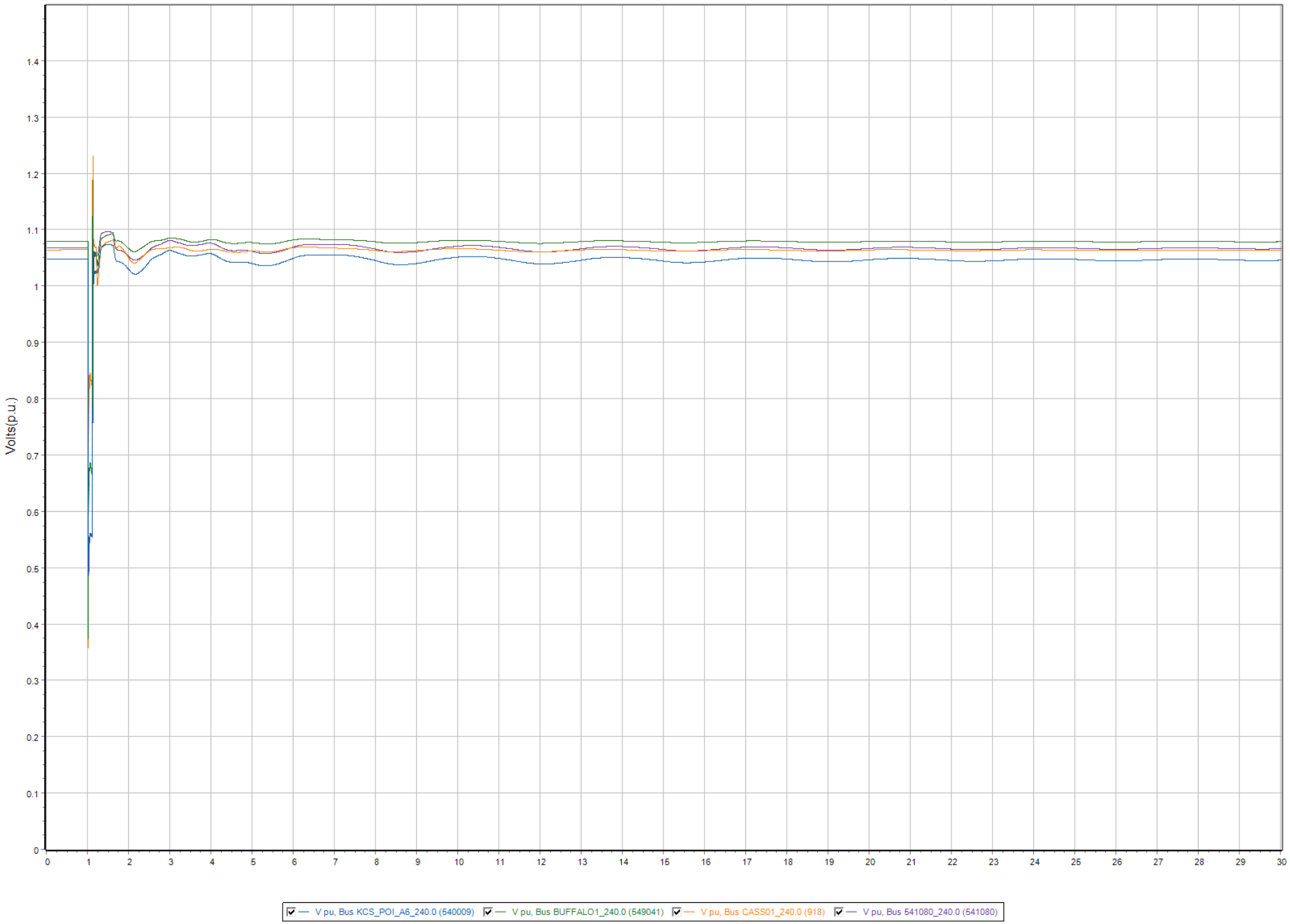


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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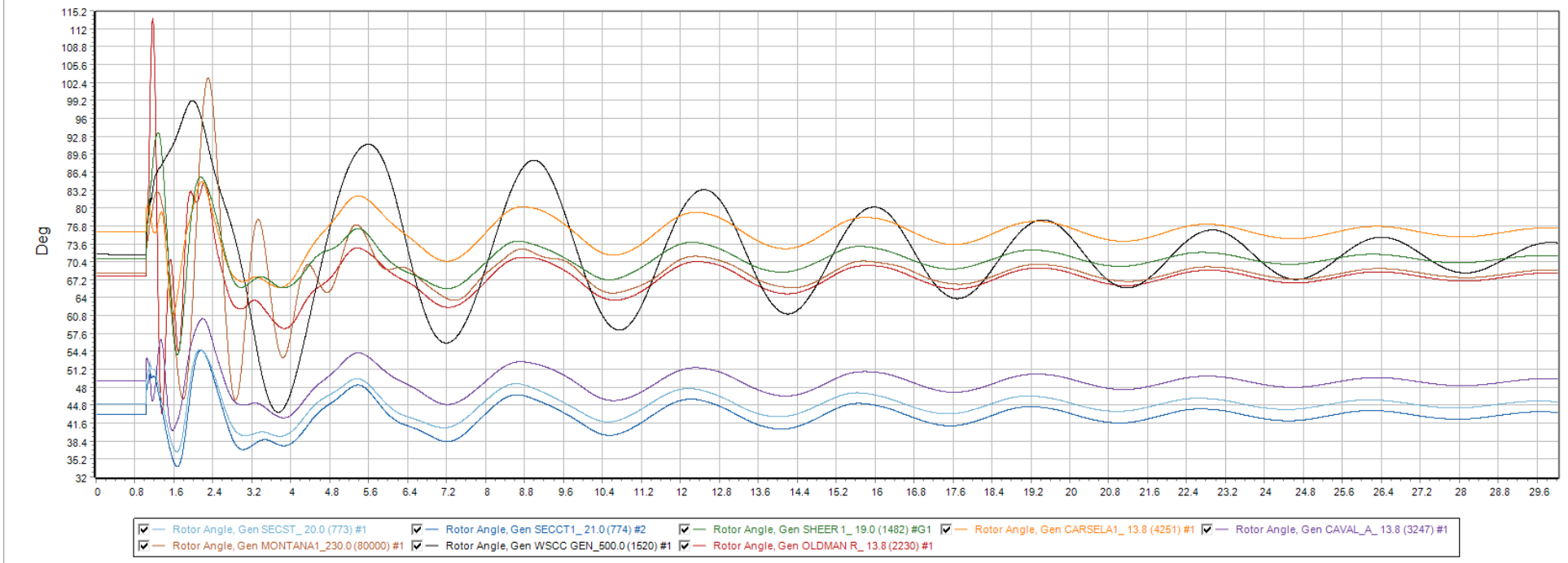
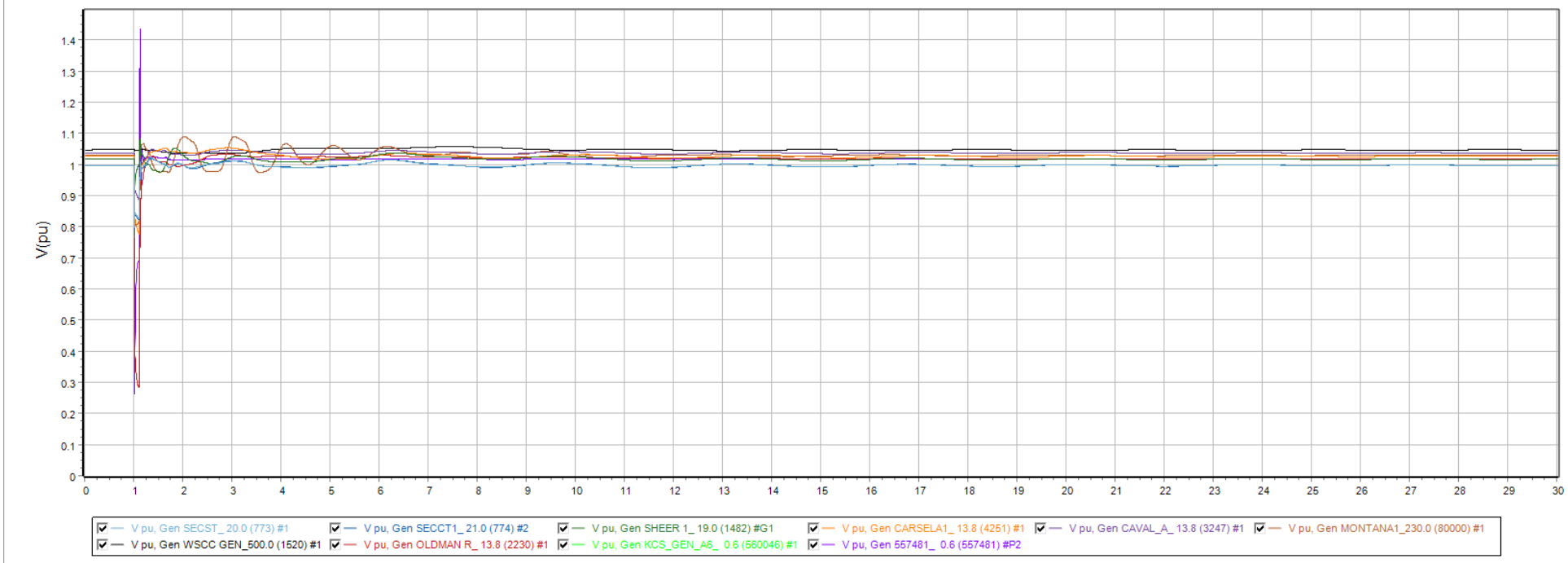
May 16, 2023 20:27:18

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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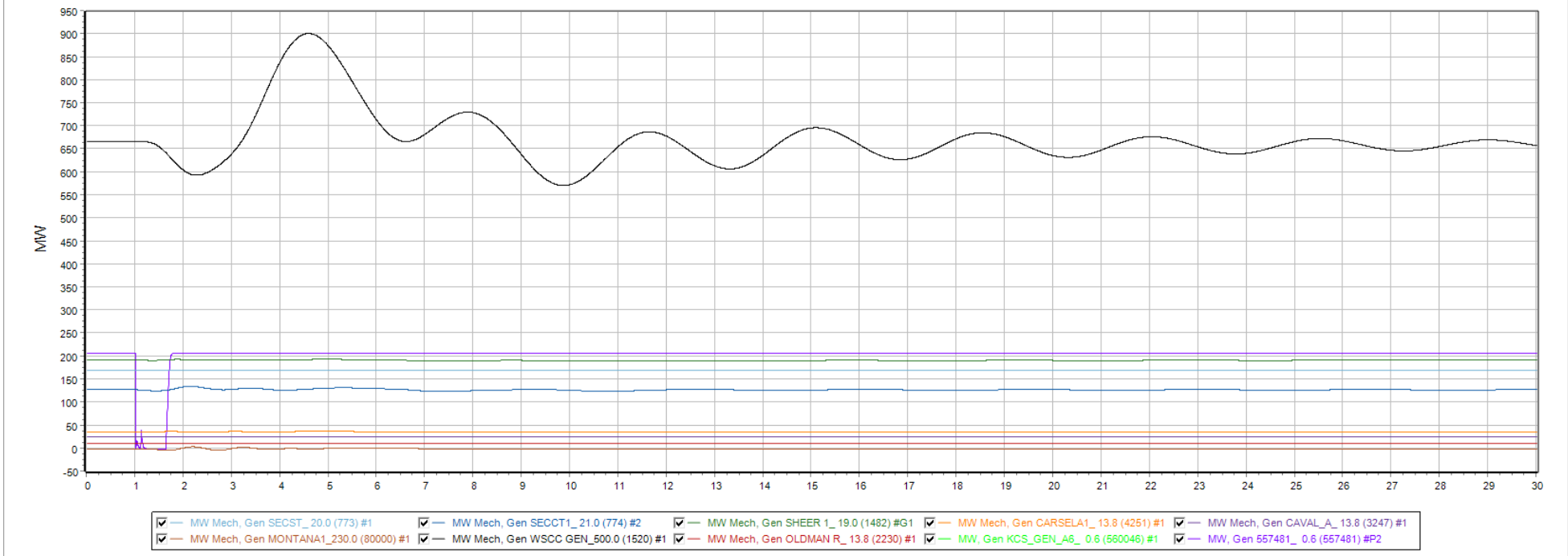
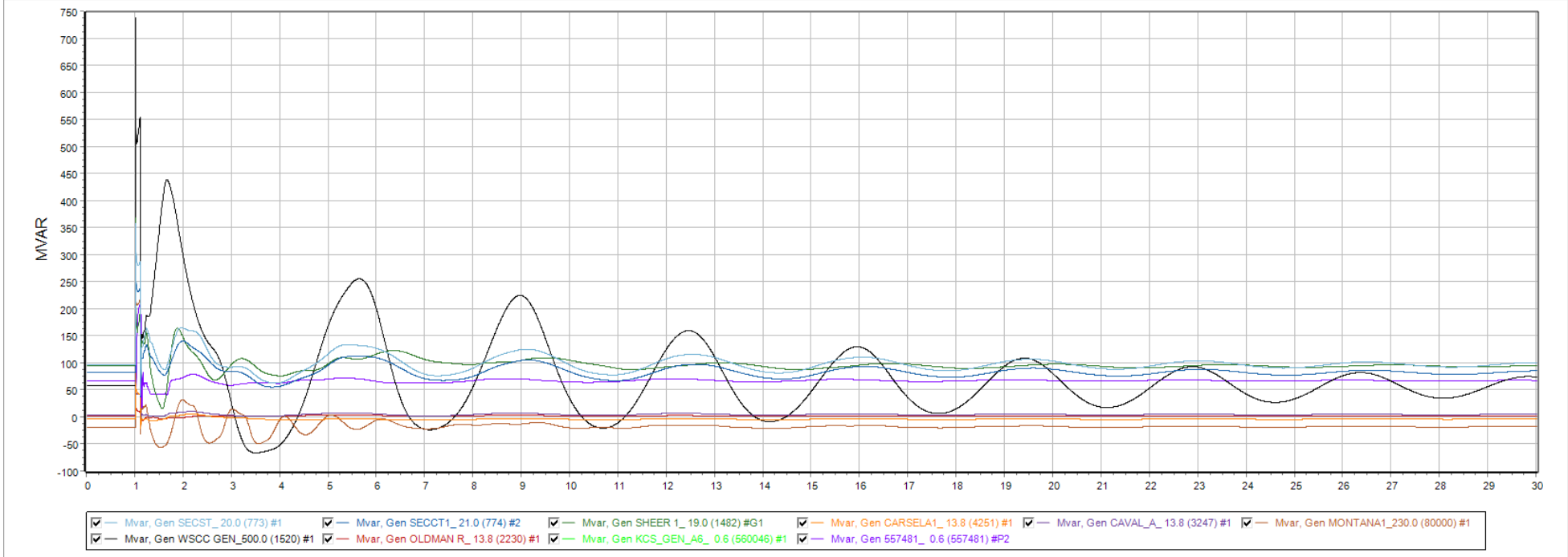
May 16, 2023 20:37:27

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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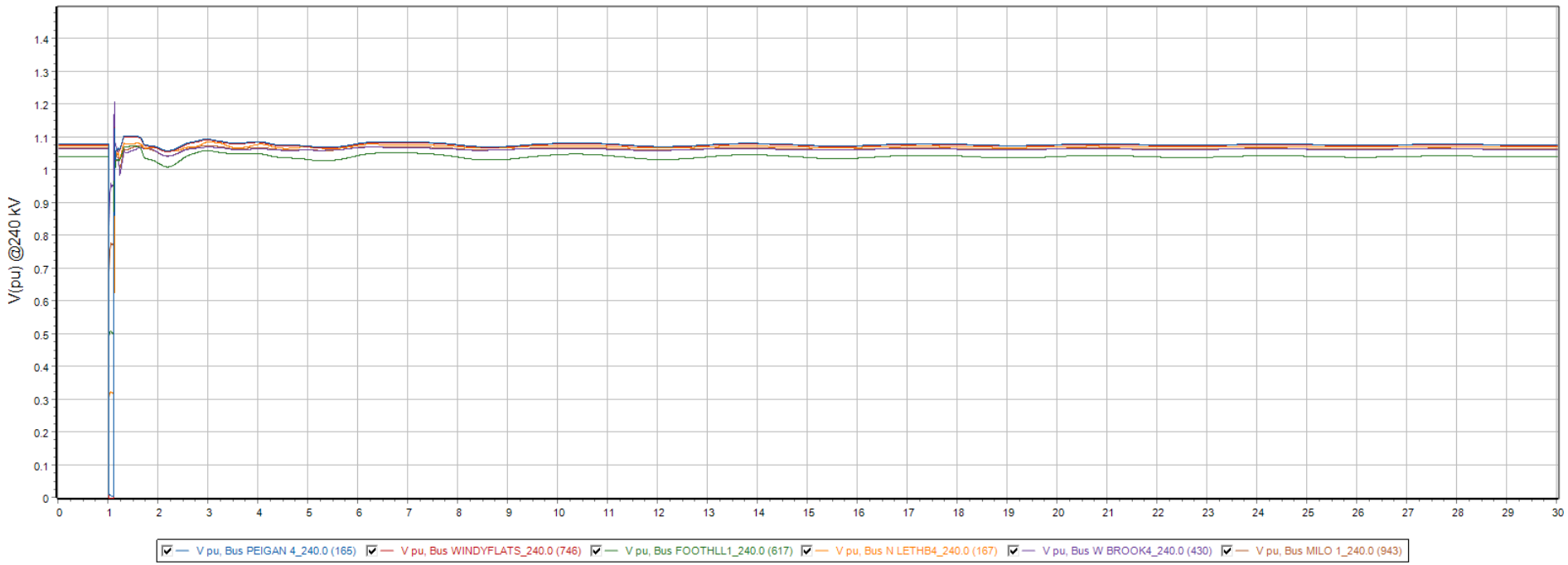
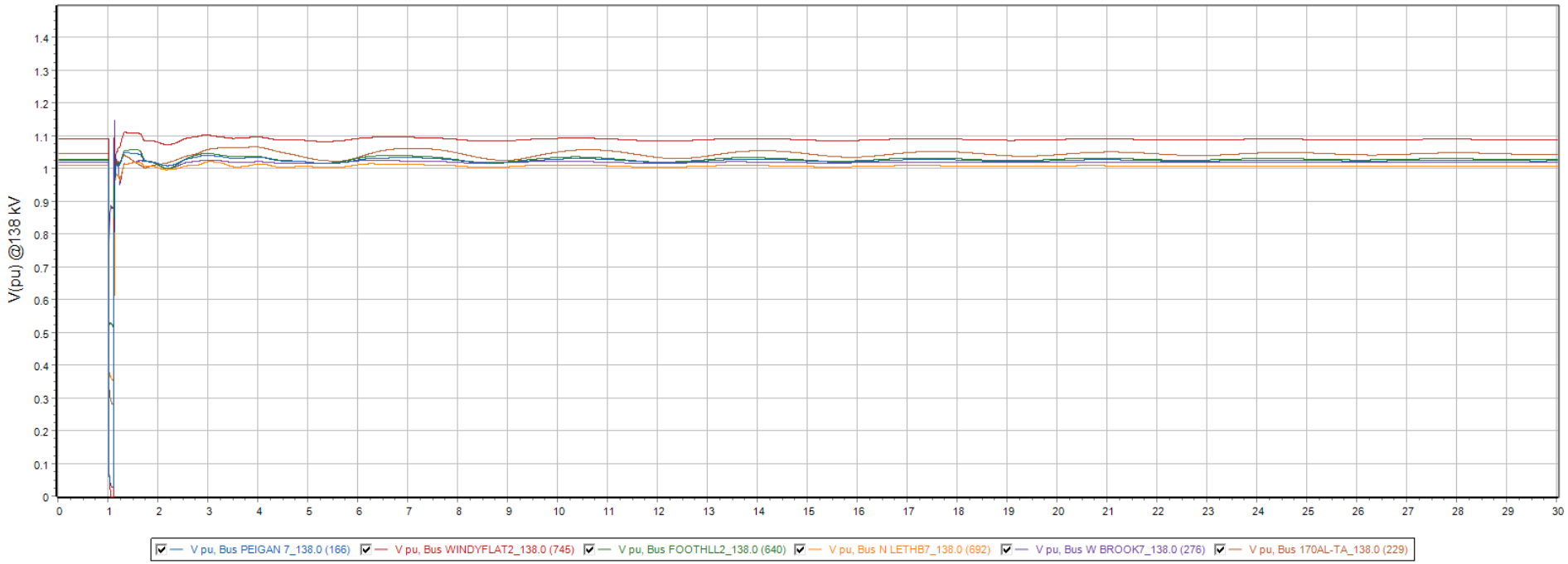
May 16, 2023 20:37:28

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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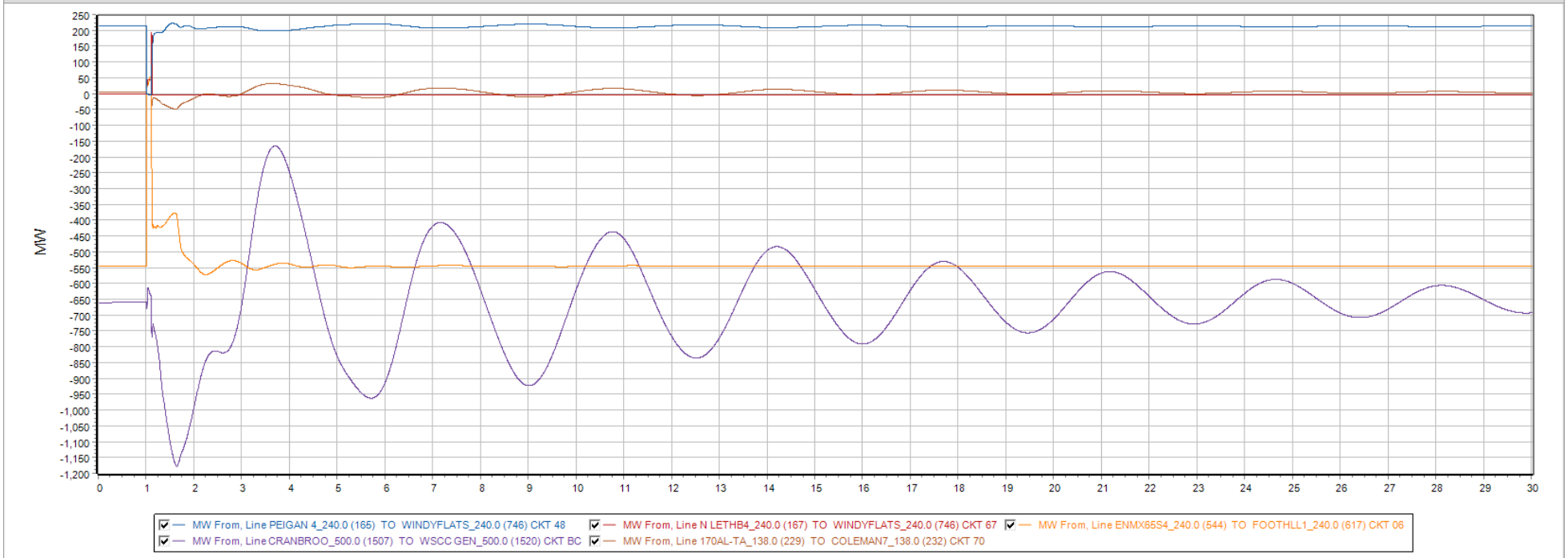
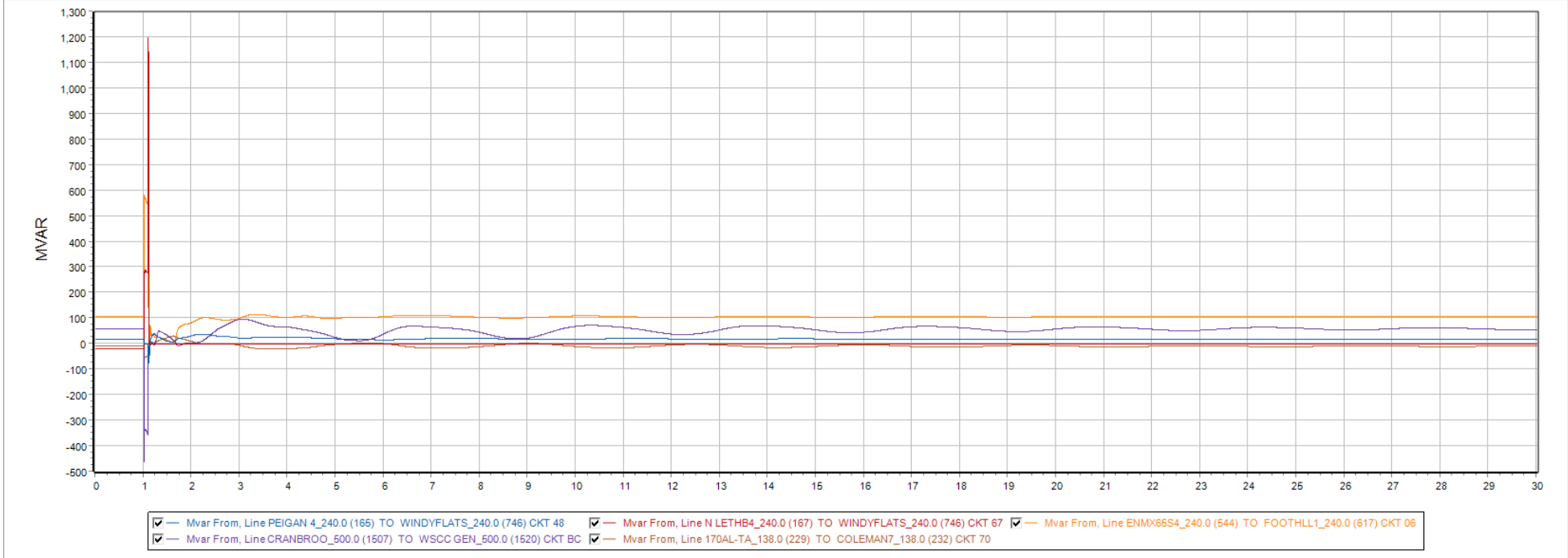
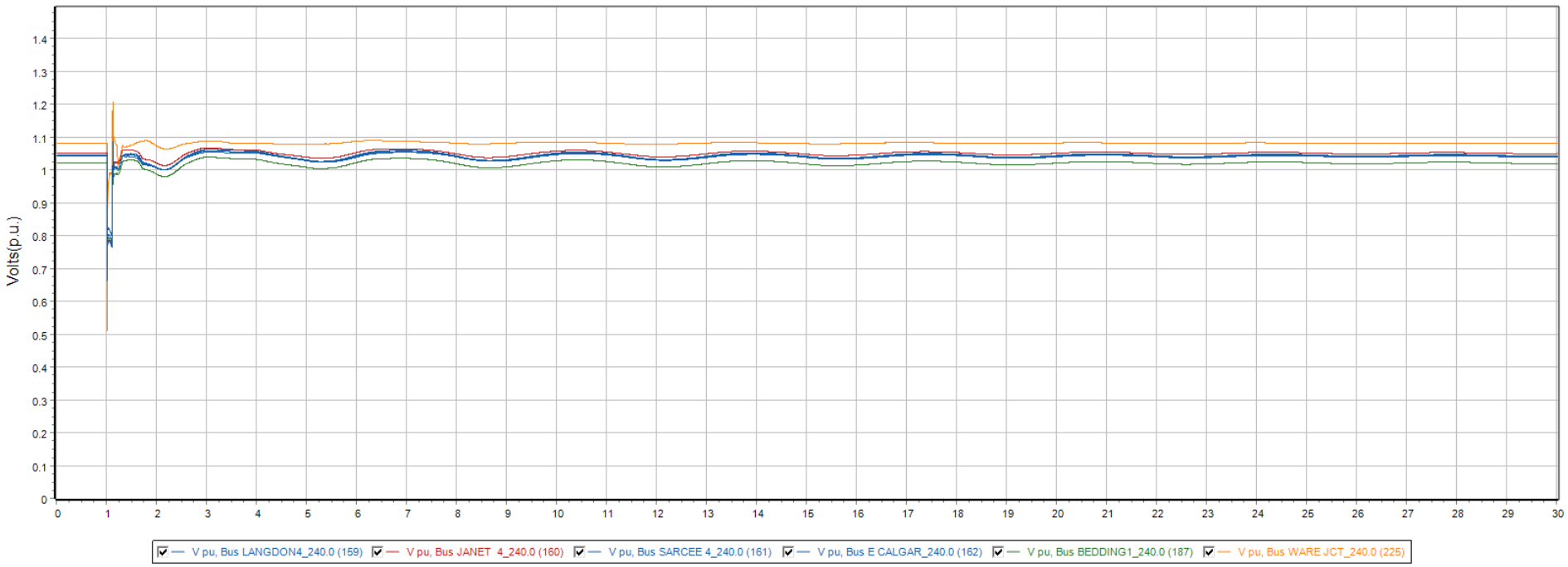
May 16, 2023 20:37:28

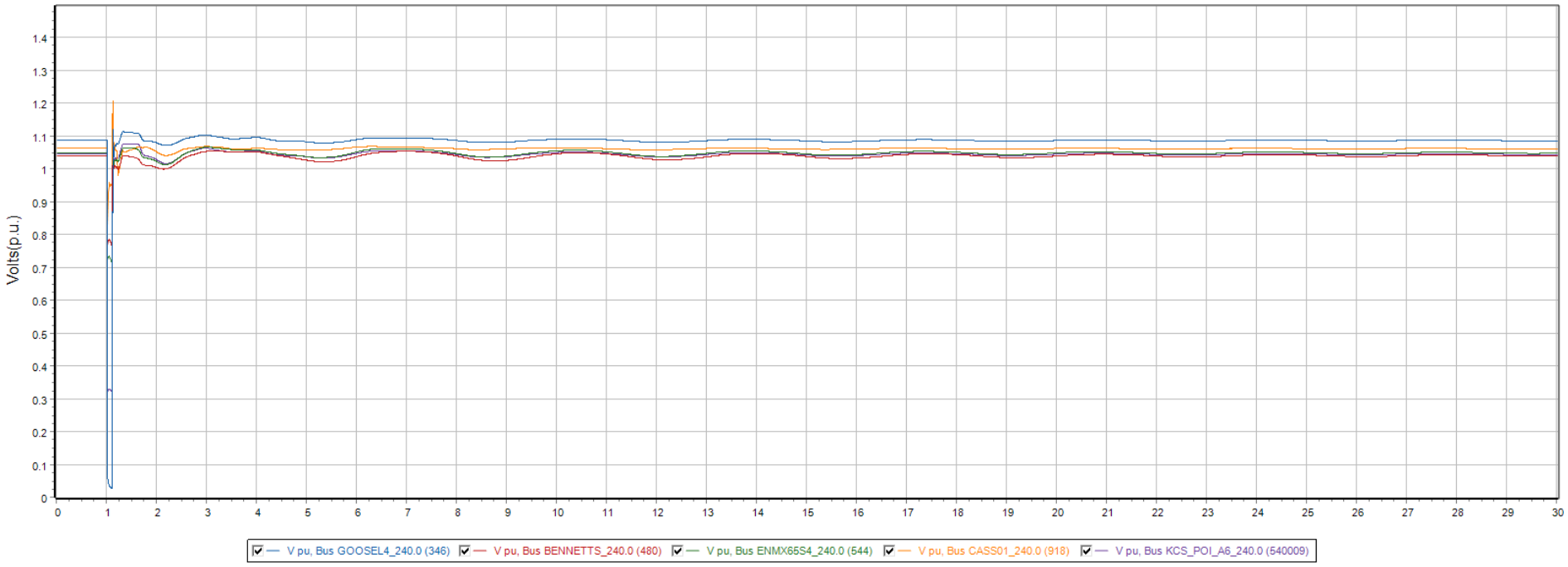
Monitor Line MW & MVAR. Q4



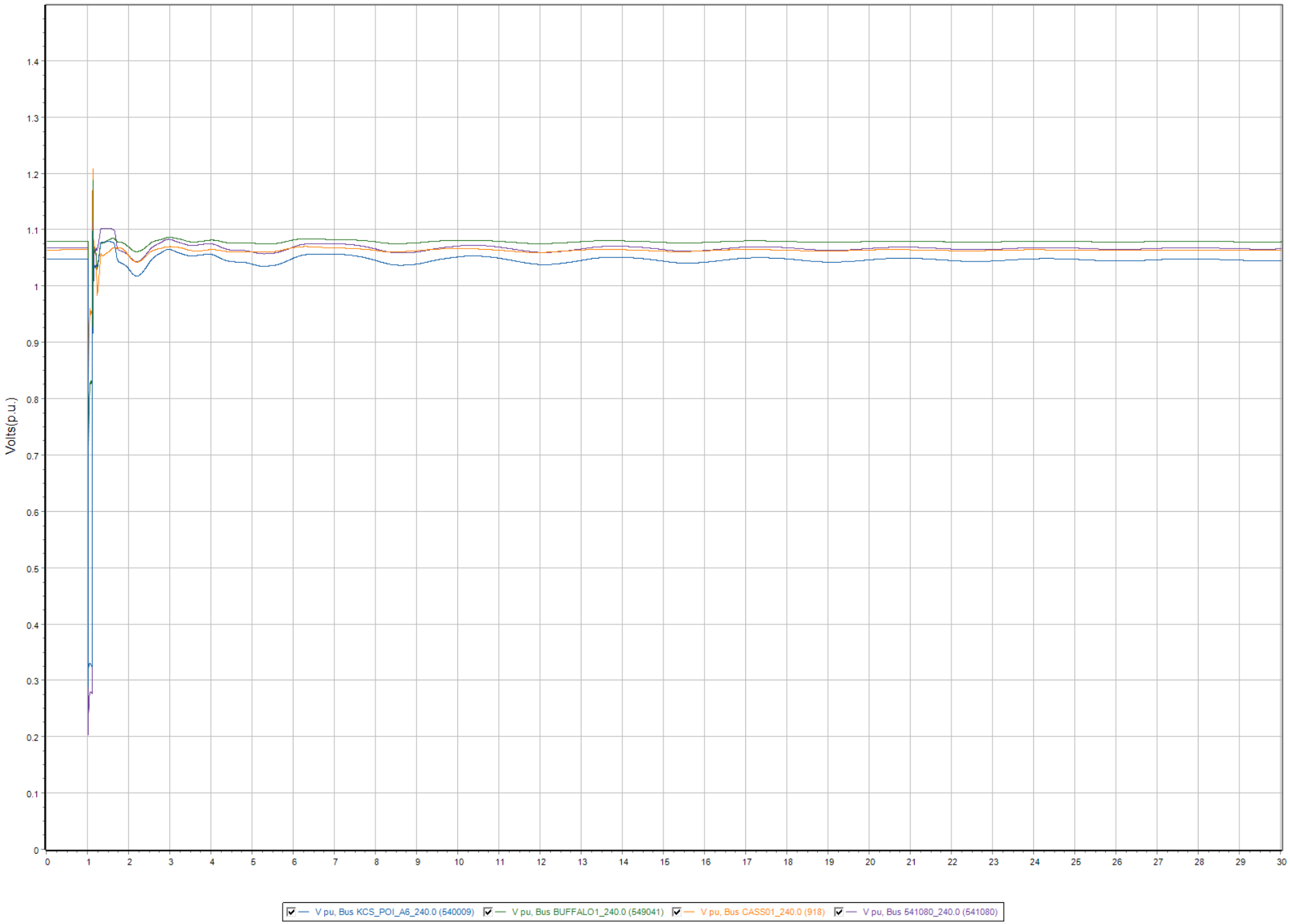


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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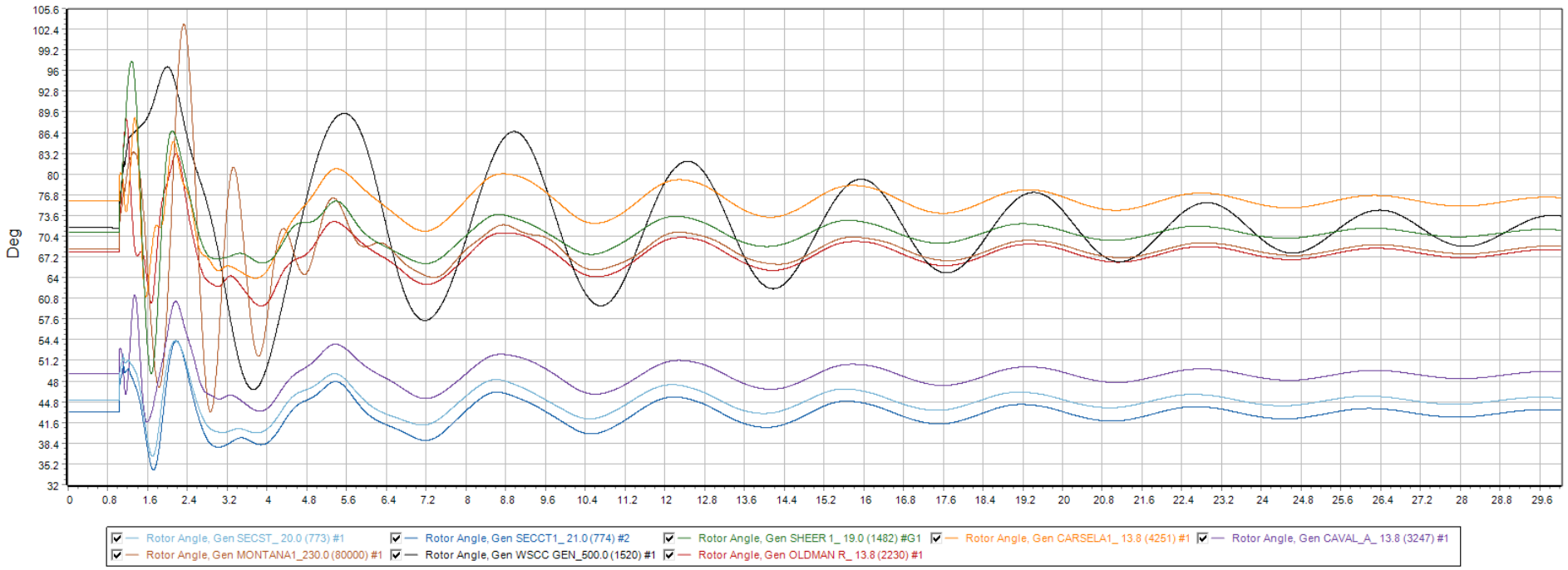
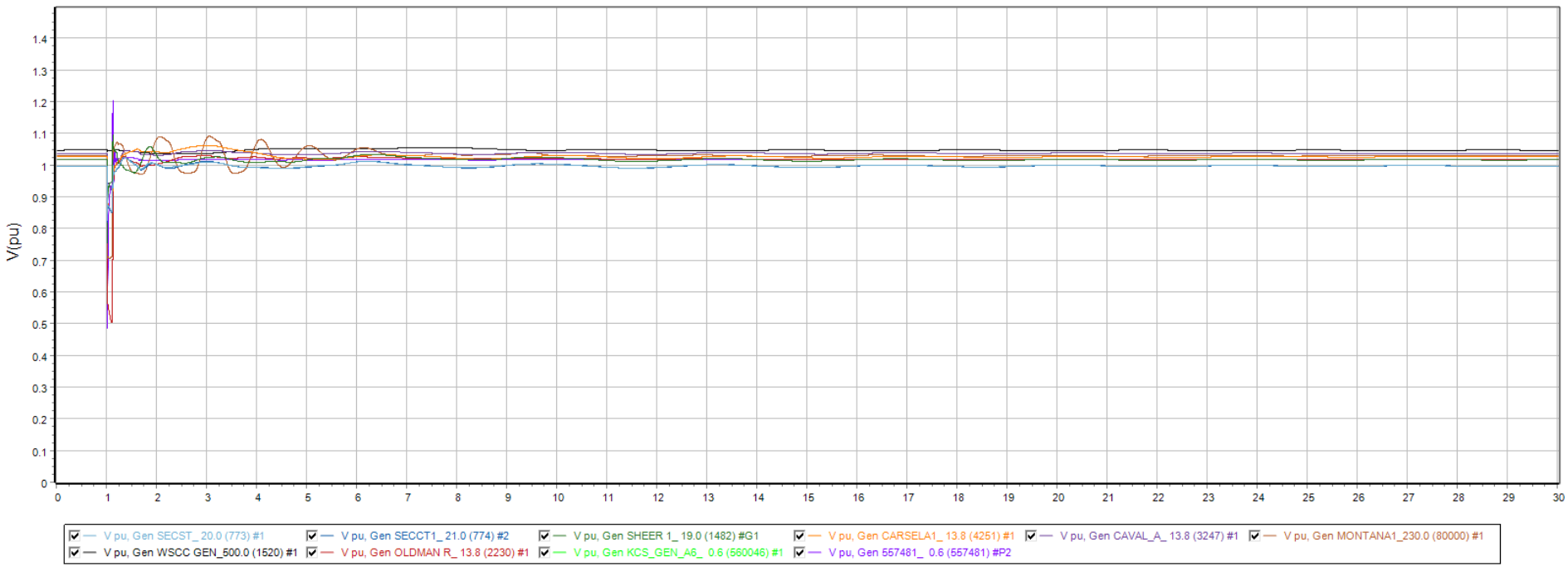
May 16, 2023 20:37:30

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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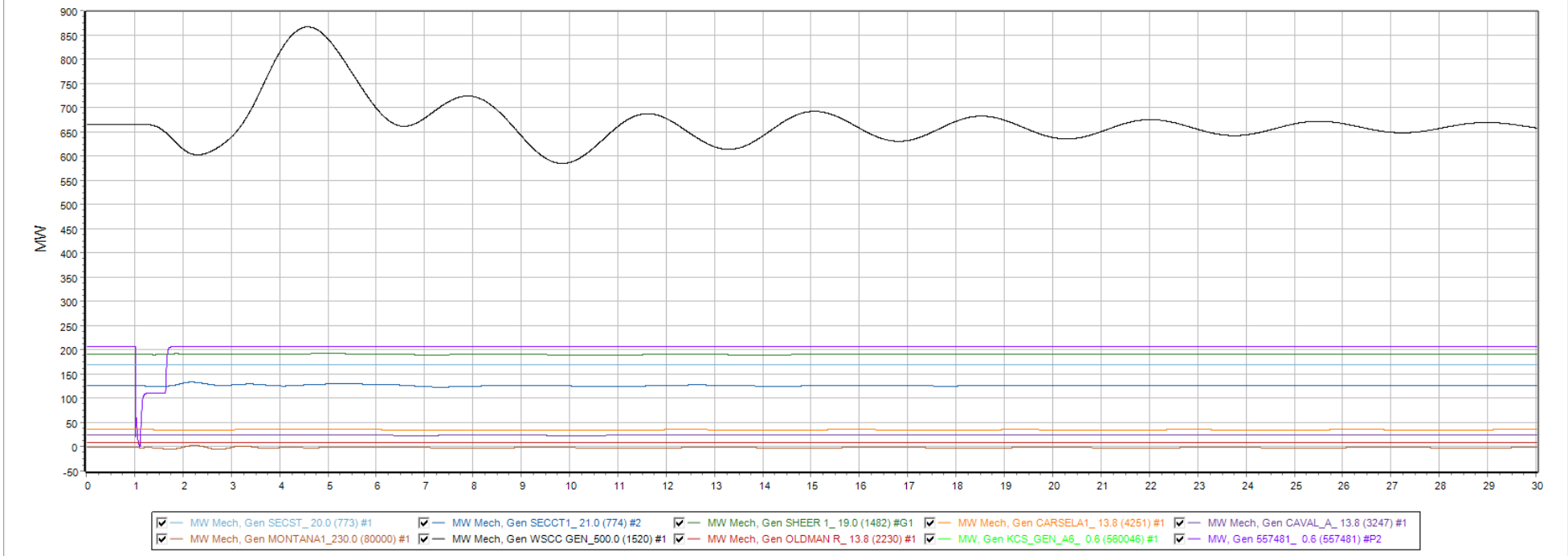
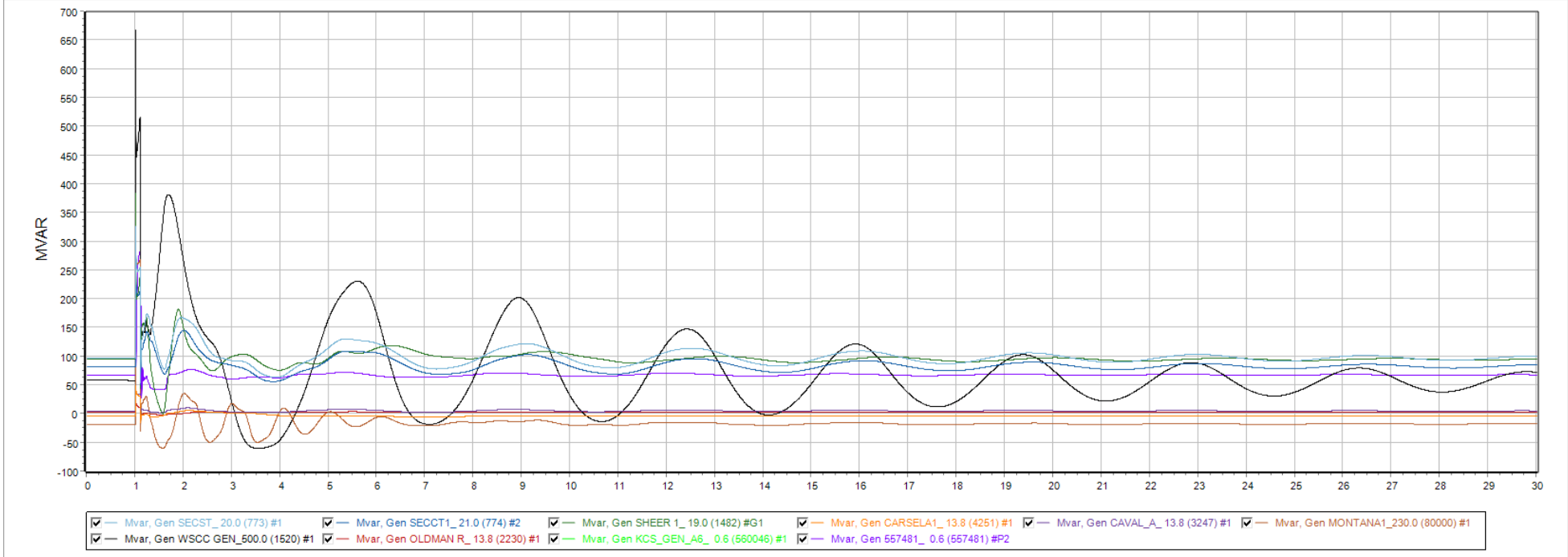
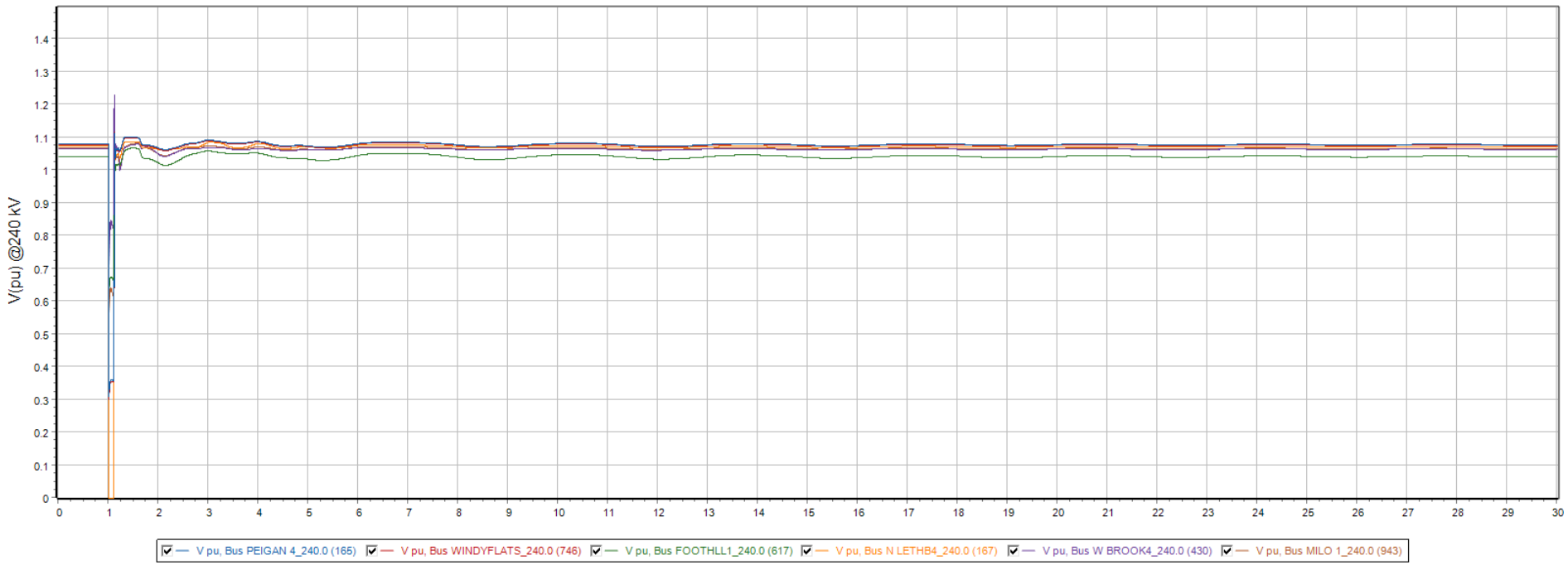
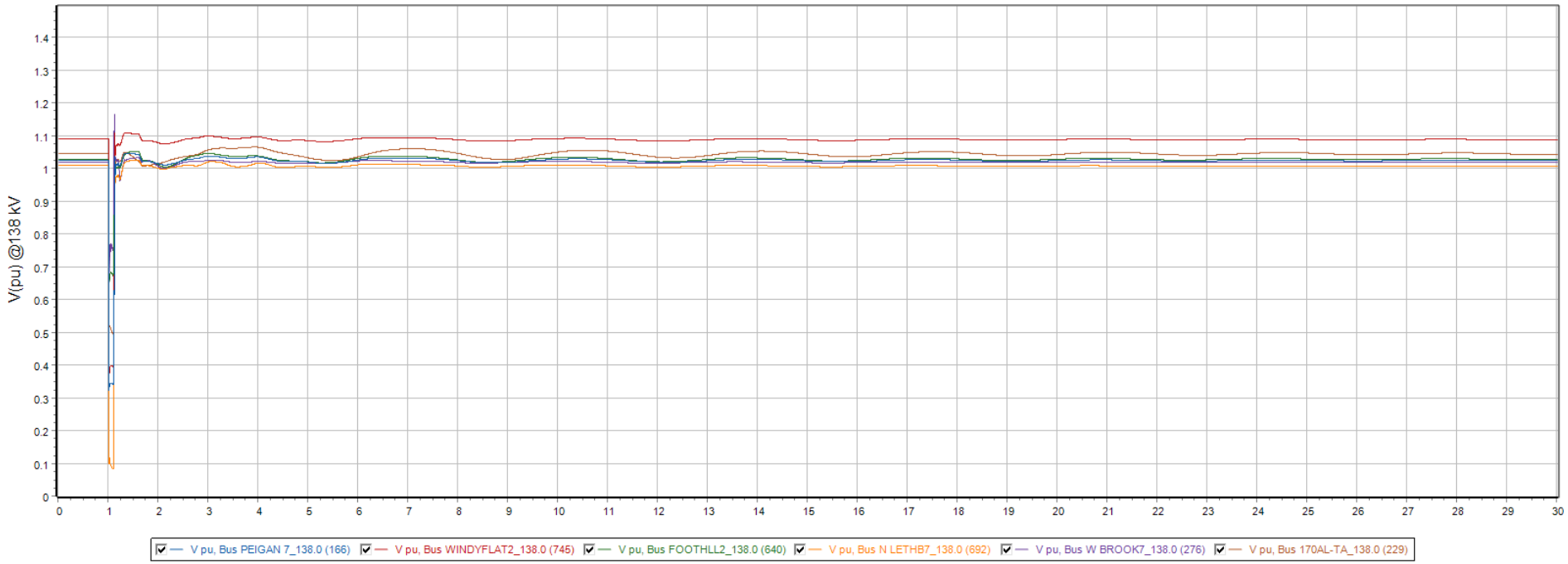
Monitor Gens. Q2



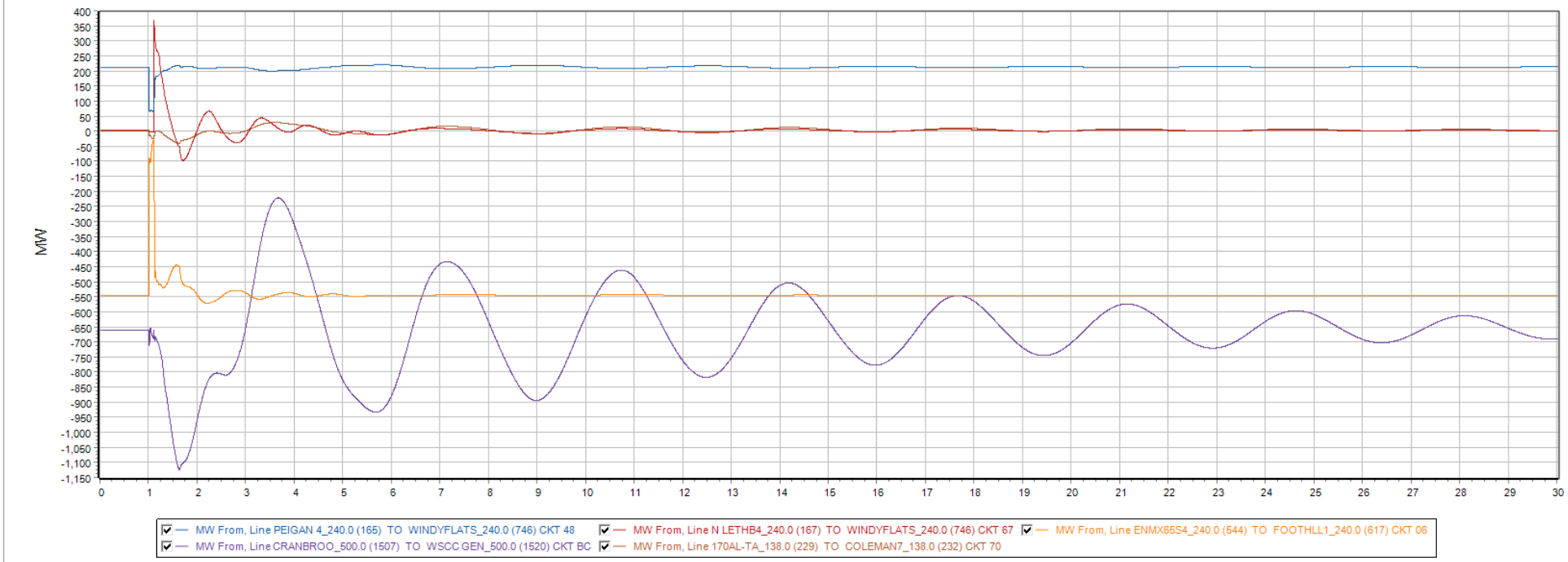


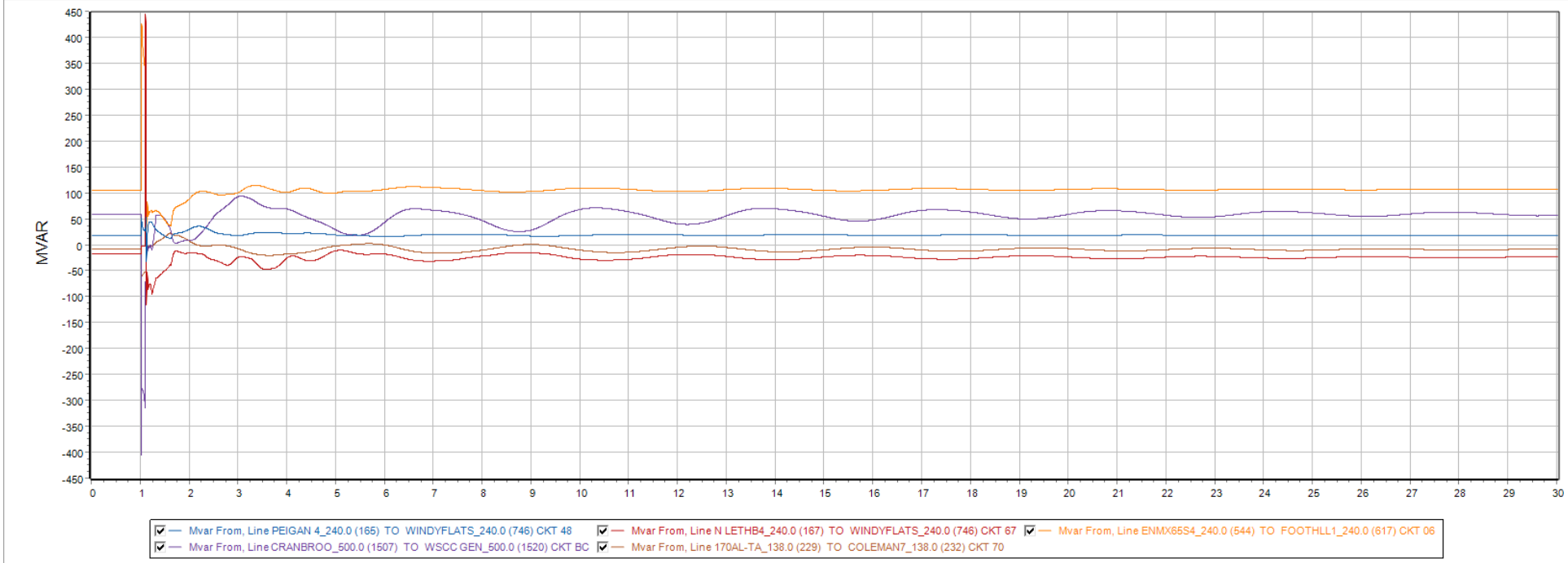
Monitor Bus Volts Q3



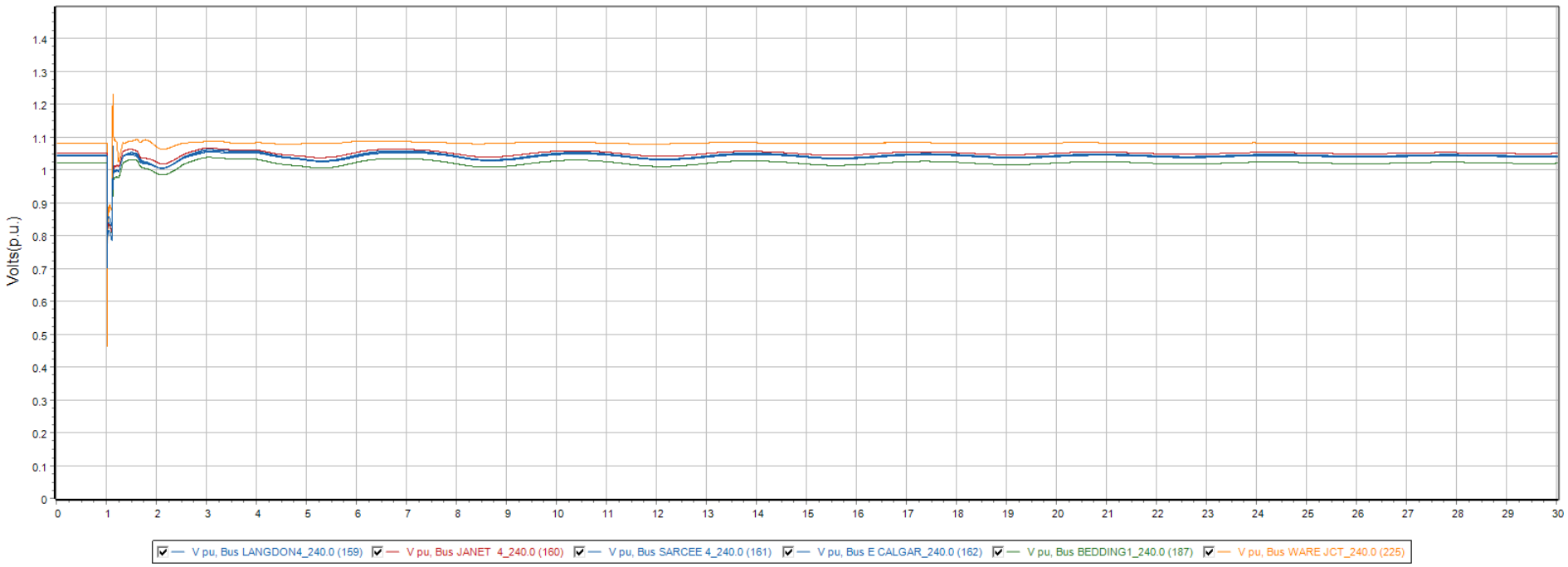


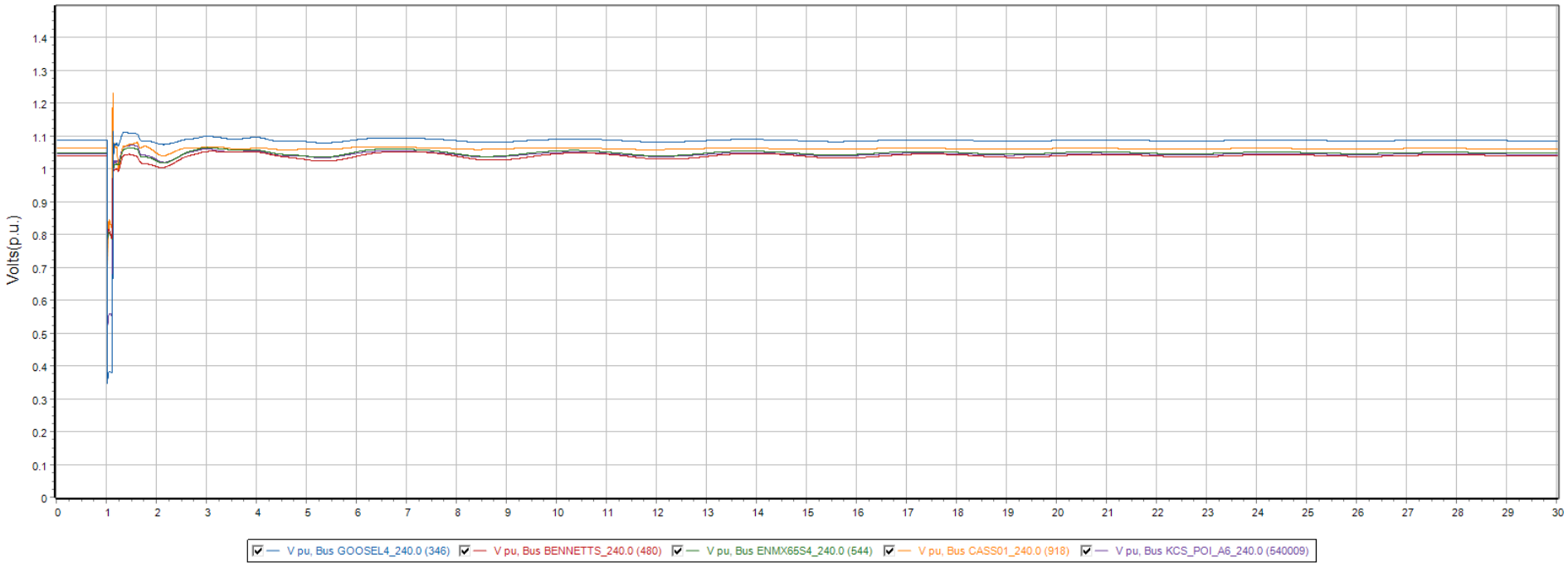
Monitor Line MW & MVAR. Q4



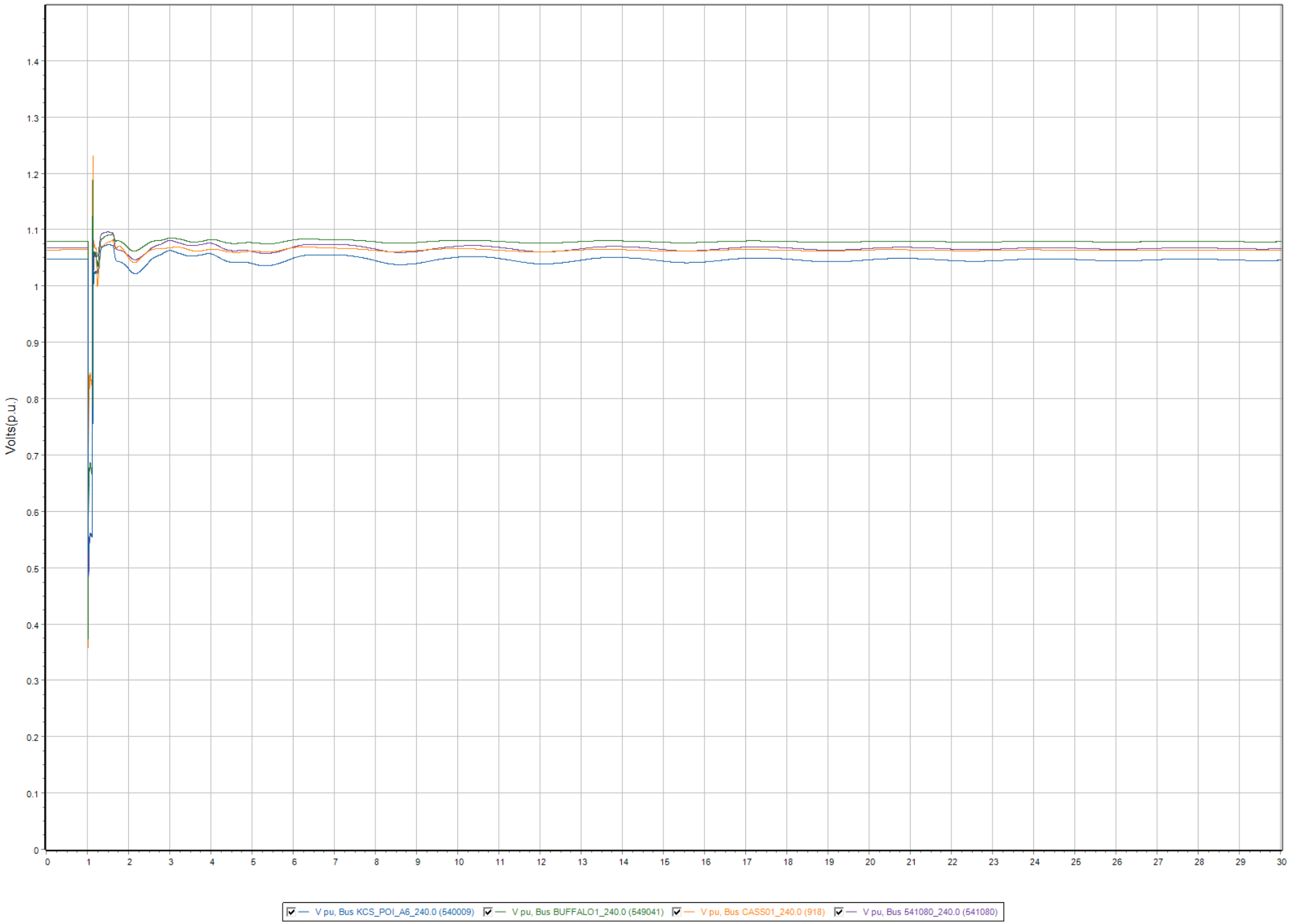


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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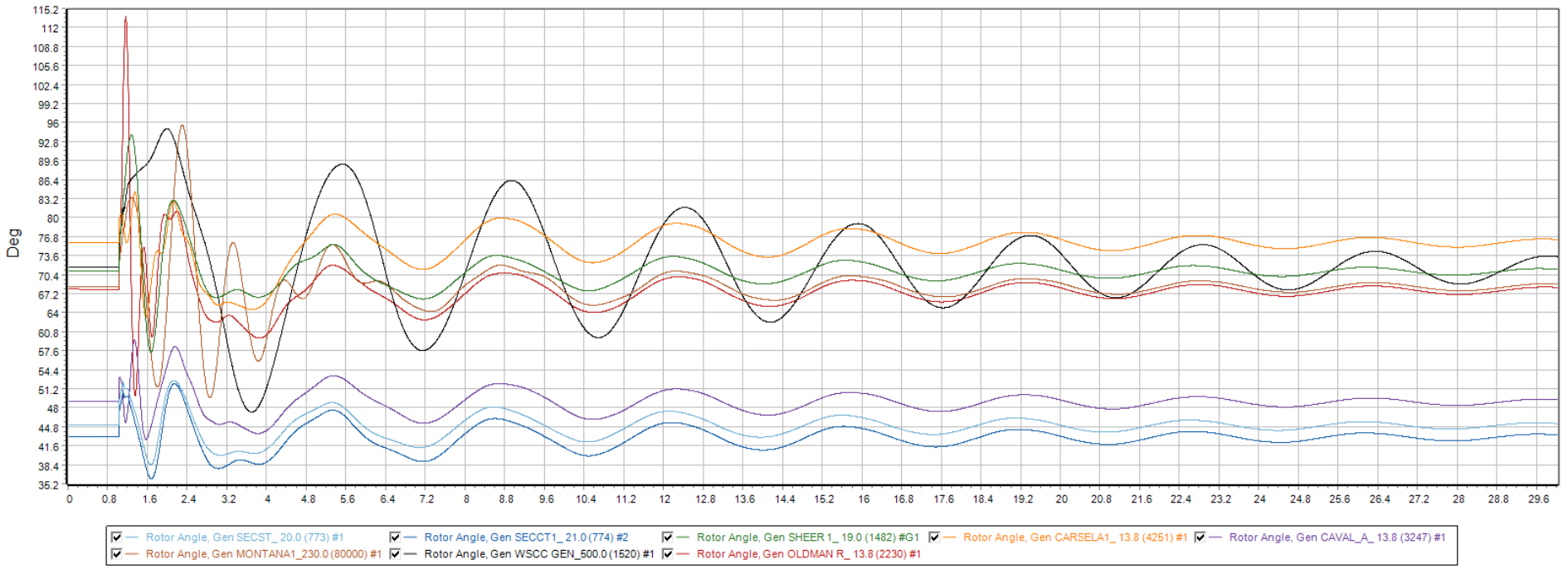
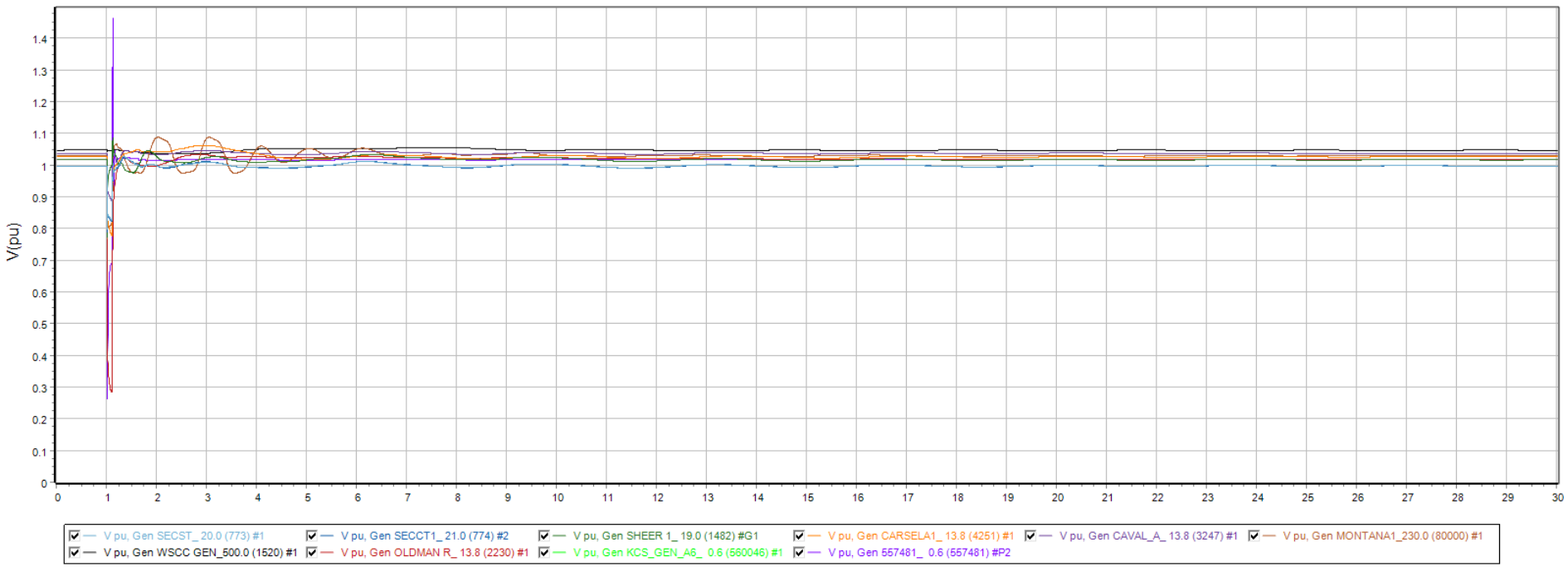
Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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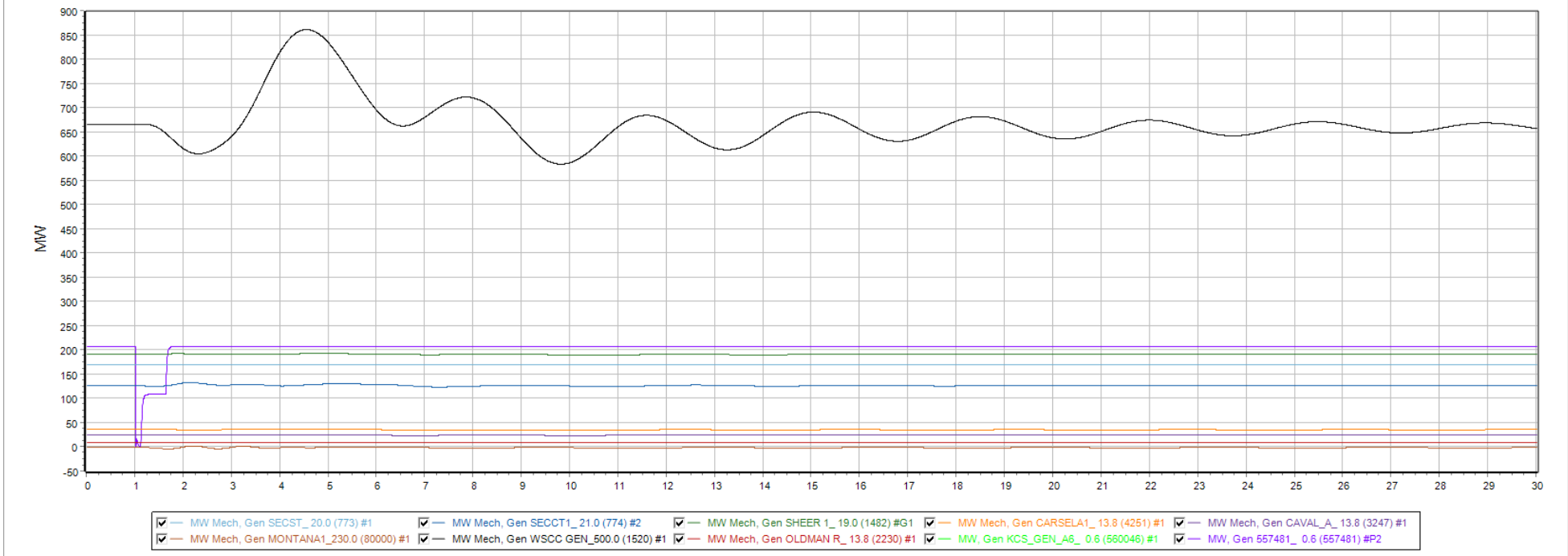
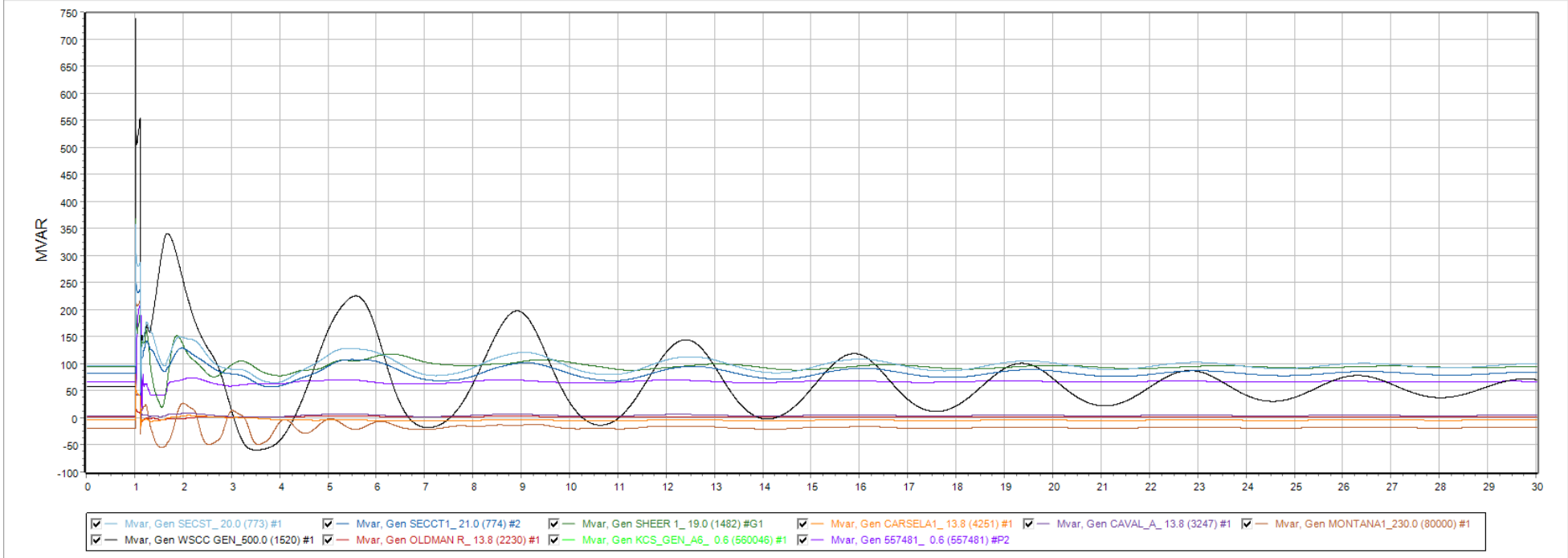
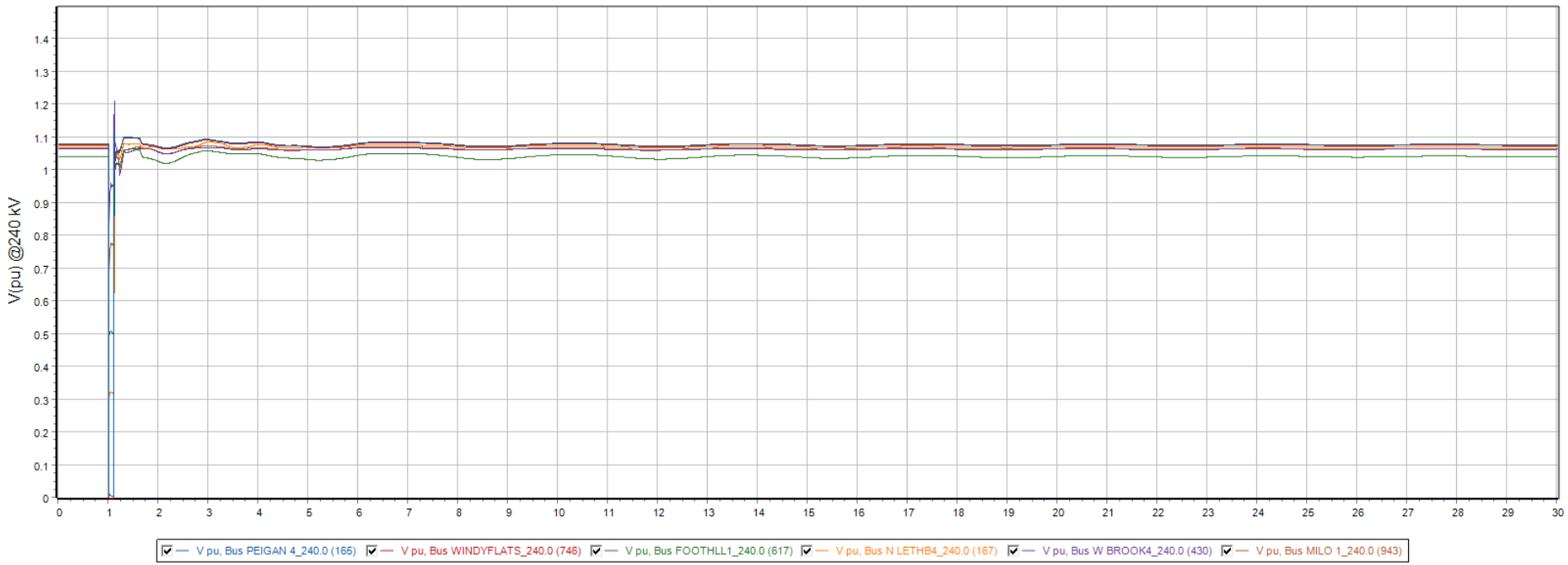
May 16, 2023 20:57:23

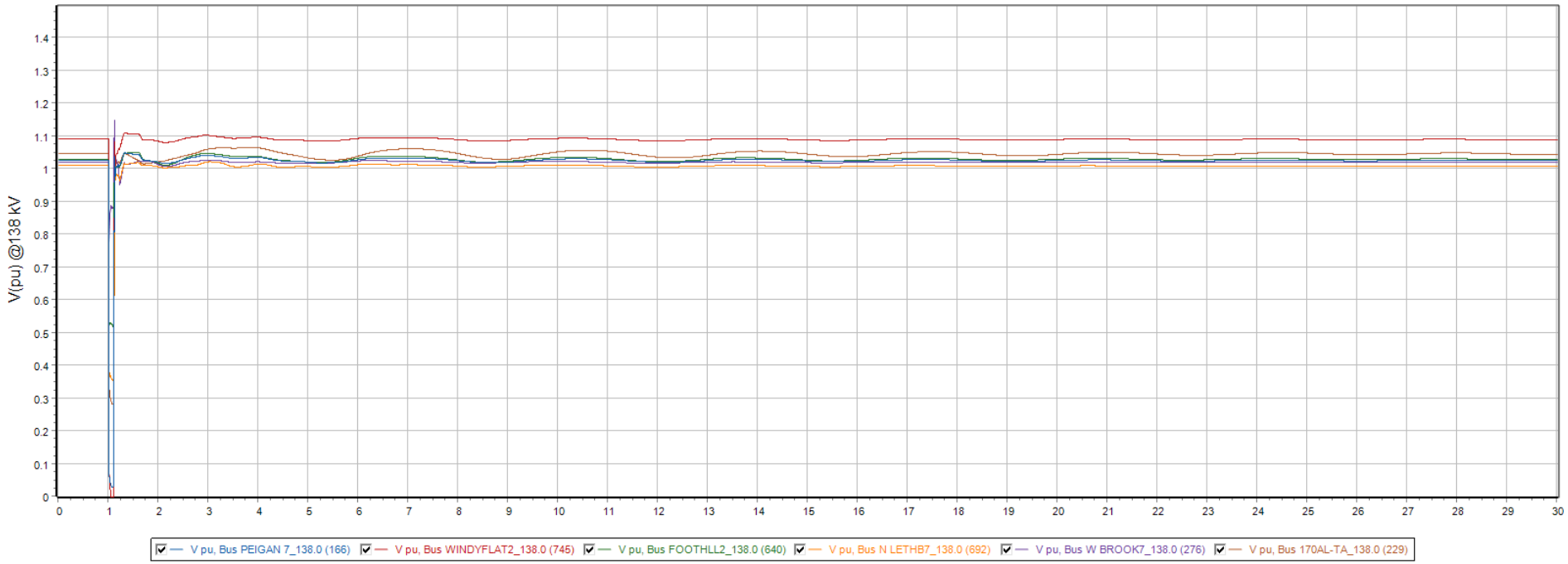
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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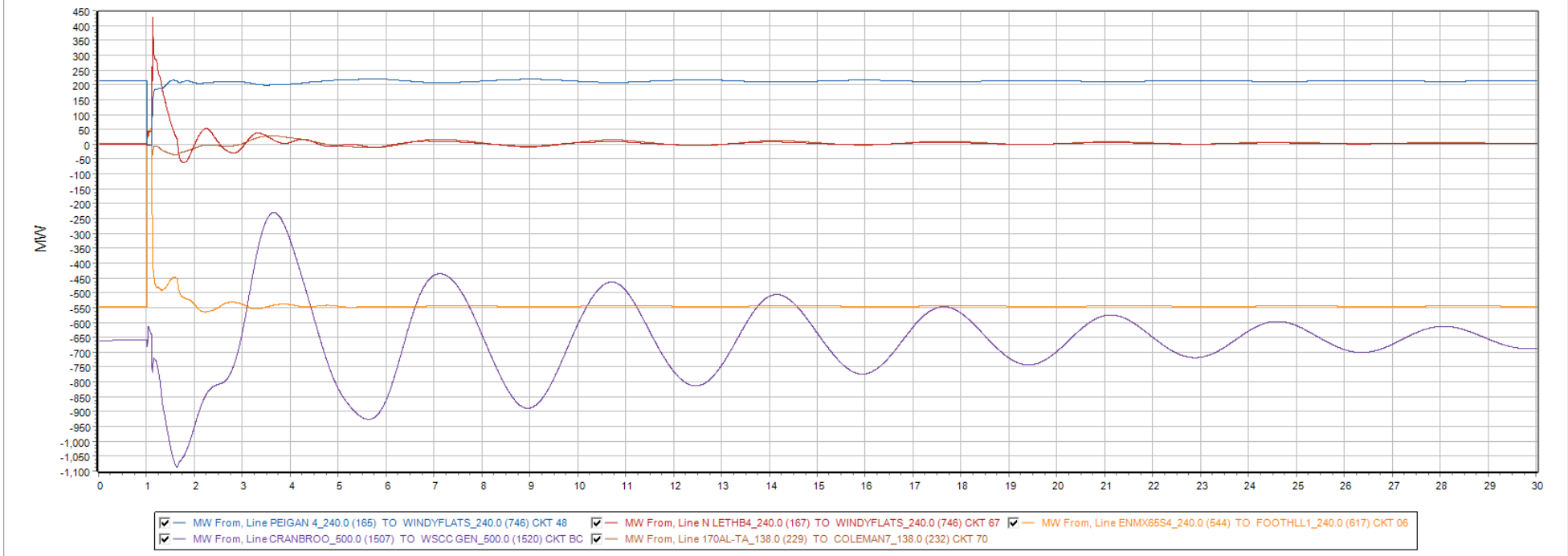
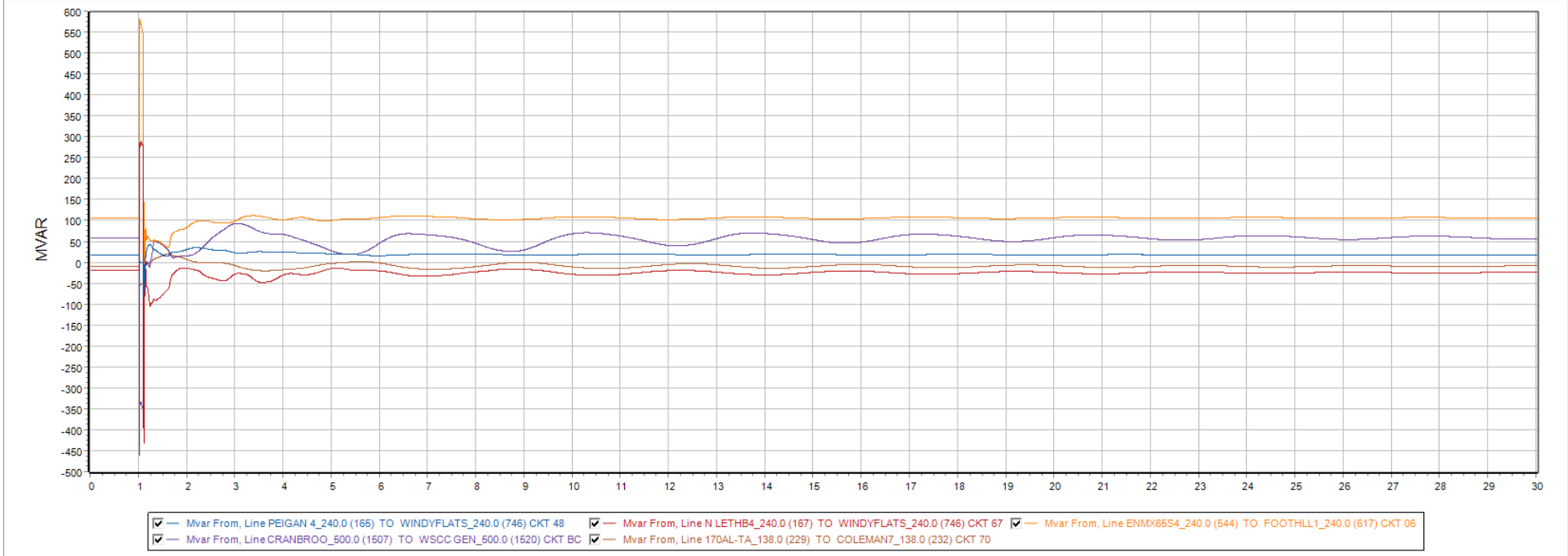
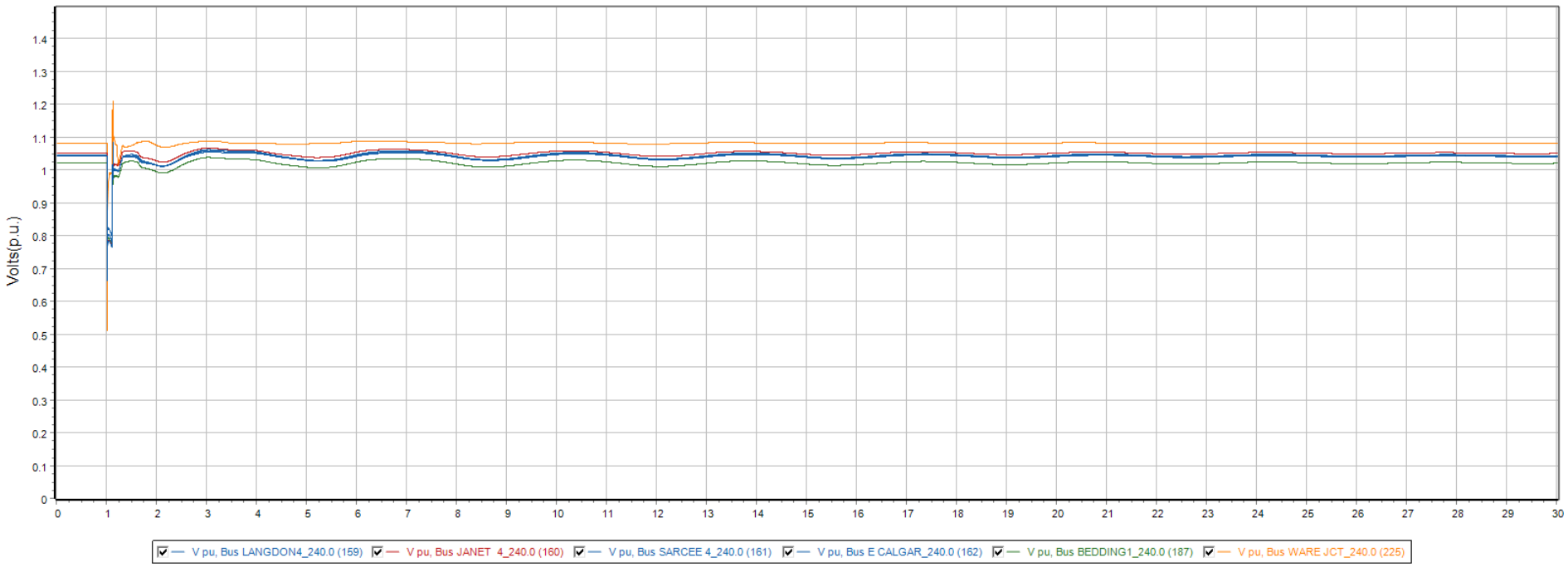
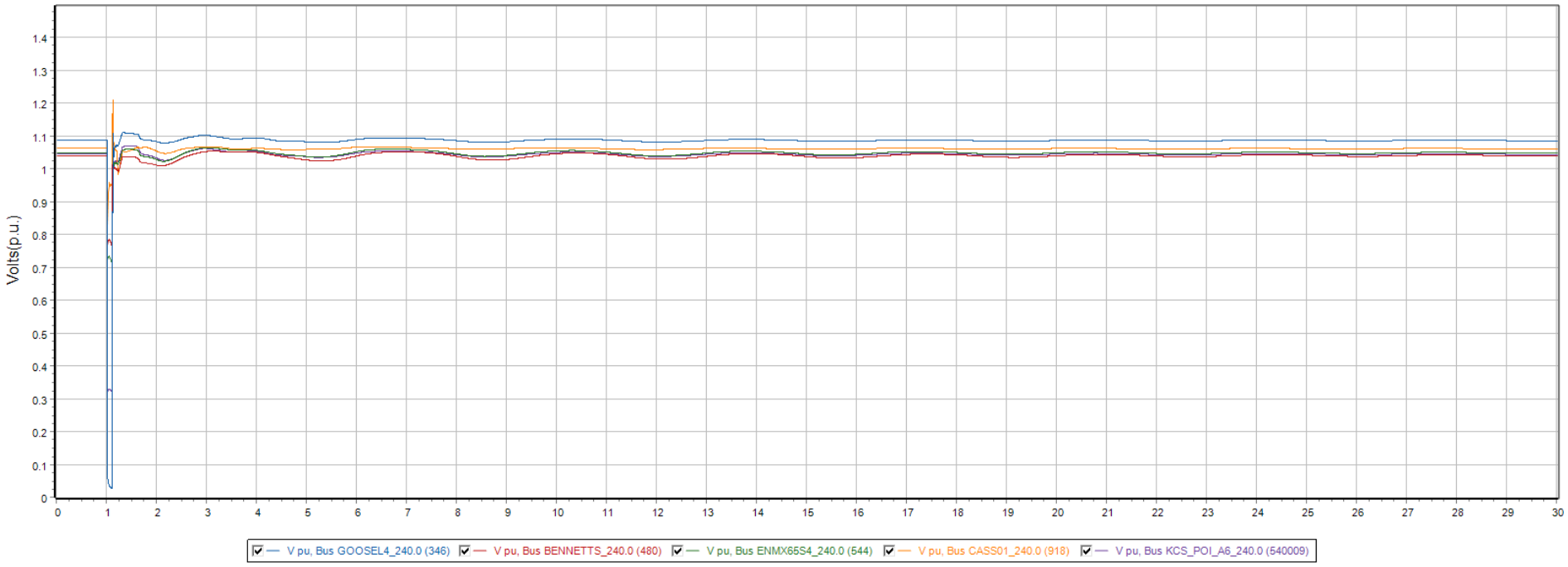
Monitor Line MW & MVAR. Q4



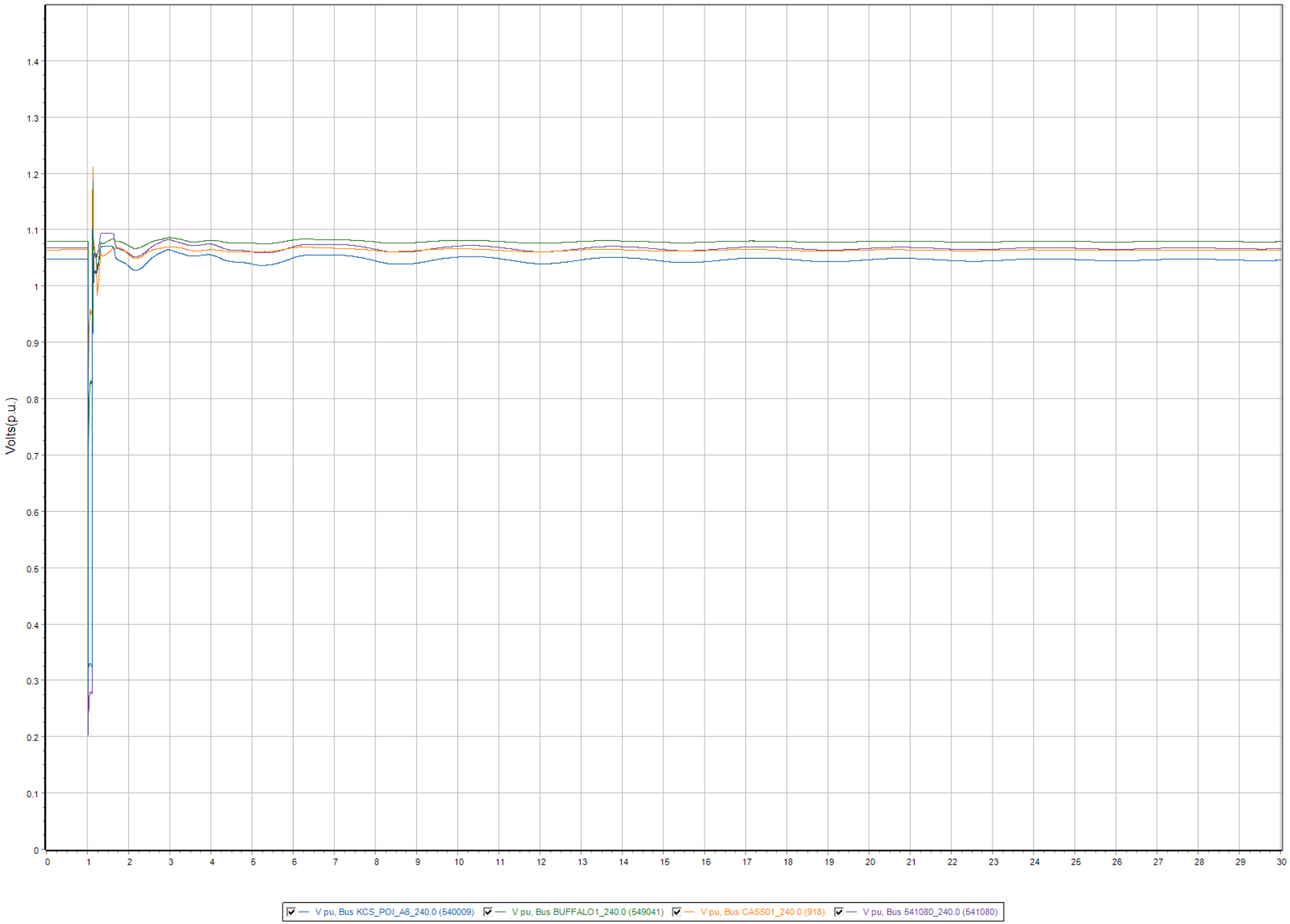


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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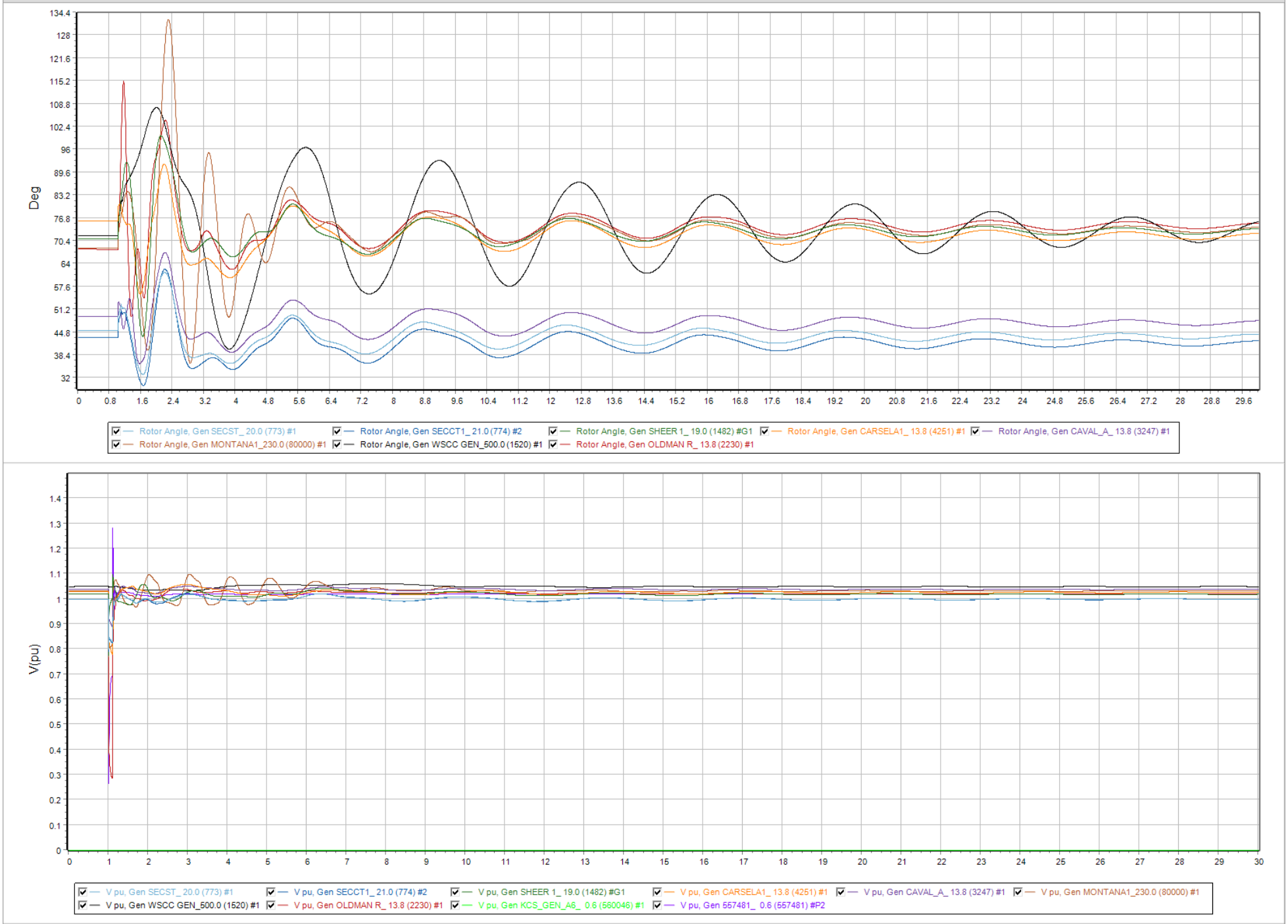
May 16, 2023 20:57:25

Monitor Gens. Q1



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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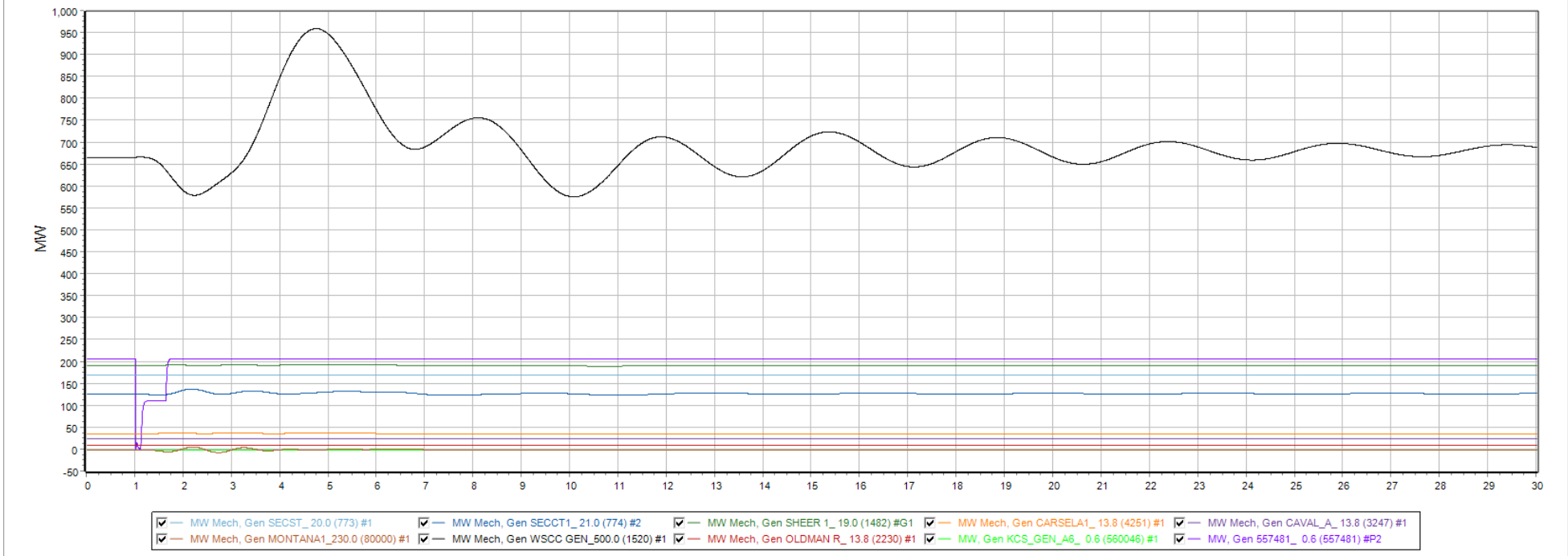
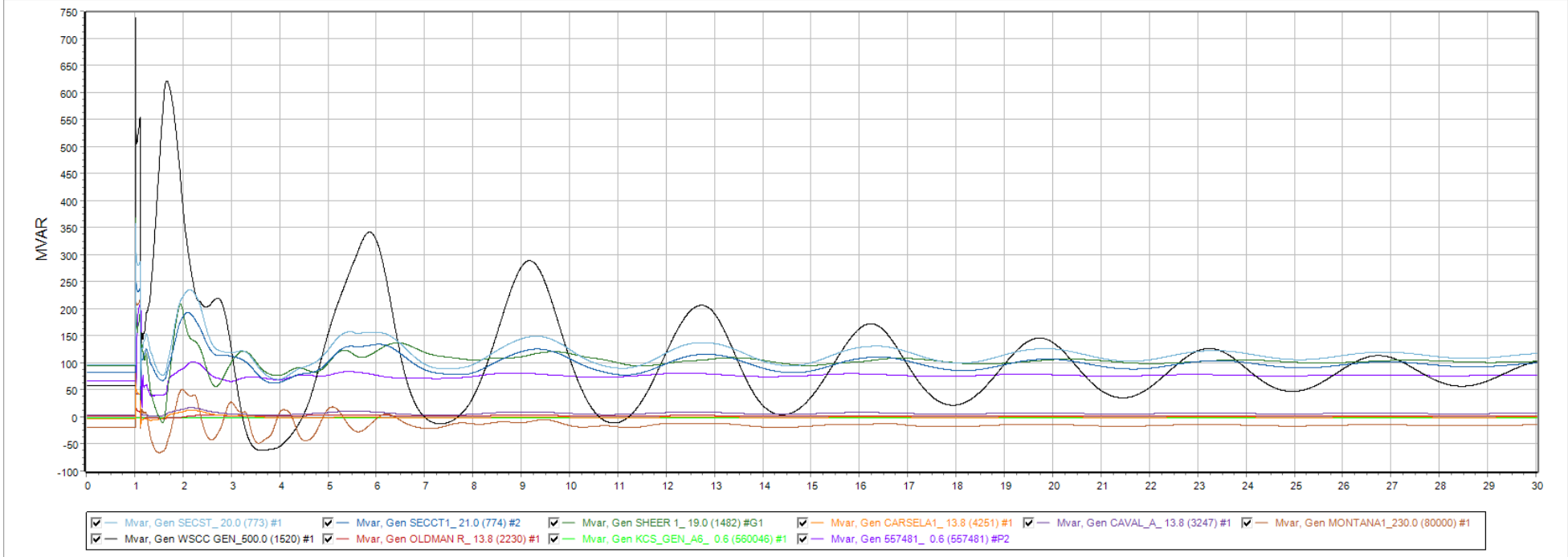
Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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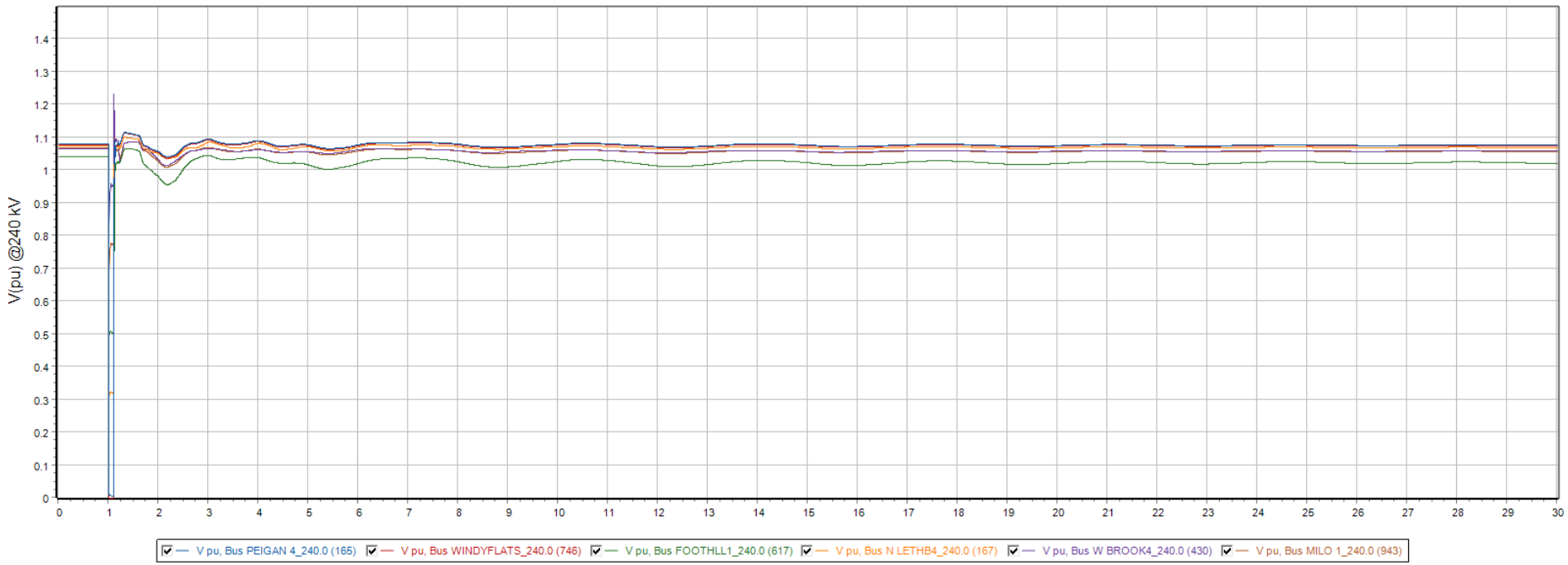
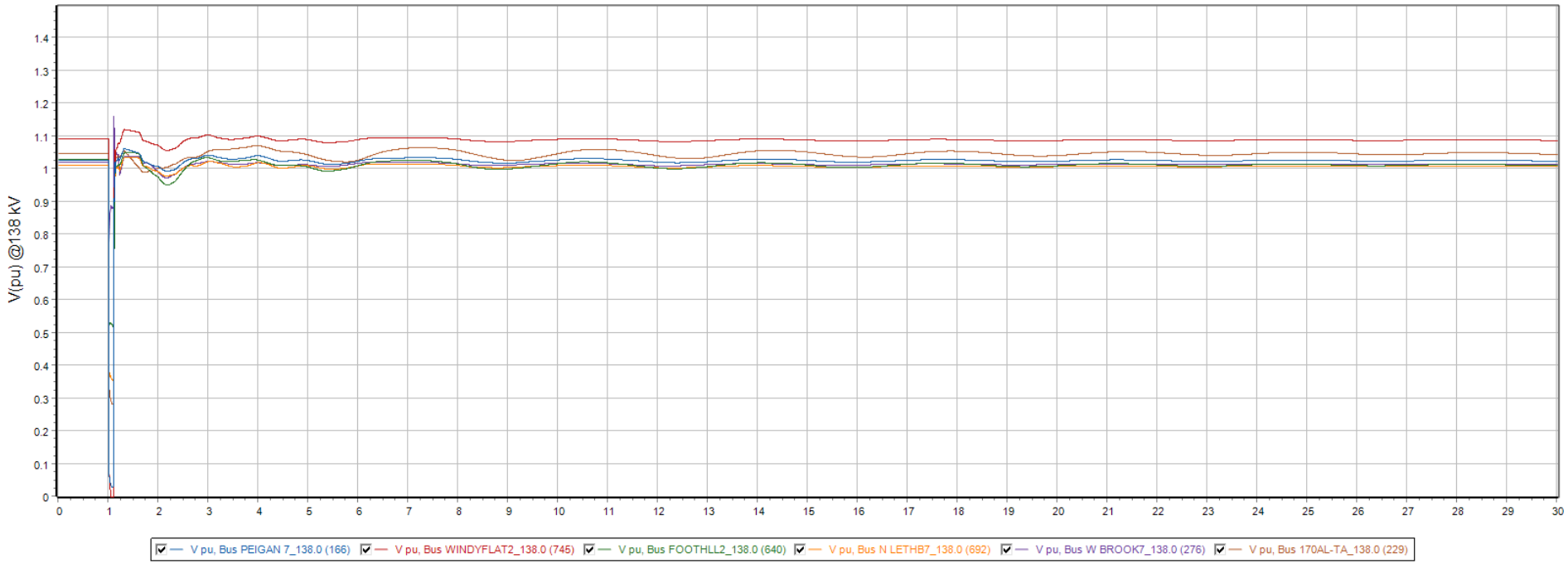
May 16, 2023 23:17:40

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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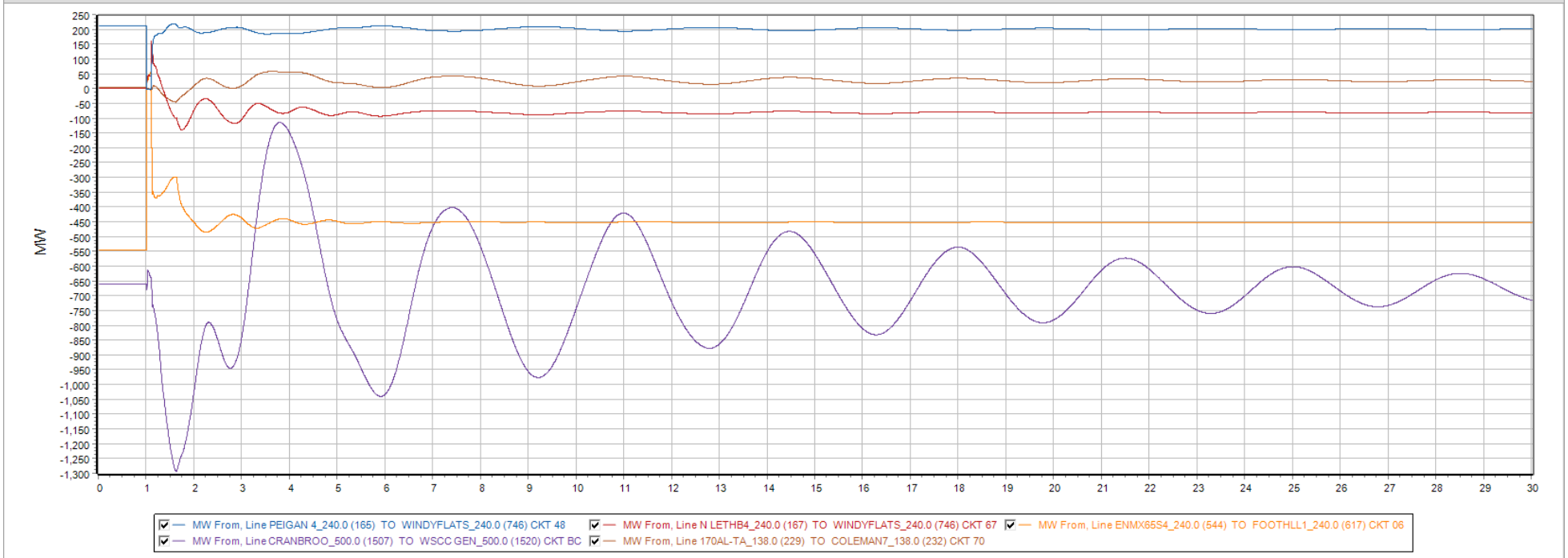
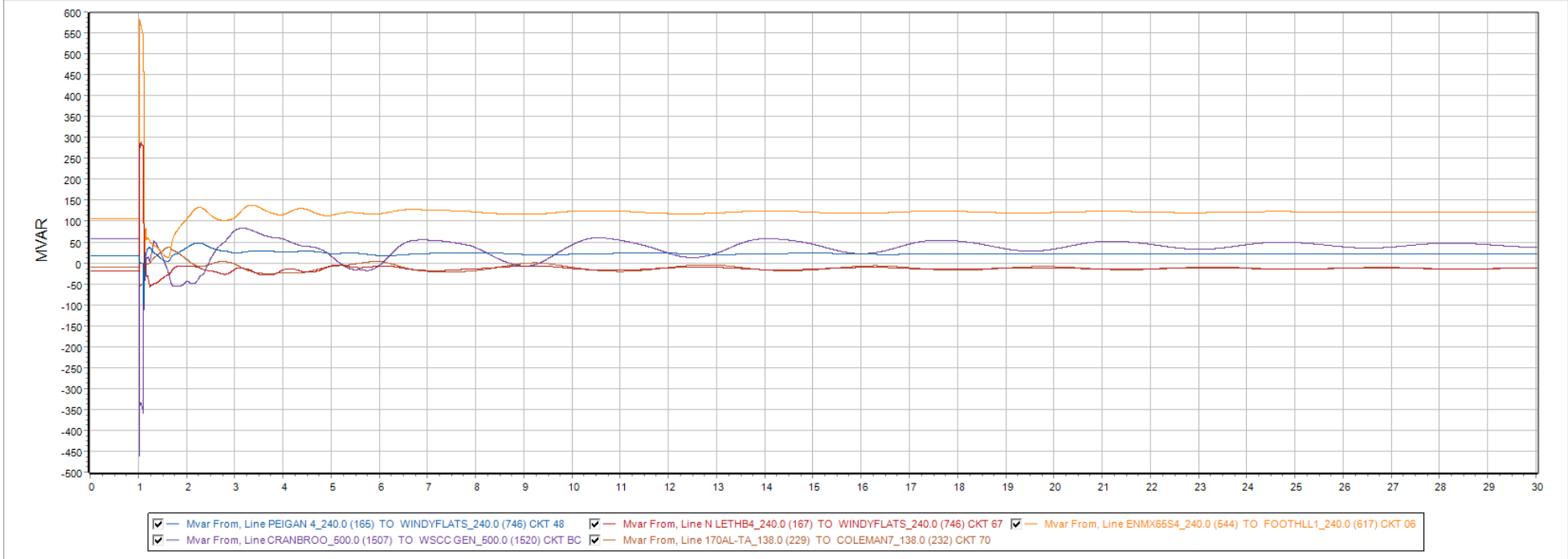
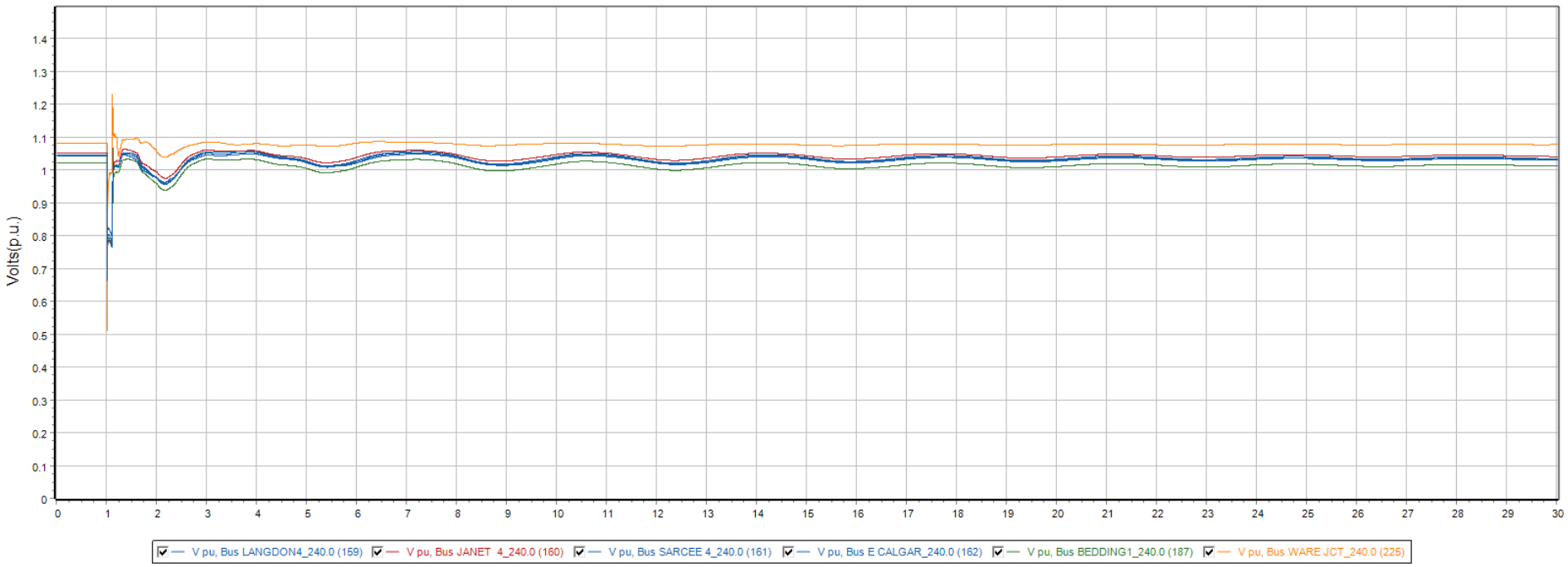
May 16, 2023 23:17:41

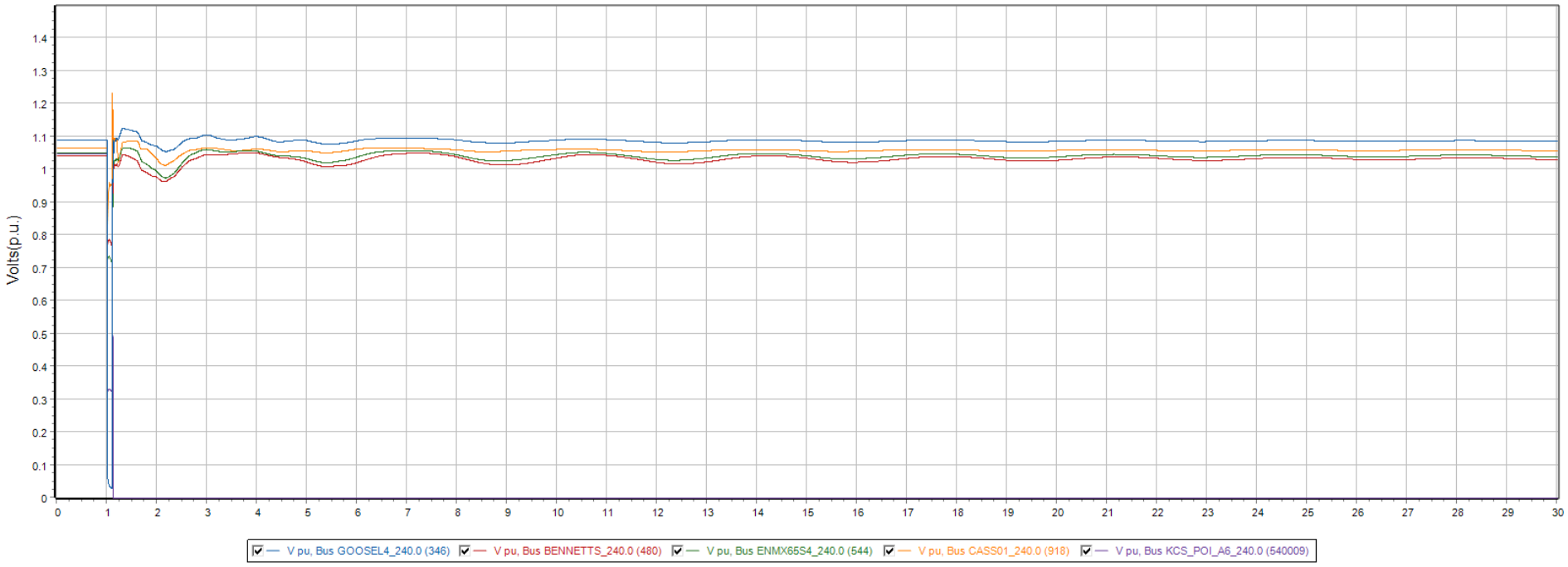
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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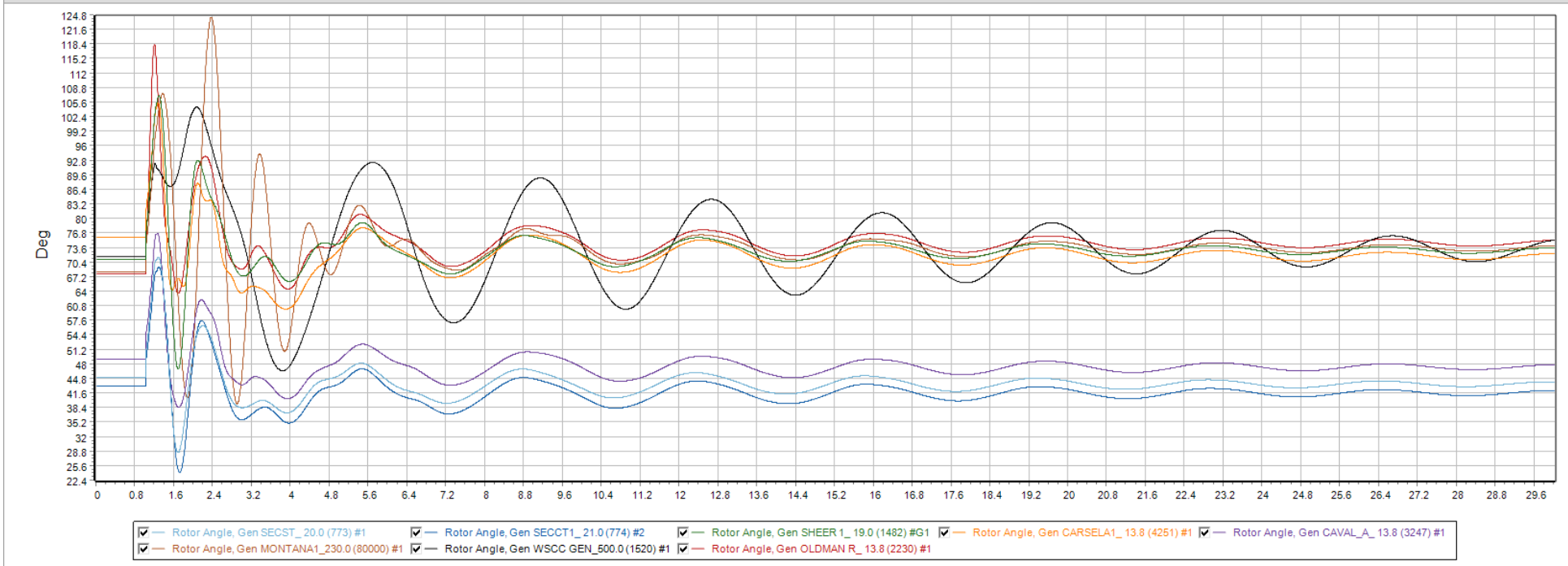
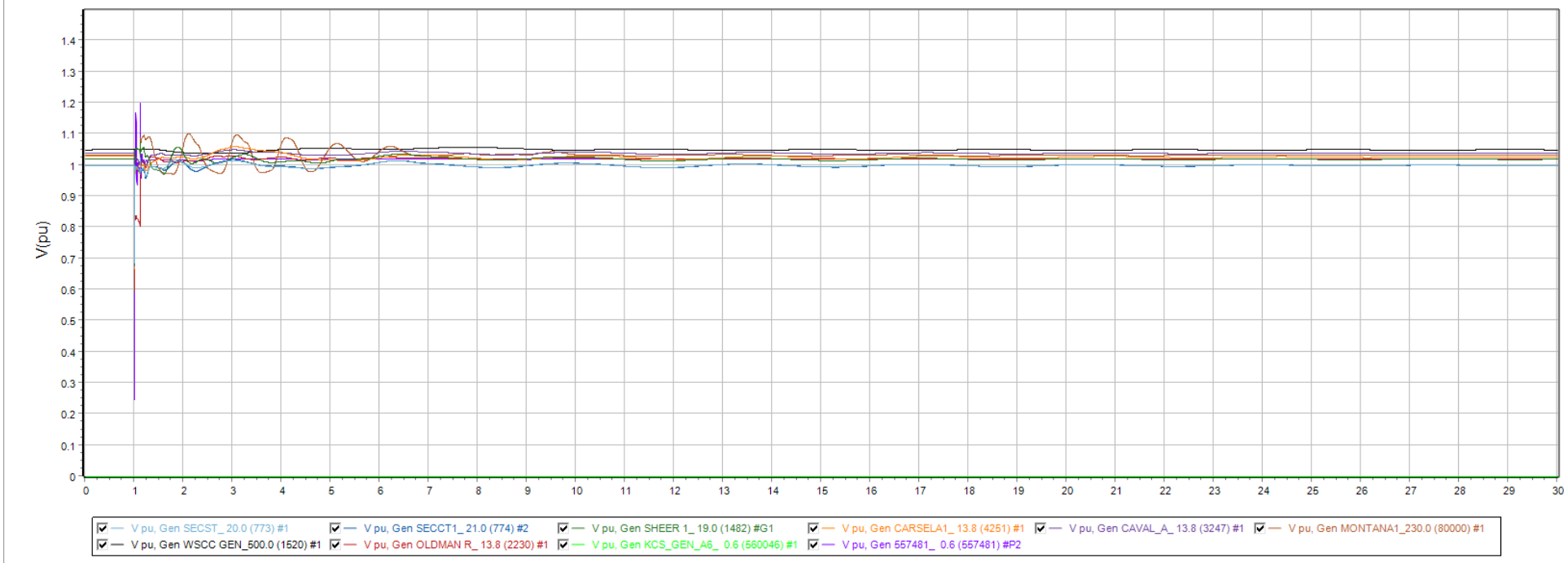
Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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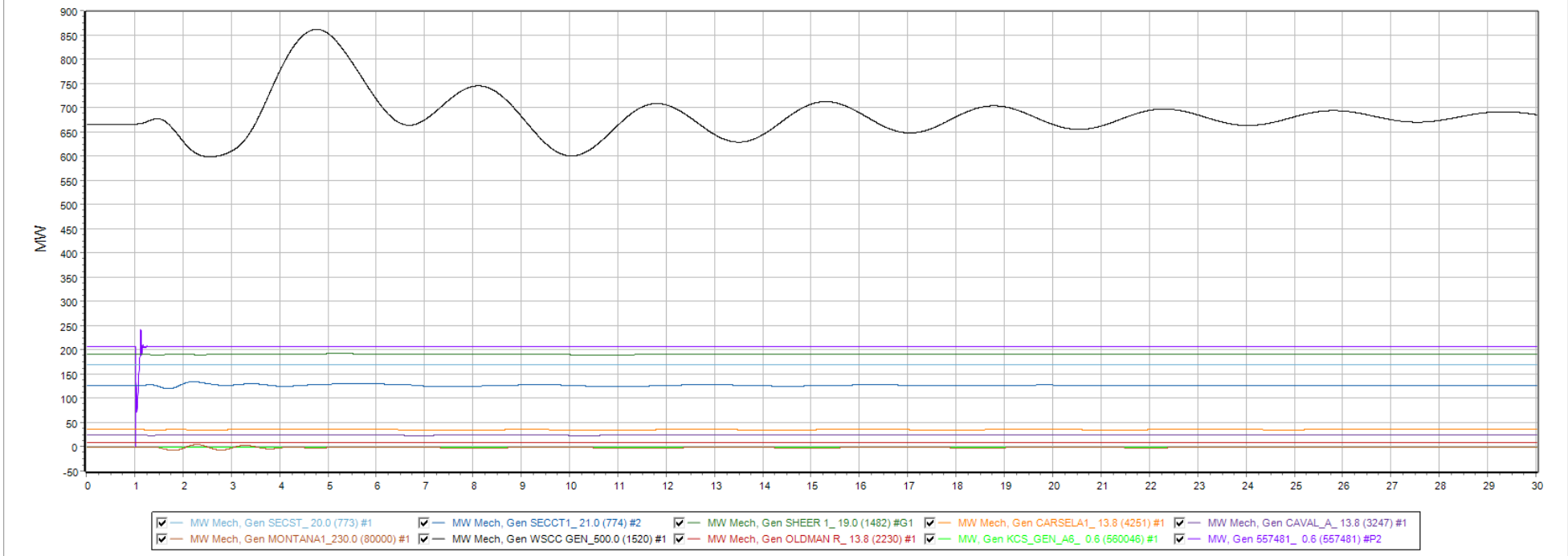
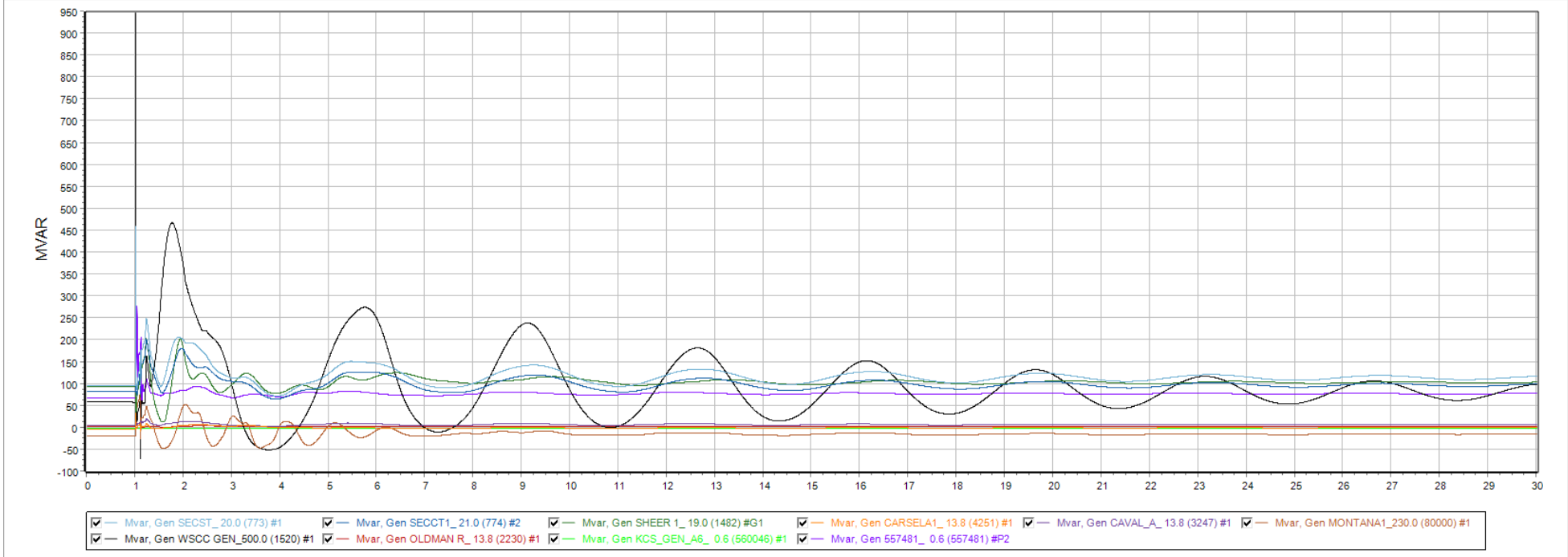
May 16, 2023 23:25:20

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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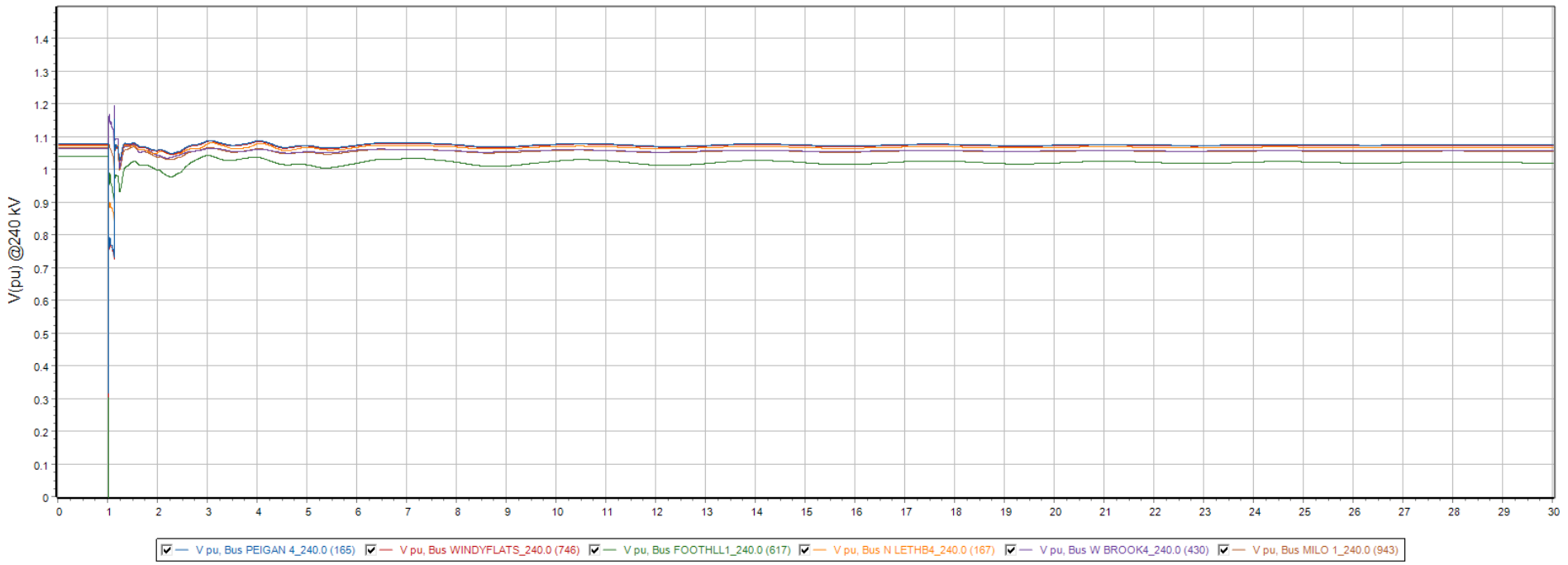
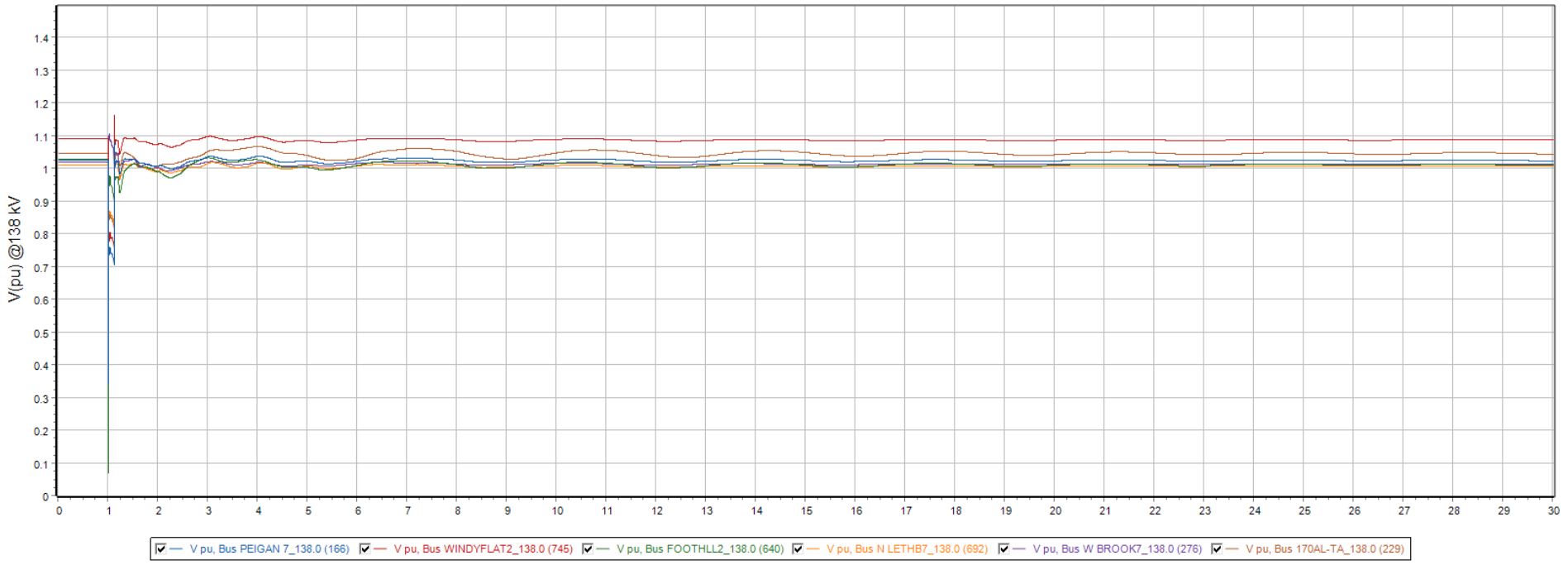
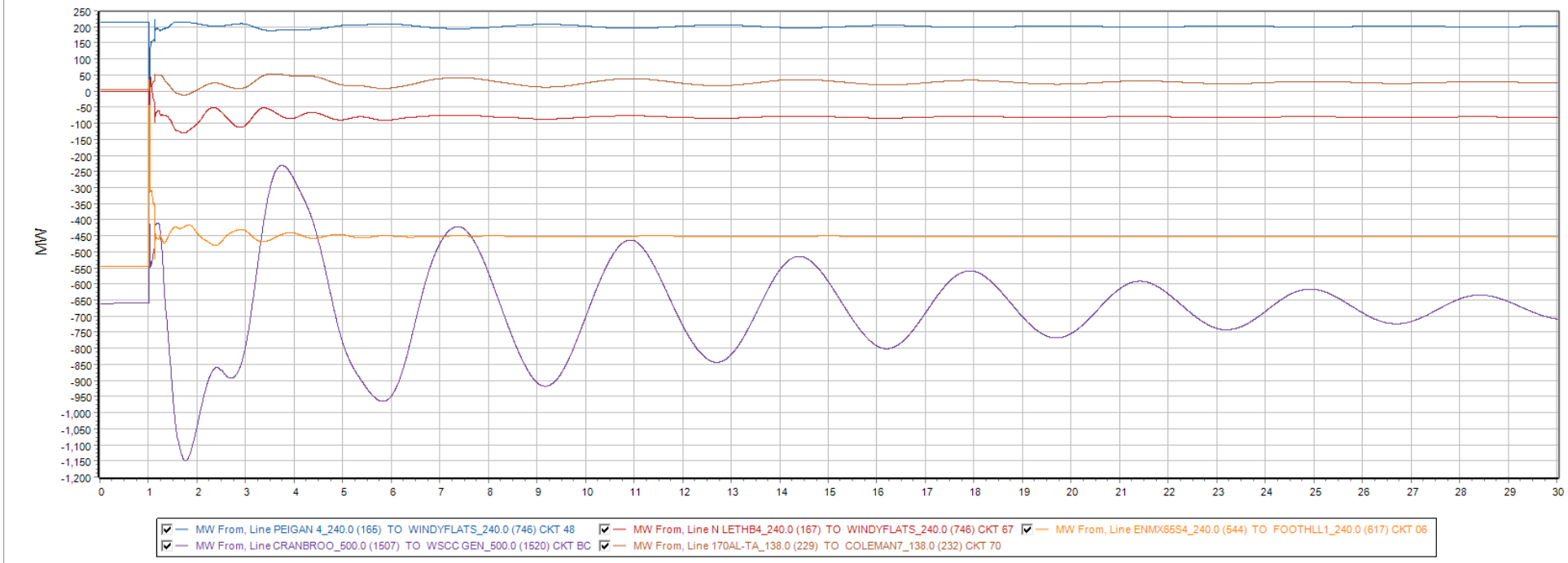
May 16, 2023 23:25:21

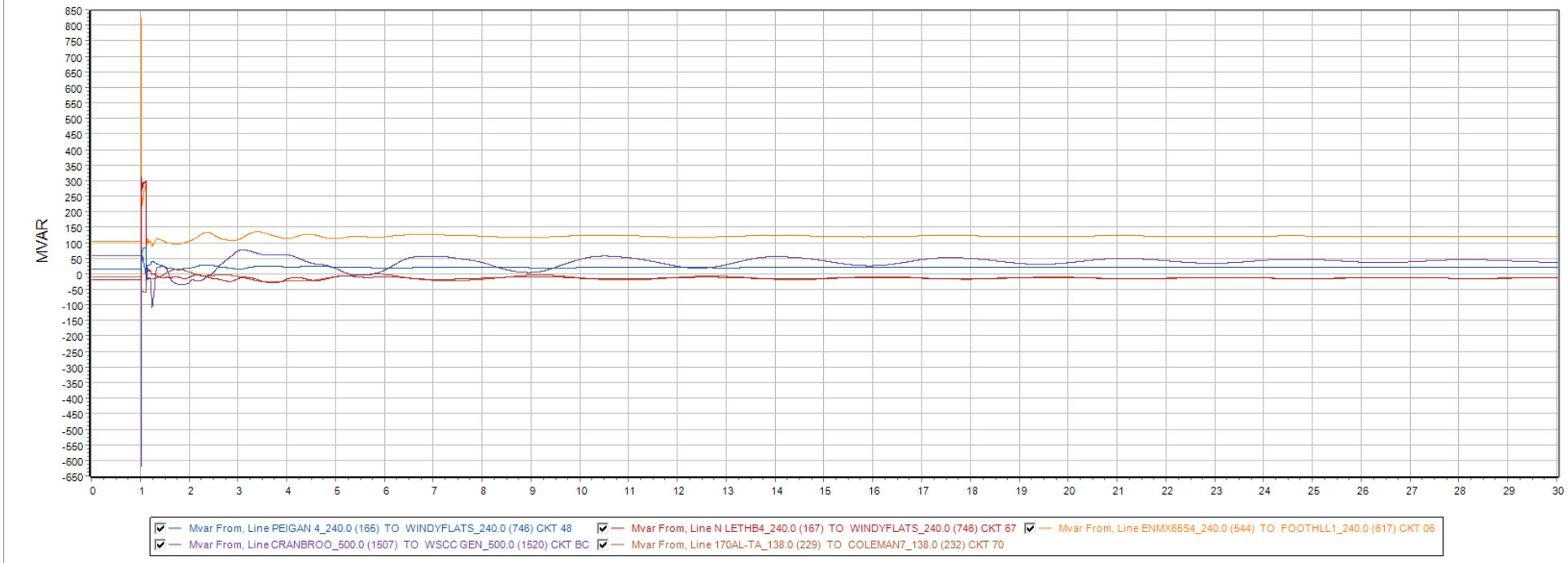
Monitor Bus Volts Q3



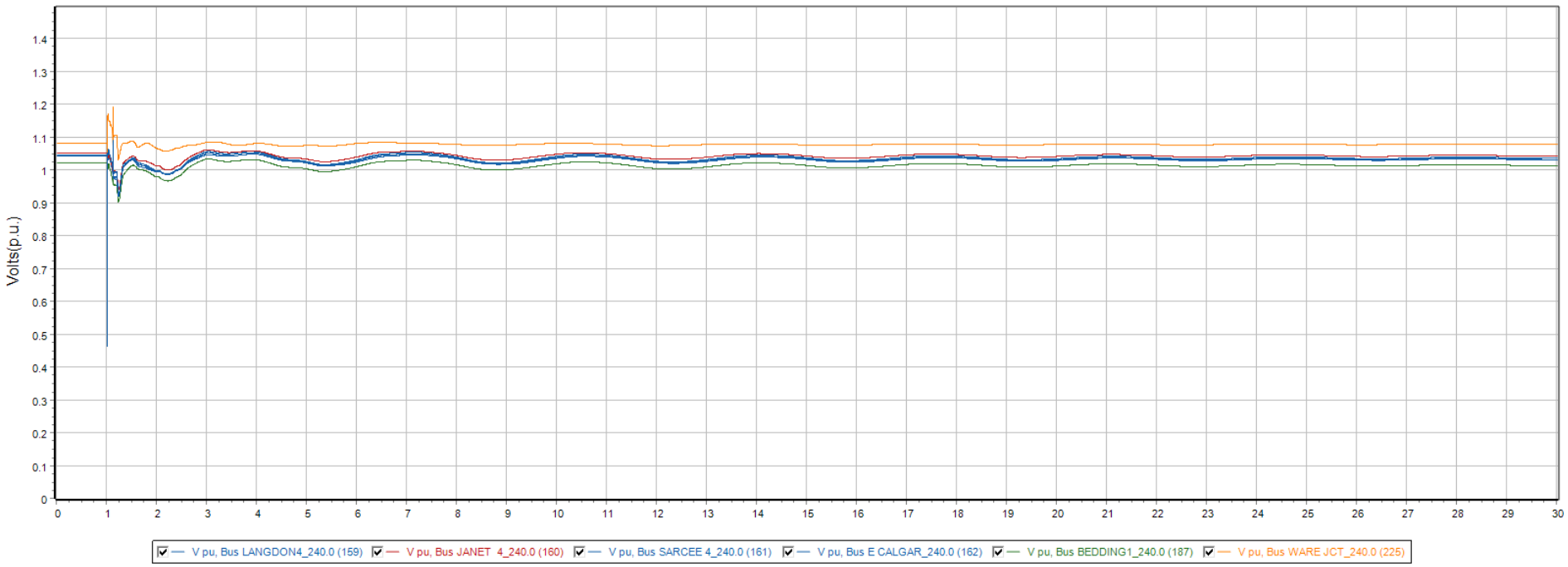


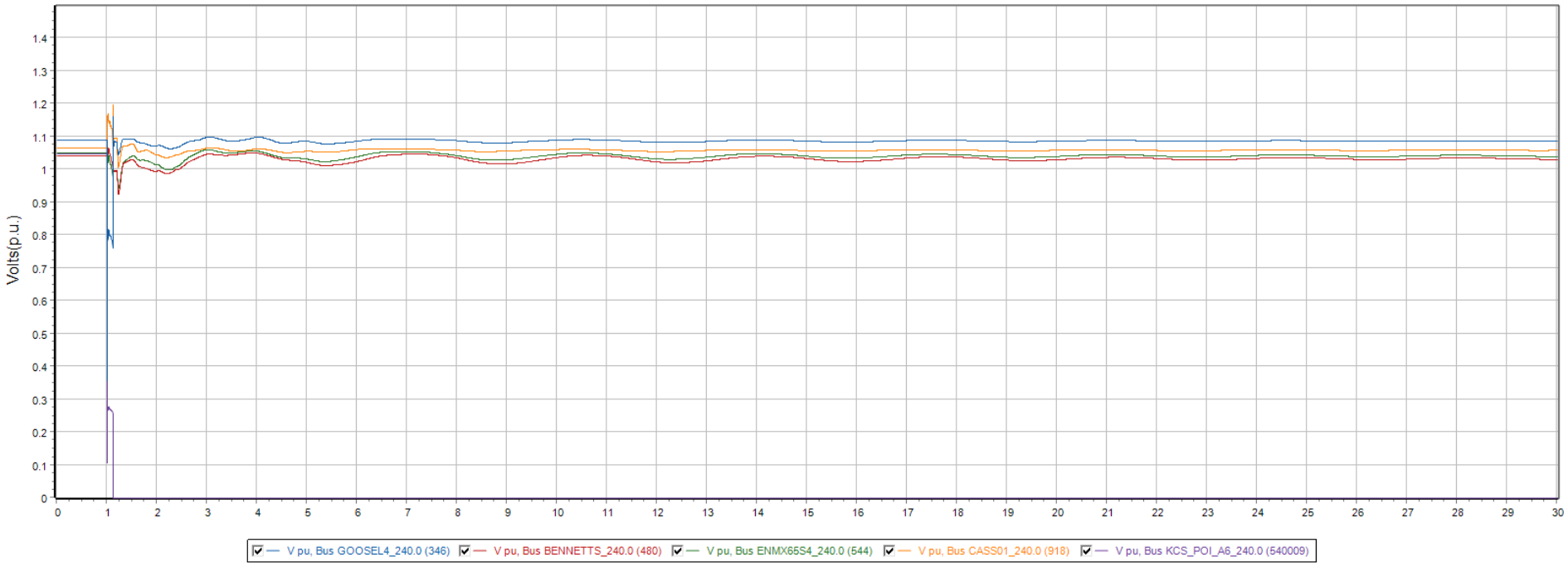
Monitor Line MW & MVAR. Q4



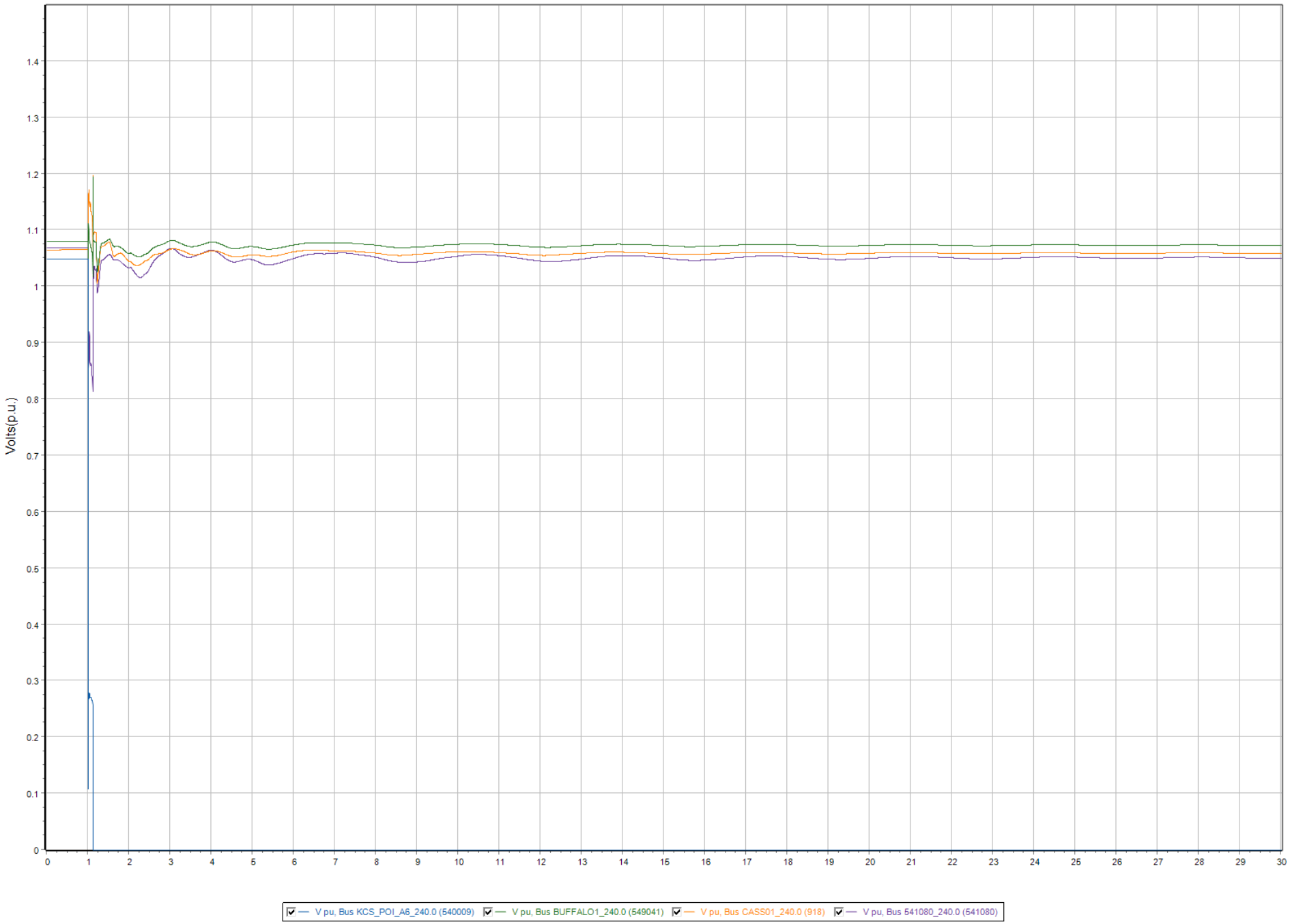


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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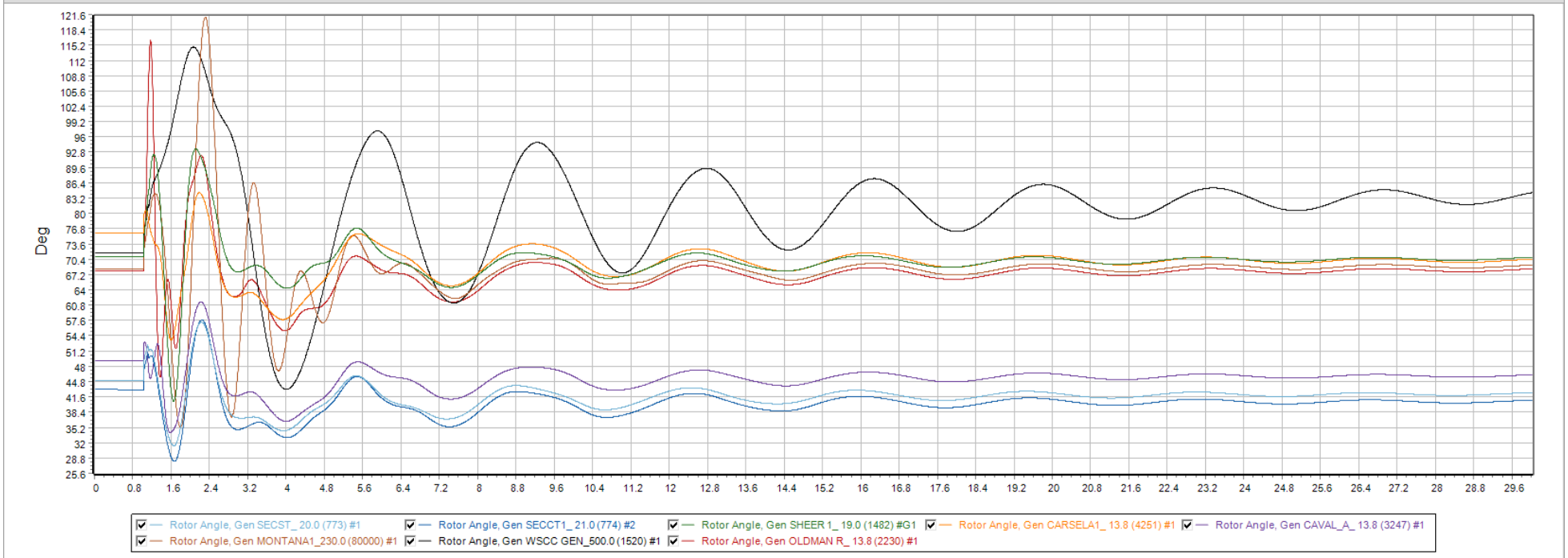
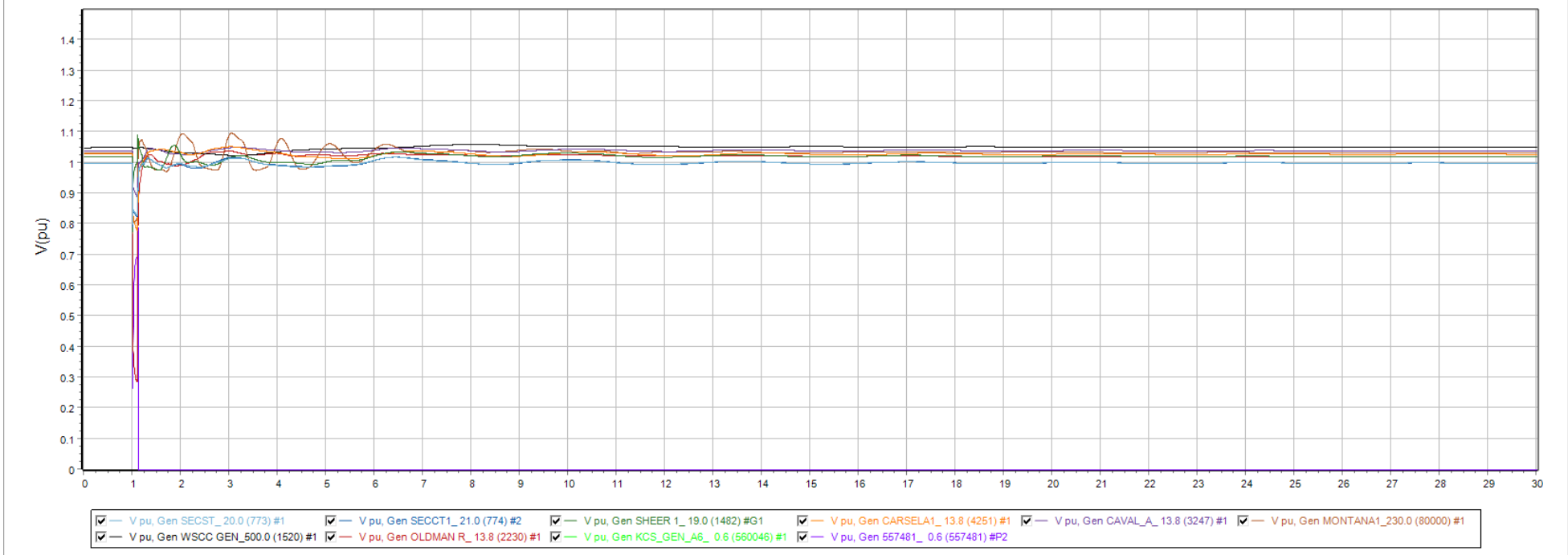
May 16, 2023 23:25:23

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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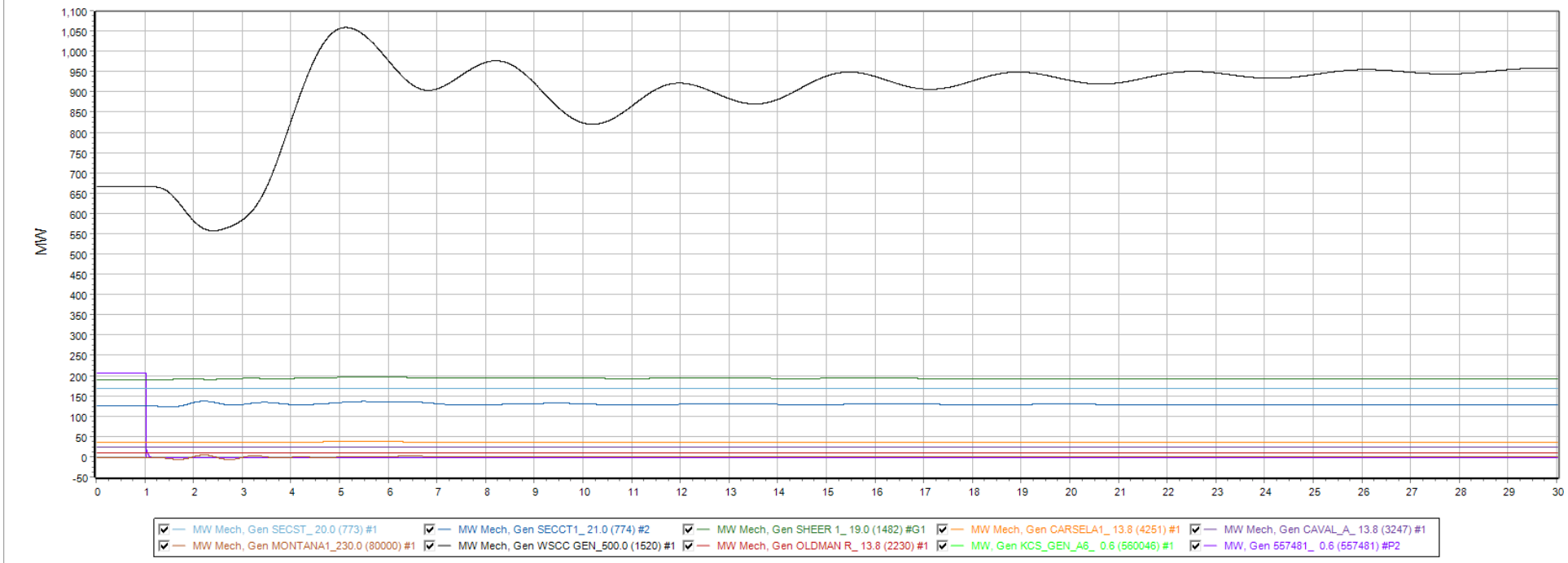
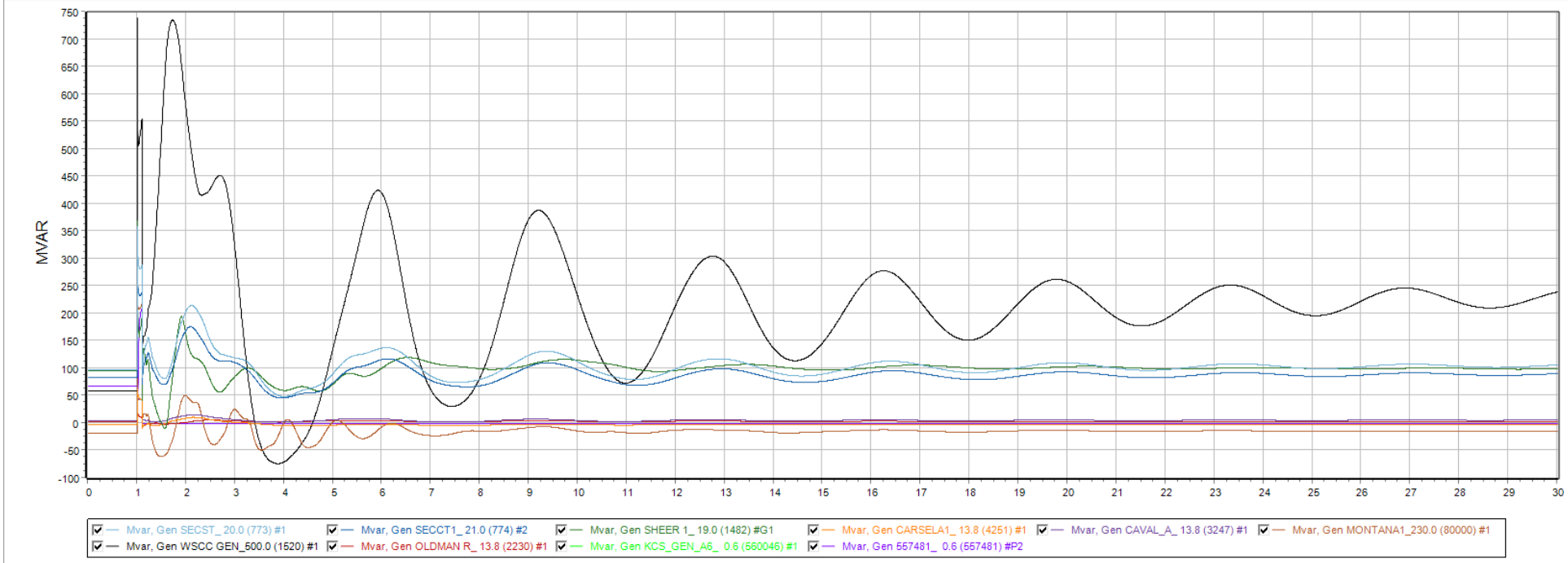
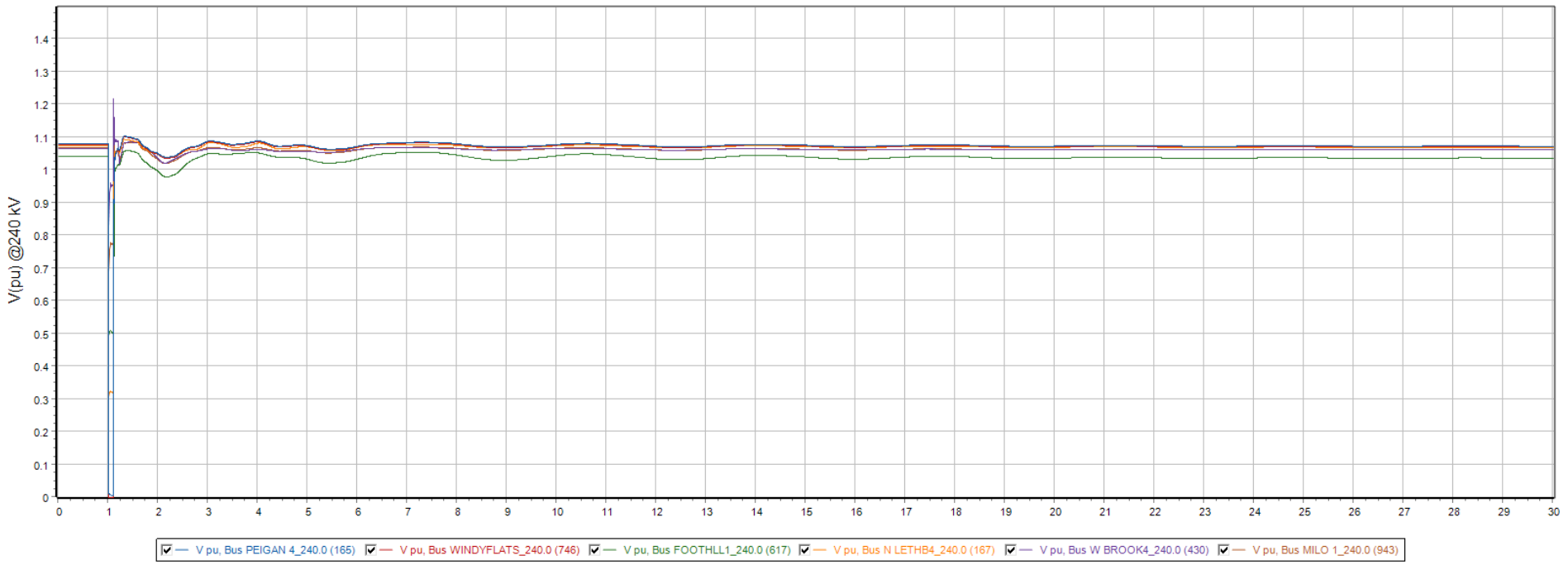
May 16, 2023 21:08:23

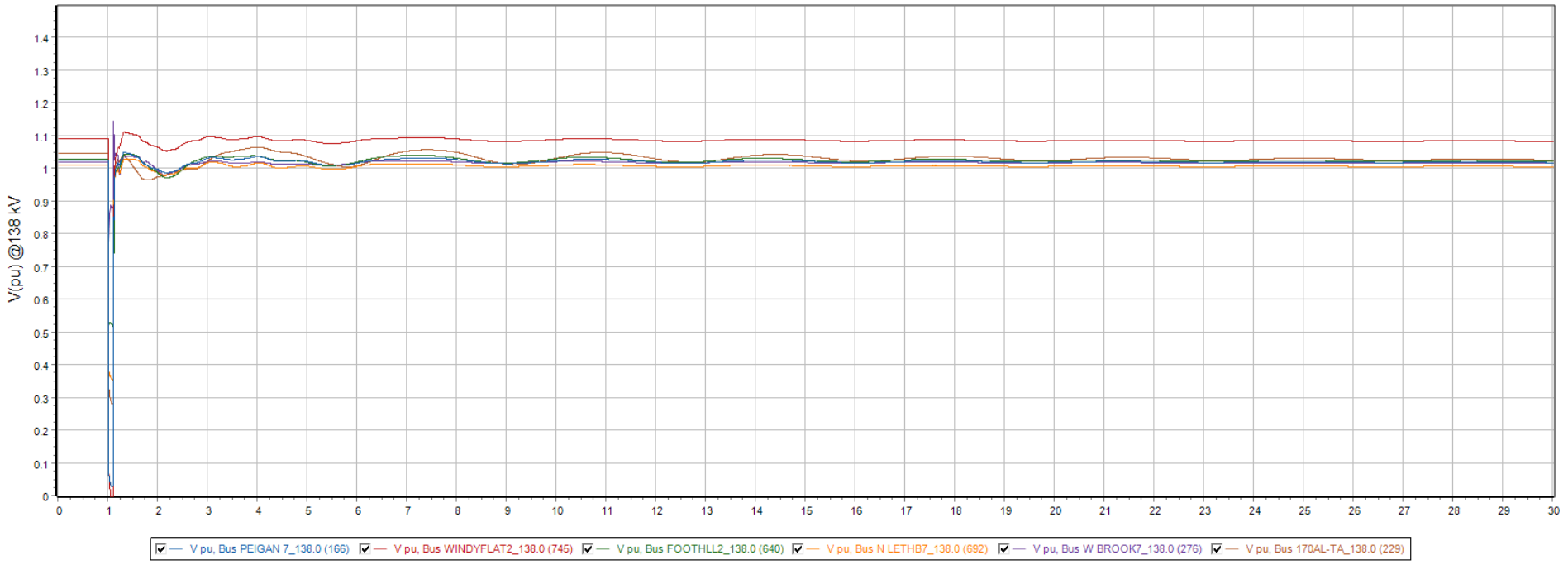
Monitor Gens. Q2



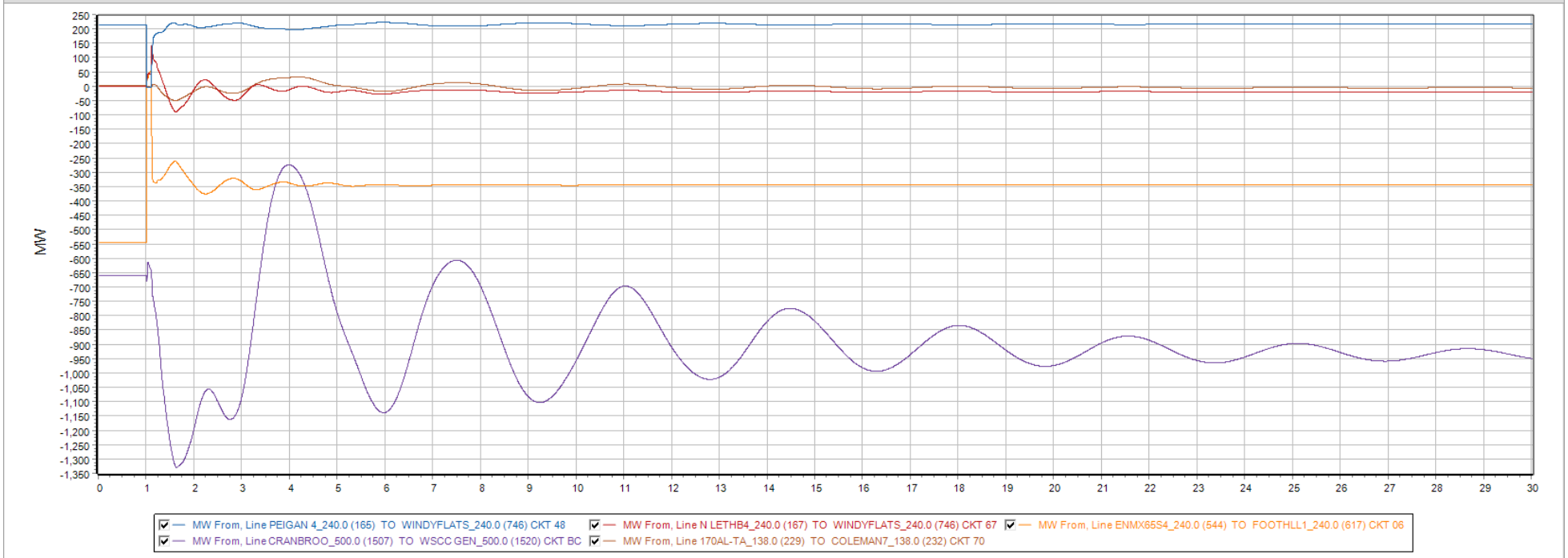


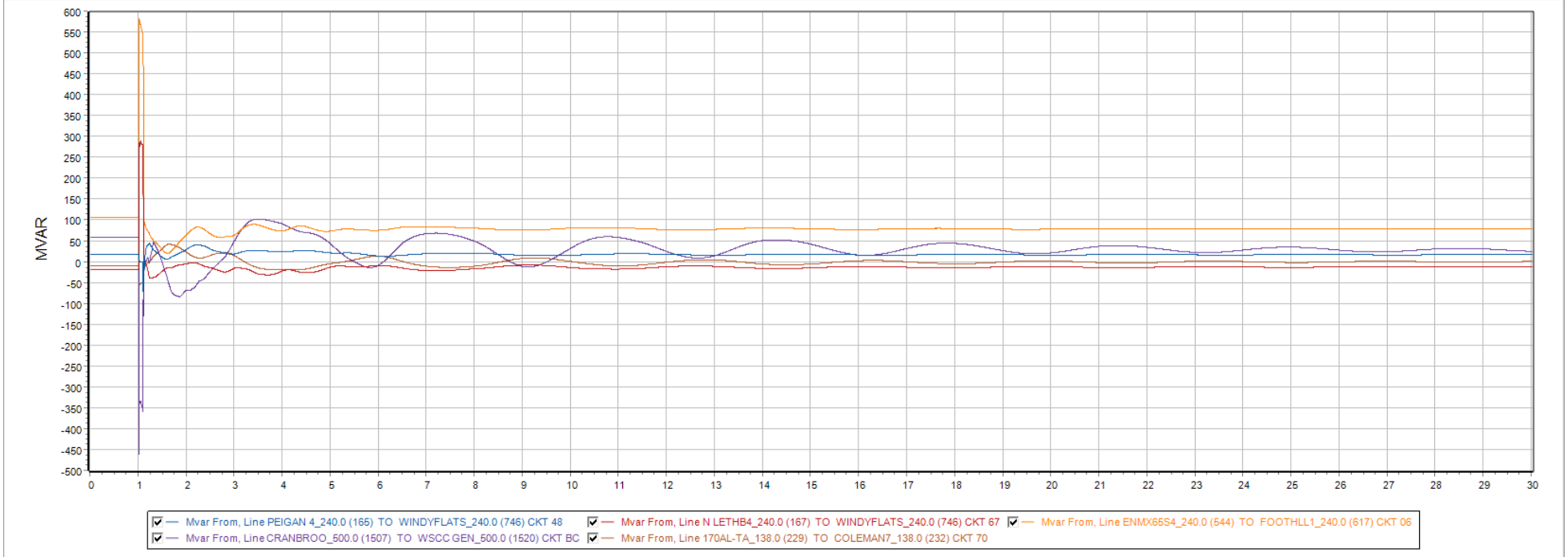
Monitor Bus Volts Q3



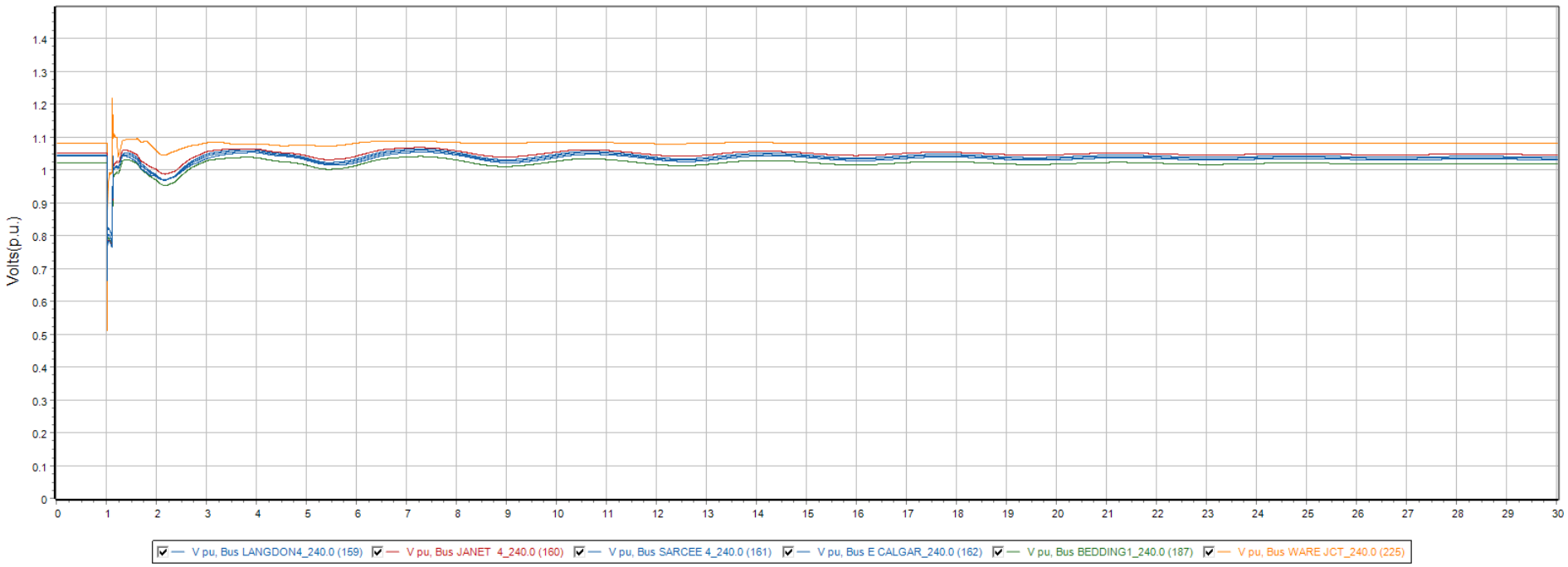


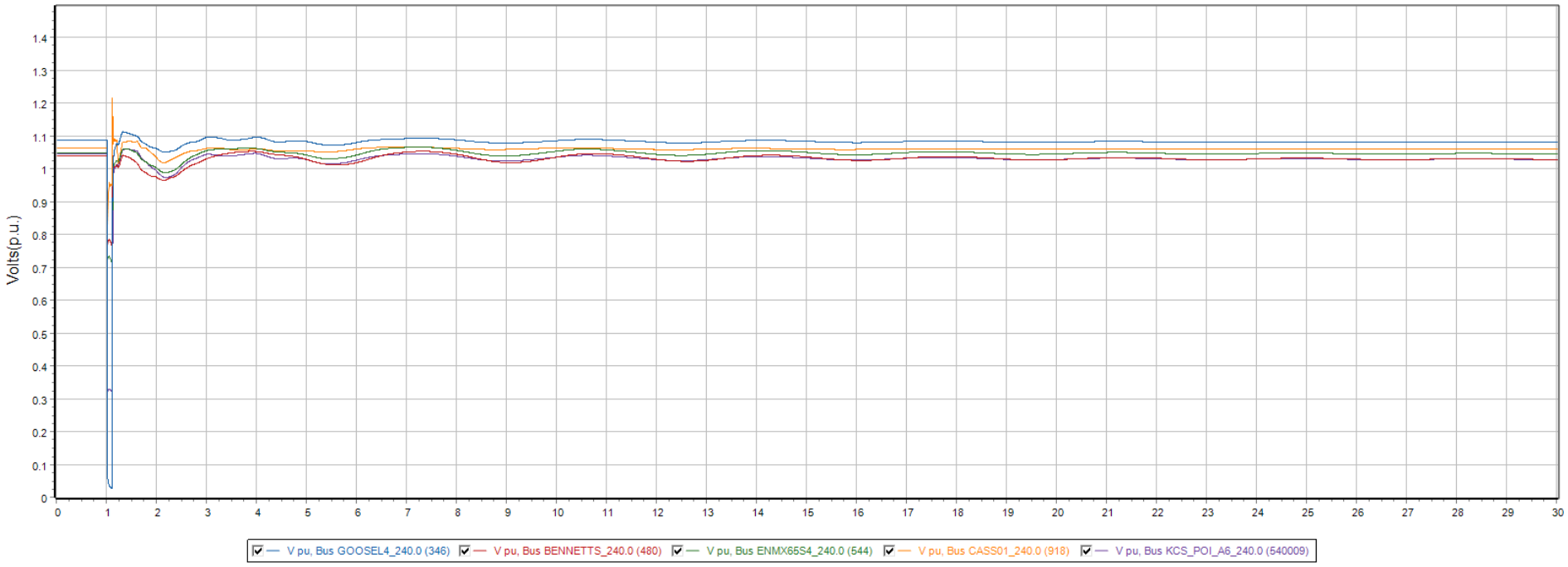
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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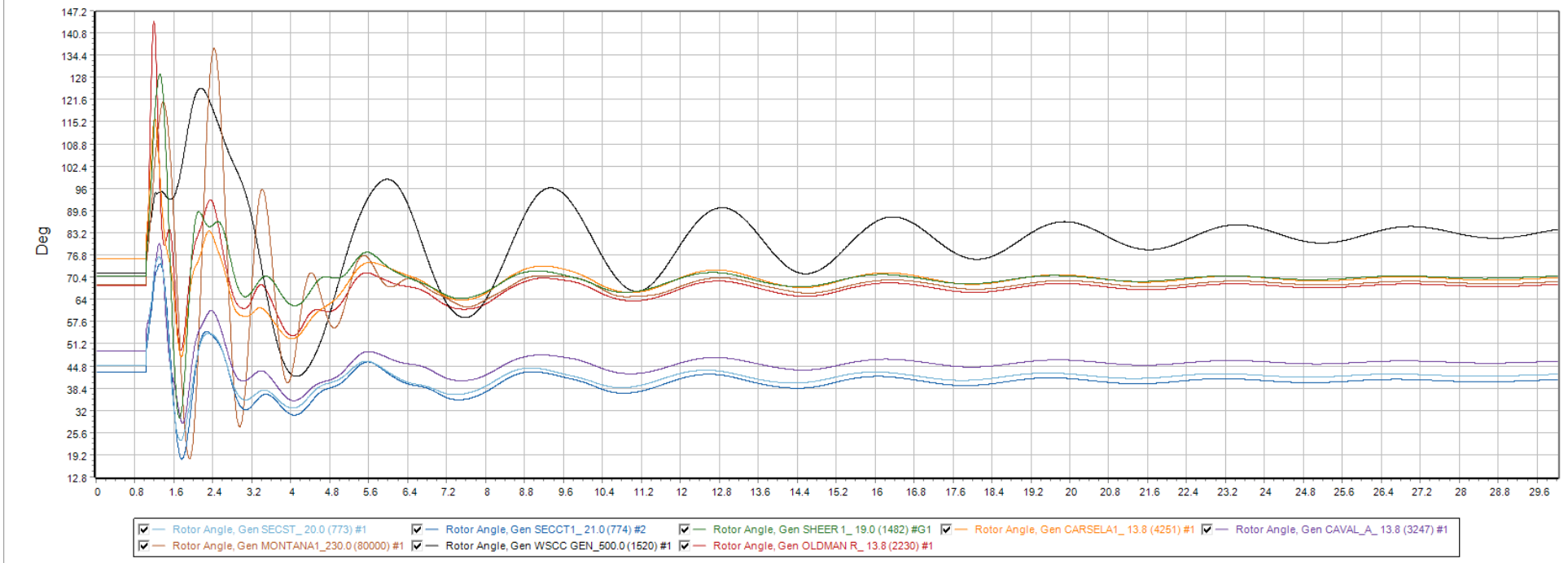
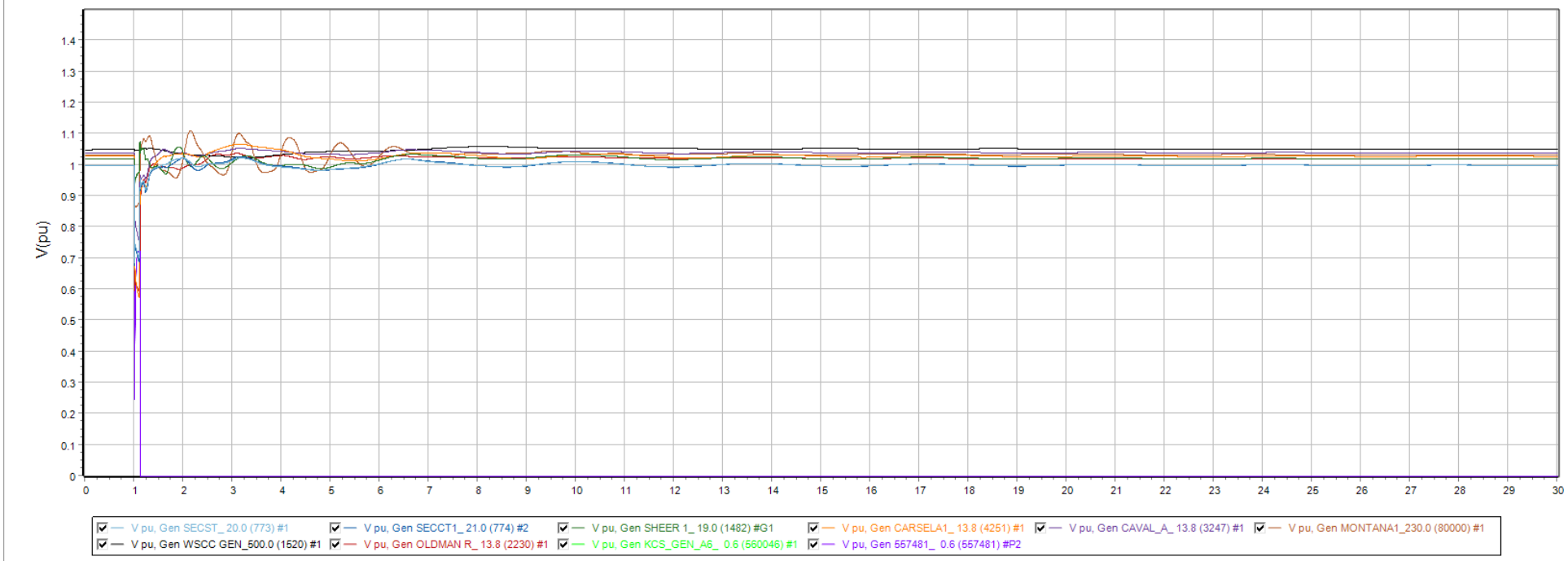
May 16, 2023 21:08:25

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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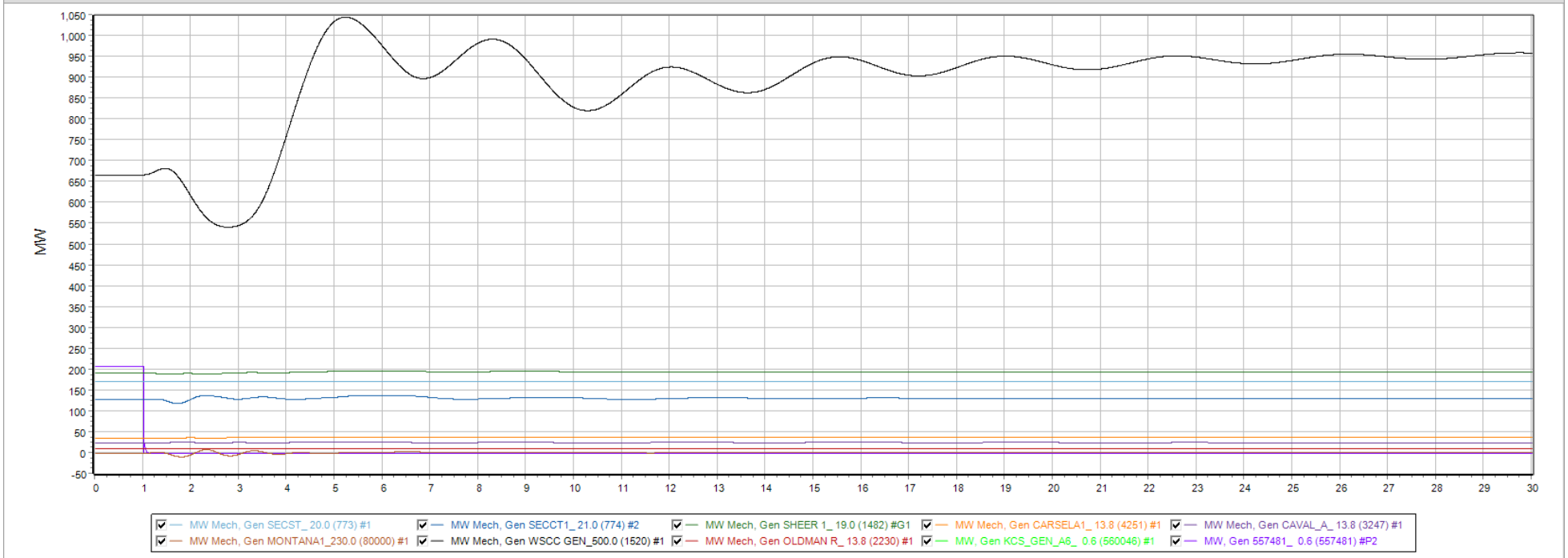
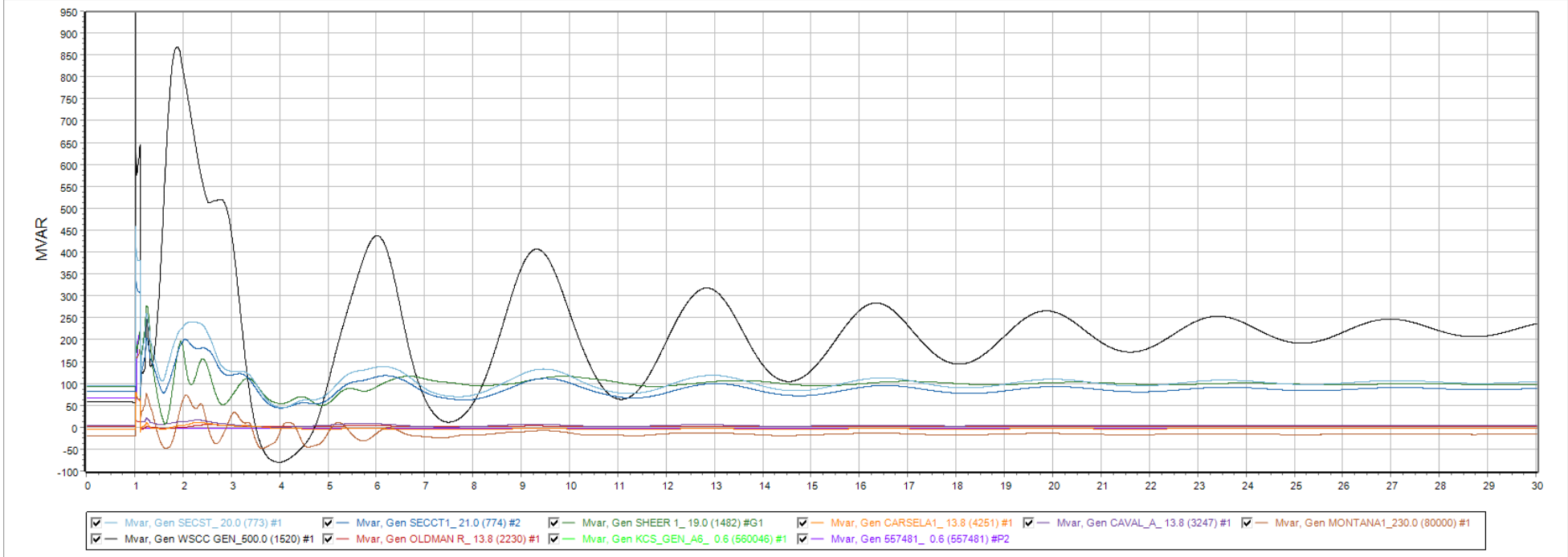
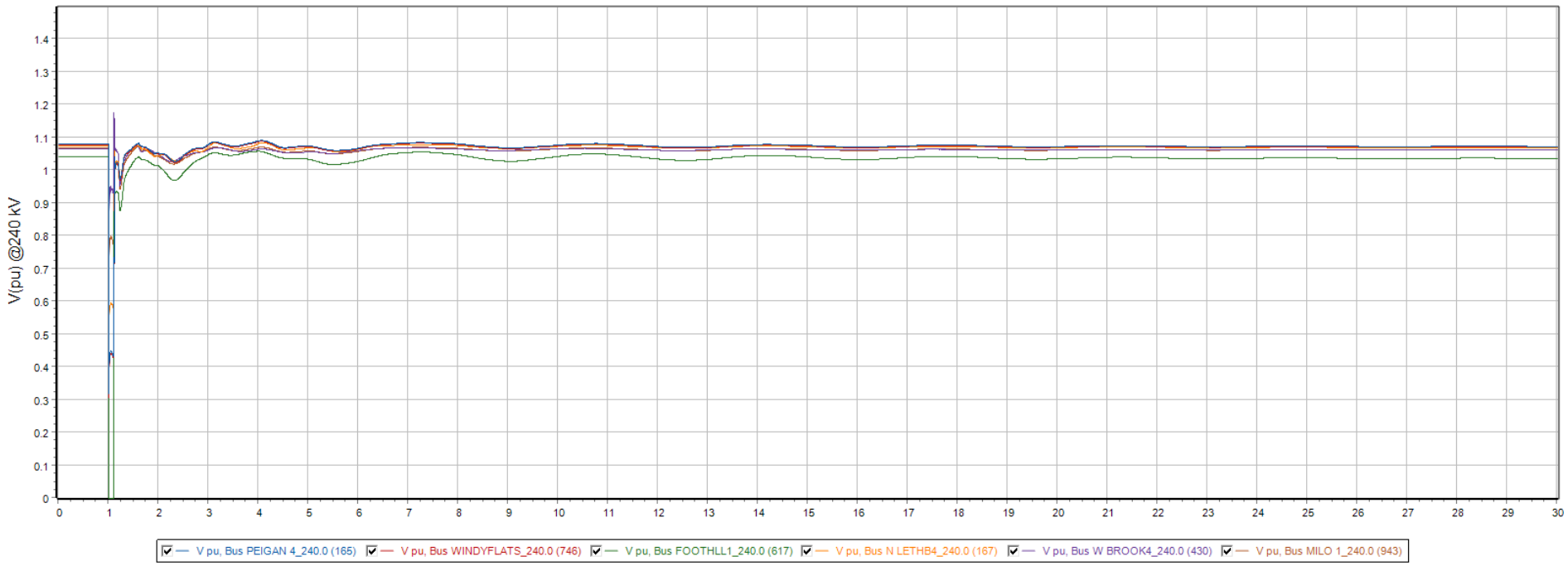
May 16, 2023 21:18:08

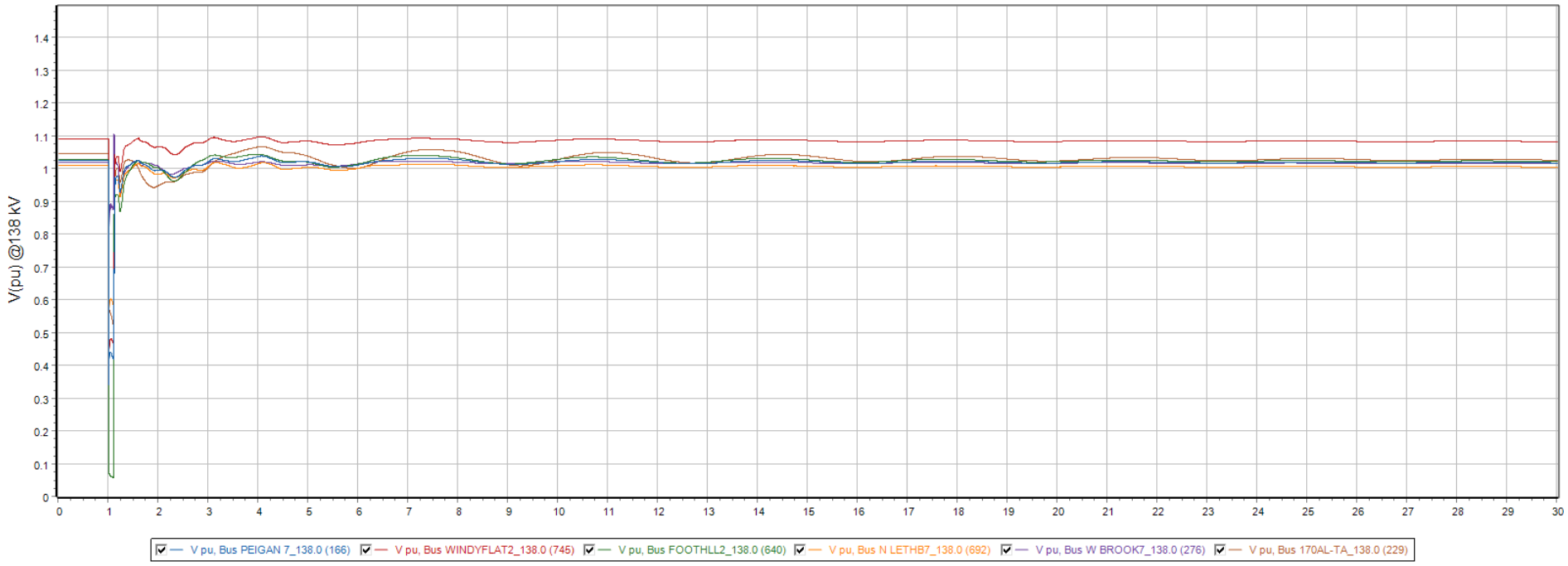
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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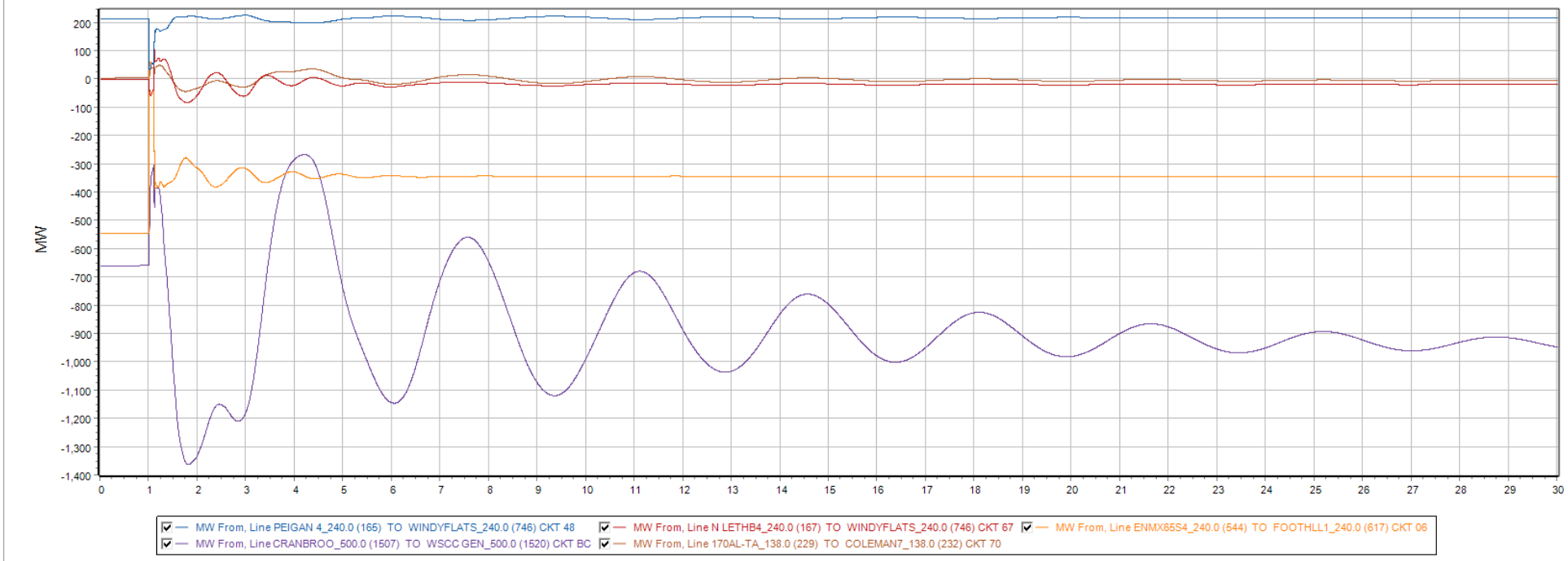
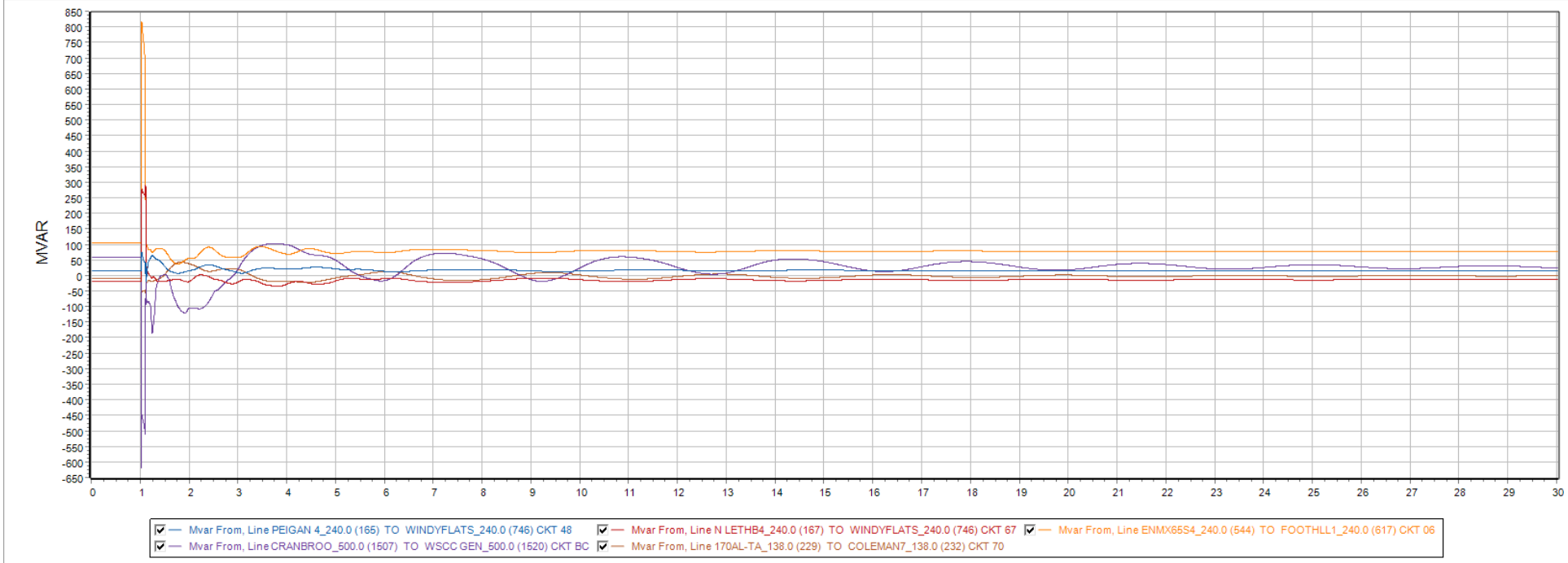
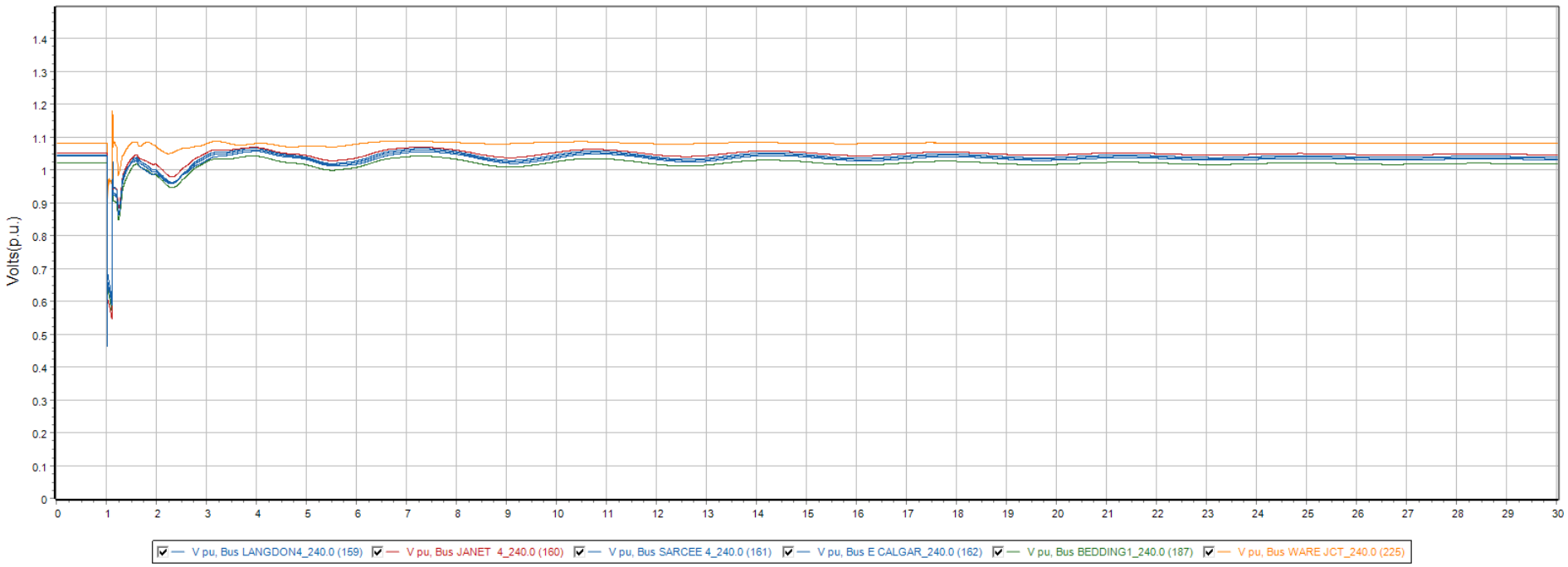
May 16, 2023 21:18:09

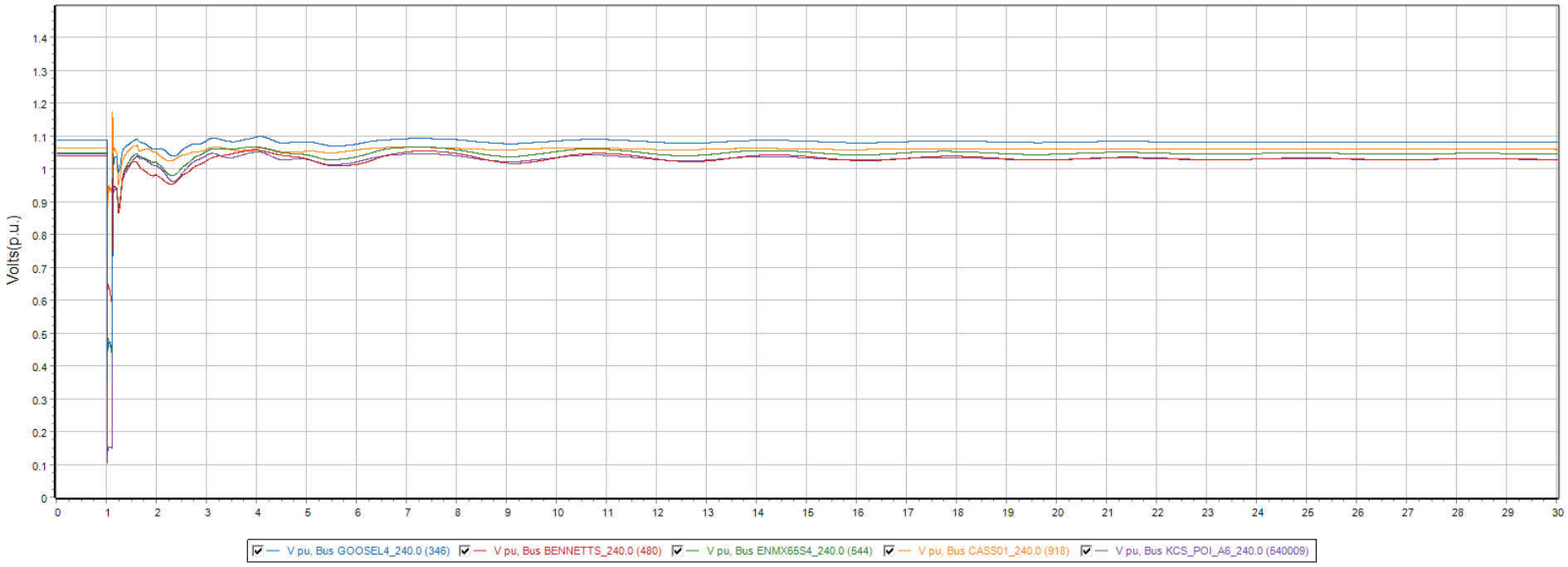
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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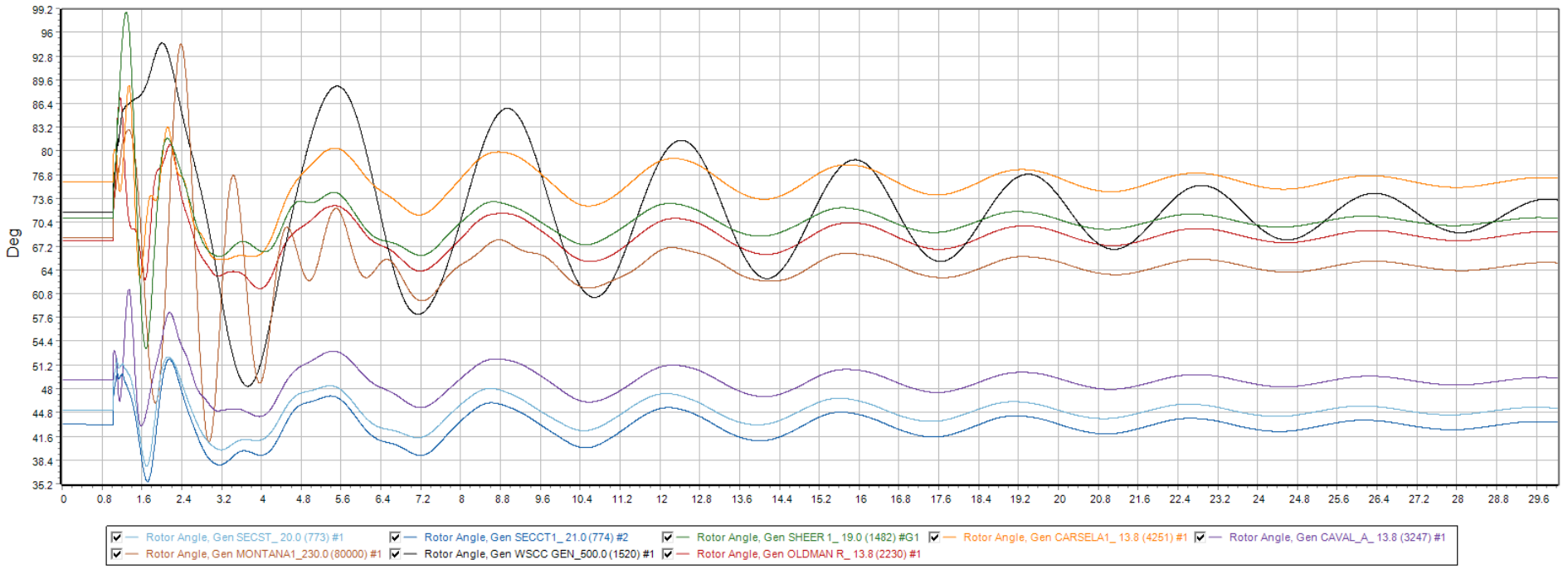
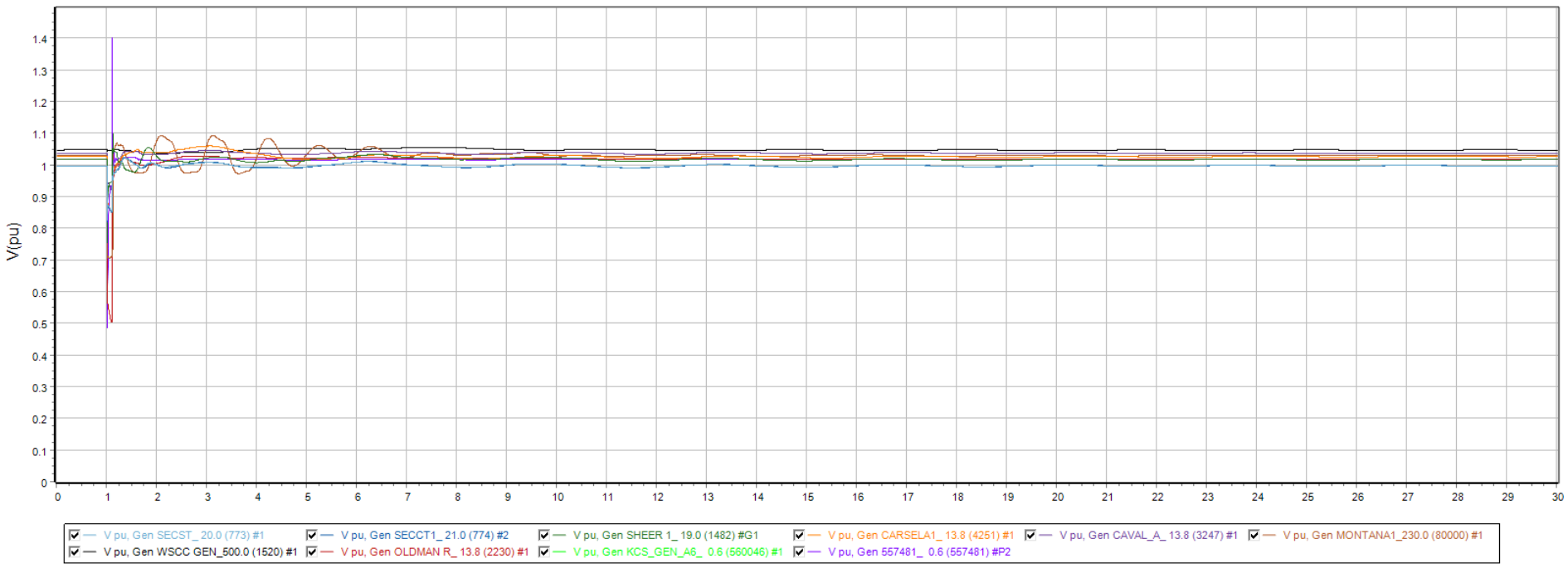
May 16, 2023 21:18:10

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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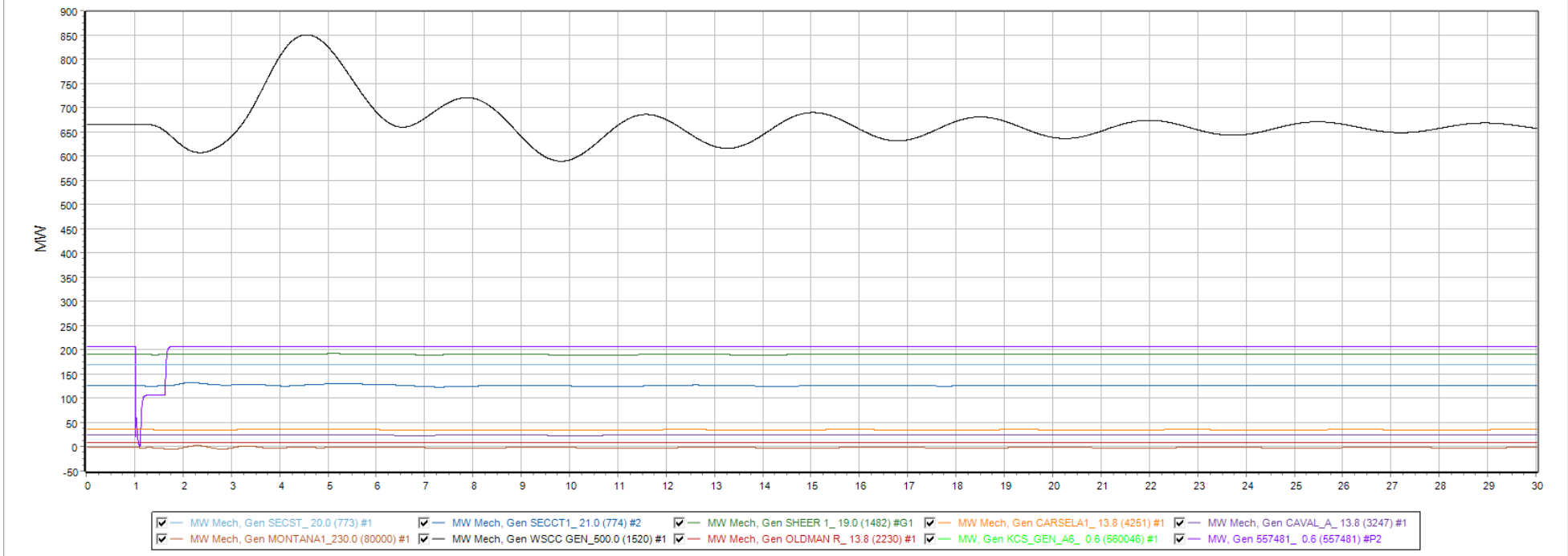
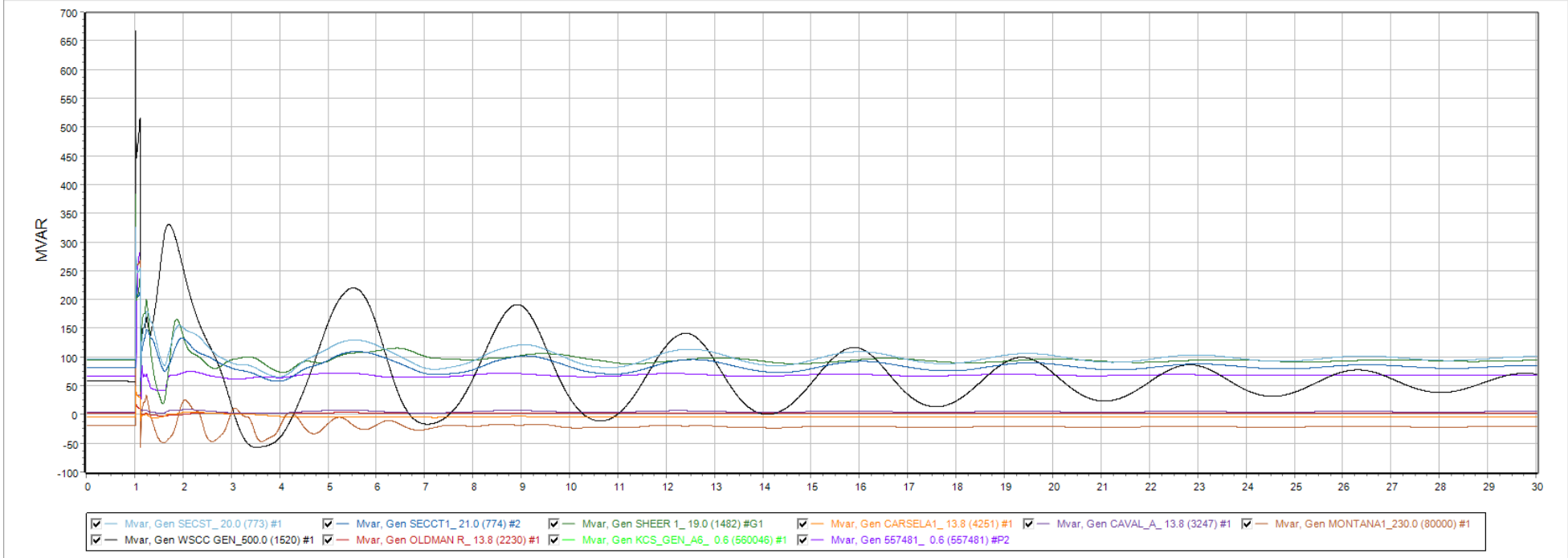
May 16, 2023 21:28:01

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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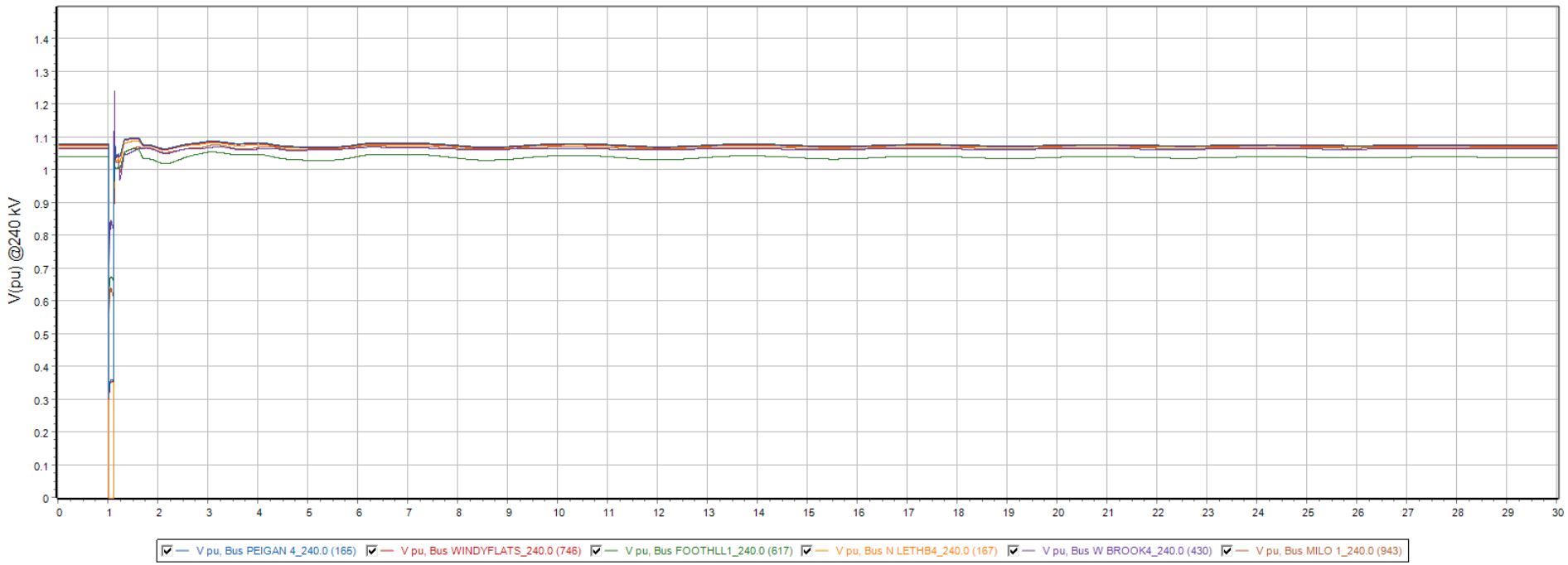
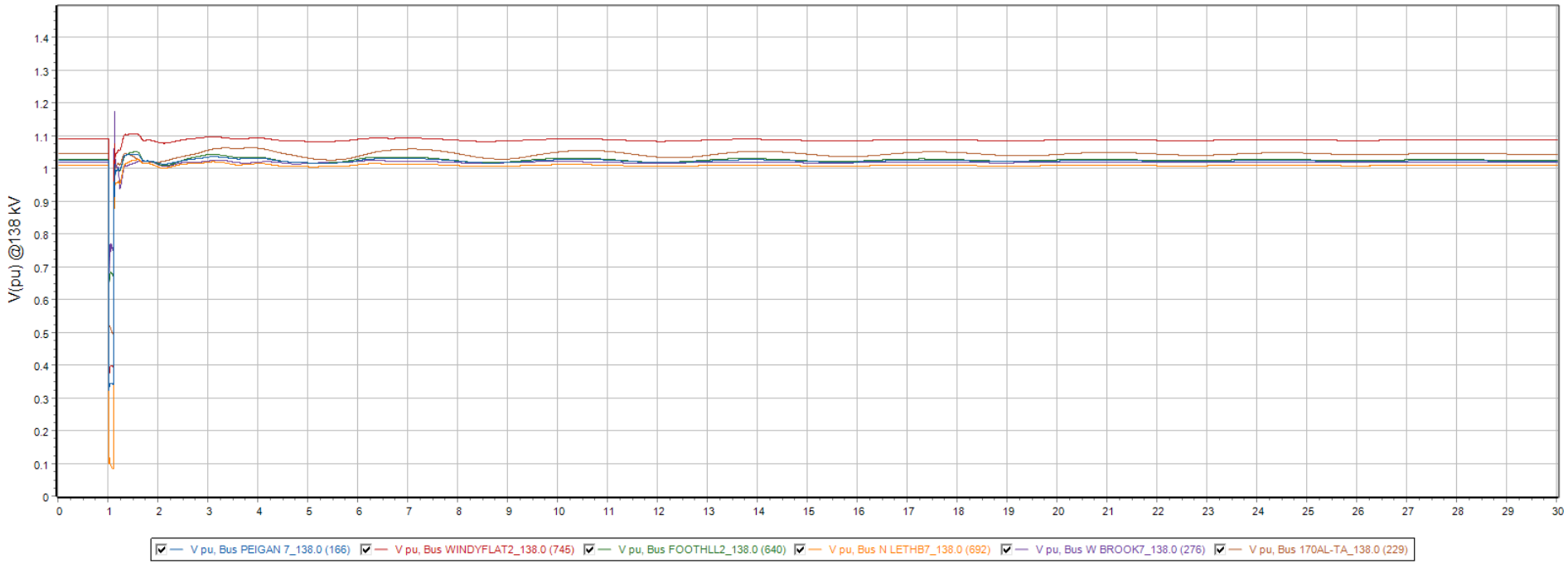
May 16, 2023 21:28:02

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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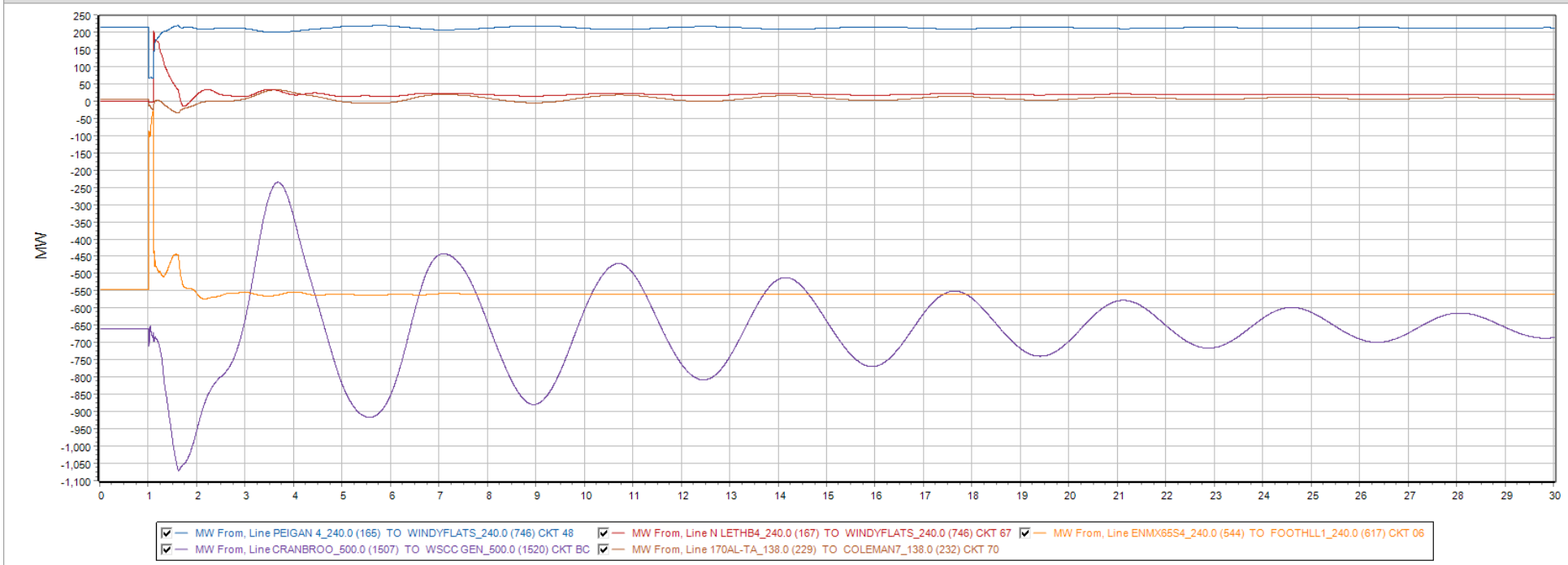
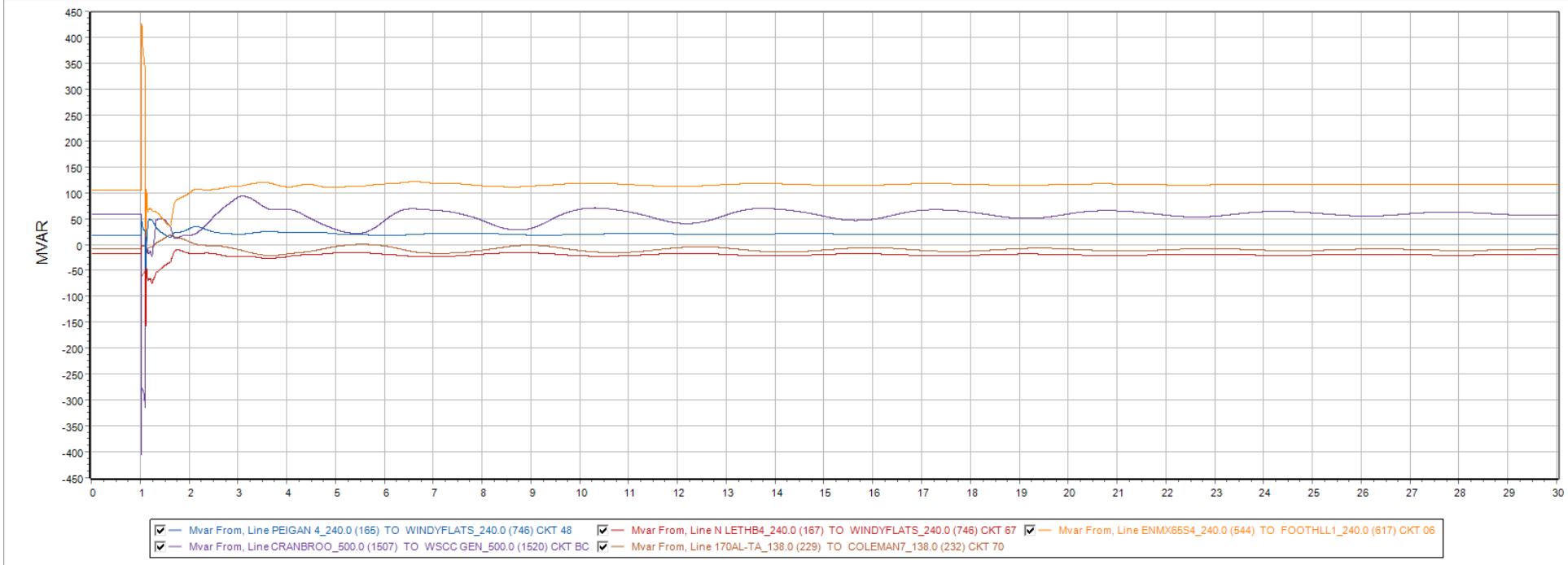
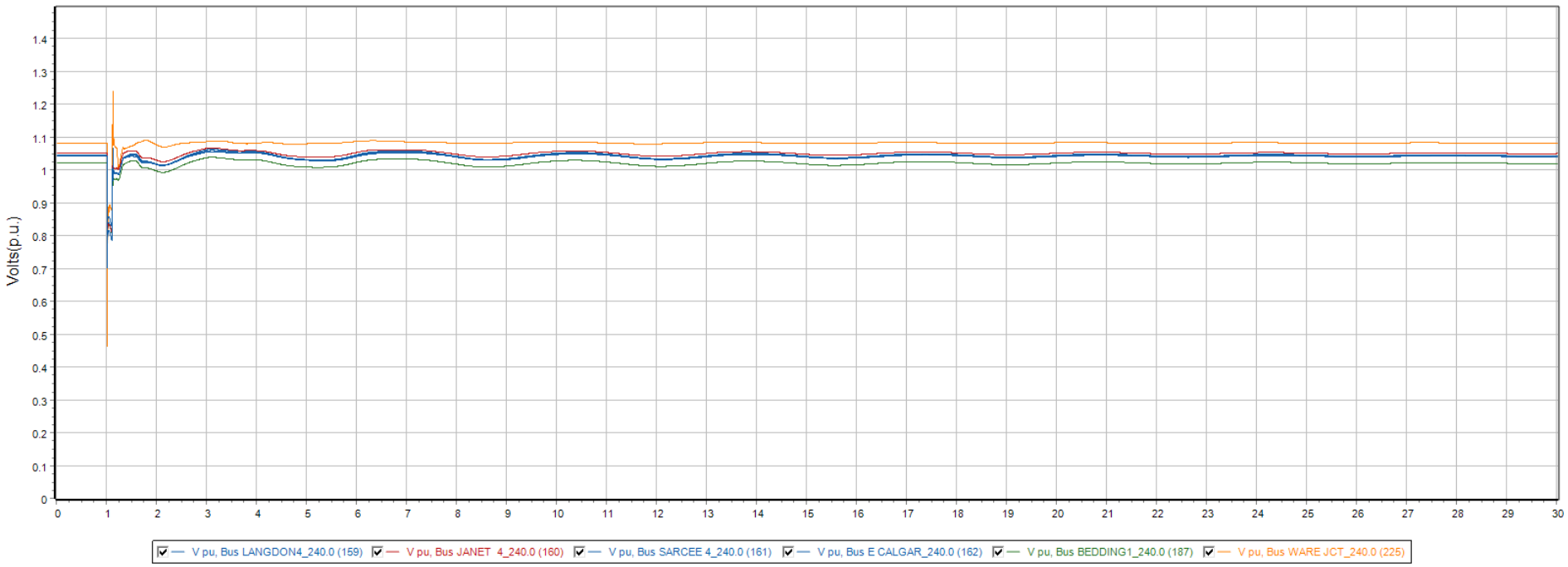
May 16, 2023 21:28:03

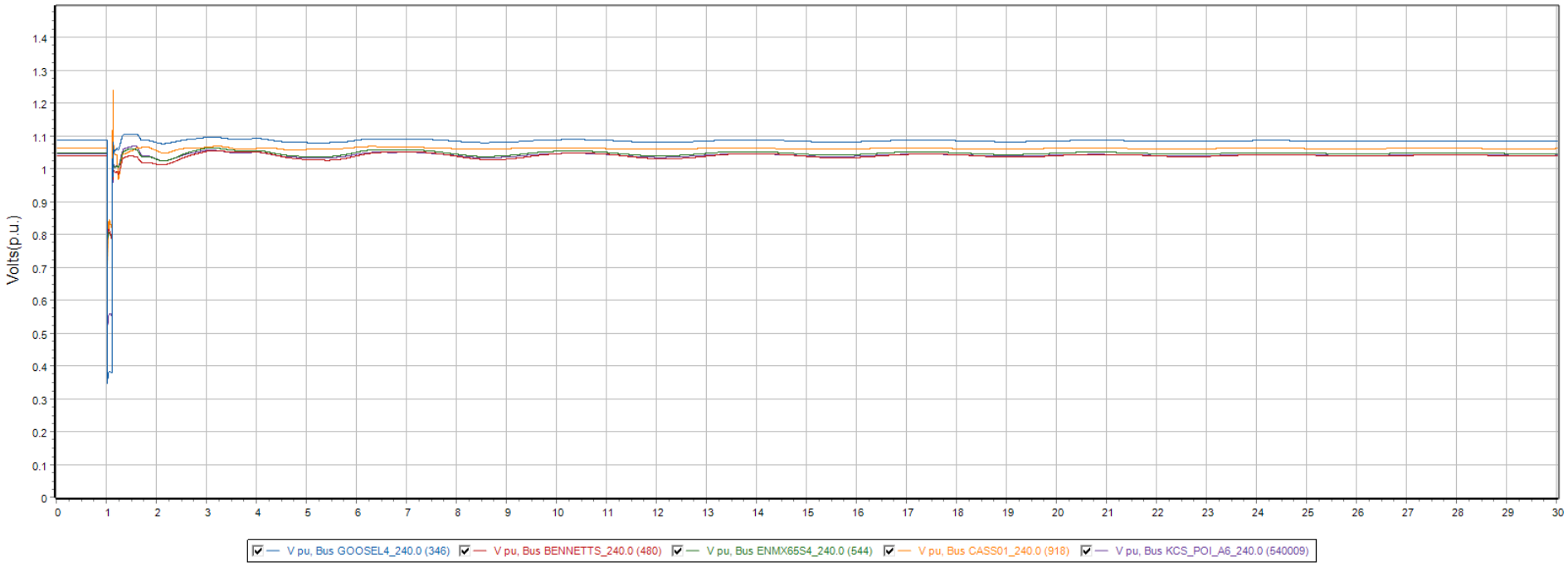
Monitor Line MW & MVAR. Q4



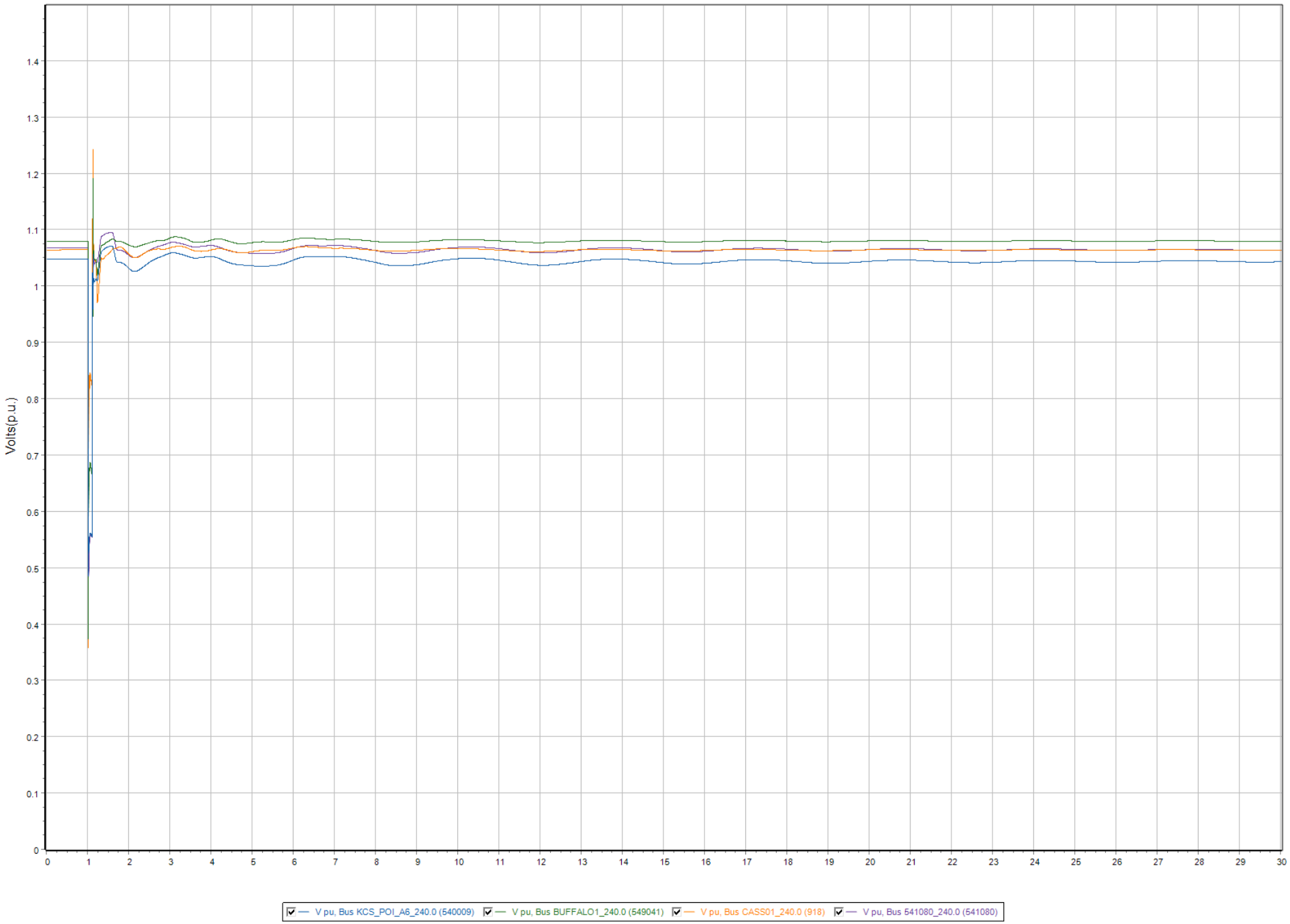


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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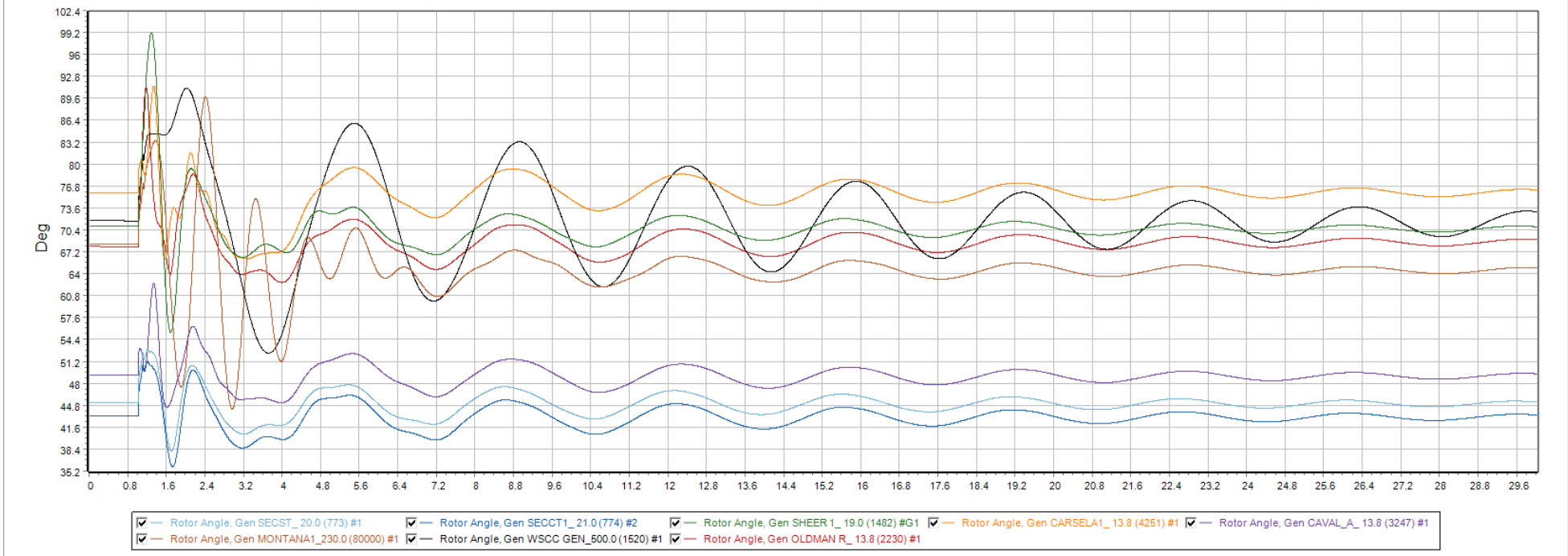
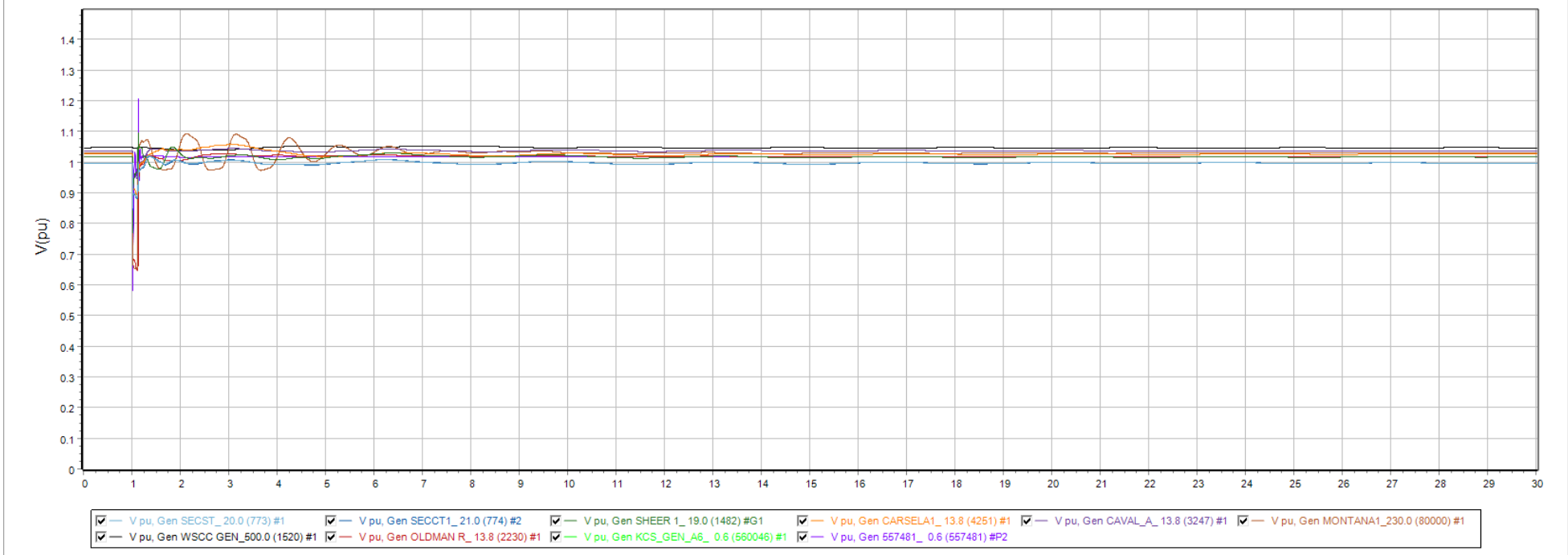
May 16, 2023 21:28:04

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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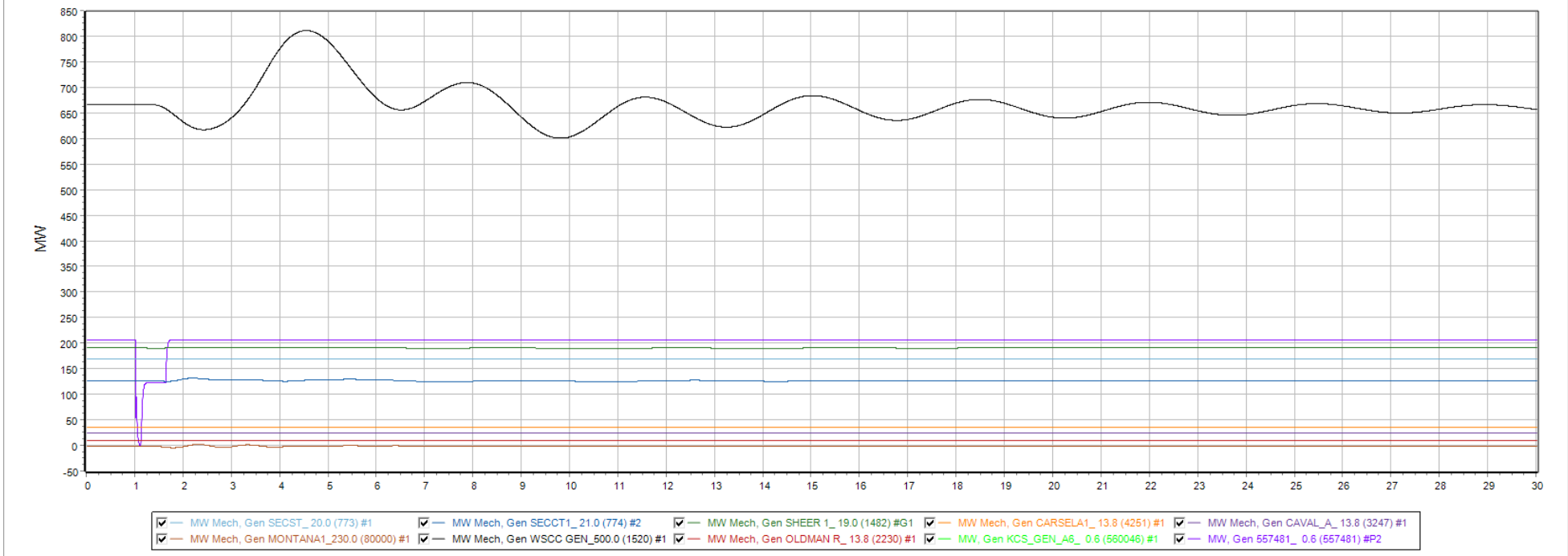
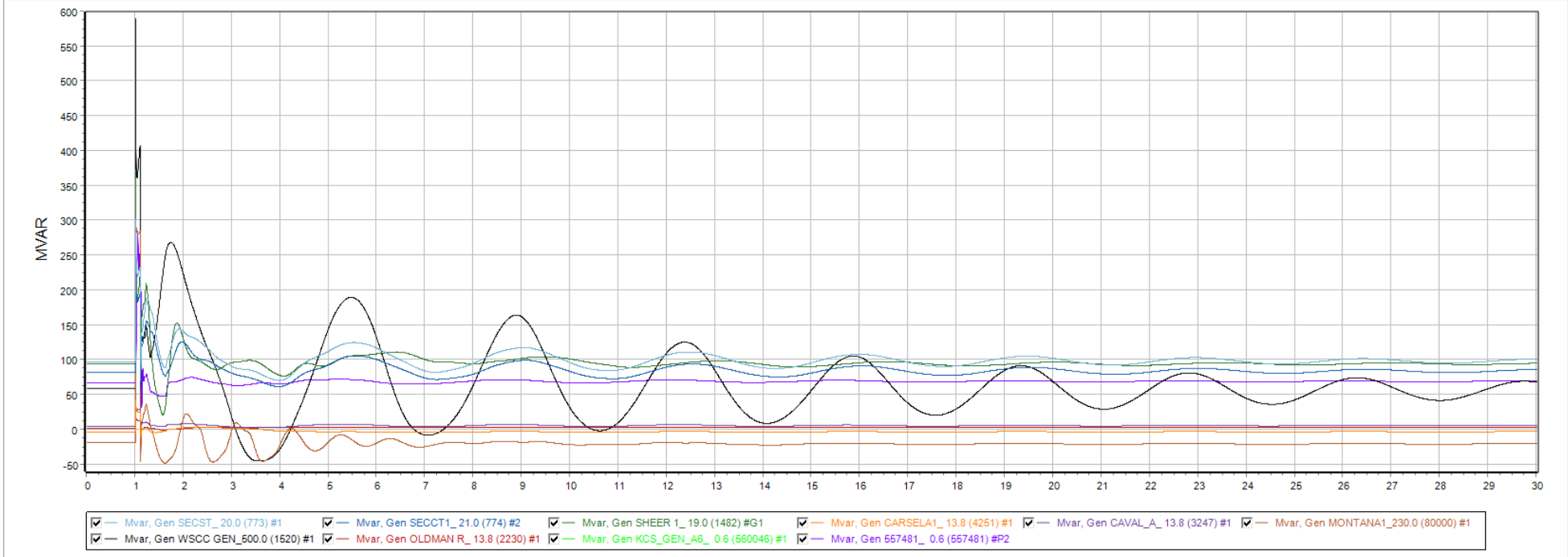
May 16, 2023 21:38:08

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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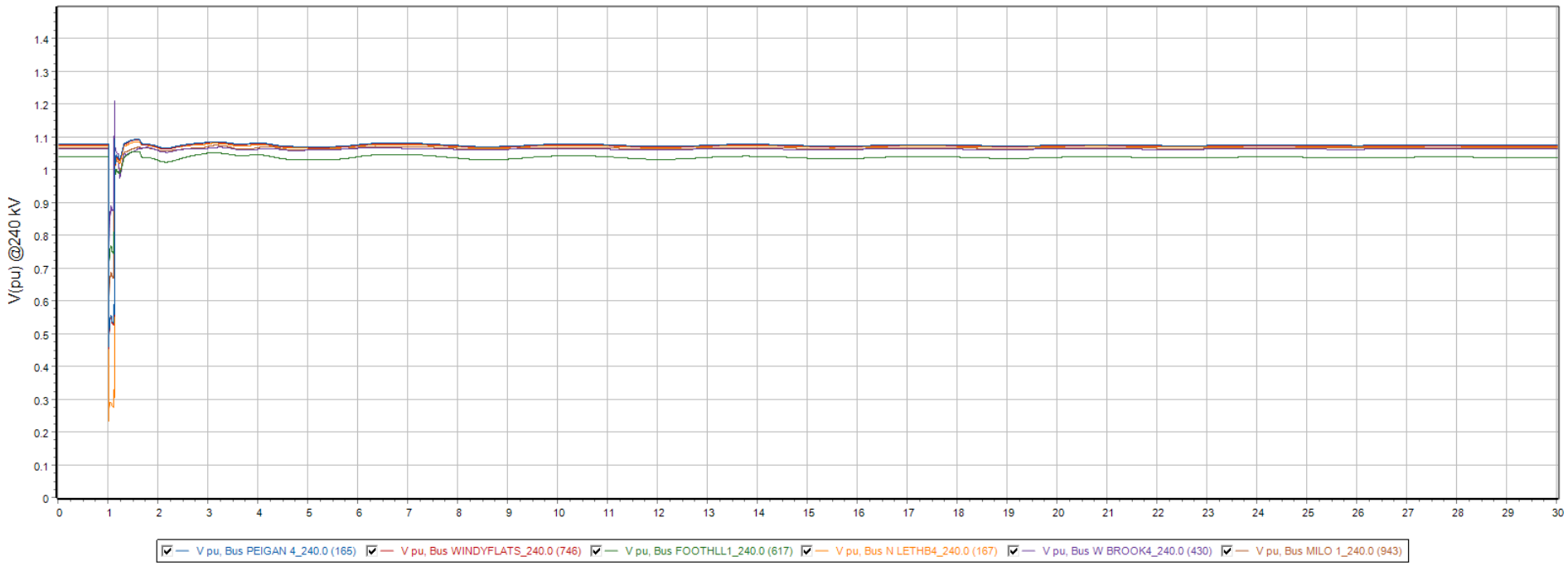
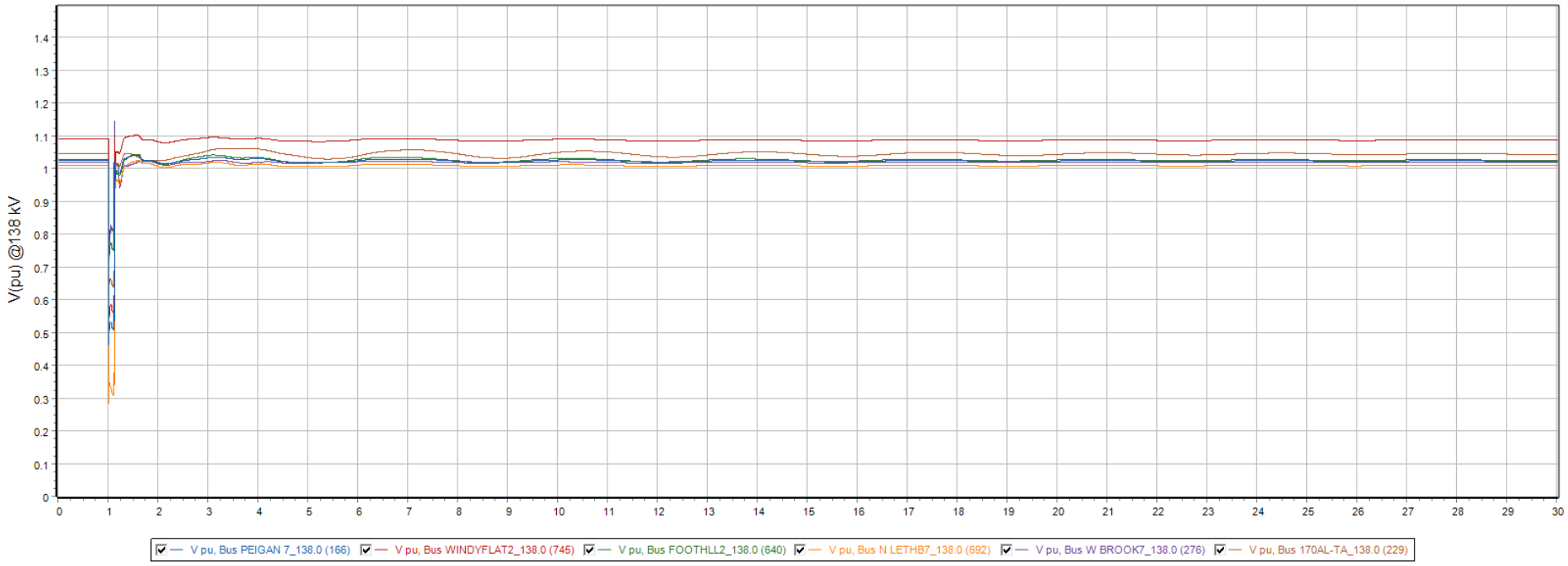
May 16, 2023 21:38:08

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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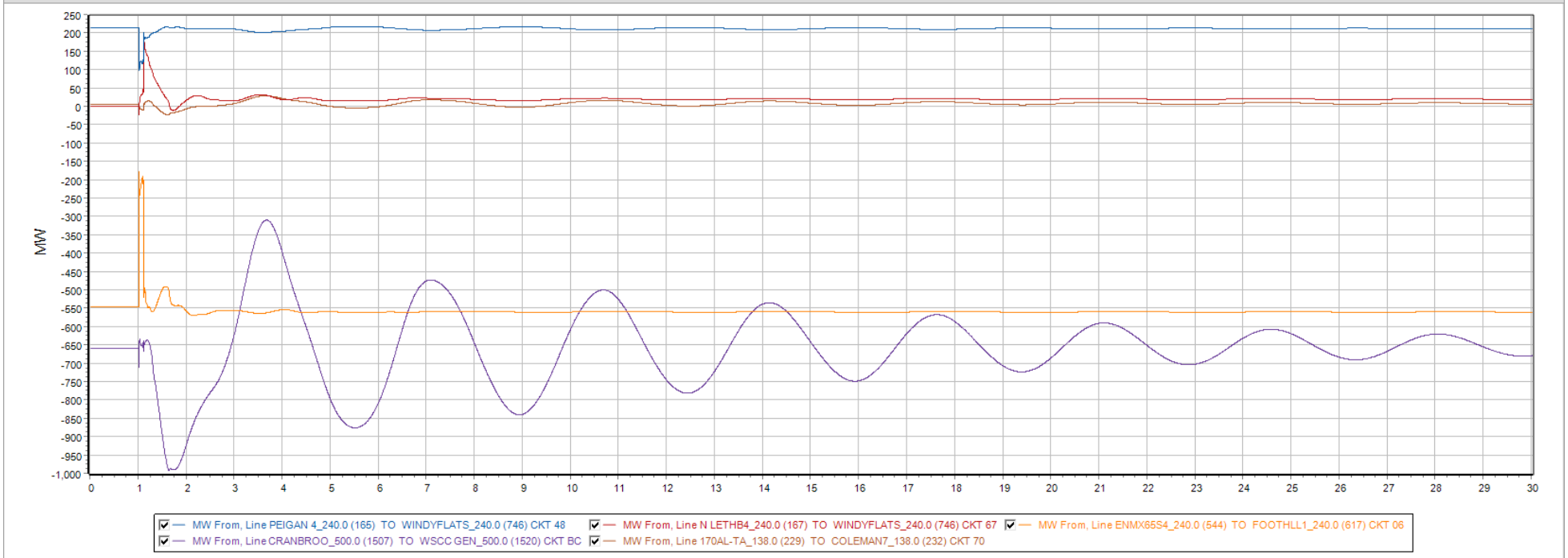
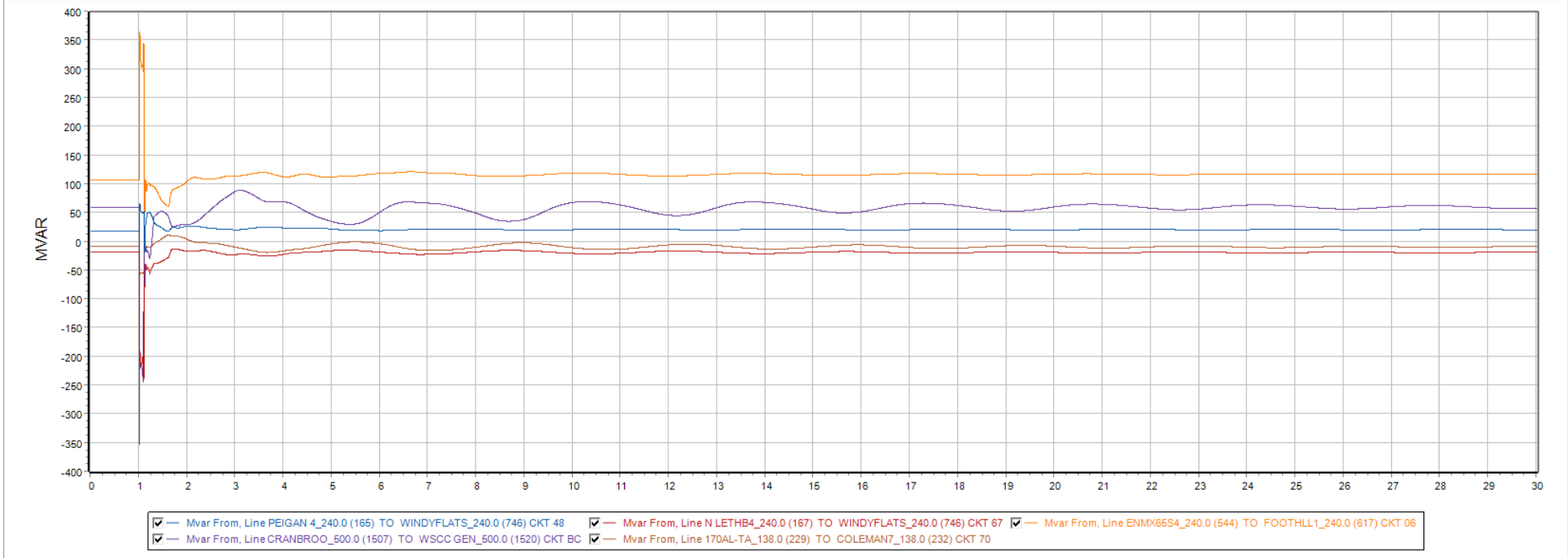
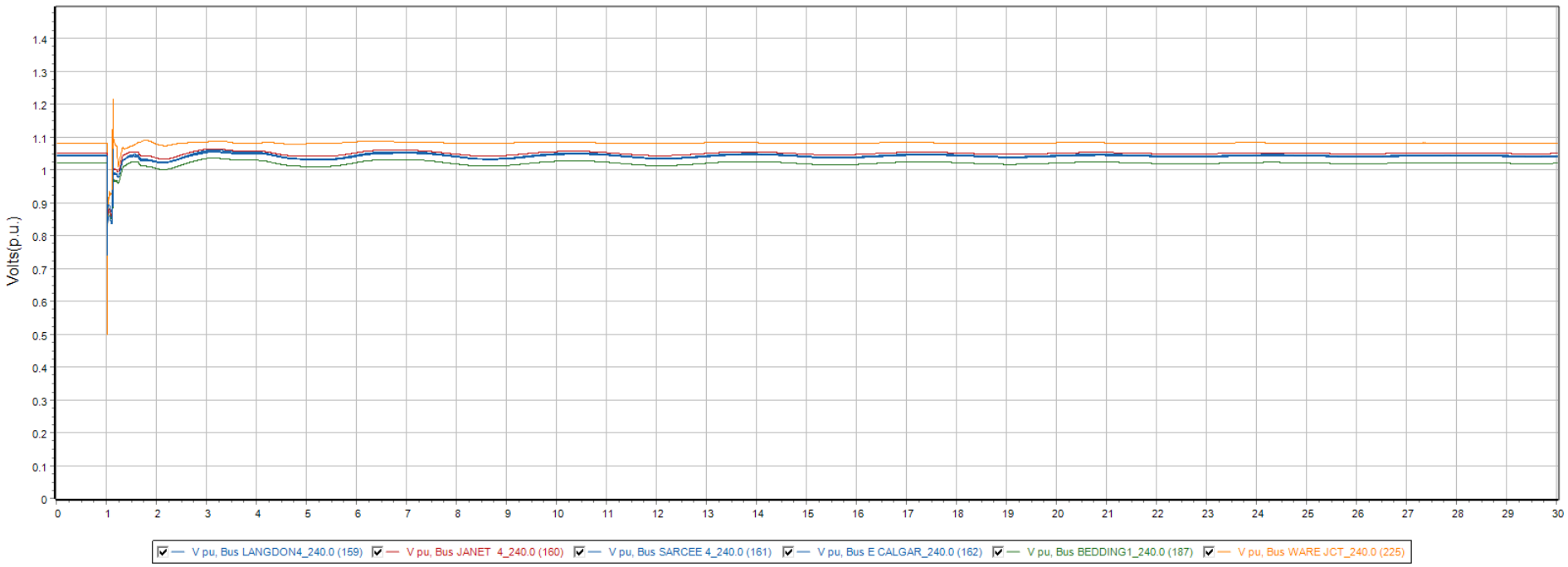
May 16, 2023 21:38:09

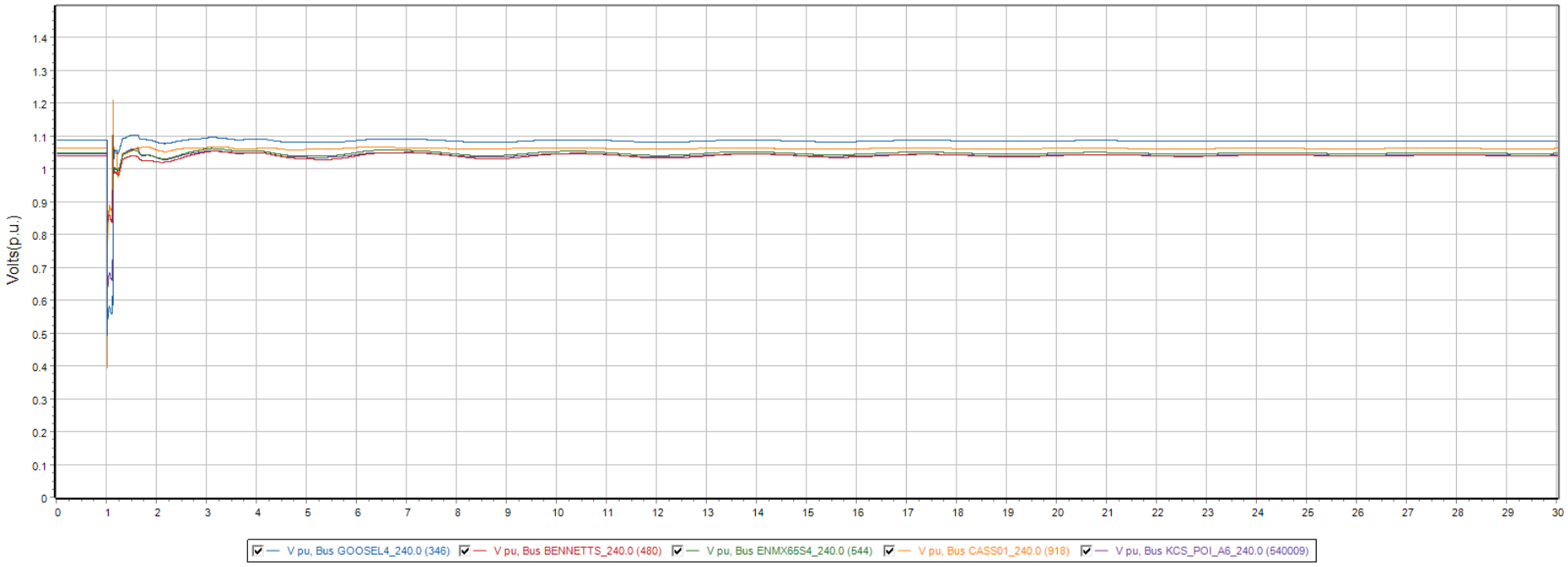
Monitor Line MW & MVAR. Q4



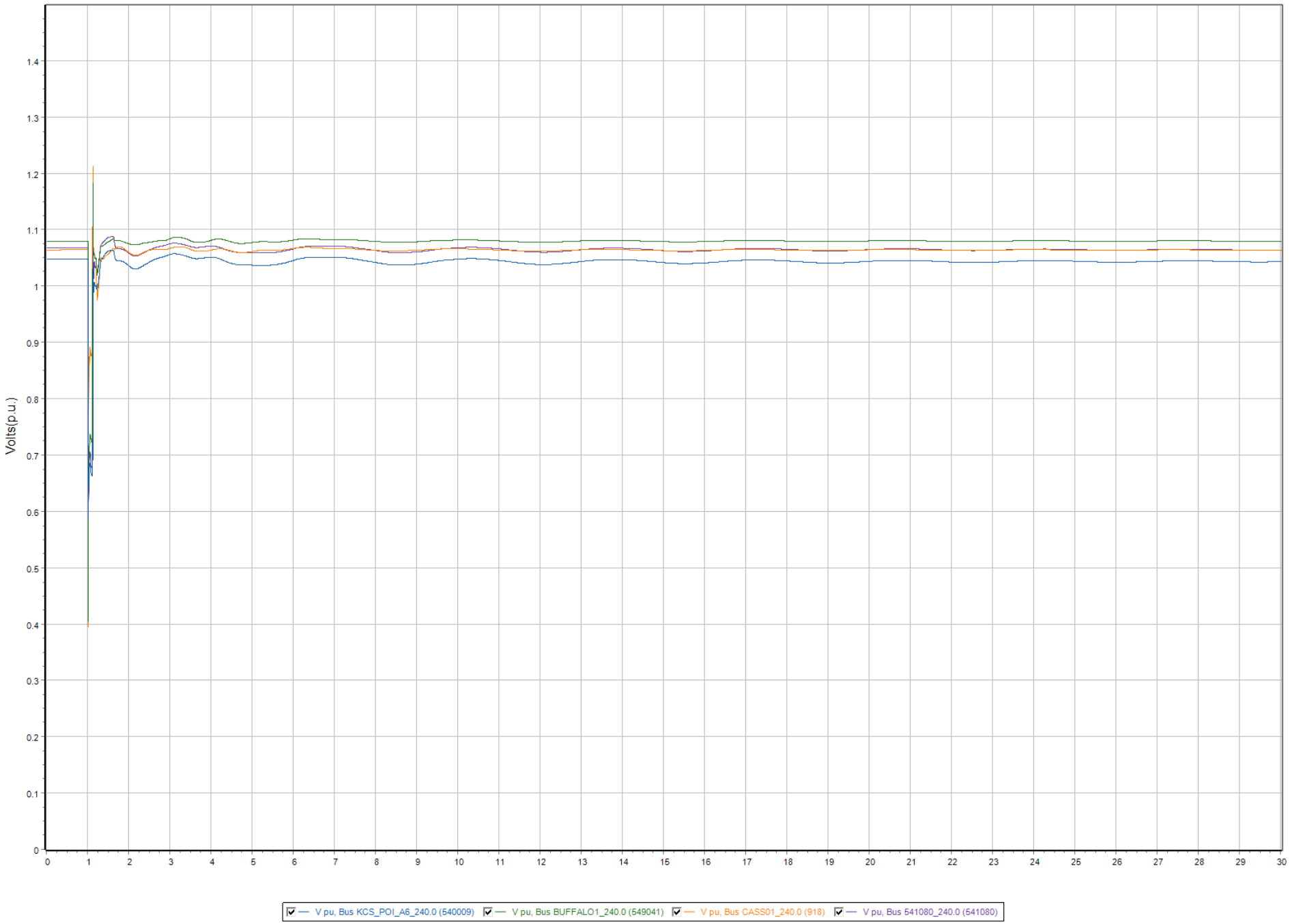


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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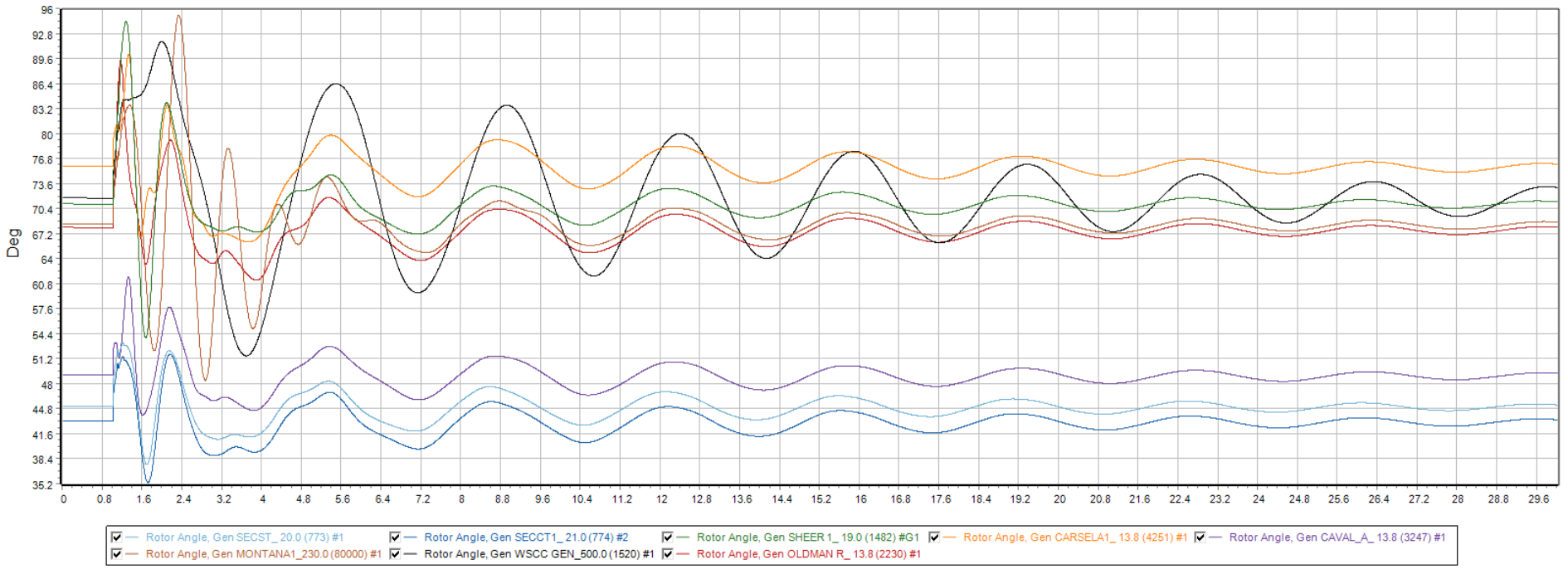
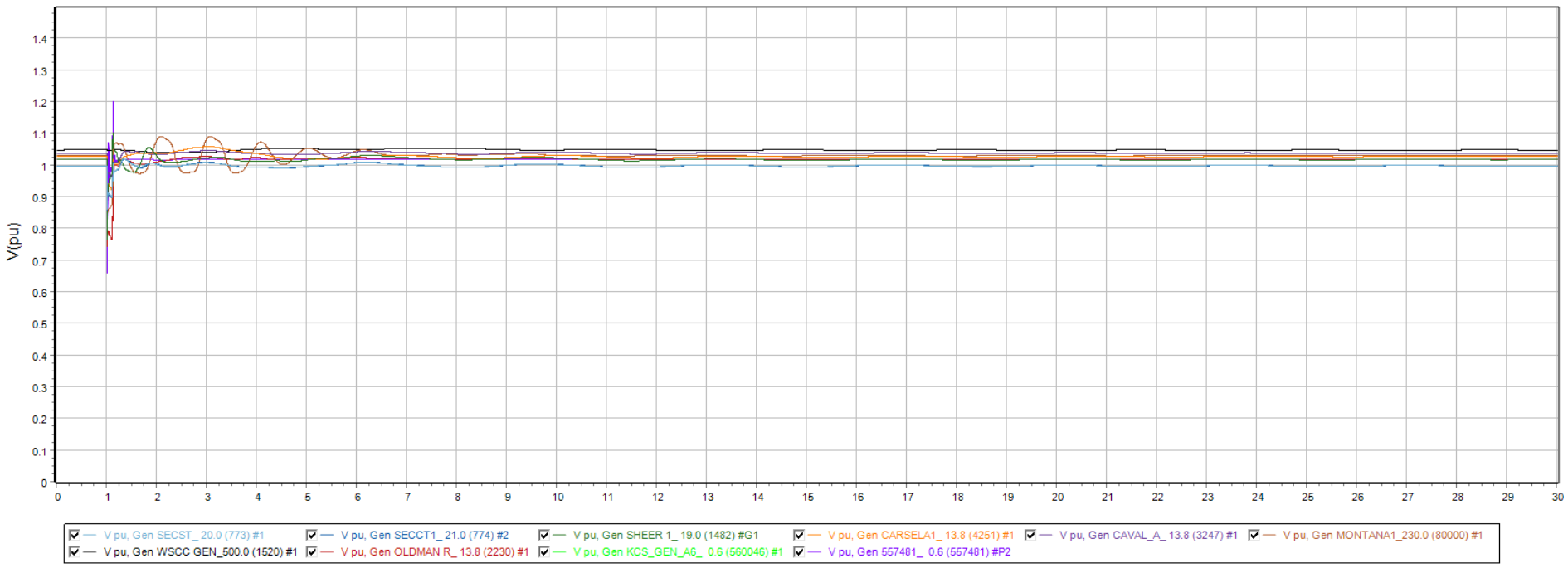
May 16, 2023 21:38:10

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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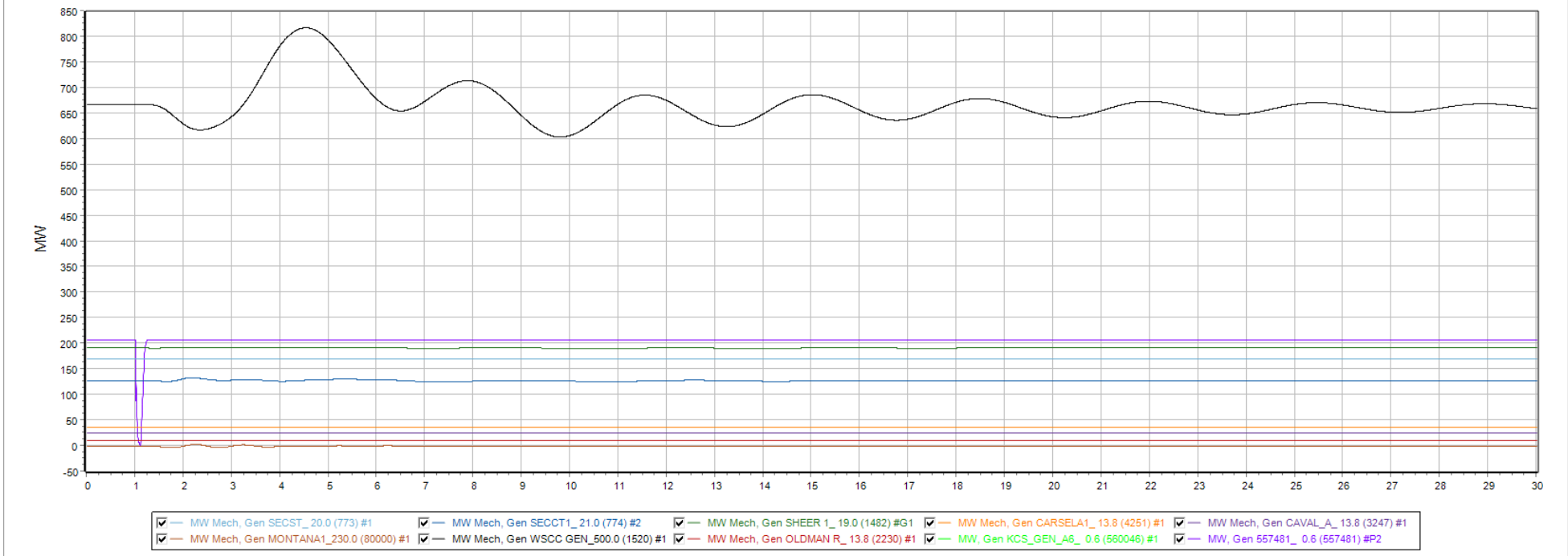
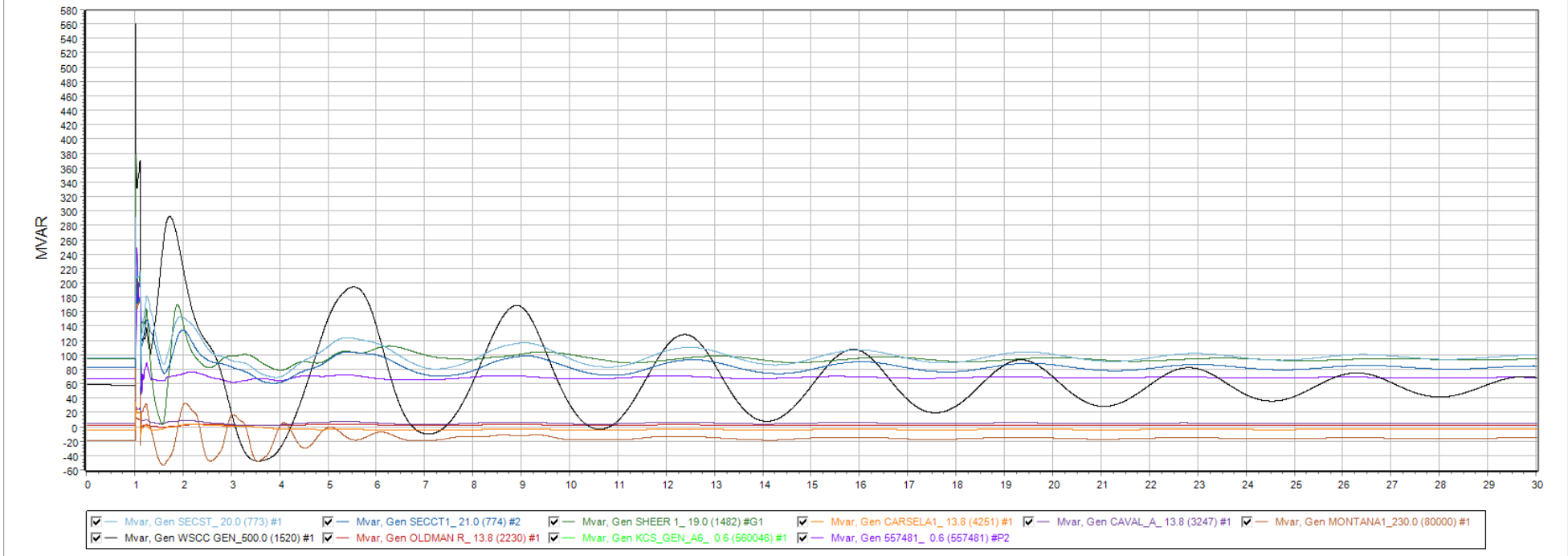
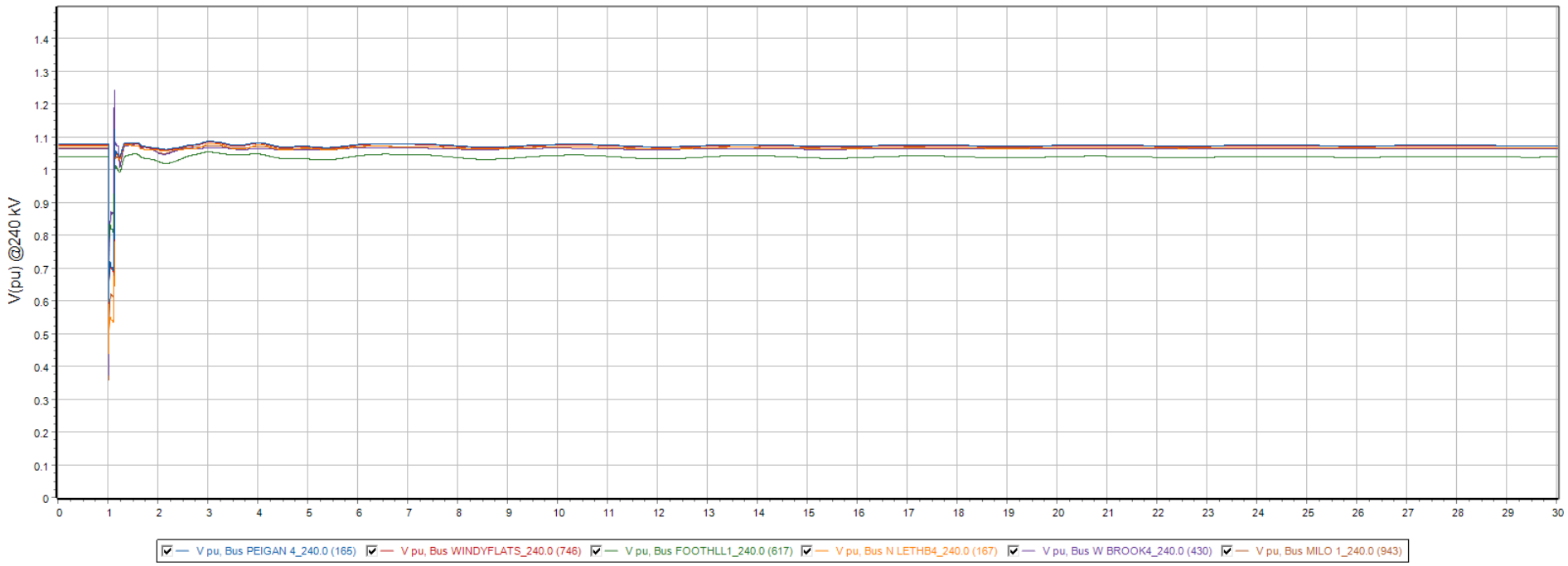
May 16, 2023 21:48:39

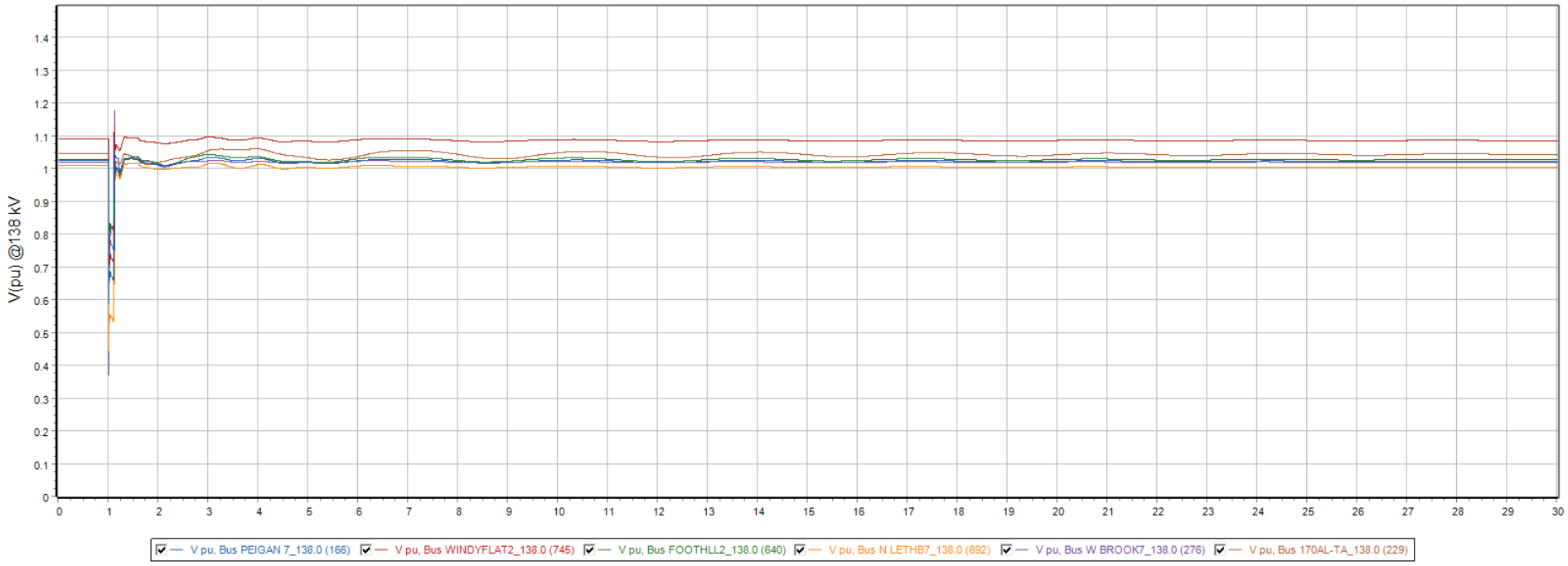
Monitor Gens. Q2



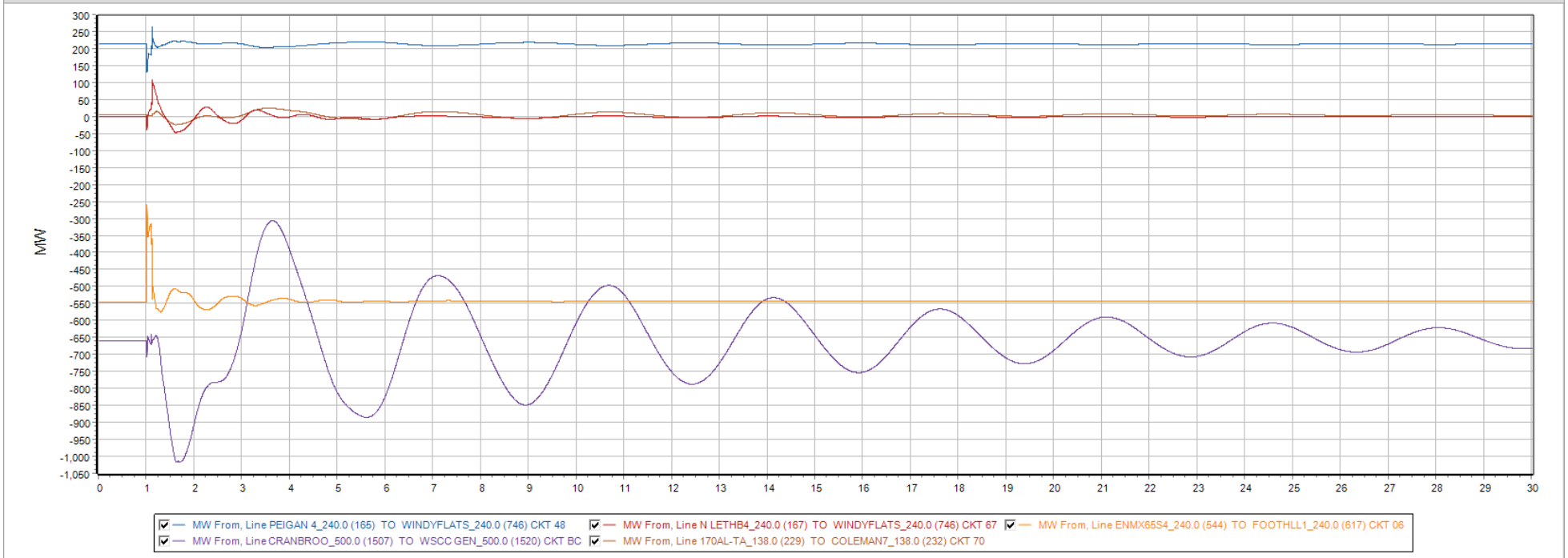


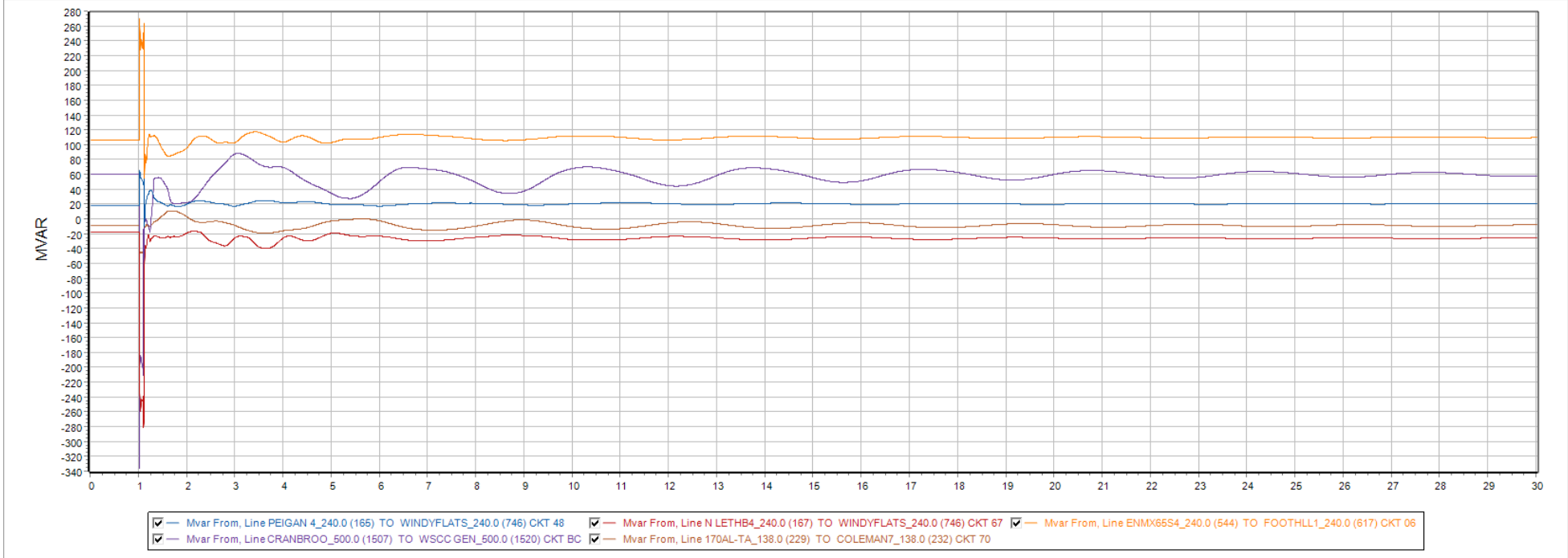
Monitor Bus Volts Q3



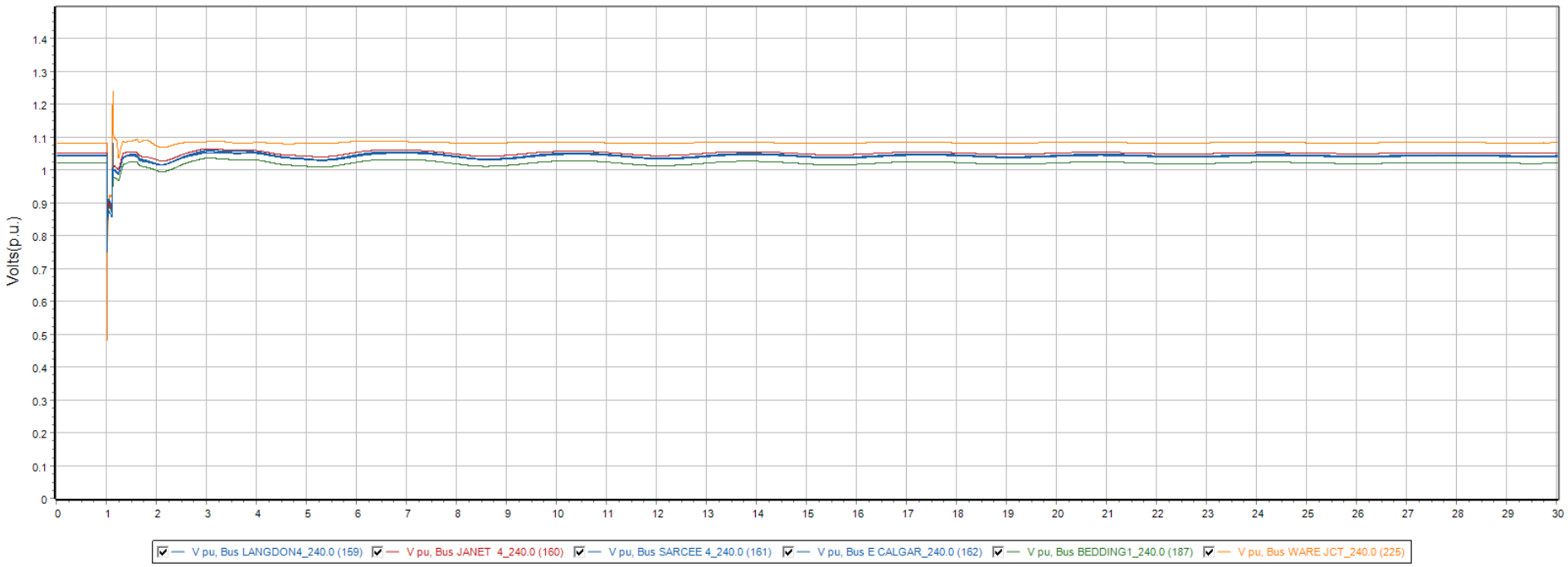


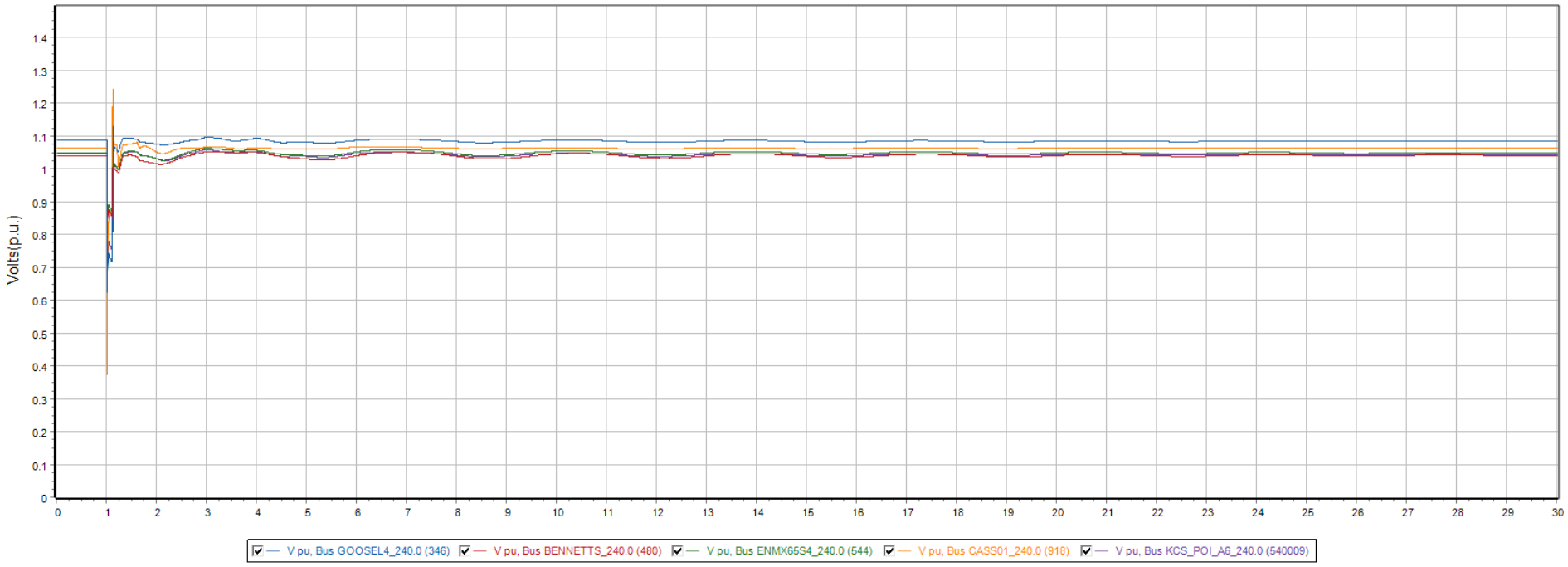
Monitor Line MW & MVAR. Q4



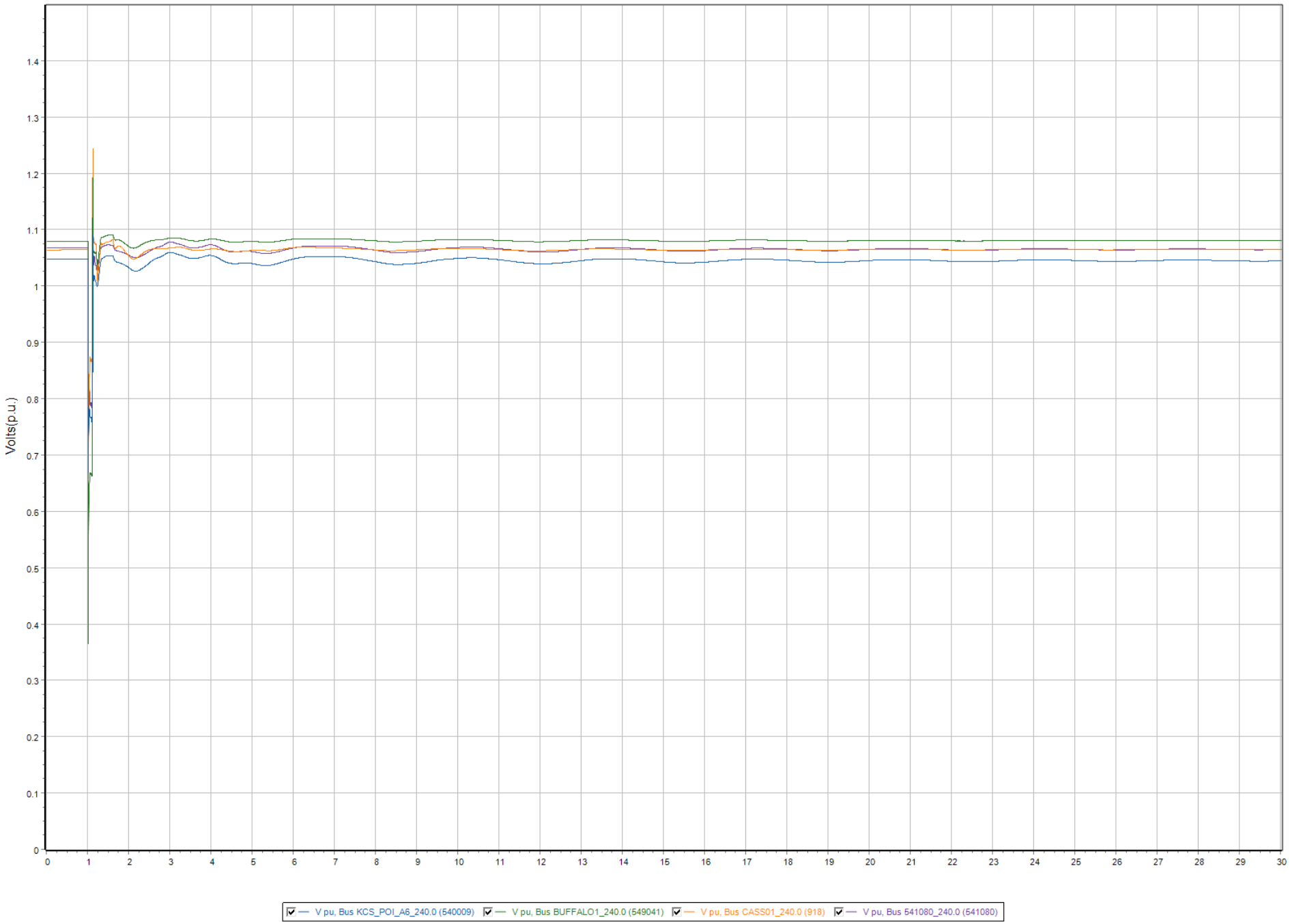


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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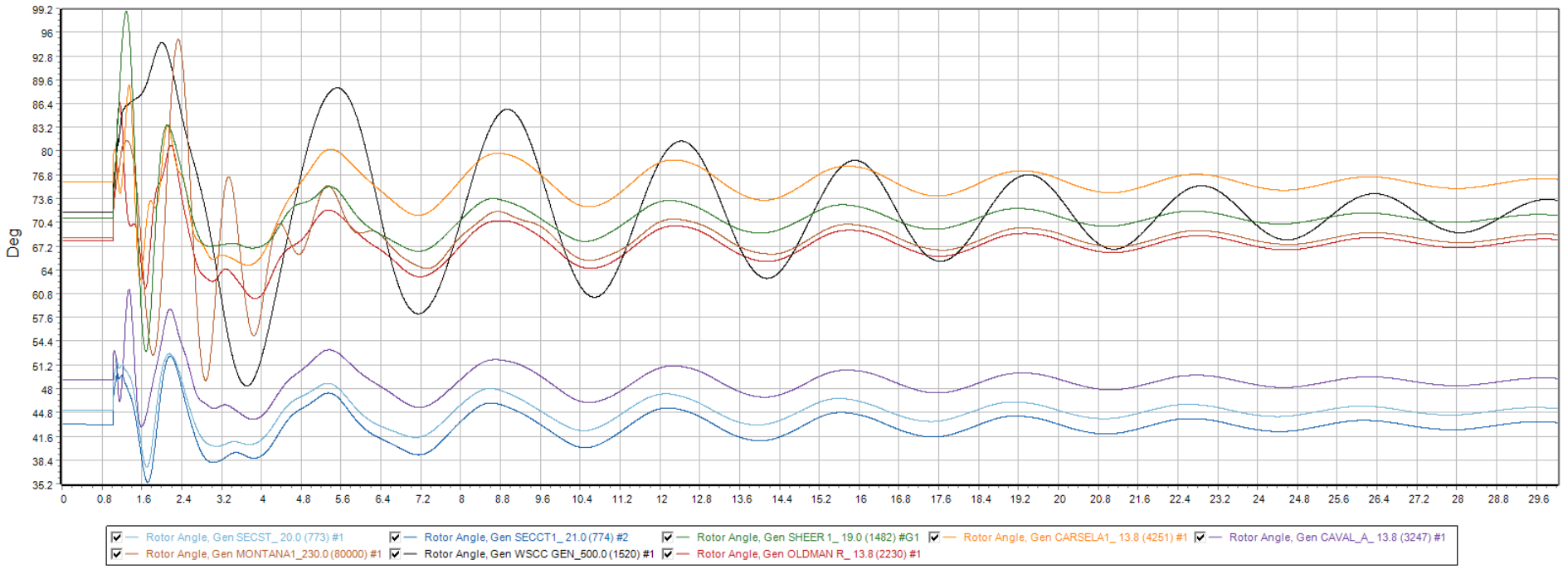
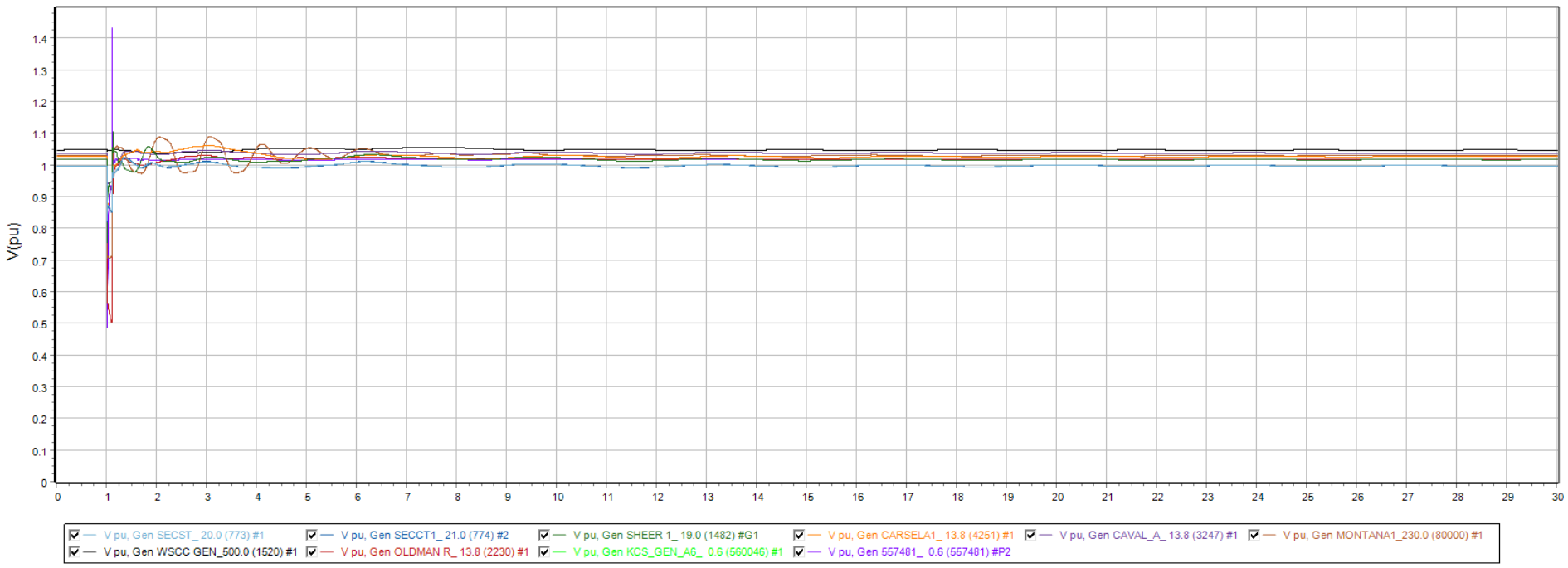
May 16, 2023 21:48:42

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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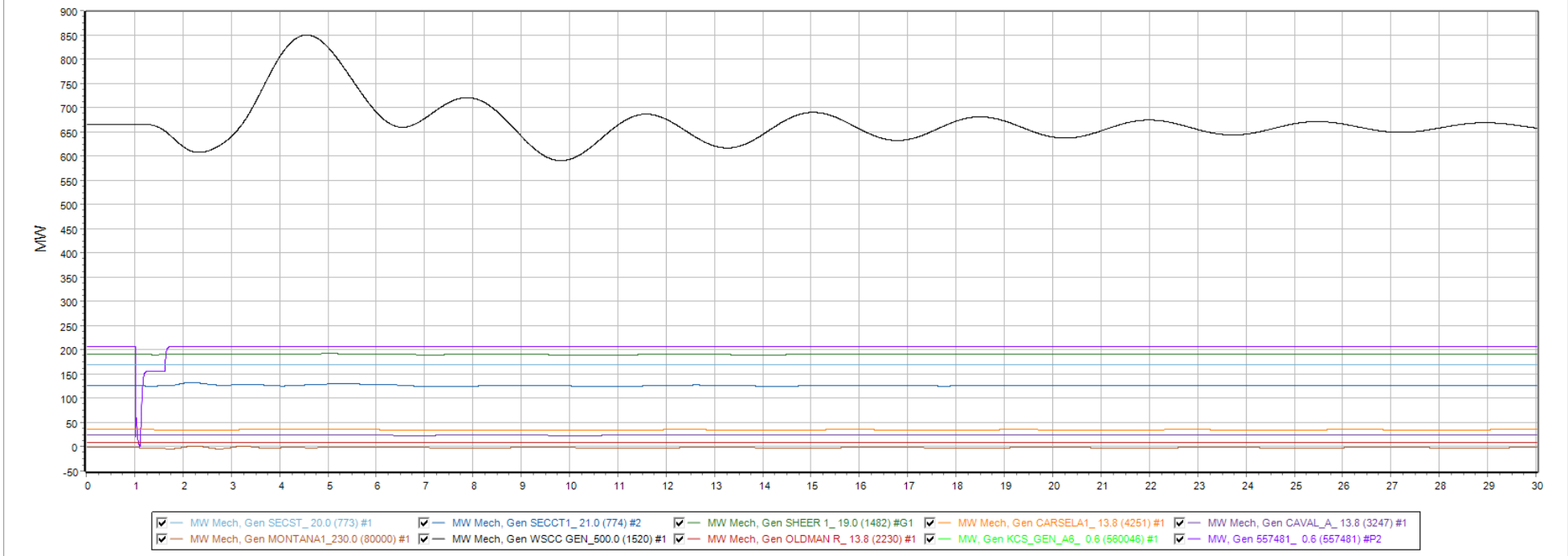
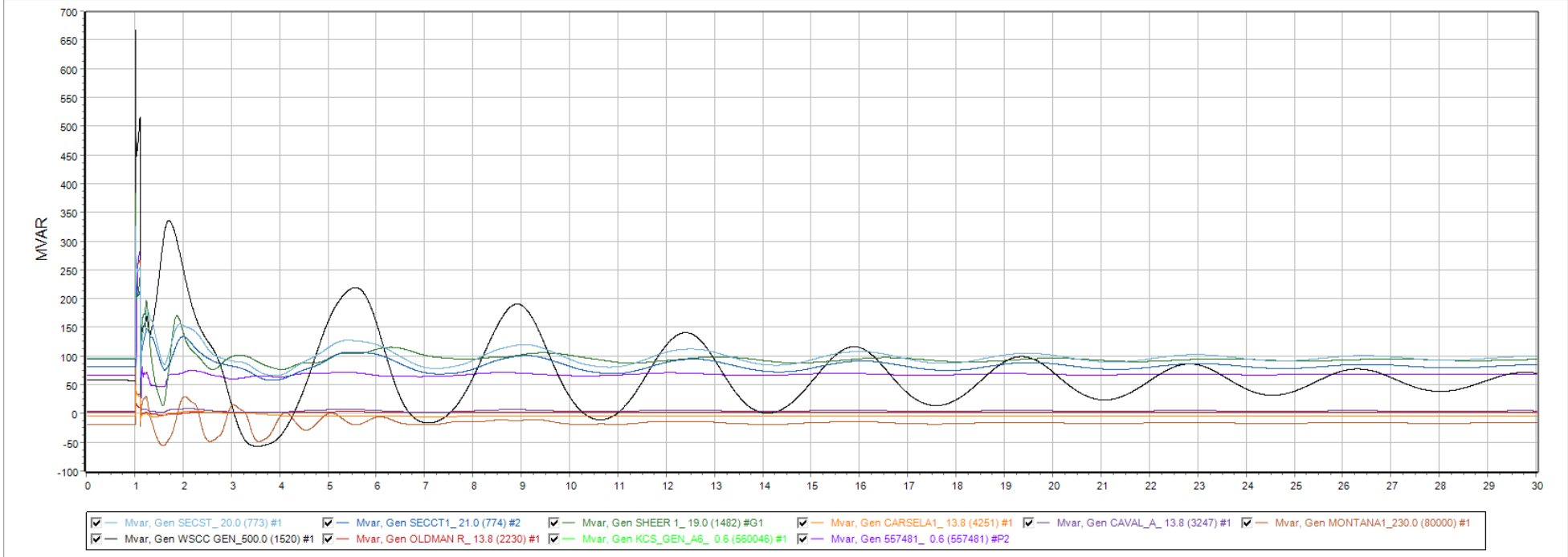
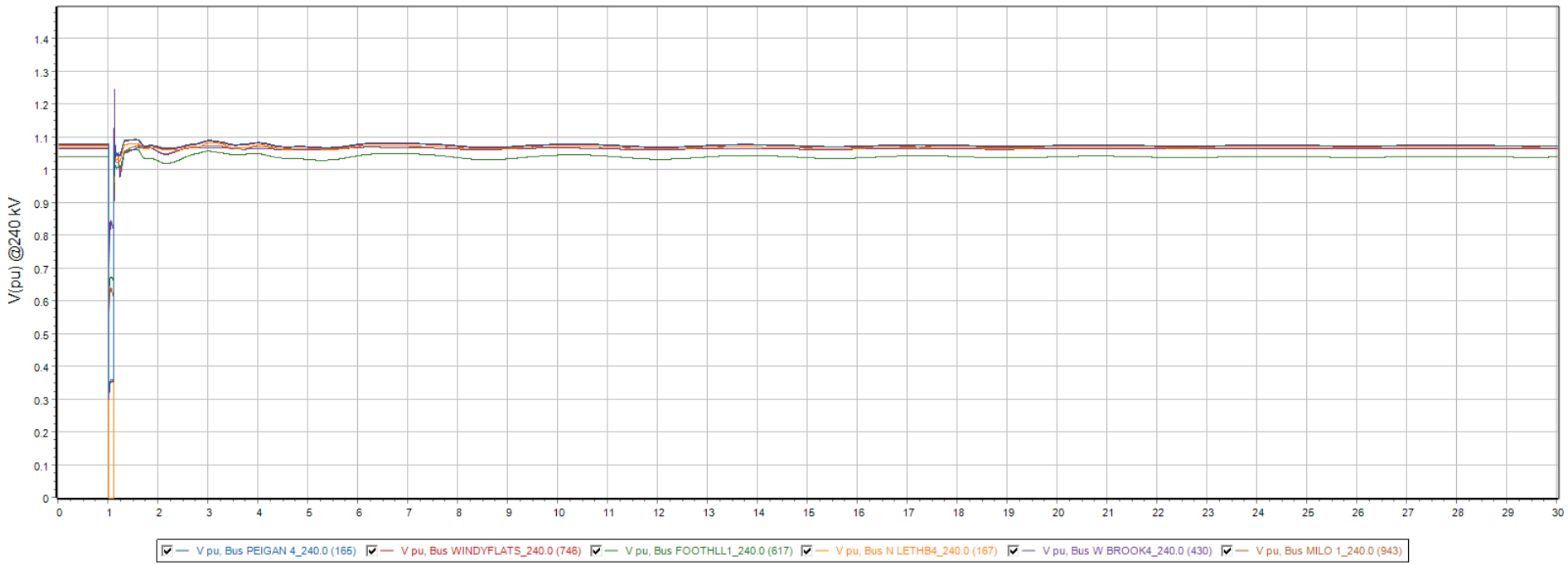
May 16, 2023 21:58:55

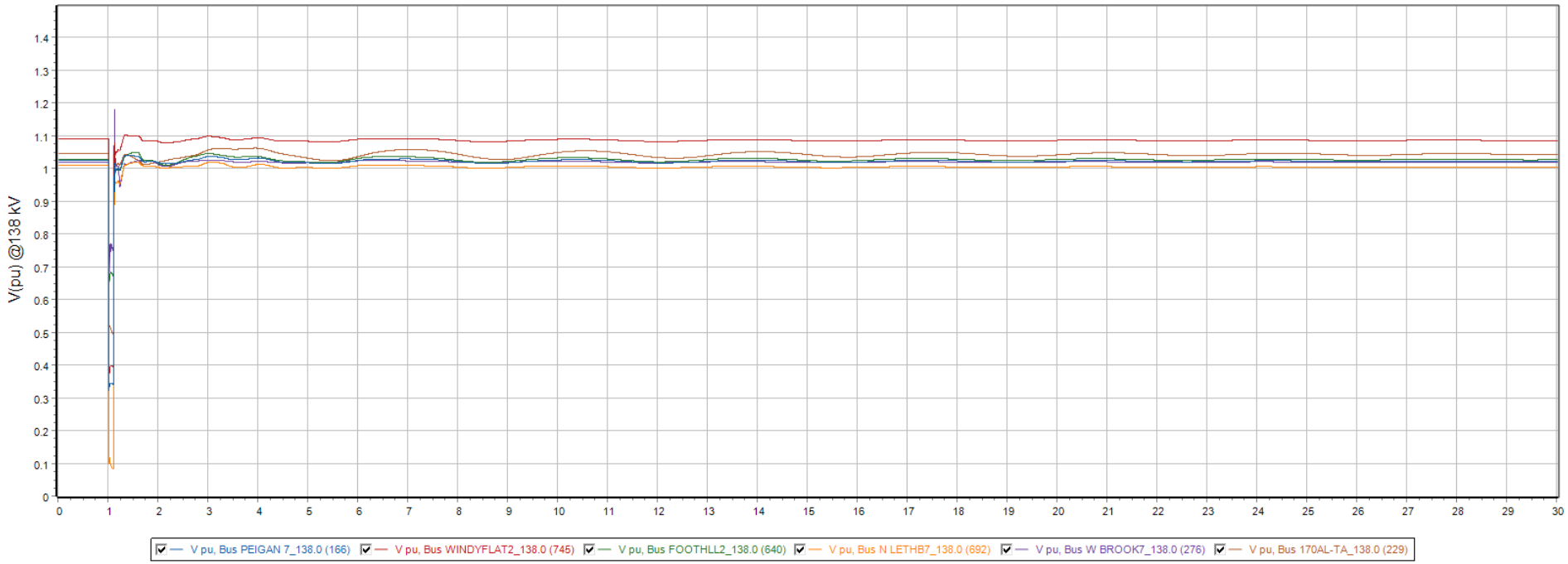
Monitor Gens. Q2



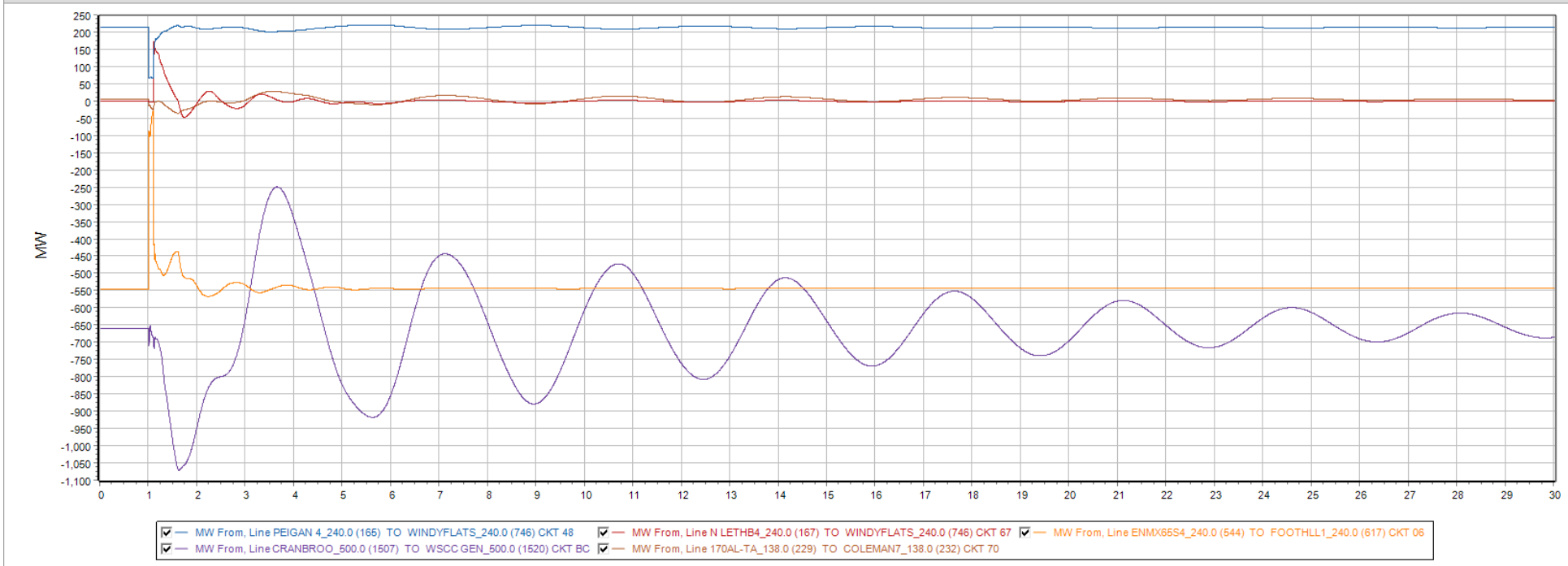


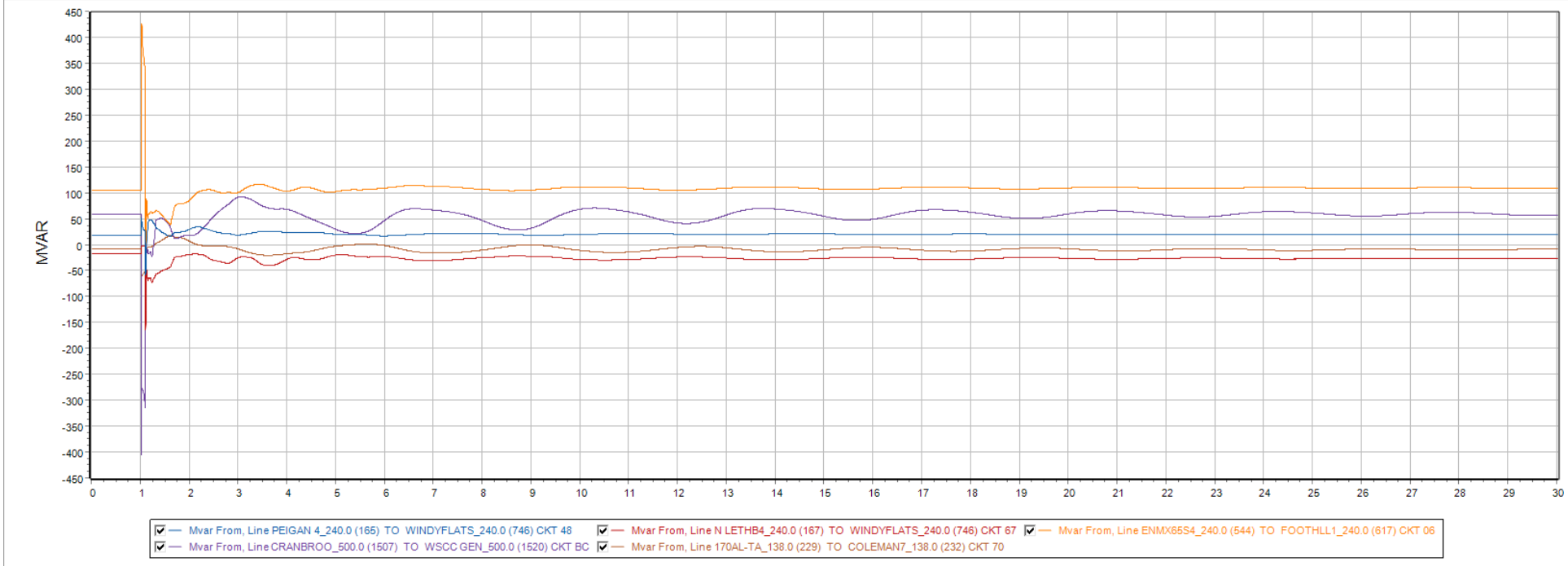
Monitor Bus Volts Q3



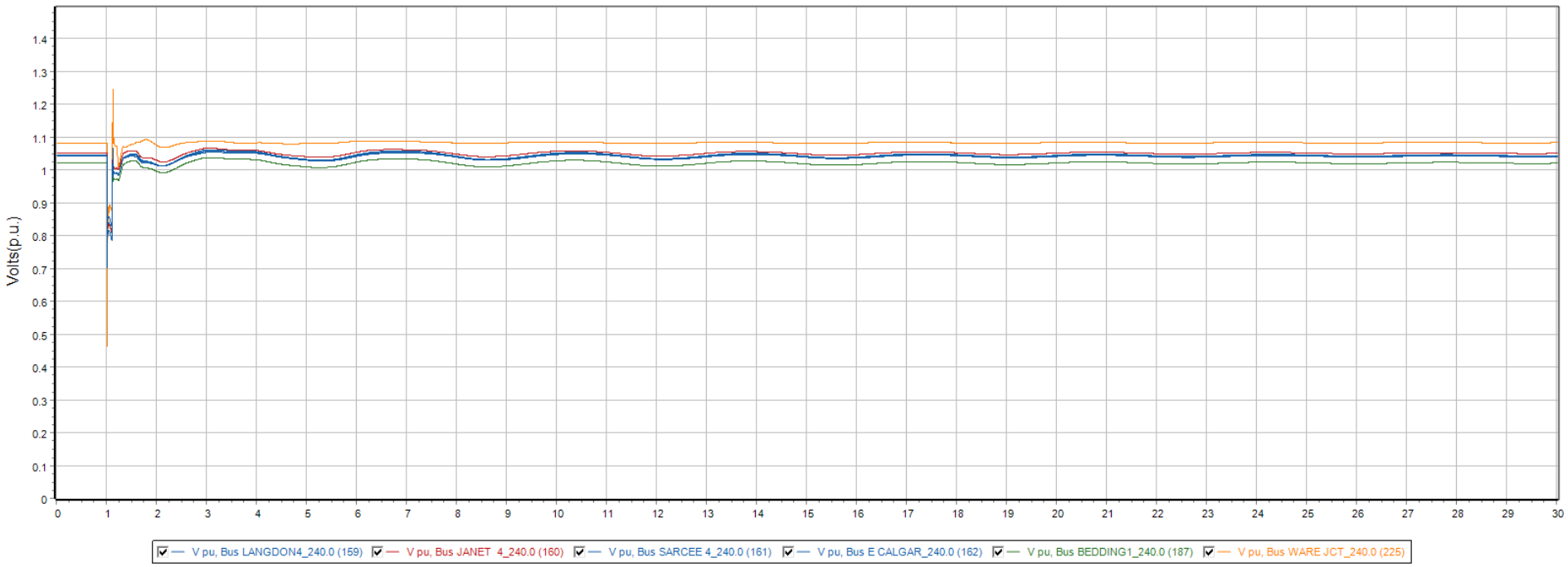


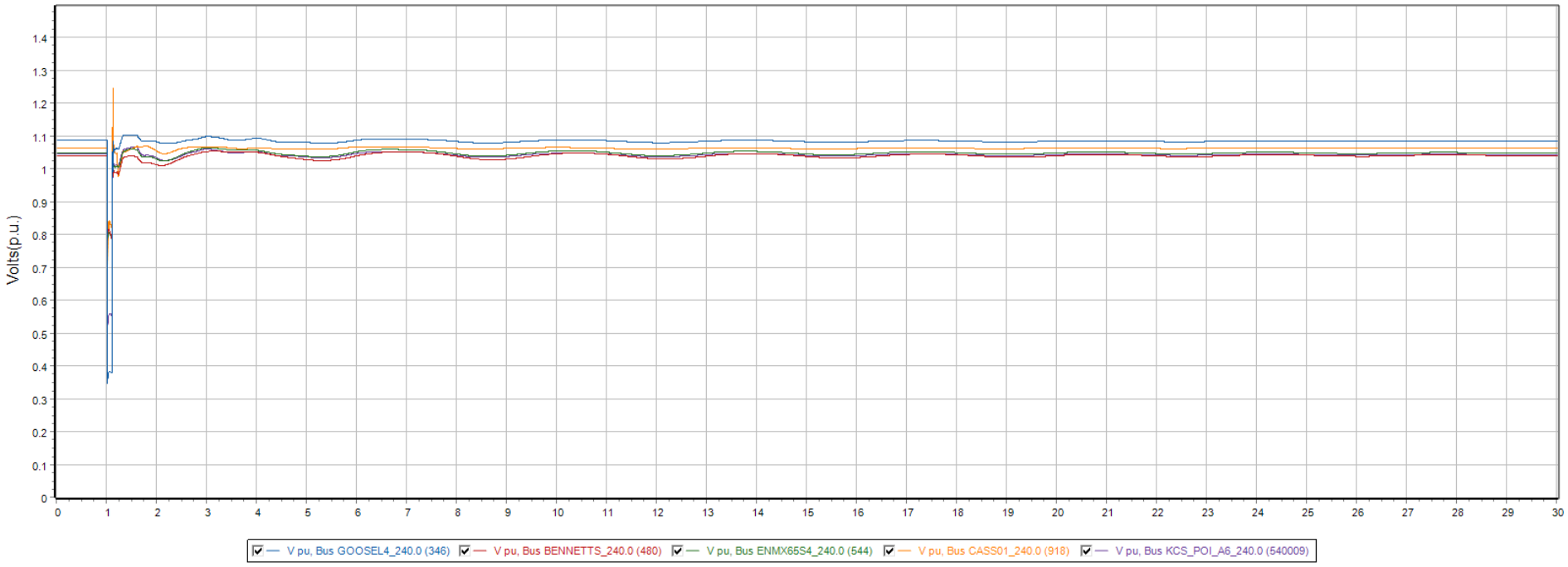
Monitor Line MW & MVAR. Q4



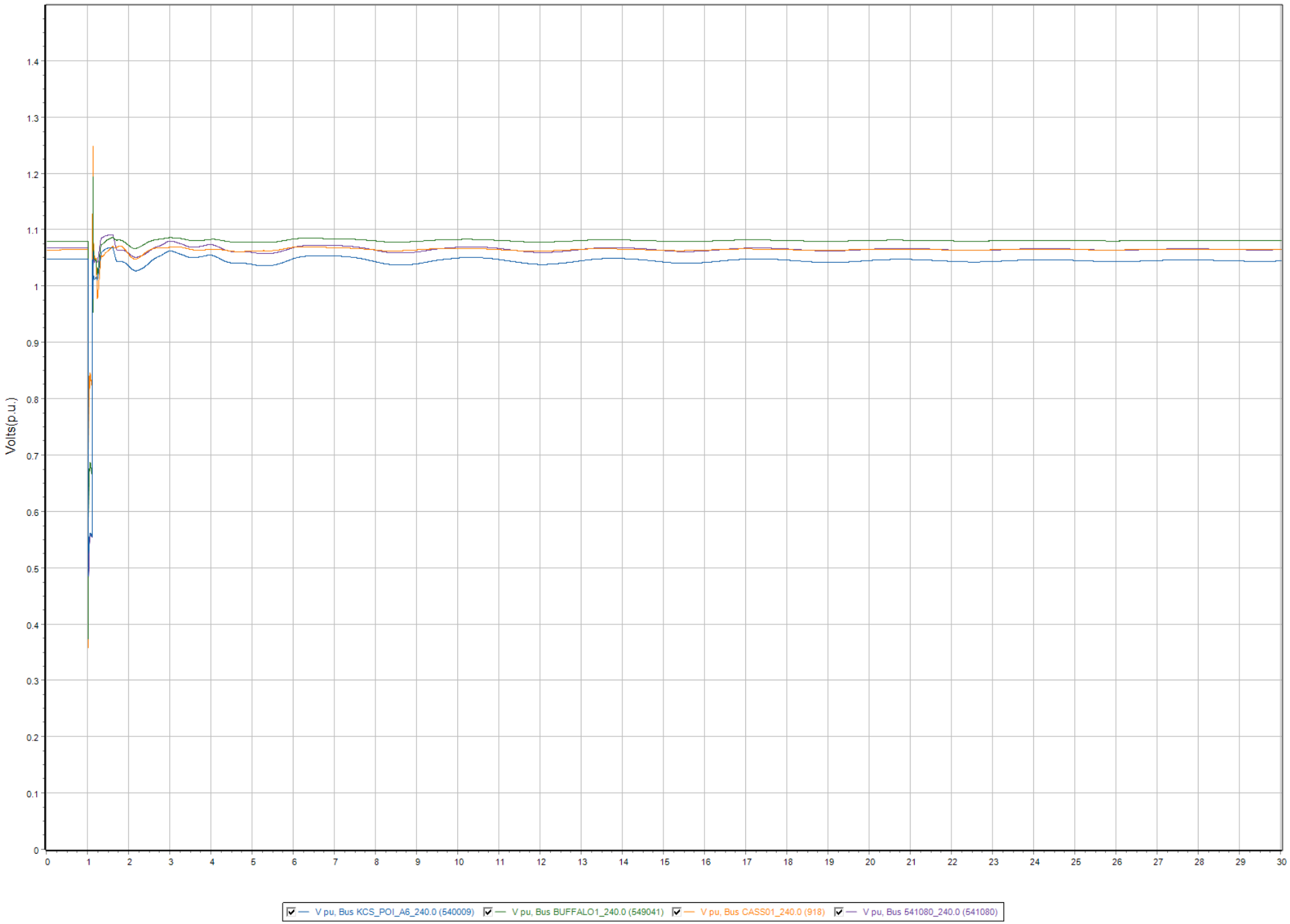


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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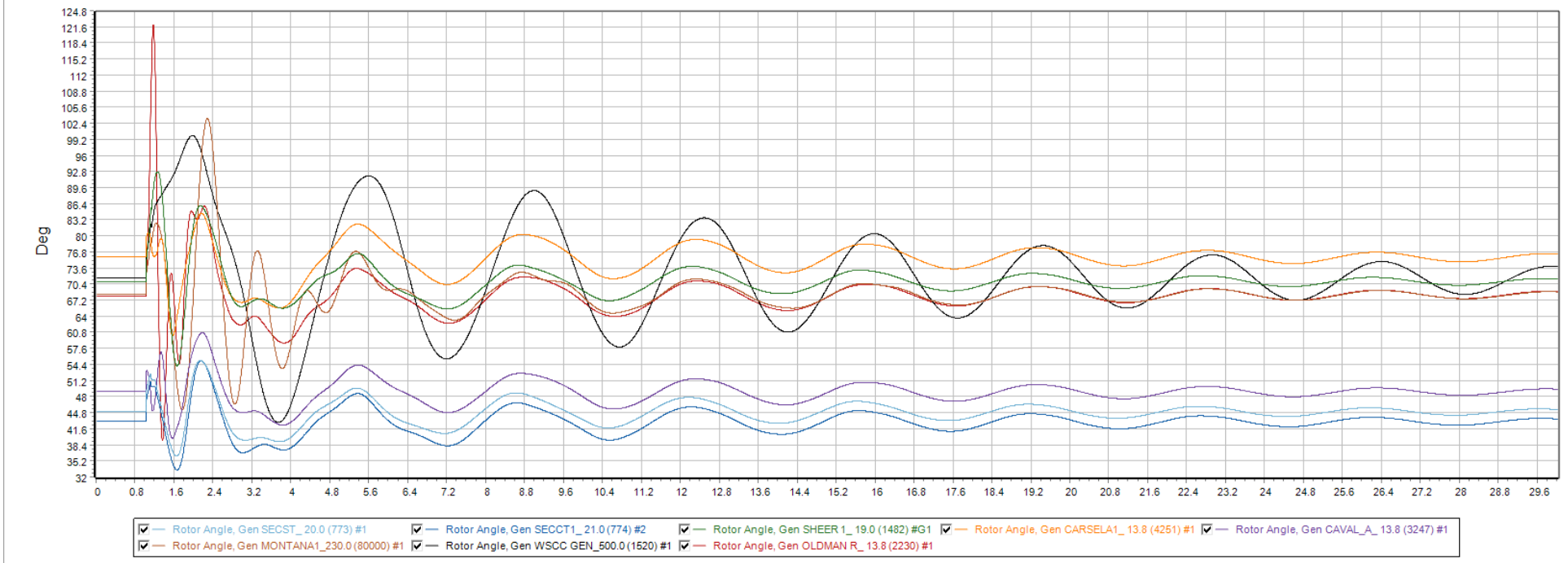
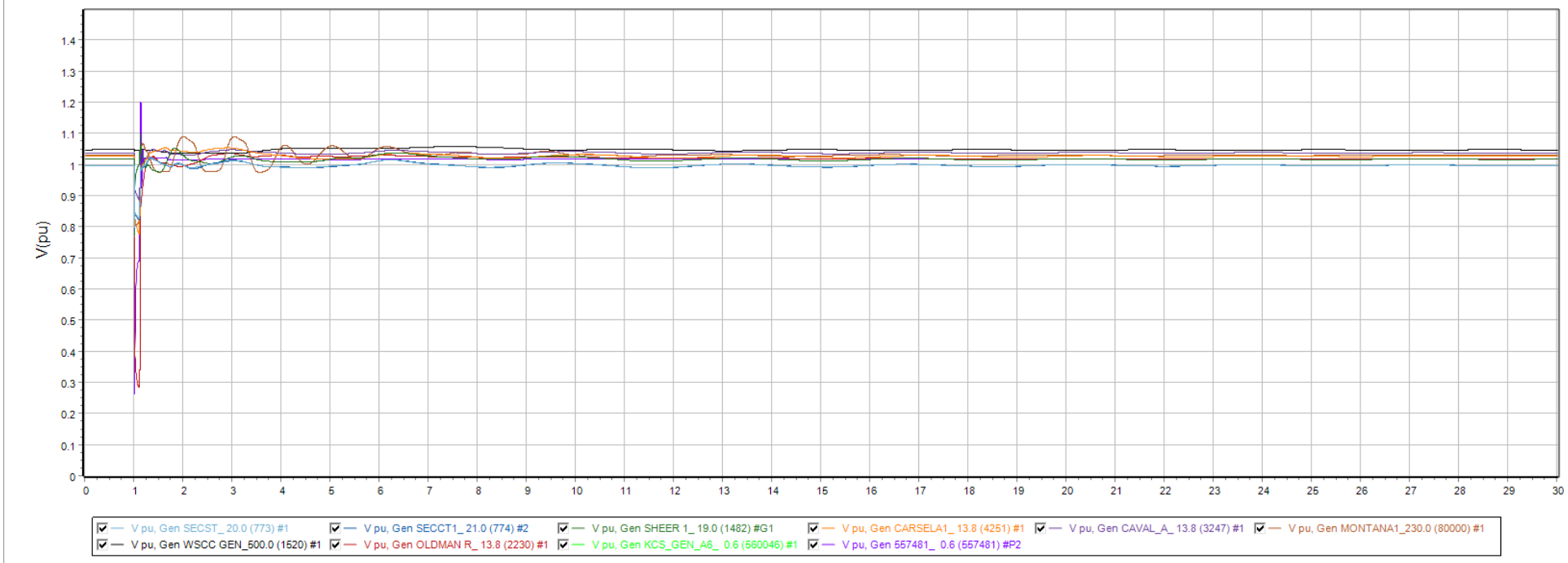
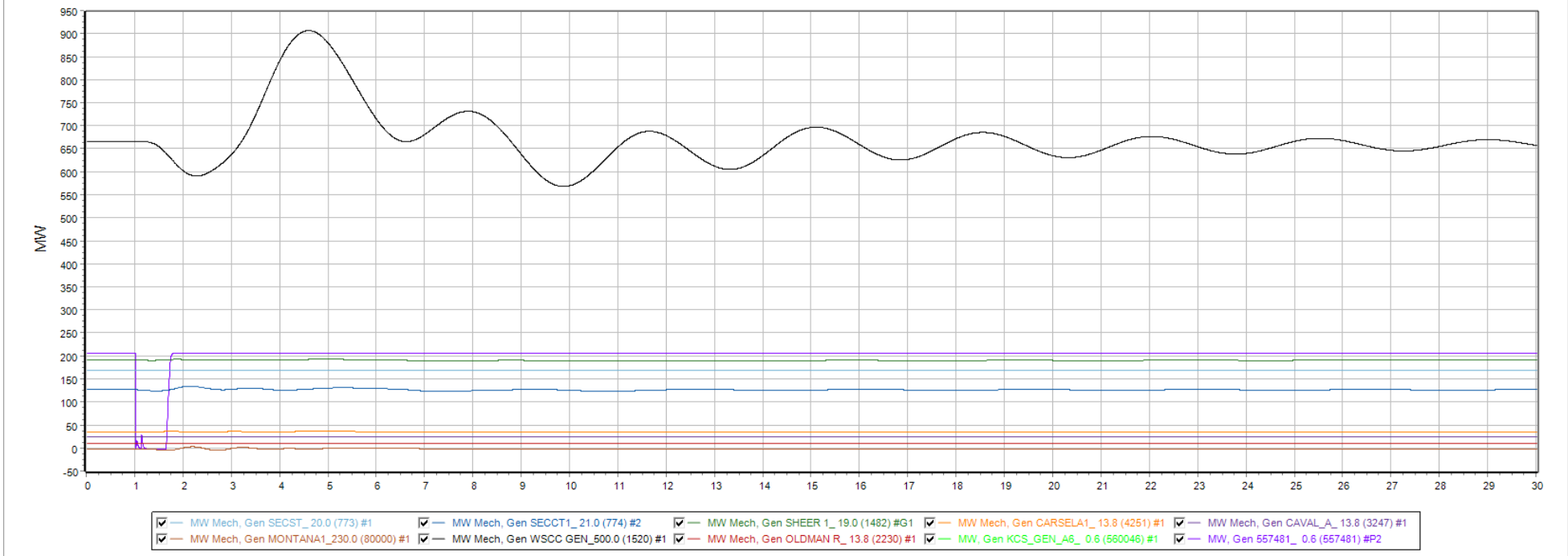
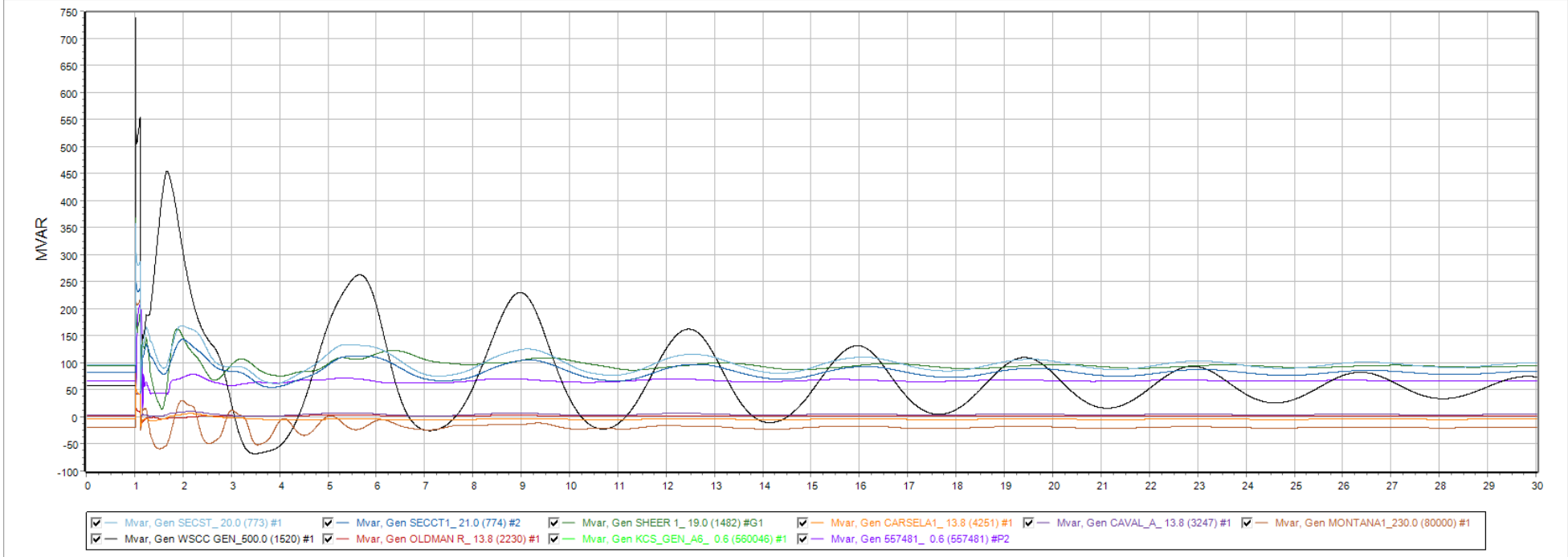
Monitor Gens. Q1



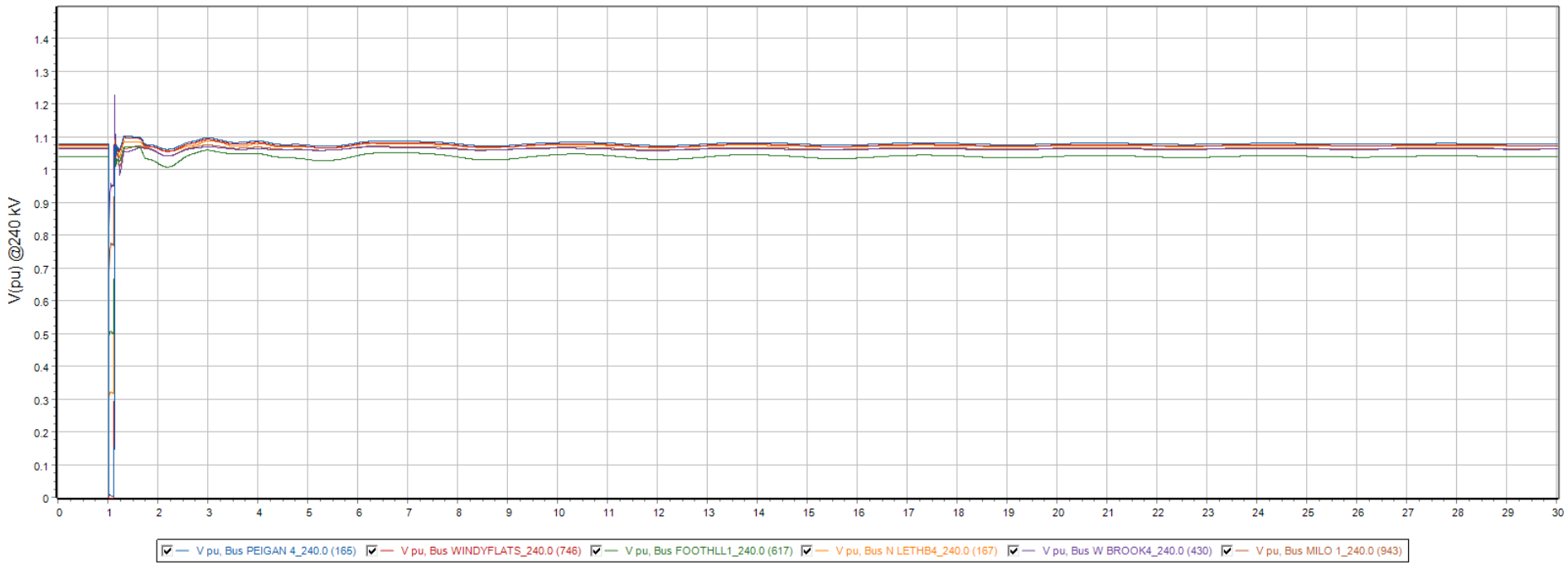


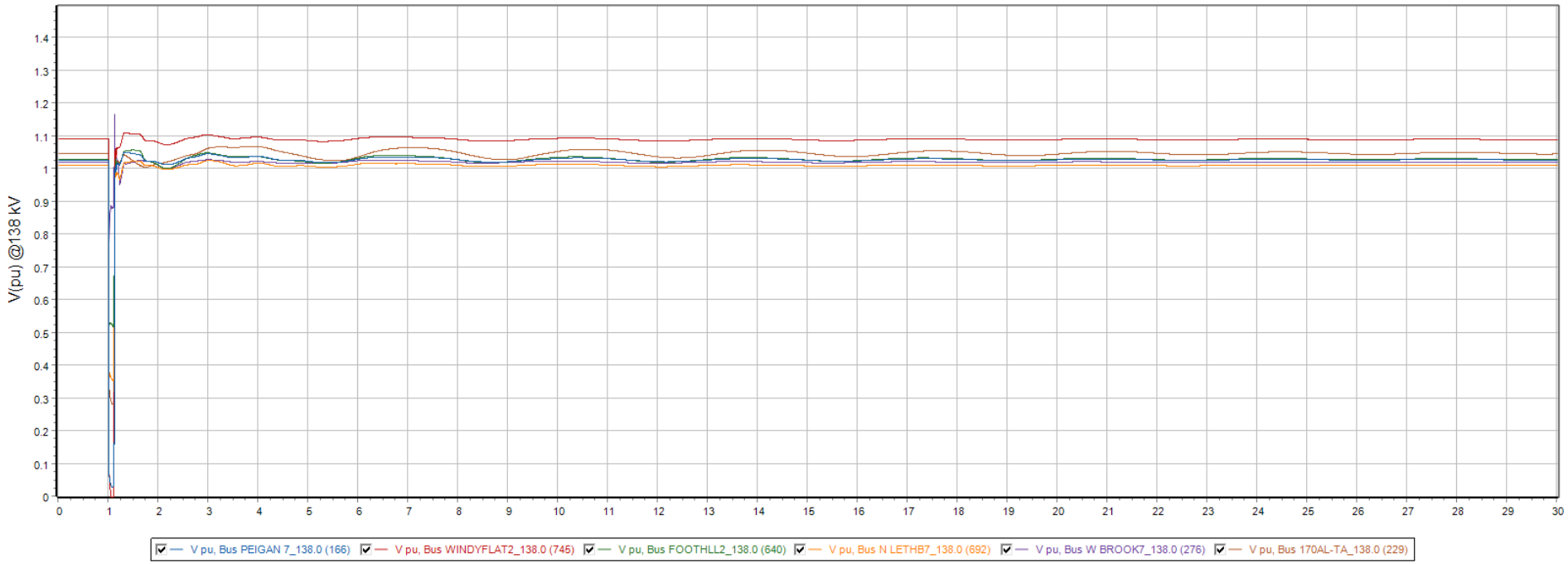
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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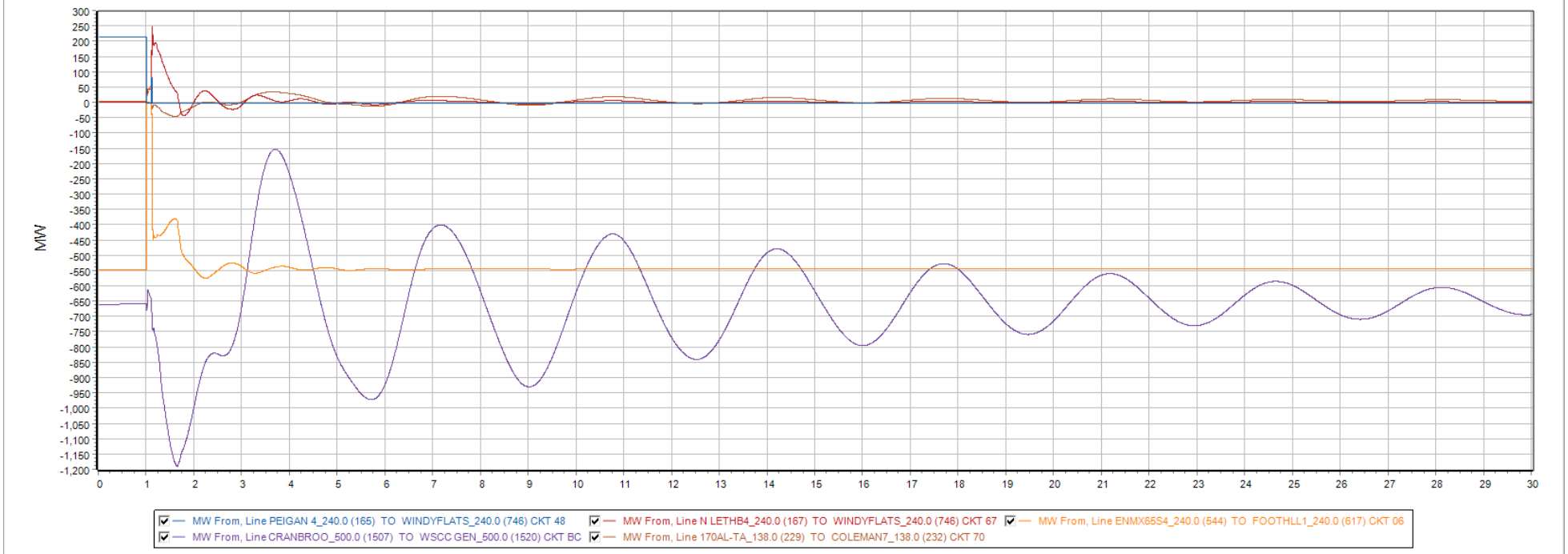
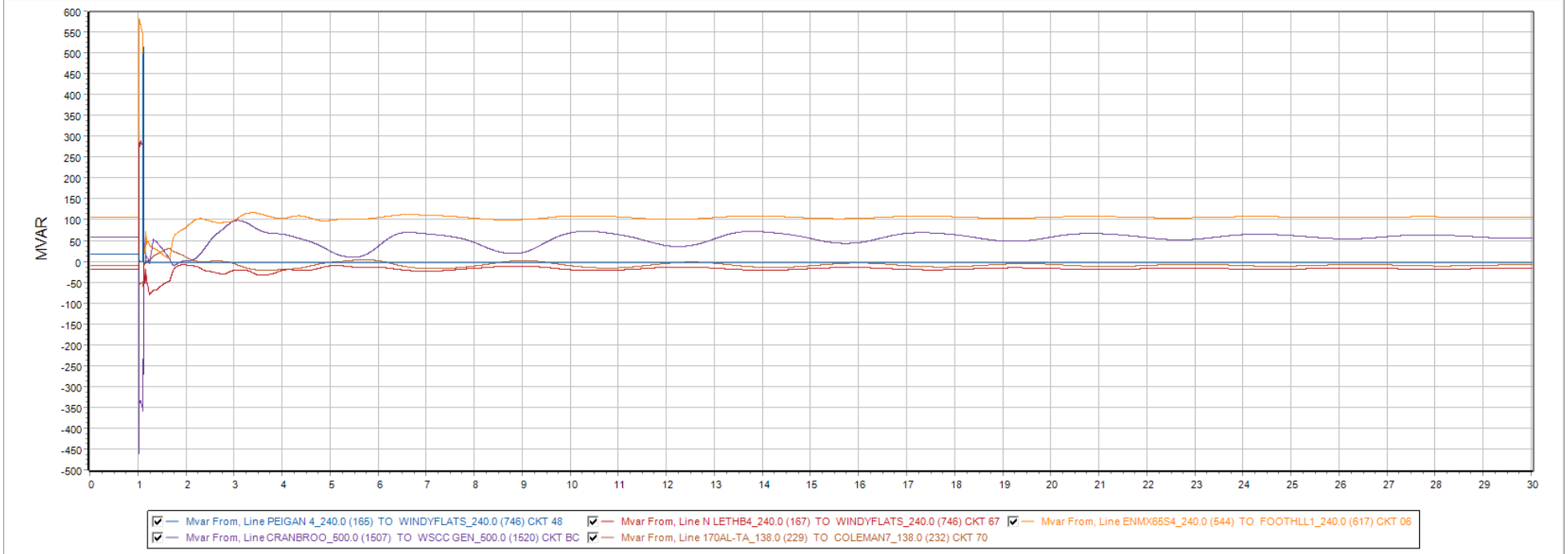
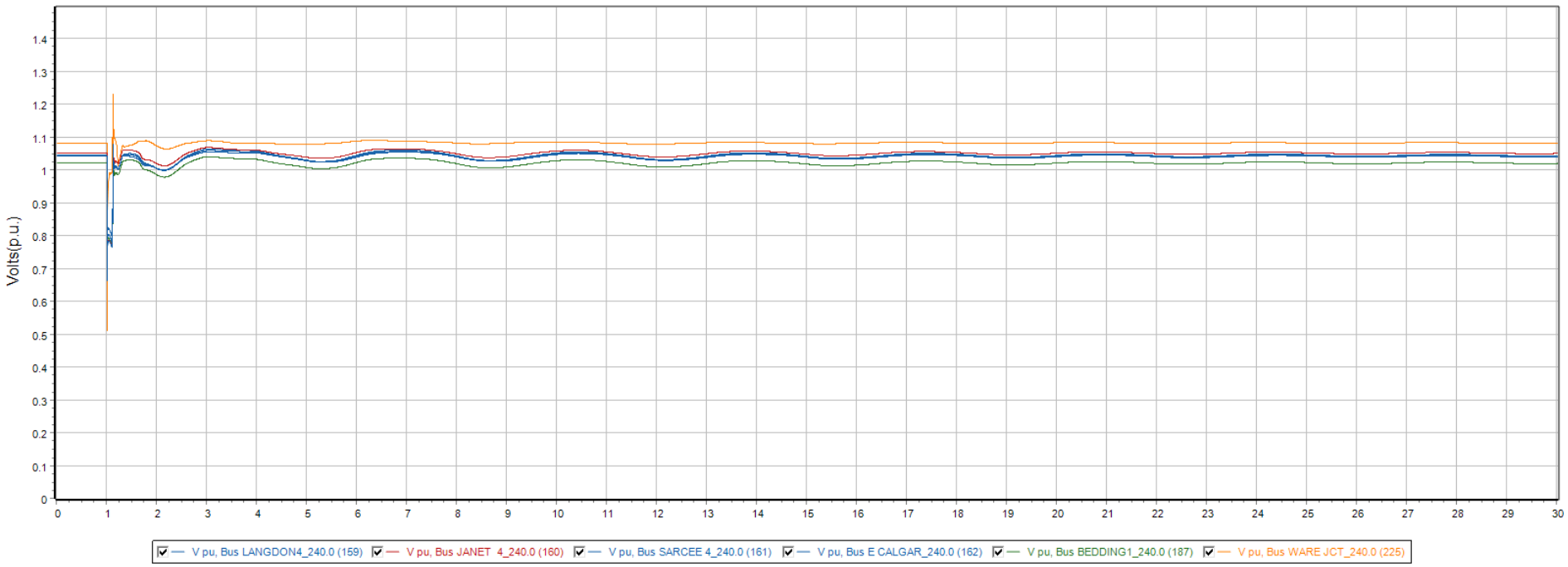
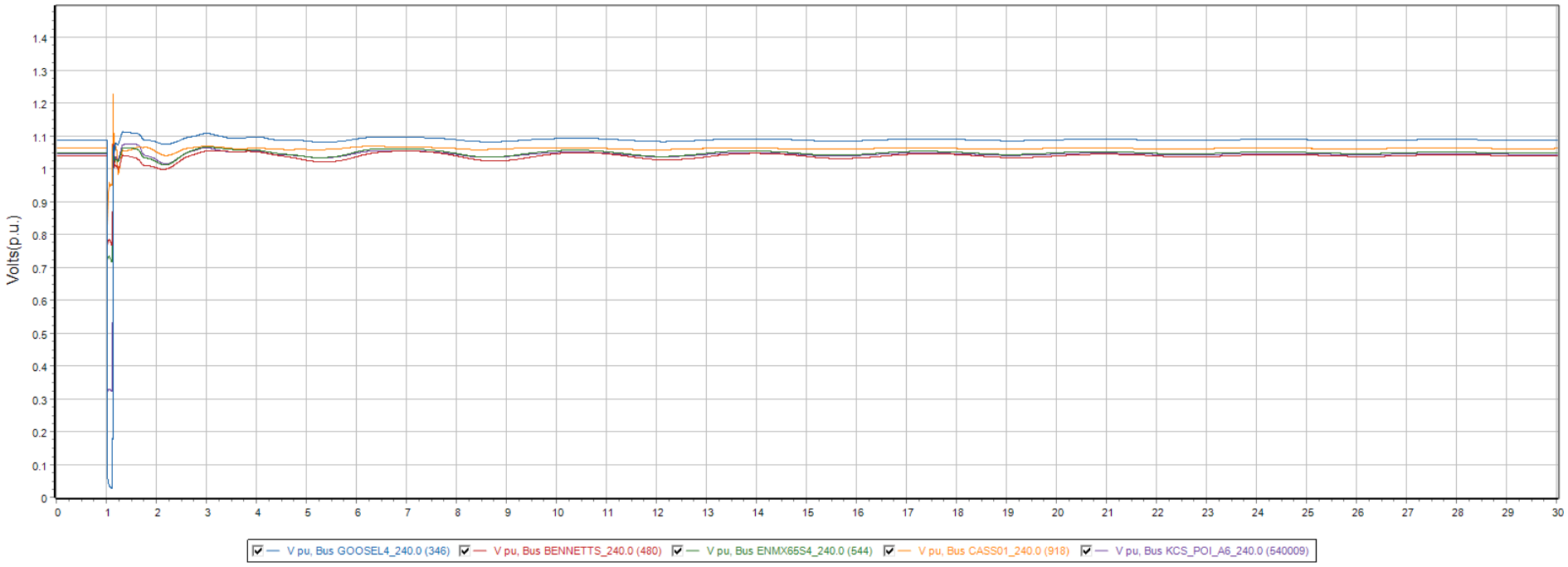
Monitor Line MW & MVAR. Q4



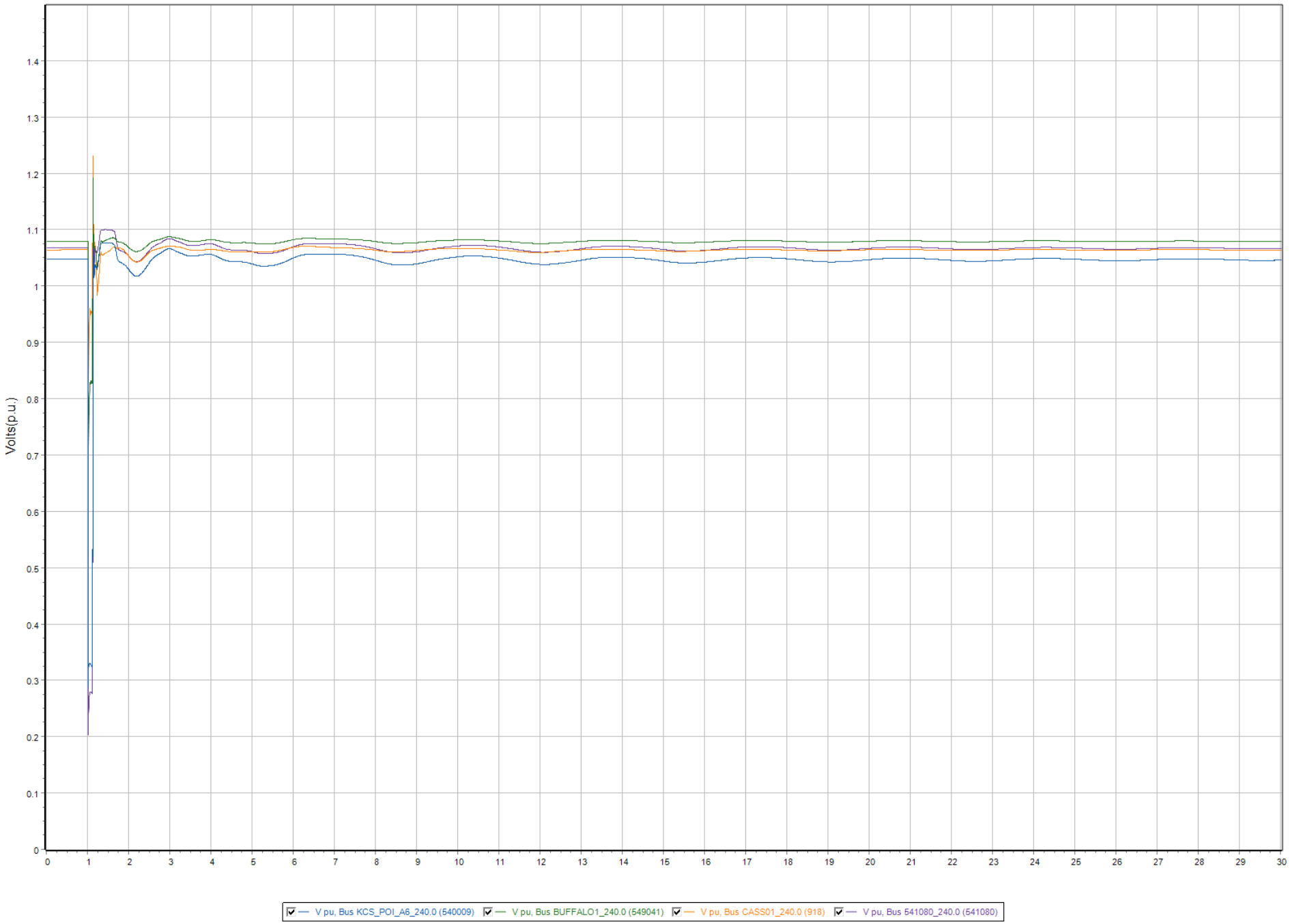


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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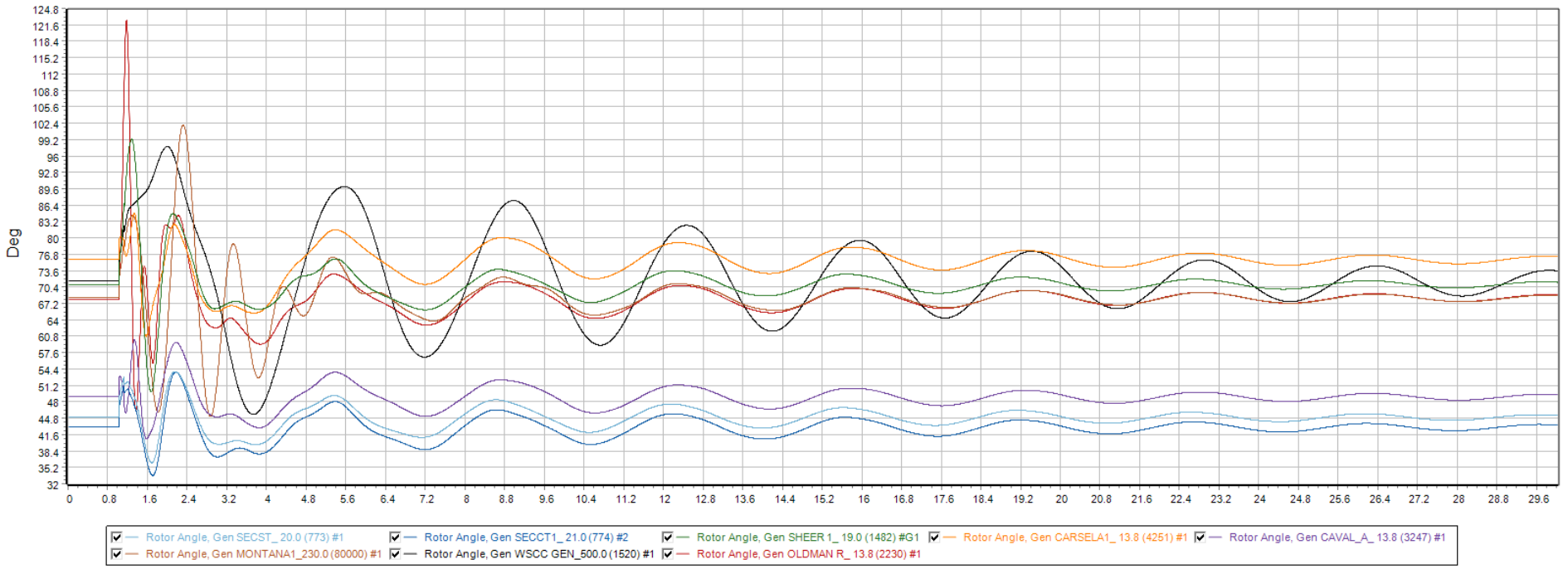
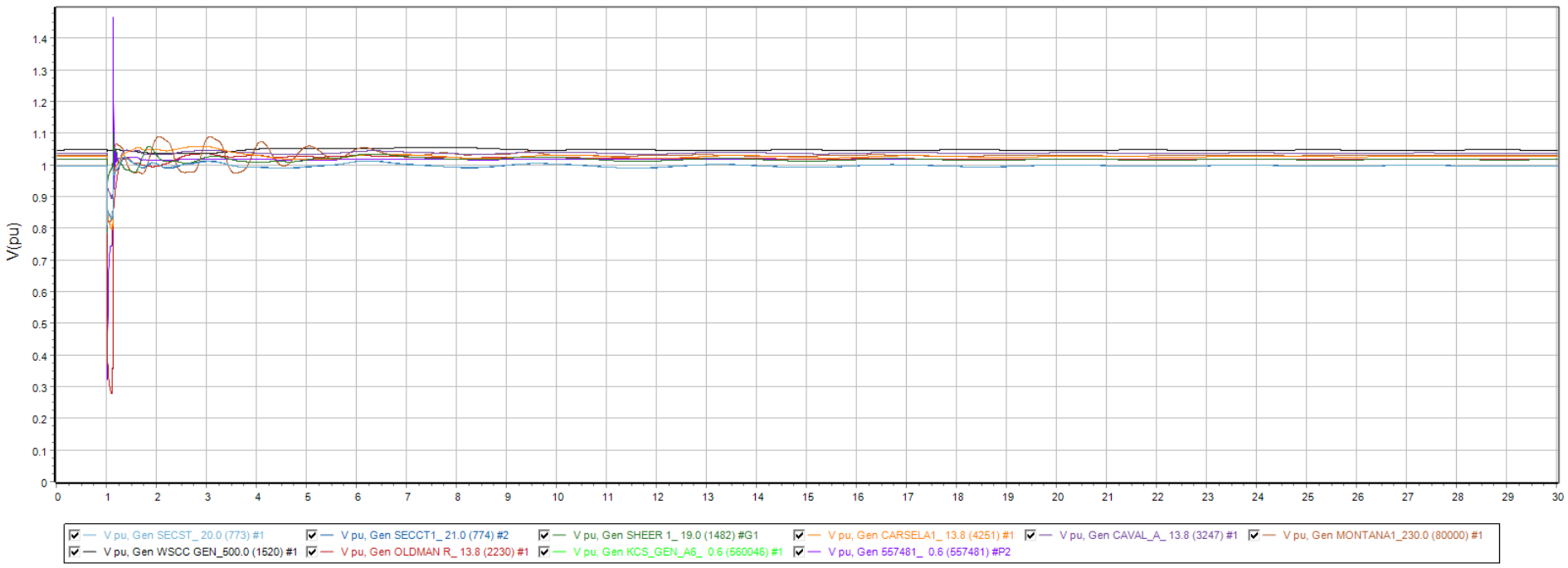
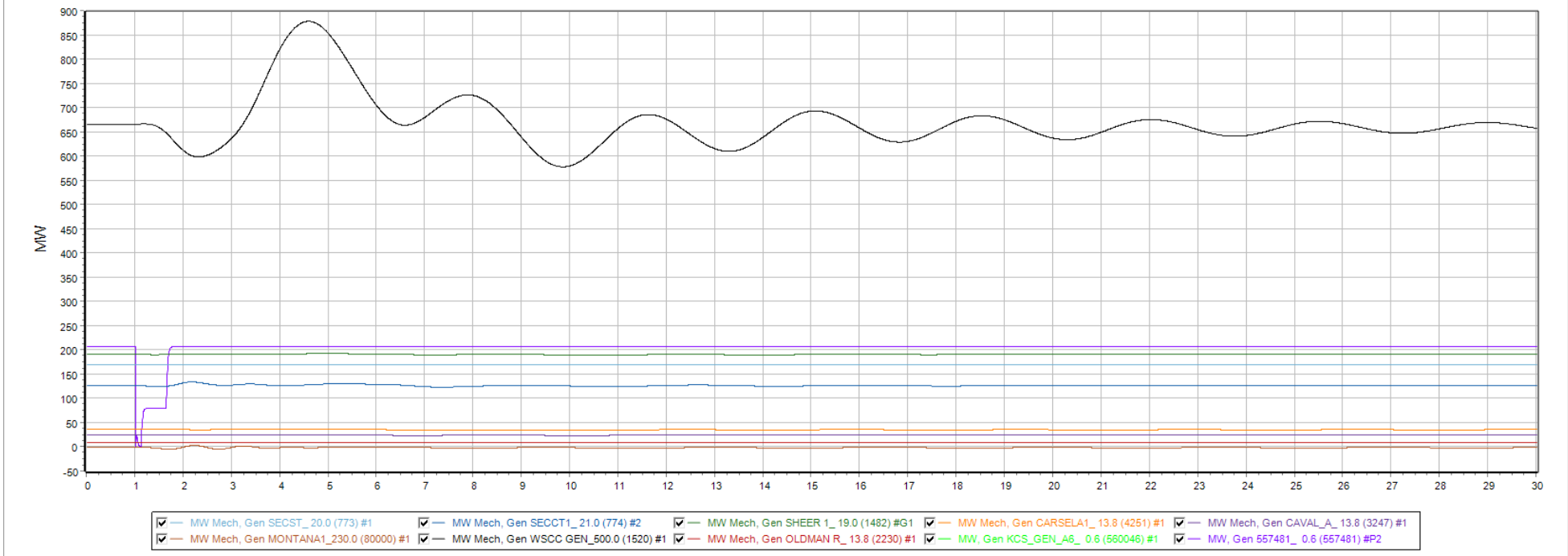
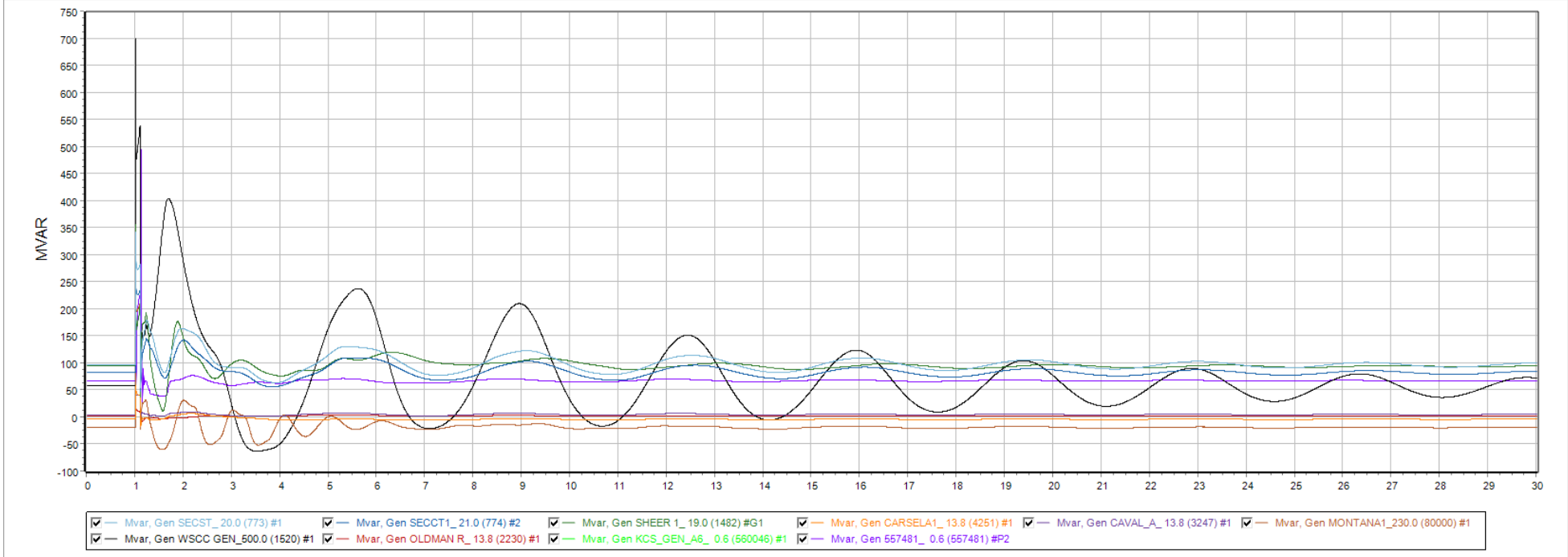
Monitor Gens. Q1



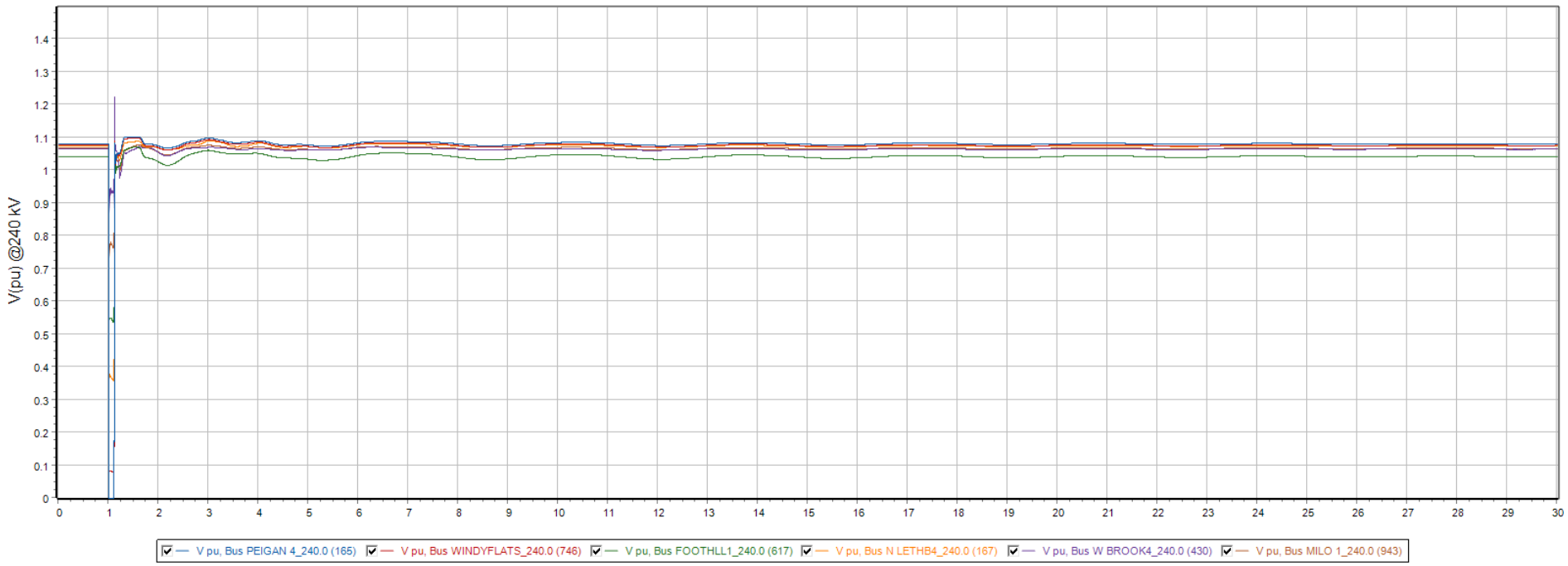


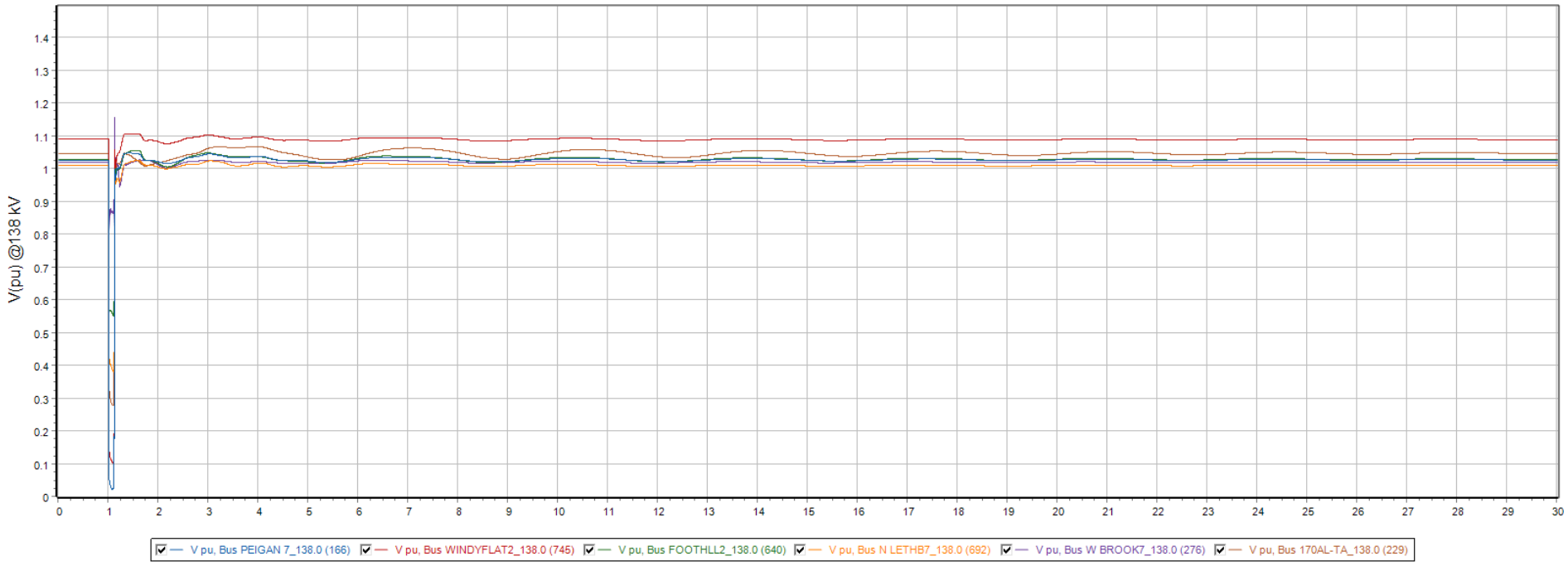
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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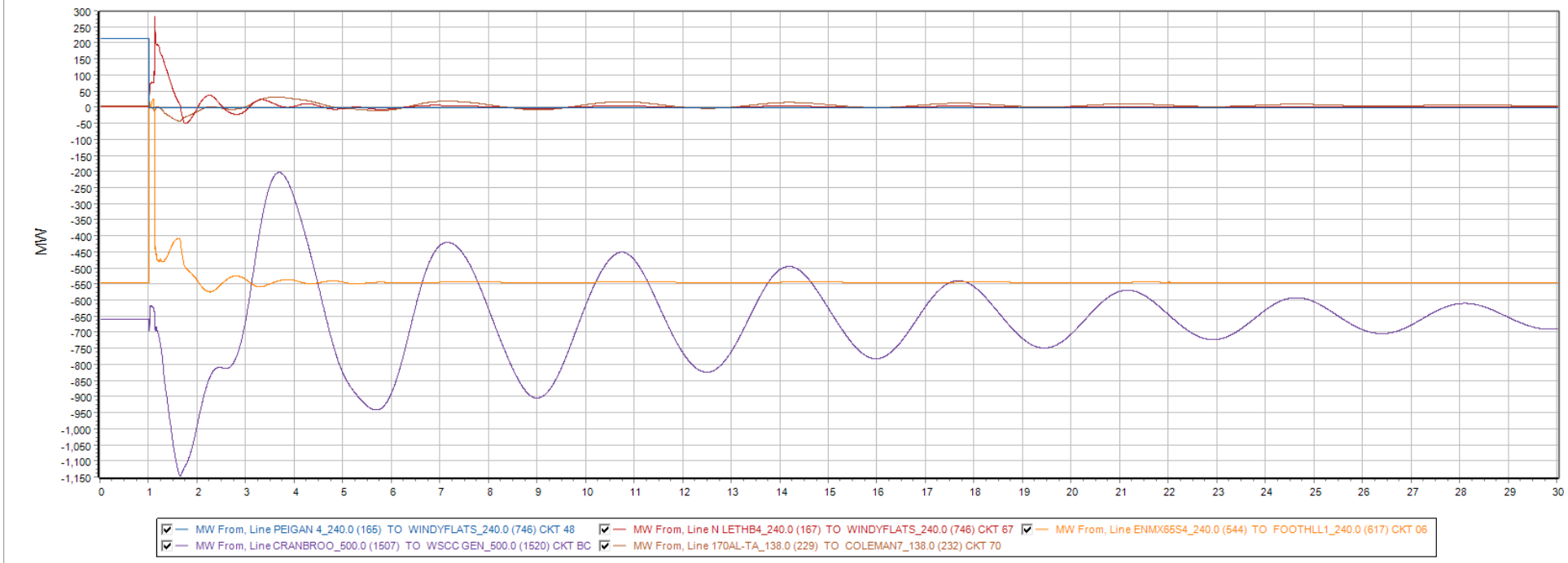
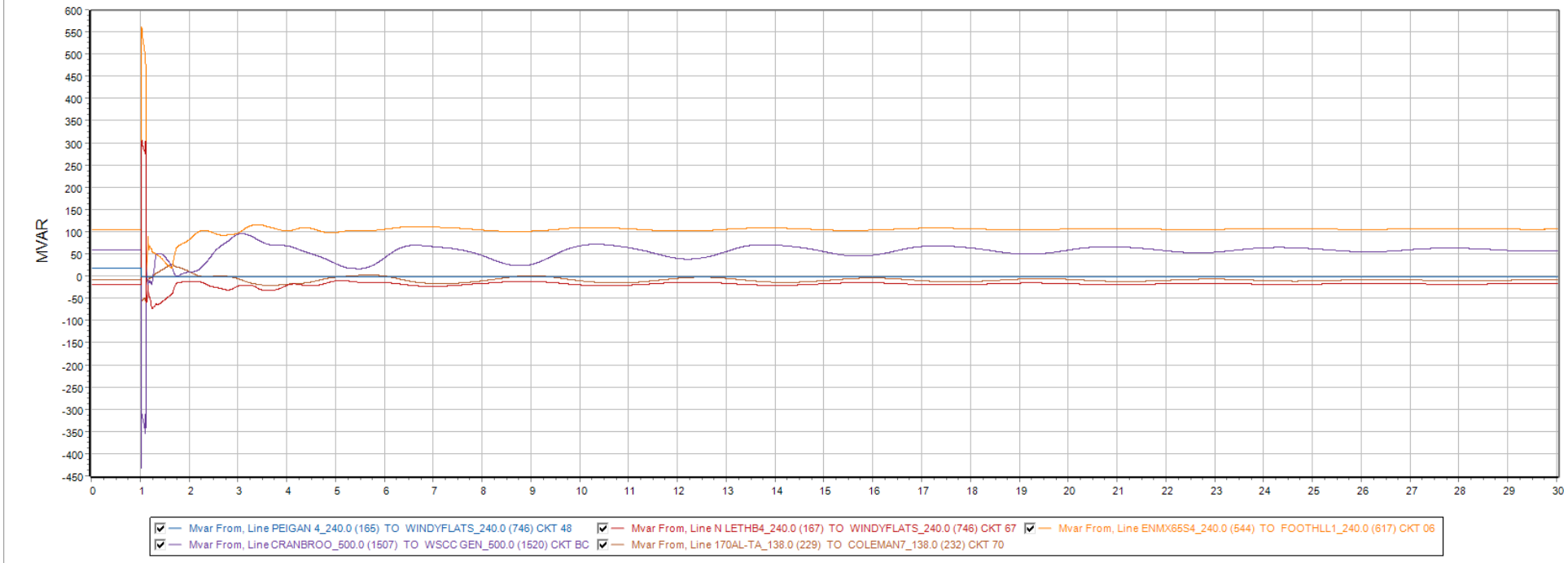
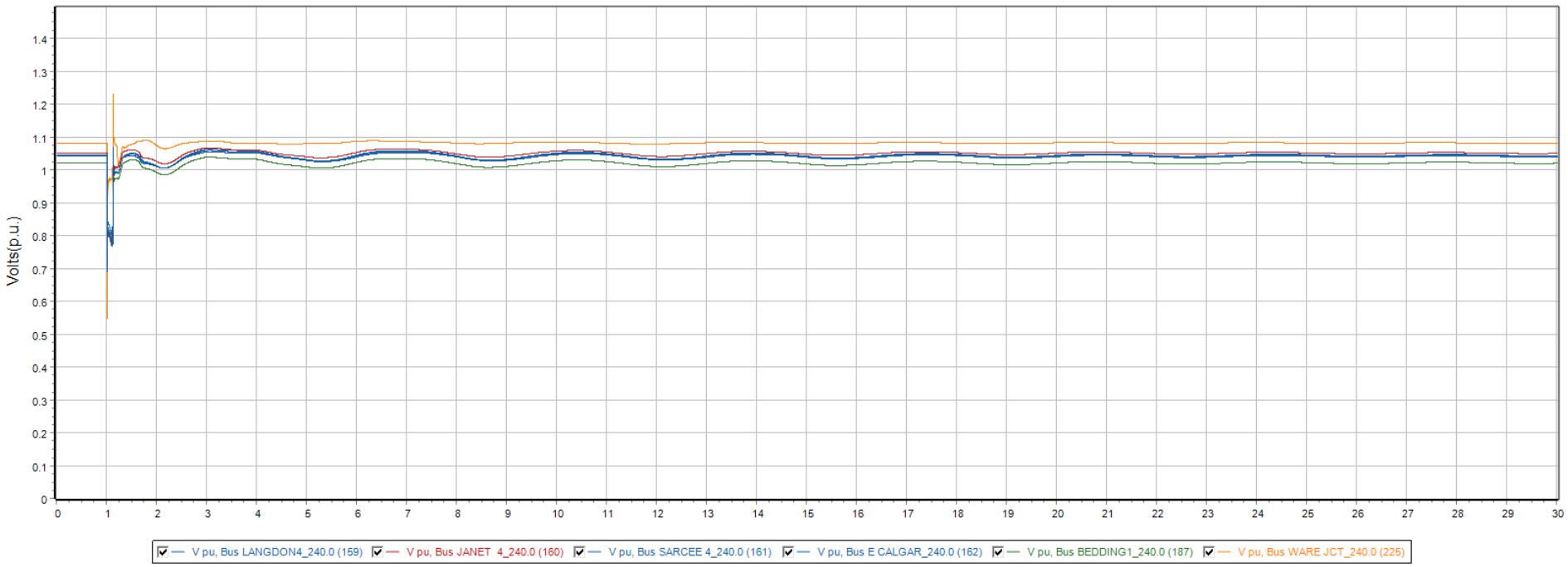
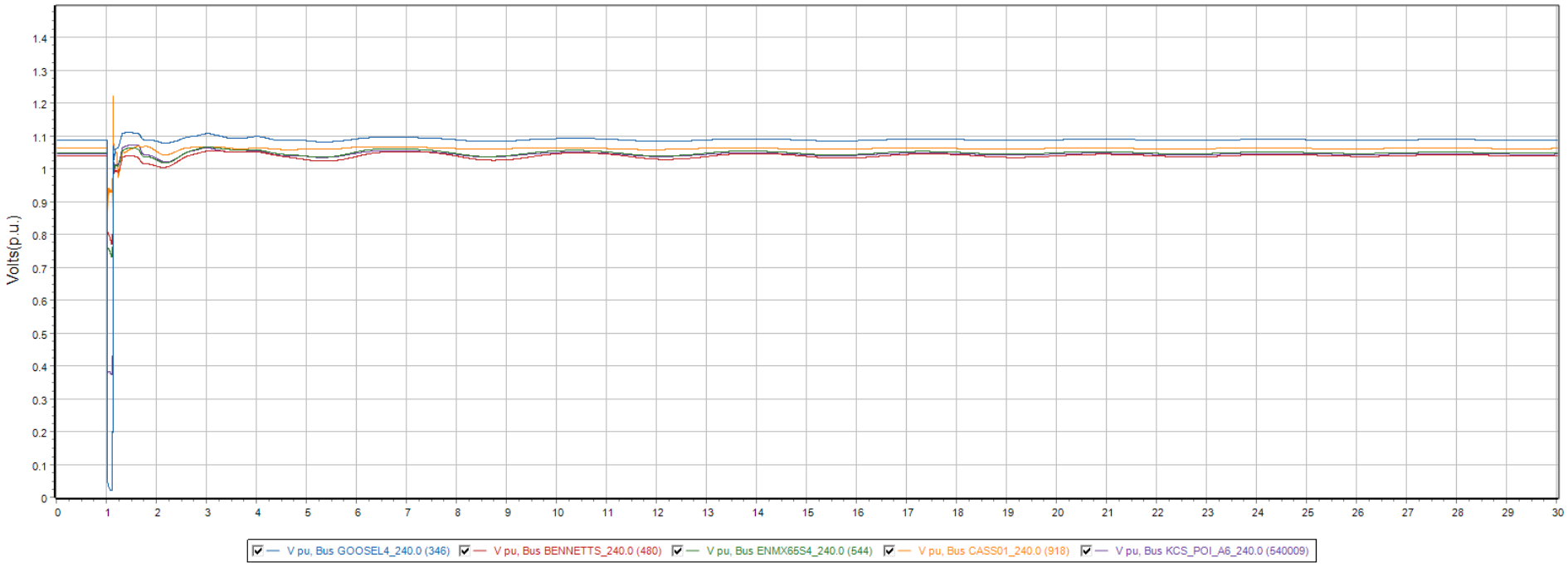
Monitor Line MW & MVAR. Q4



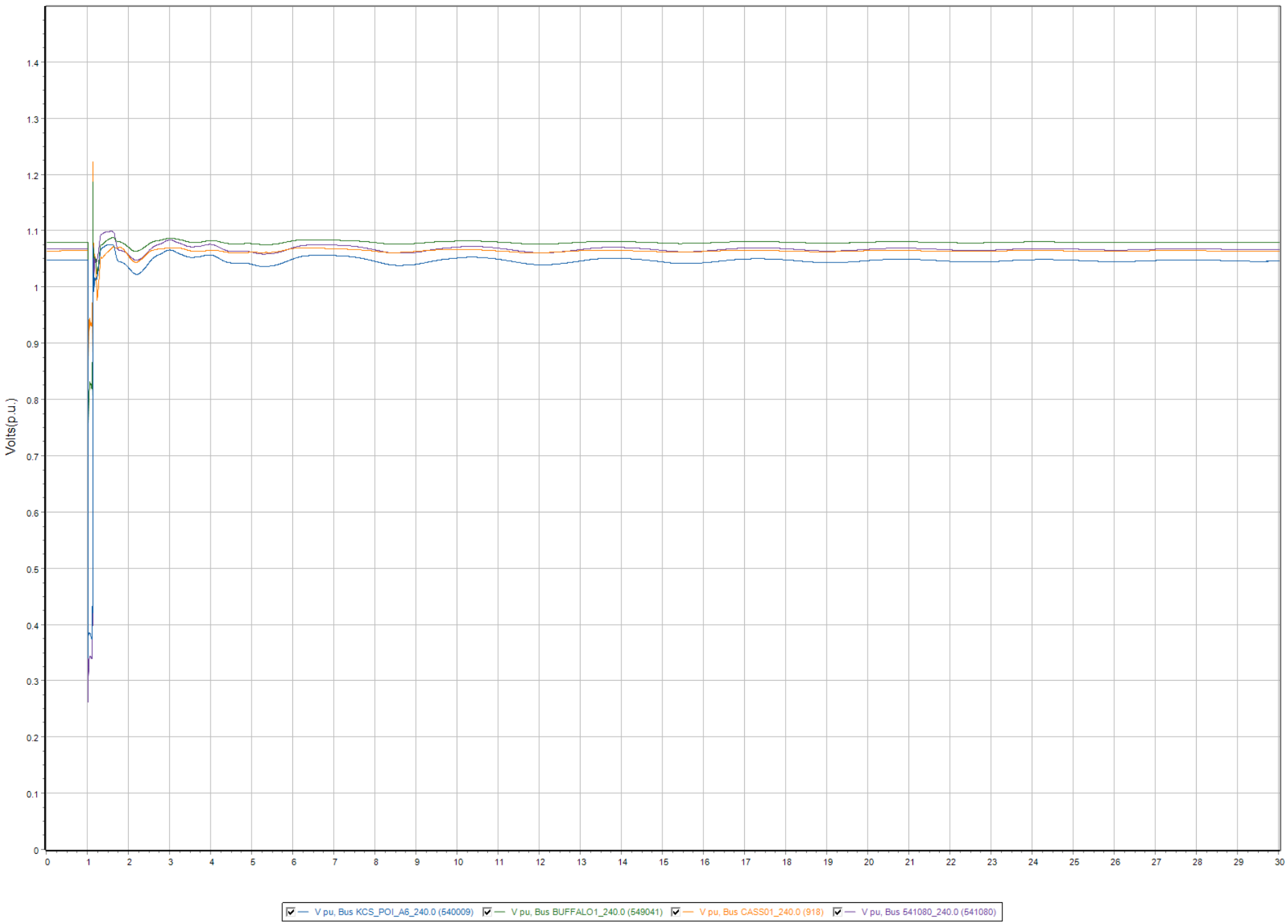


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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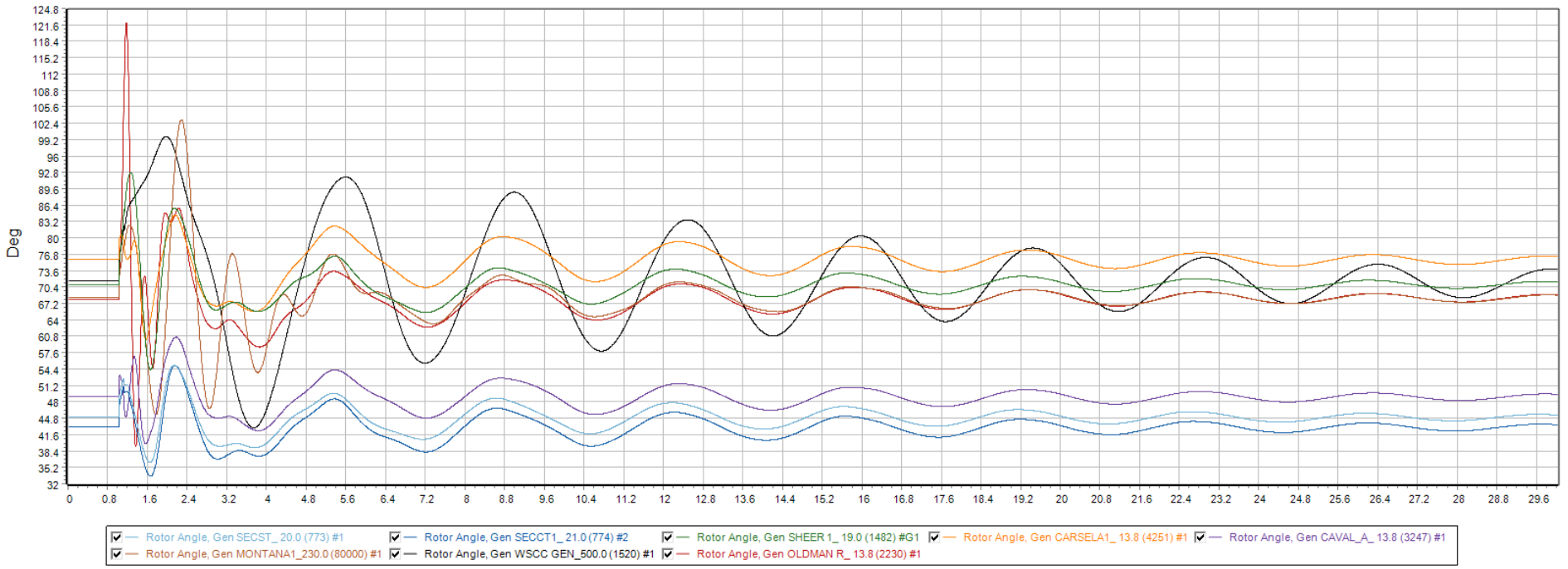
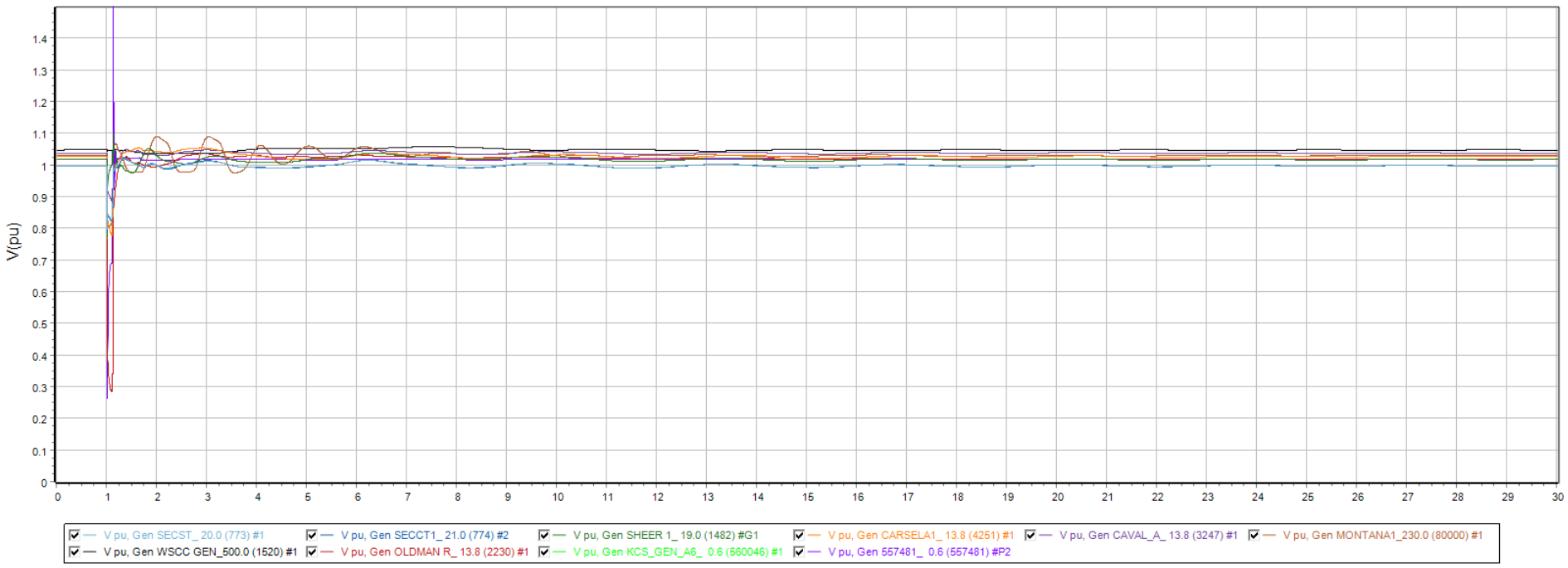
Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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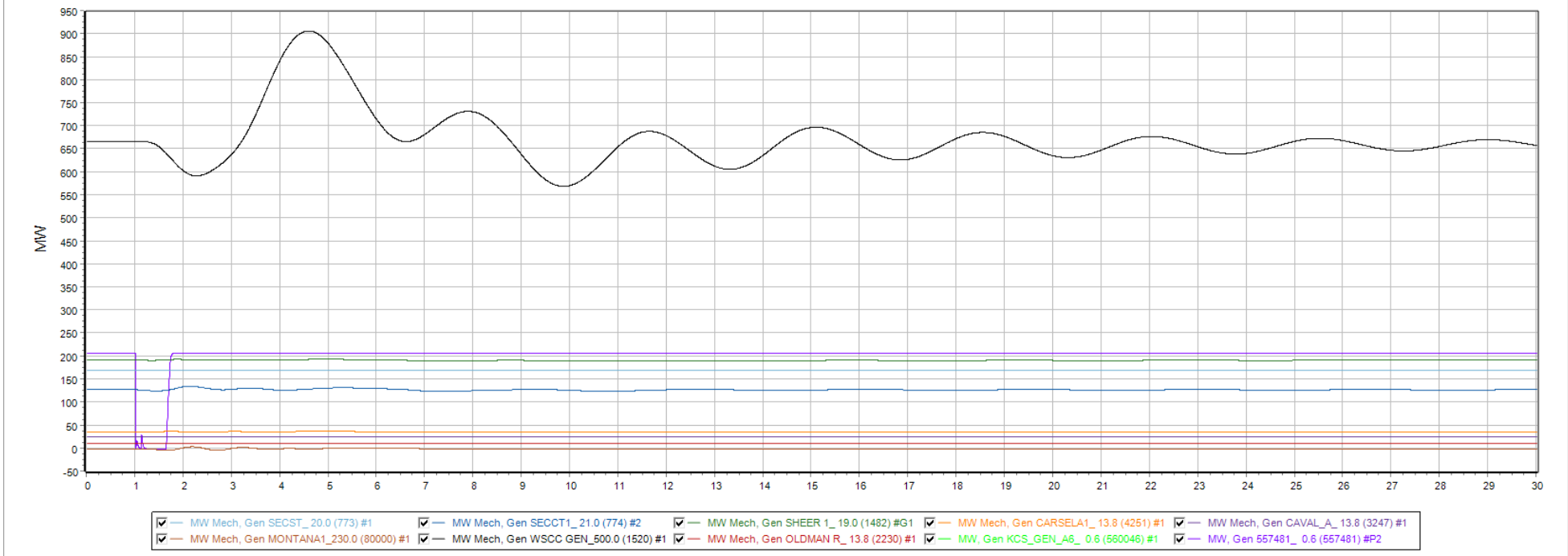
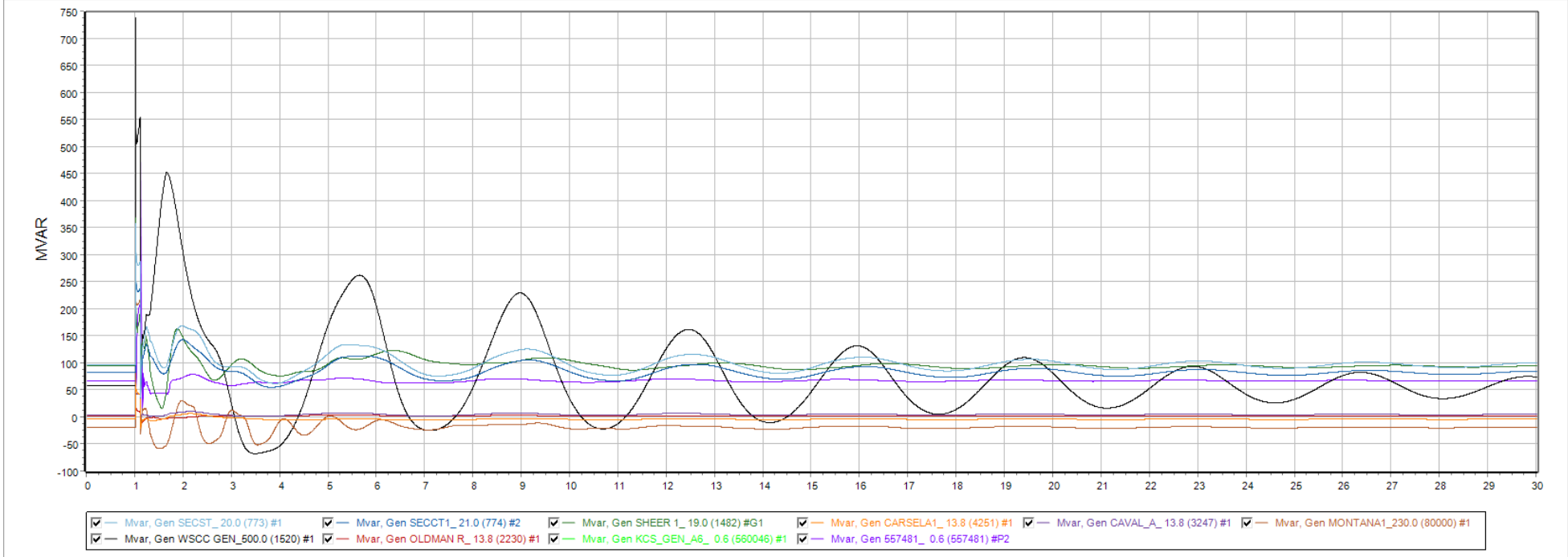
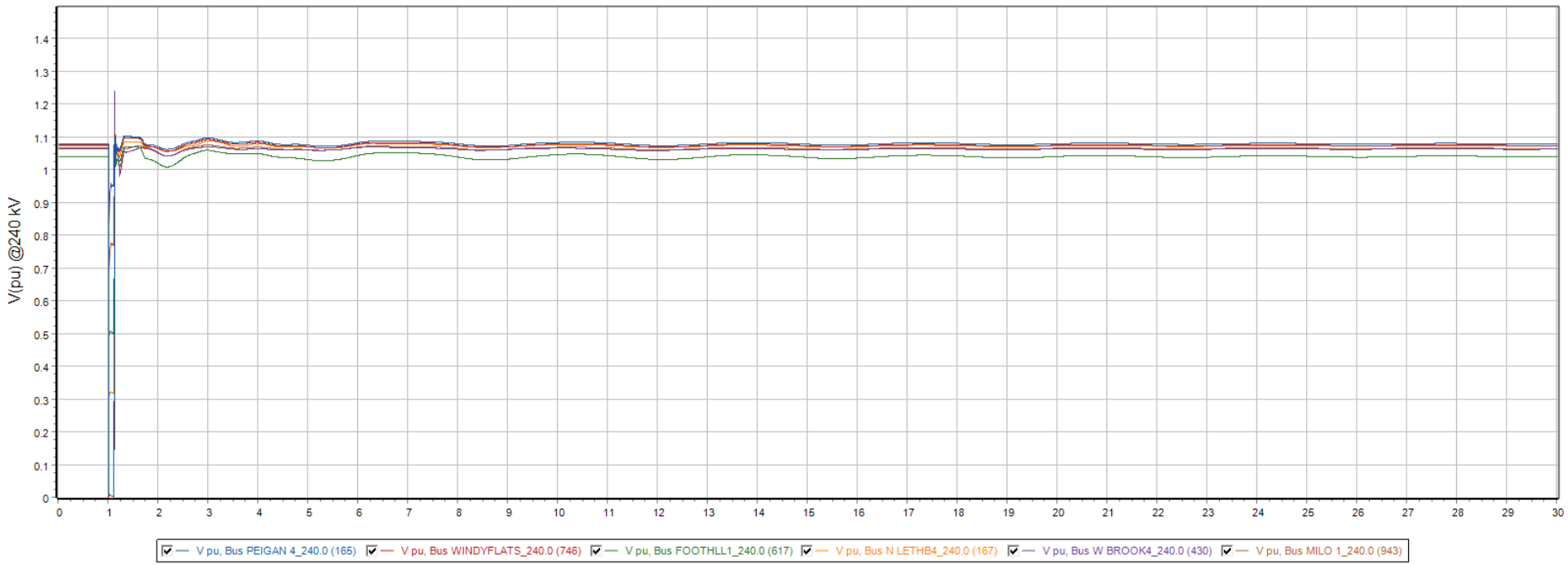
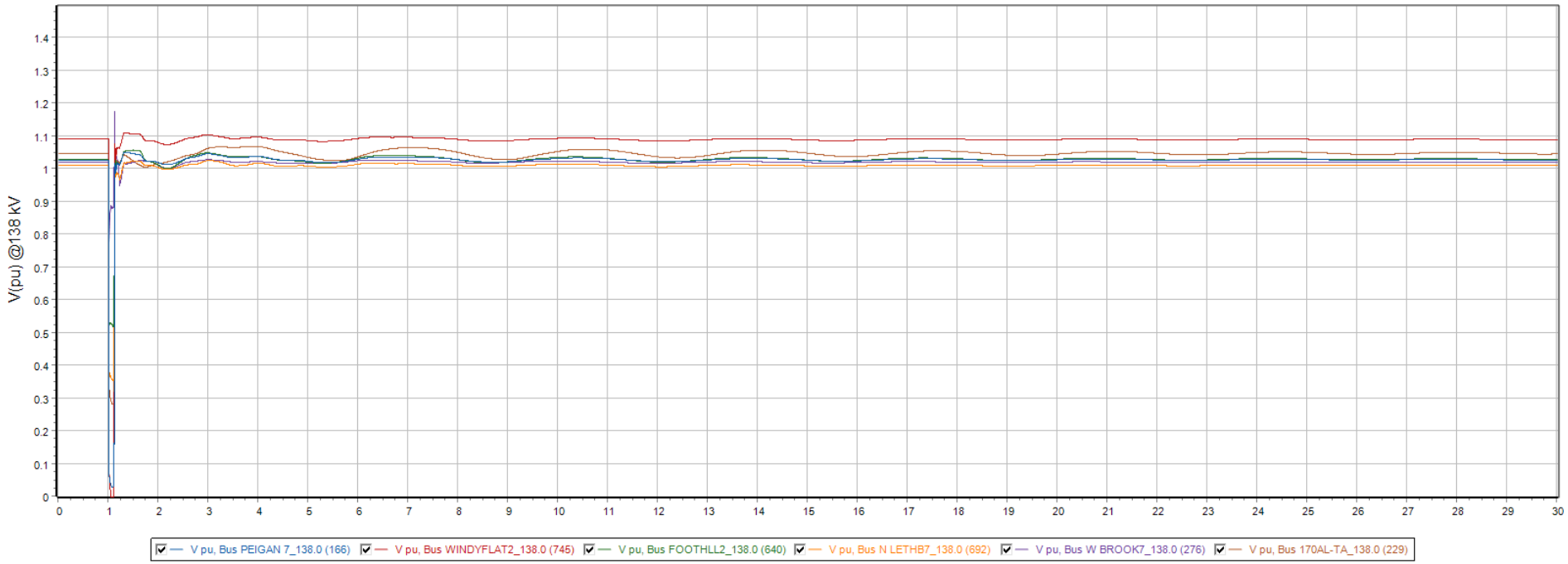
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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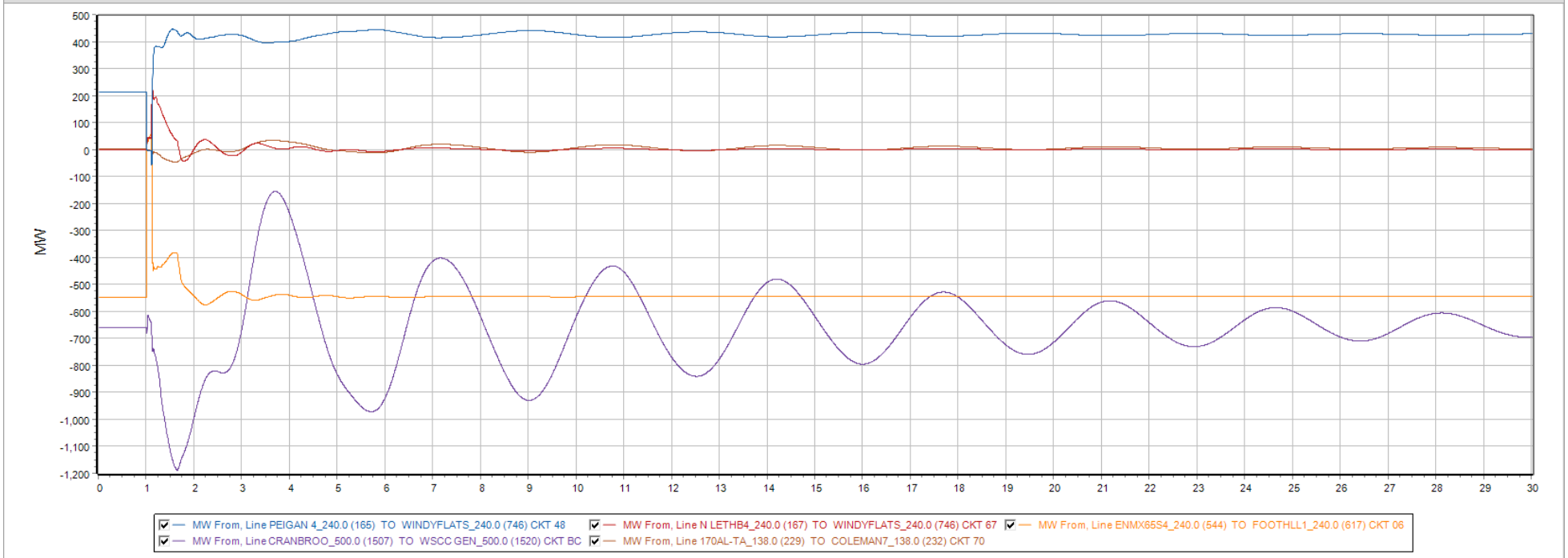
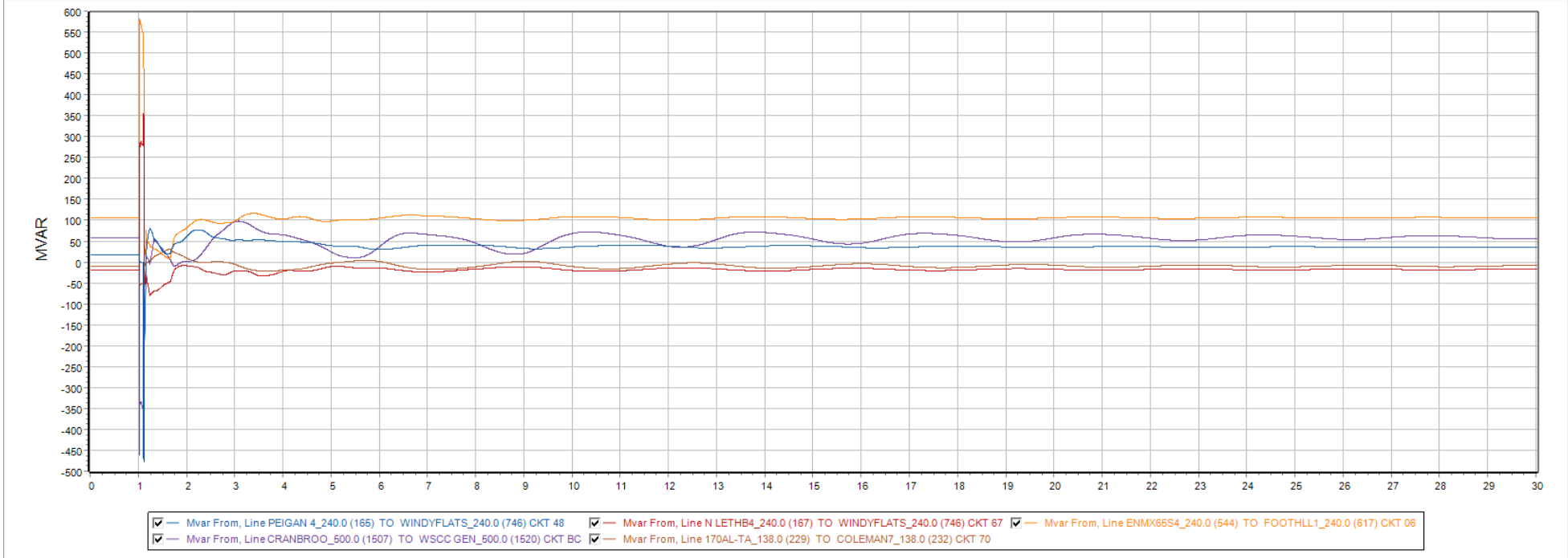
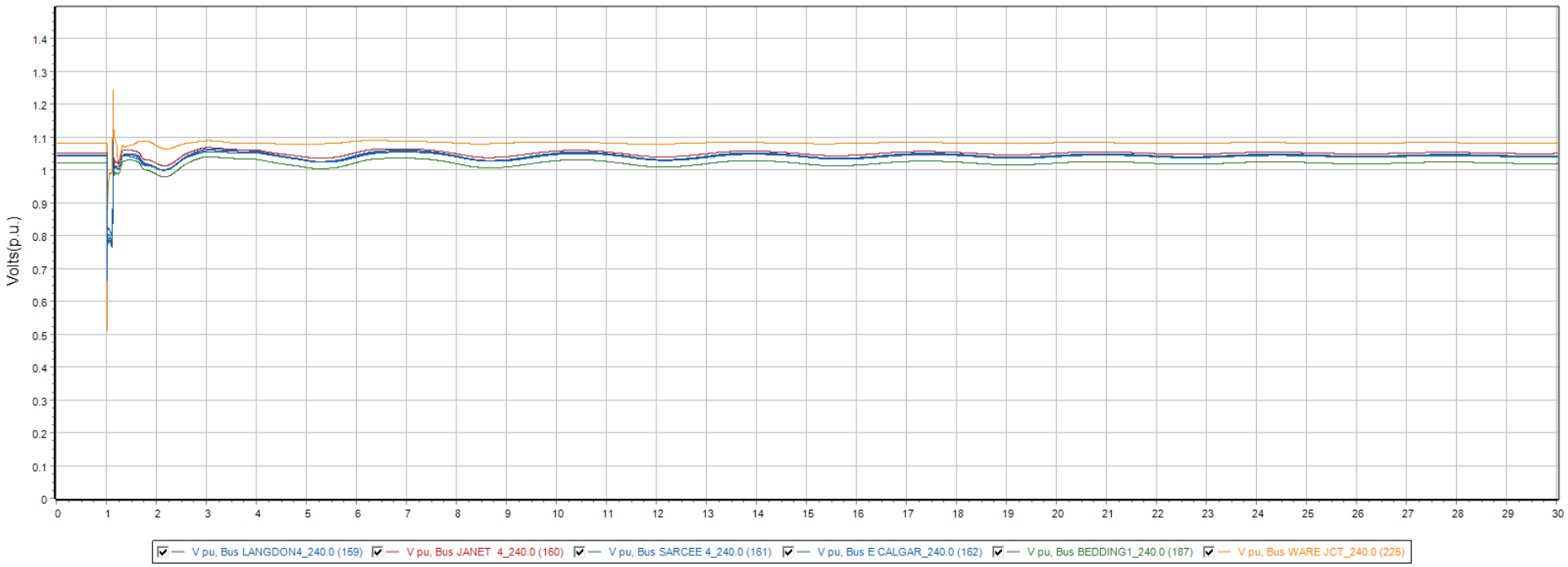
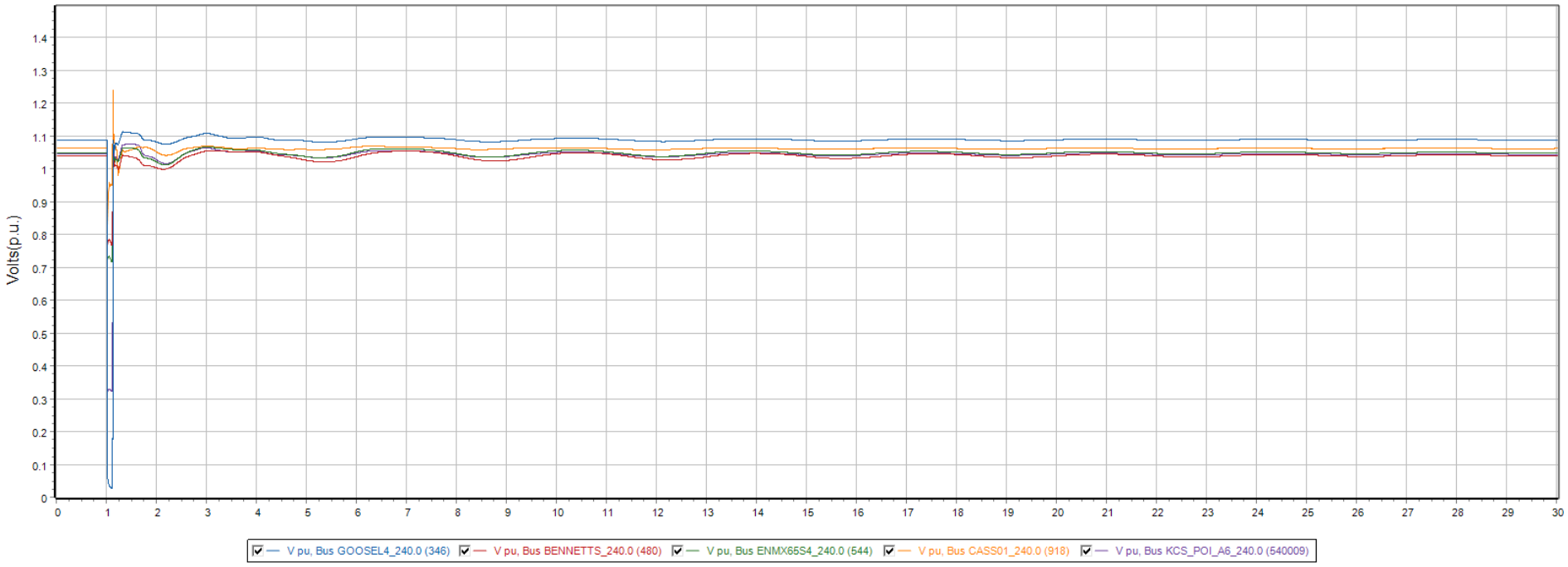
Monitor Line MW & MVAR. Q4



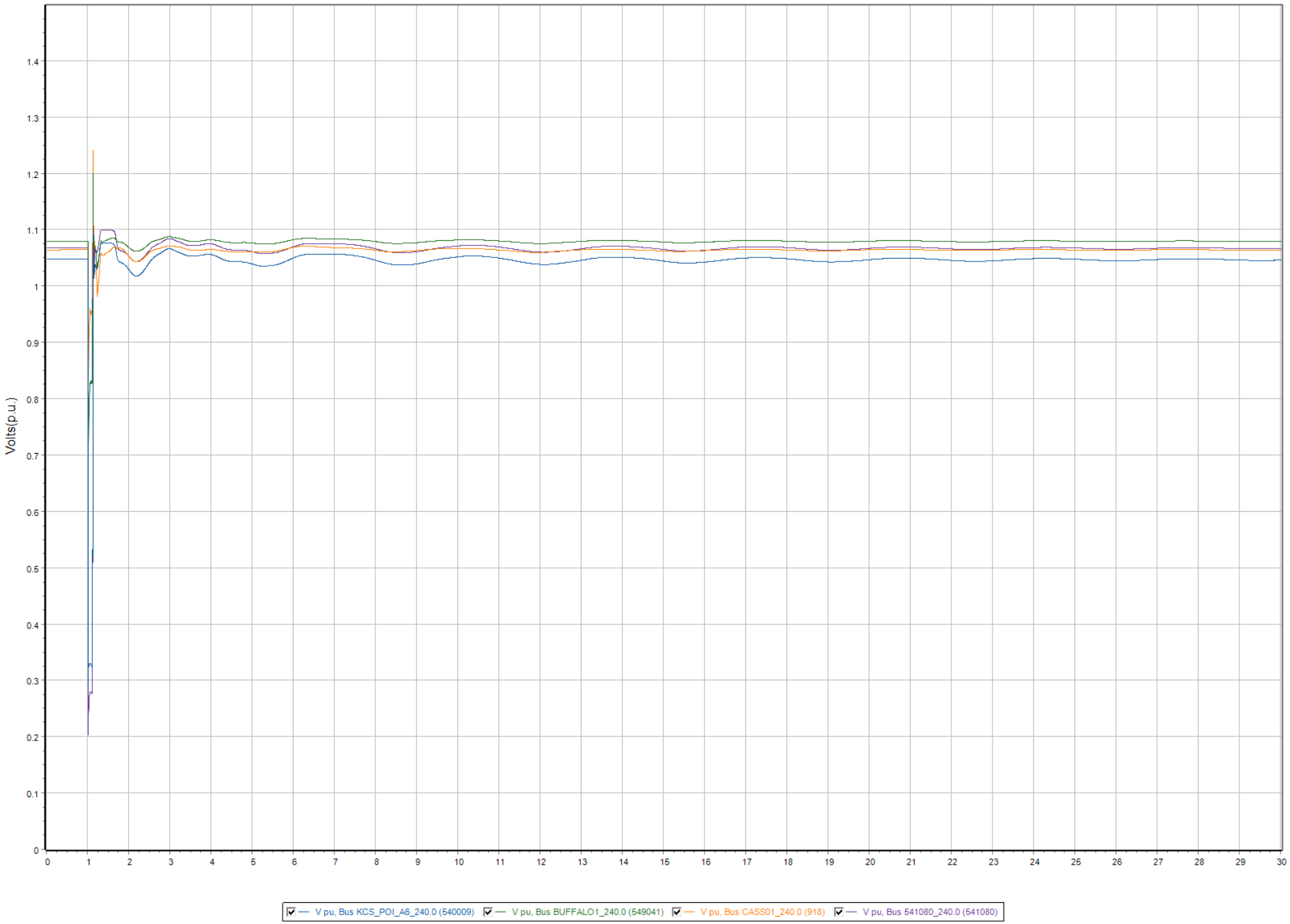


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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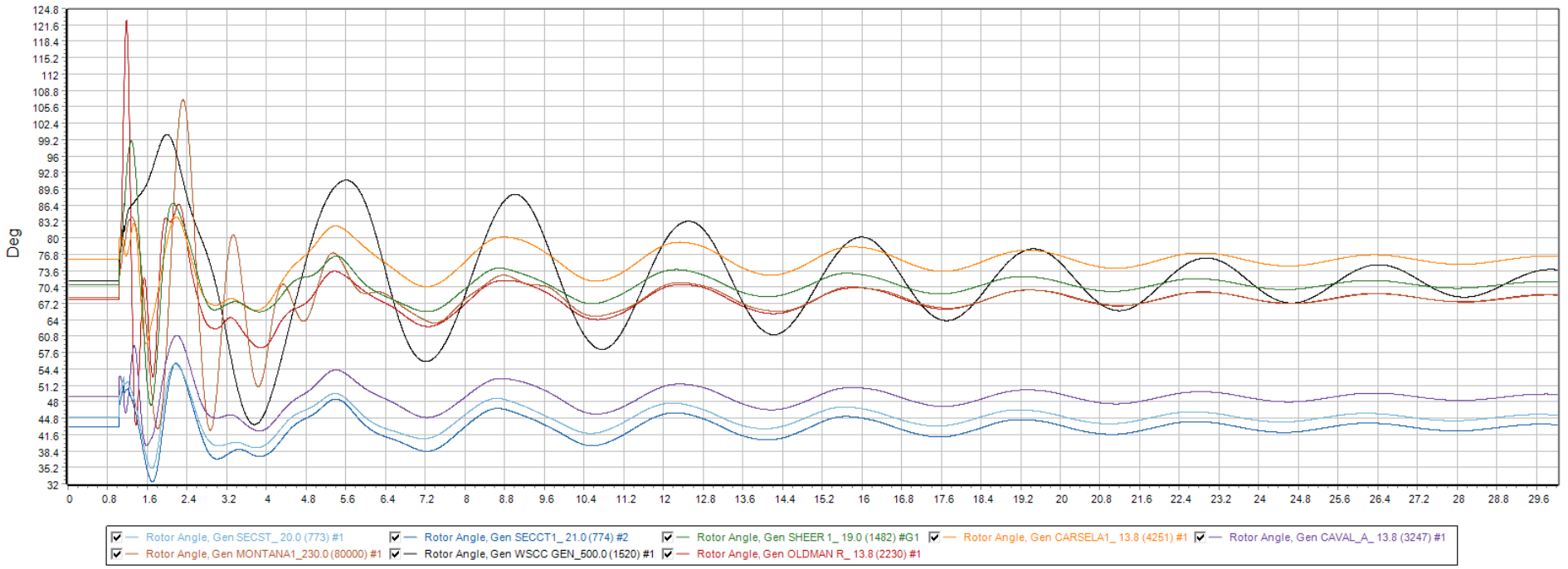
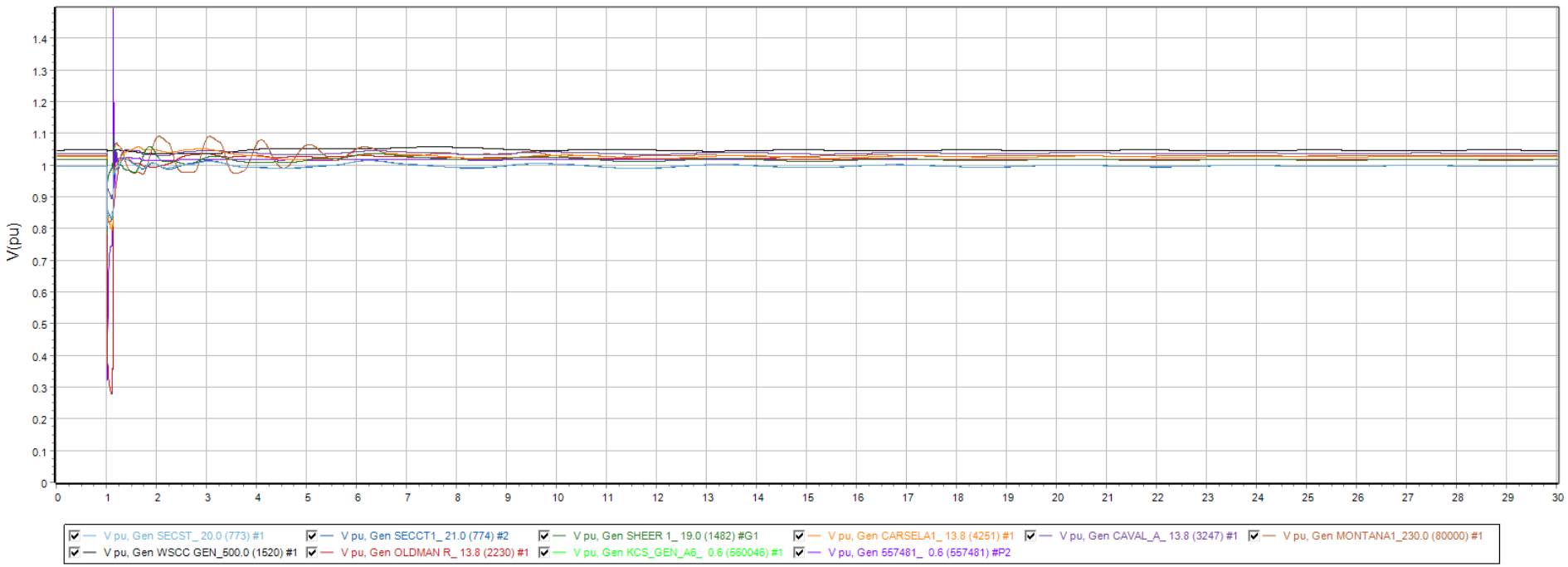
May 16, 2023 22:31:54

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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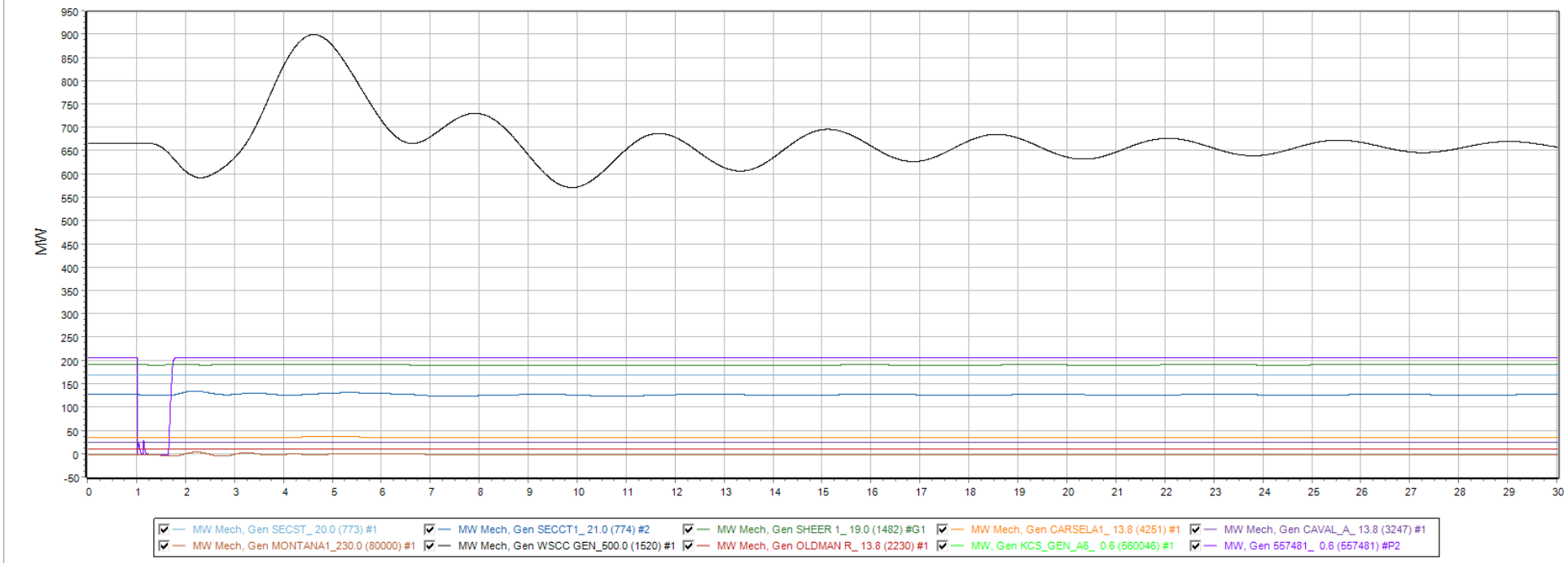
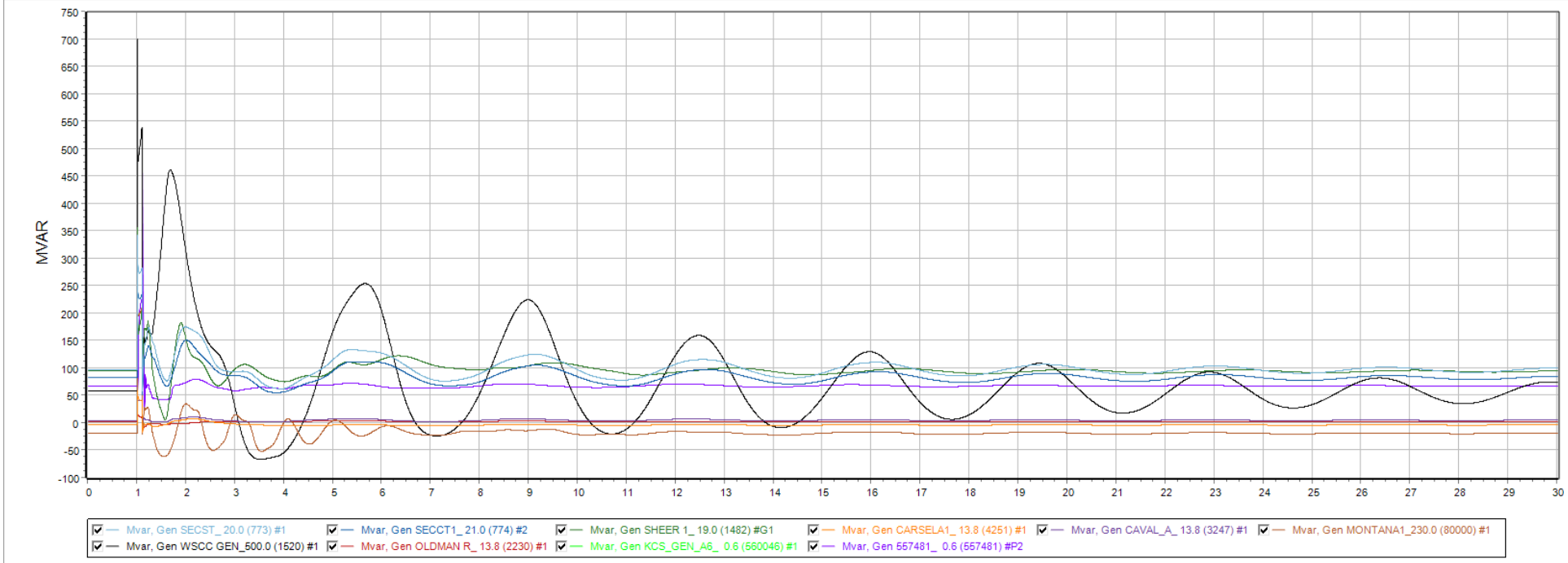
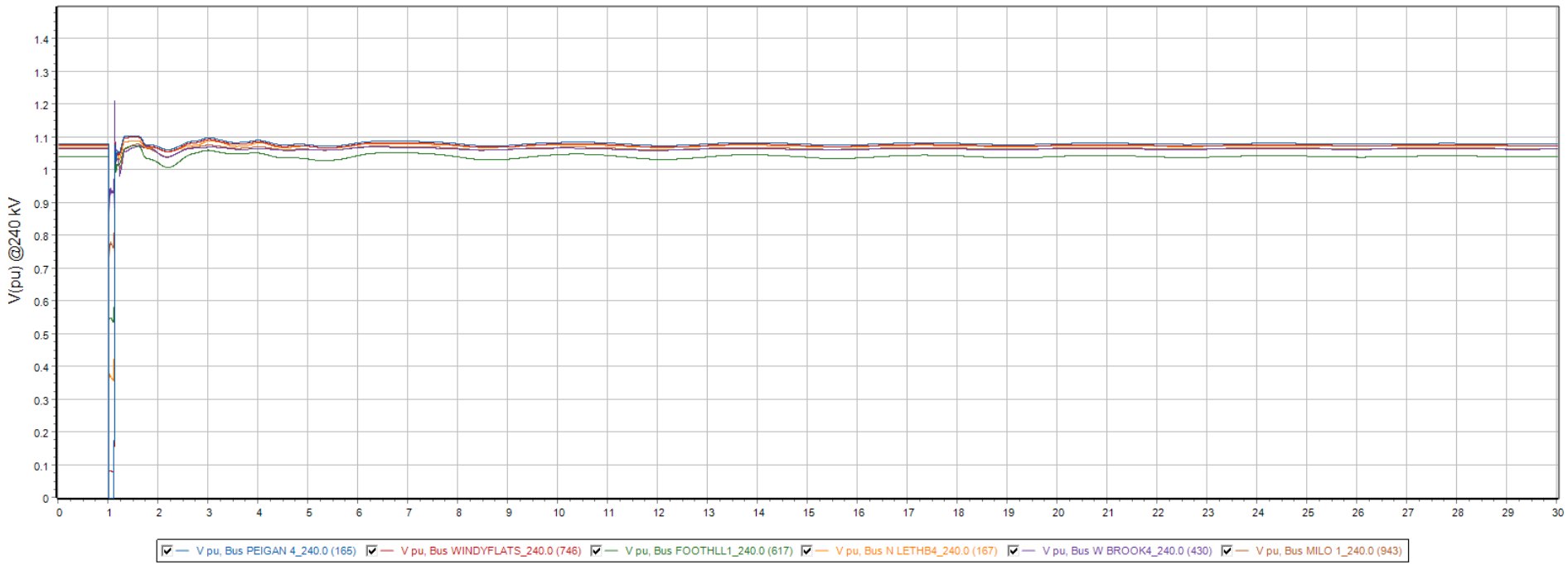
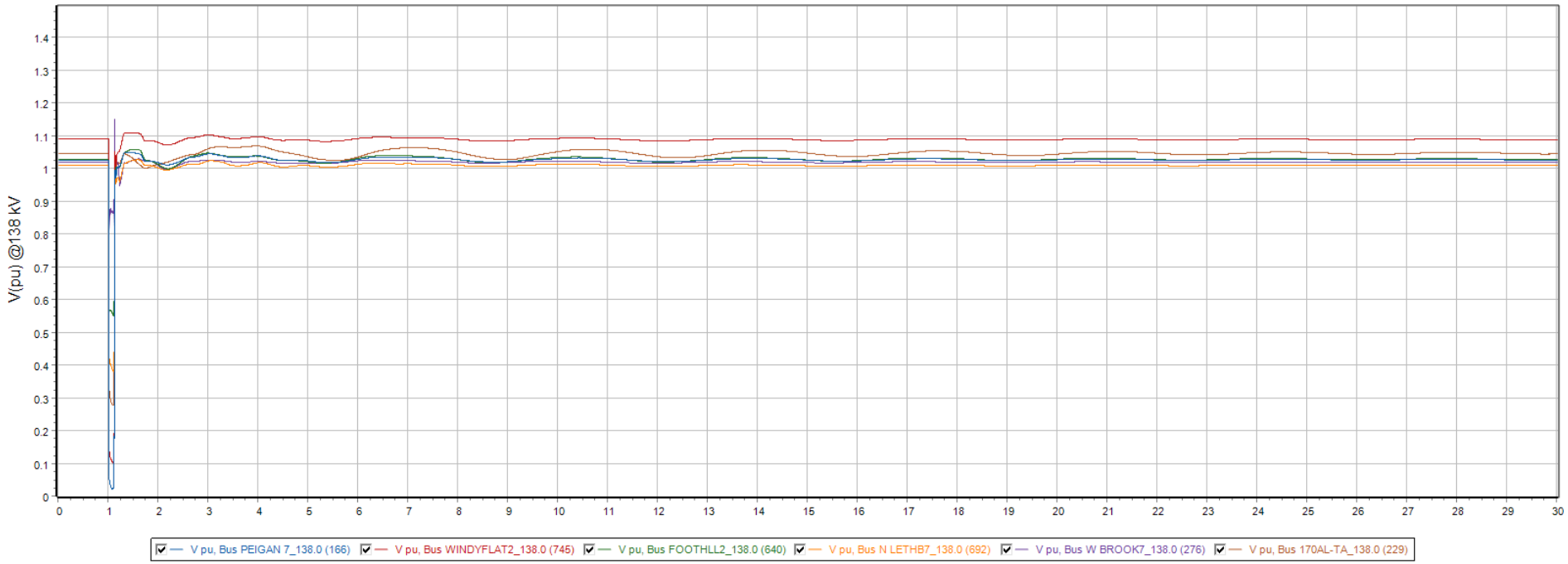
Monitor Gens. Q2





Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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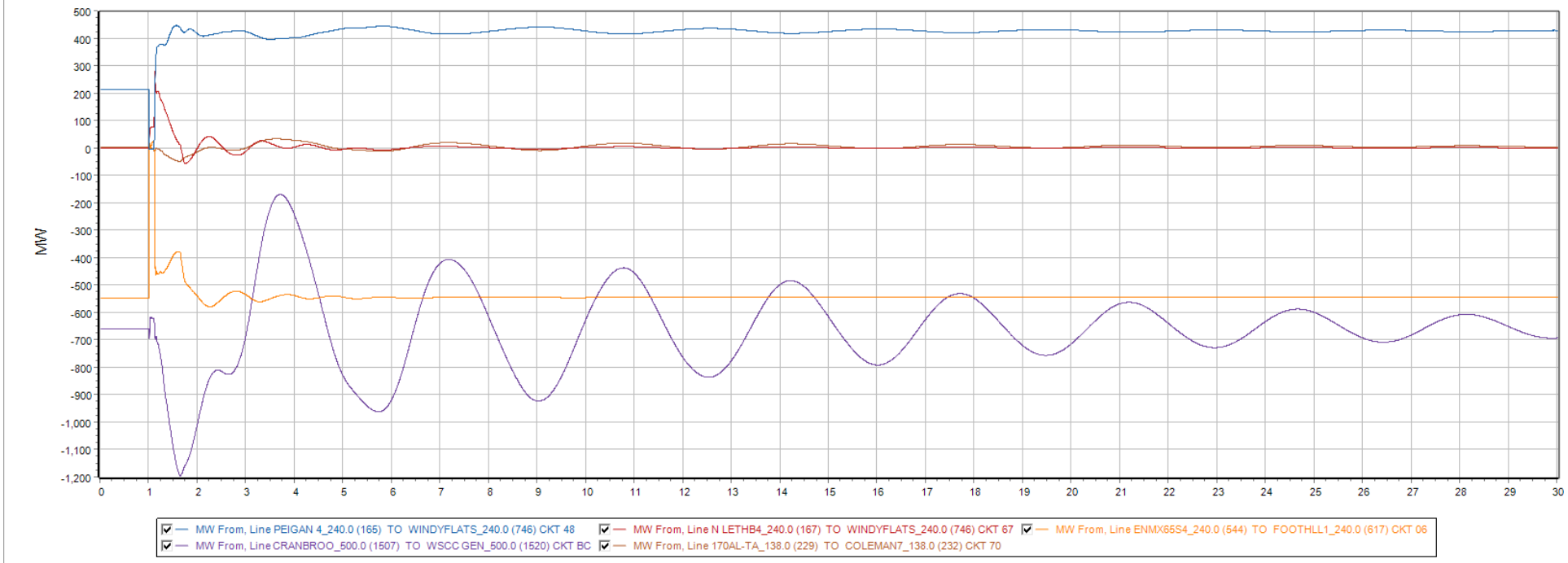
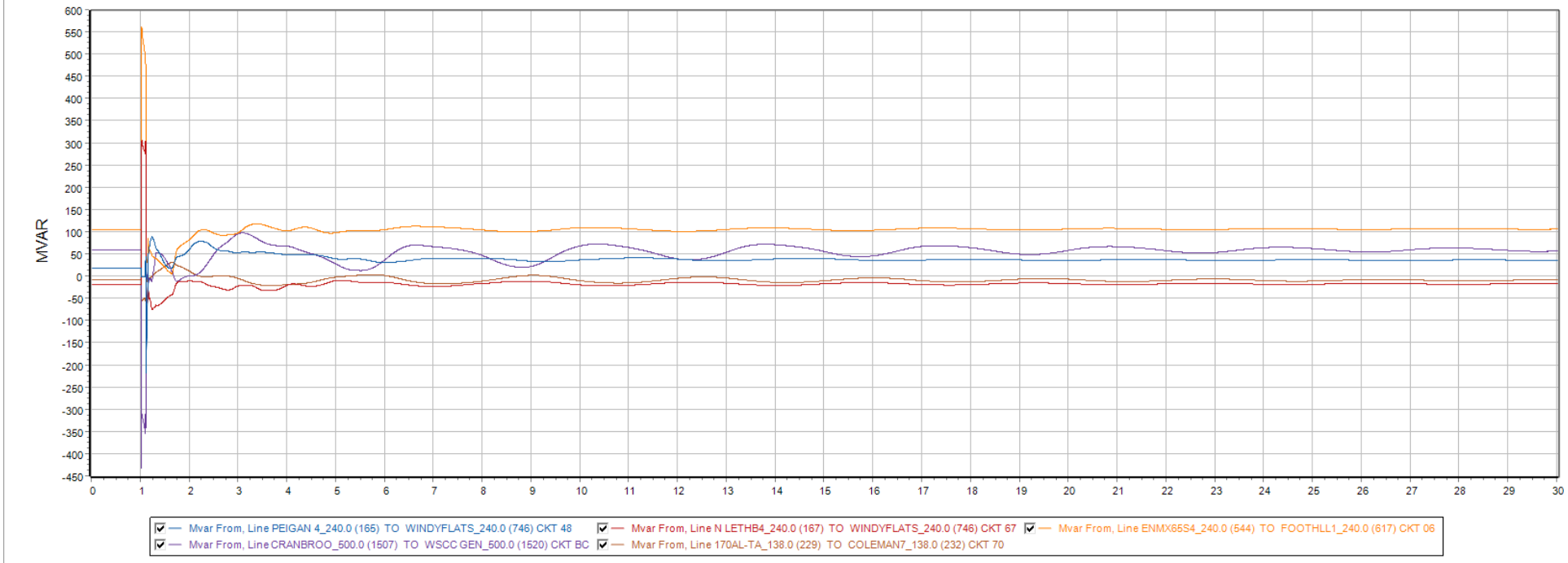
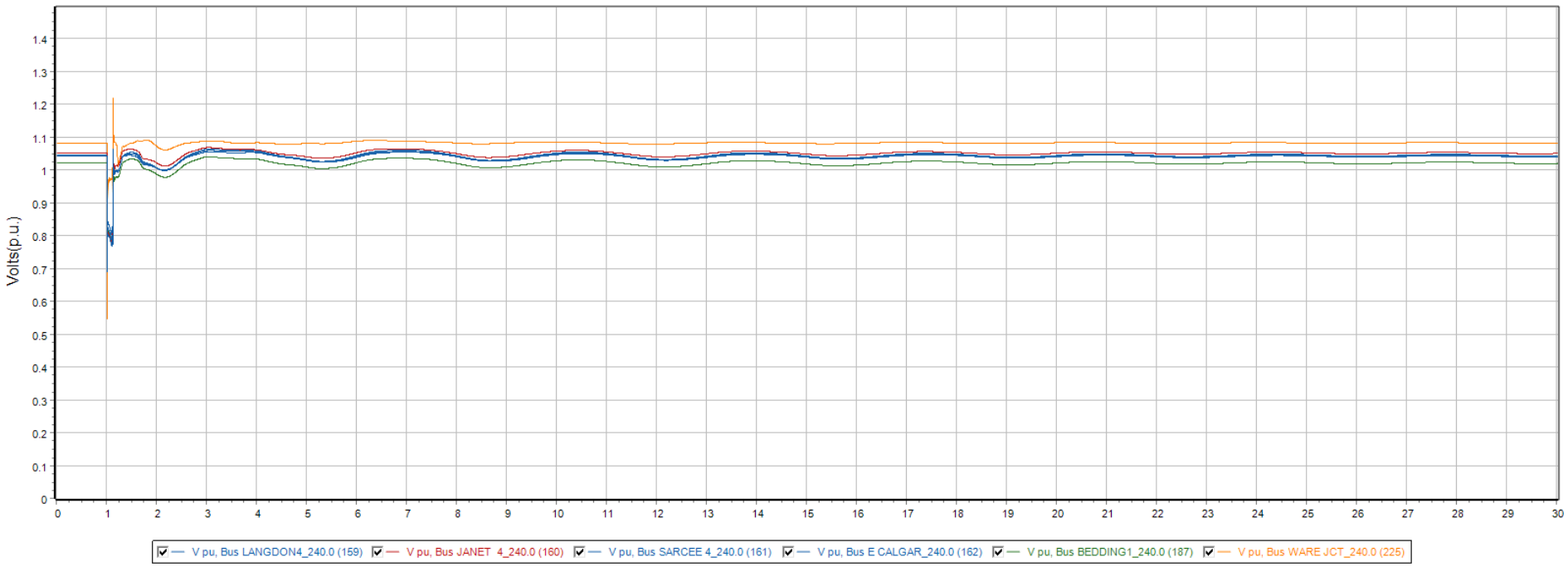
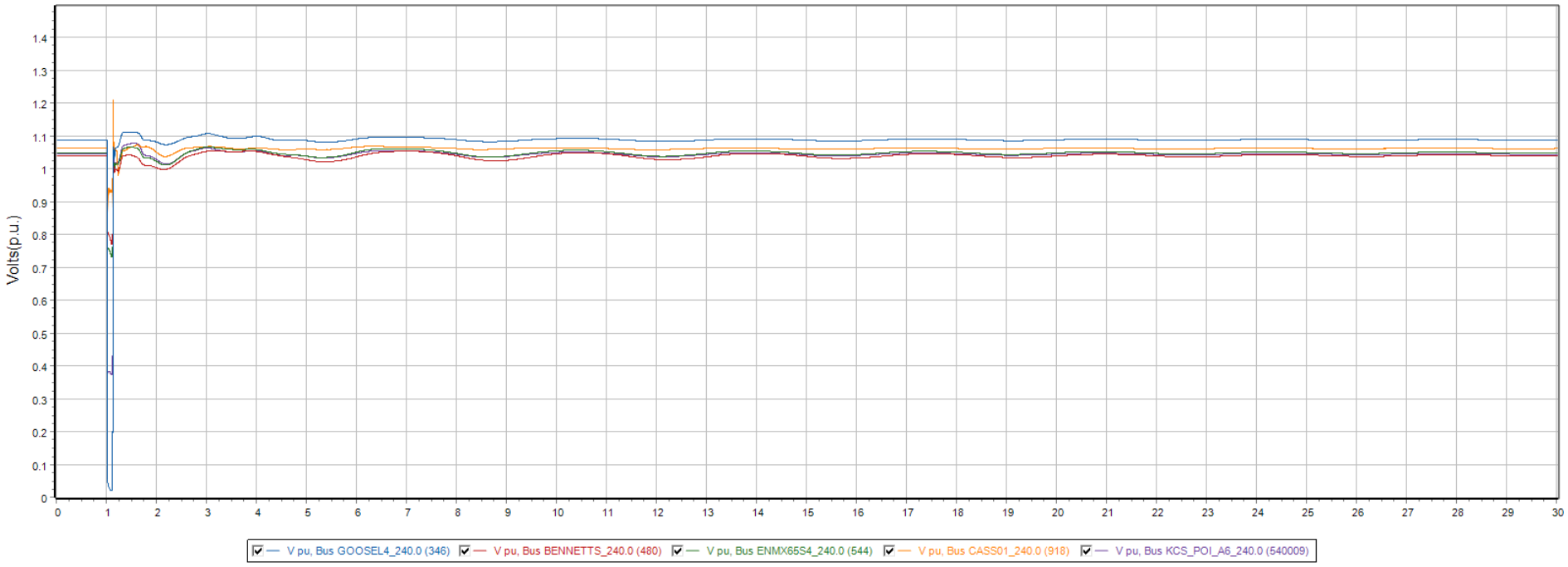
Monitor Line MW & MVAR. Q4



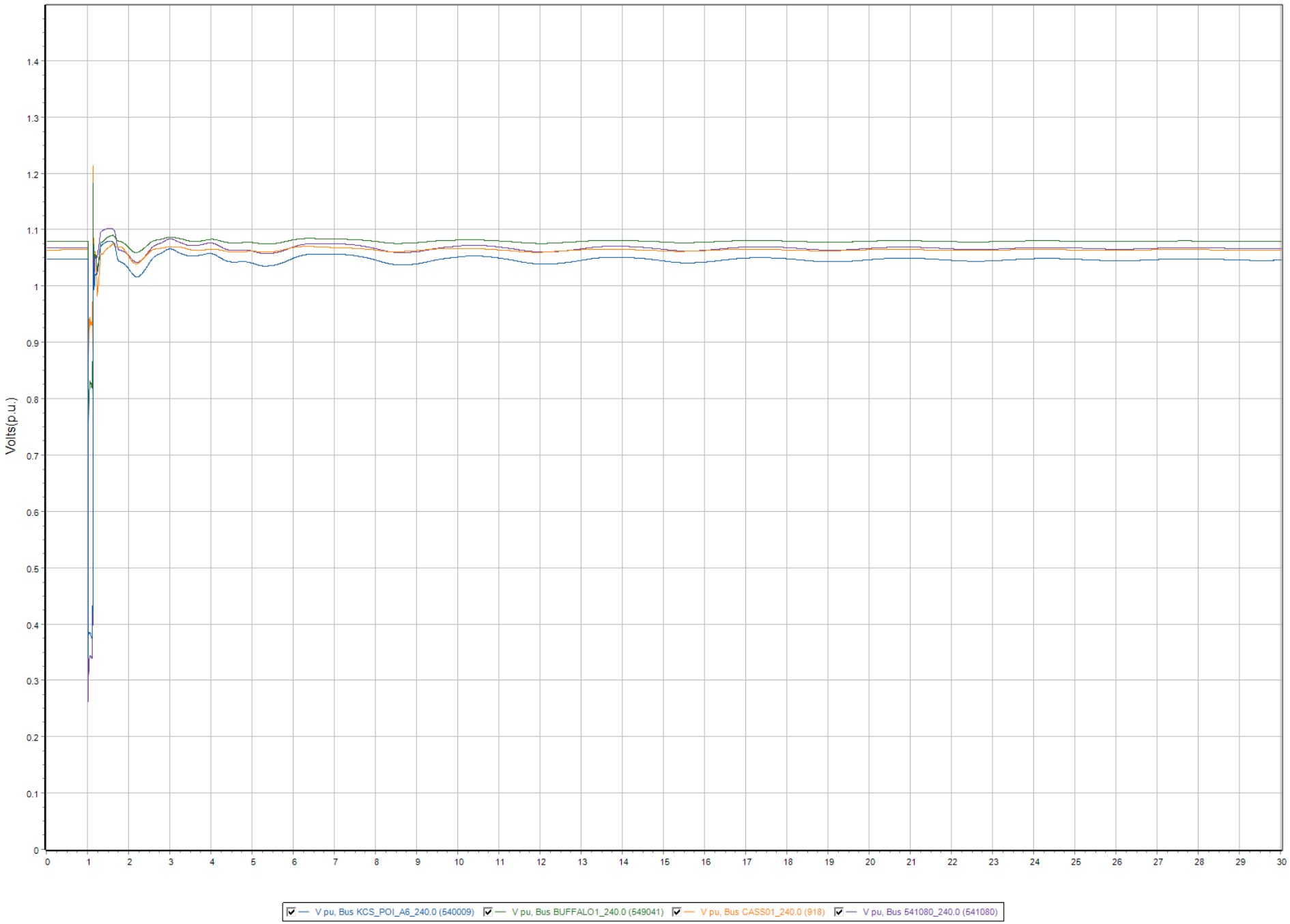


Additional 240 kV Bus Volts

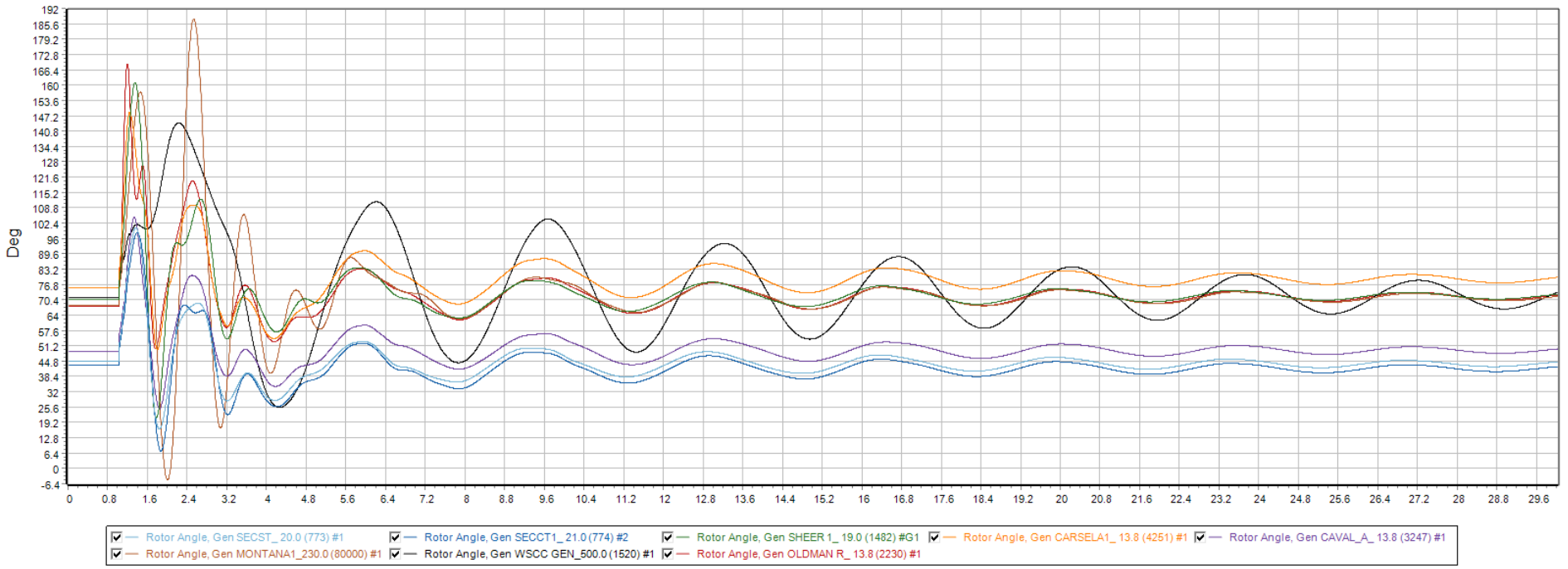


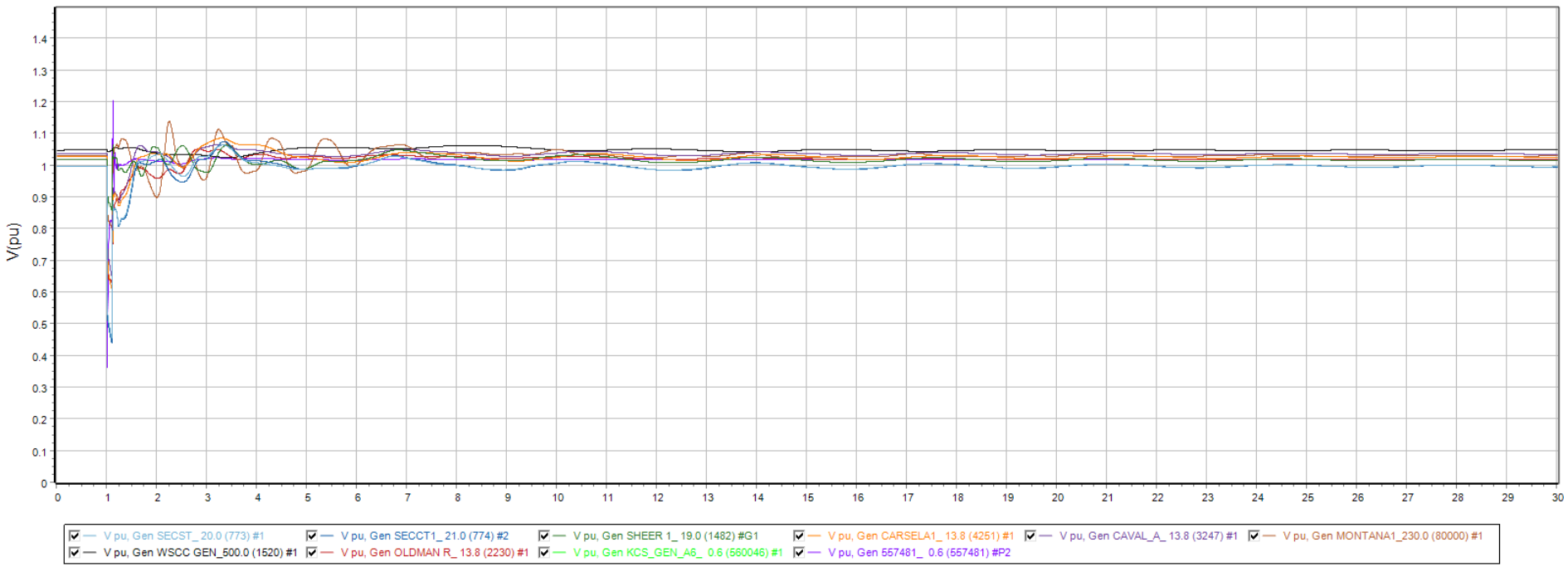


Large Project 240 kV Bus Volts



Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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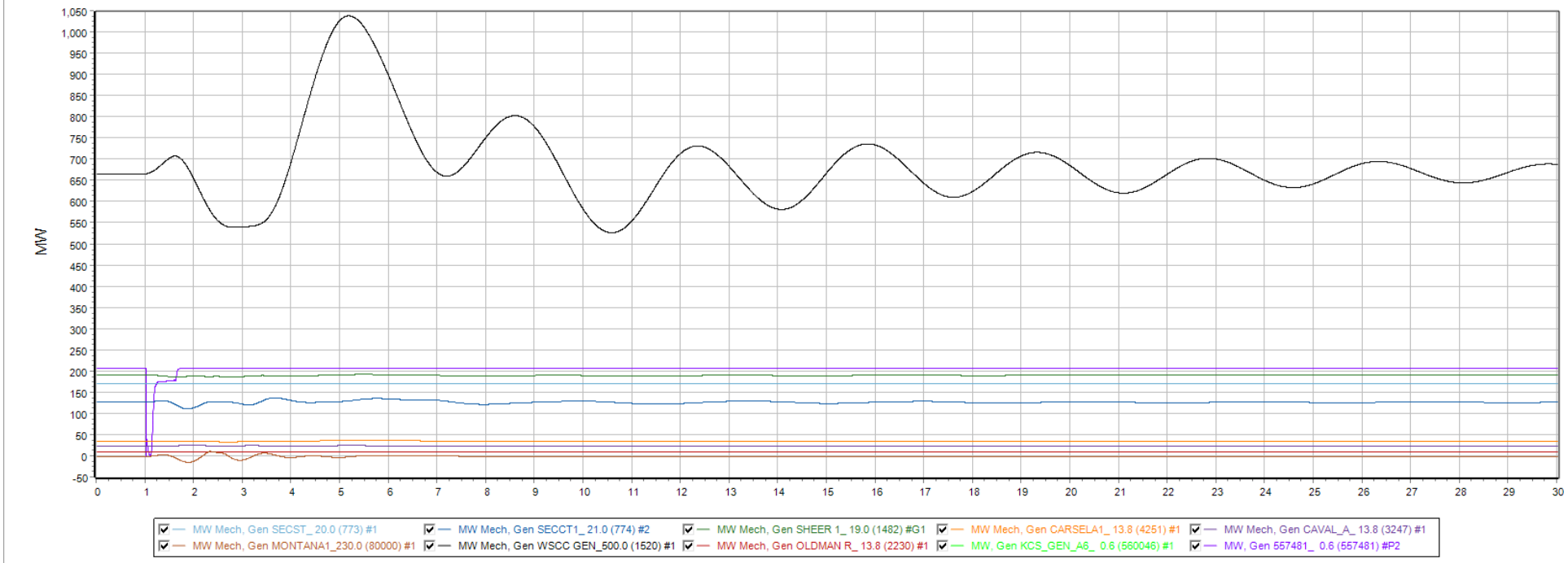
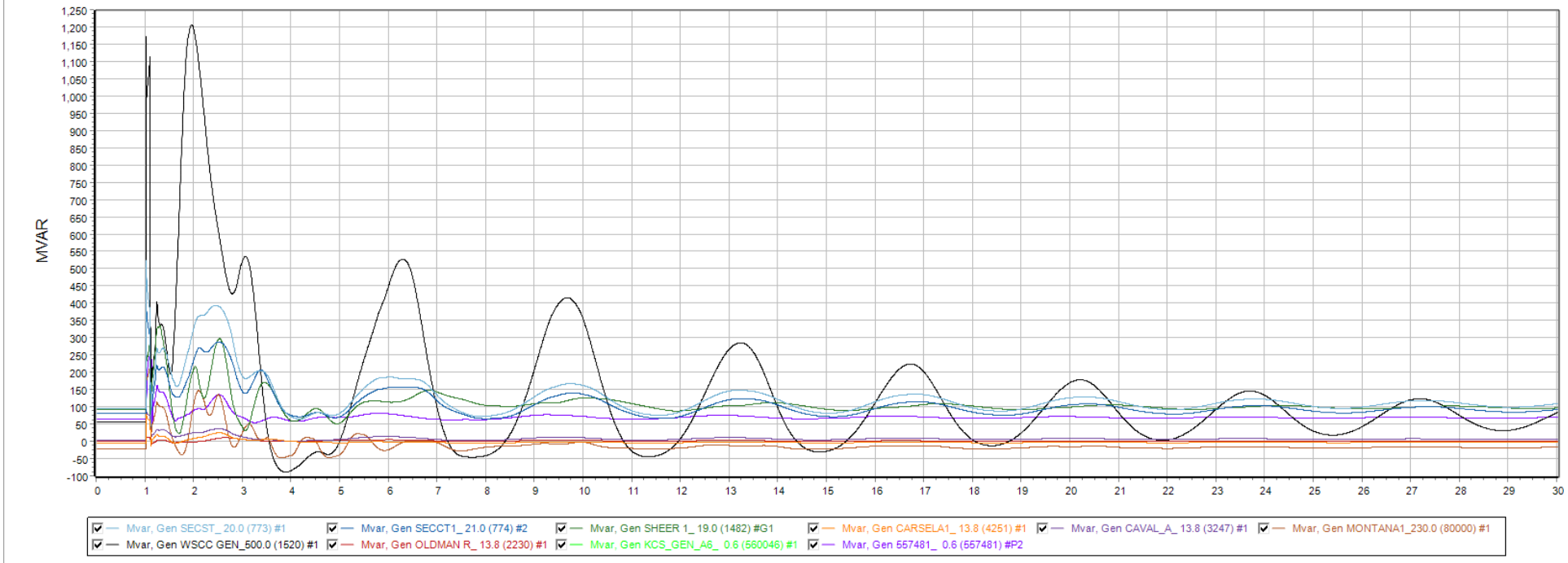
Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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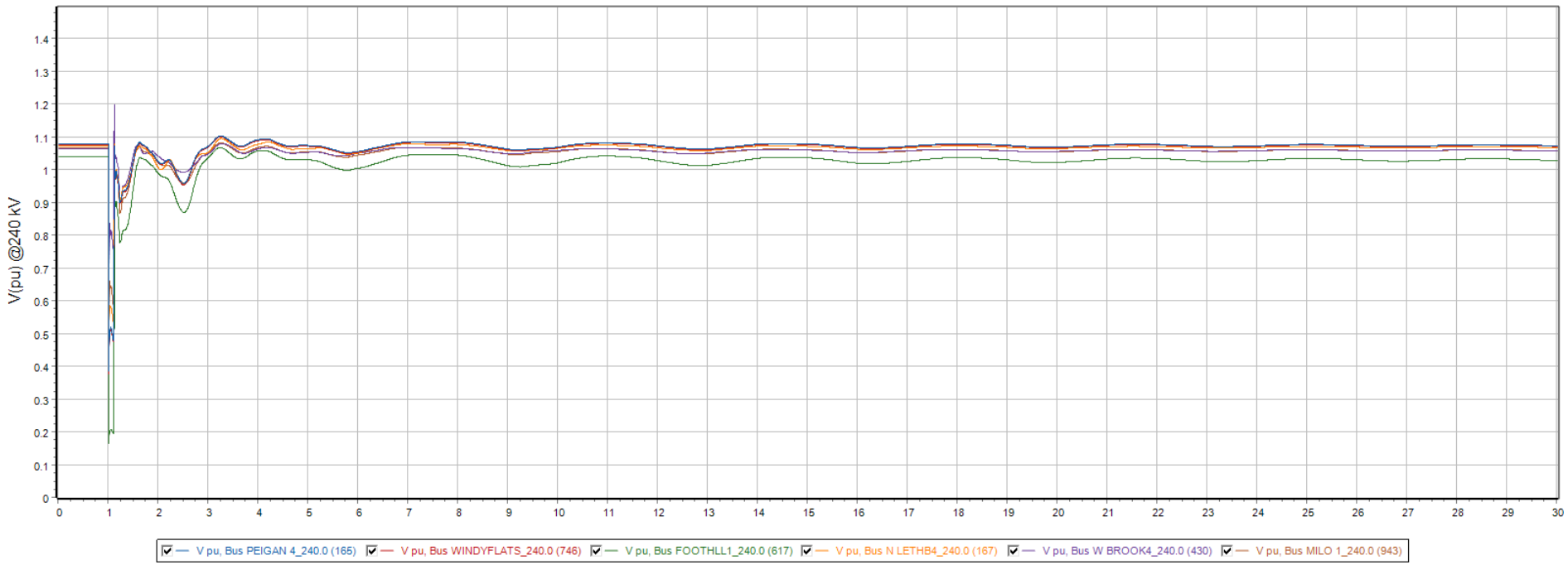
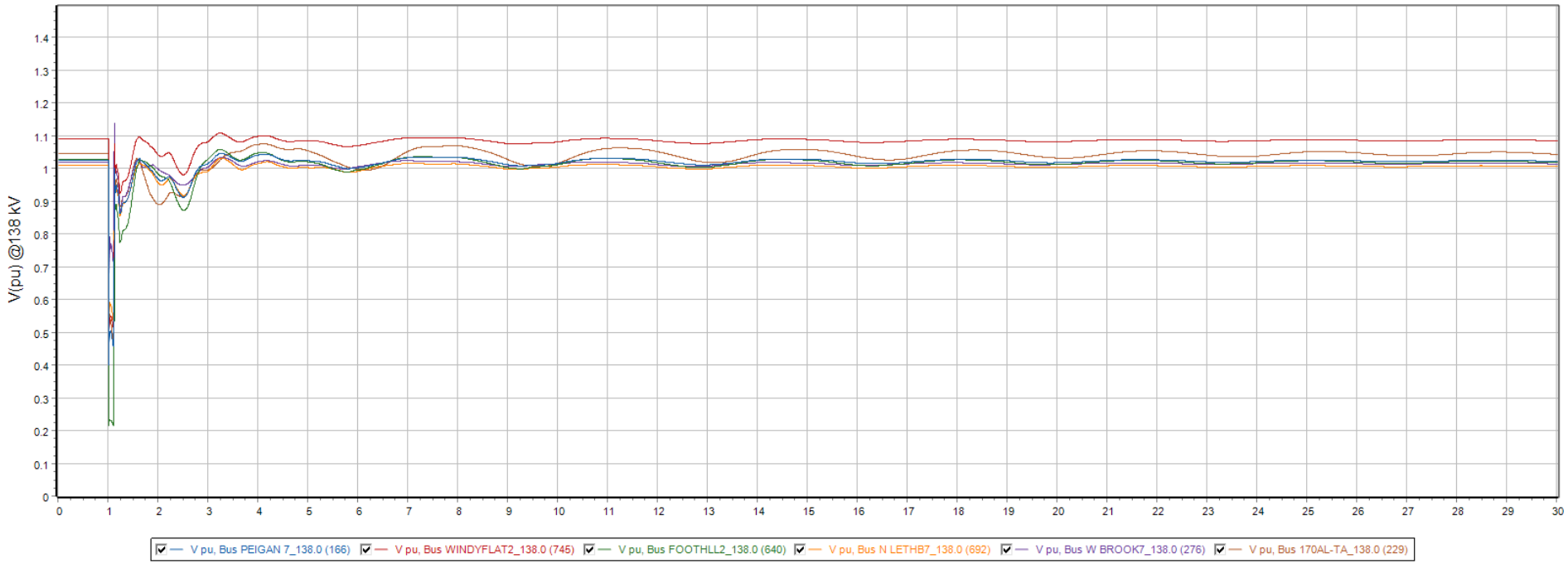
May 16, 2023 22:50:48

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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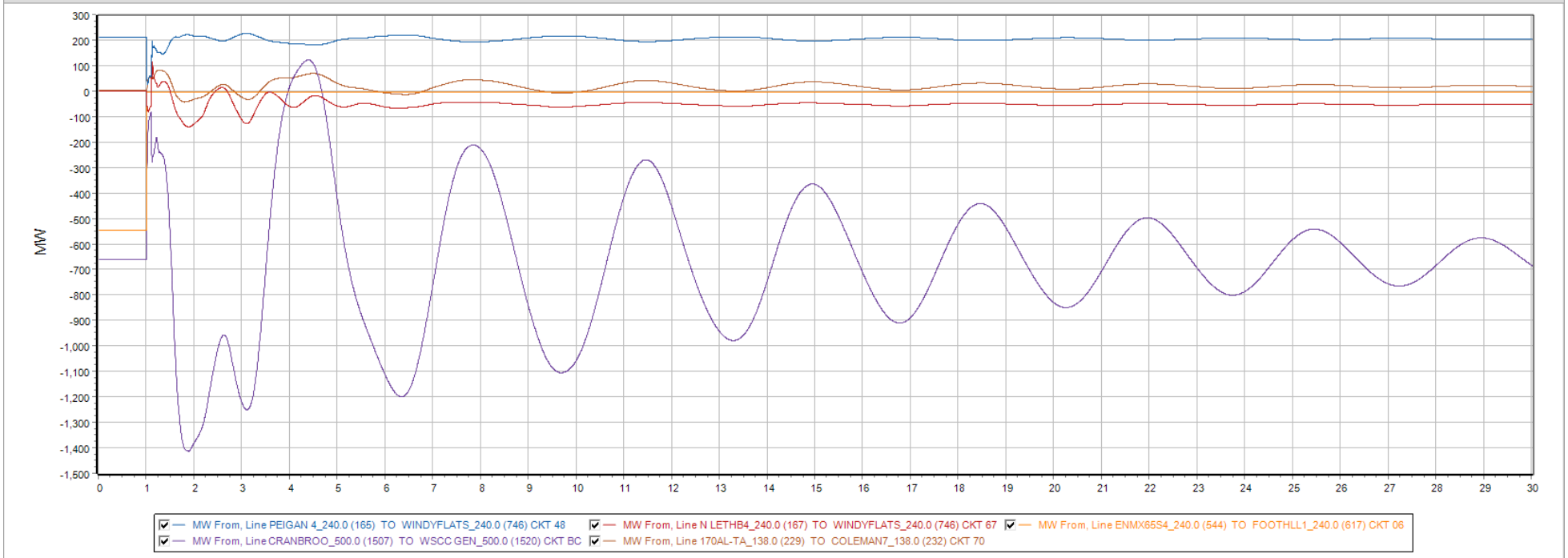
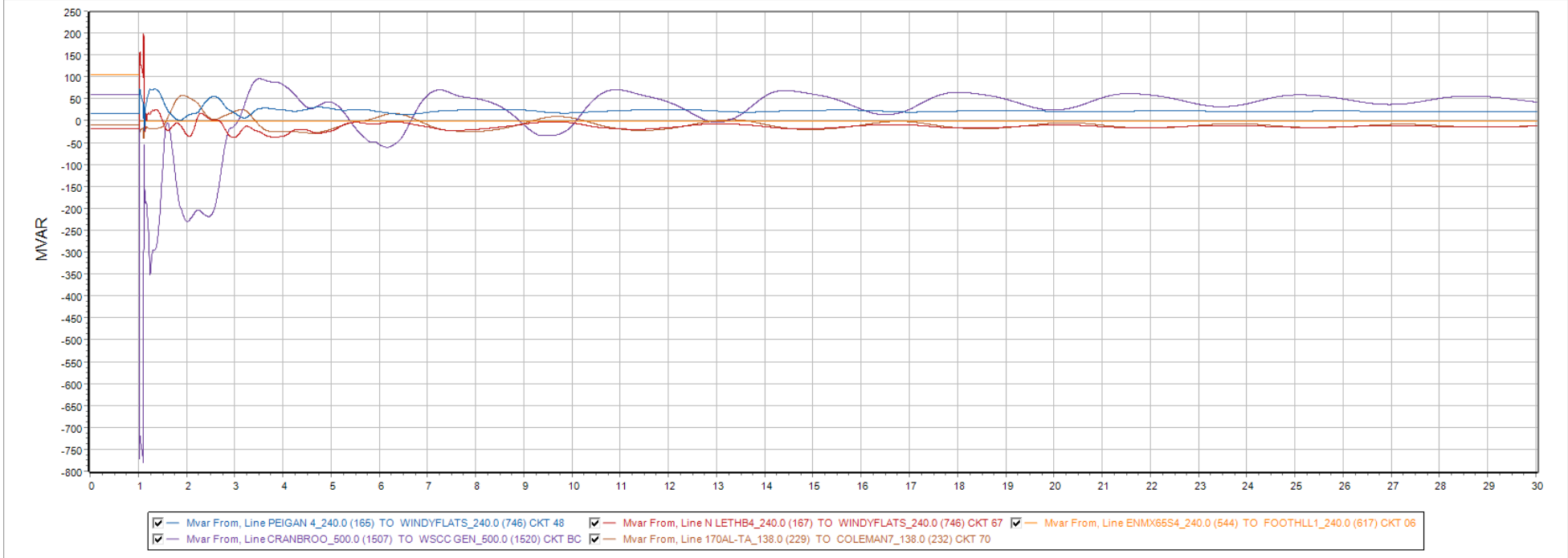
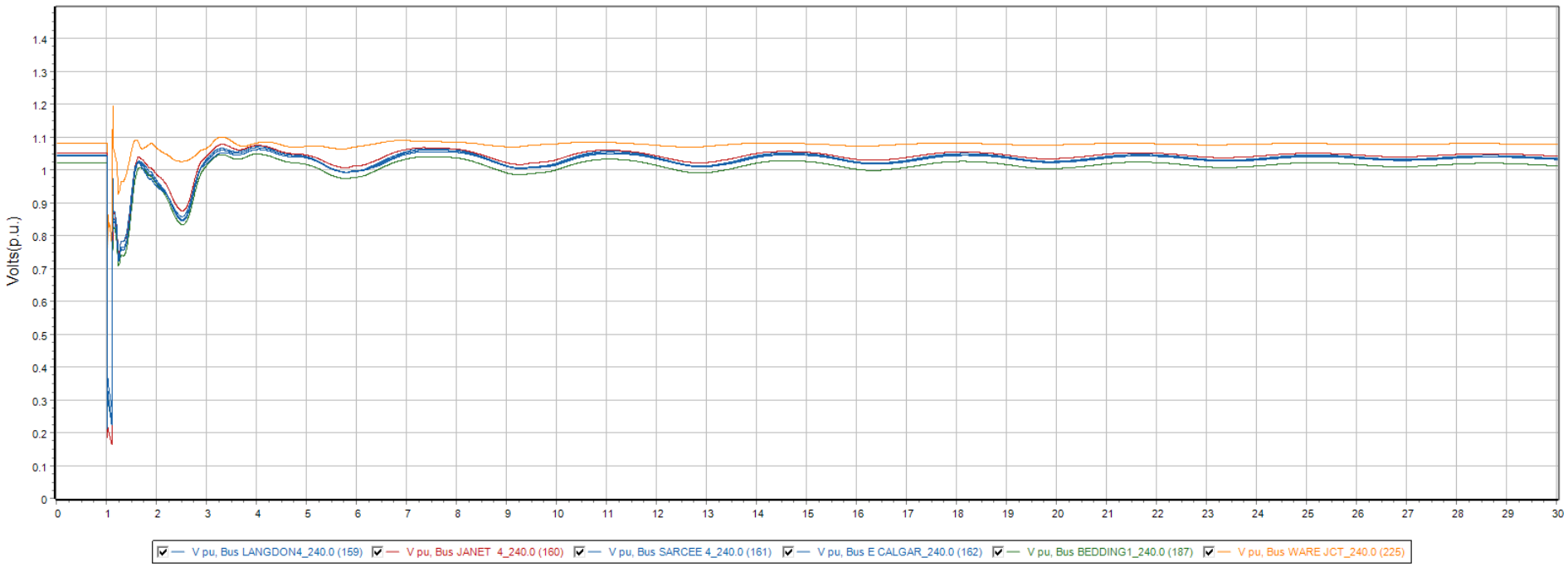
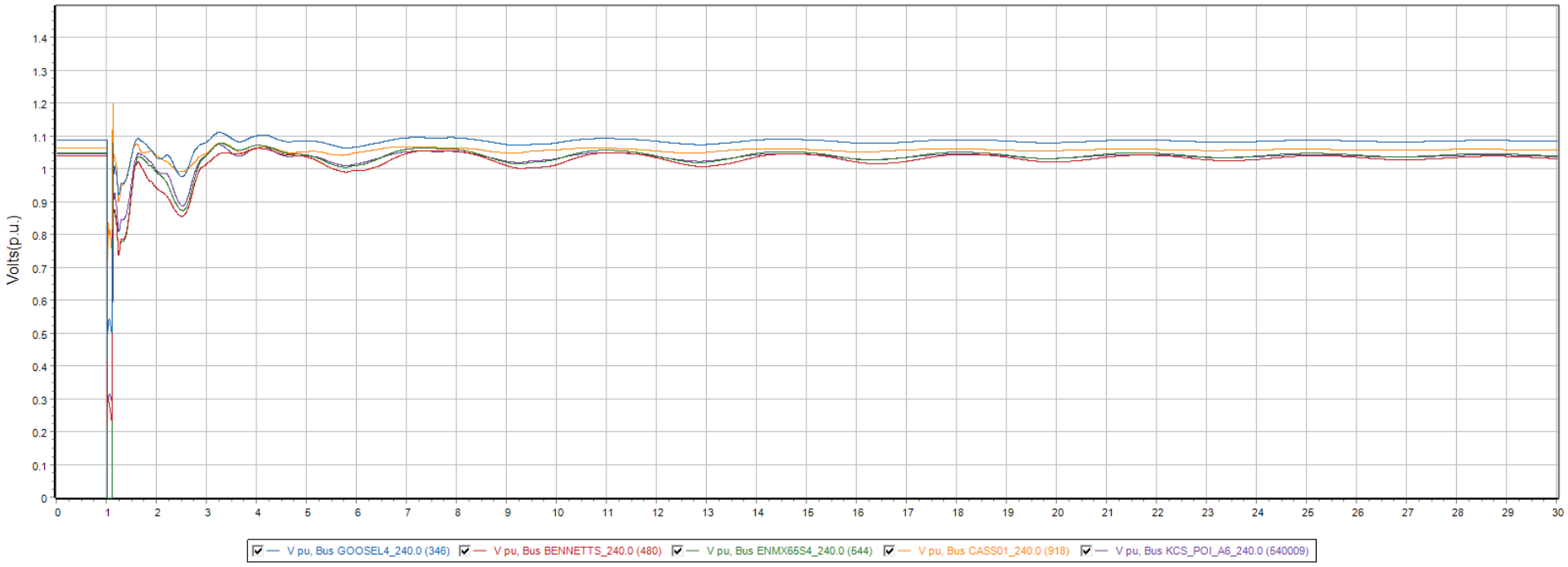
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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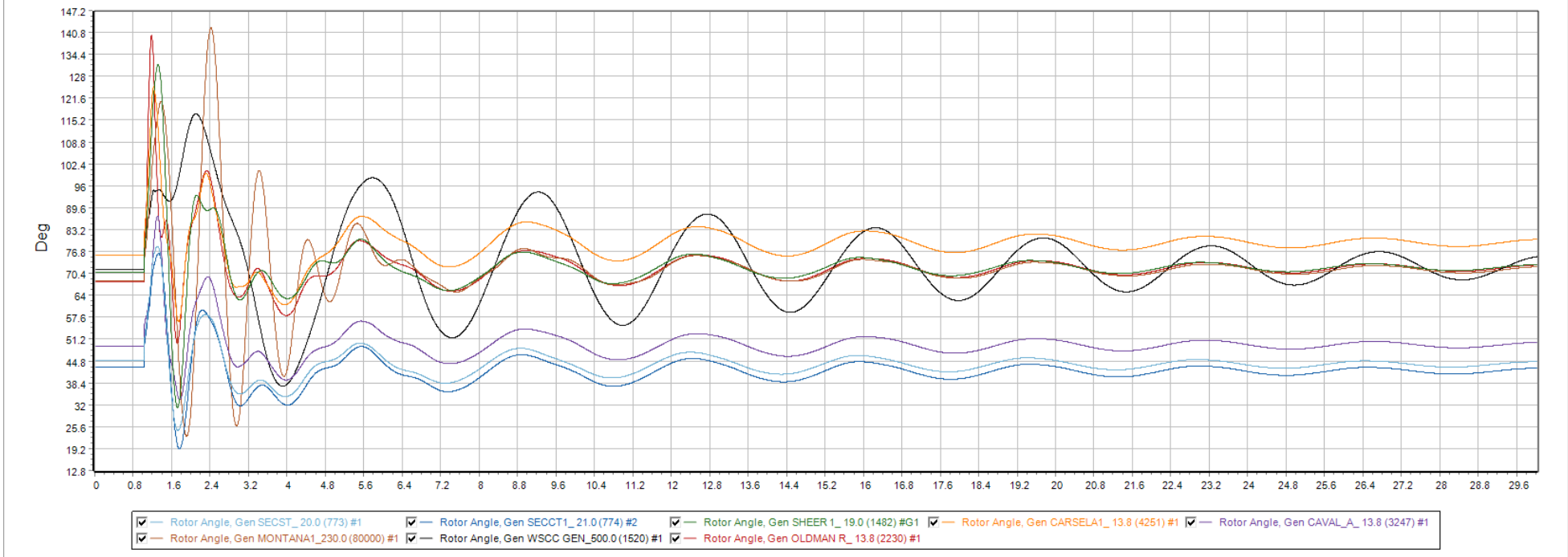
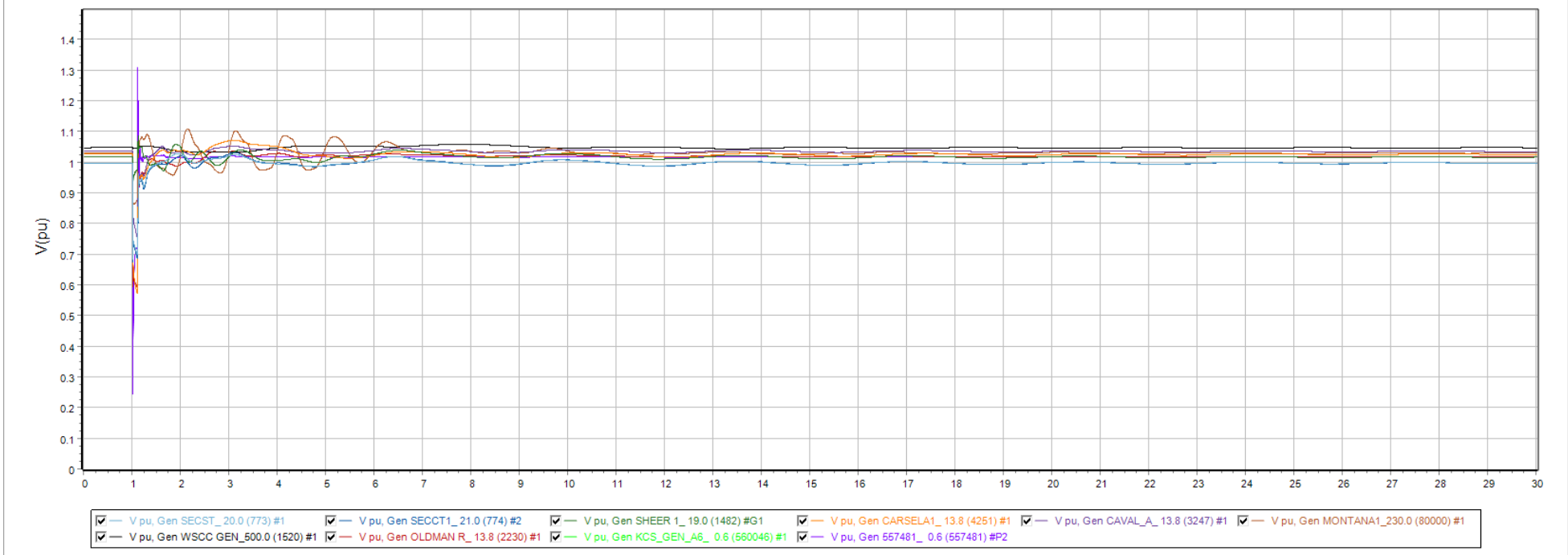
May 16, 2023 22:50:49

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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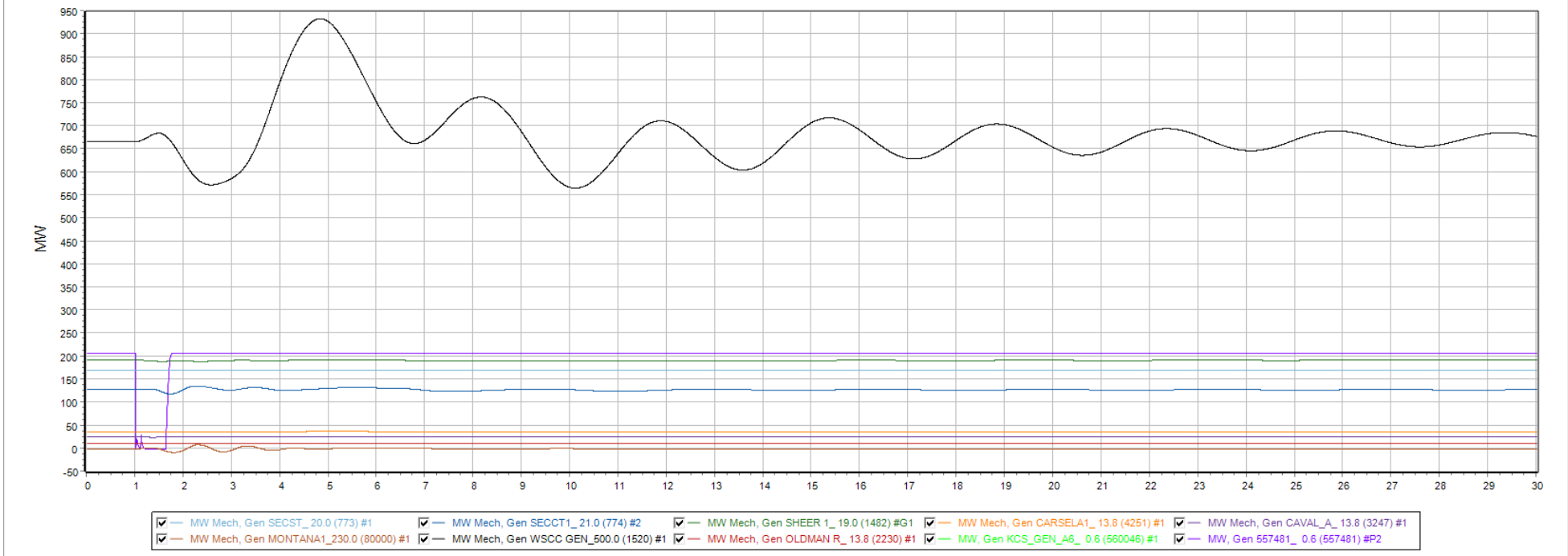
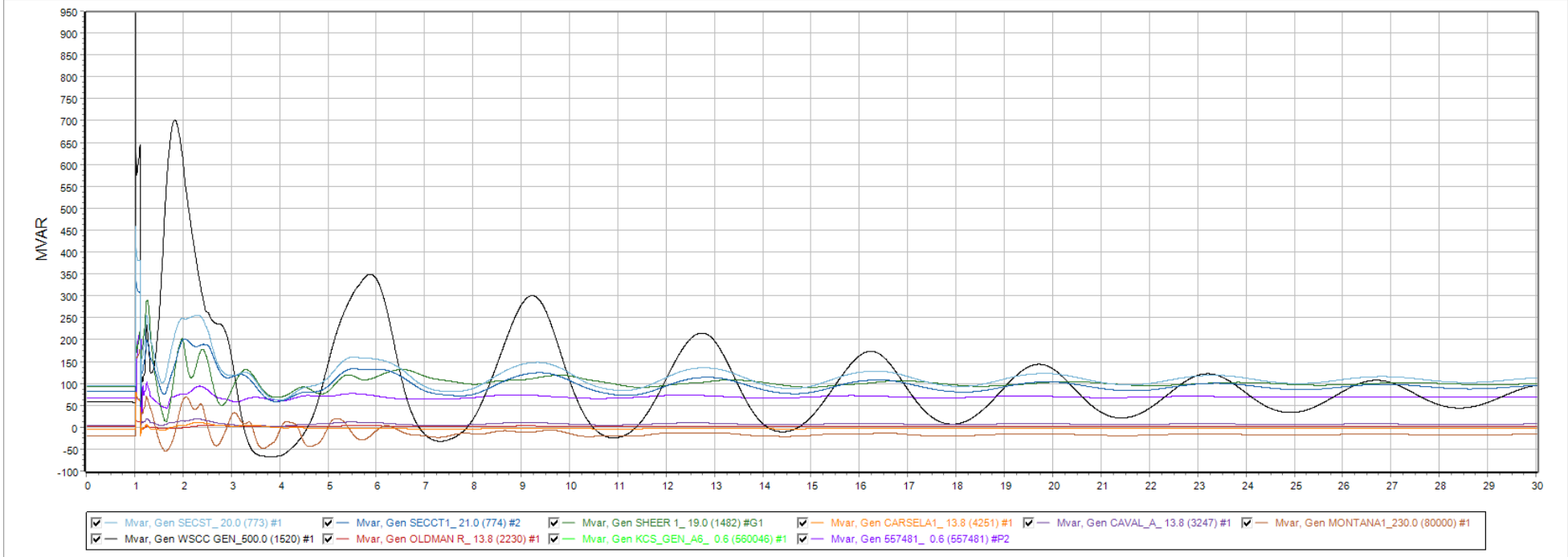
May 16, 2023 22:58:49

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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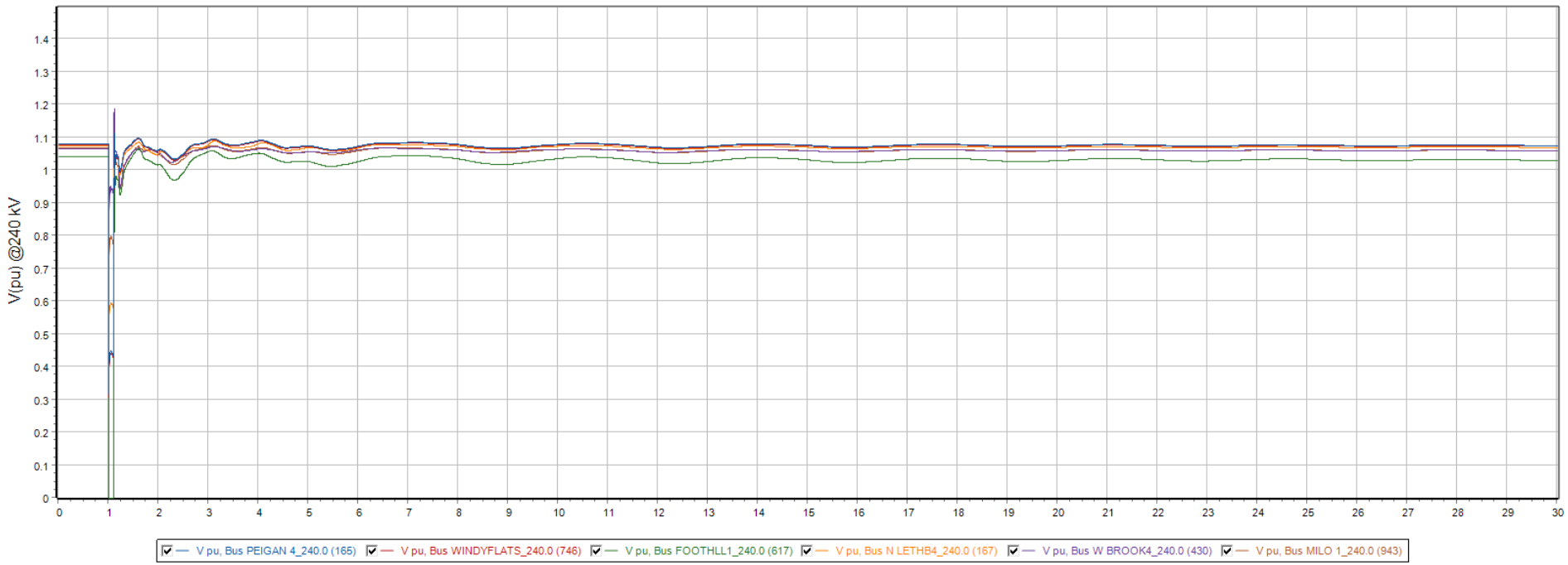
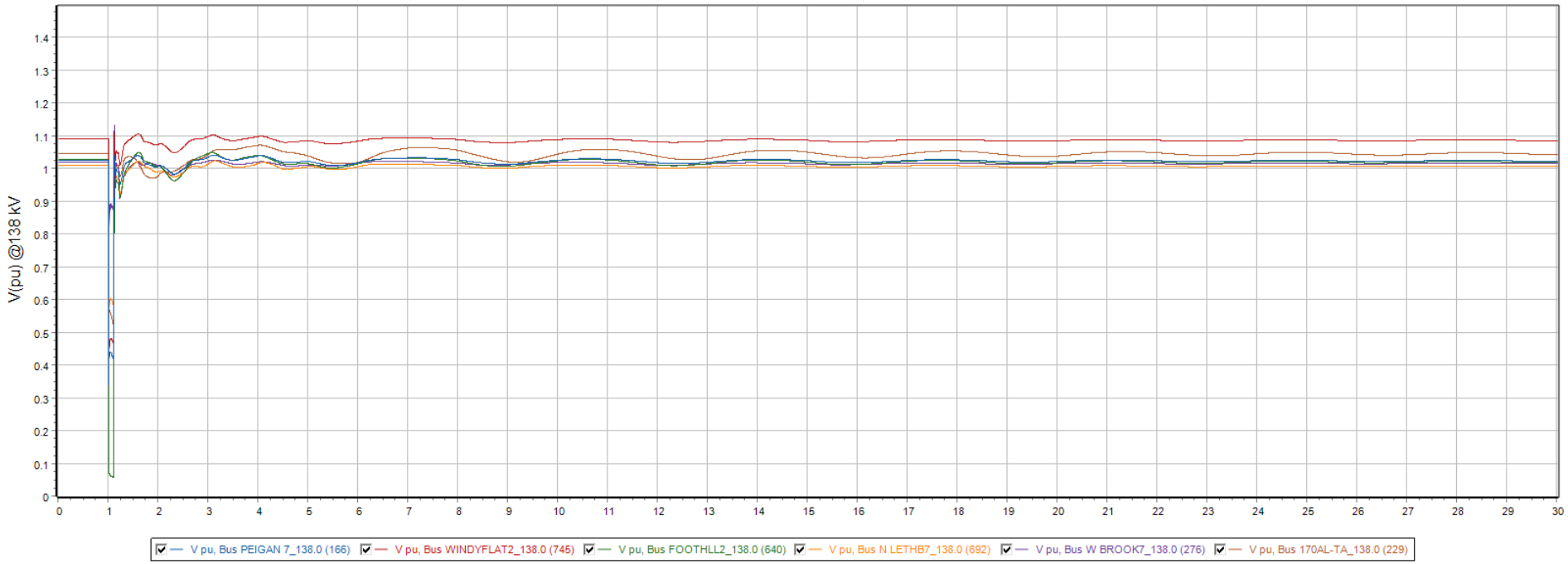
May 16, 2023 22:58:50

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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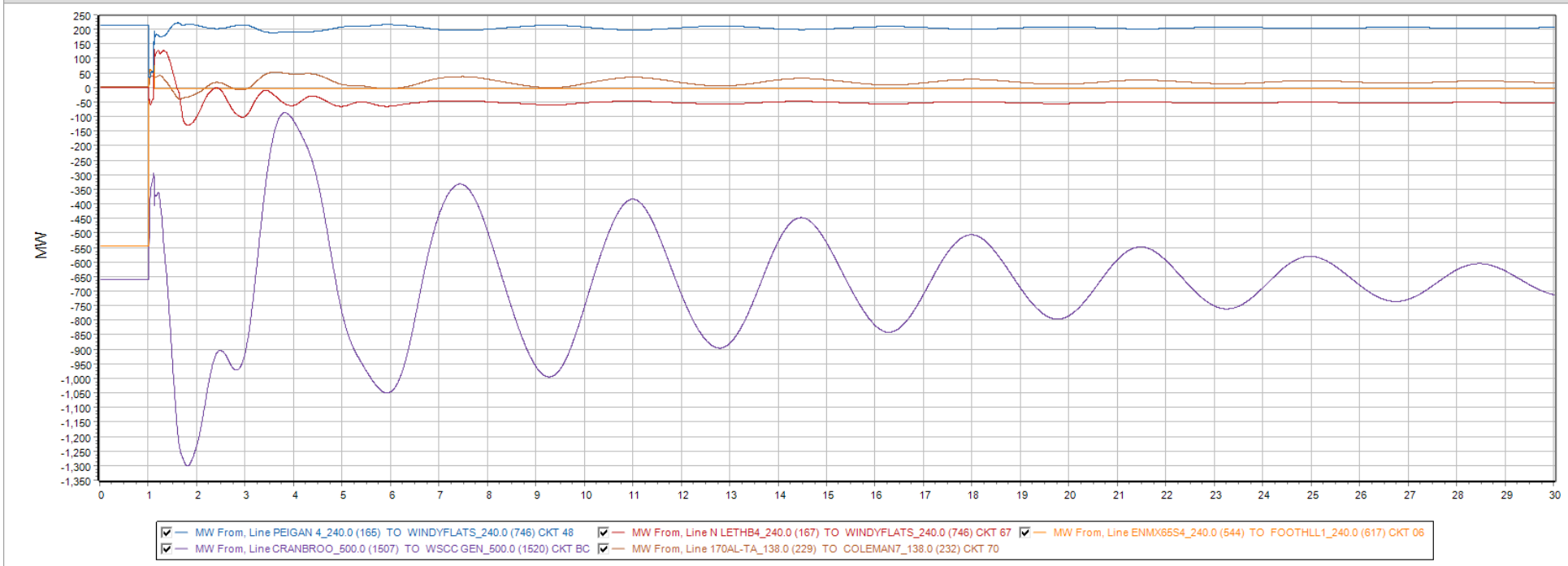
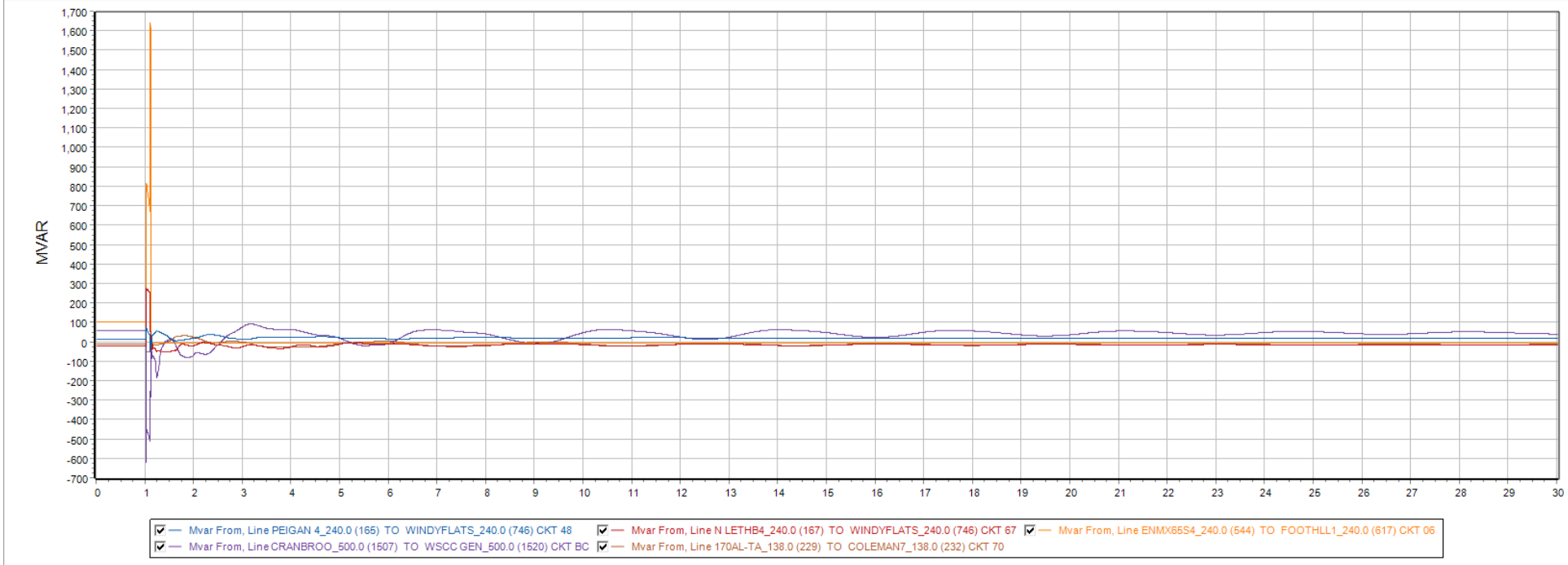
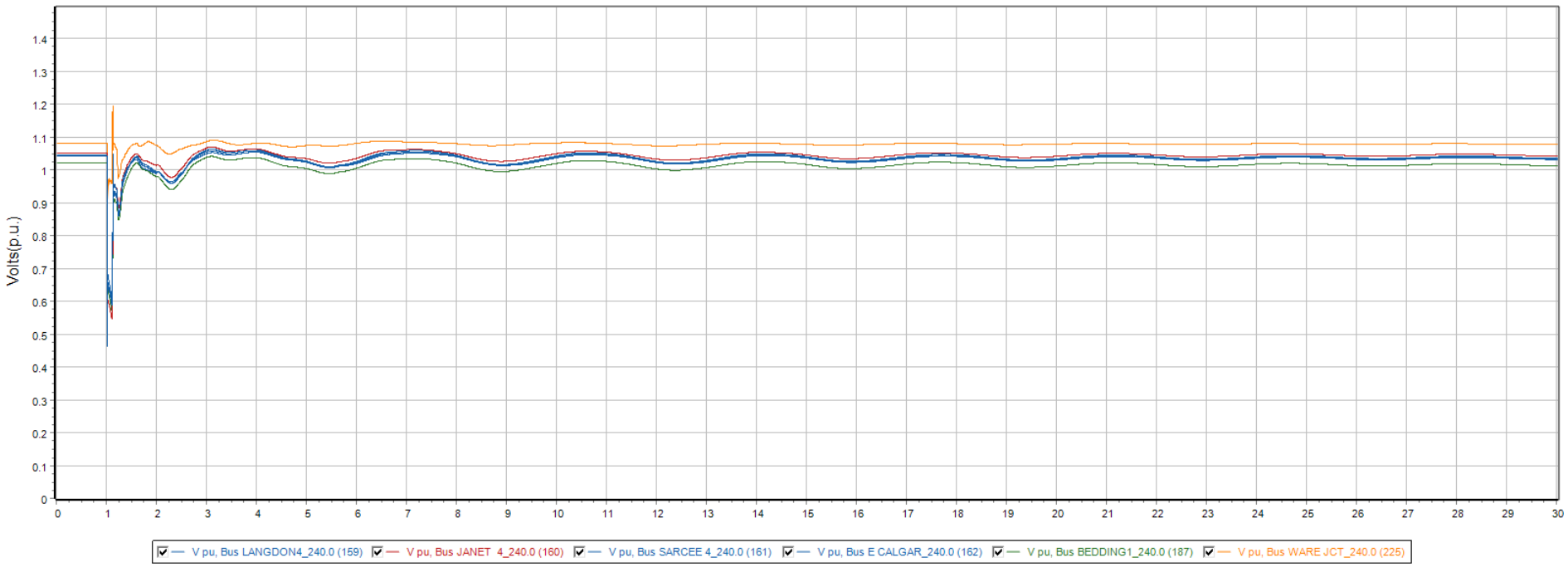
May 16, 2023 22:58:50

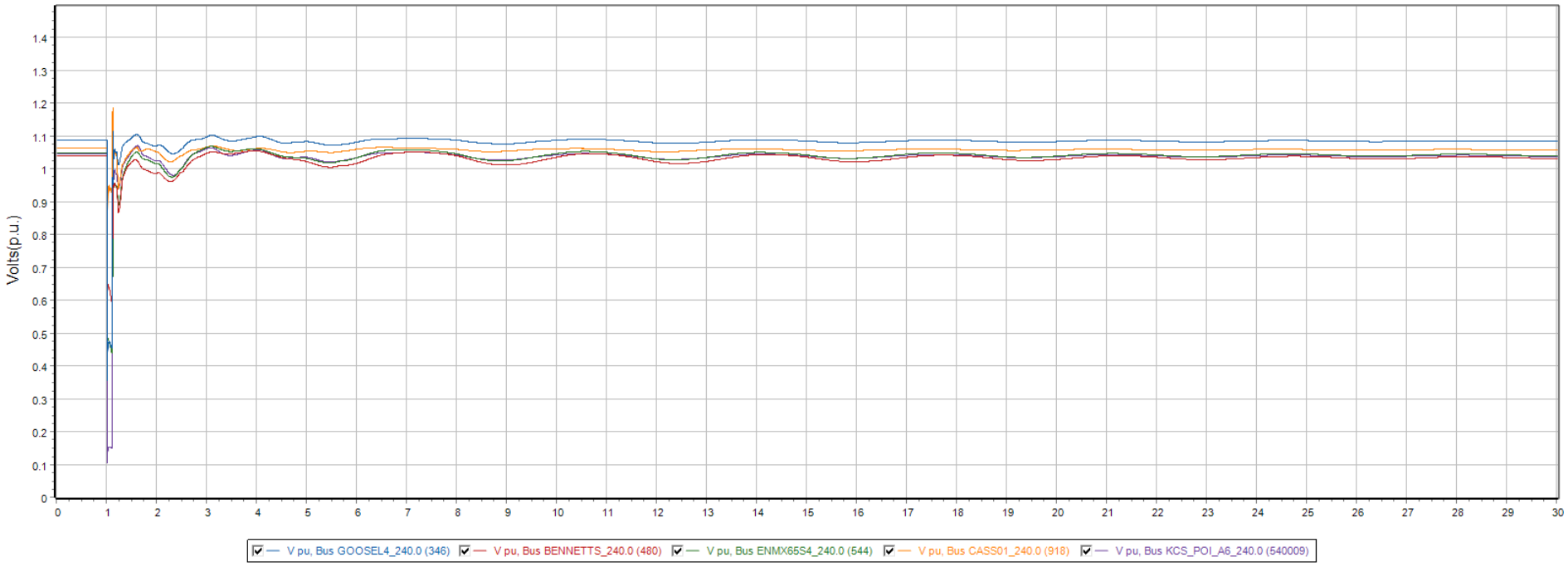
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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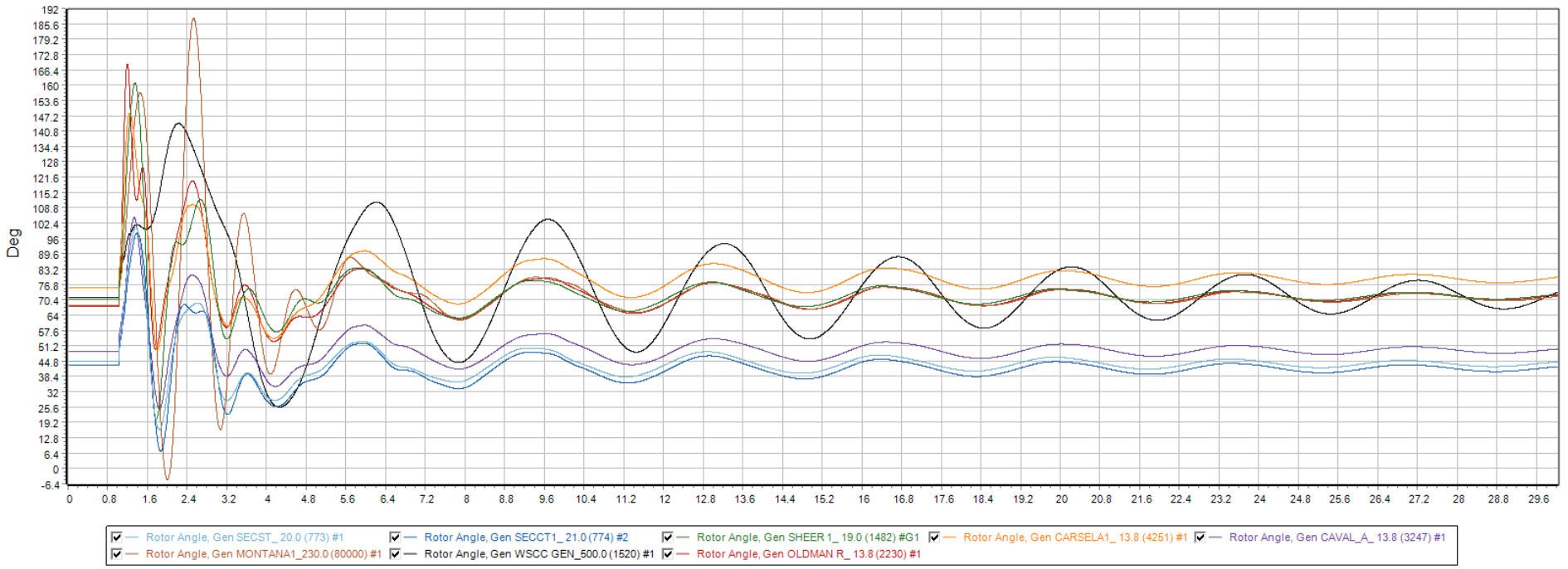
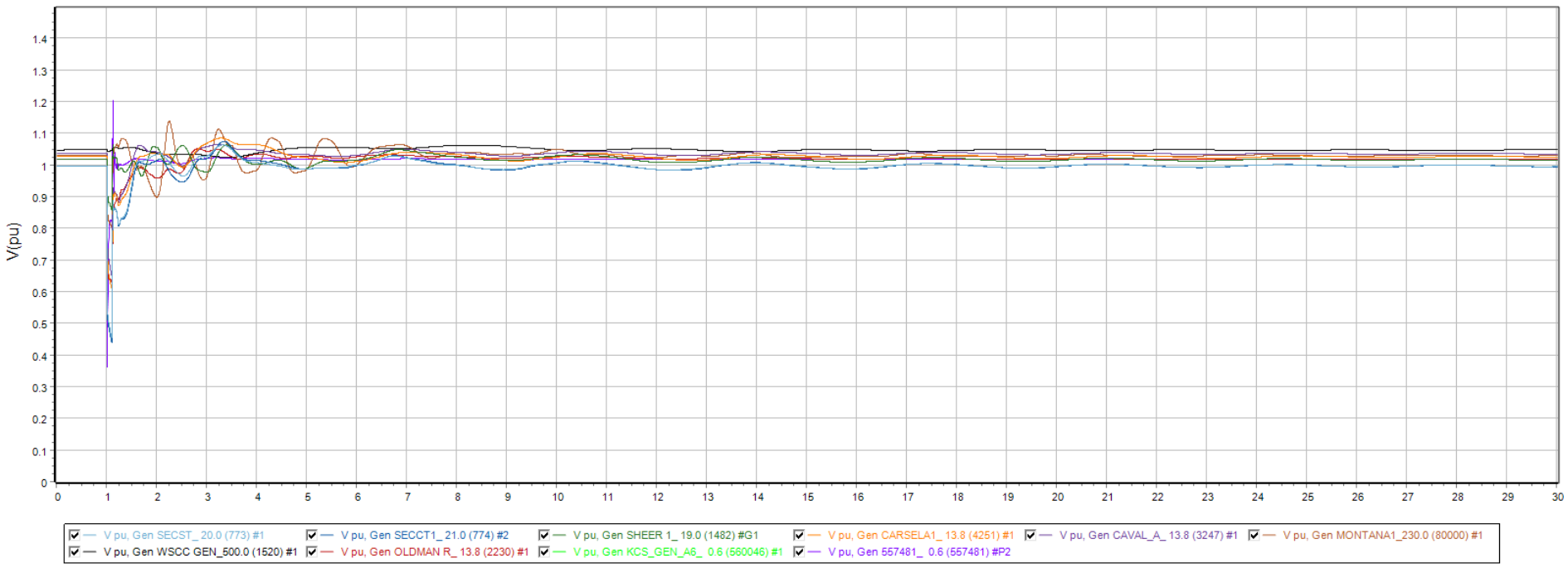
Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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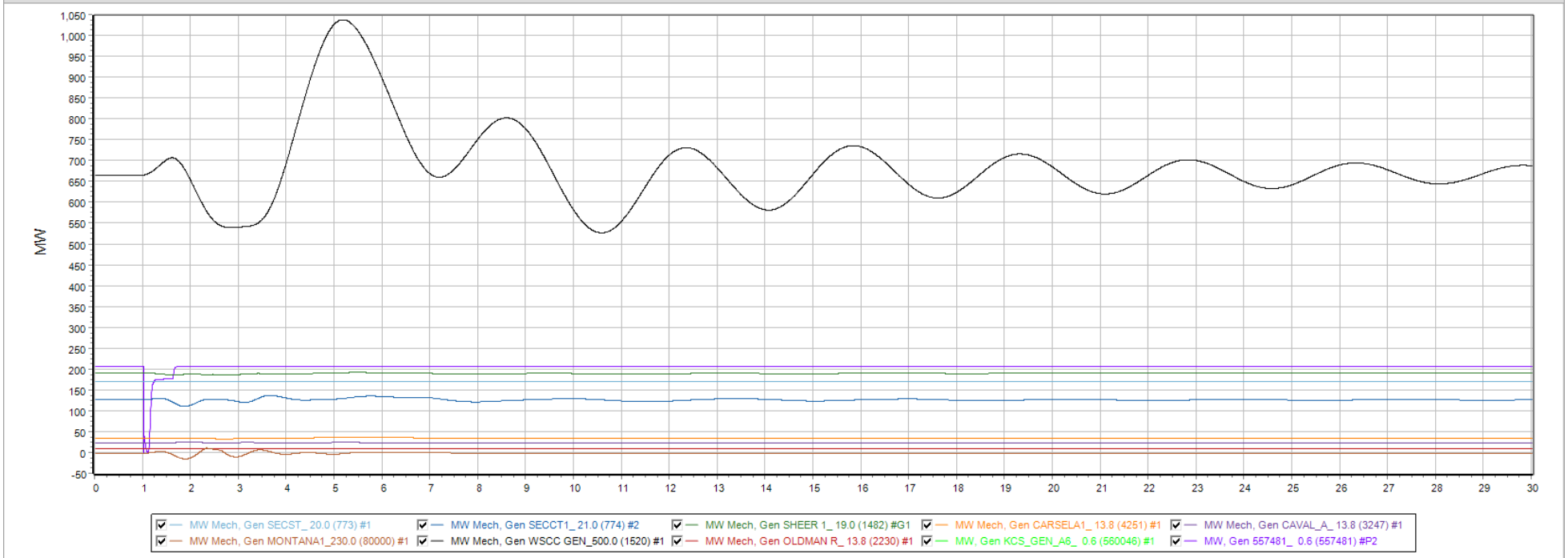
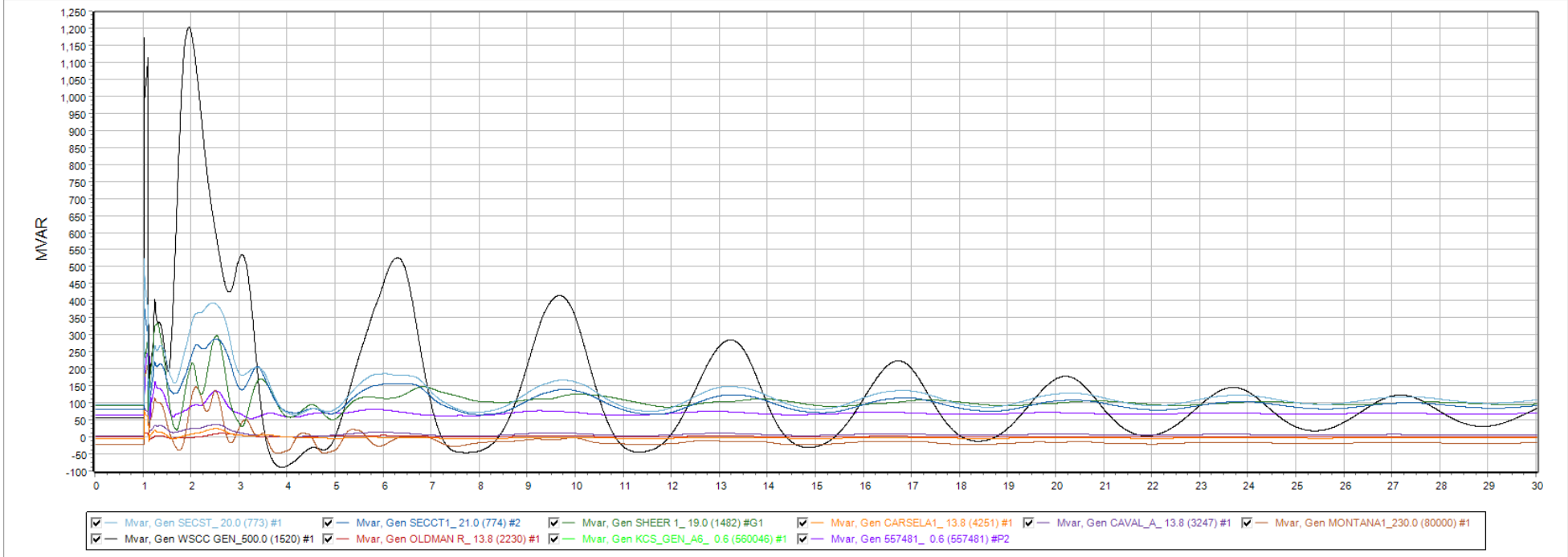
May 16, 2023 23:33:45

Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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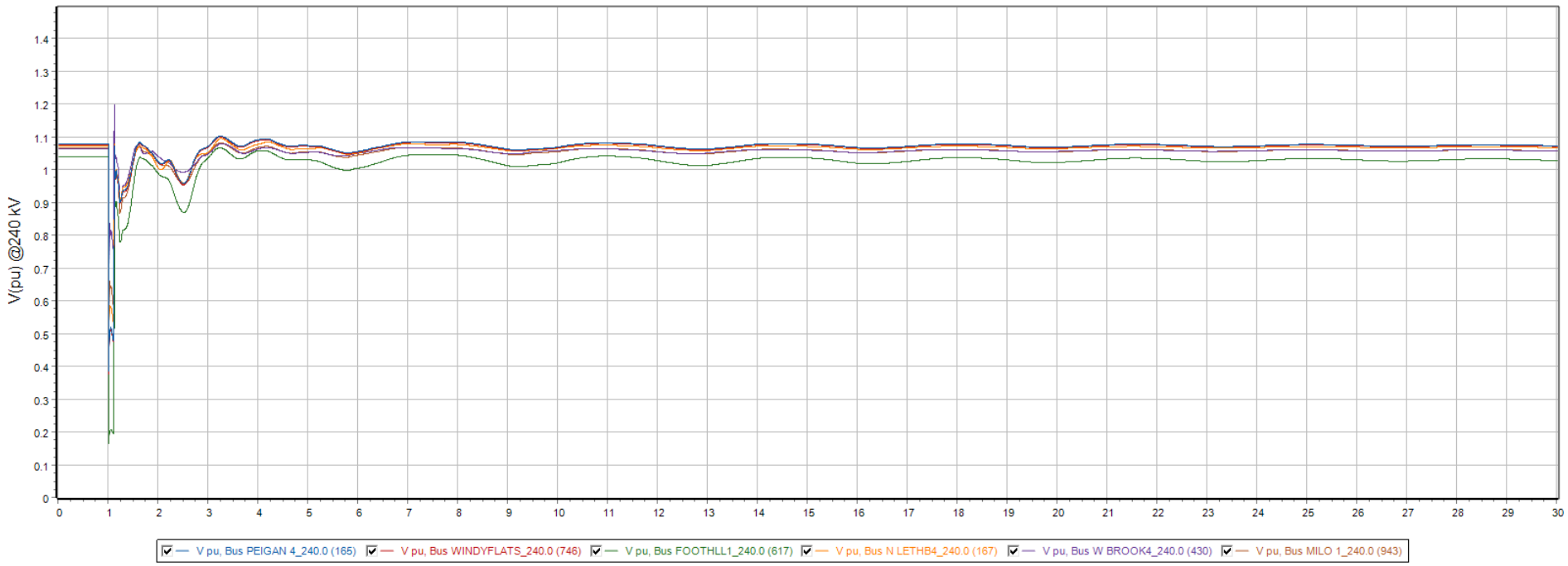
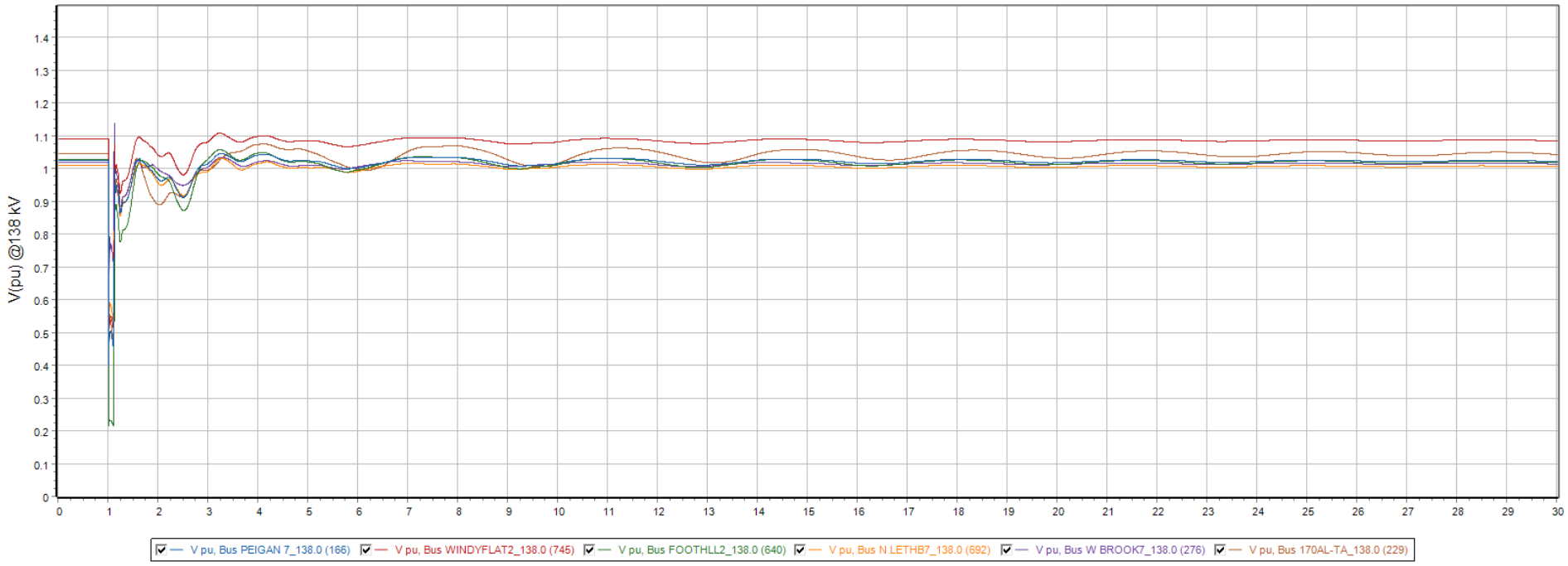
May 16, 2023 23:33:46

Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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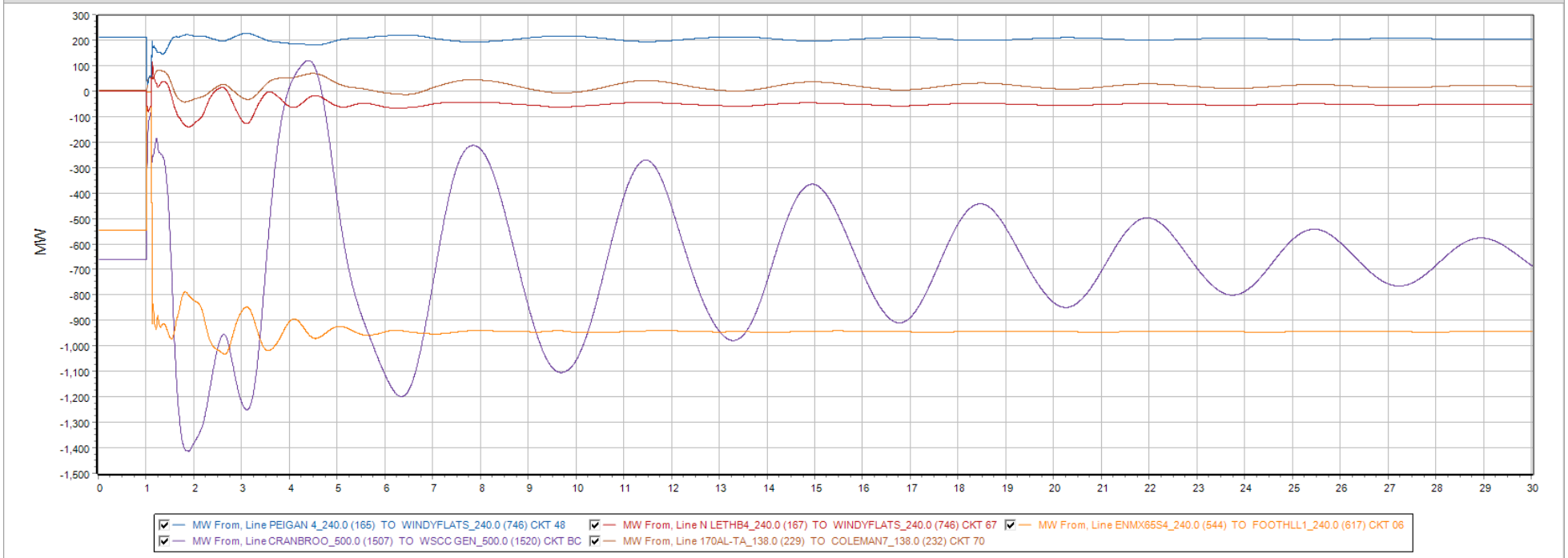
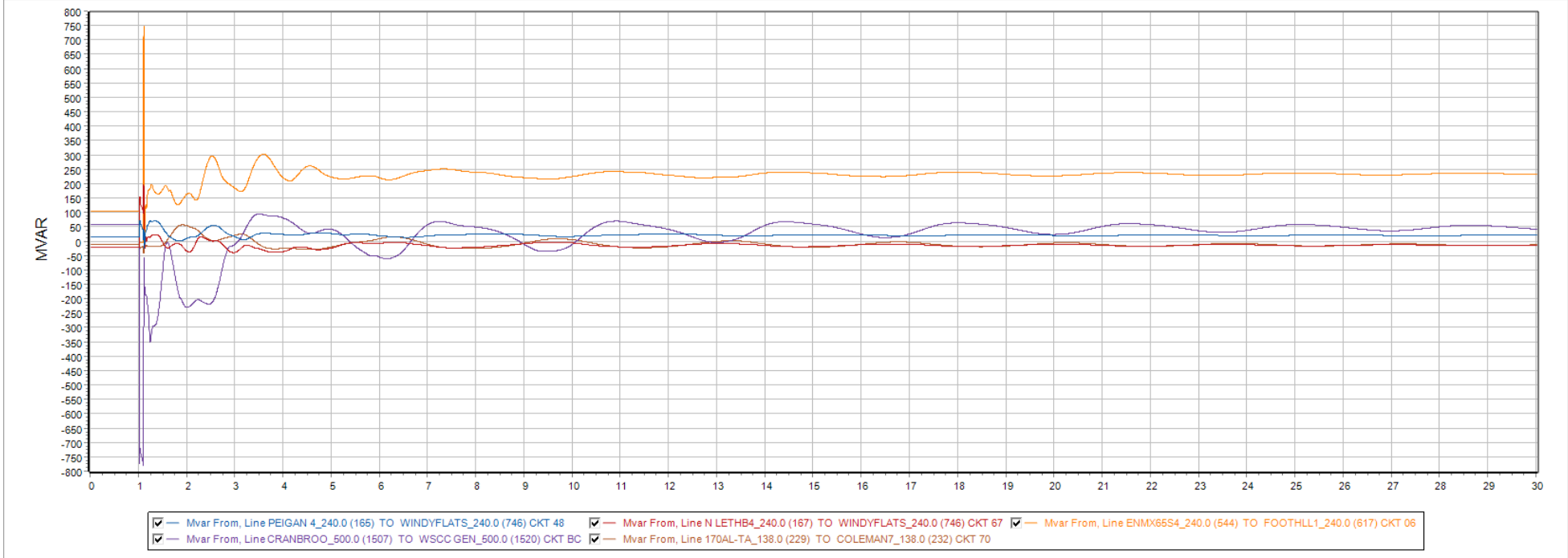
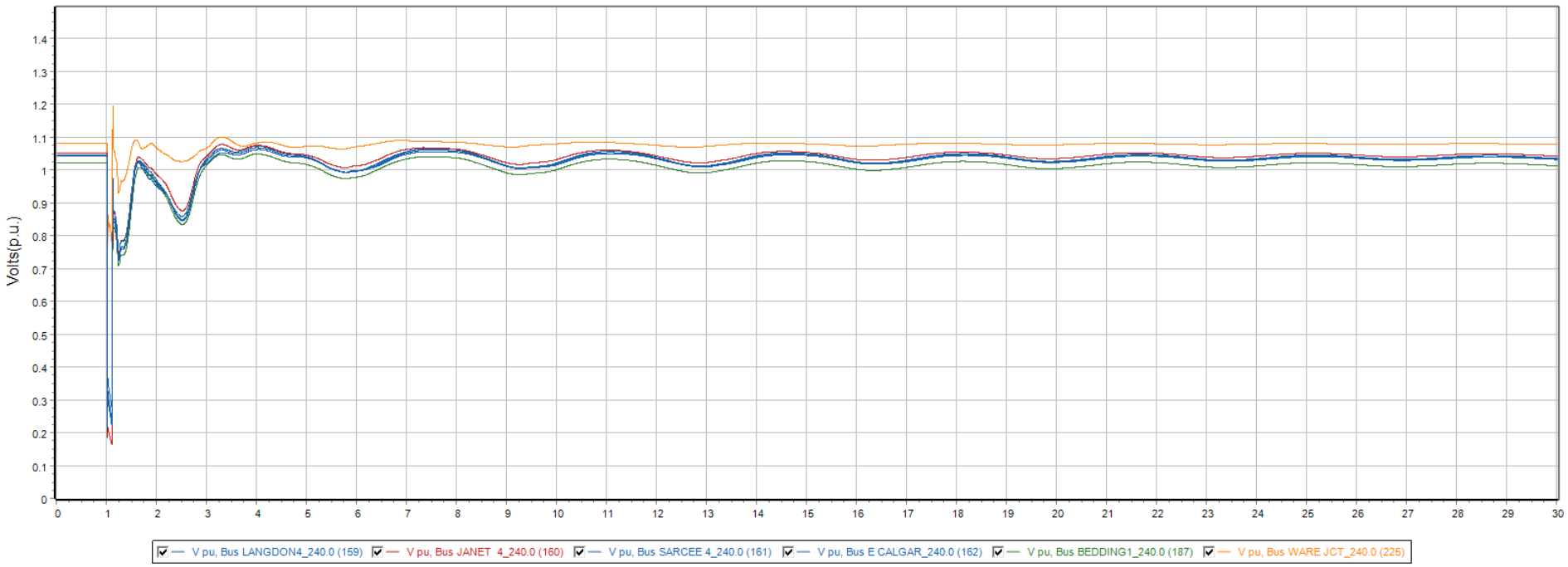
May 16, 2023 23:33:46

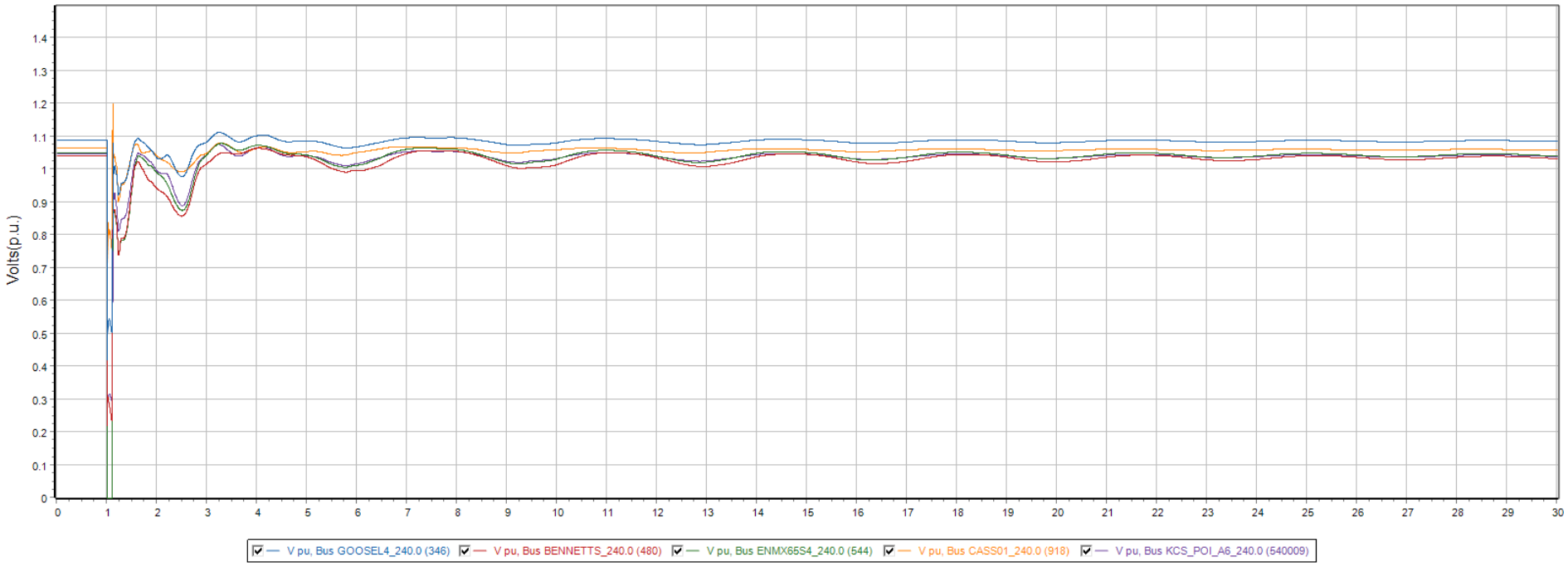
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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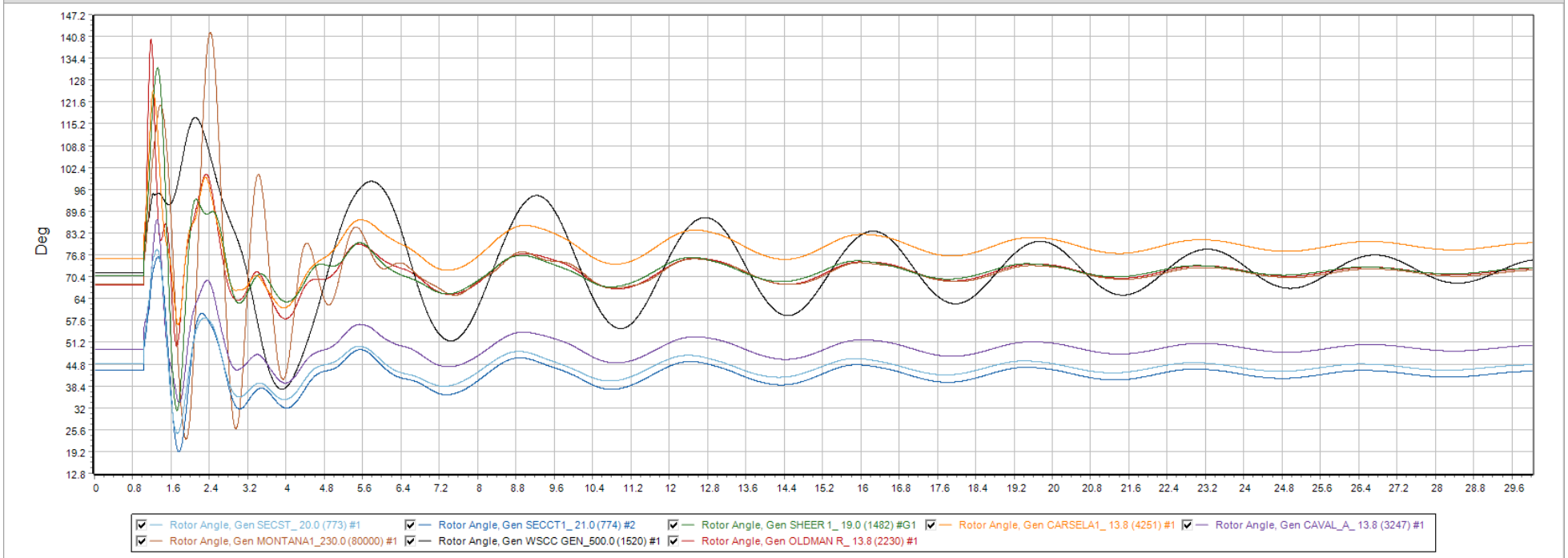
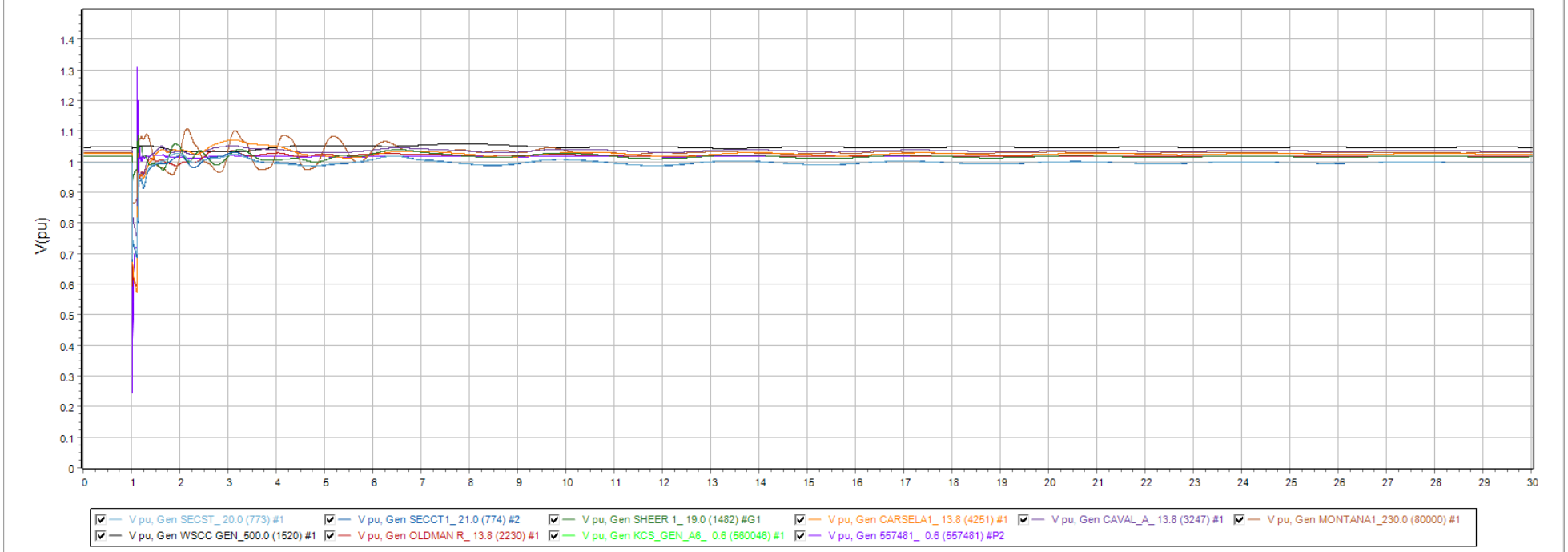
May 16, 2023 23:33:47

Monitor Gens. Q1





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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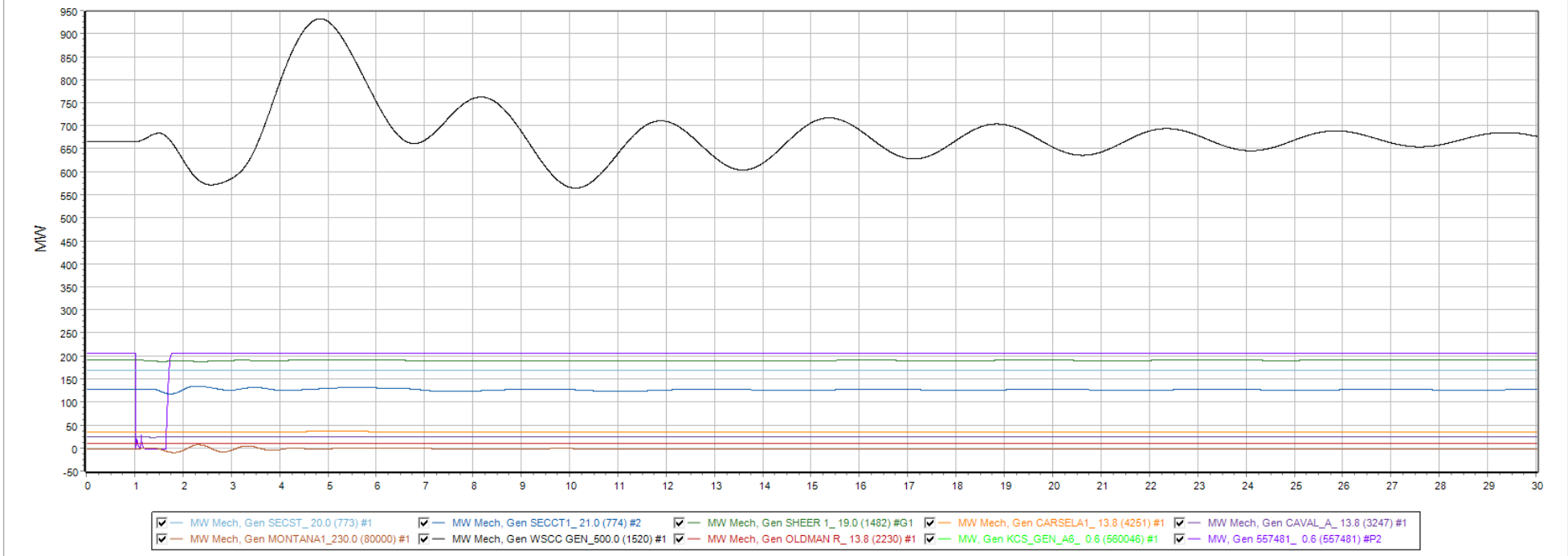
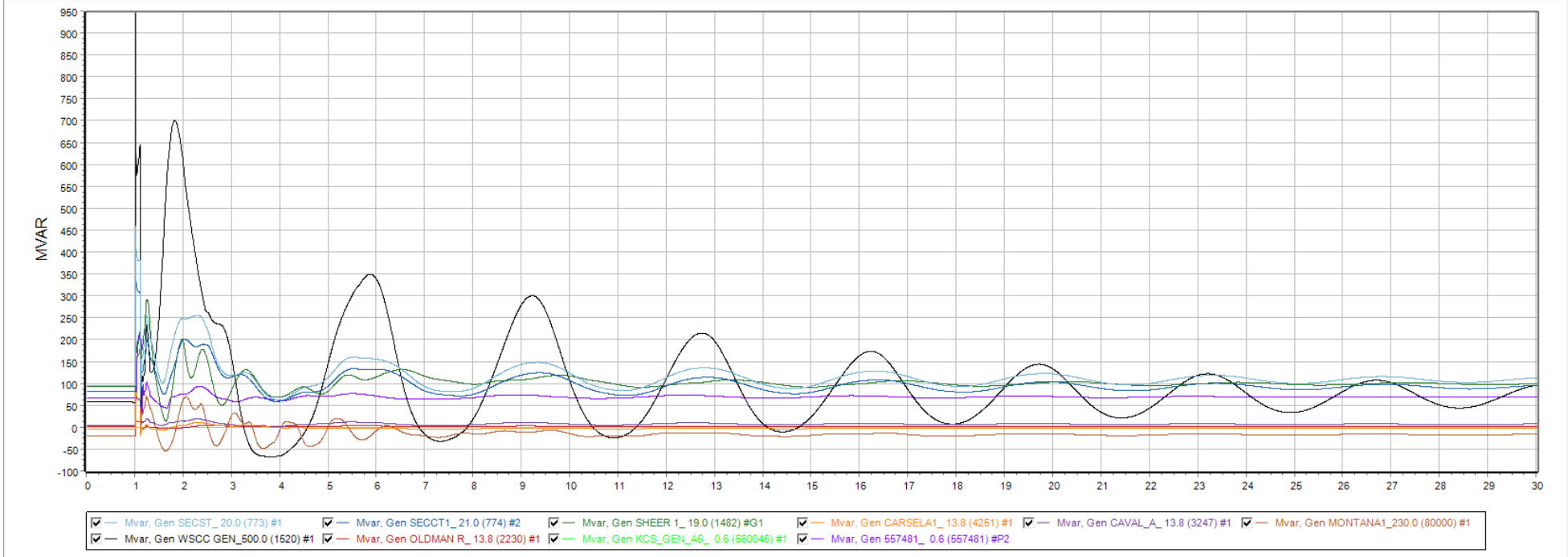
Monitor Gens. Q2





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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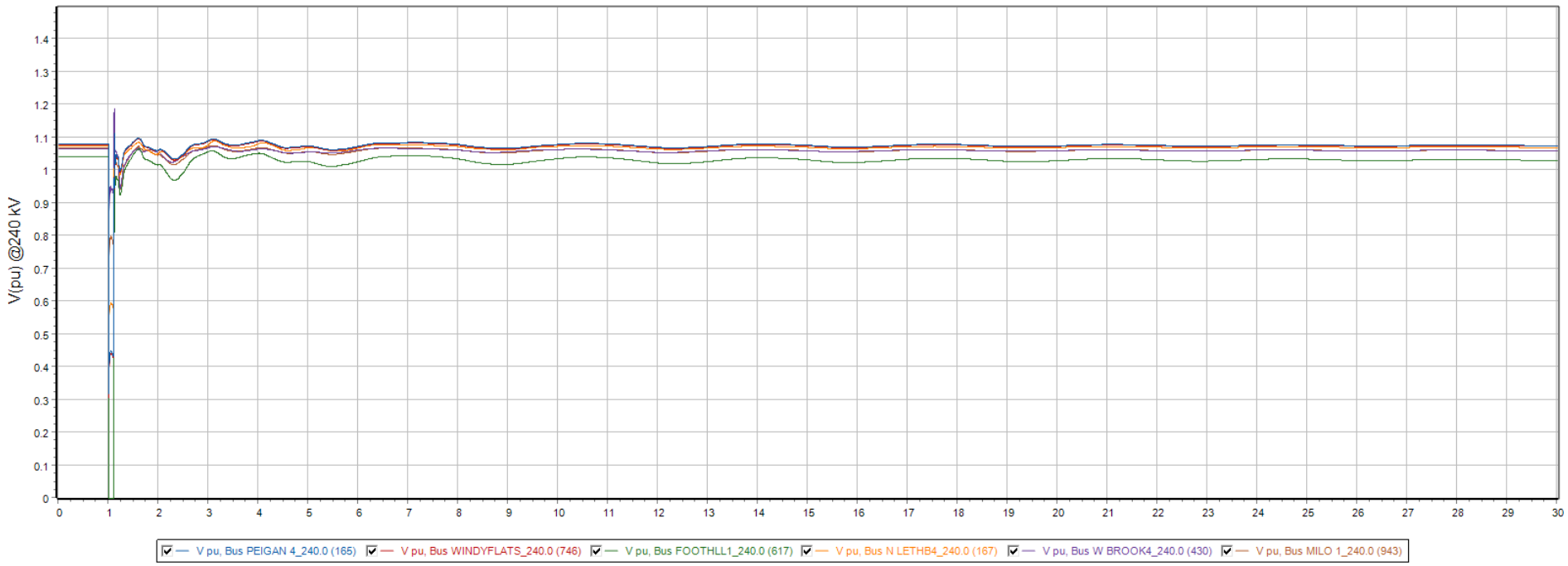
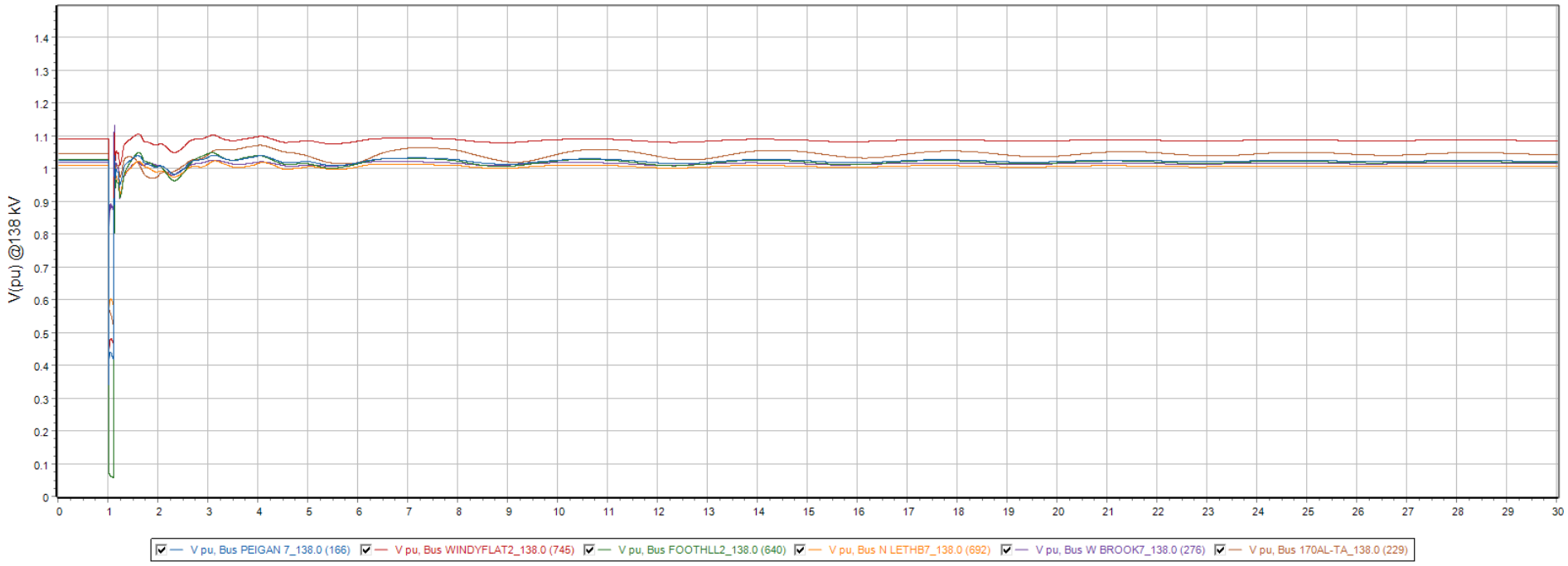
Monitor Bus Volts Q3





SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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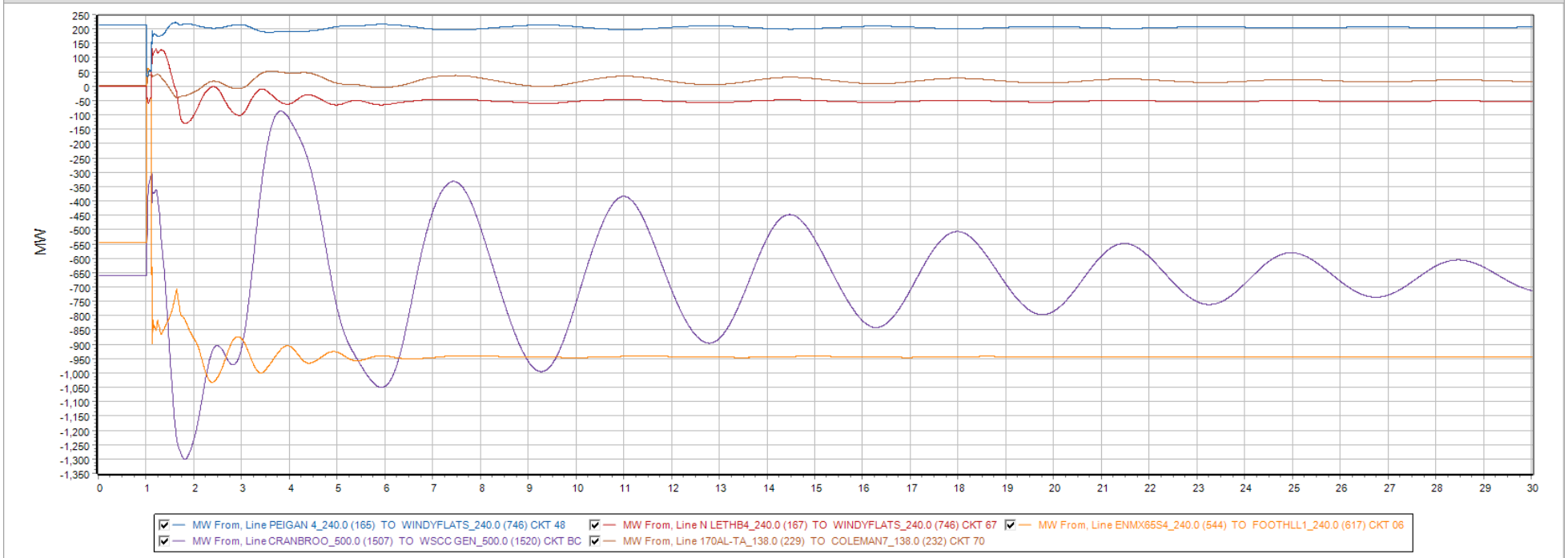
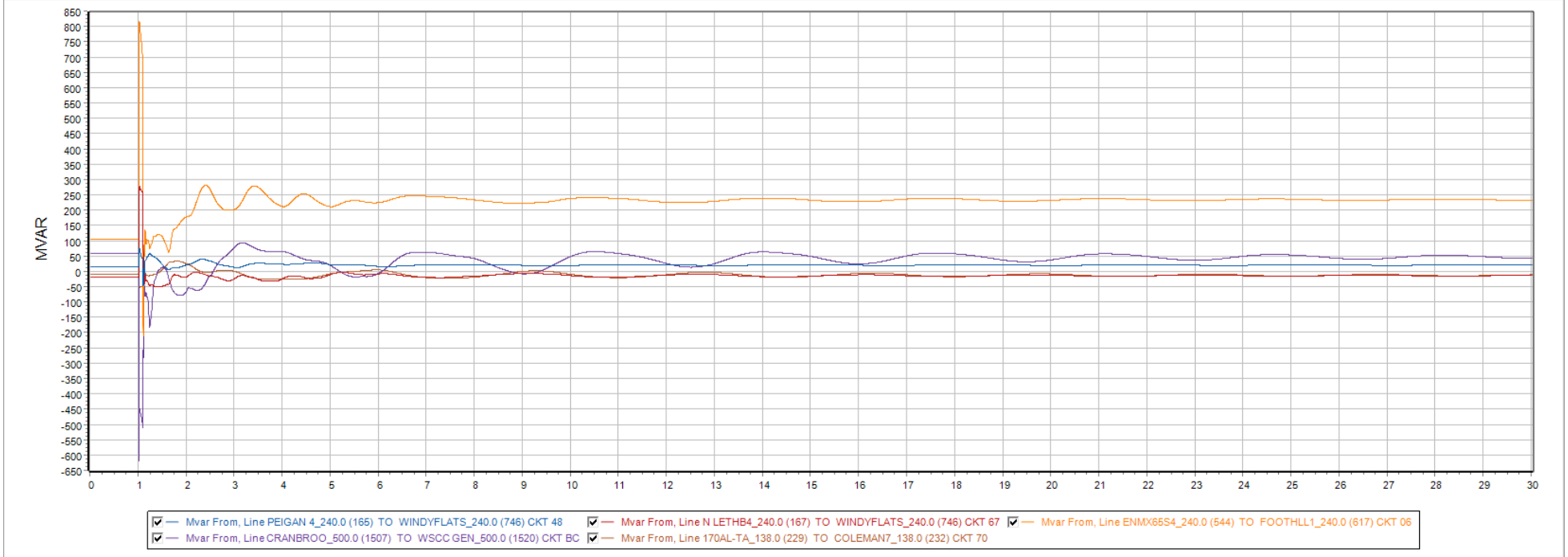
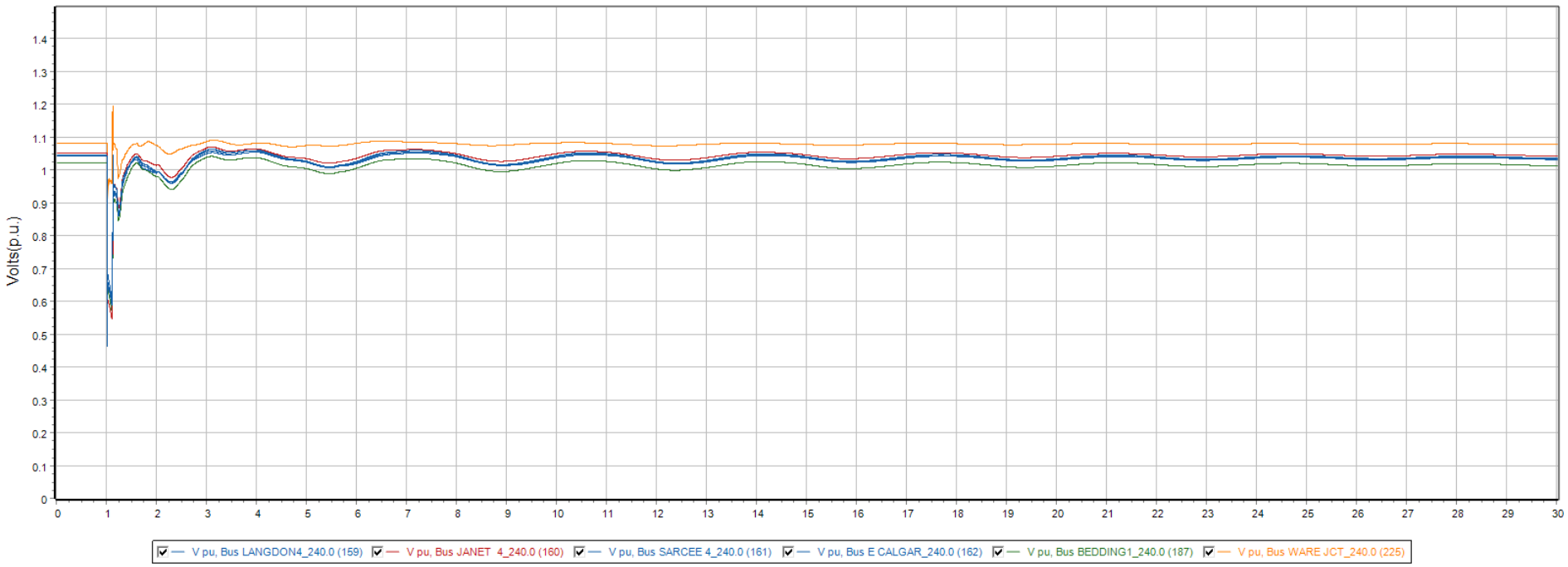
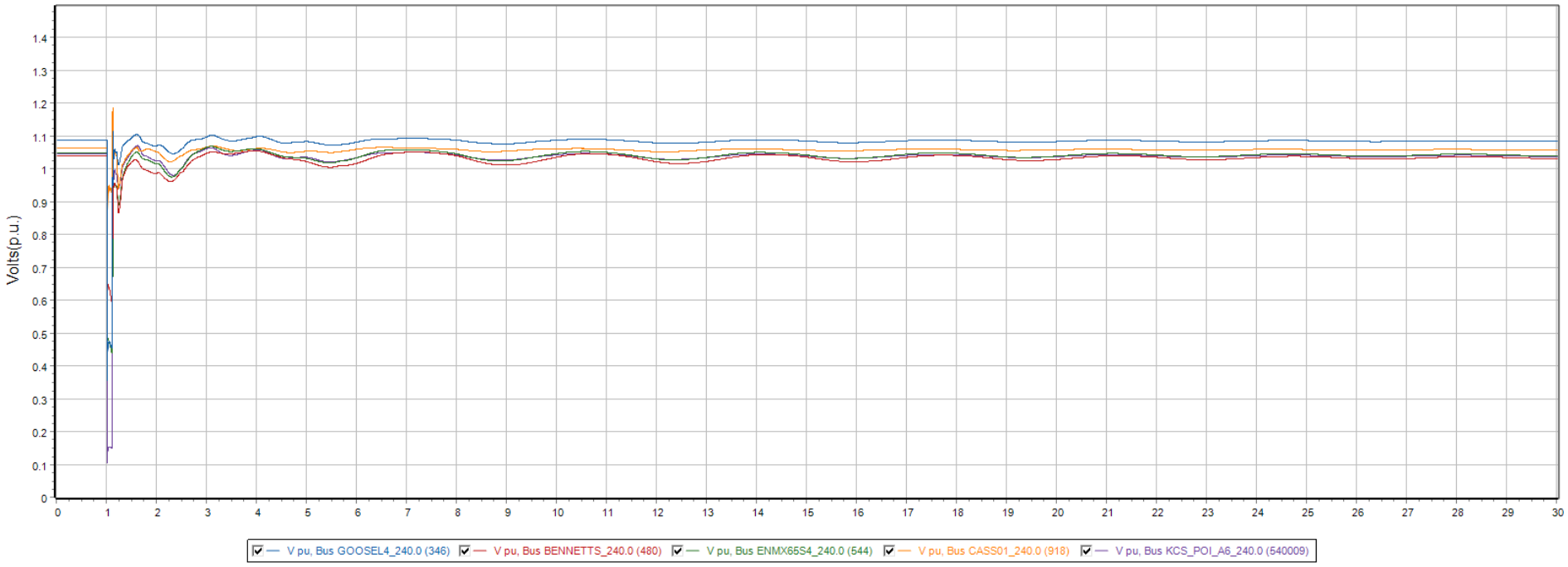
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC03_2025SL_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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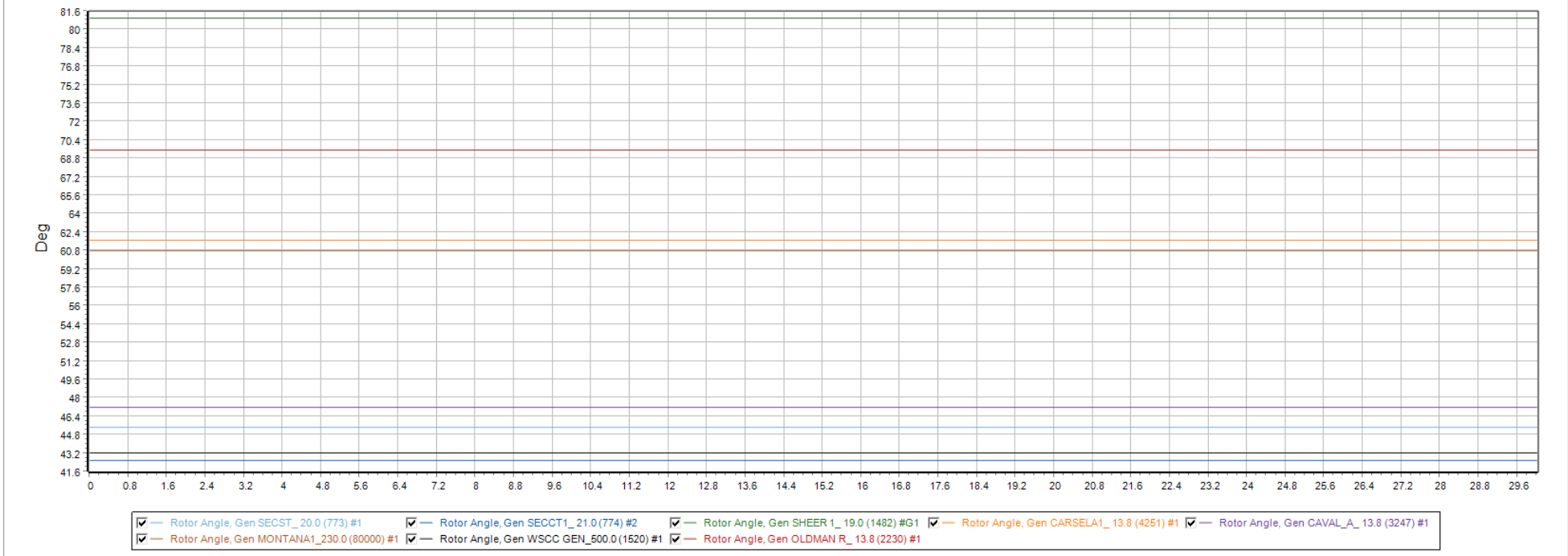
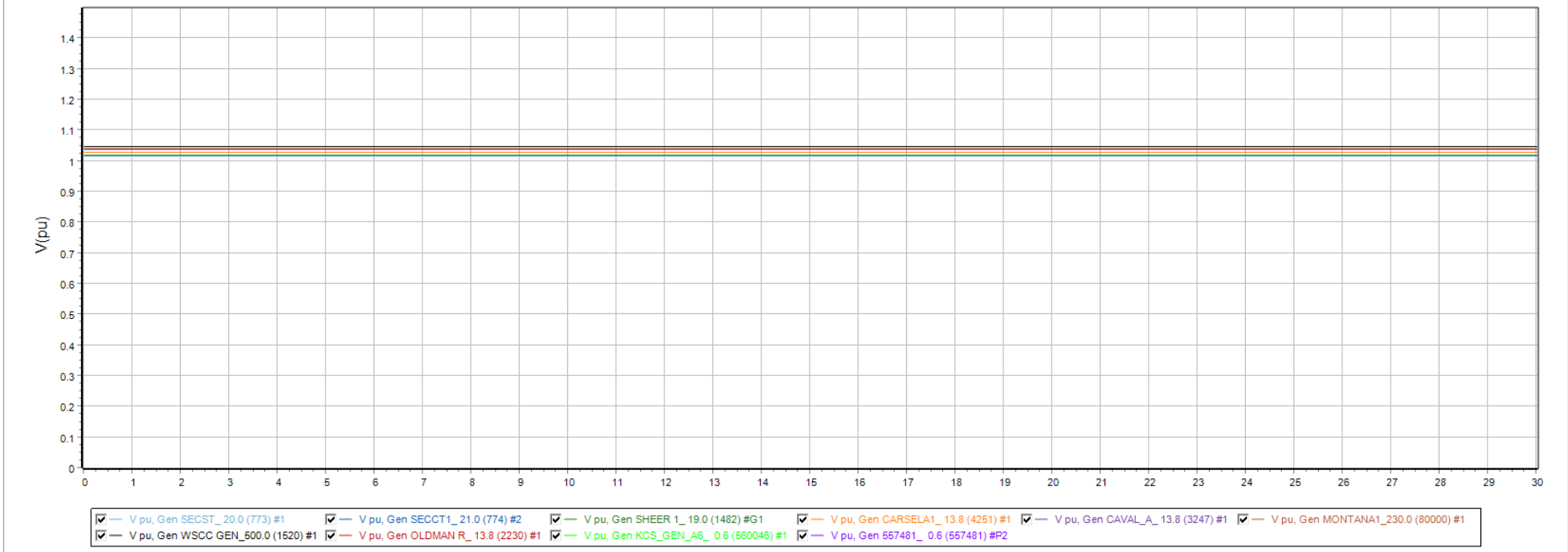
2025 SUMMER PEAK

Single Line Diagrams
P2445 - POST-PROJECT
Transient Stability Response
SC04

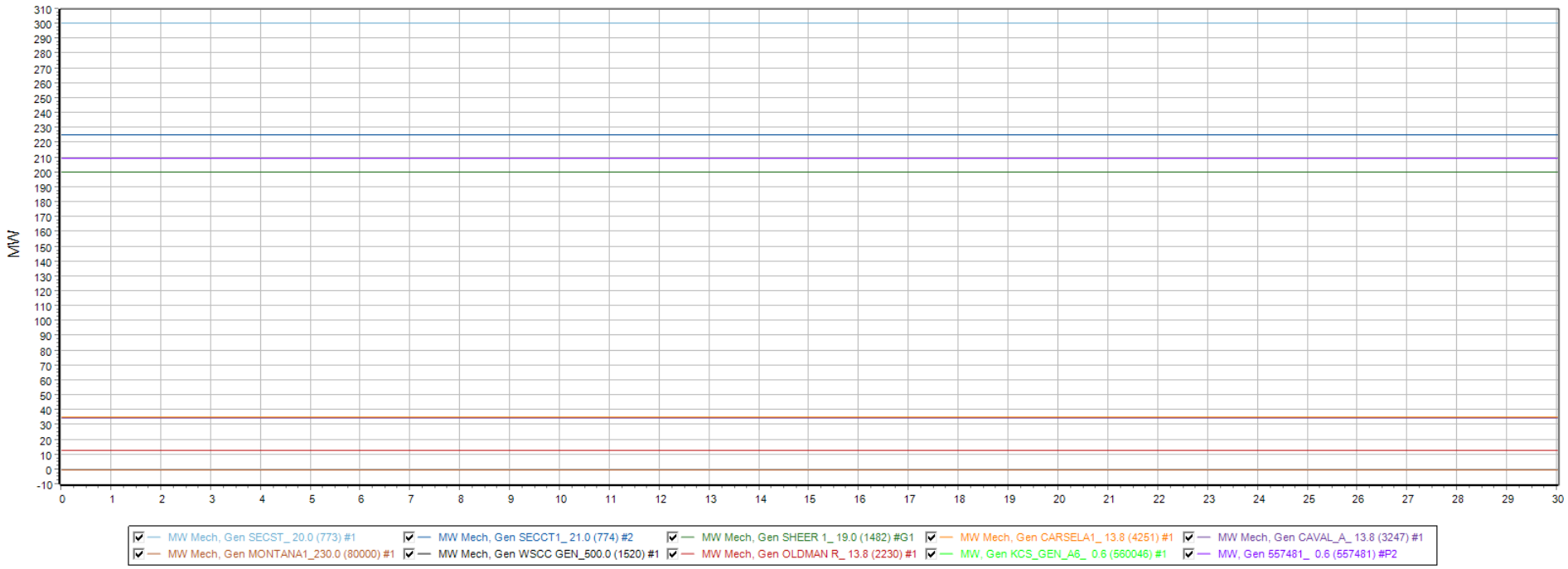
NICAN

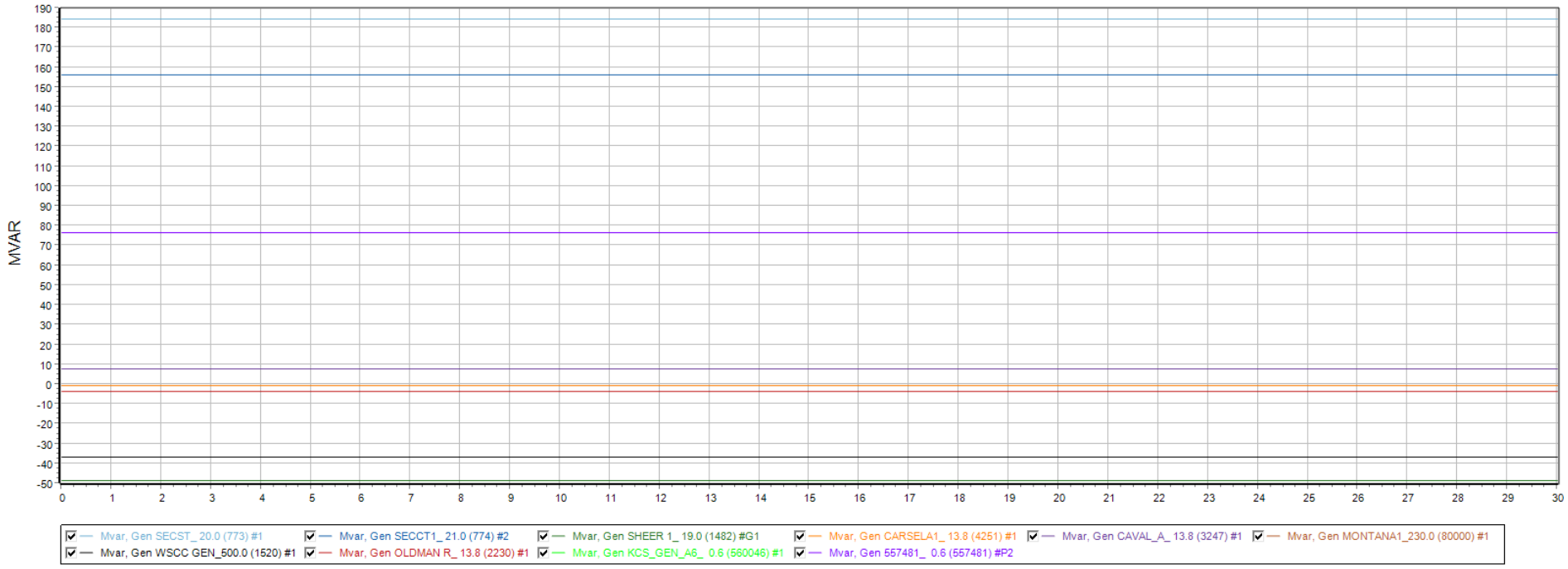
Monitor Gens. Q1



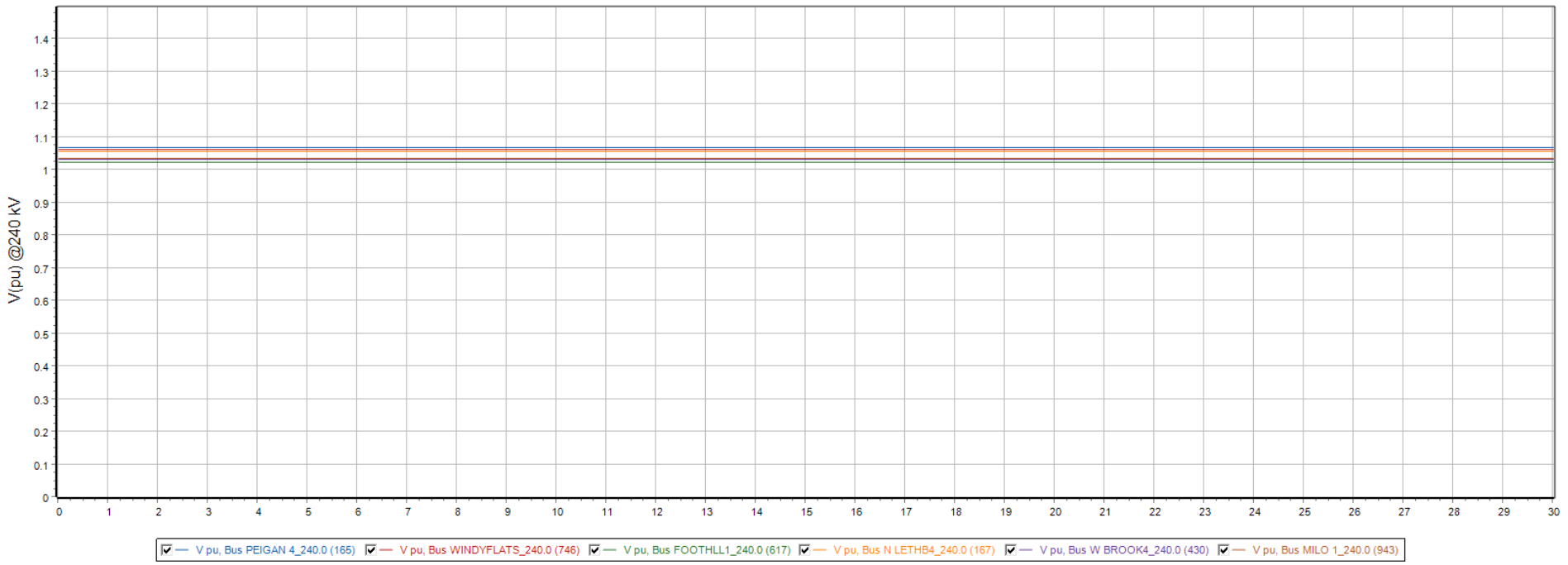


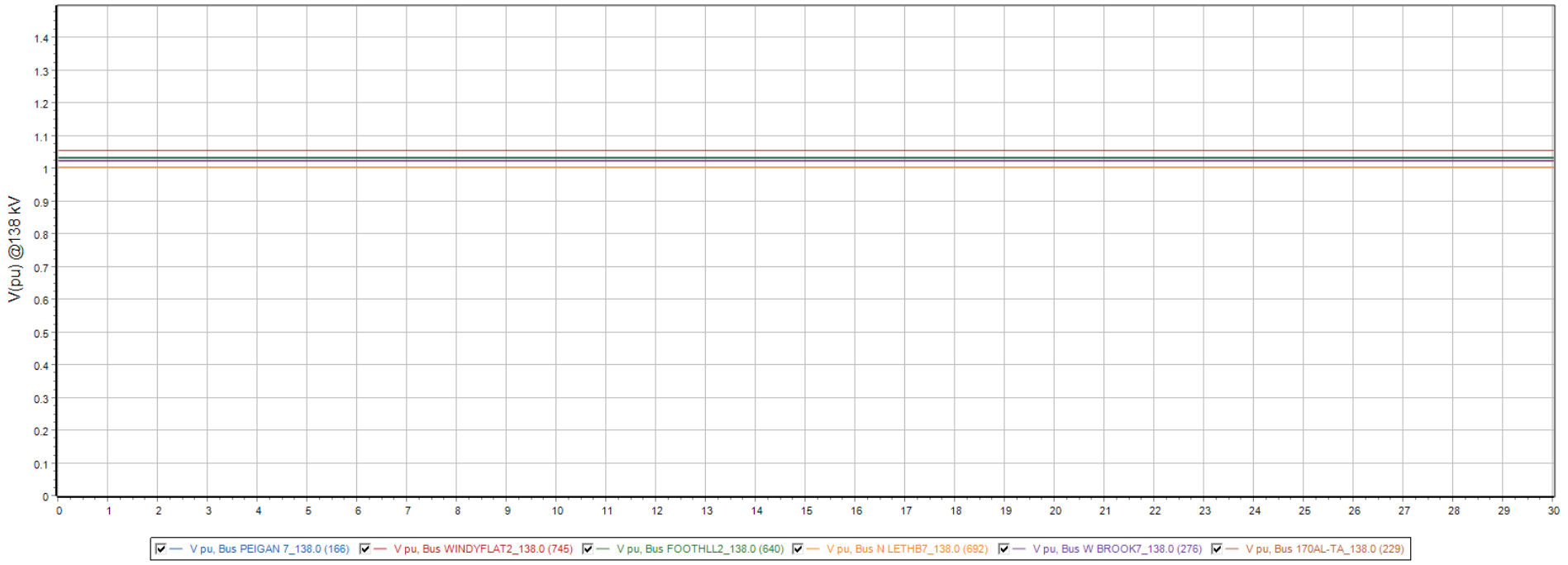
Monitor Gens. Q2



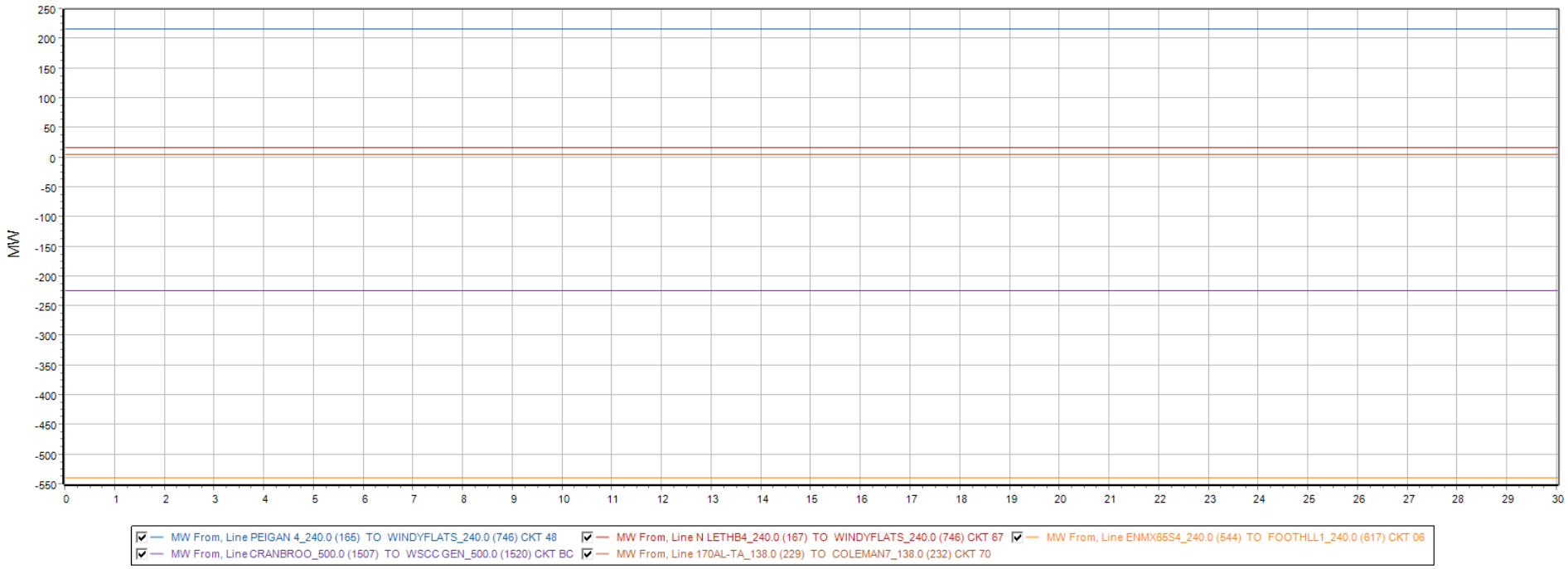


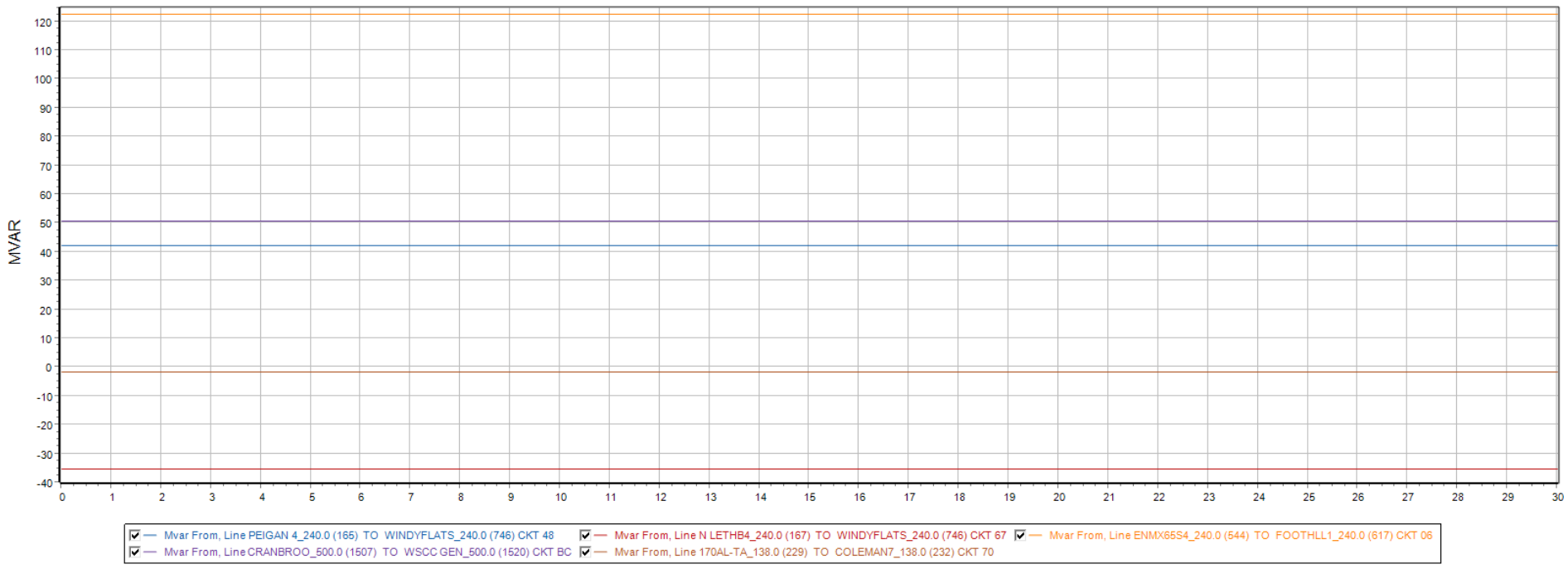
Monitor Bus Volts Q3



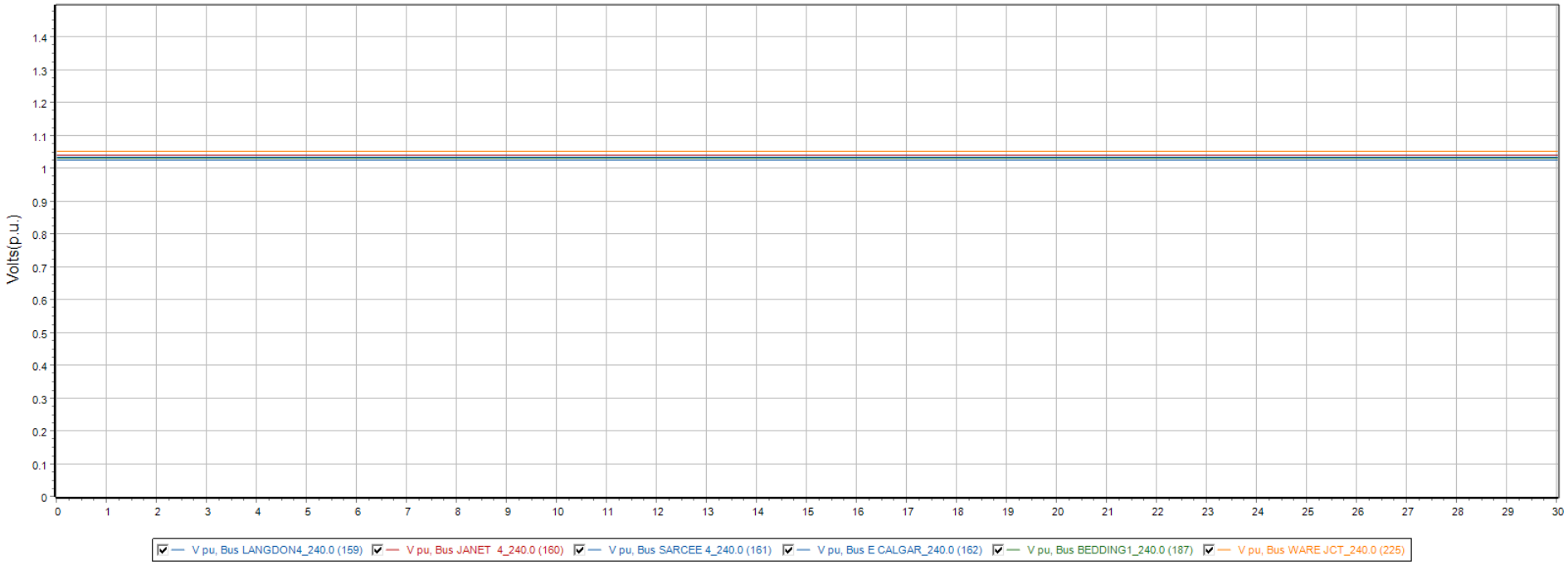


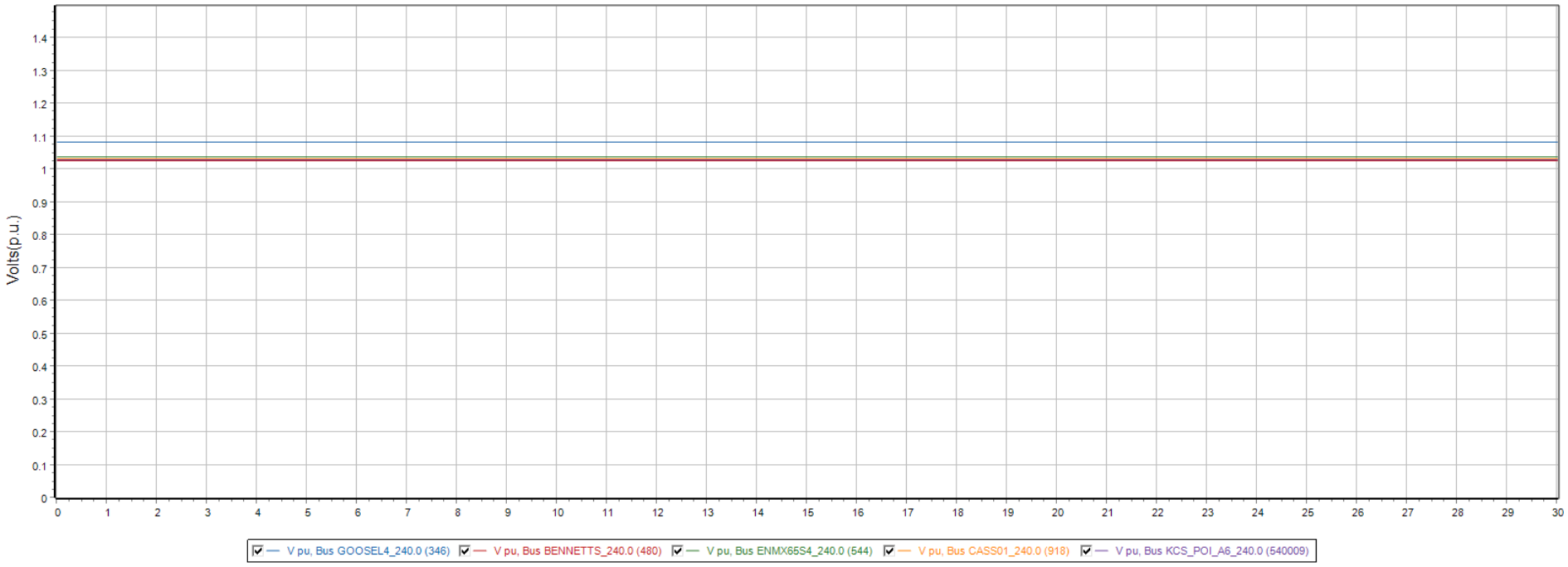
Monitor Line MW & MVAR. Q4



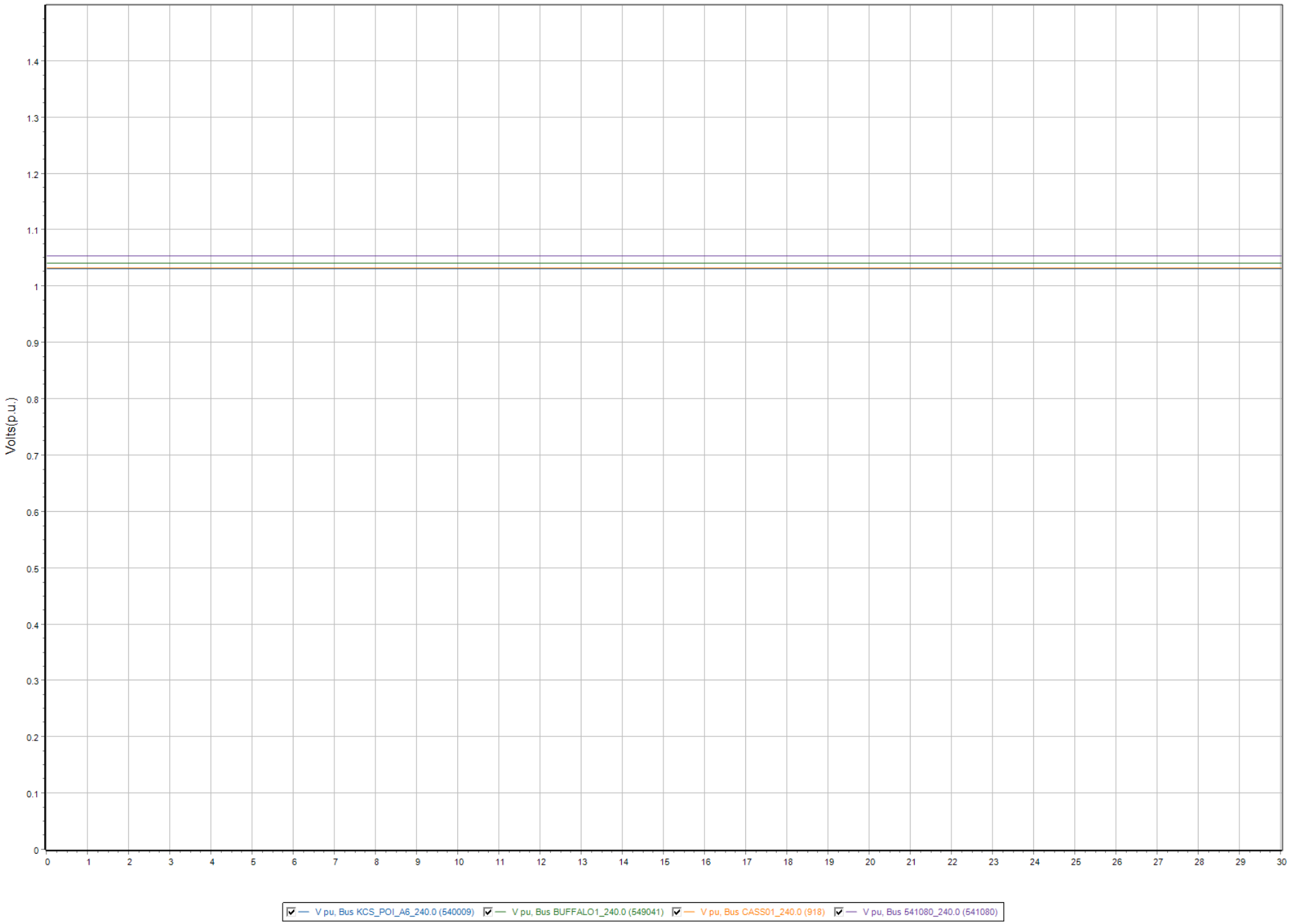


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 00 - NERC Cat A

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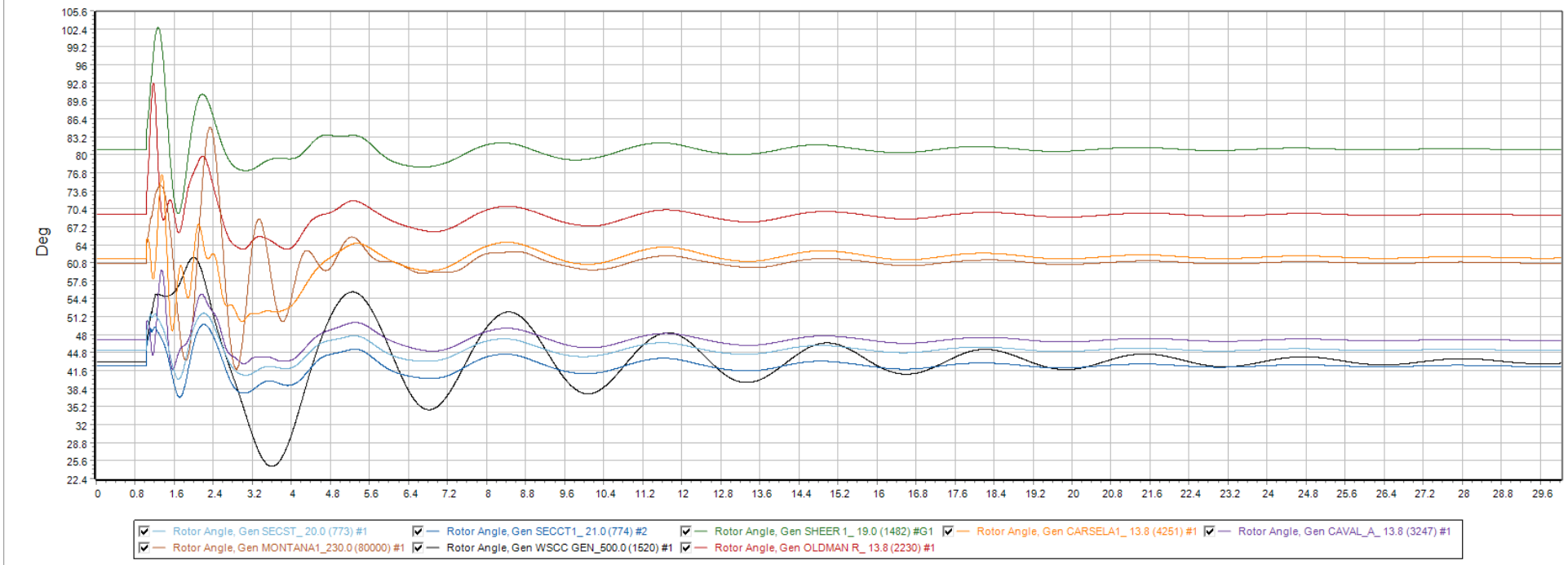
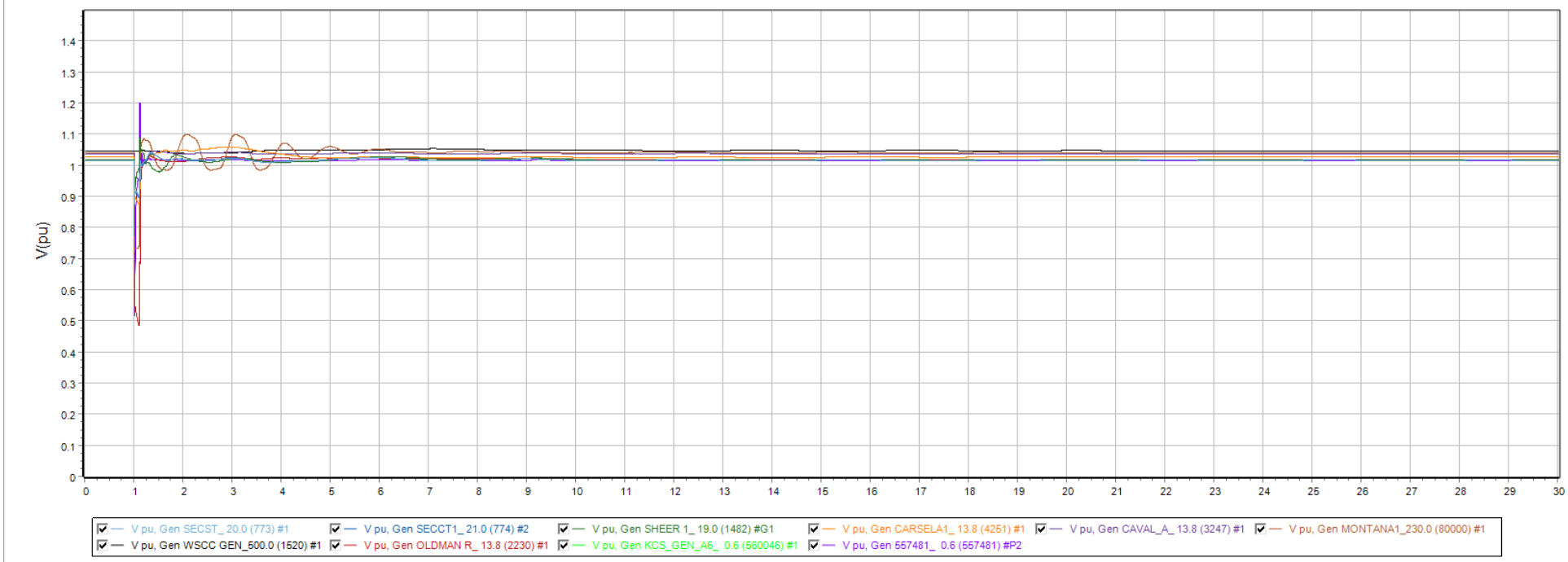
May 16, 2023 23:17:02

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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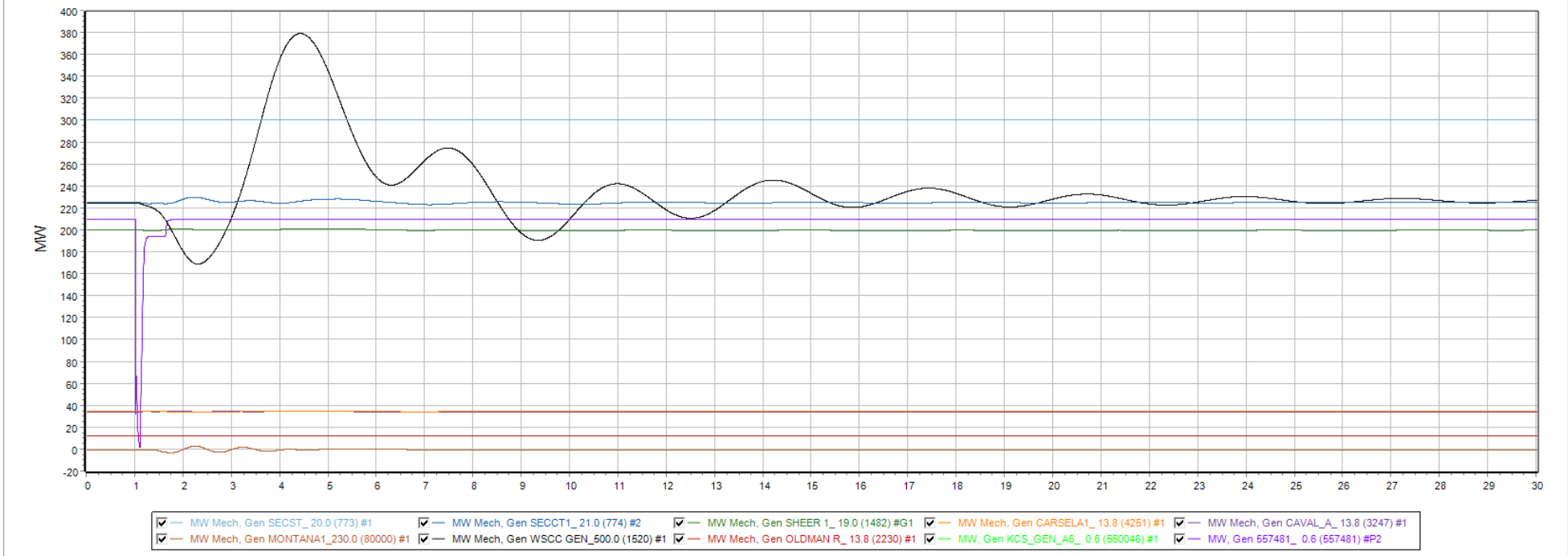
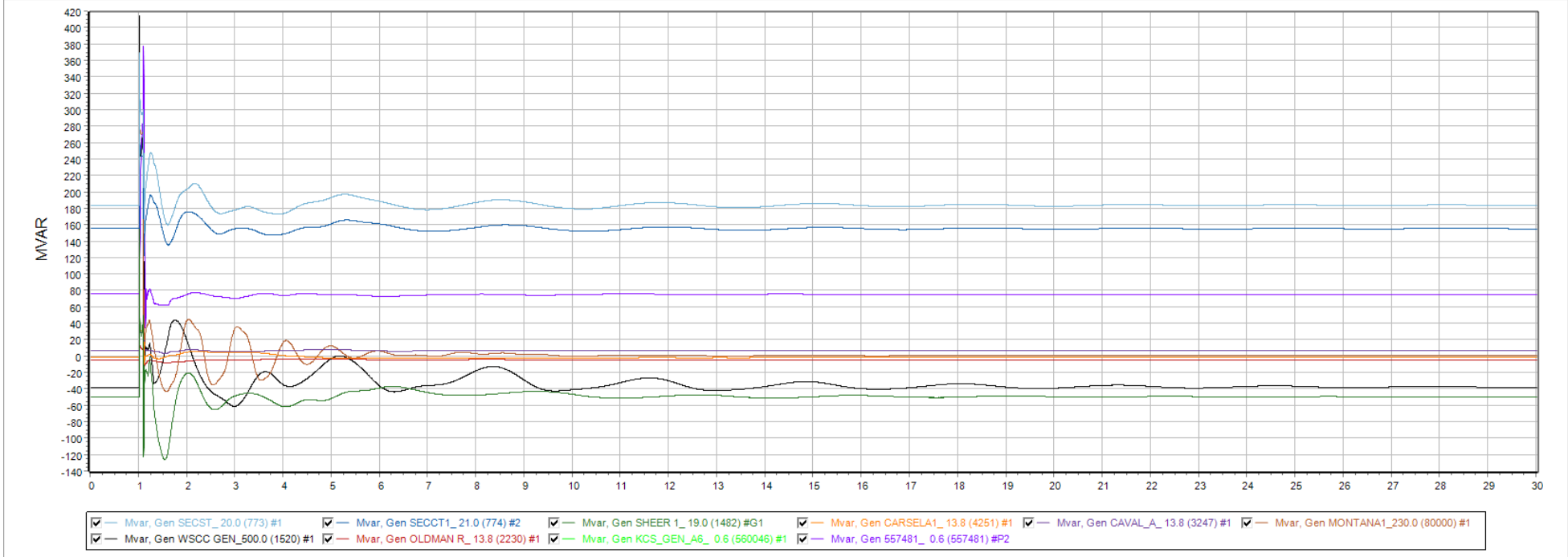
May 16, 2023 20:30:04

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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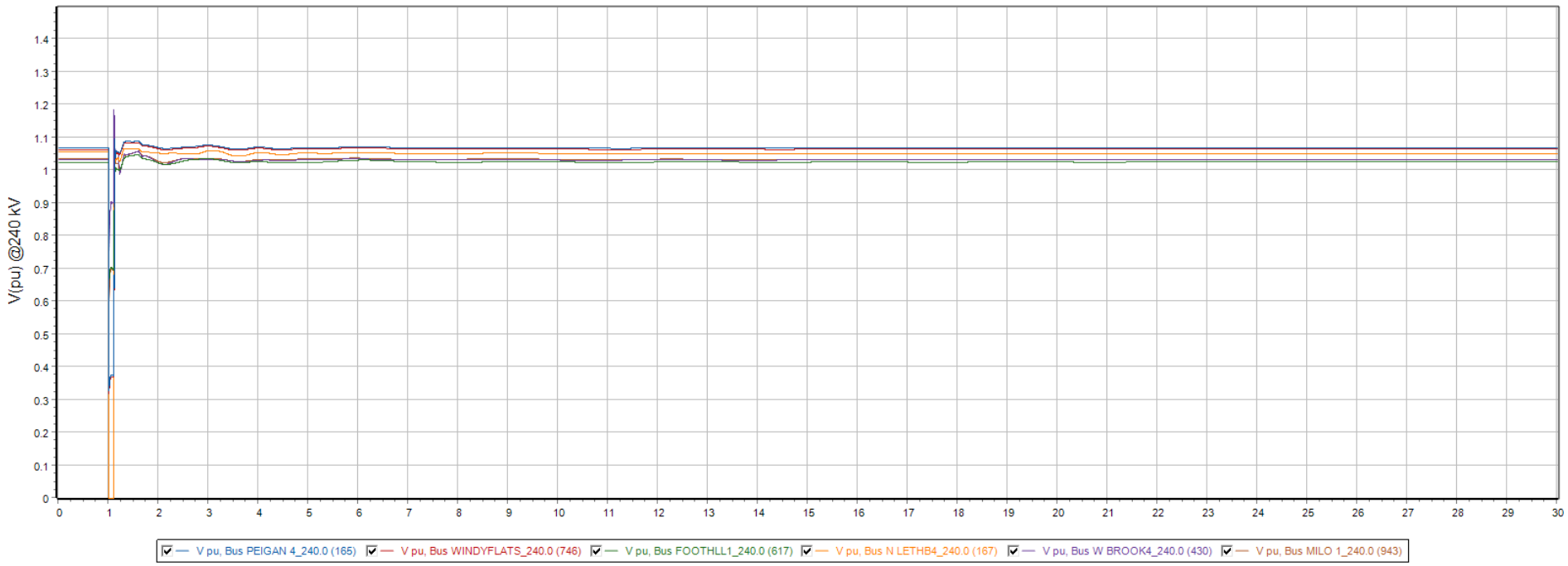
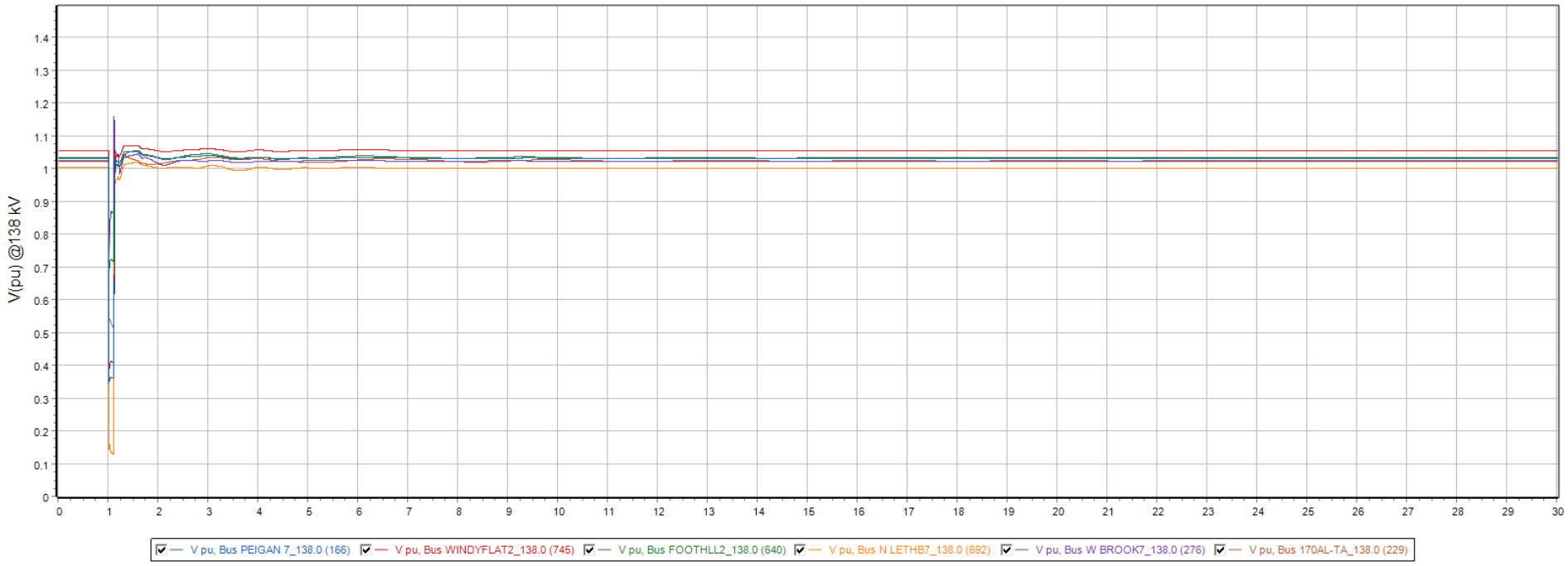
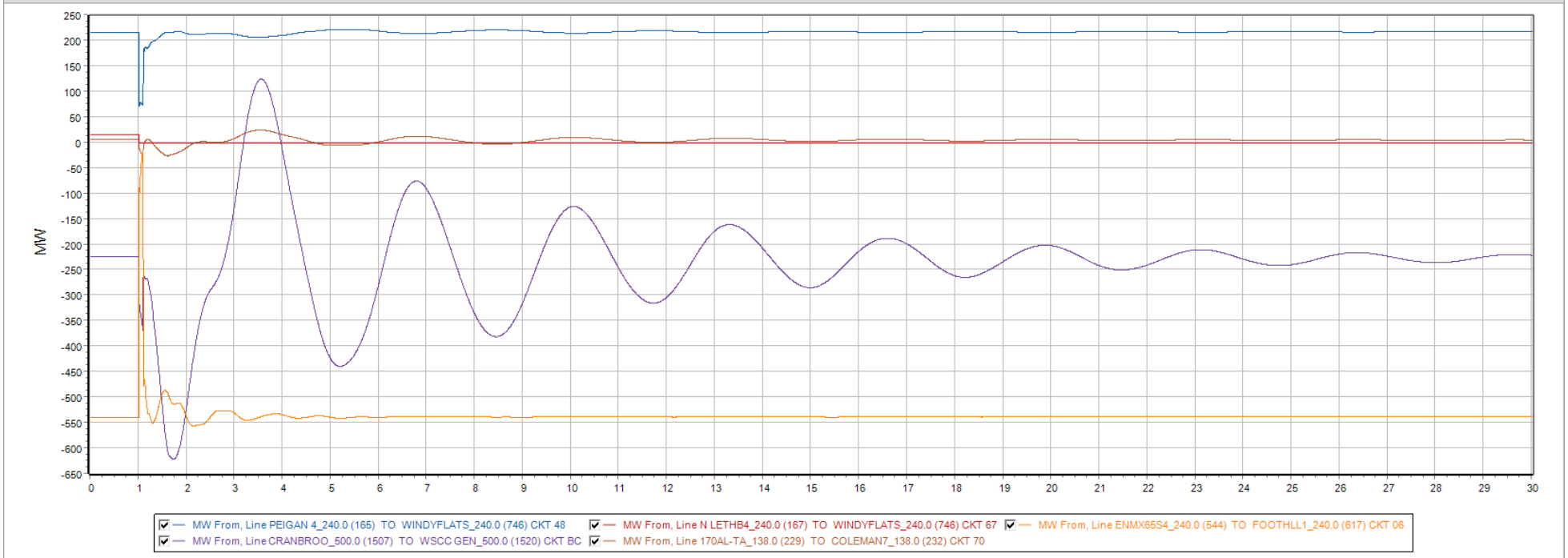
May 16, 2023 20:30:04

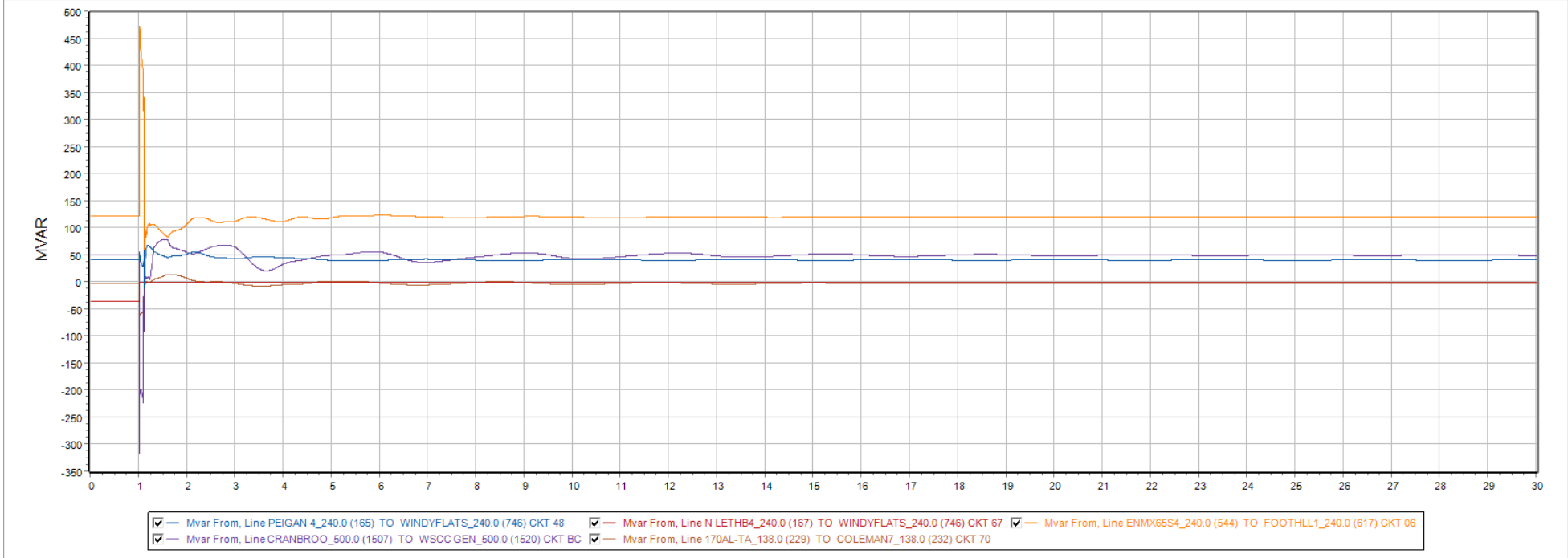
Monitor Bus Volts Q3



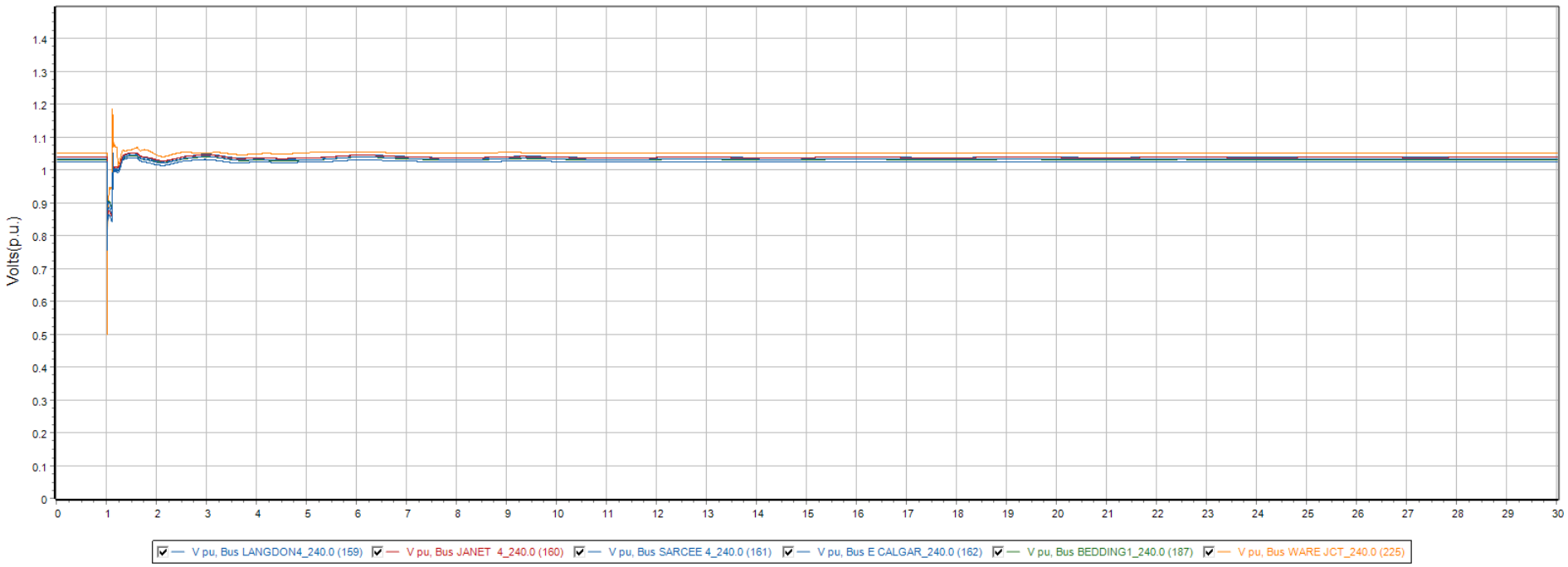


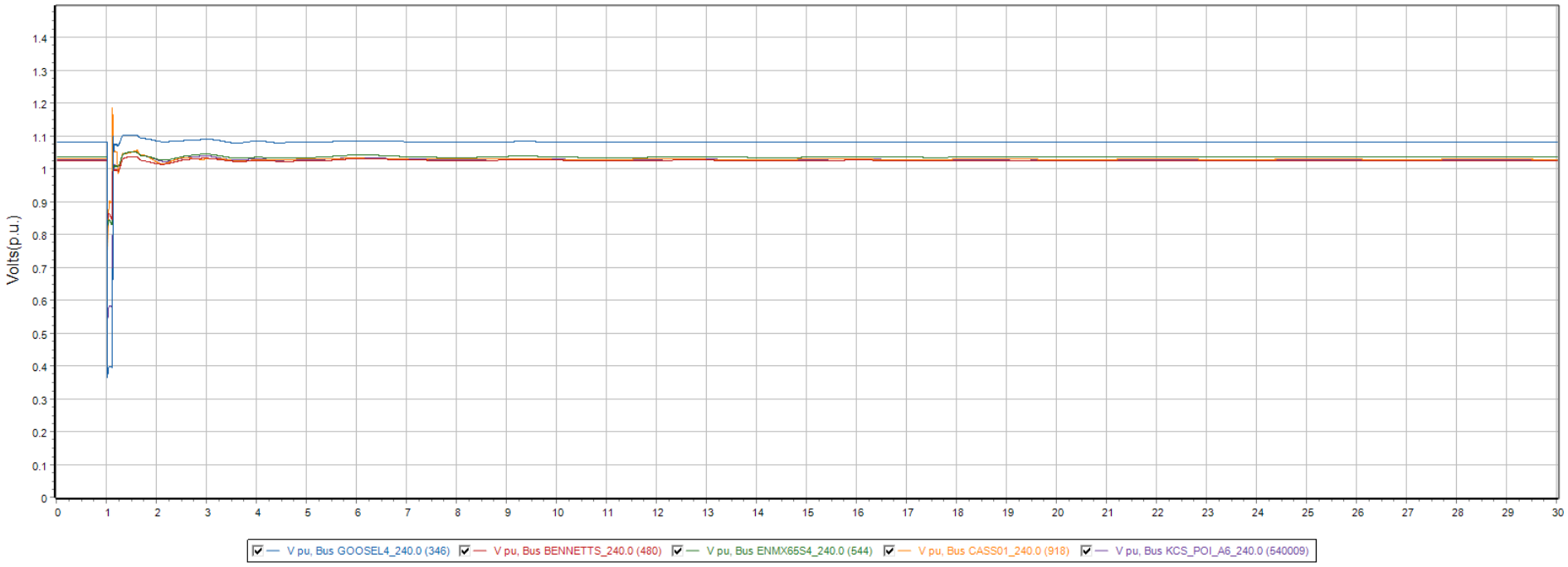
Monitor Line MW & MVAR. Q4



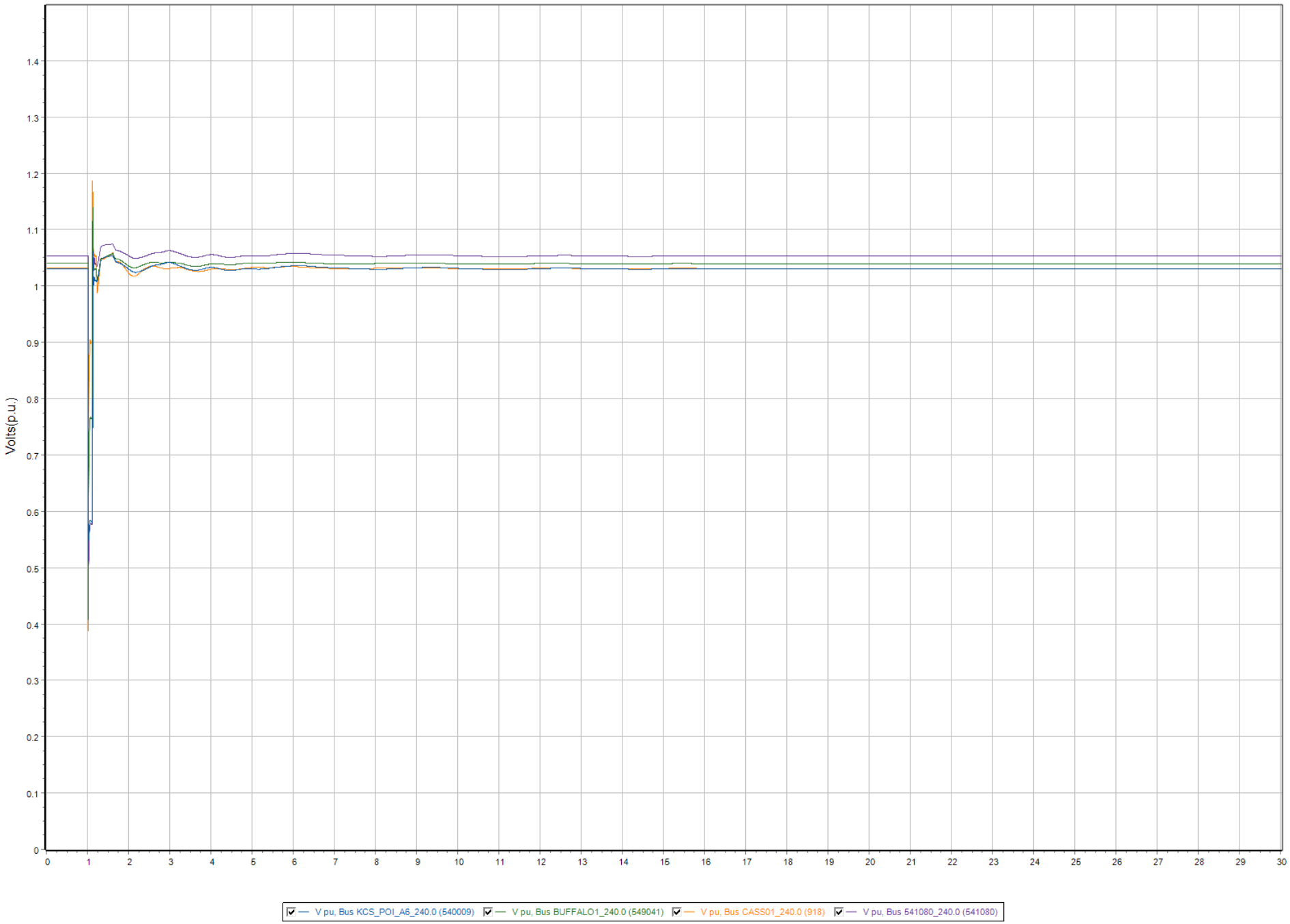


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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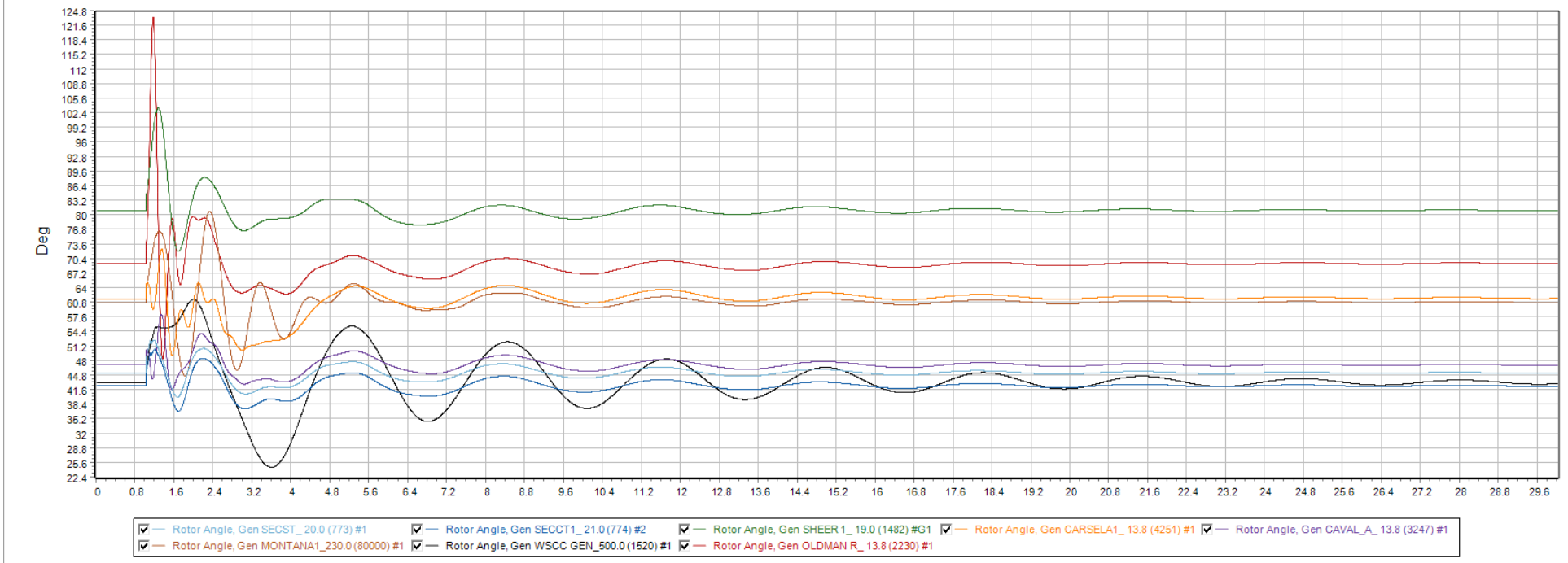
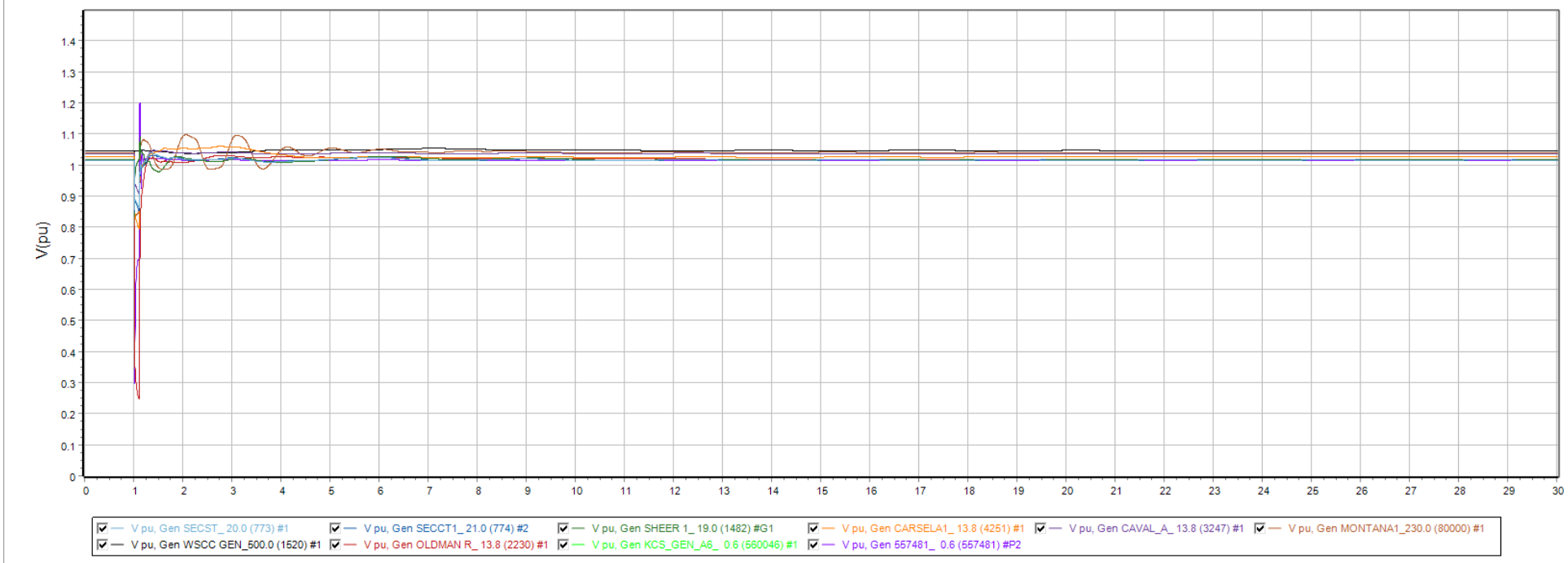
May 16, 2023 20:30:06

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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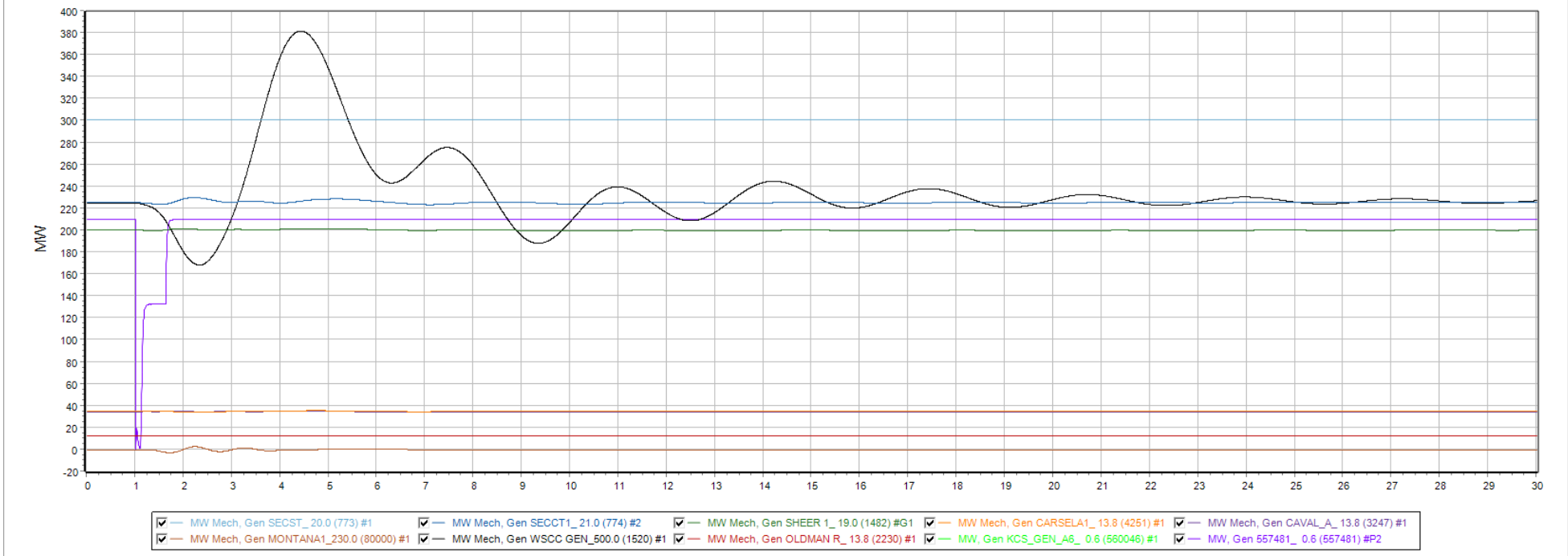
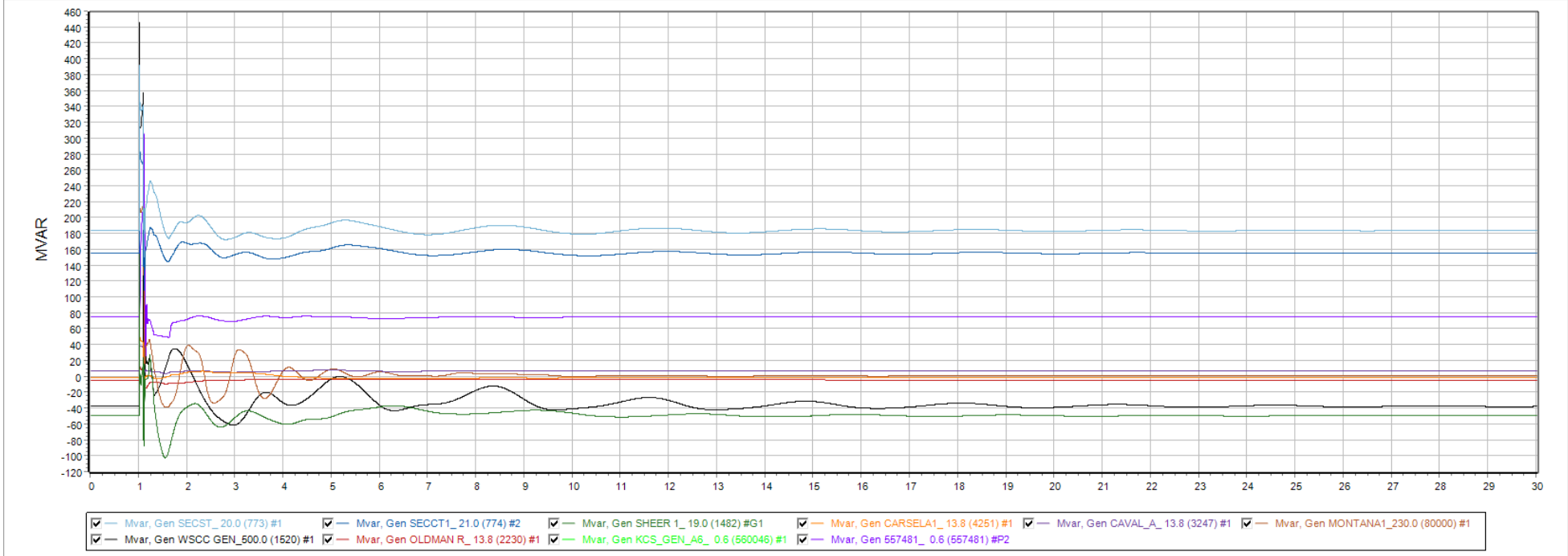
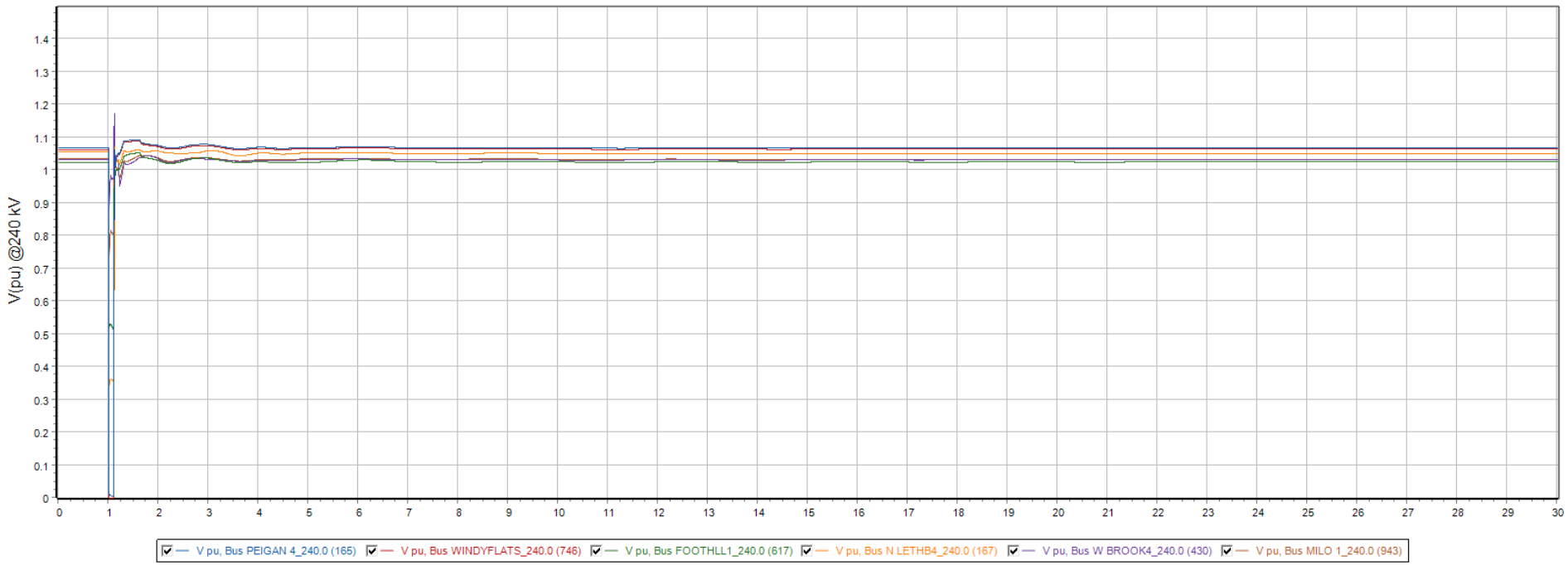
May 16, 2023 20:41:10

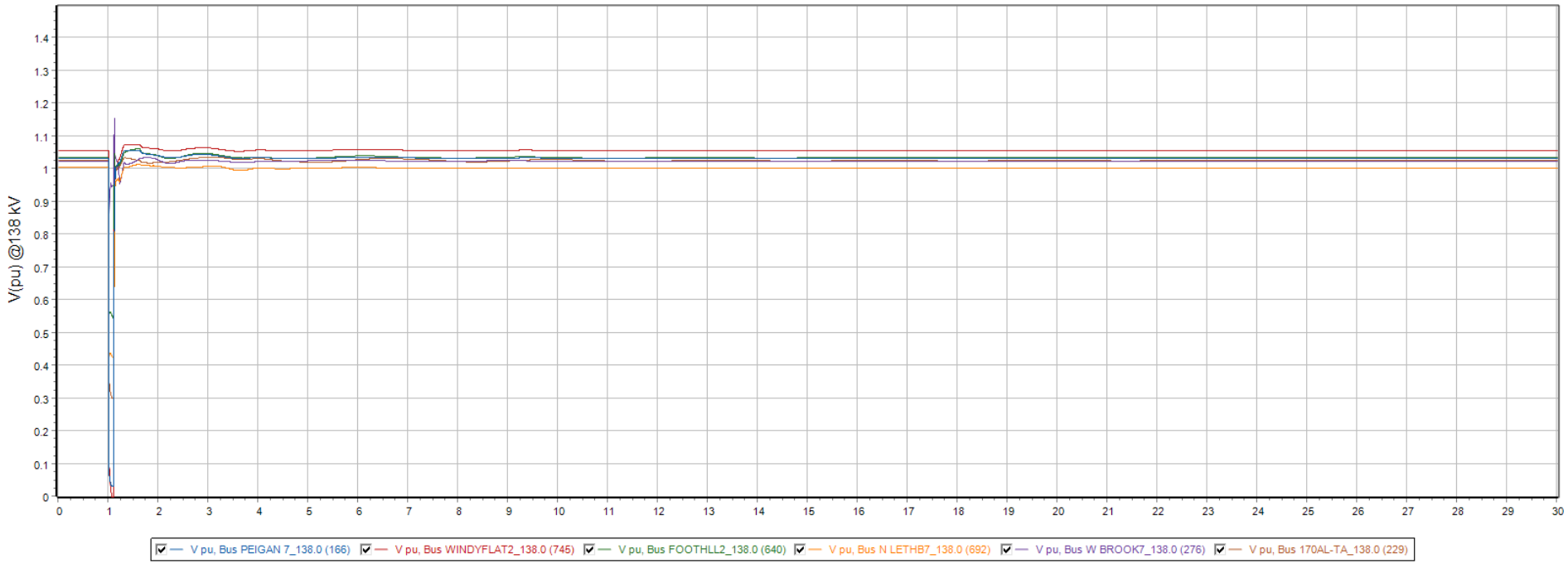
Monitor Gens. Q2



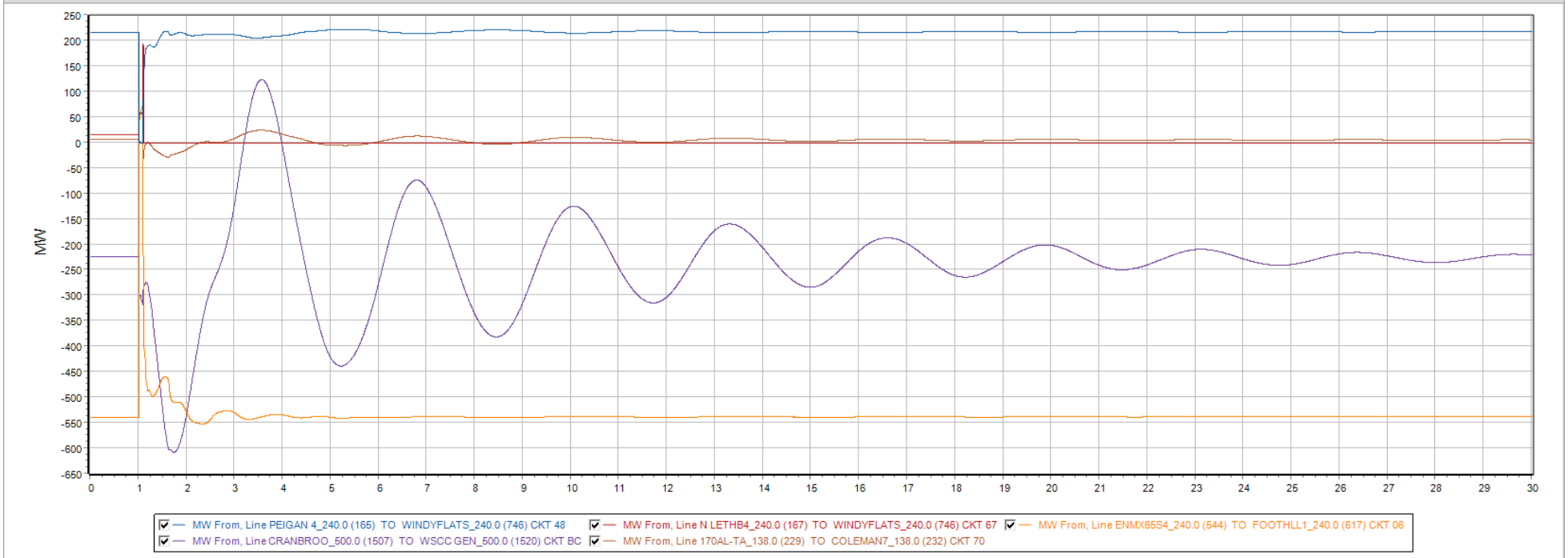


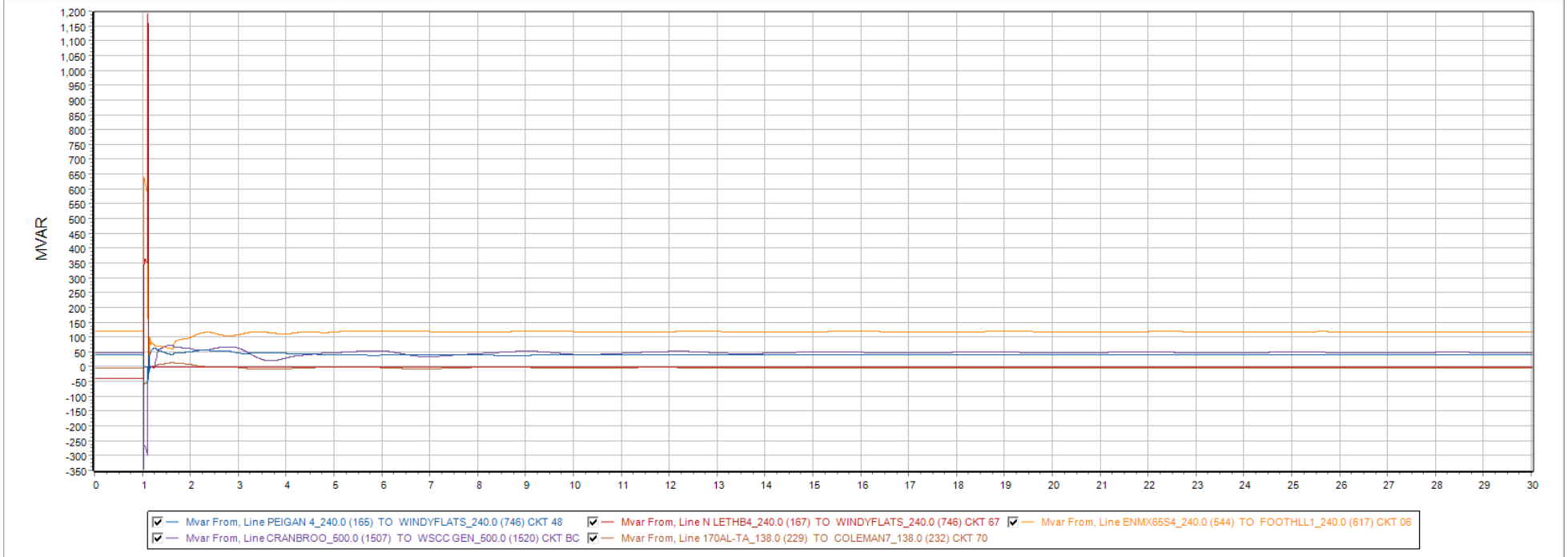
Monitor Bus Volts Q3



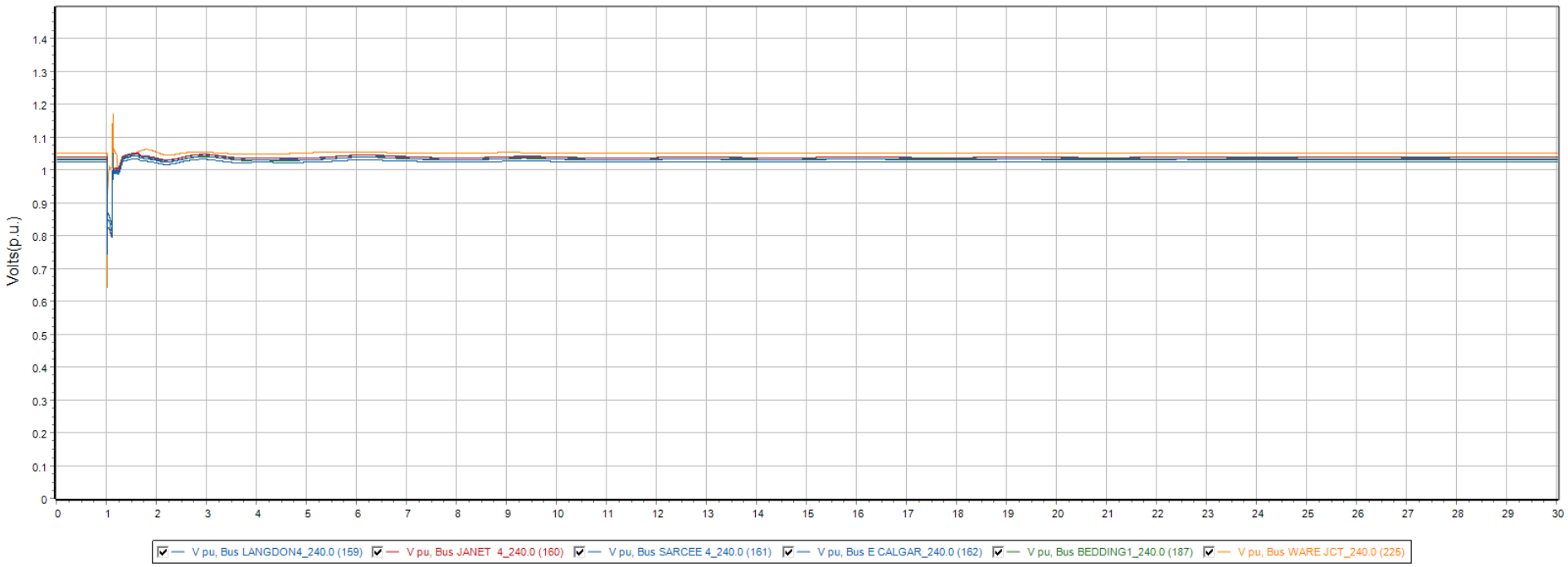


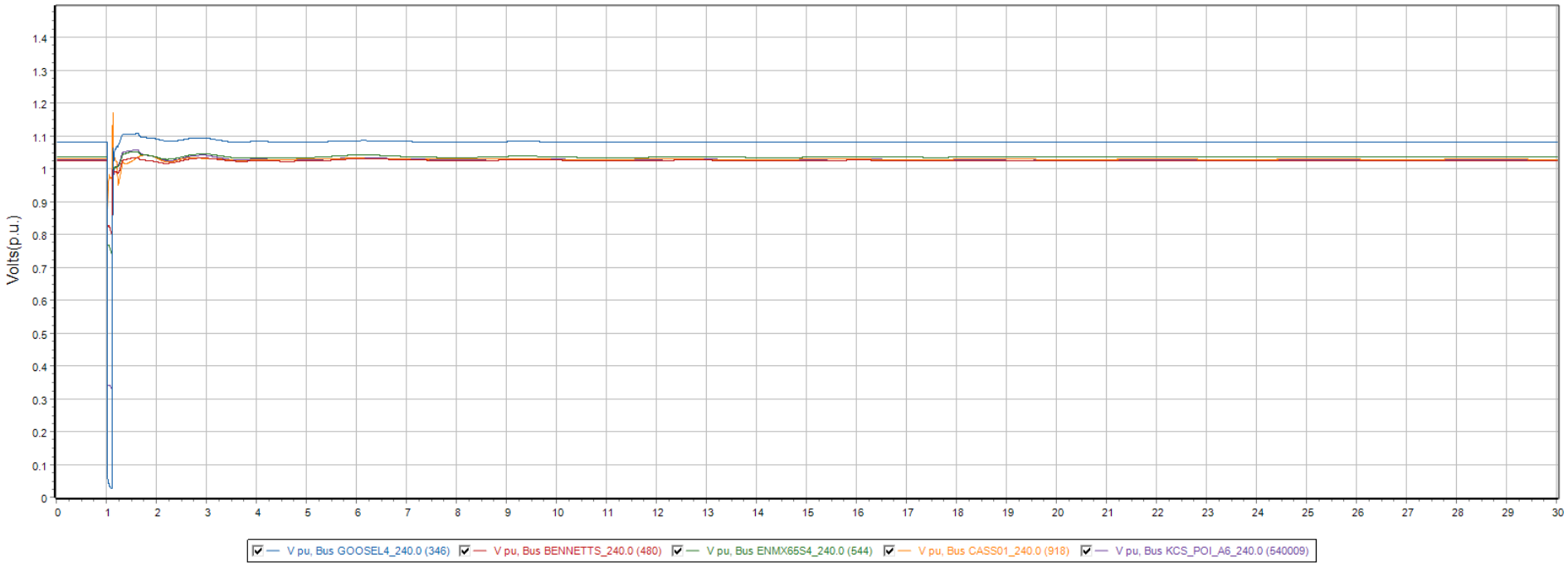
Monitor Line MW & MVAR. Q4



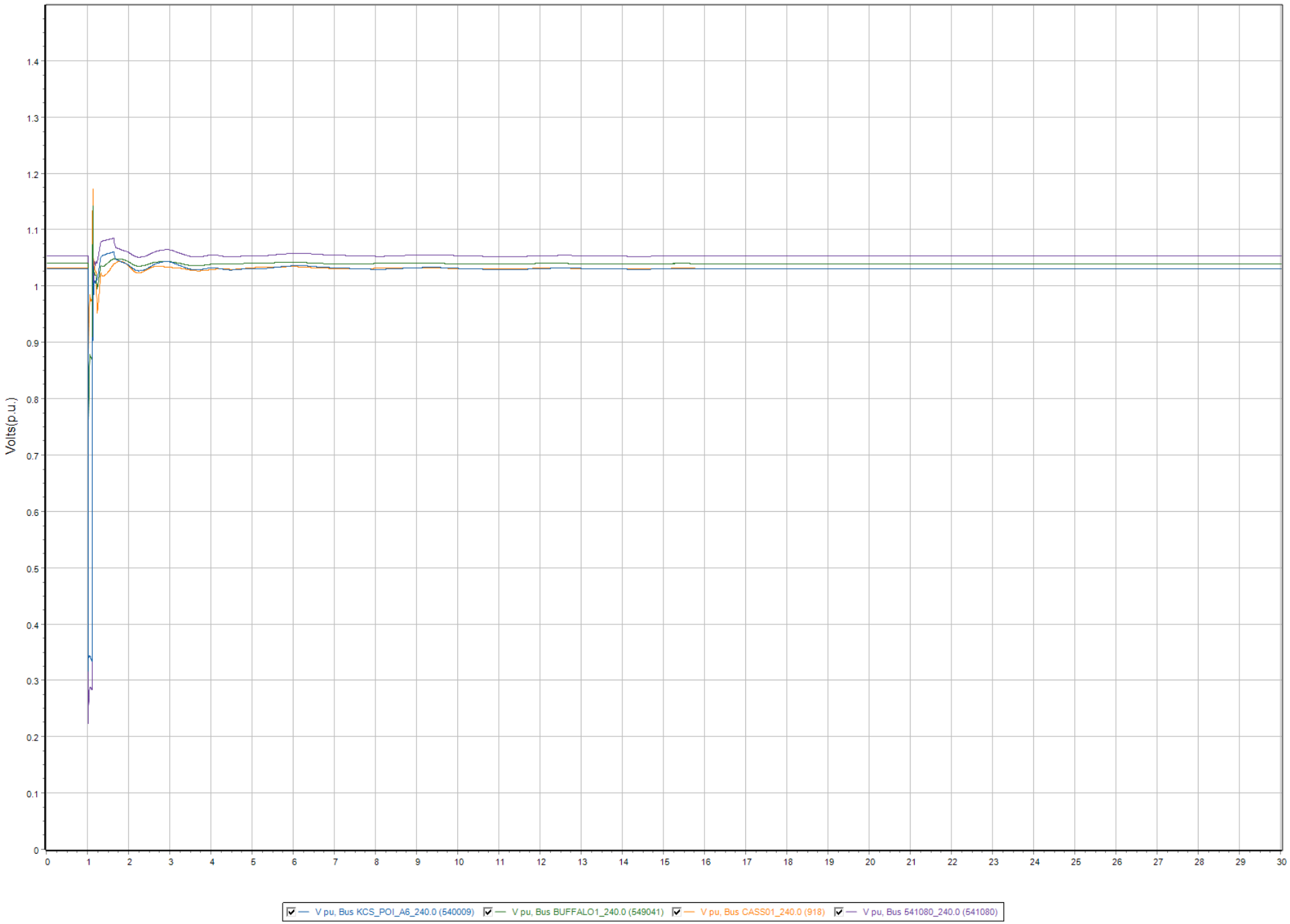


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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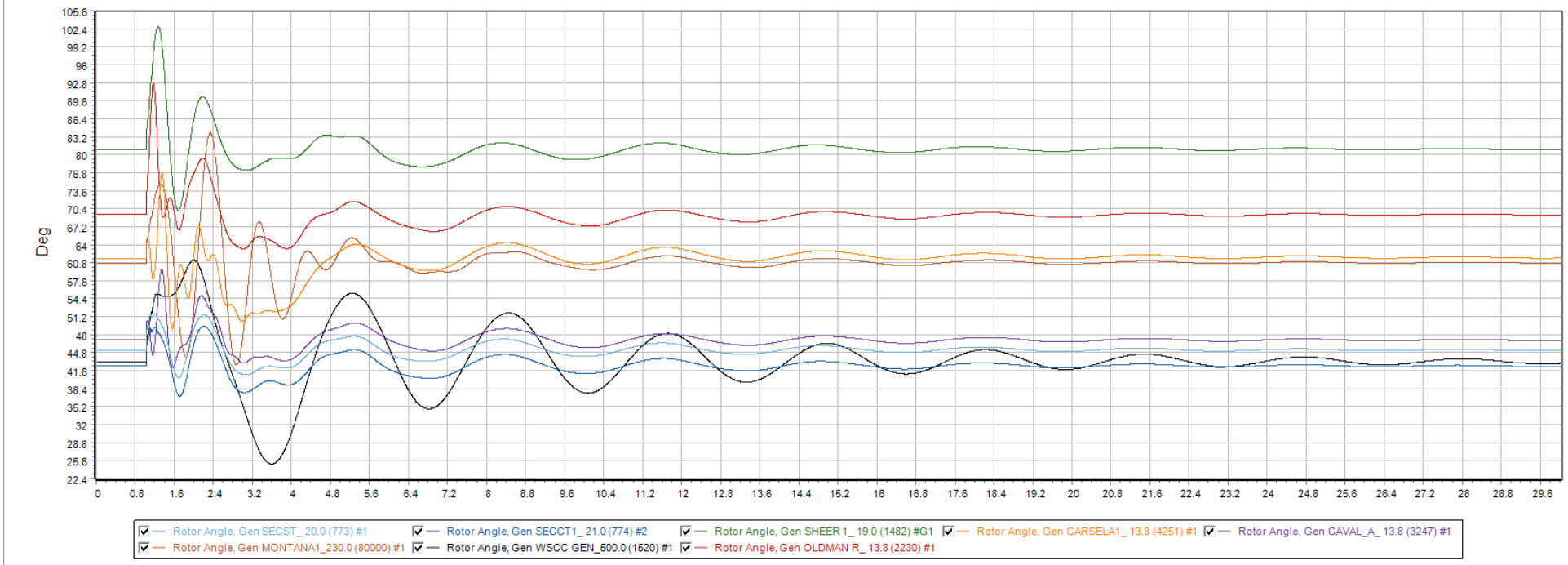
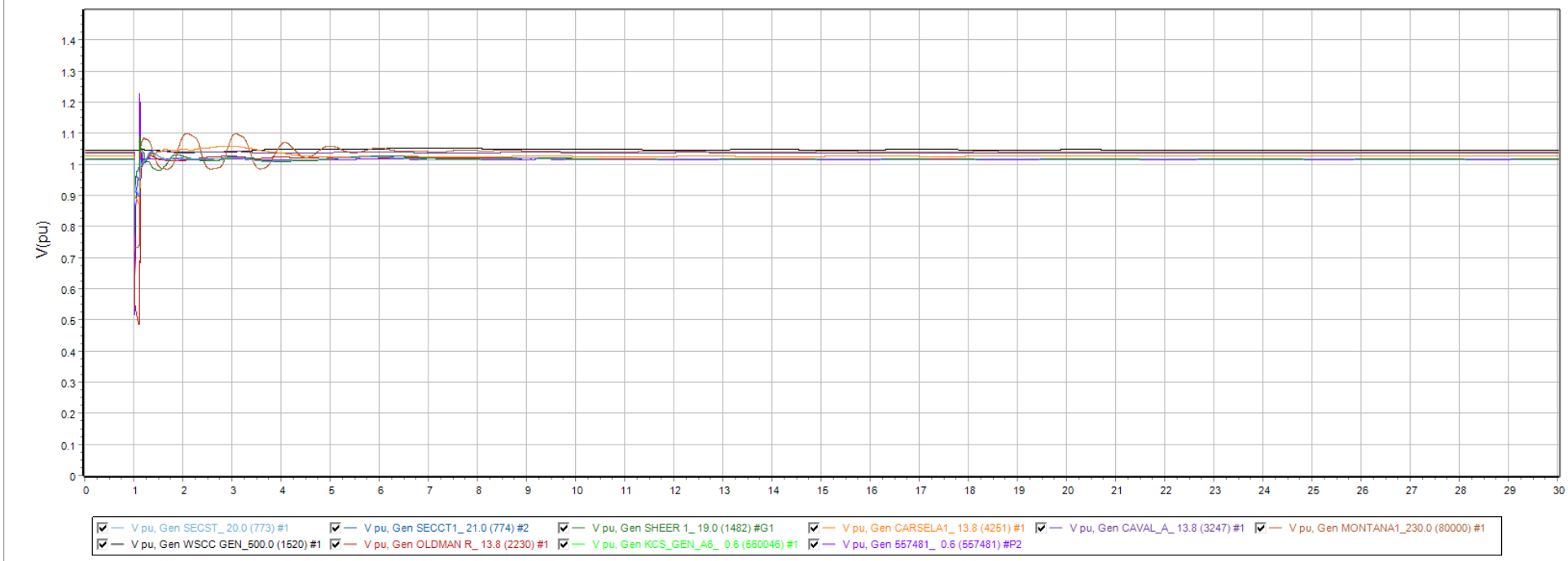
May 16, 2023 20:41:13

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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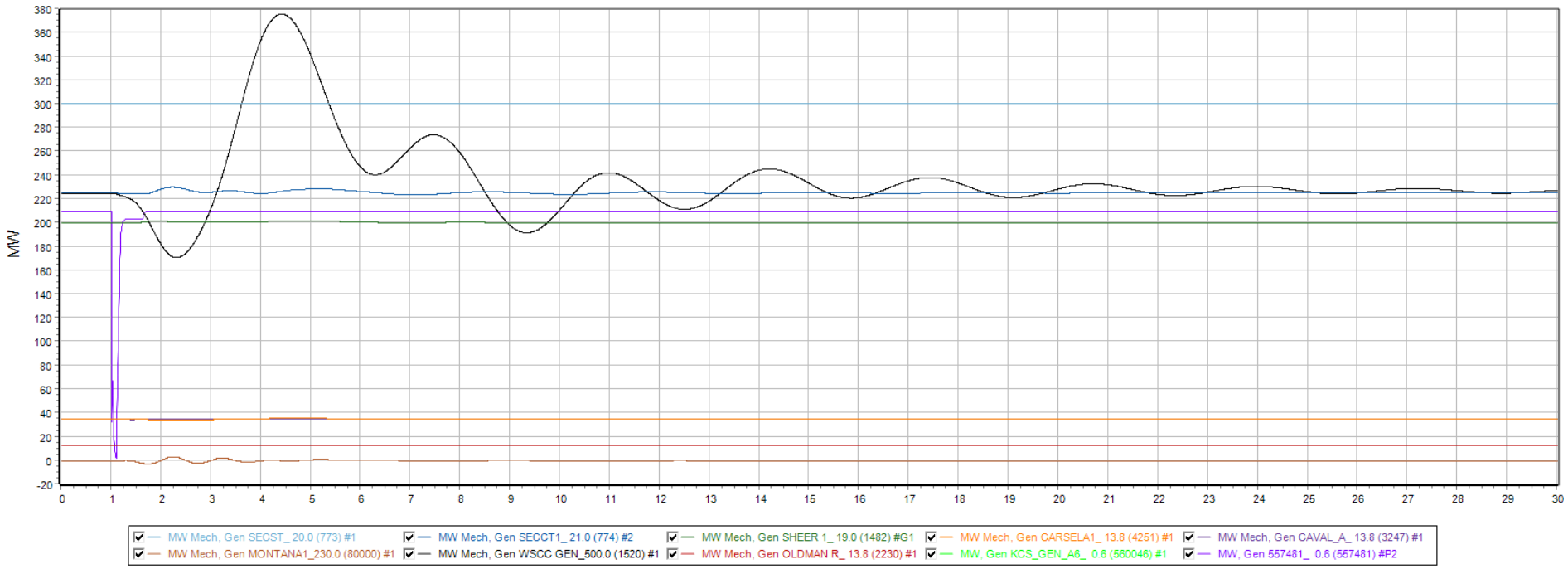
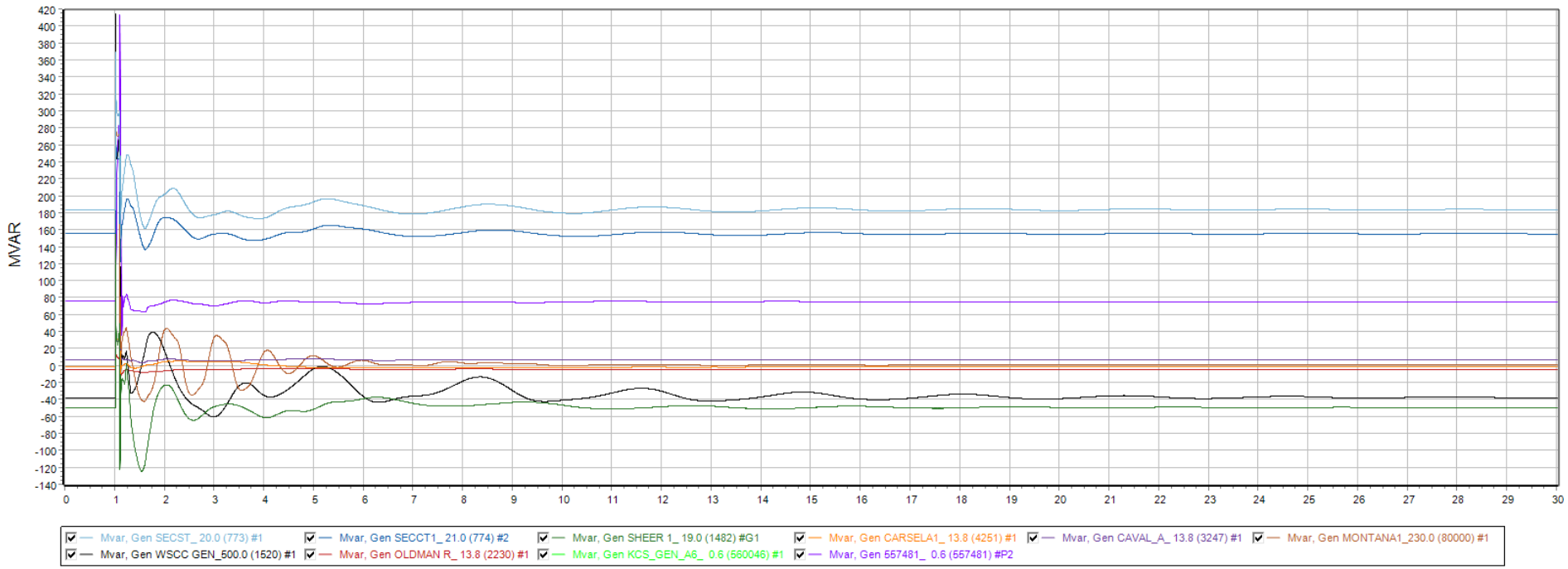
May 16, 2023 20:51:14

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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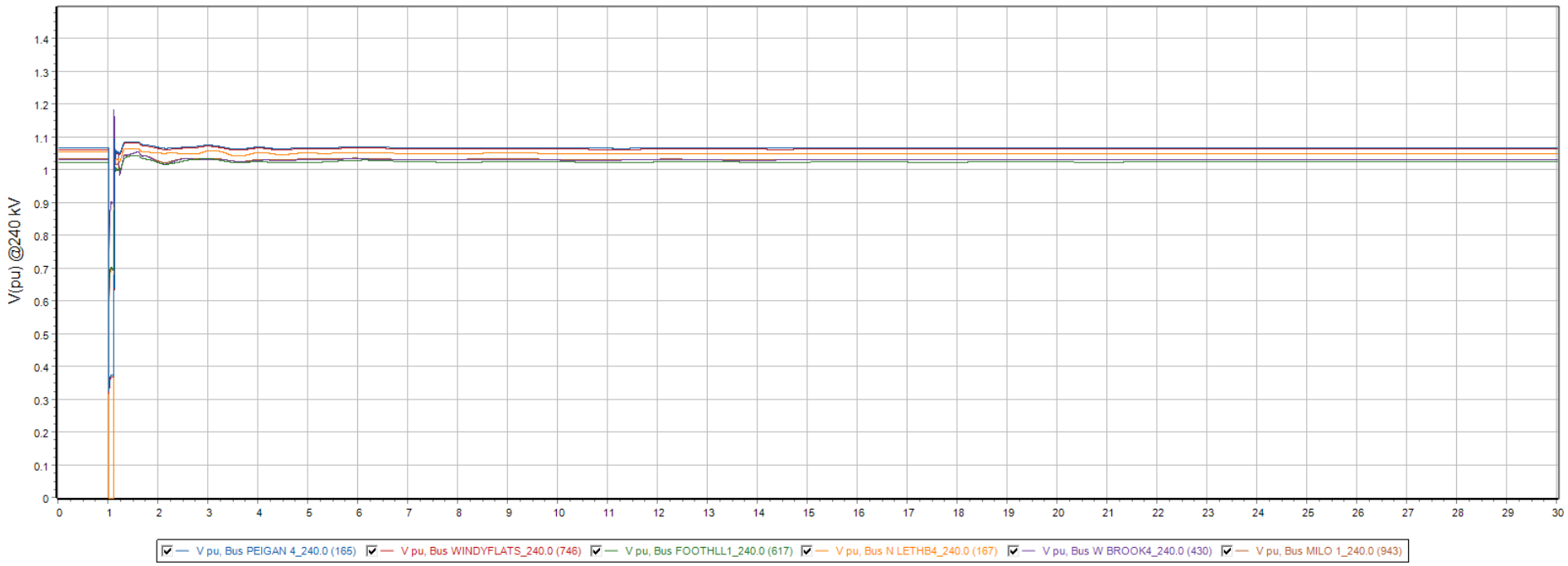
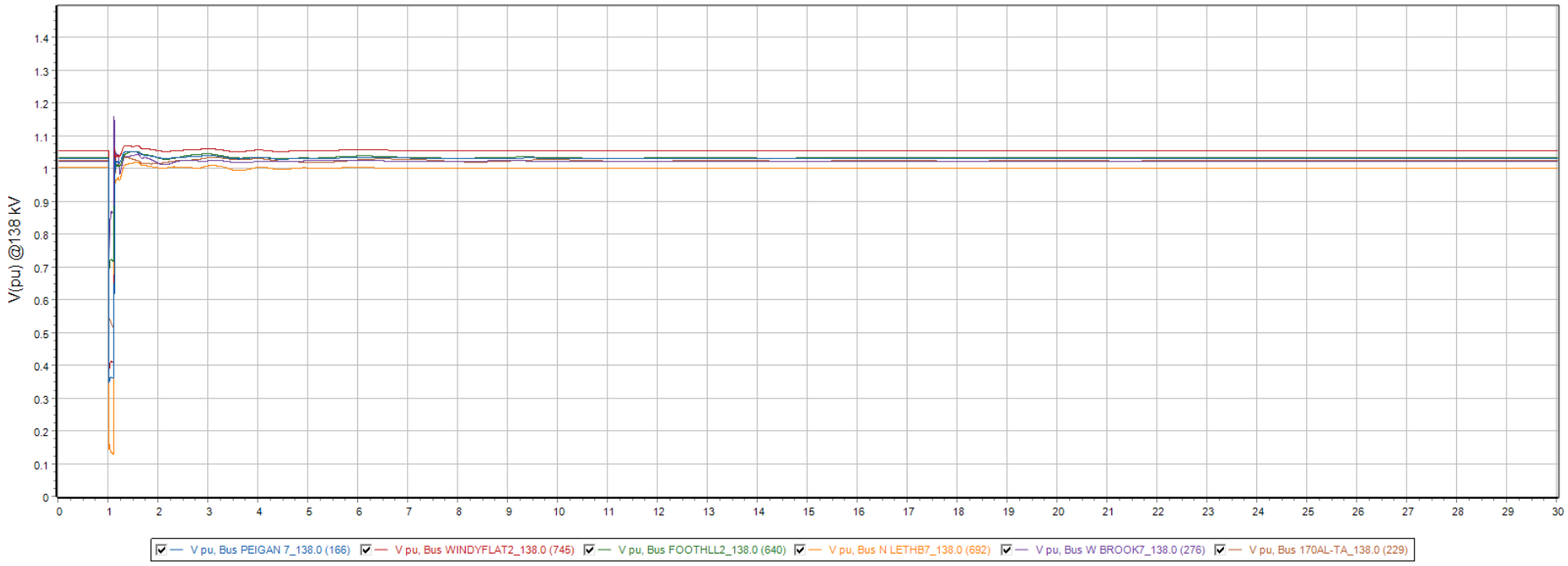
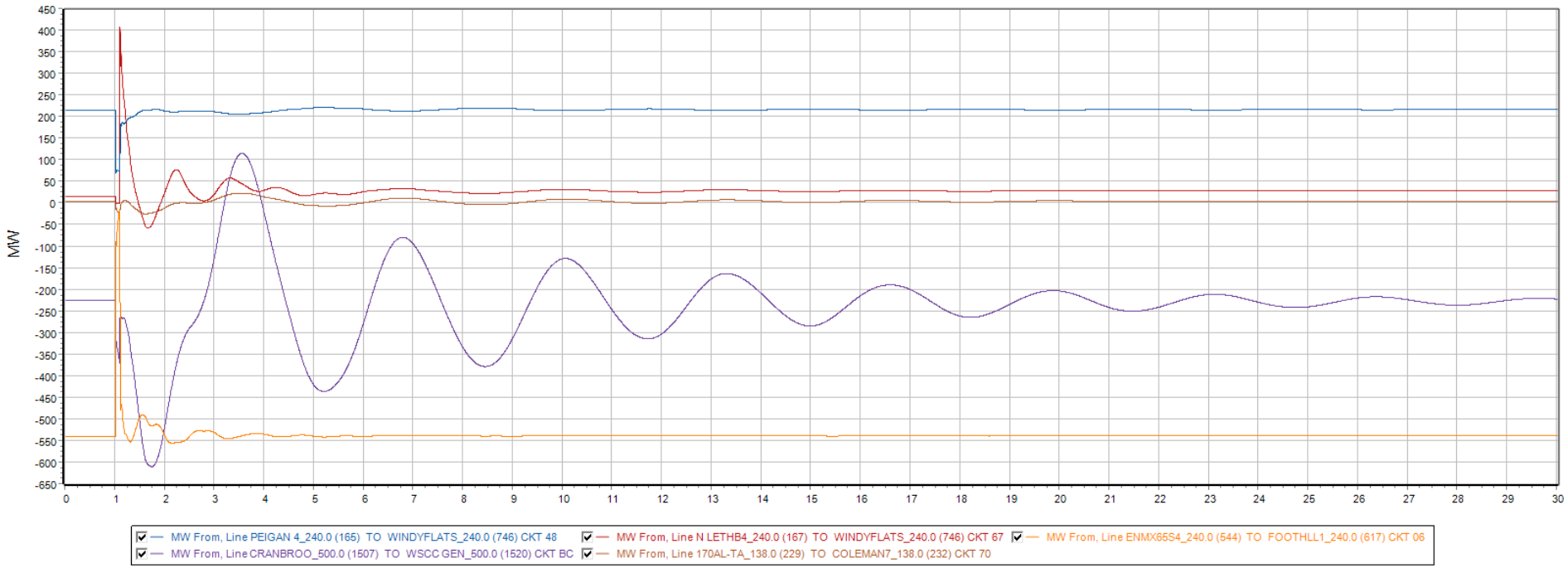
May 16, 2023 20:51:14

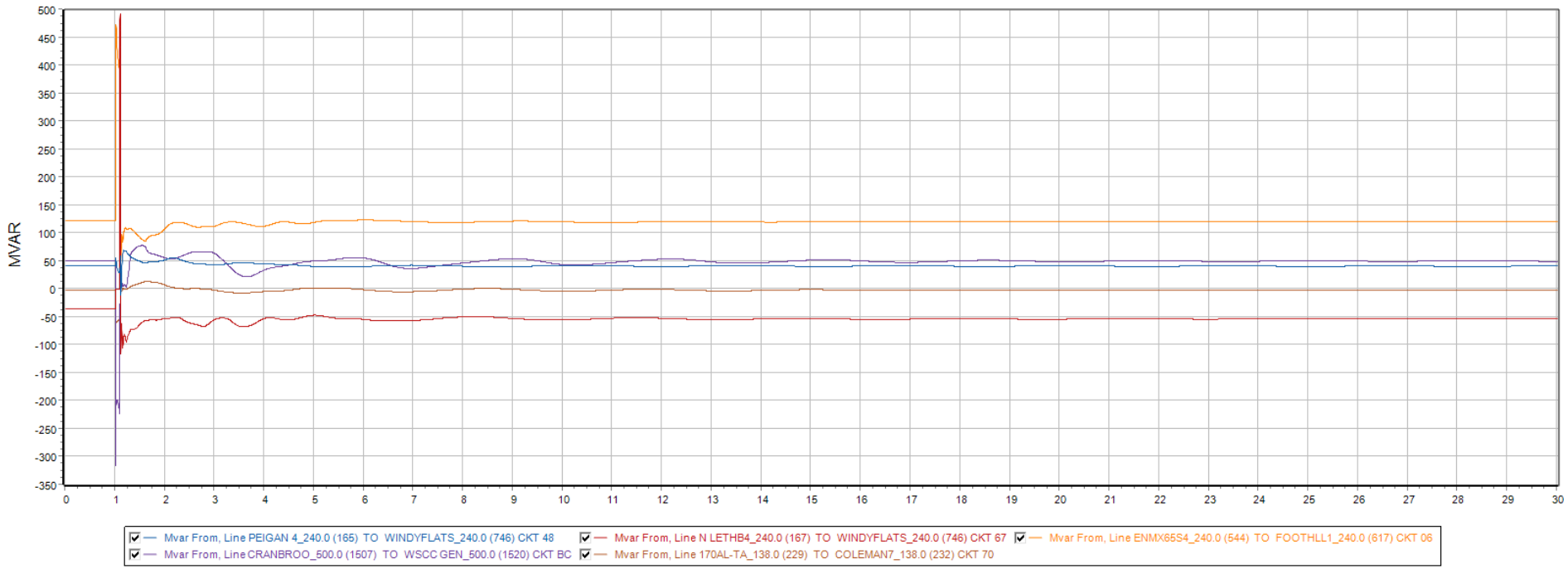
Monitor Bus Volts Q3



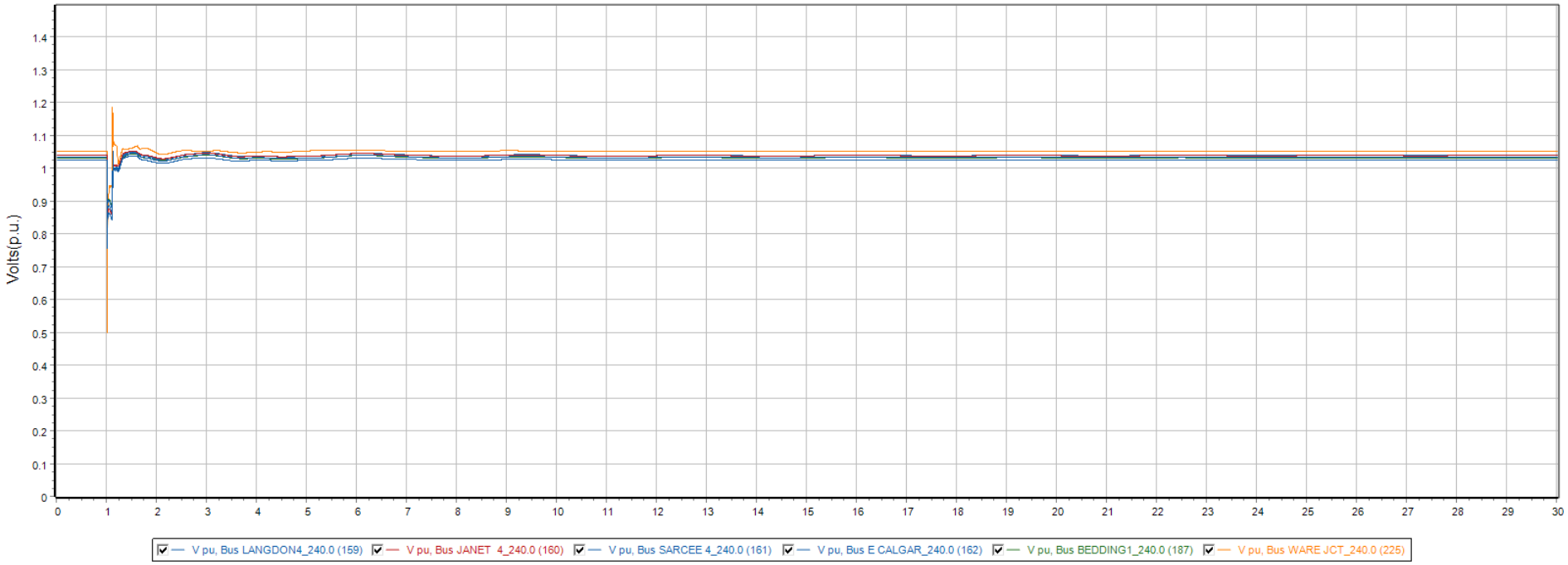


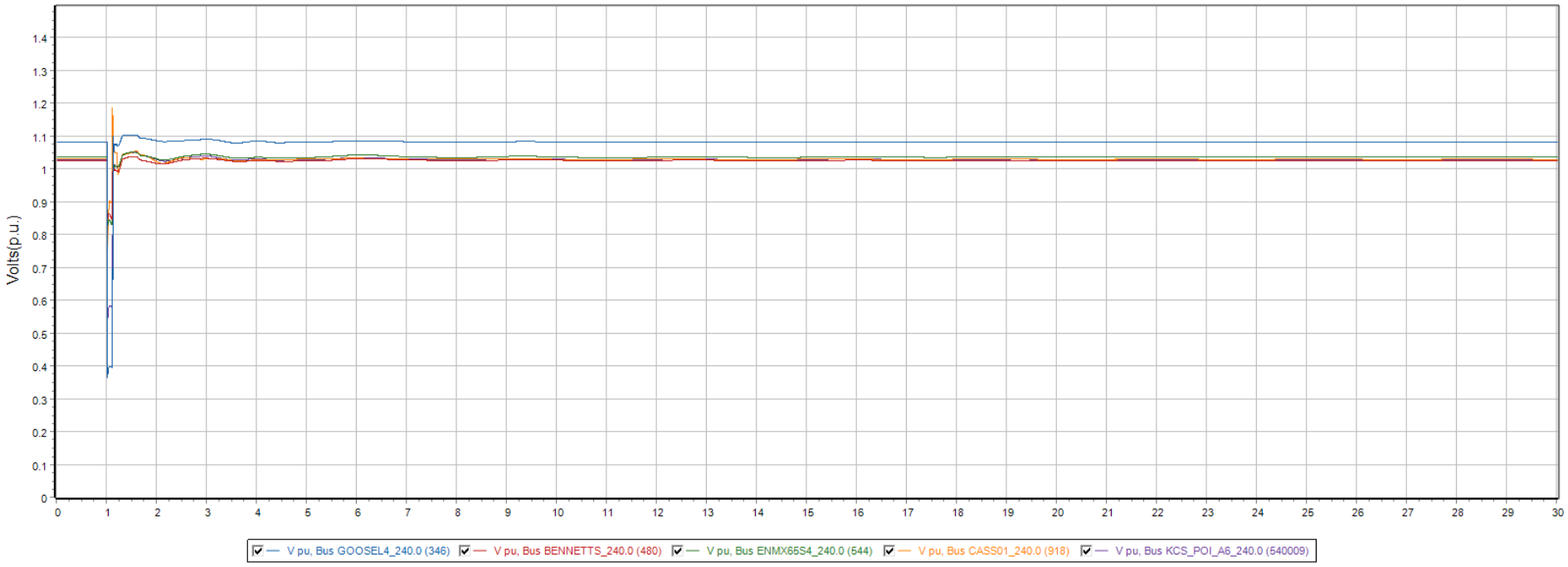
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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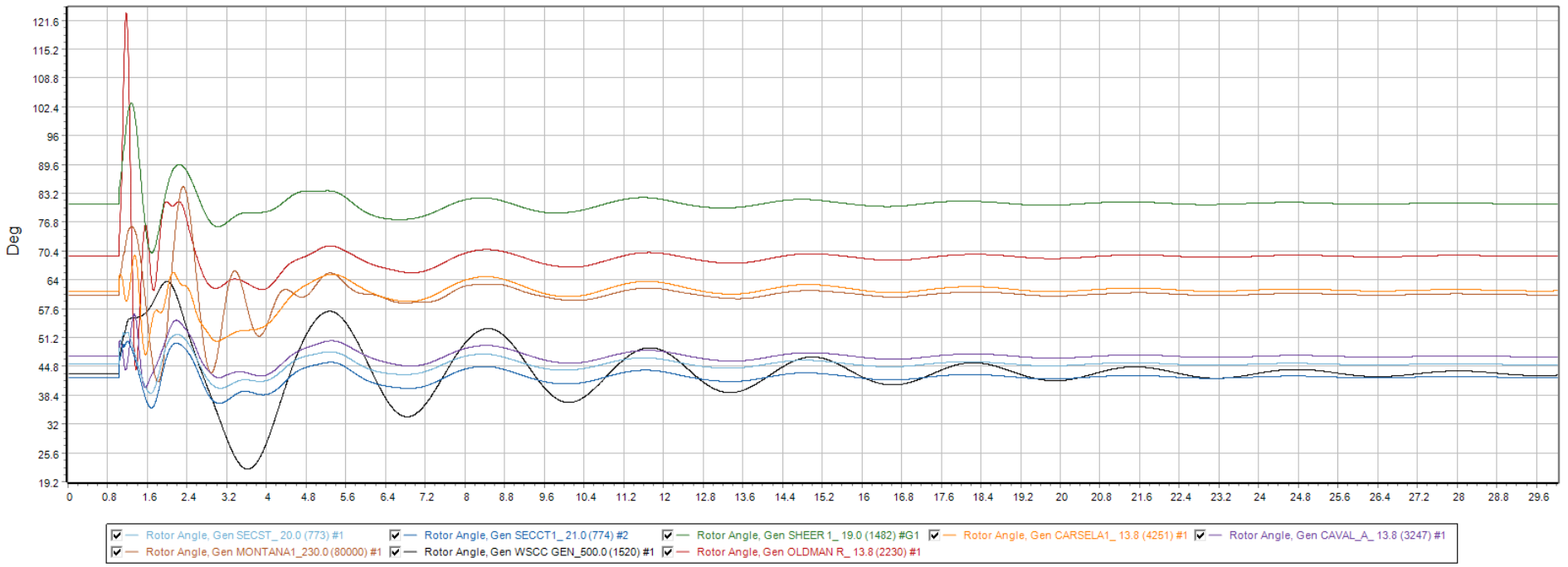
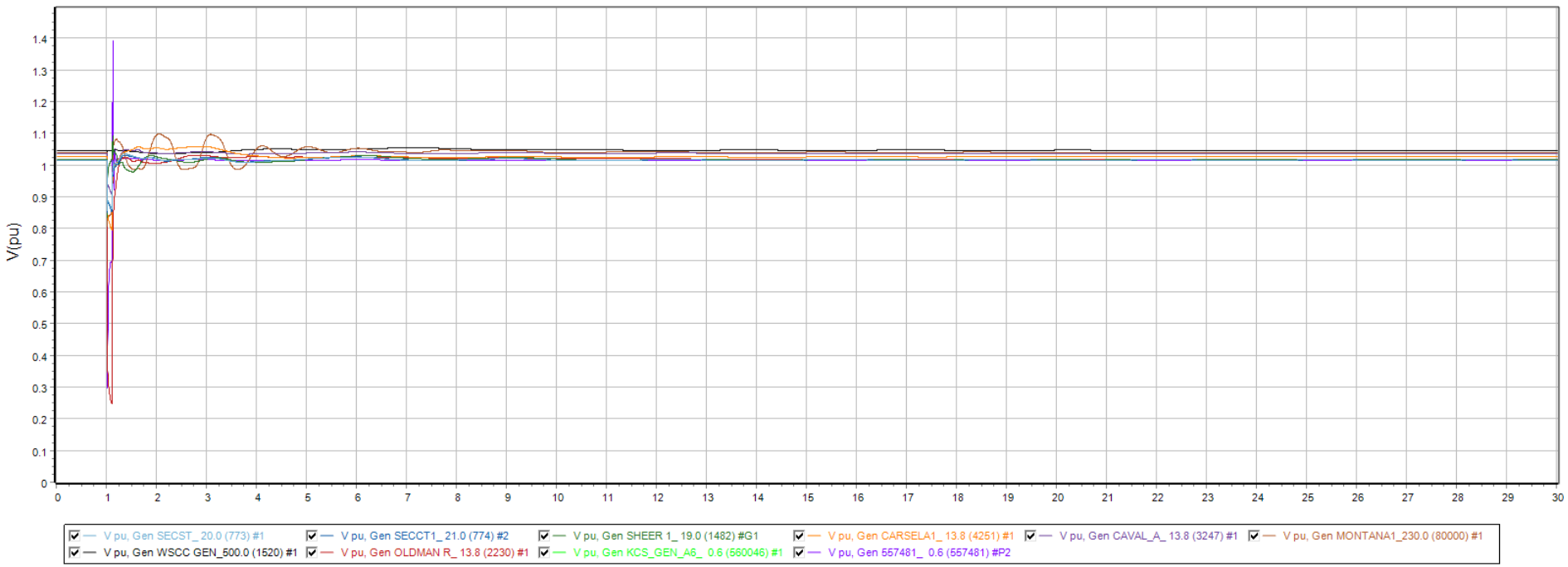
May 16, 2023 20:51:16

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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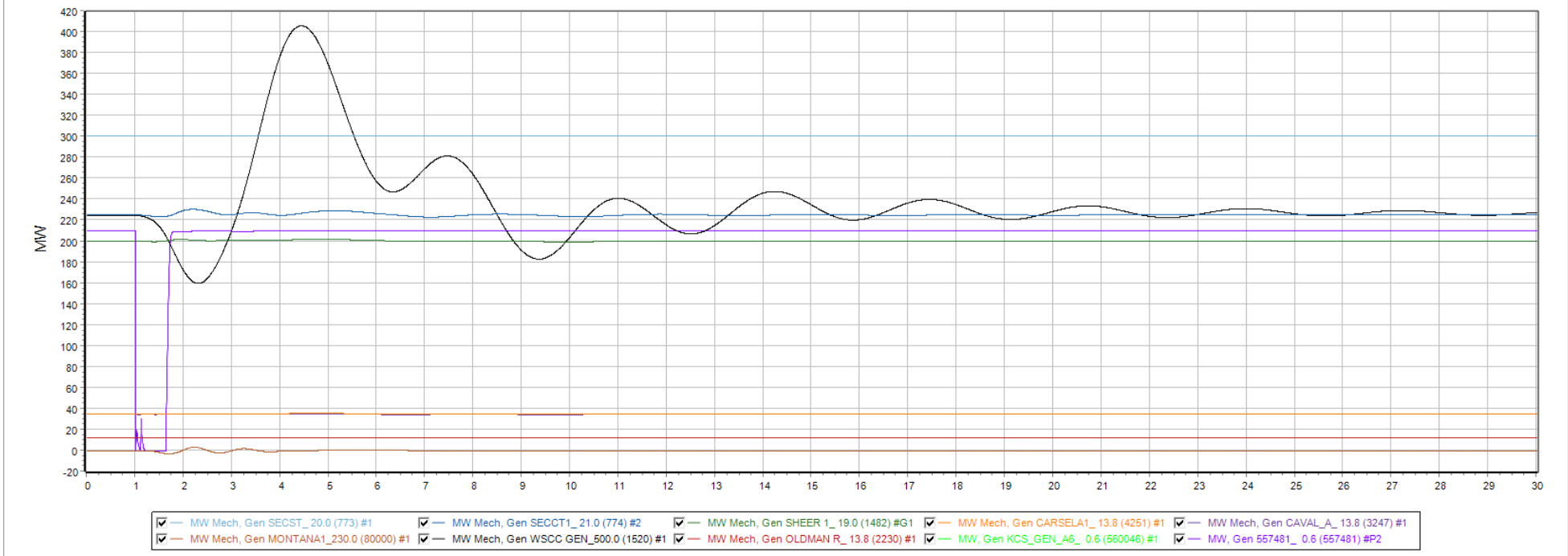
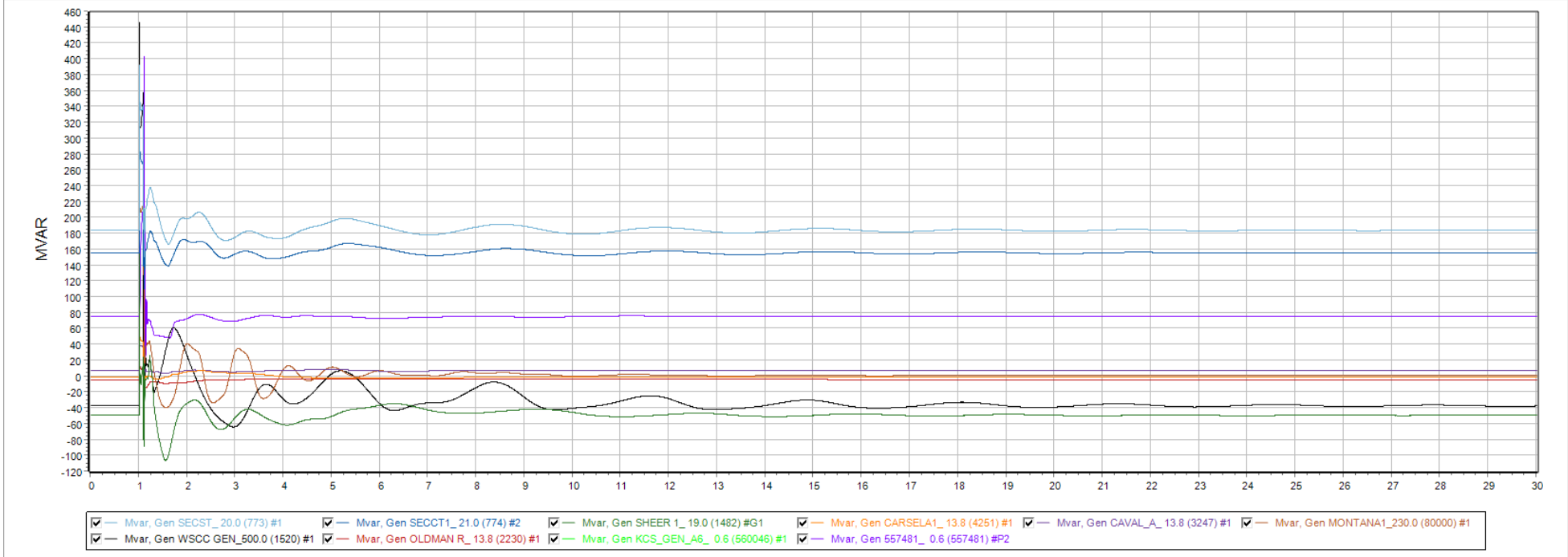
May 16, 2023 21:02:15

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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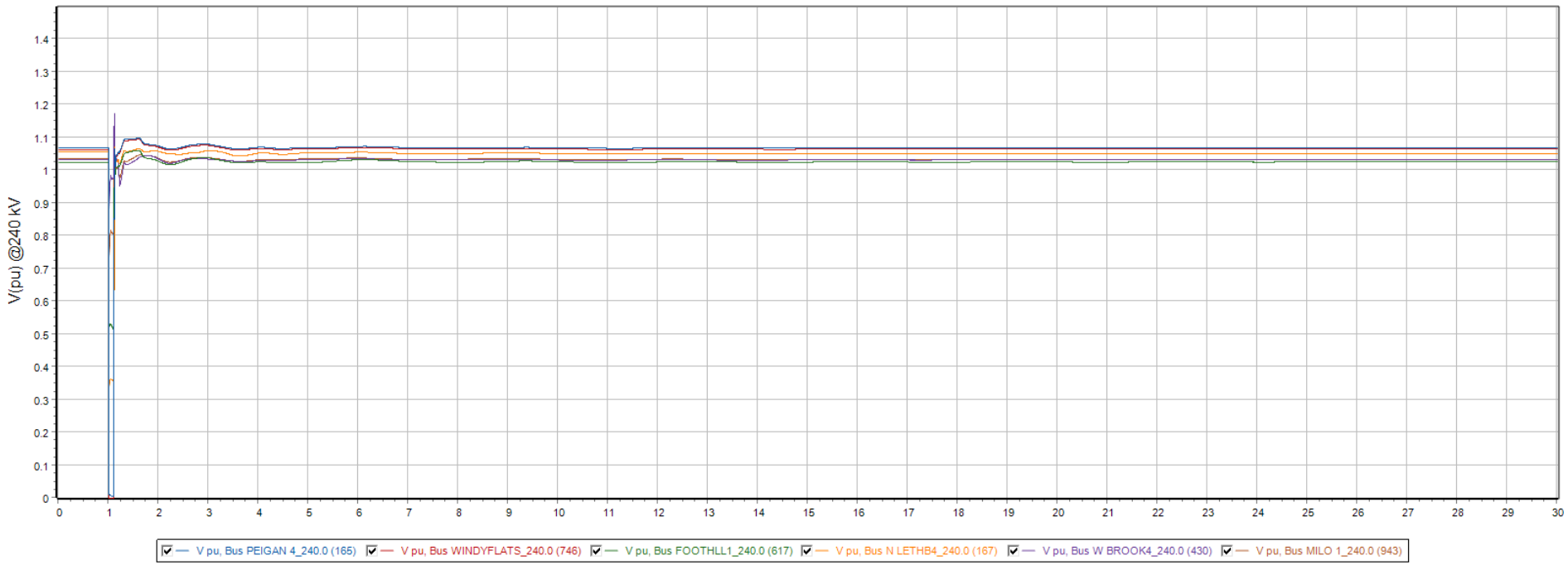
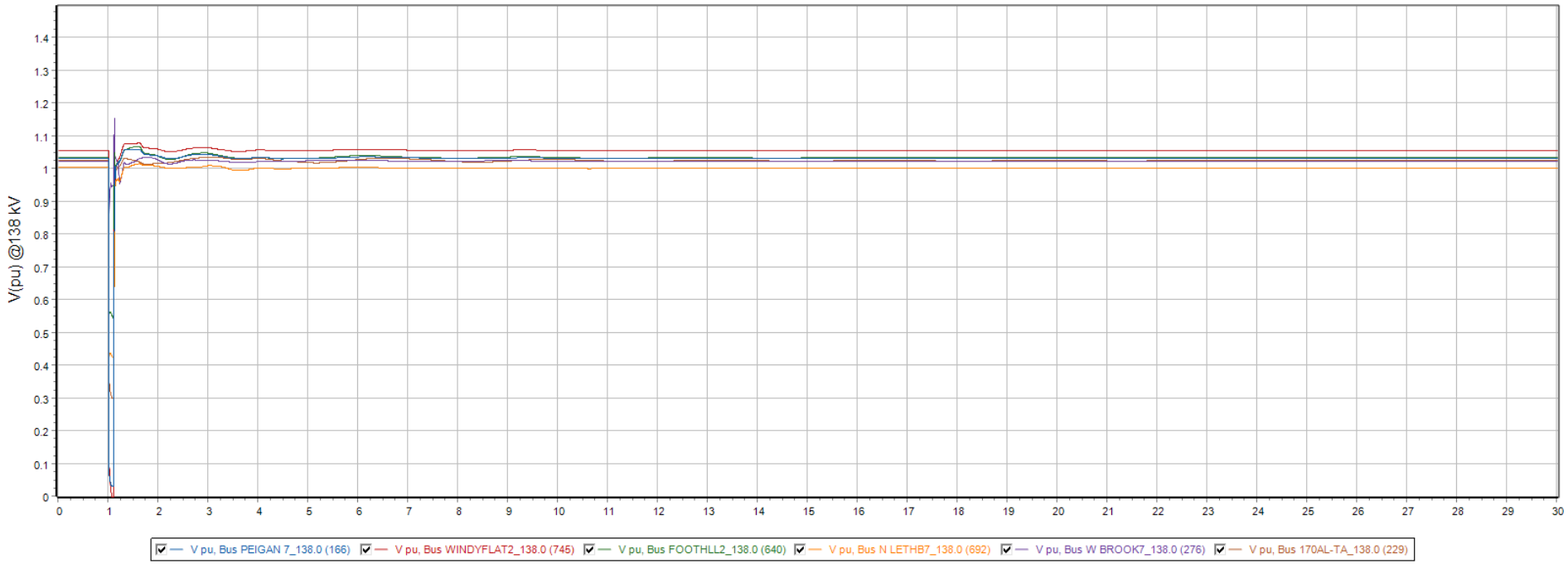
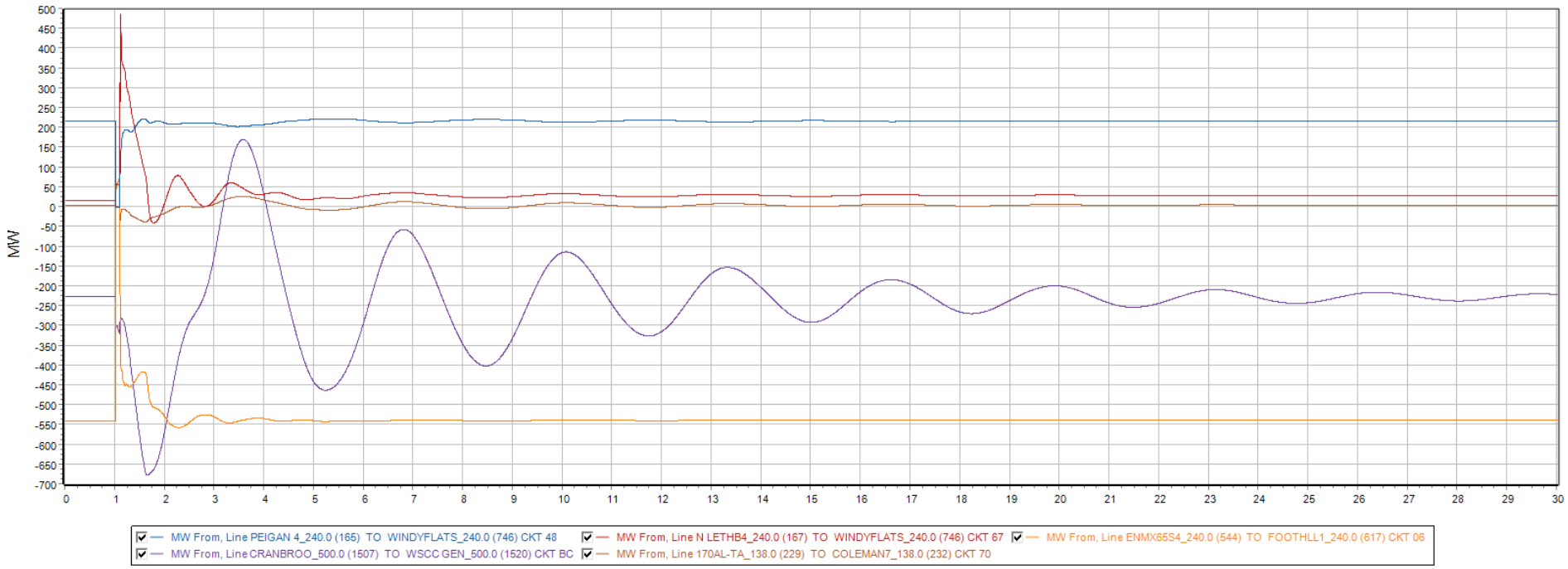
May 16, 2023 21:02:15

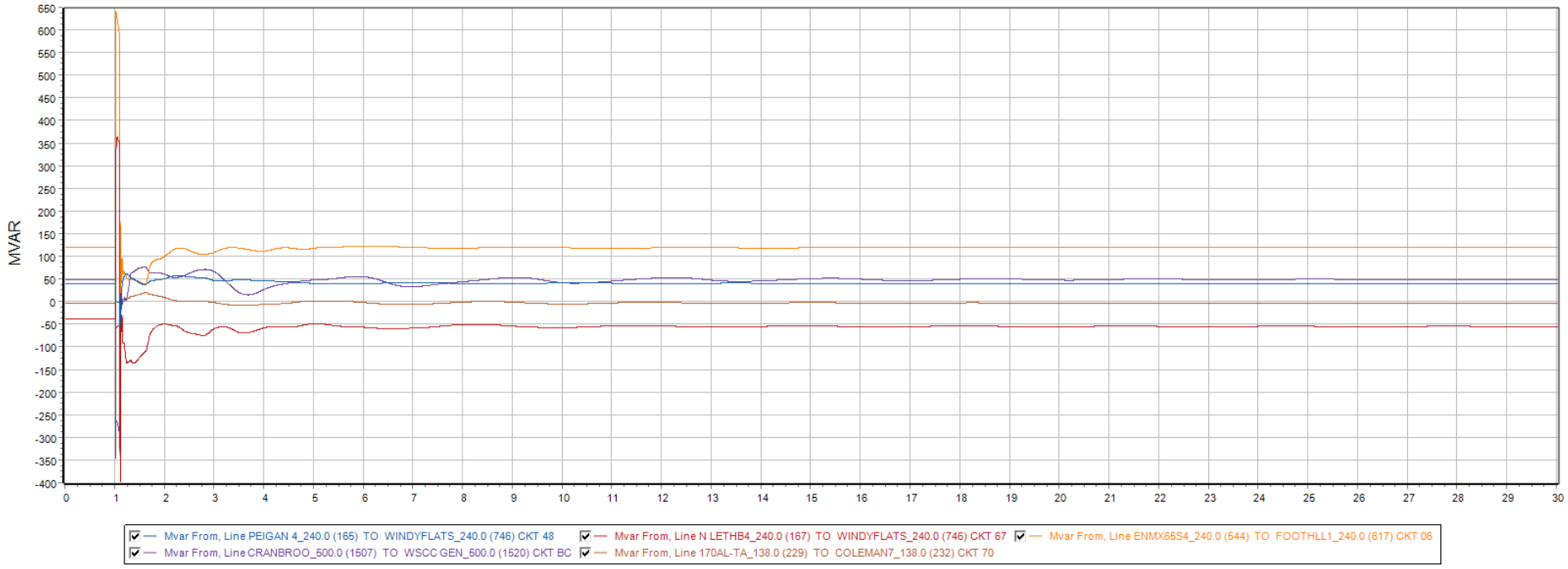
Monitor Bus Volts Q3



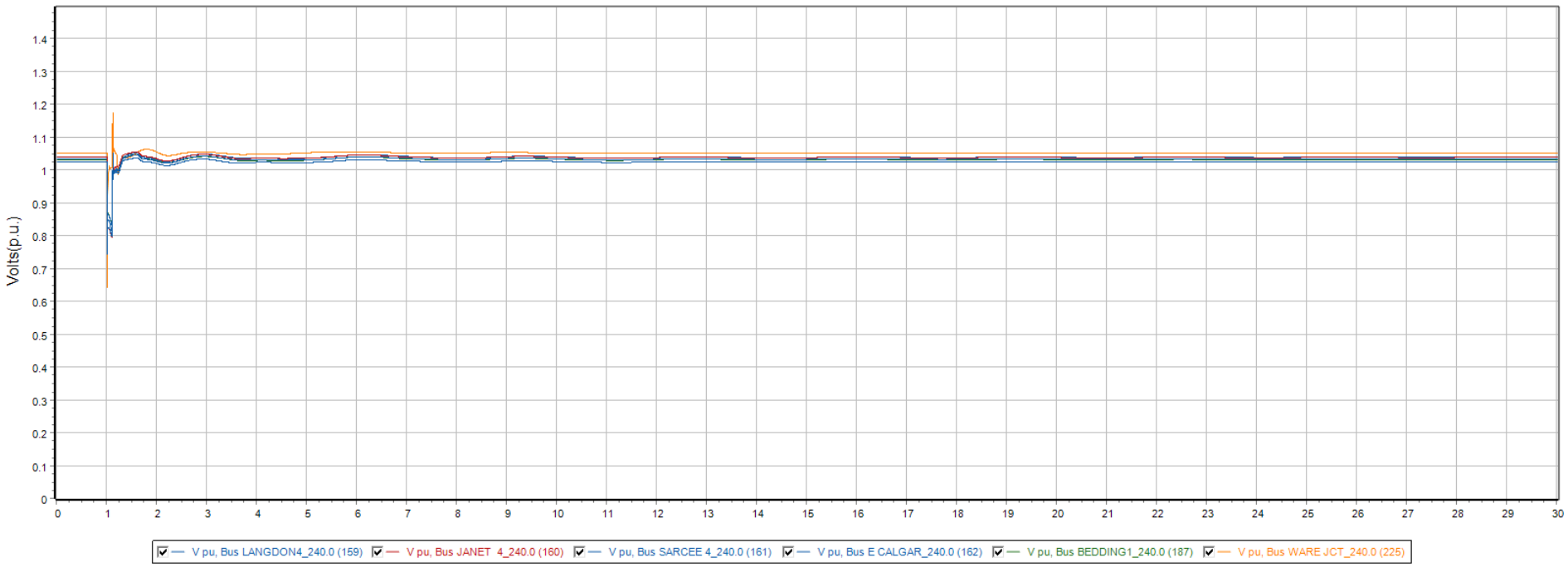


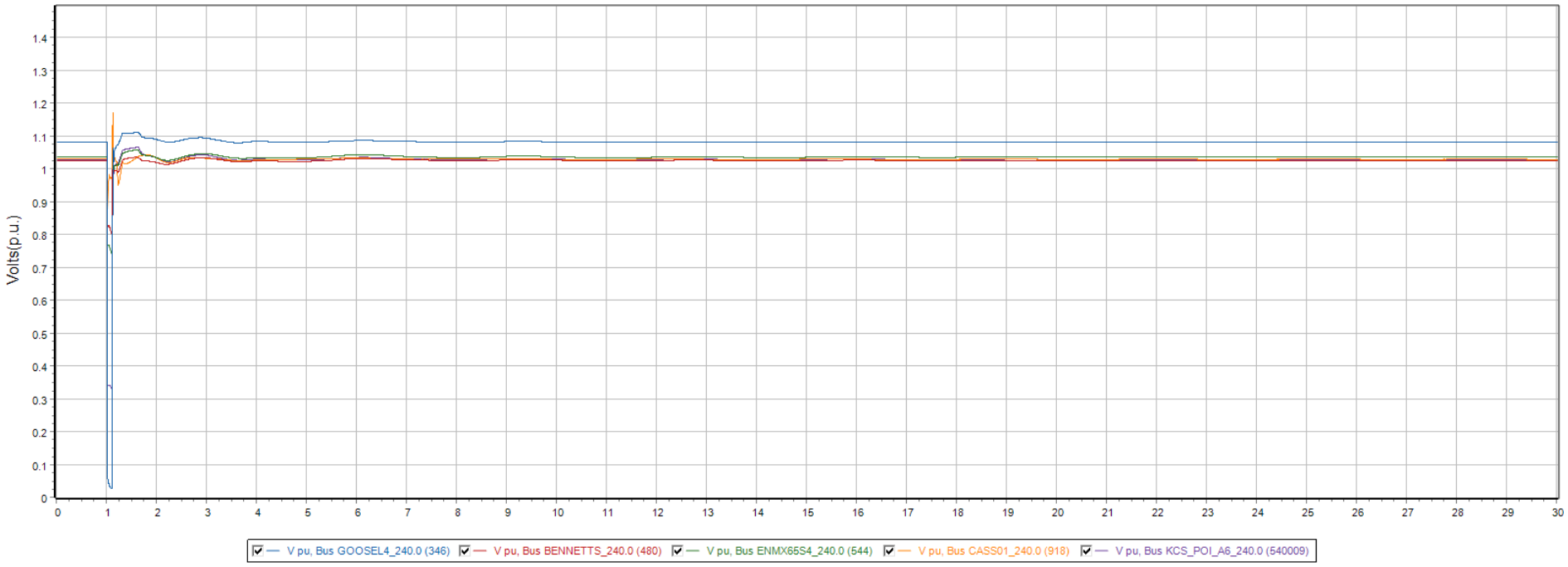
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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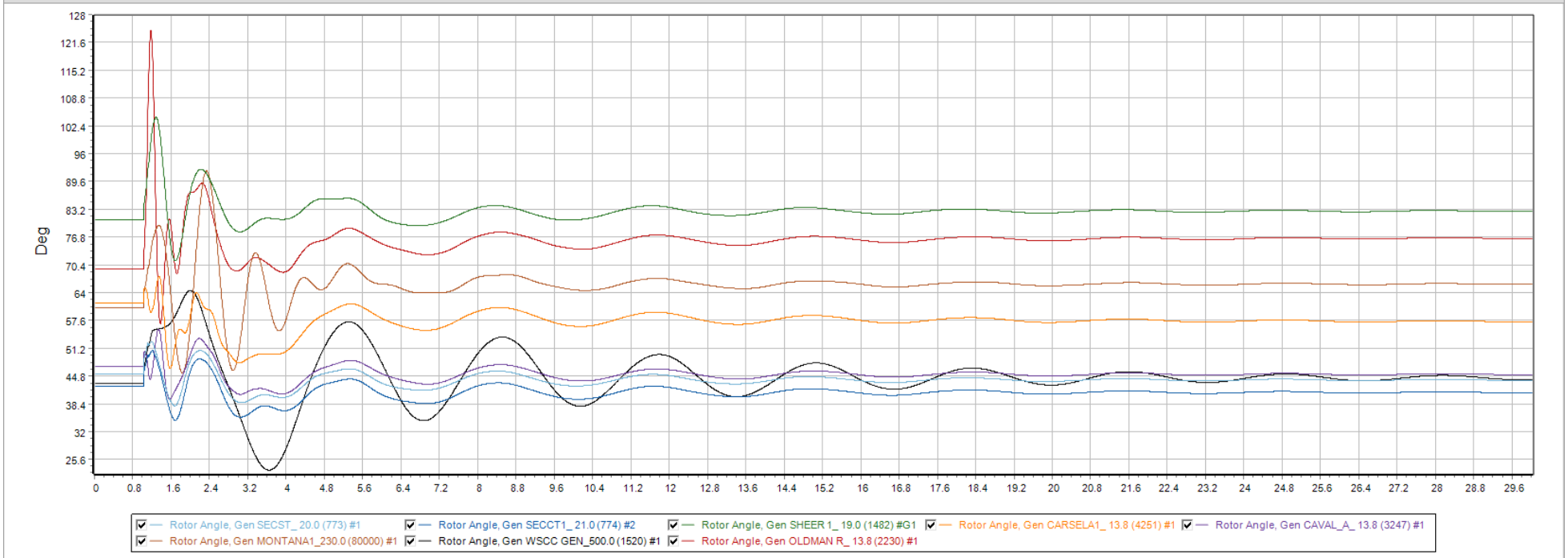
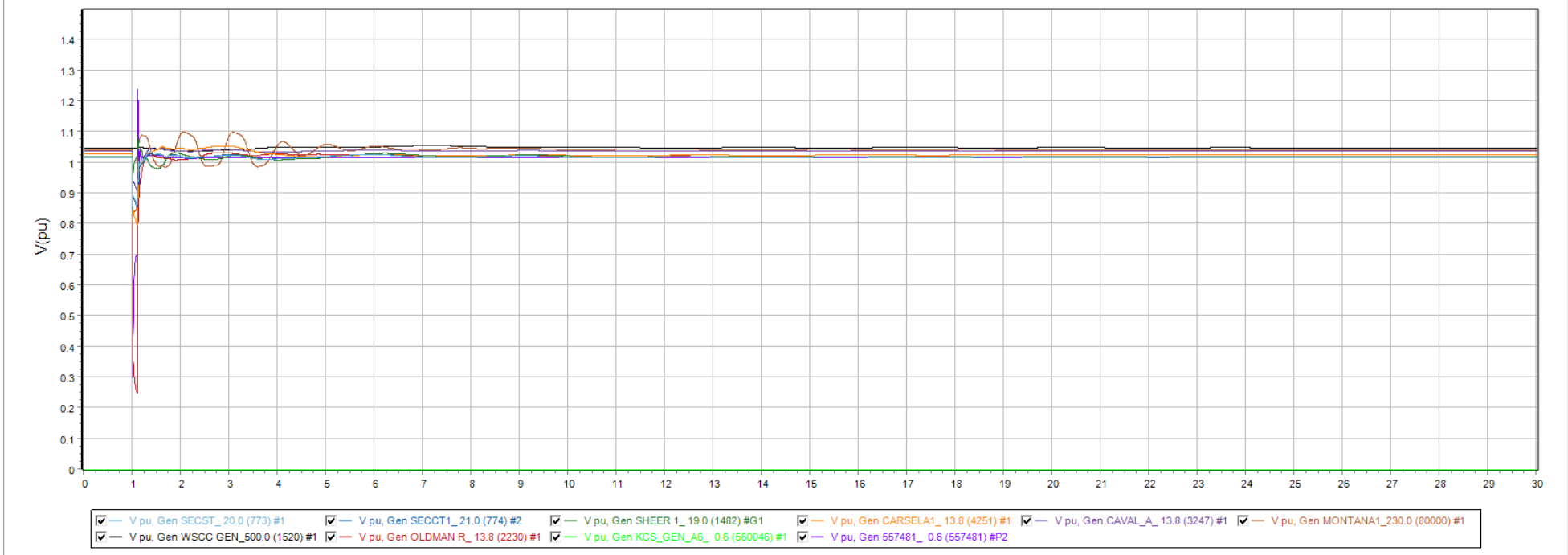
May 16, 2023 21:02:17

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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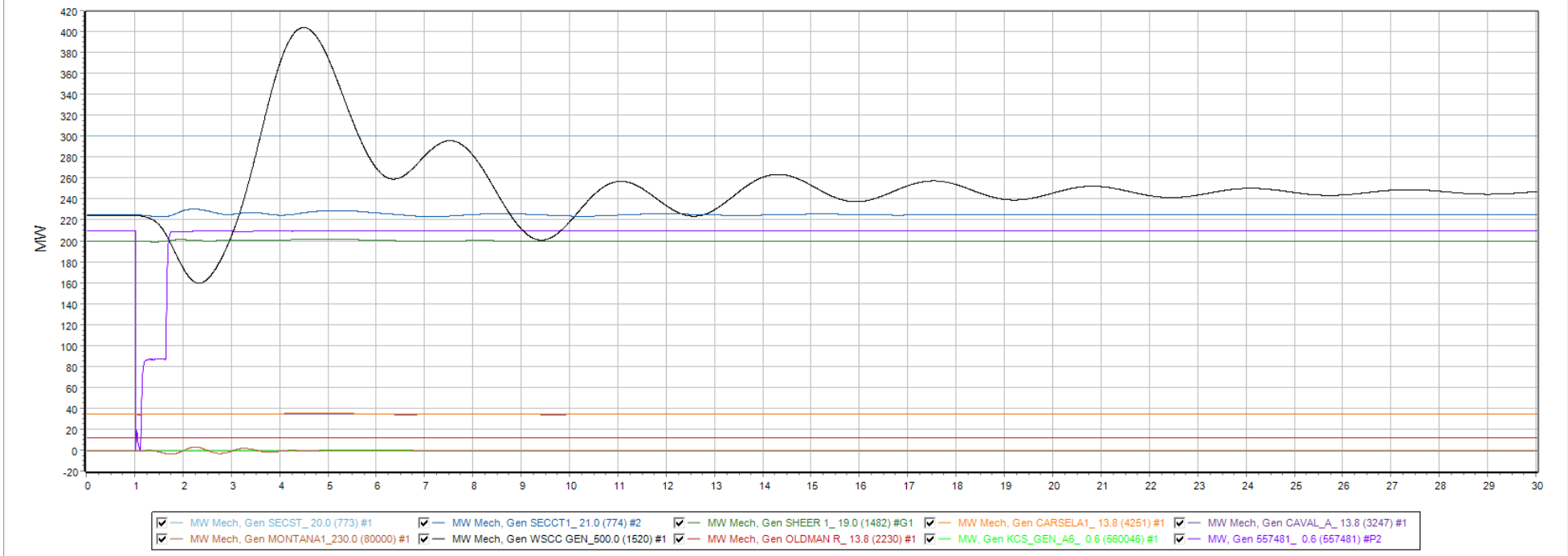
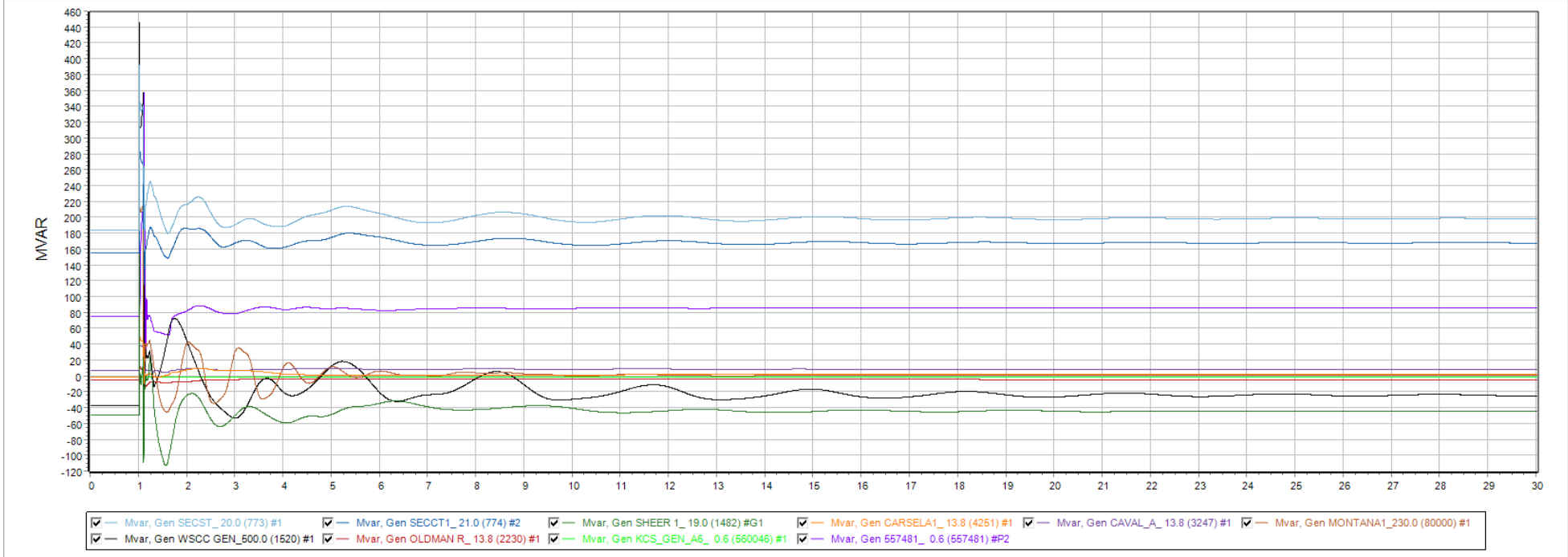
May 16, 2023 23:27:10

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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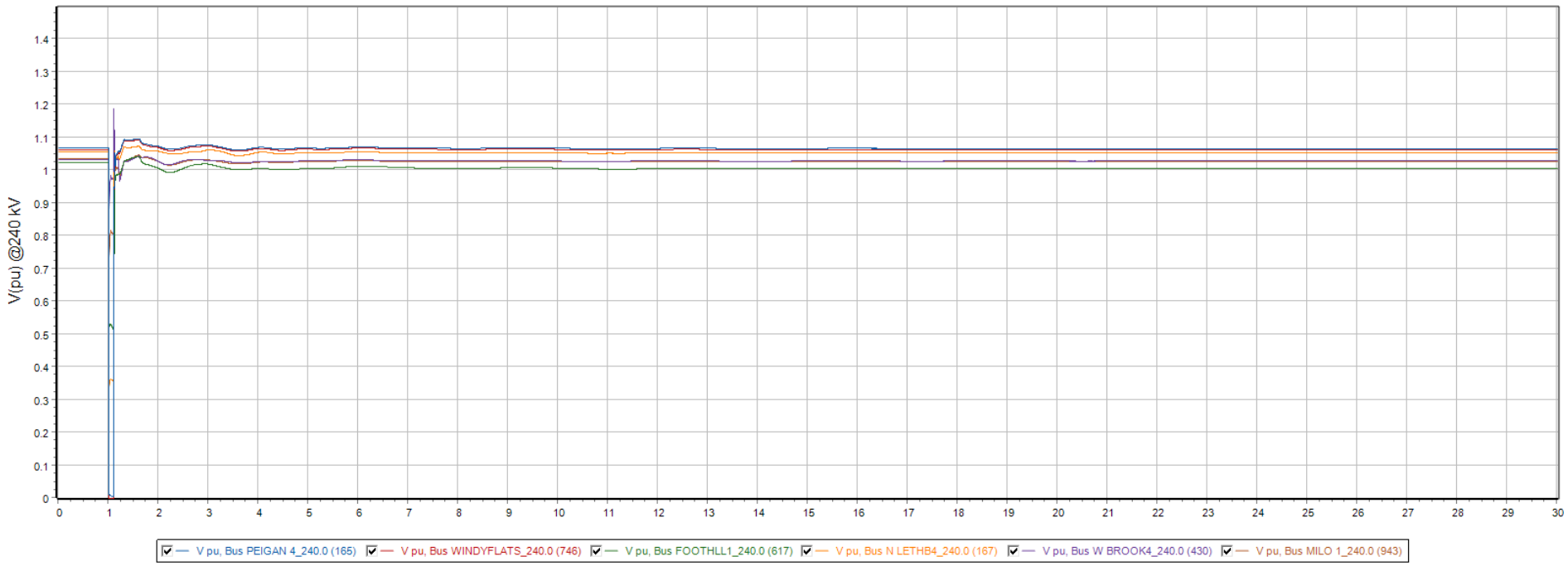
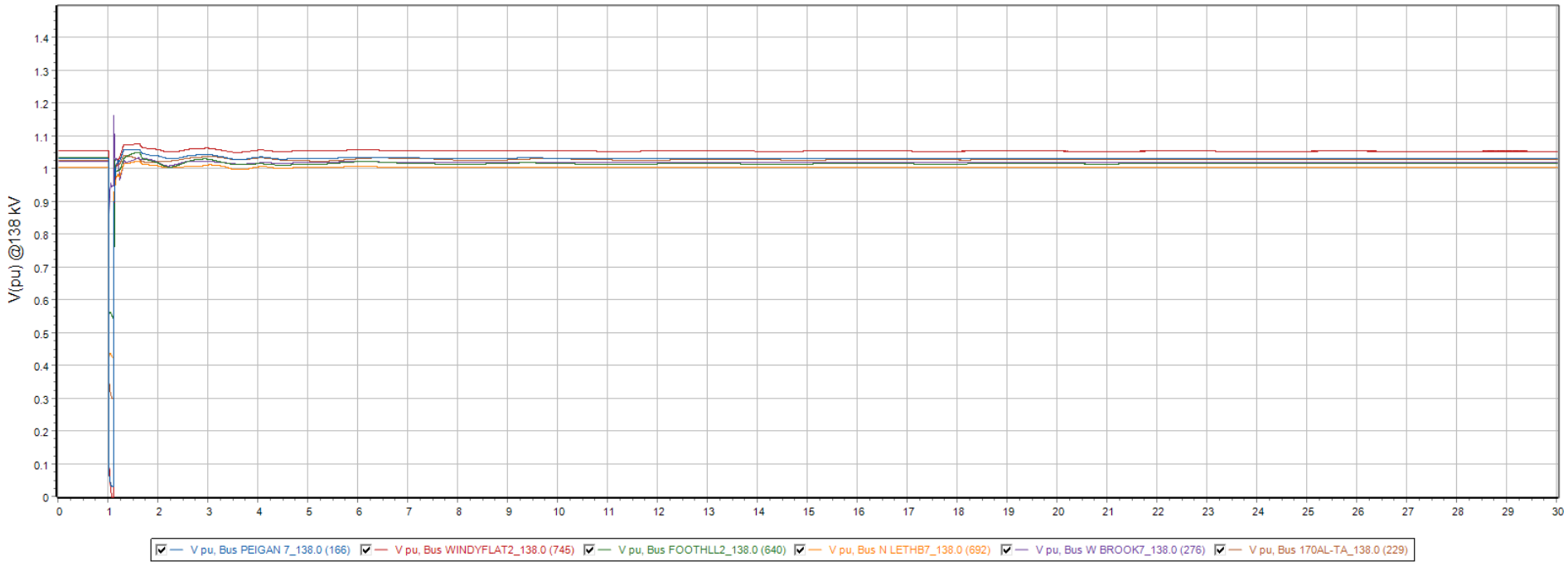
May 16, 2023 23:27:11

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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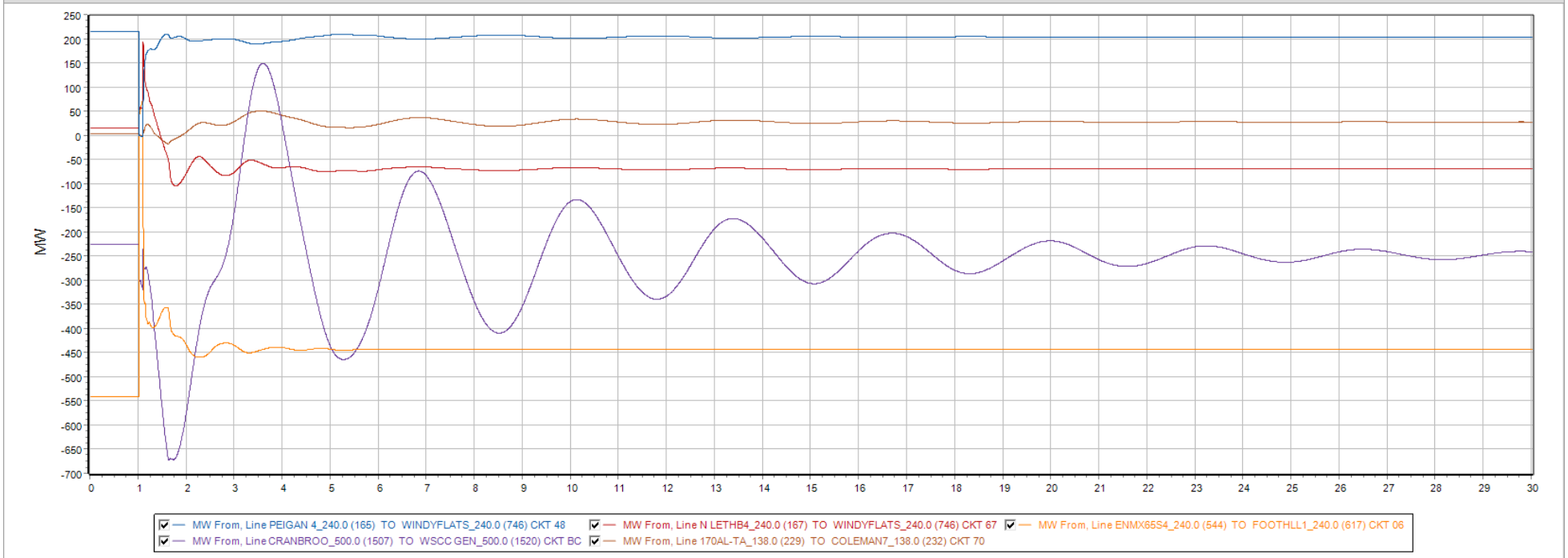
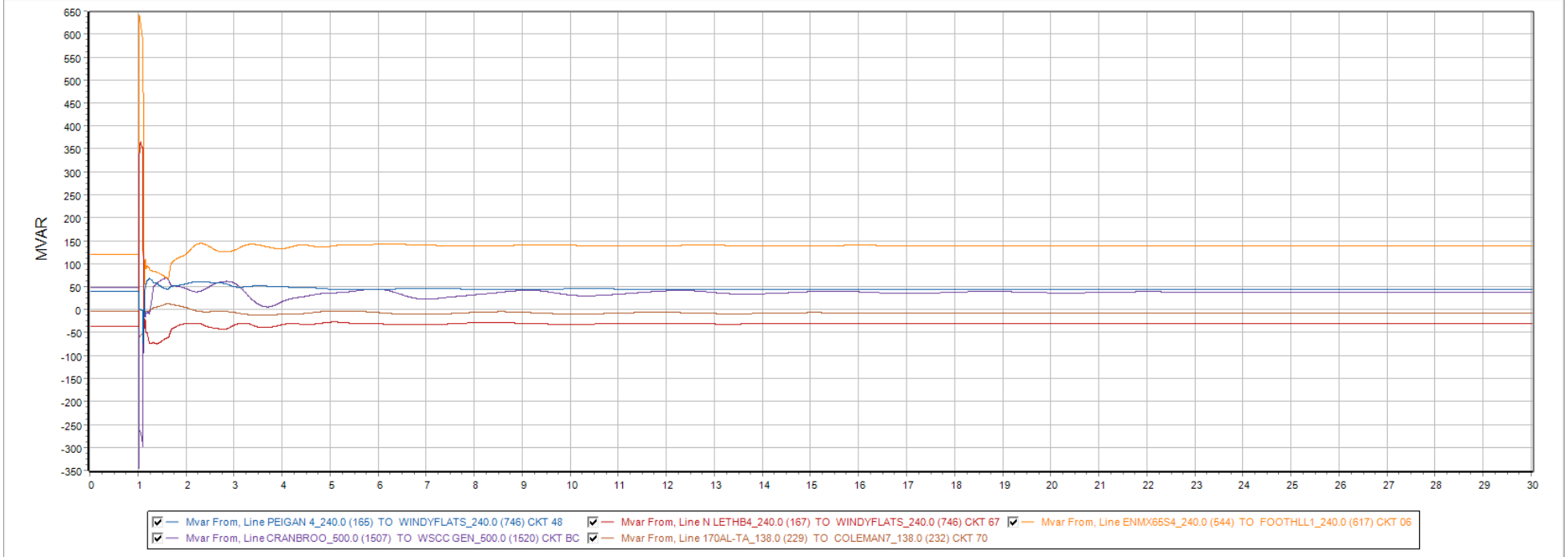
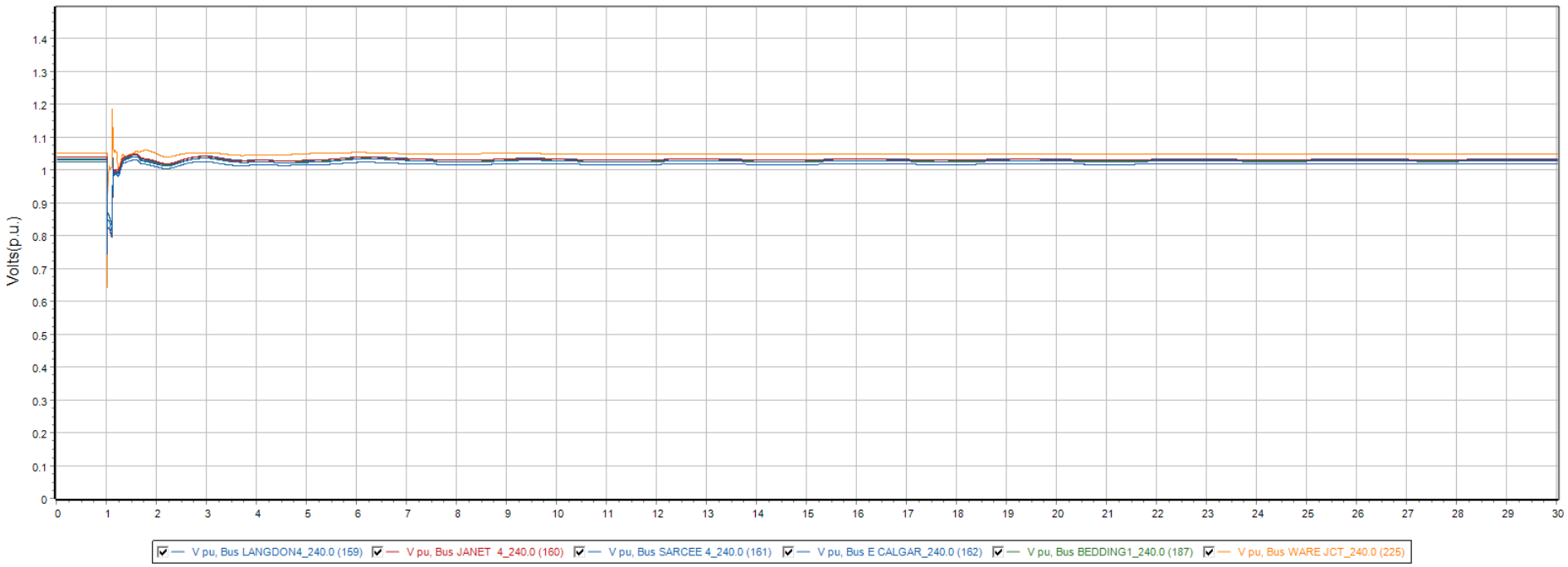
May 16, 2023 23:27:11

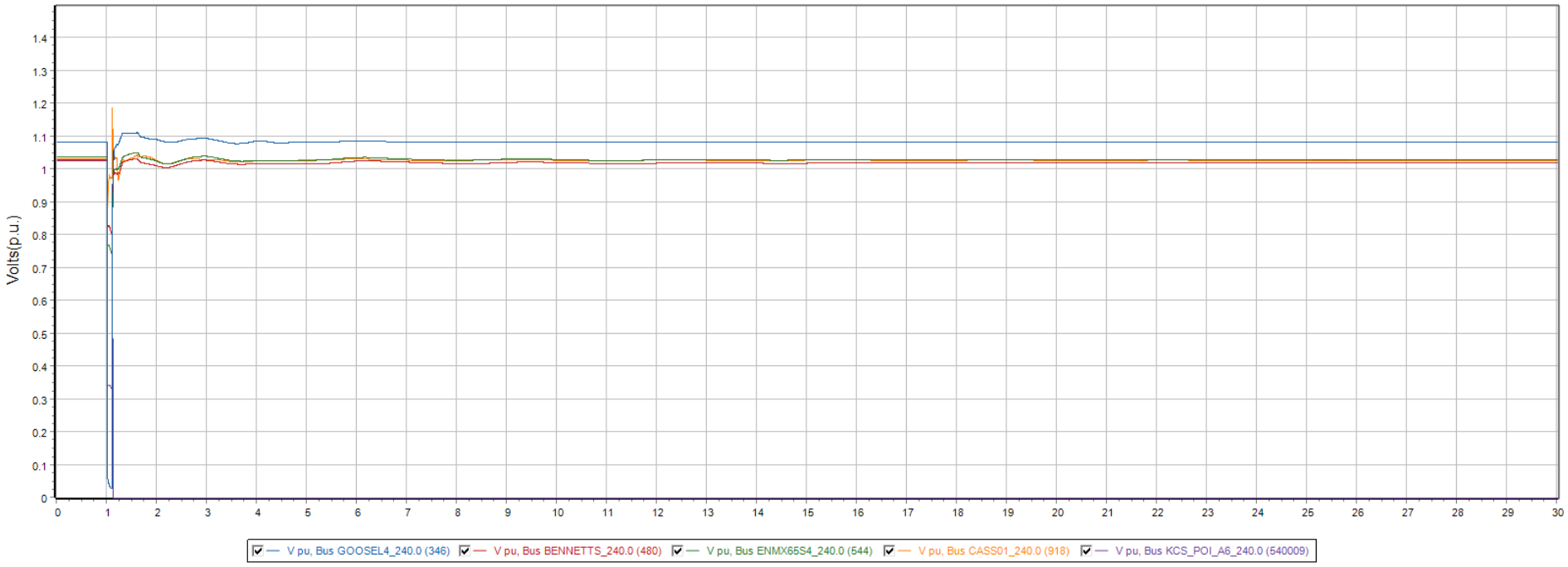
Monitor Line MW & MVAR. Q4



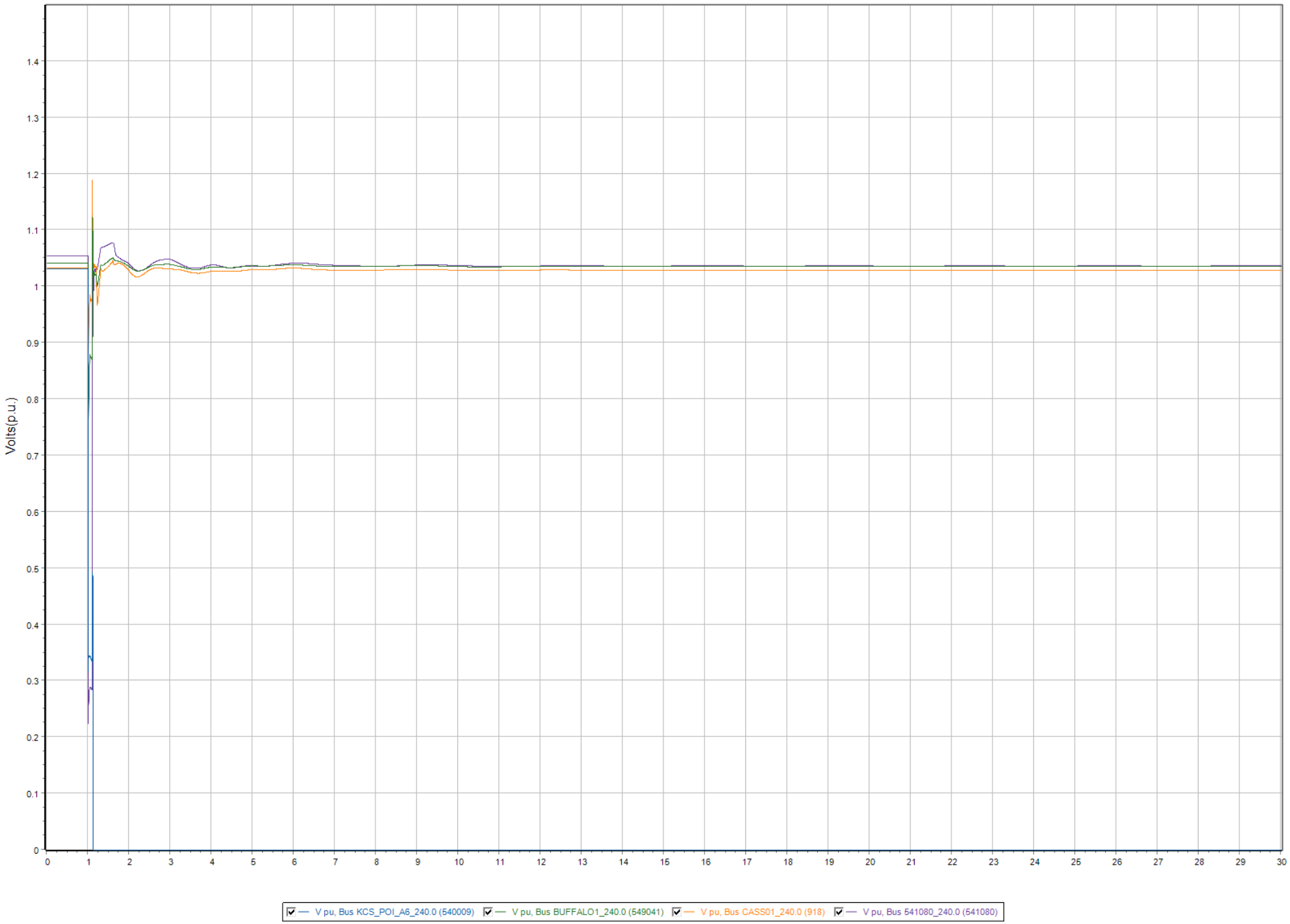


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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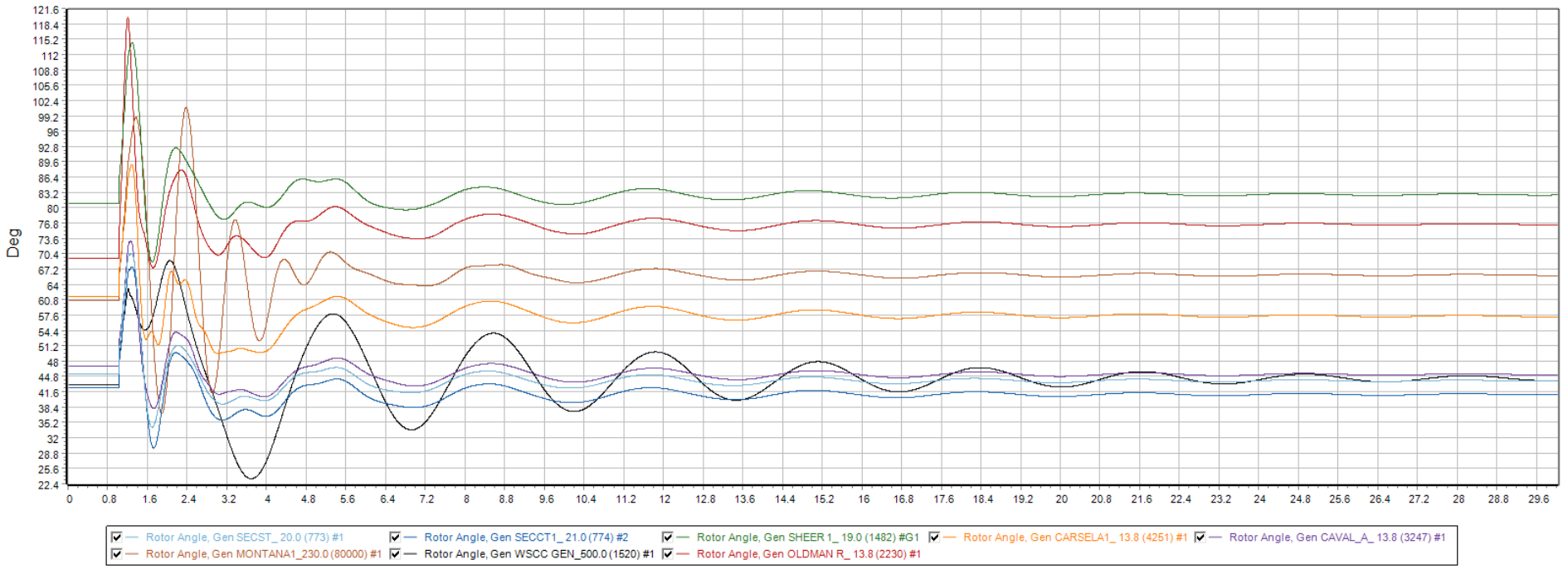
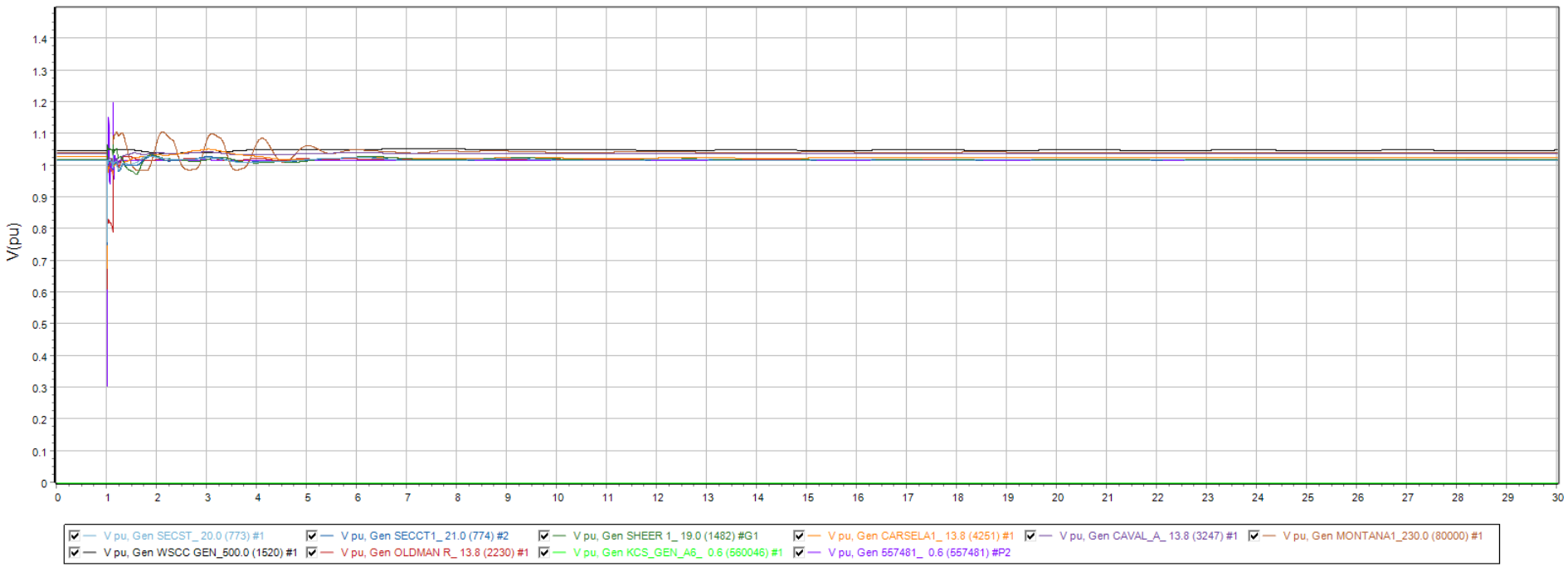
May 16, 2023 23:27:13

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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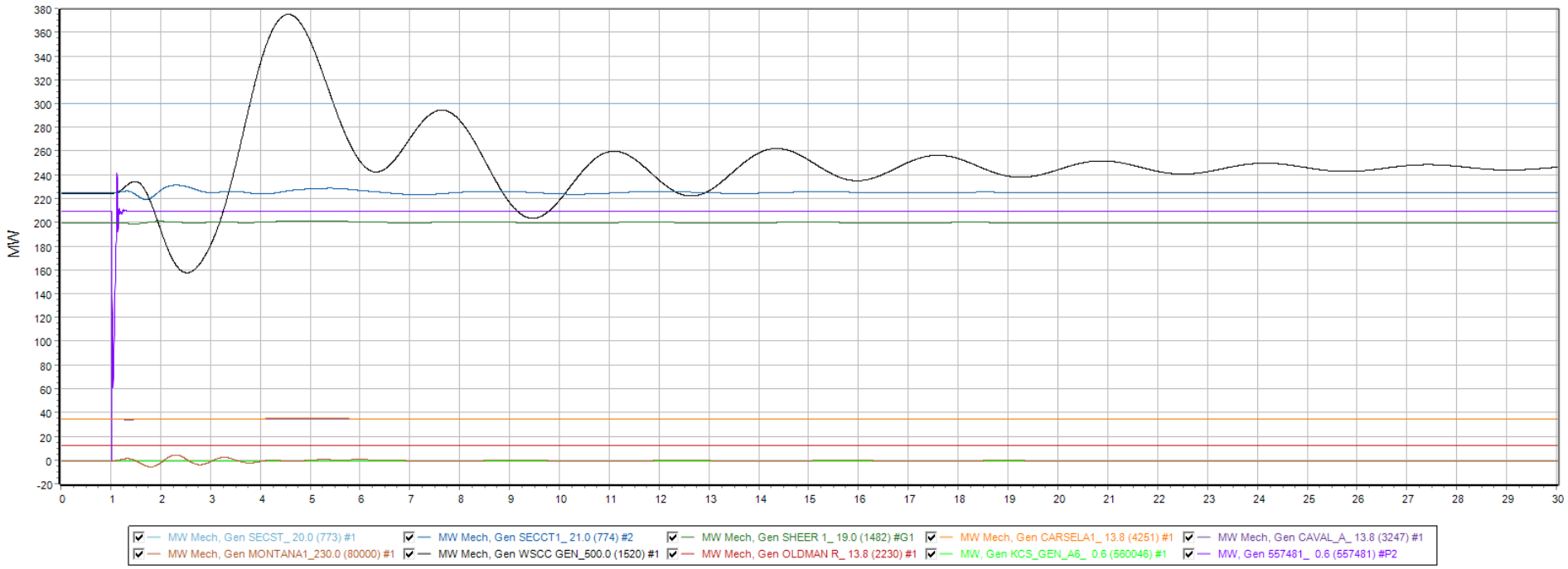
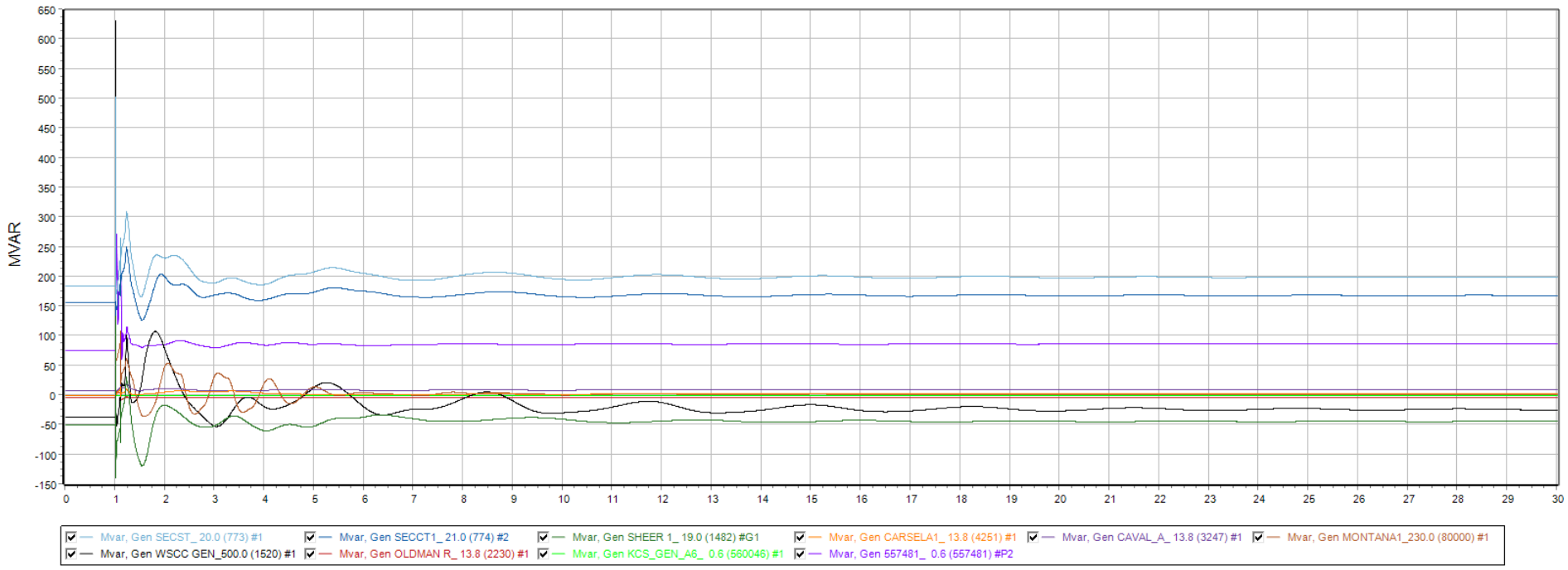
May 16, 2023 23:35:59

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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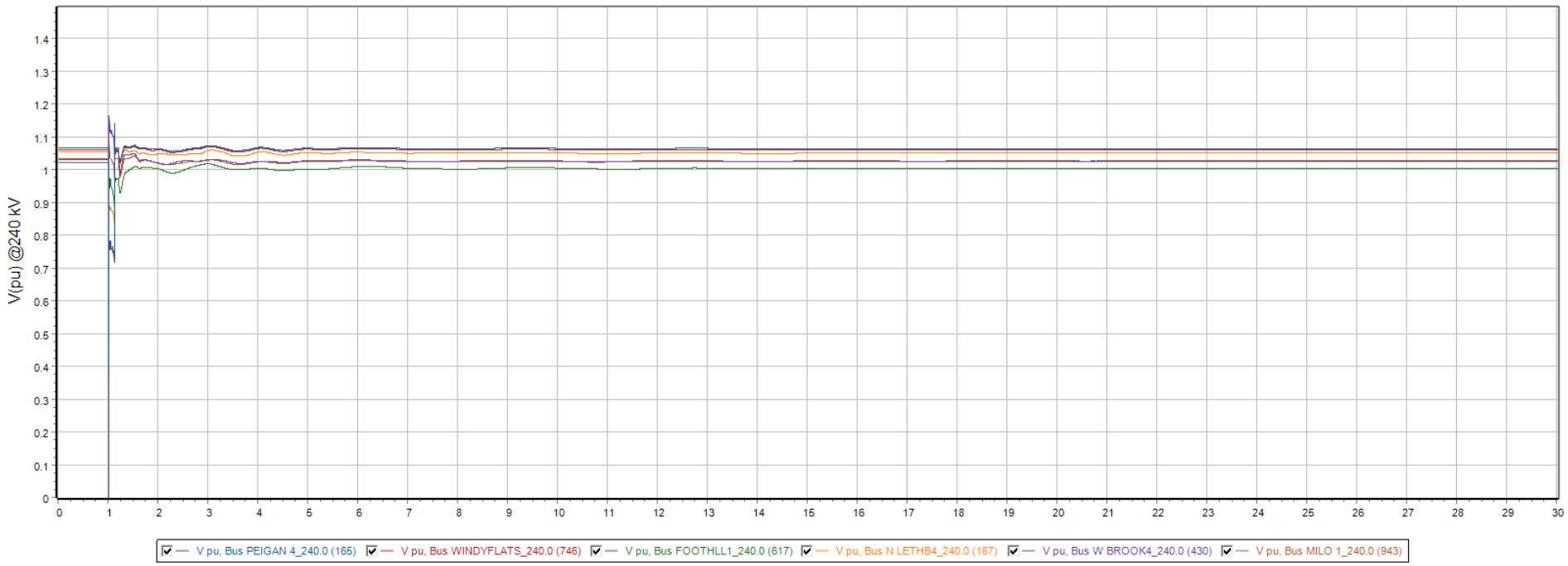
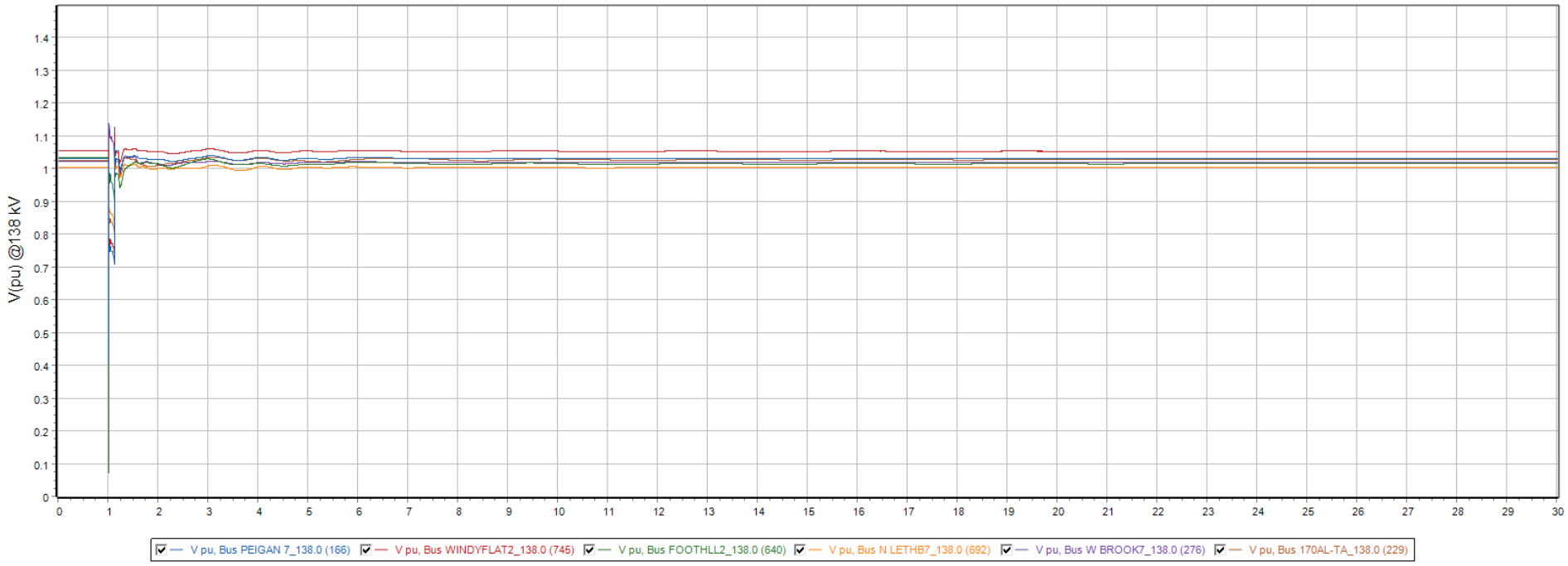
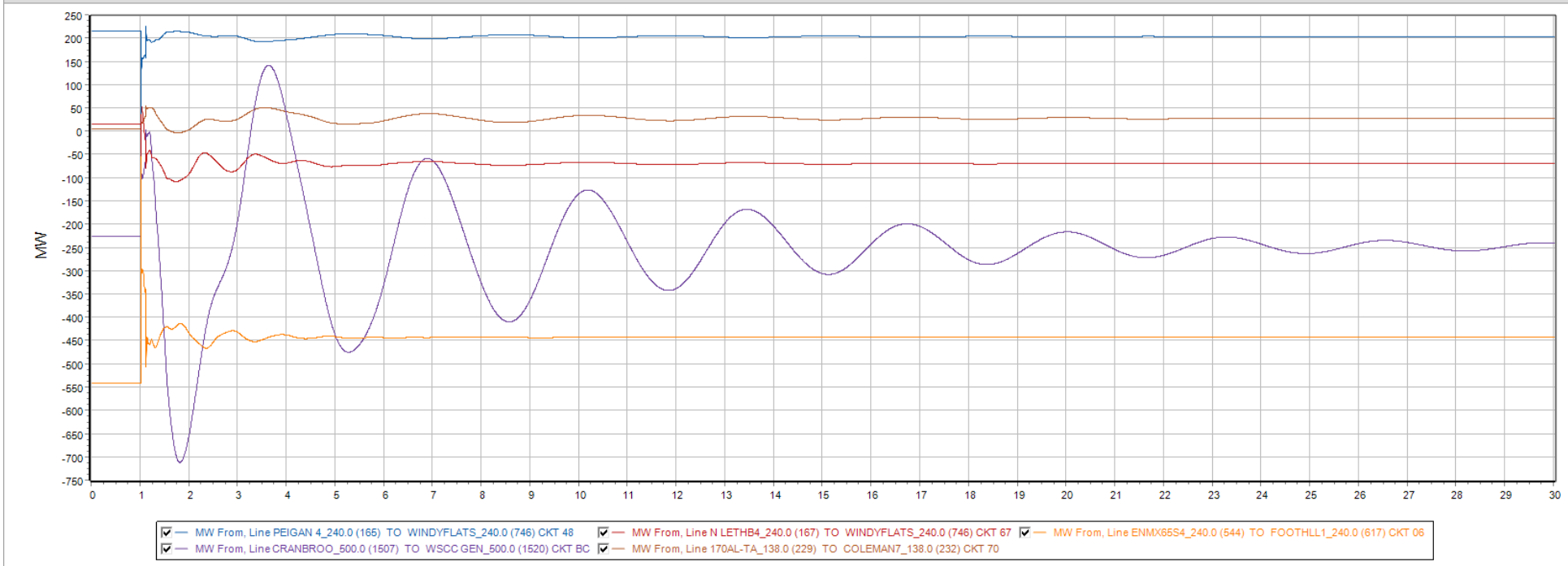
May 16, 2023 23:36:00

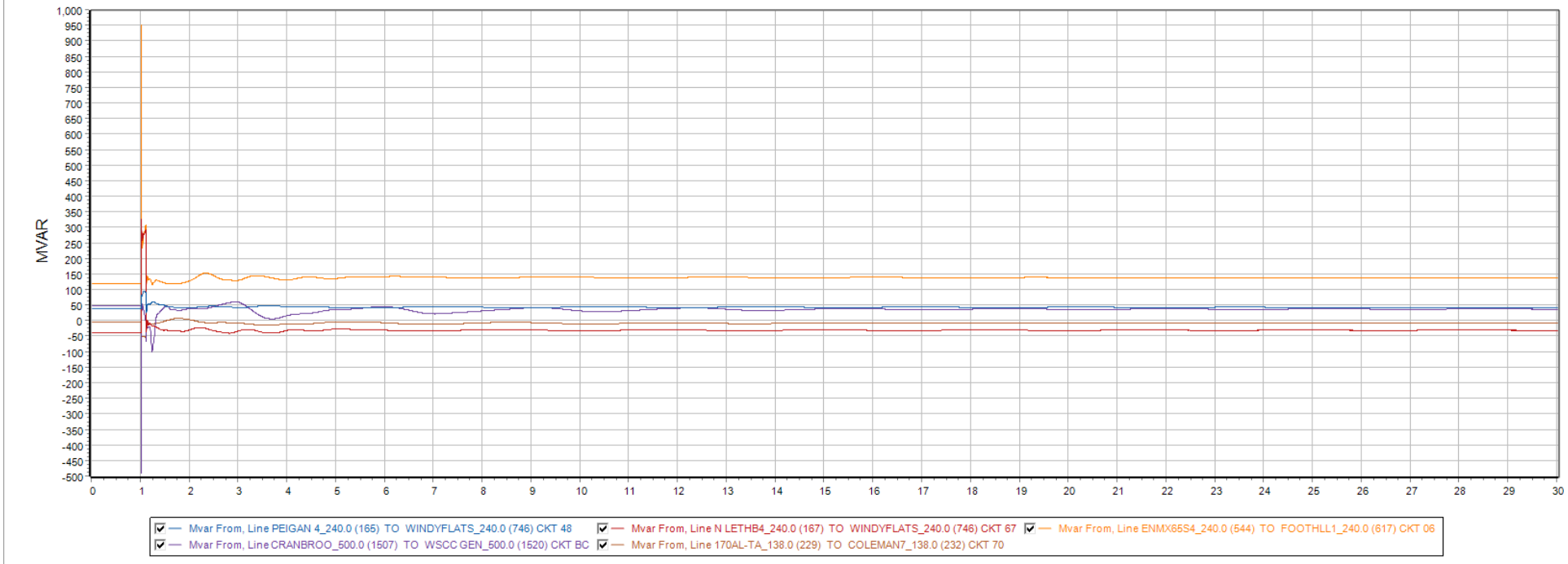
Monitor Bus Volts Q3



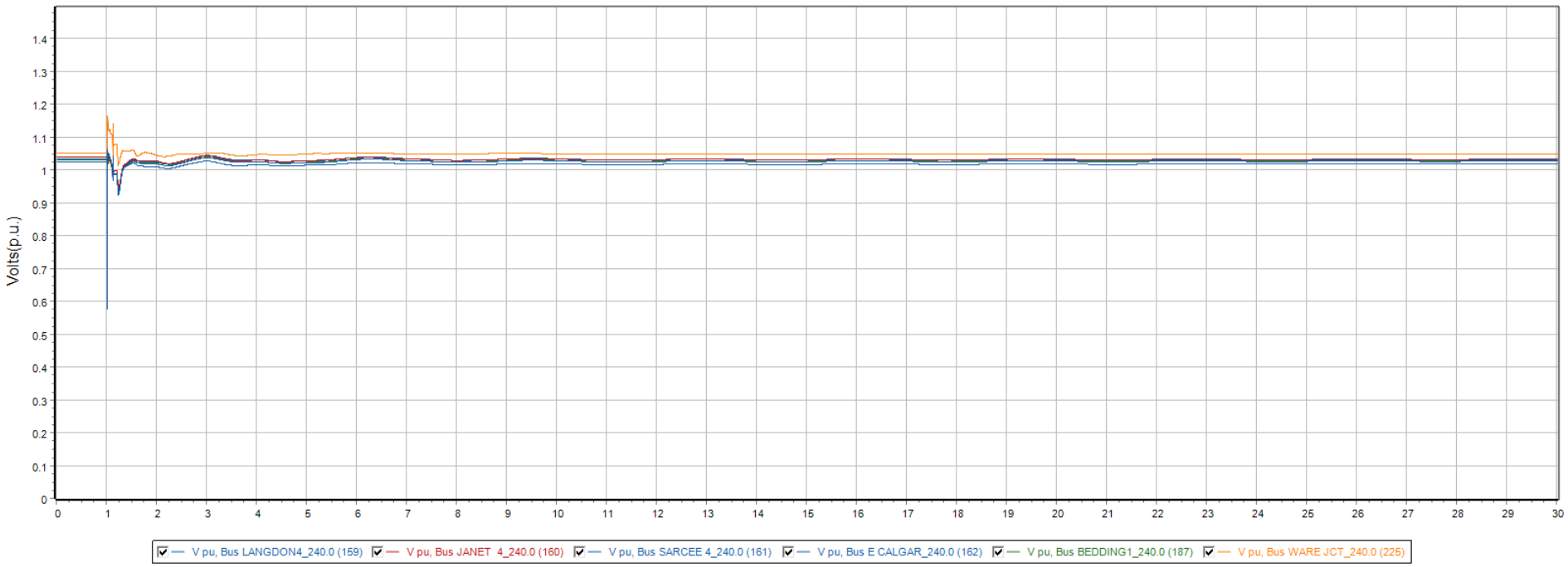


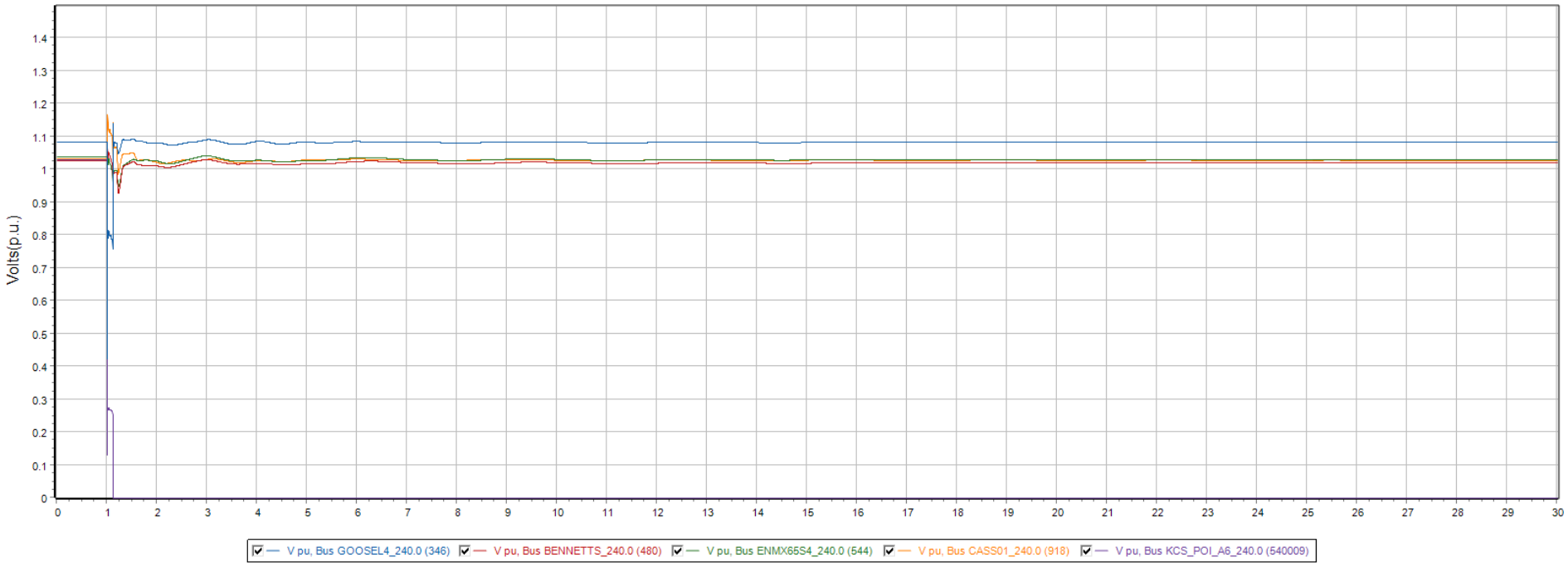
Monitor Line MW & MVAR. Q4



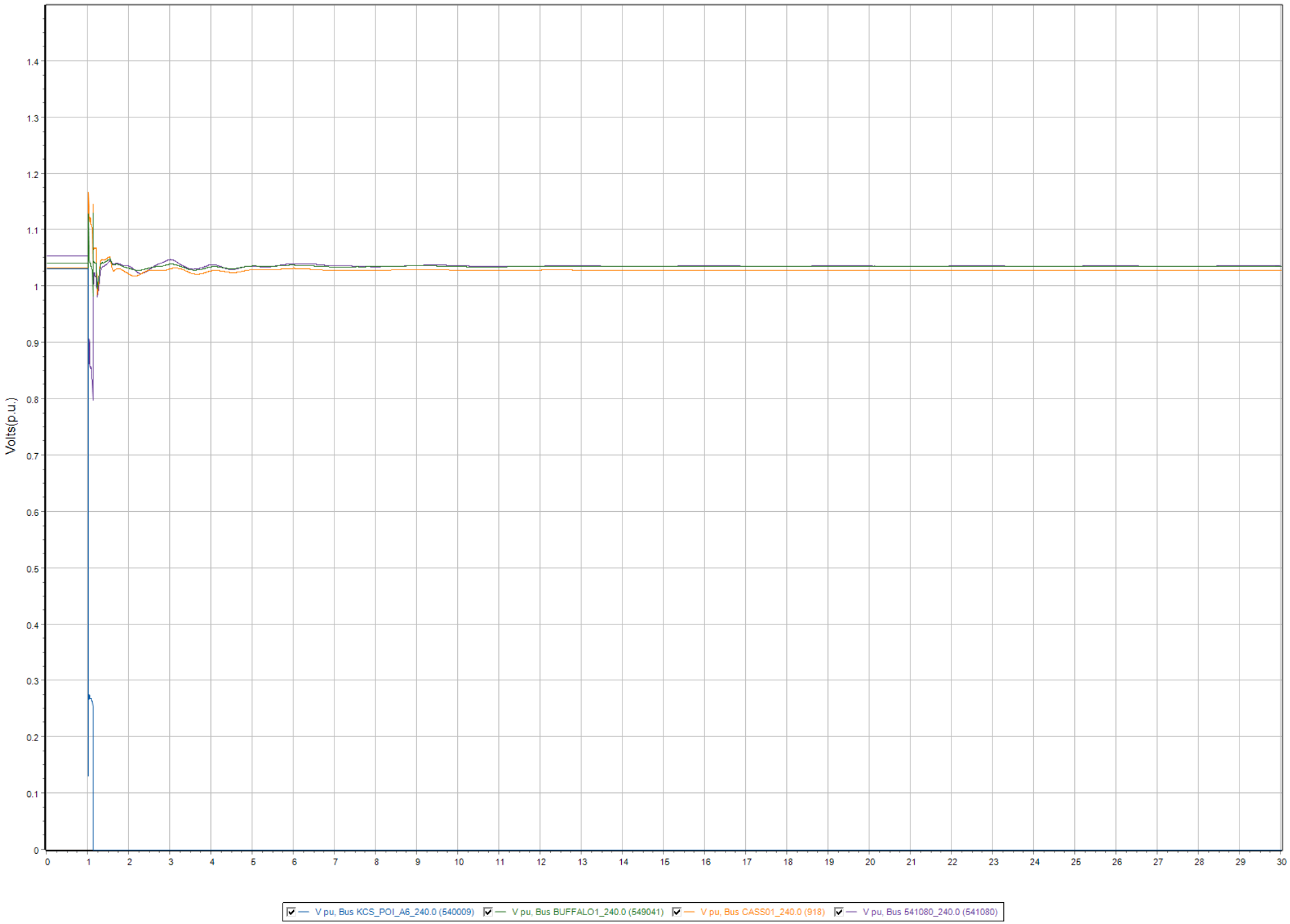


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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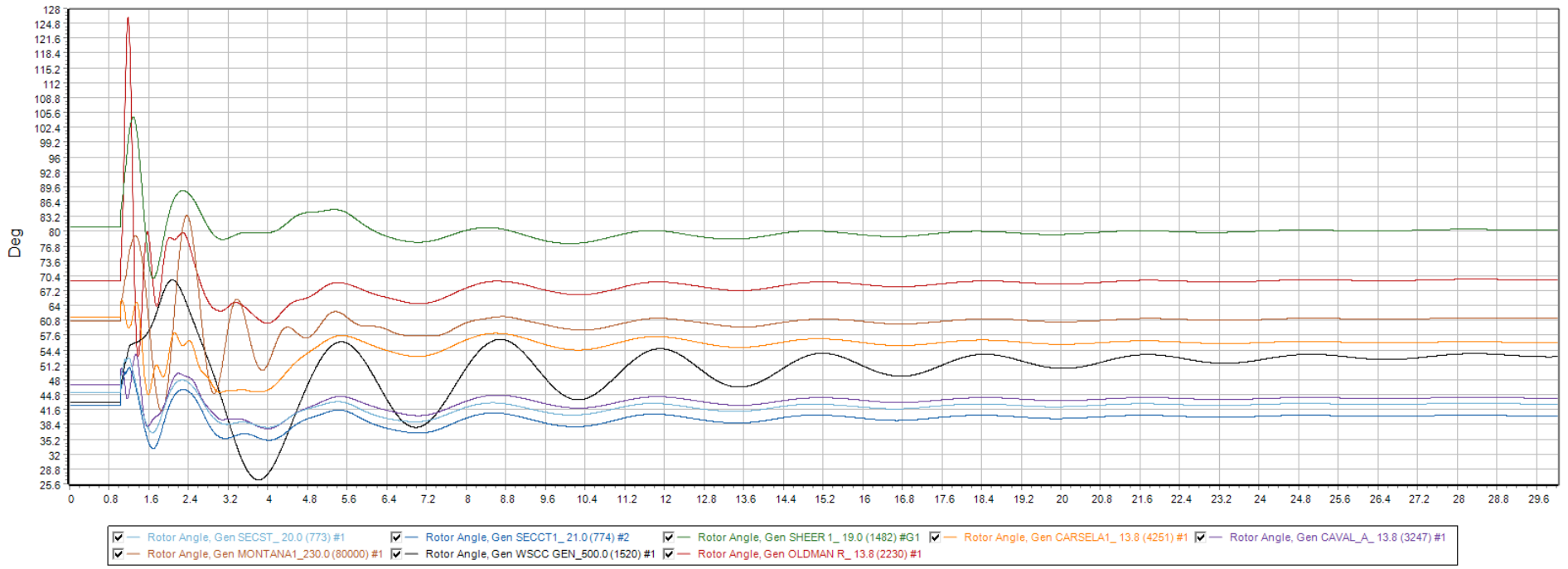
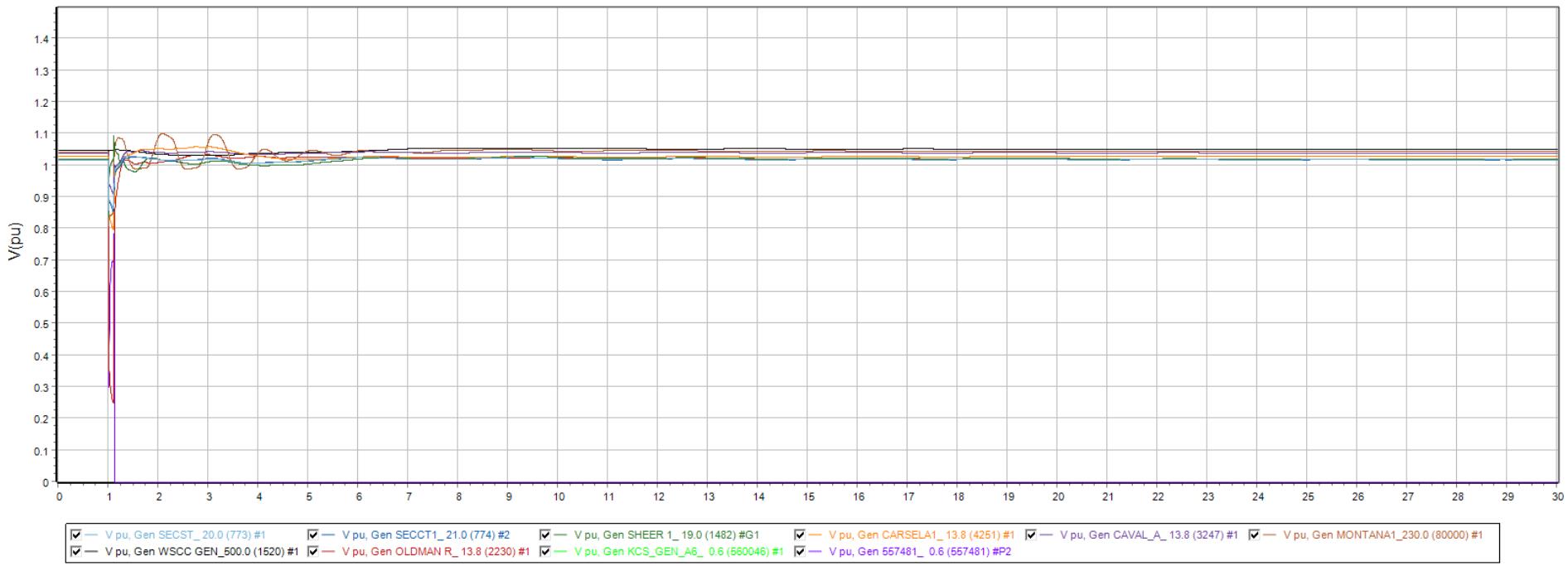
May 16, 2023 23:36:02

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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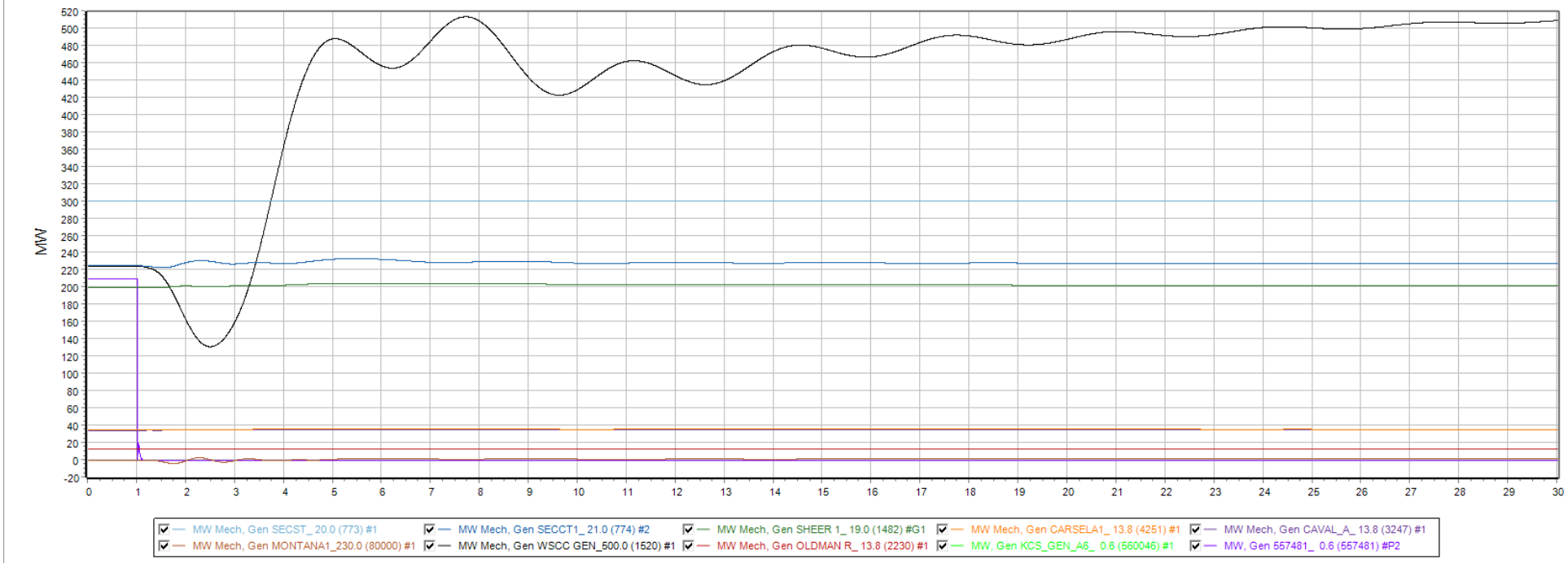
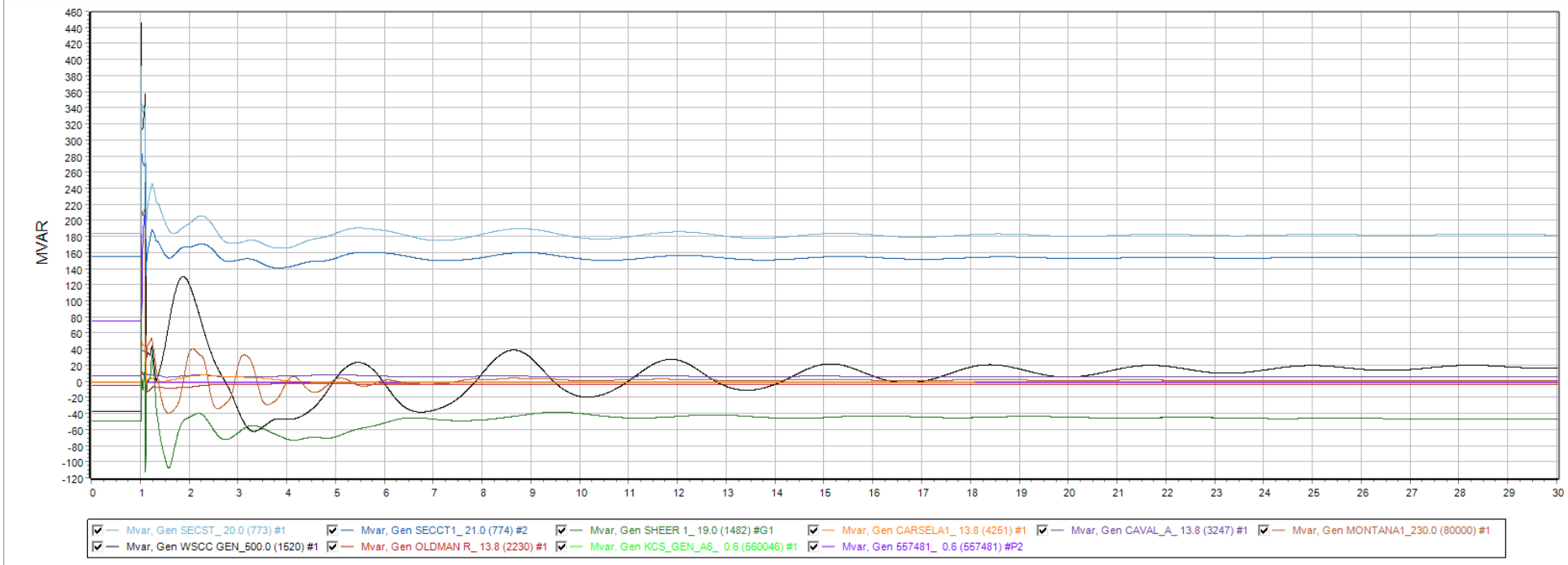
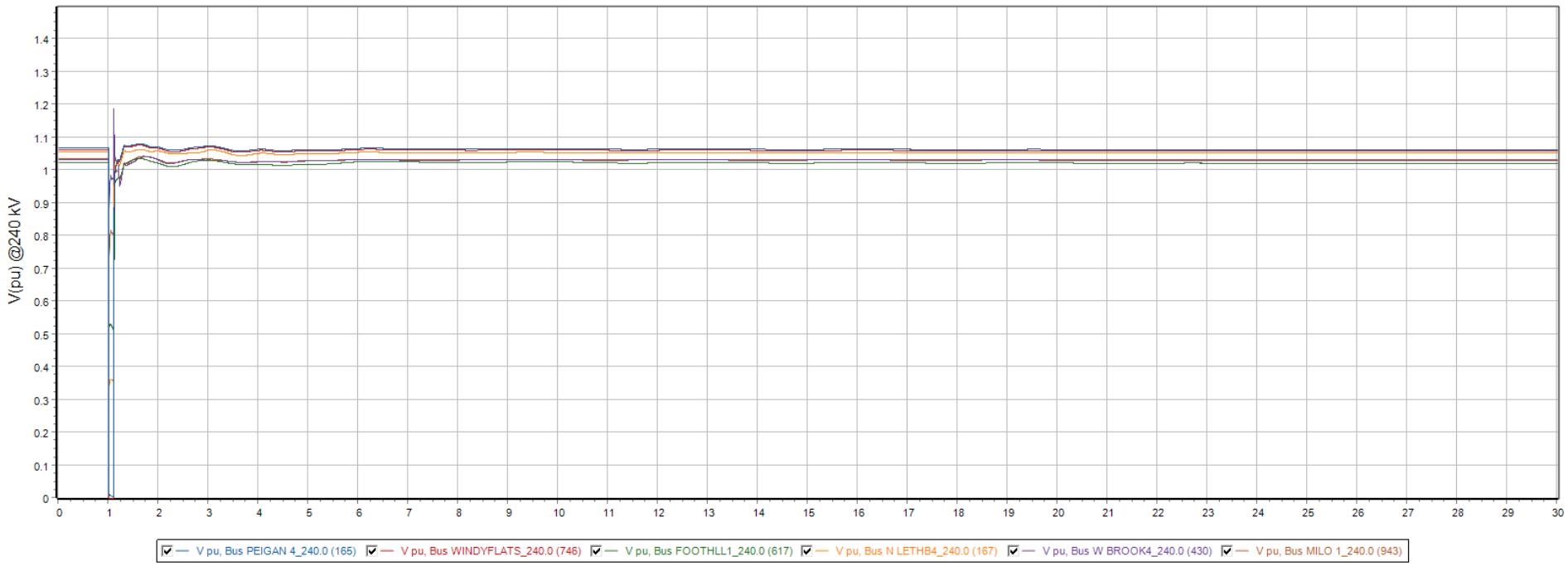
May 16, 2023 21:13:44

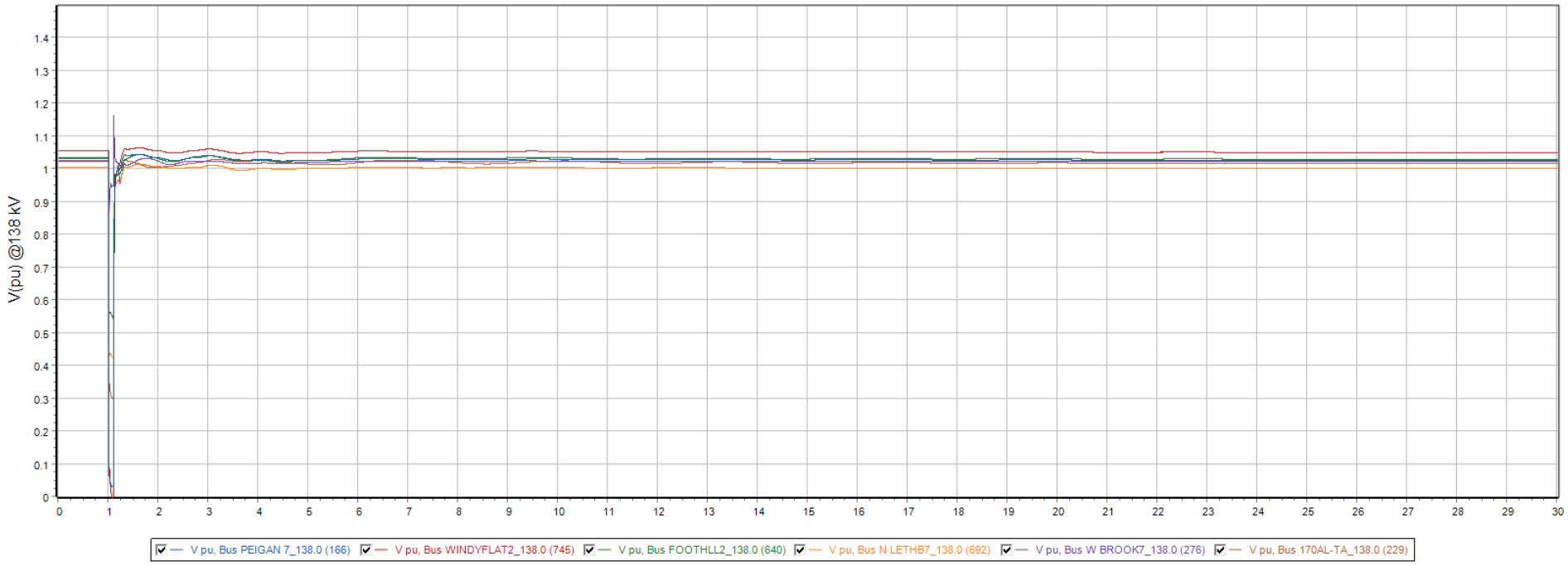
Monitor Gens. Q2





Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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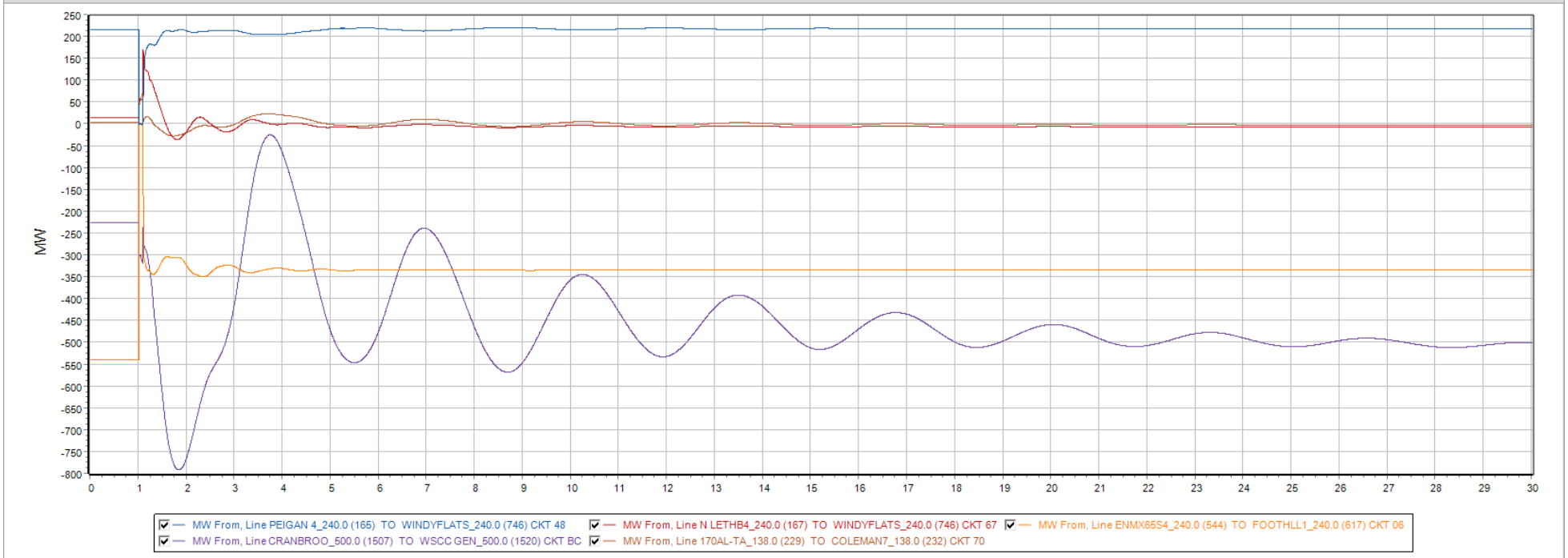
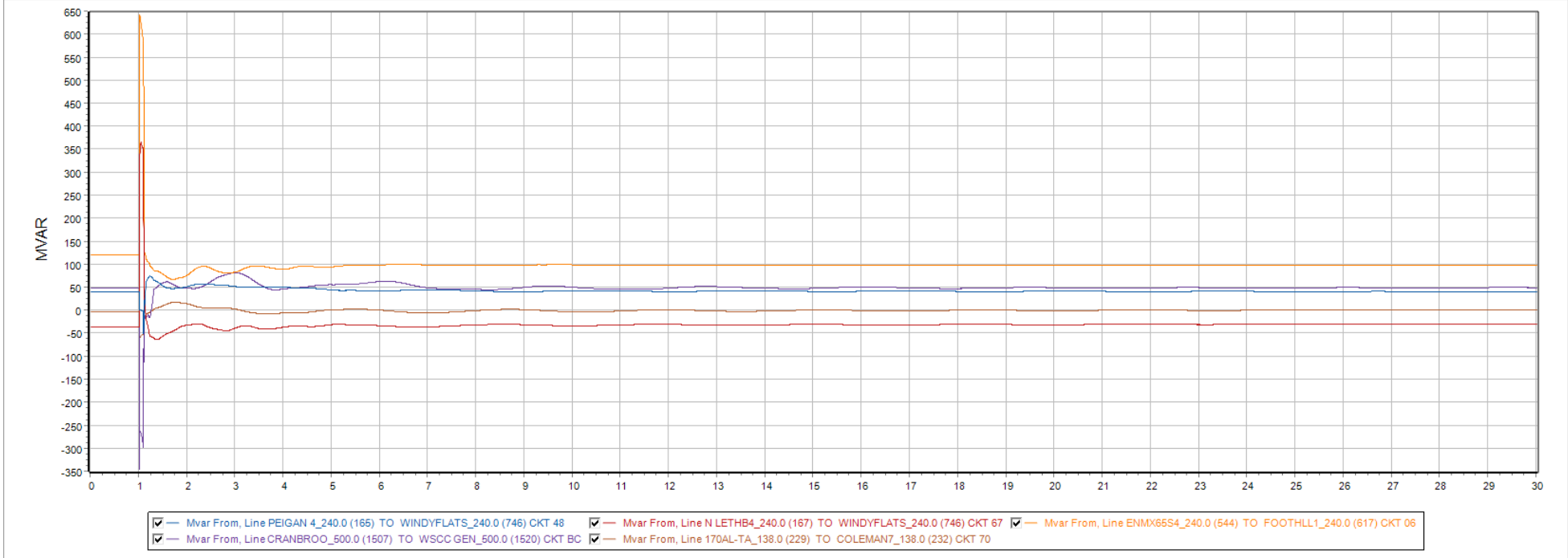
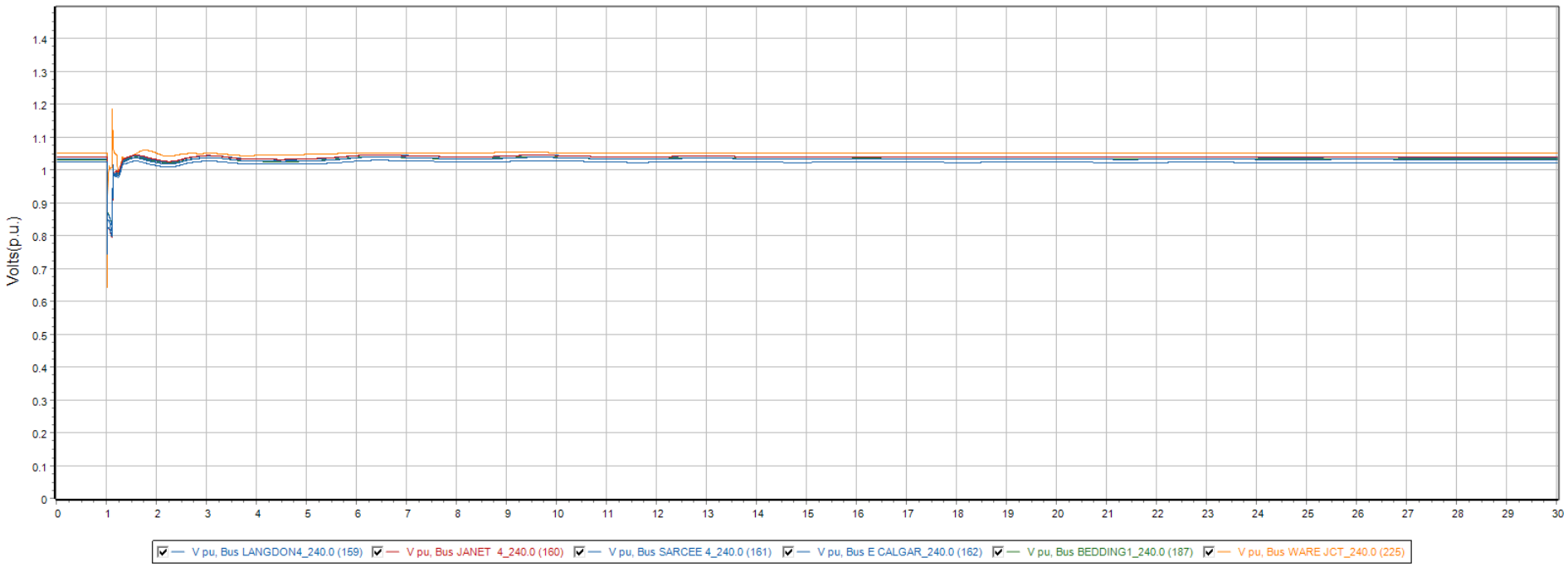
May 16, 2023 21:13:46

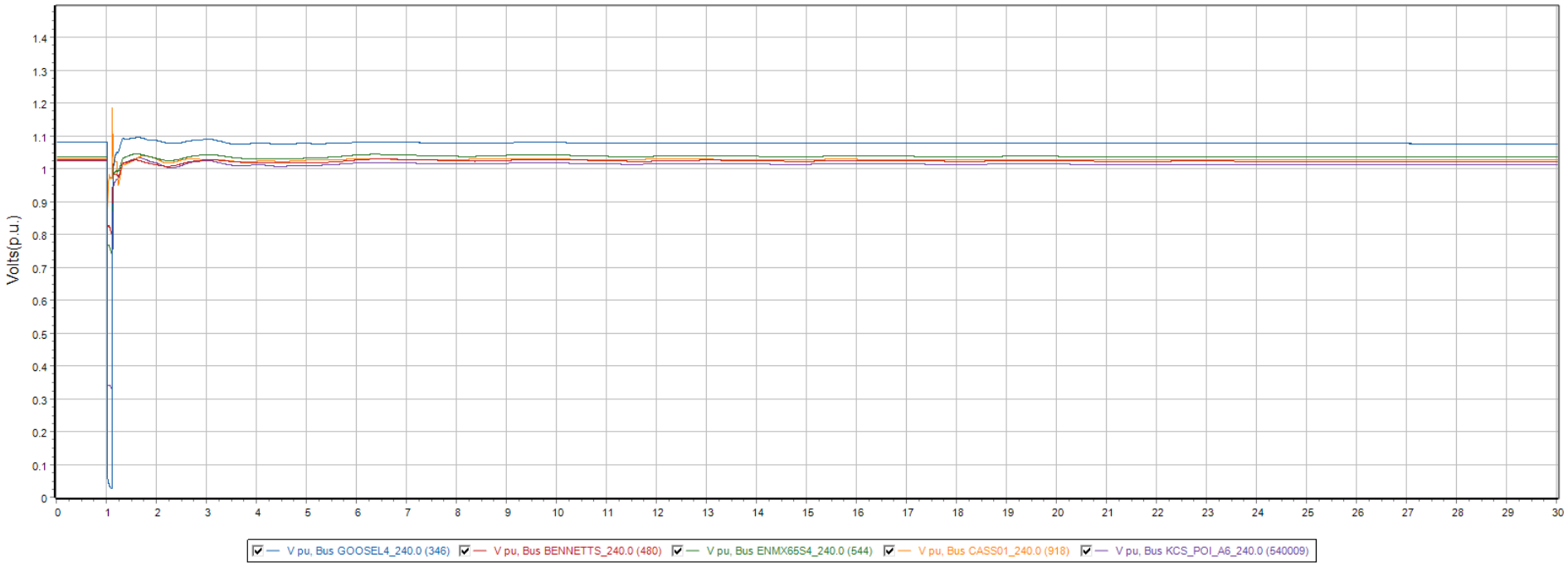
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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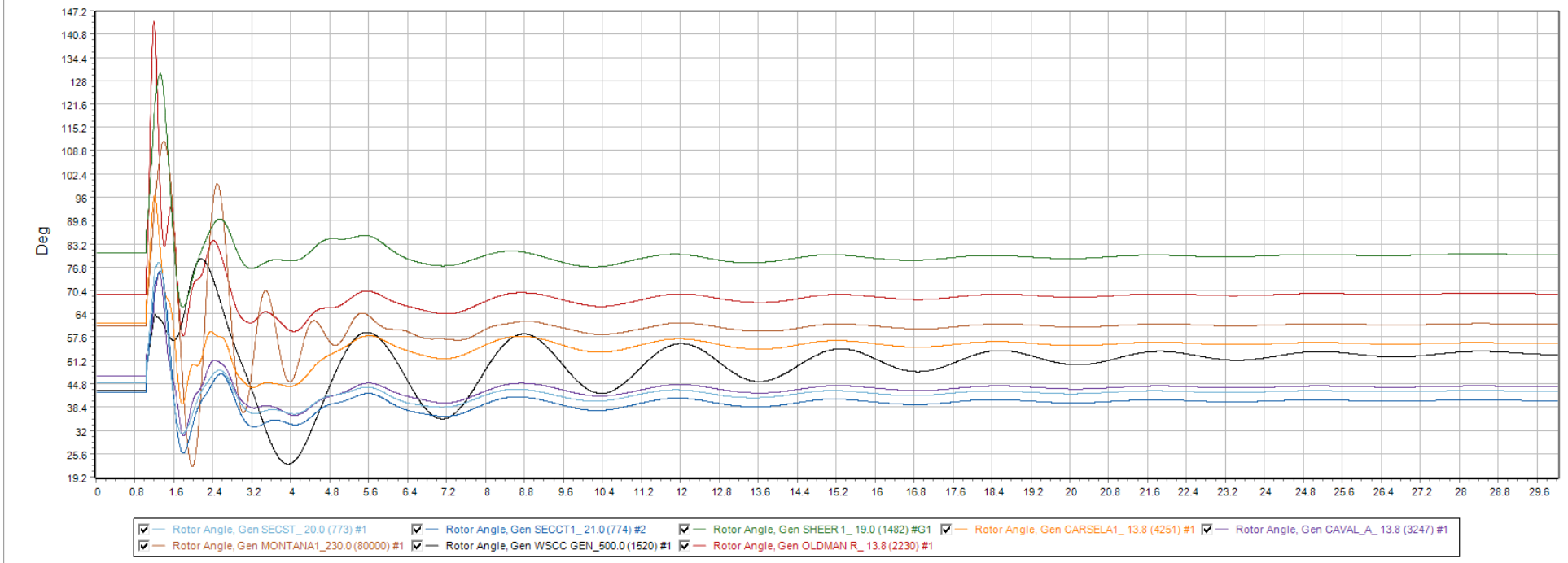
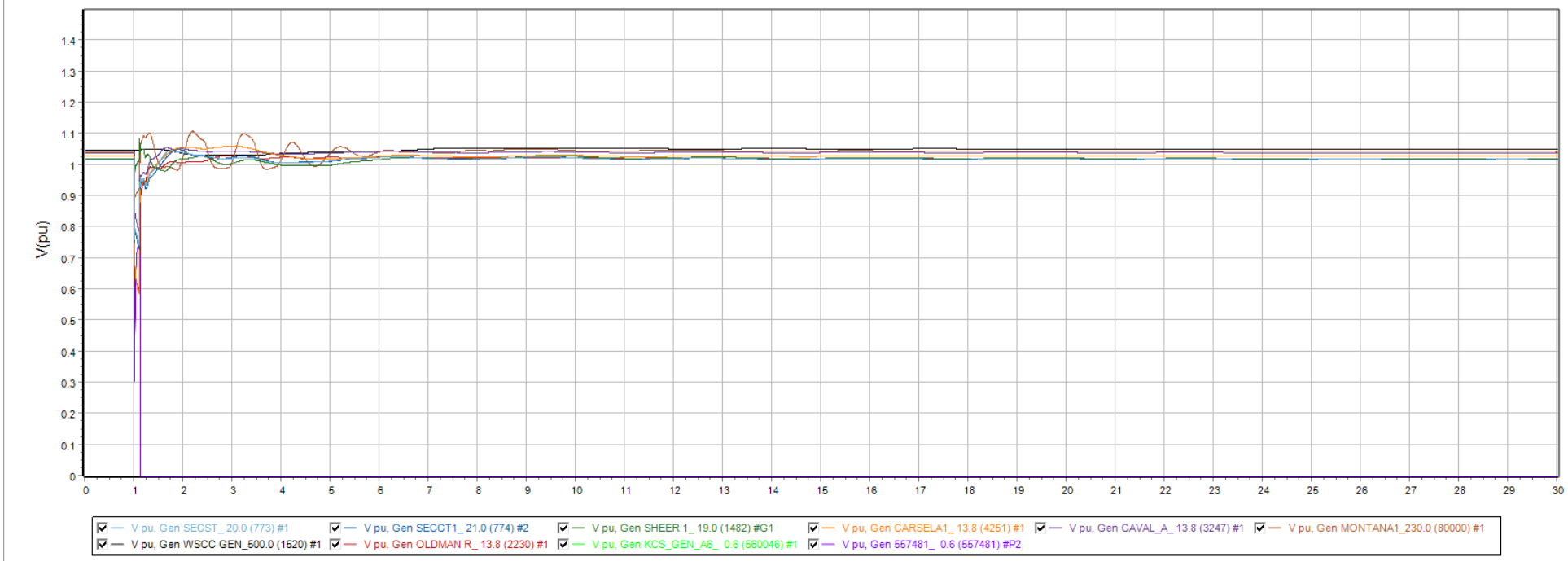
May 16, 2023 21:13:47

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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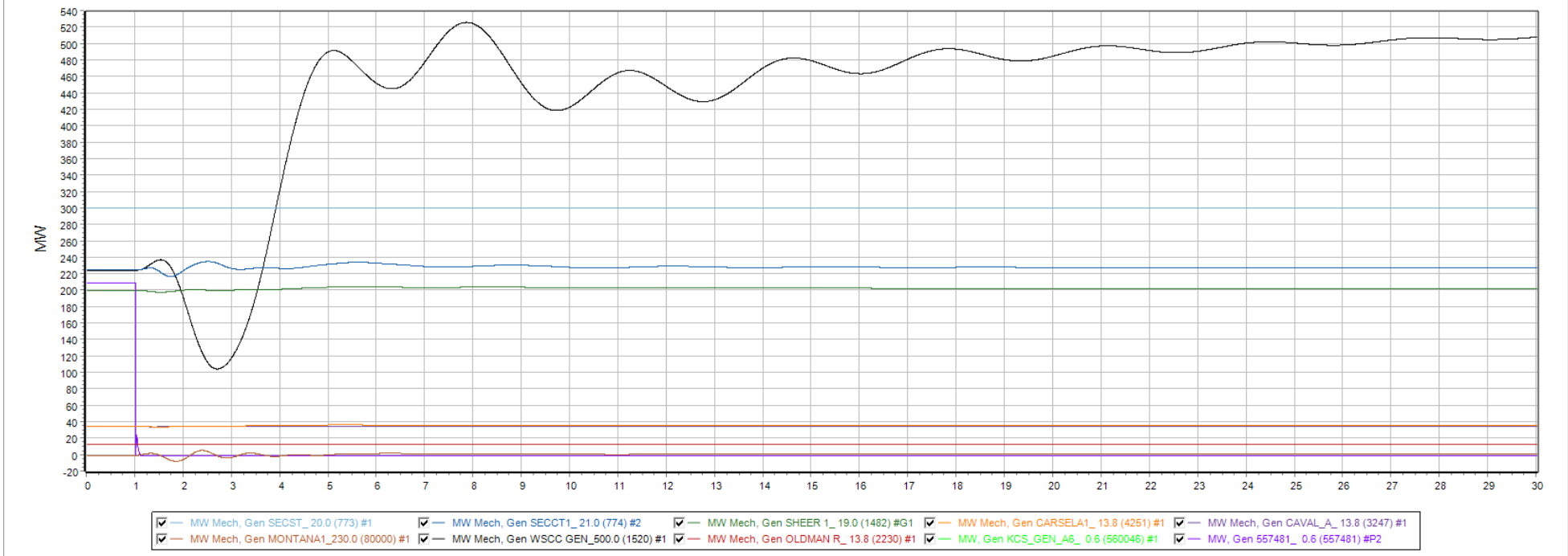
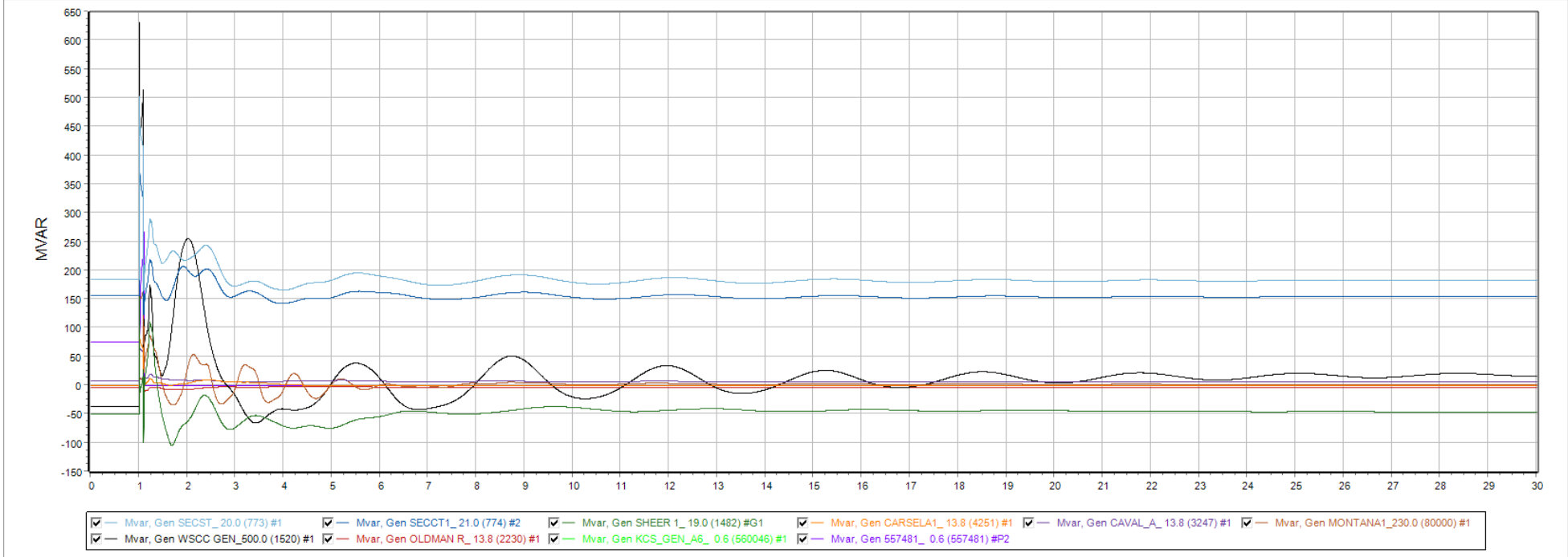
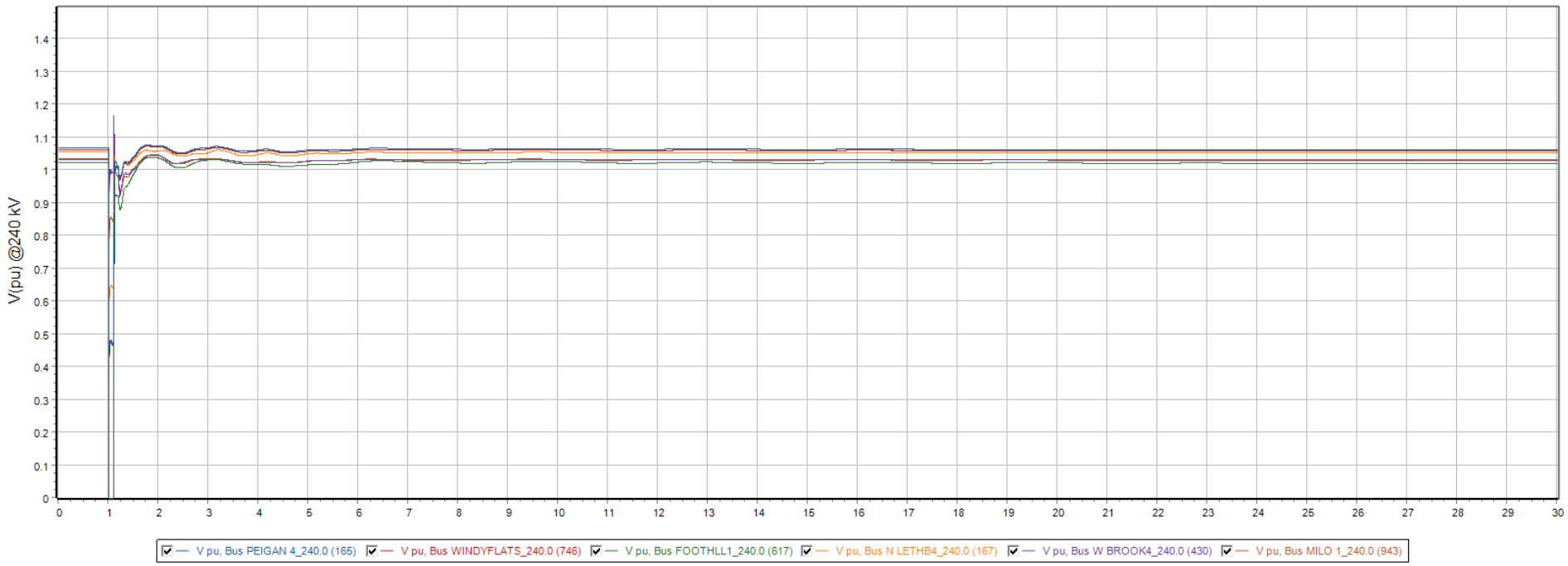
May 16, 2023 21:24:20

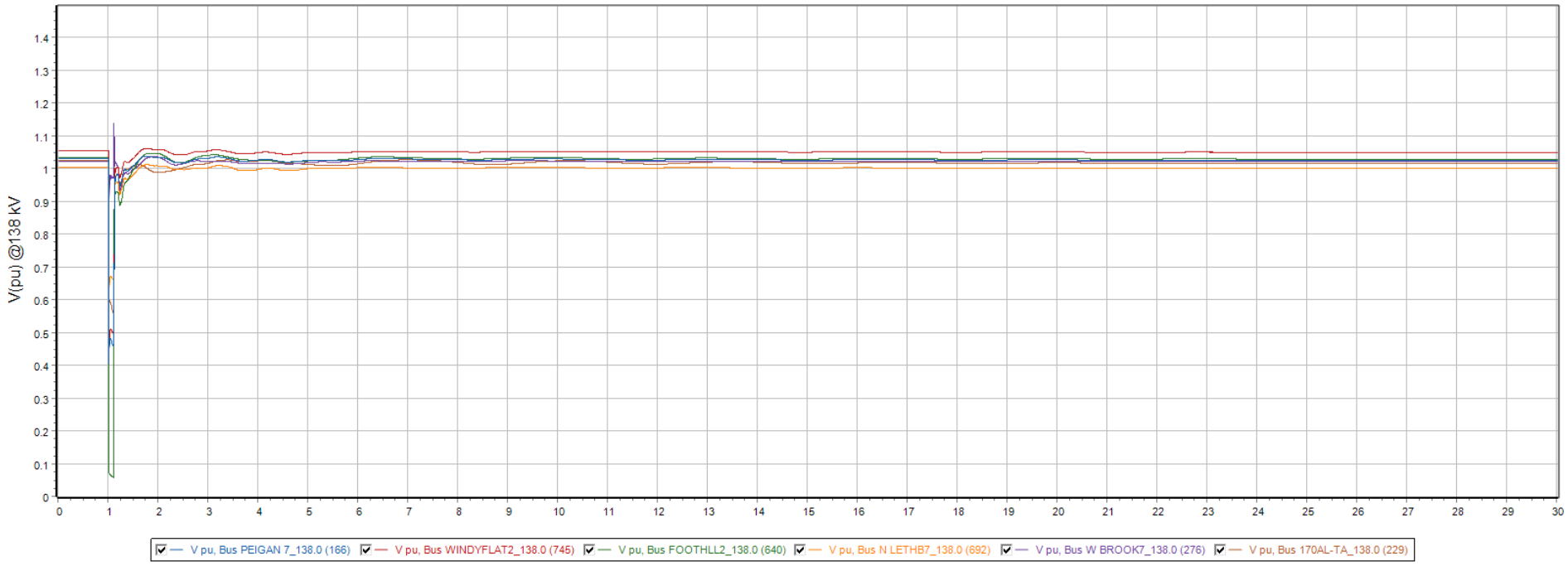
Monitor Gens. Q2





Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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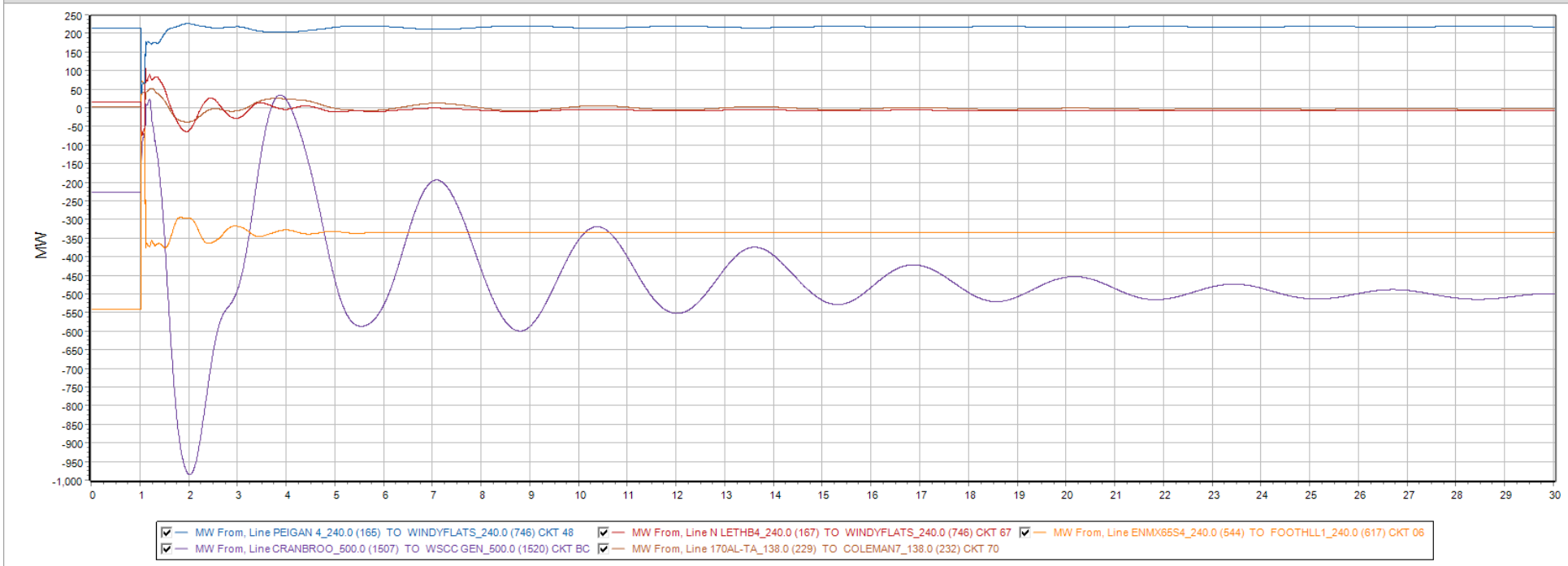
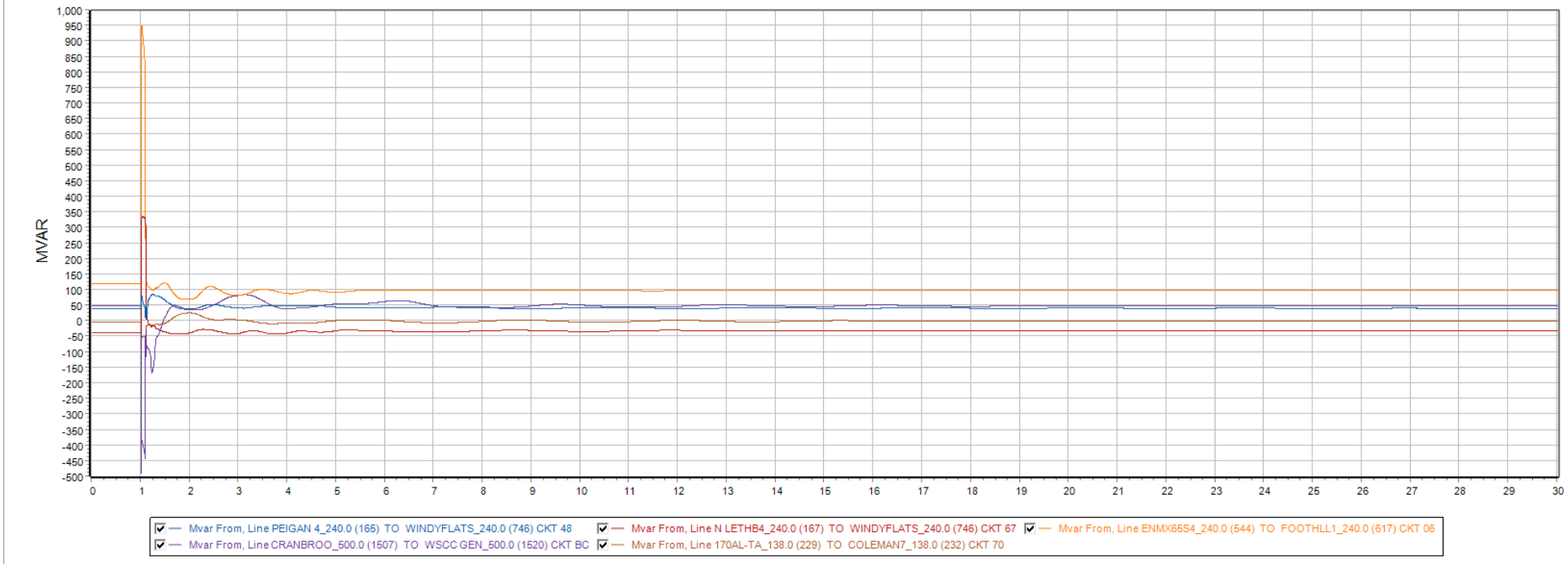
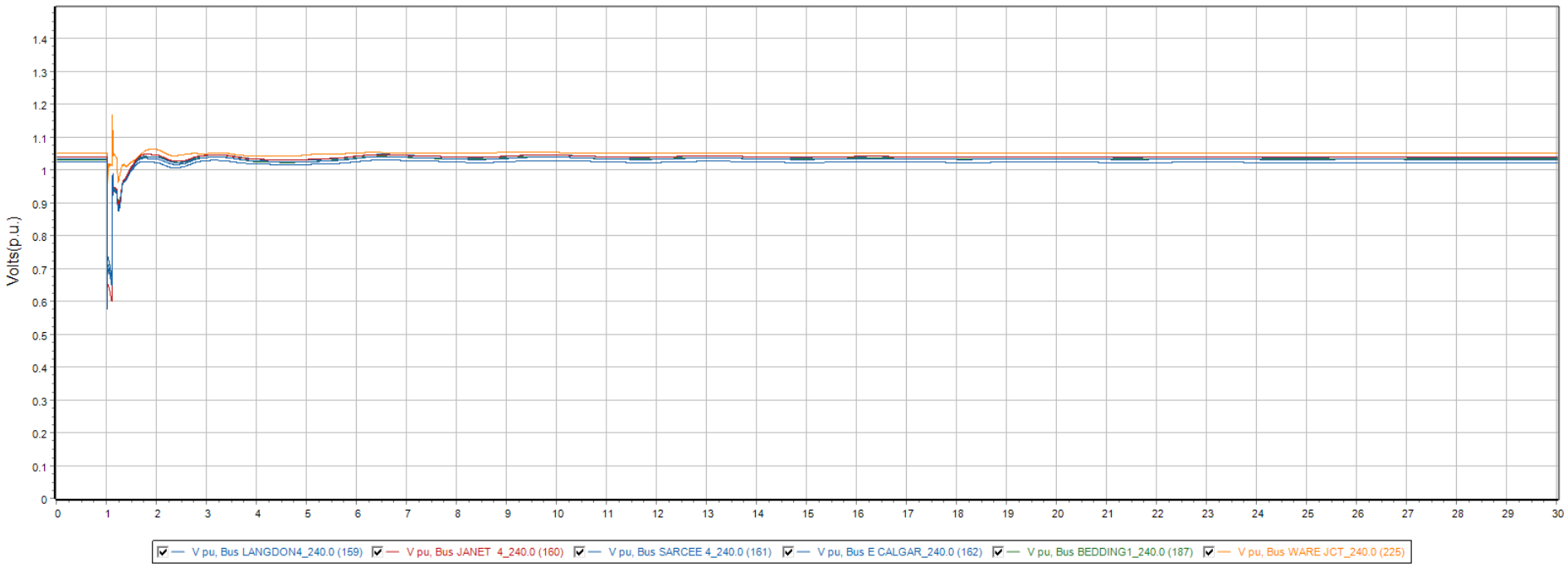
May 16, 2023 21:24:21

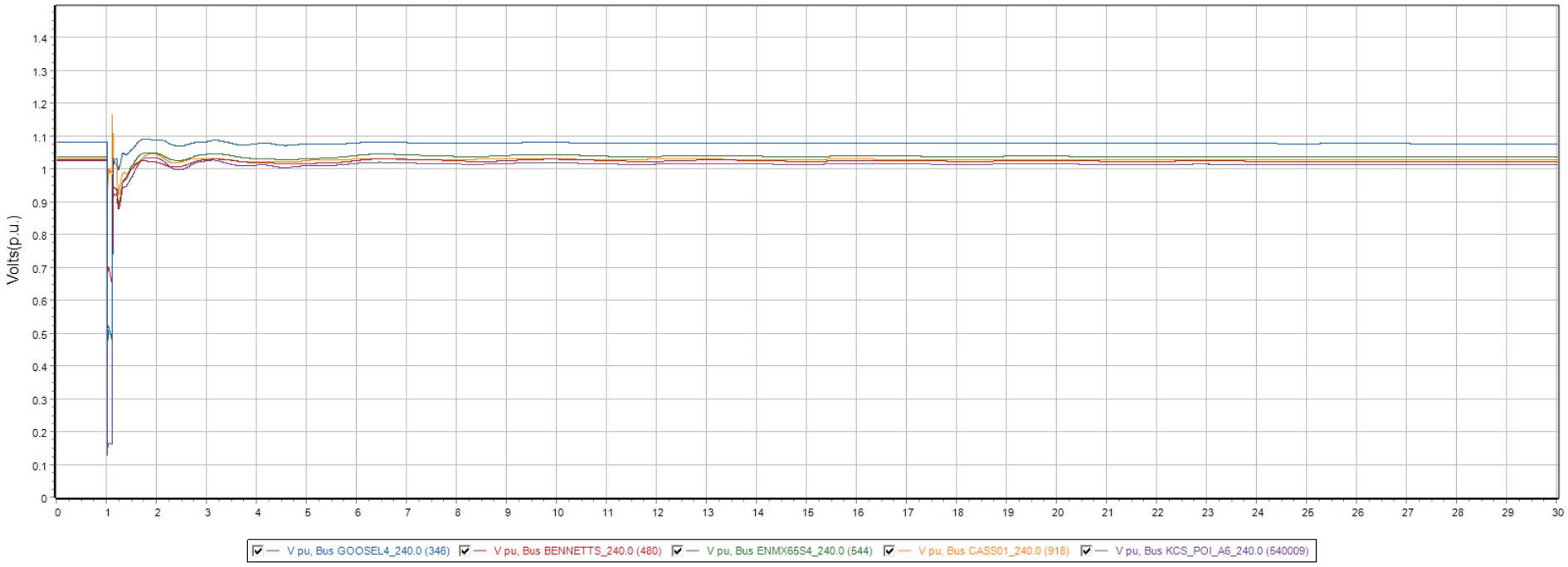
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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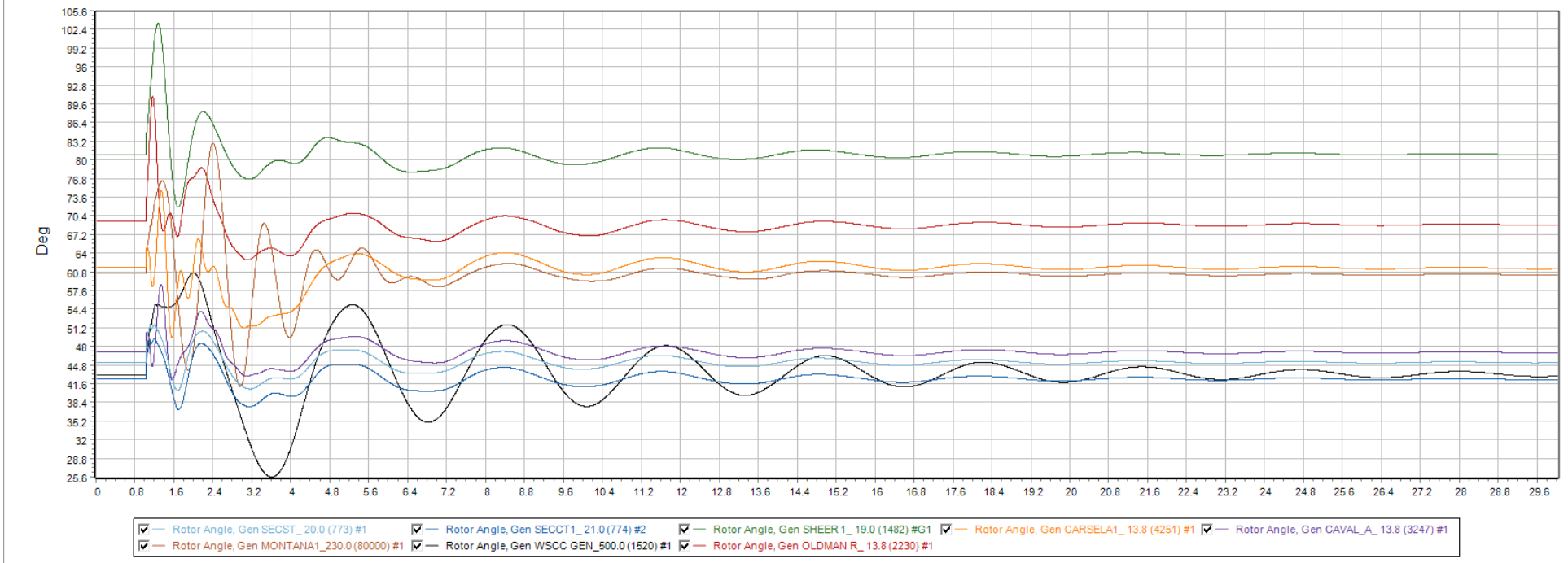
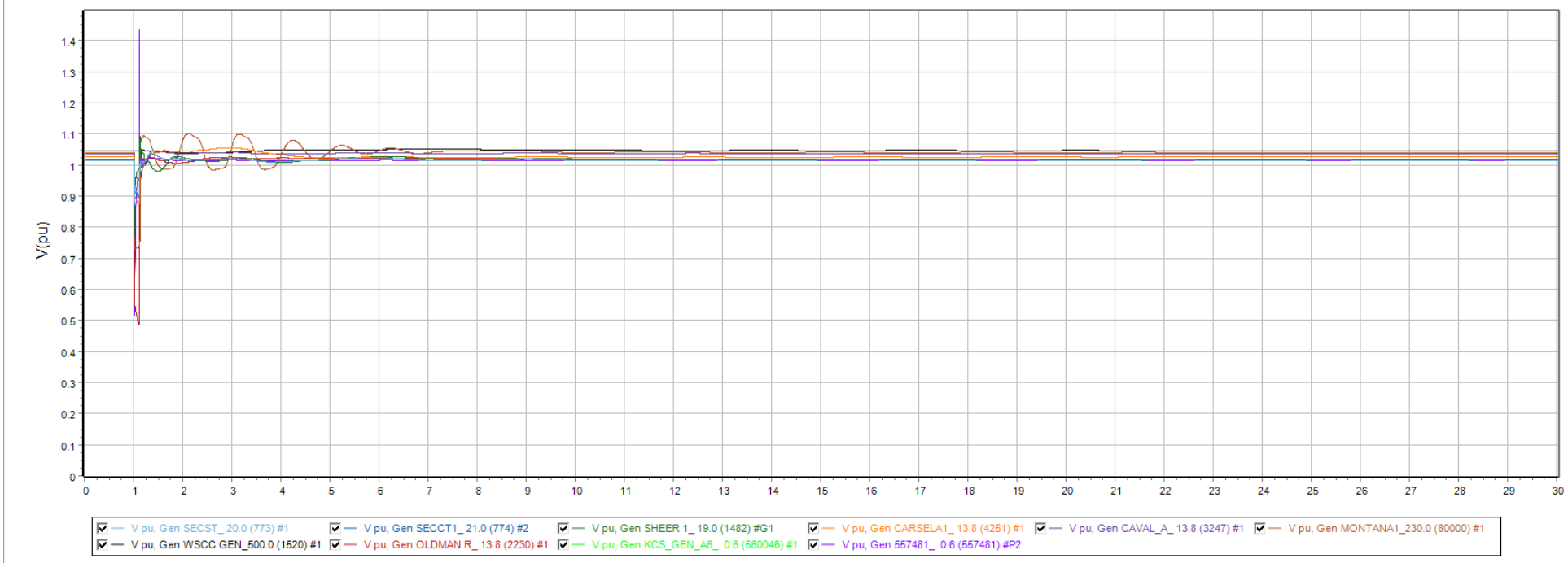
May 16, 2023 21:24:22

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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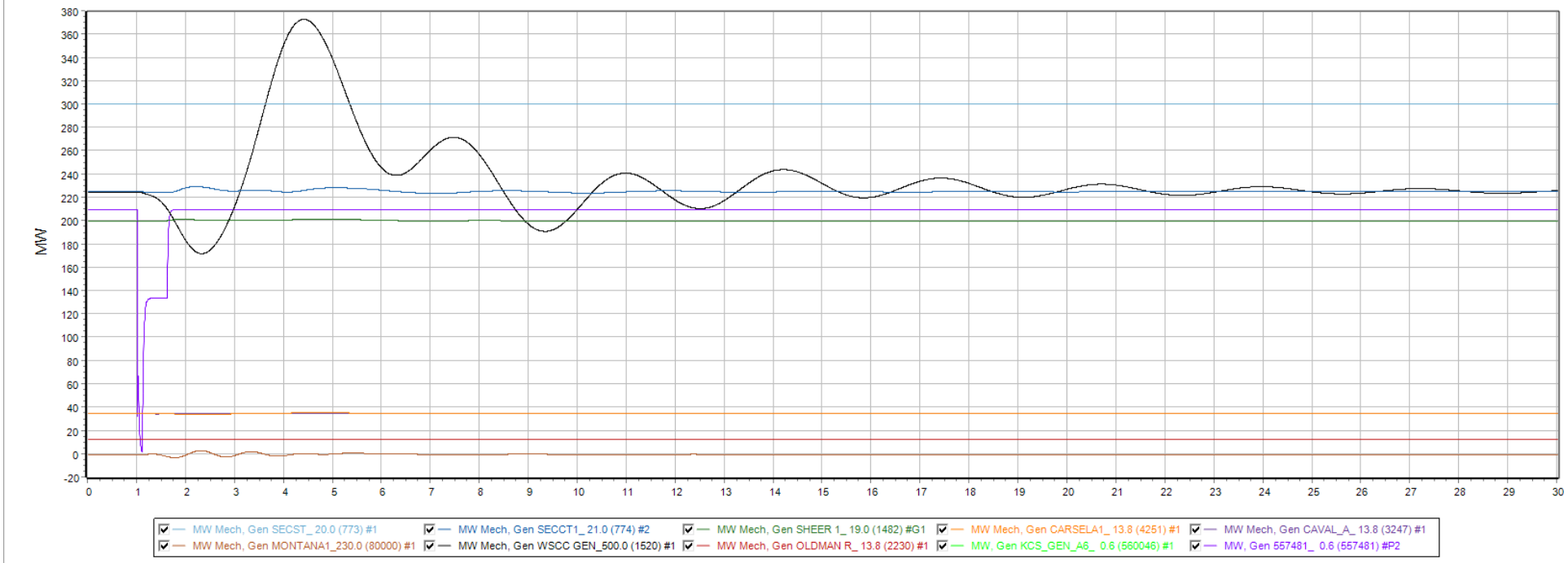
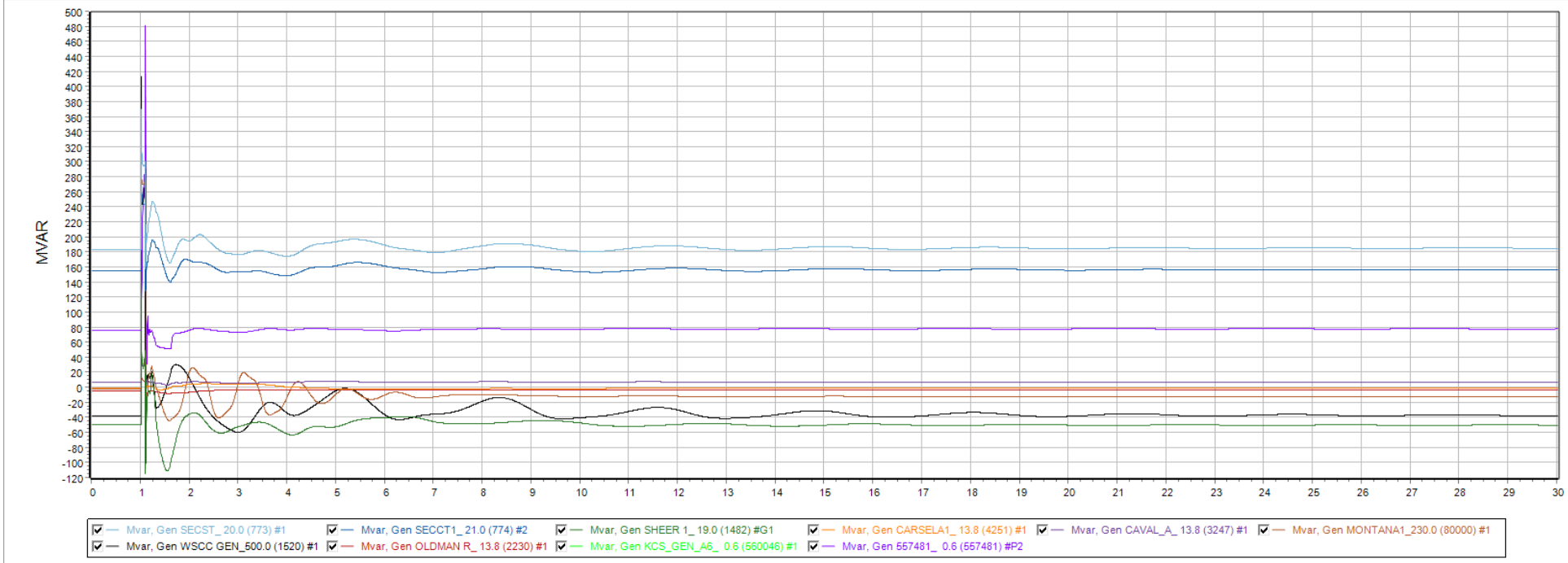
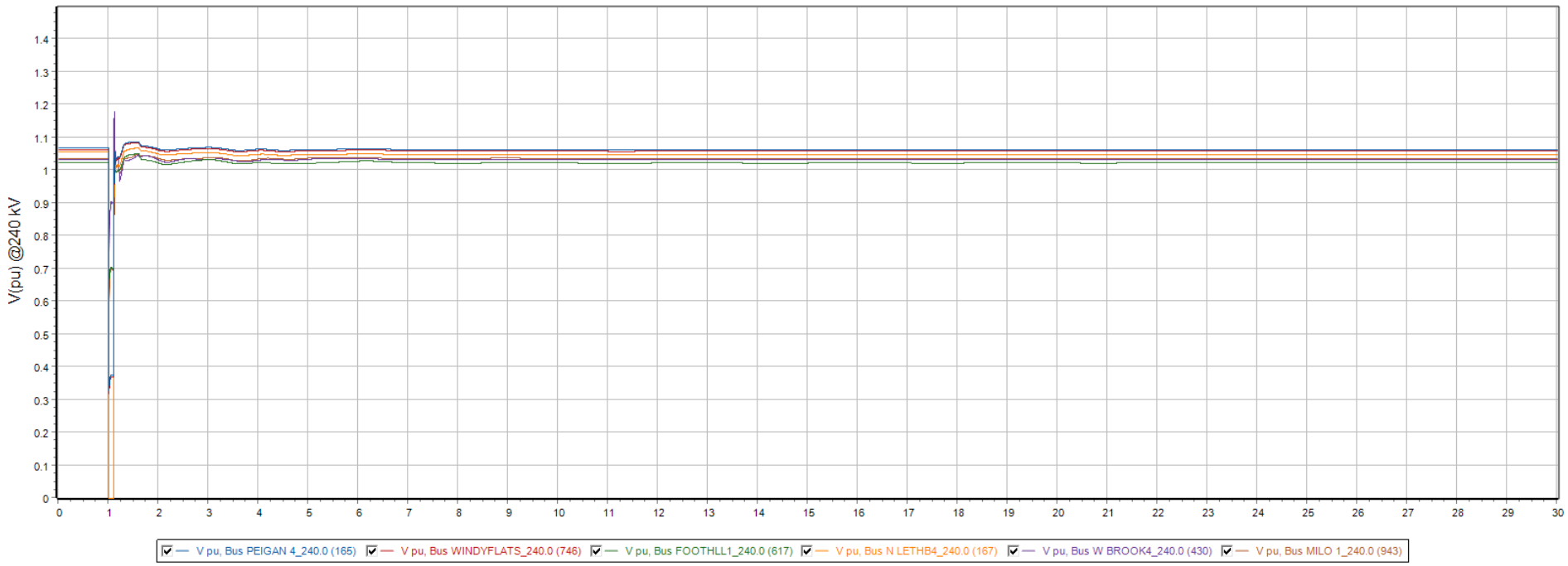
May 16, 2023 21:34:56

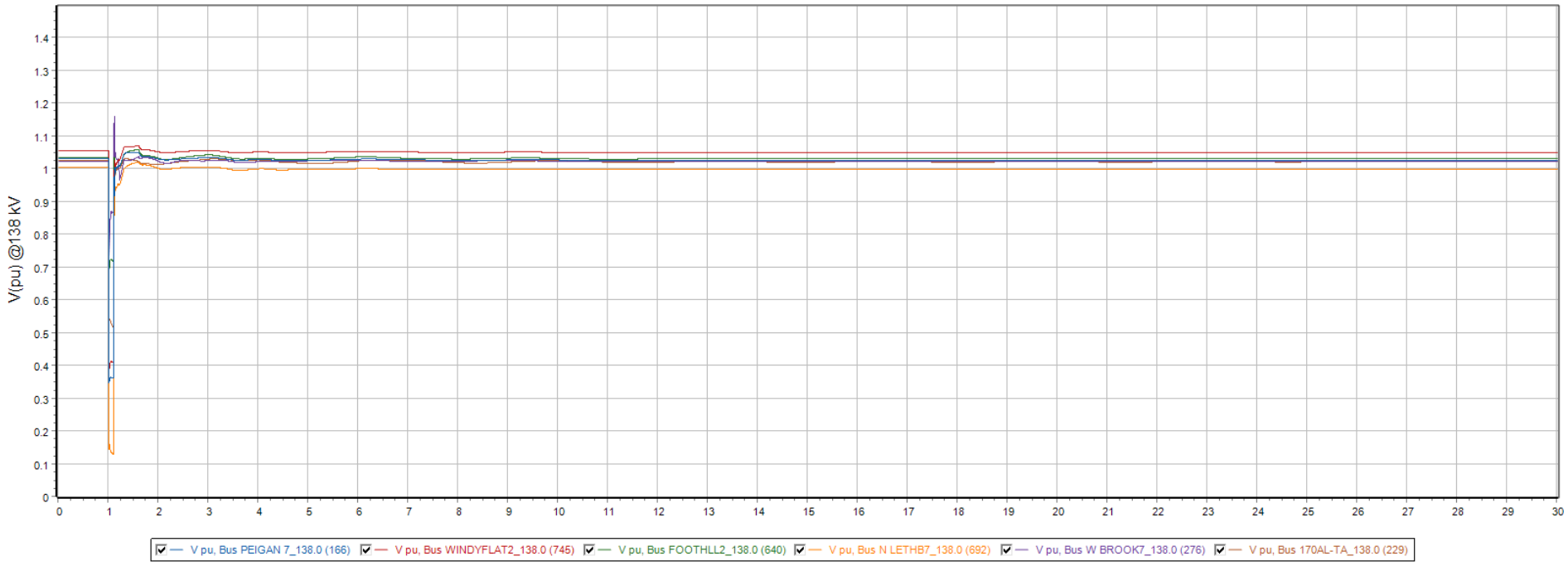
Monitor Gens. Q2





Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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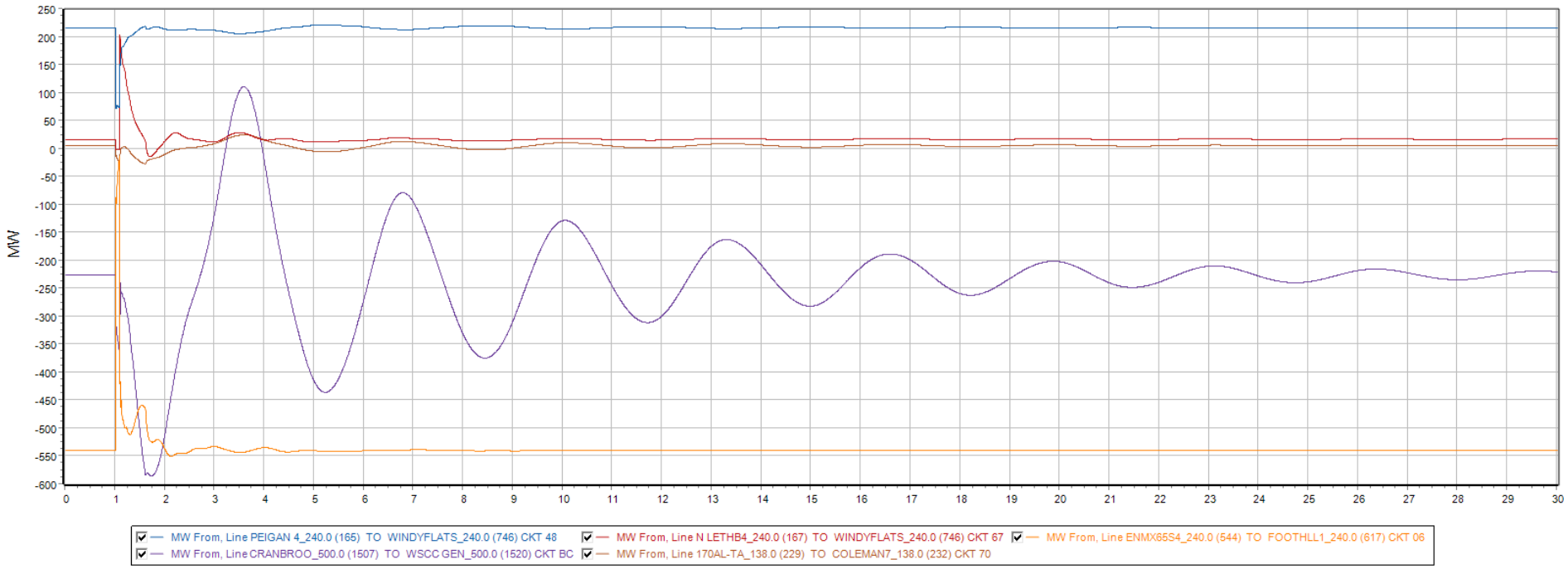
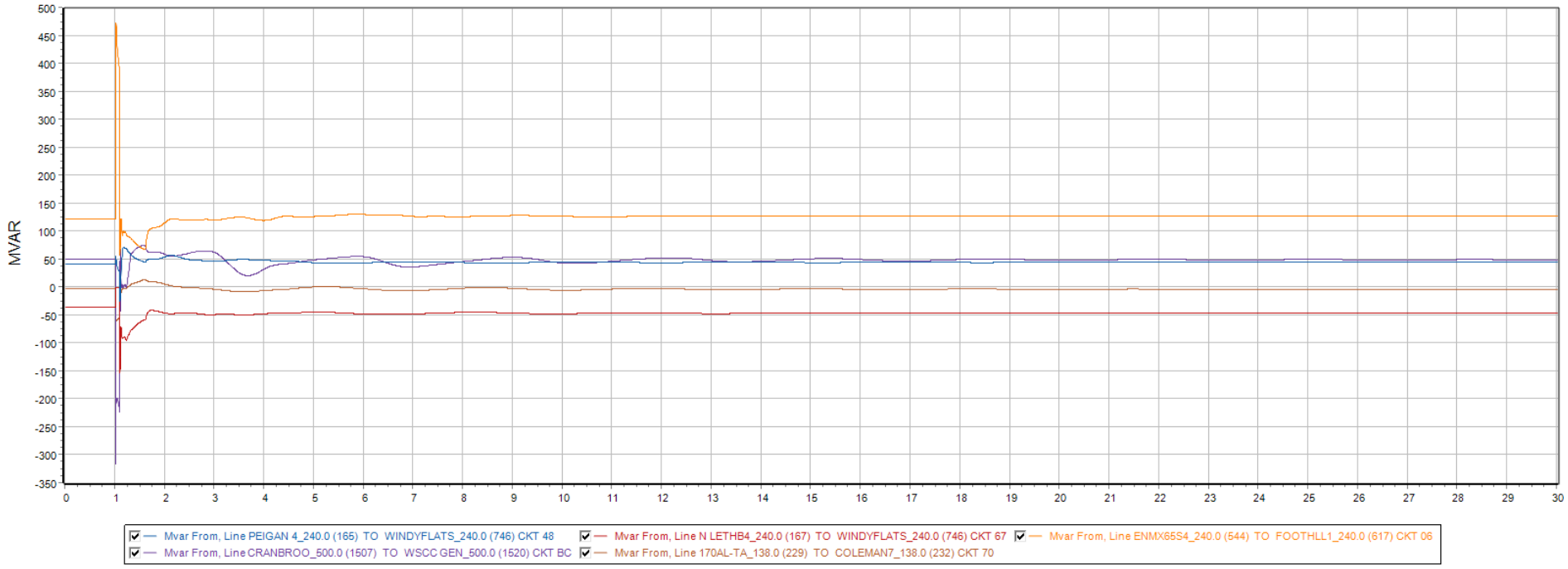
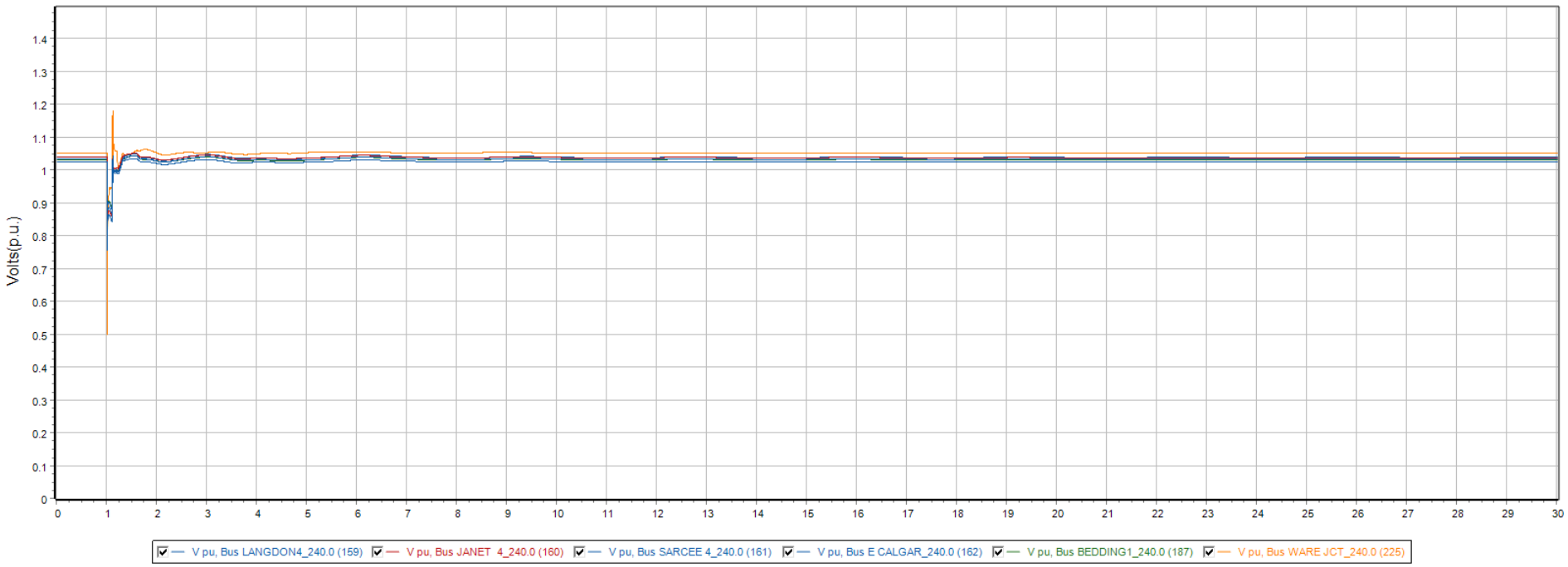
May 16, 2023 21:34:57

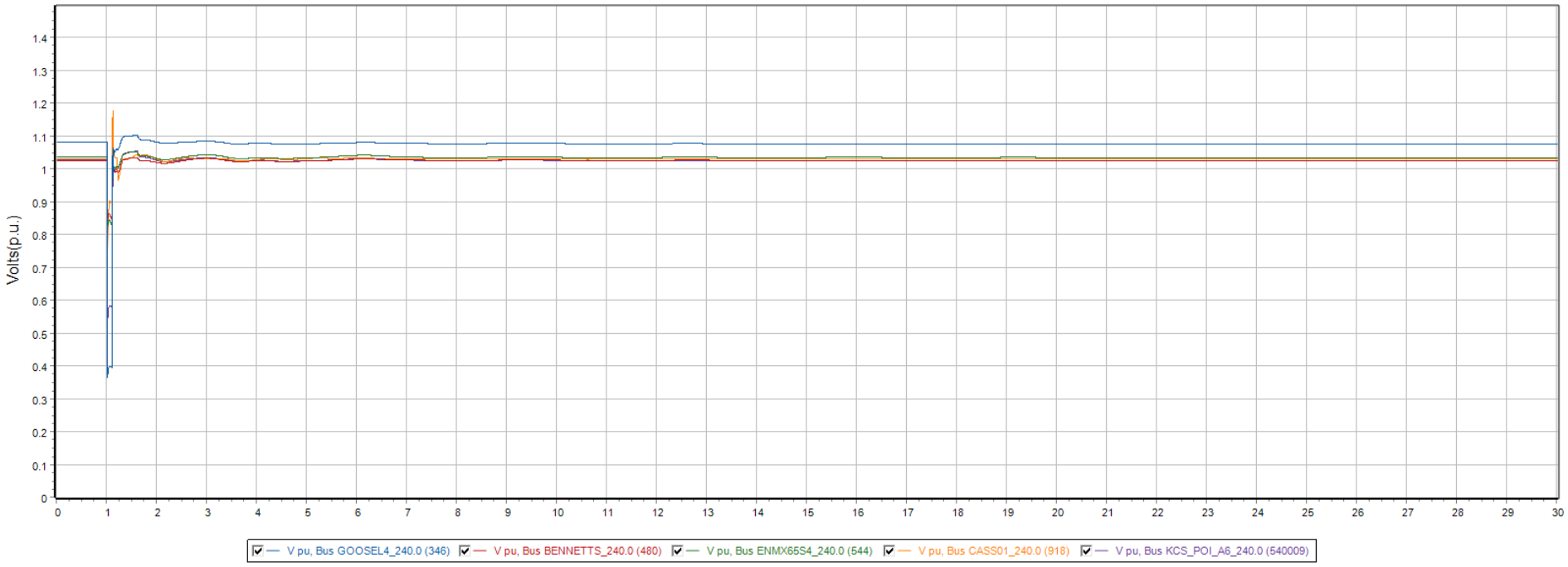
Monitor Line MW & MVAR. Q4



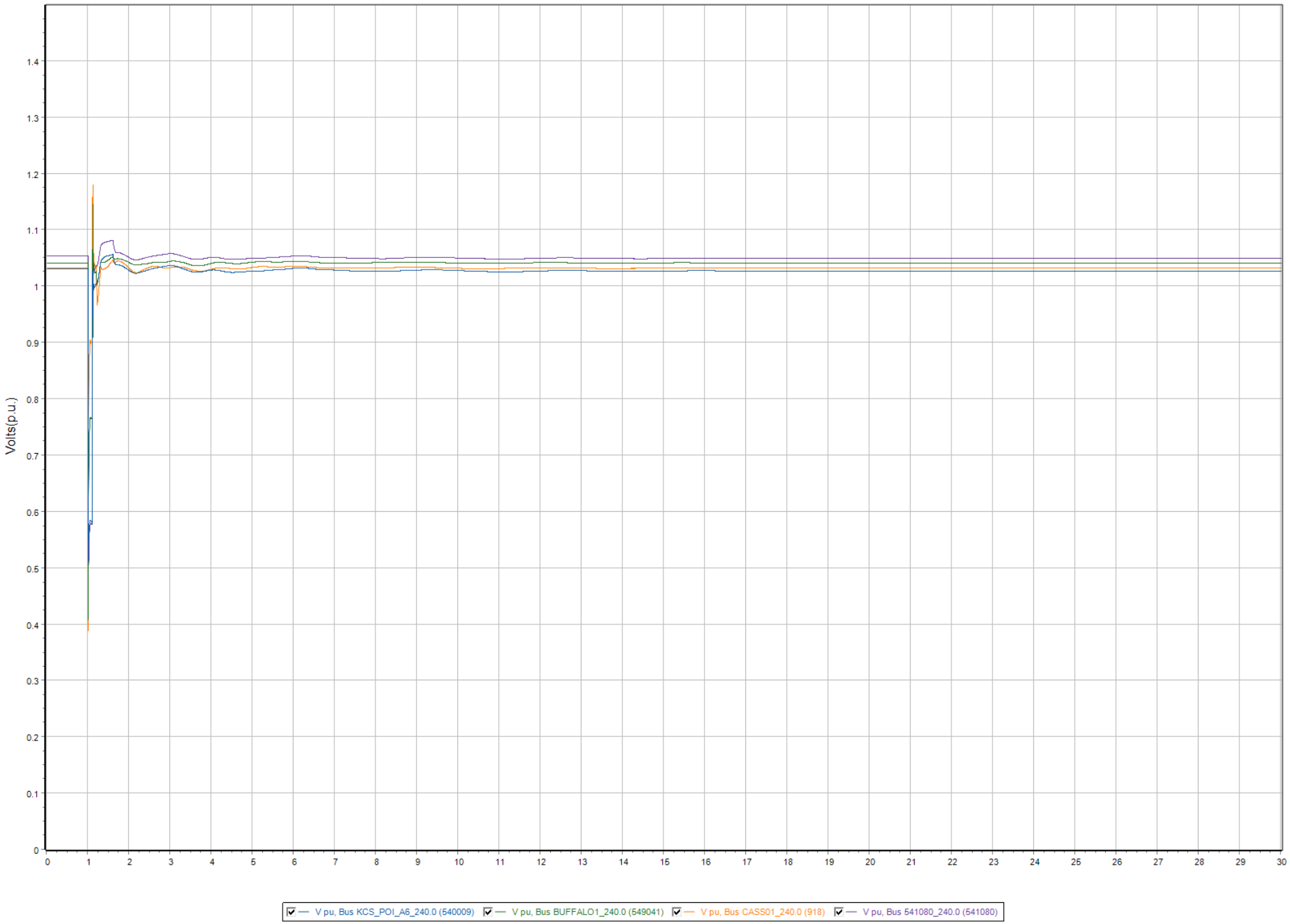


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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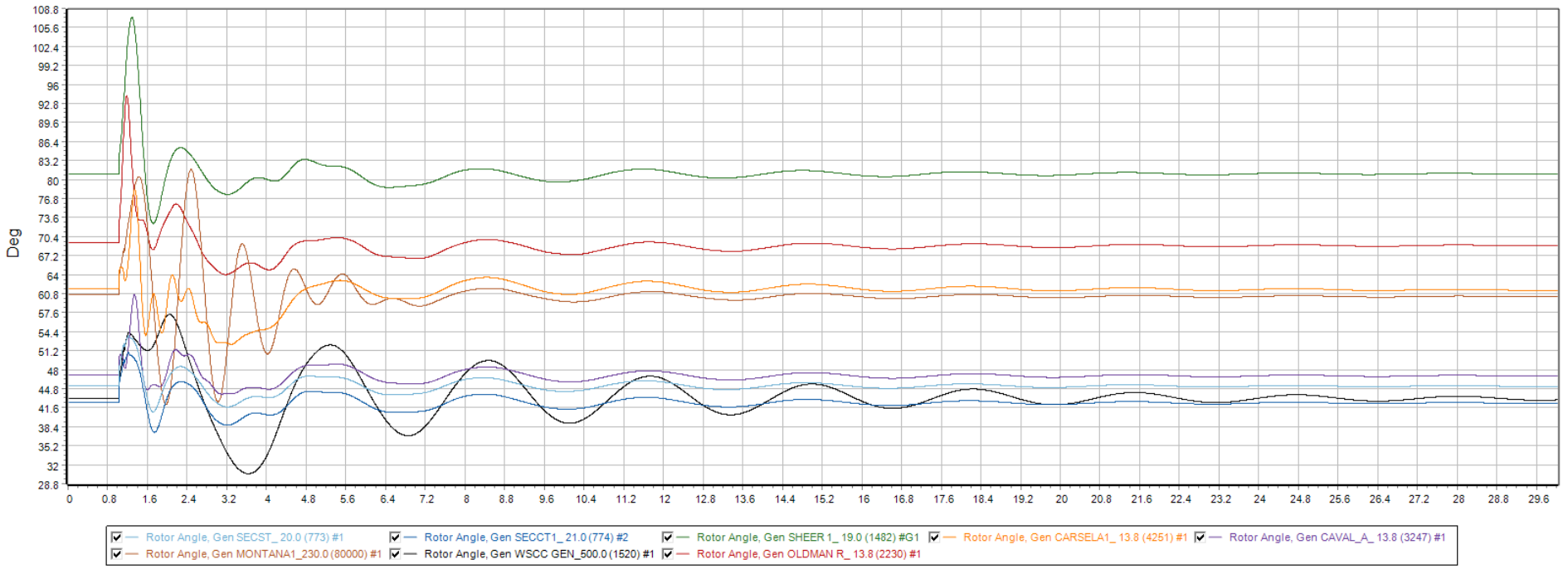
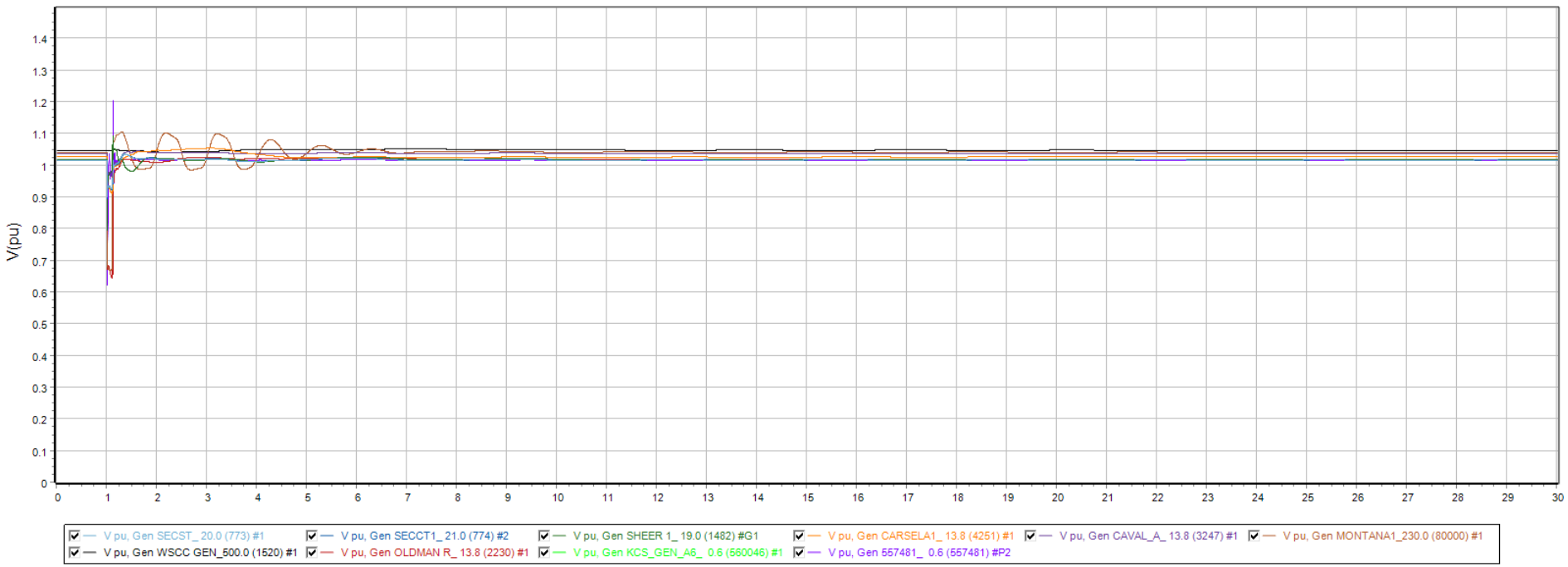
May 16, 2023 21:34:58

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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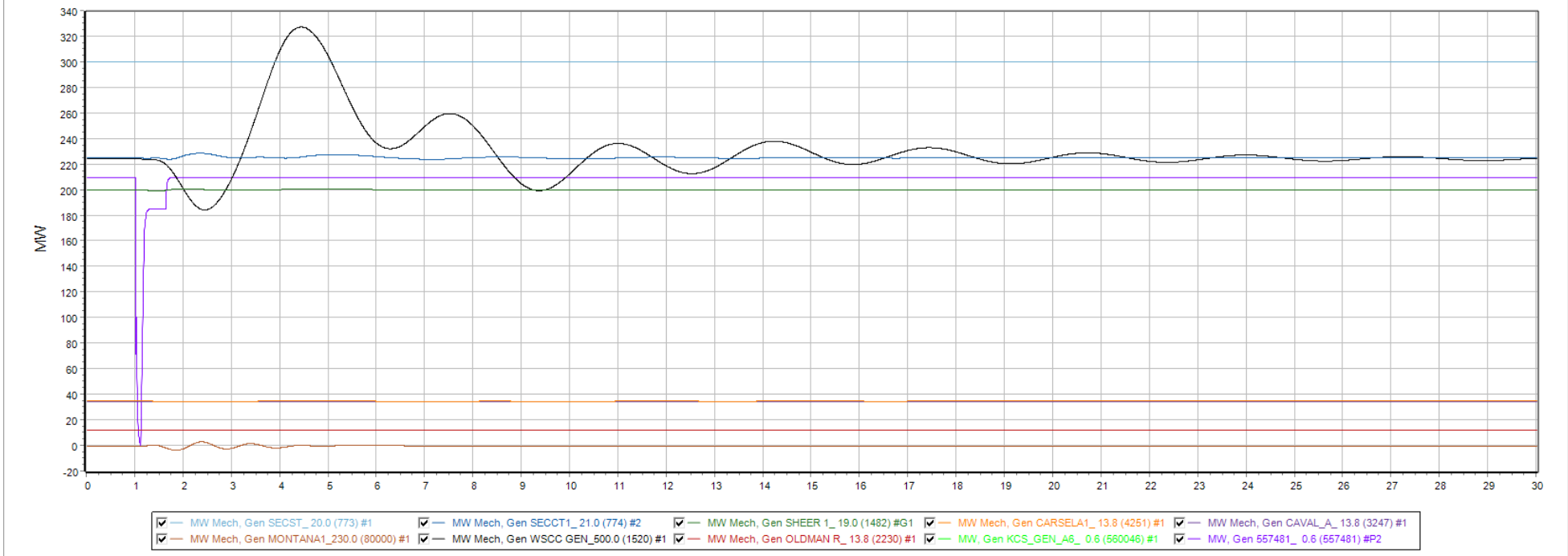
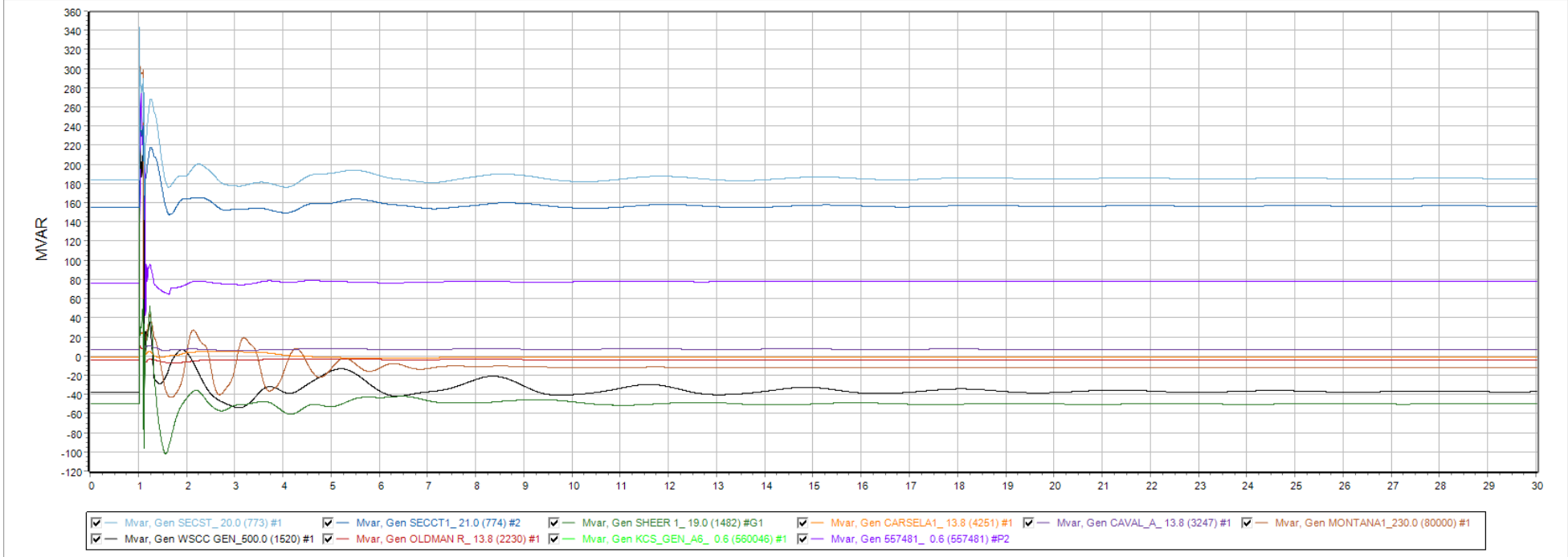
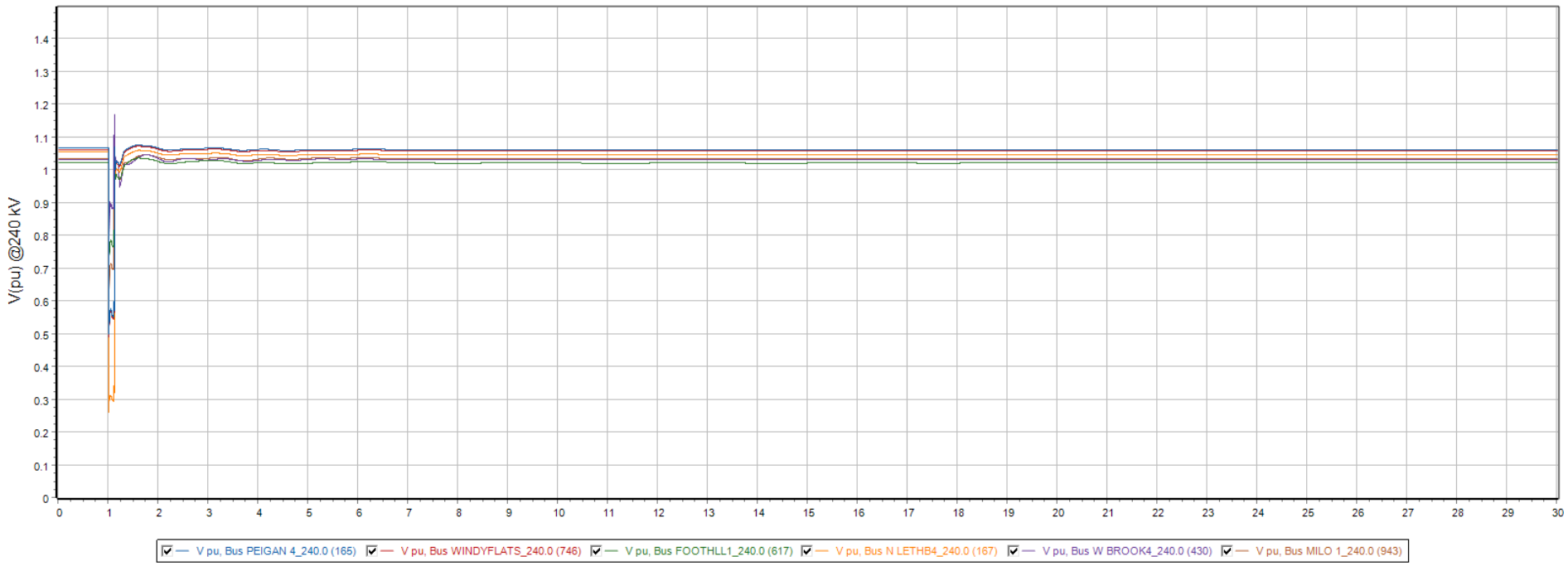
May 16, 2023 21:45:40

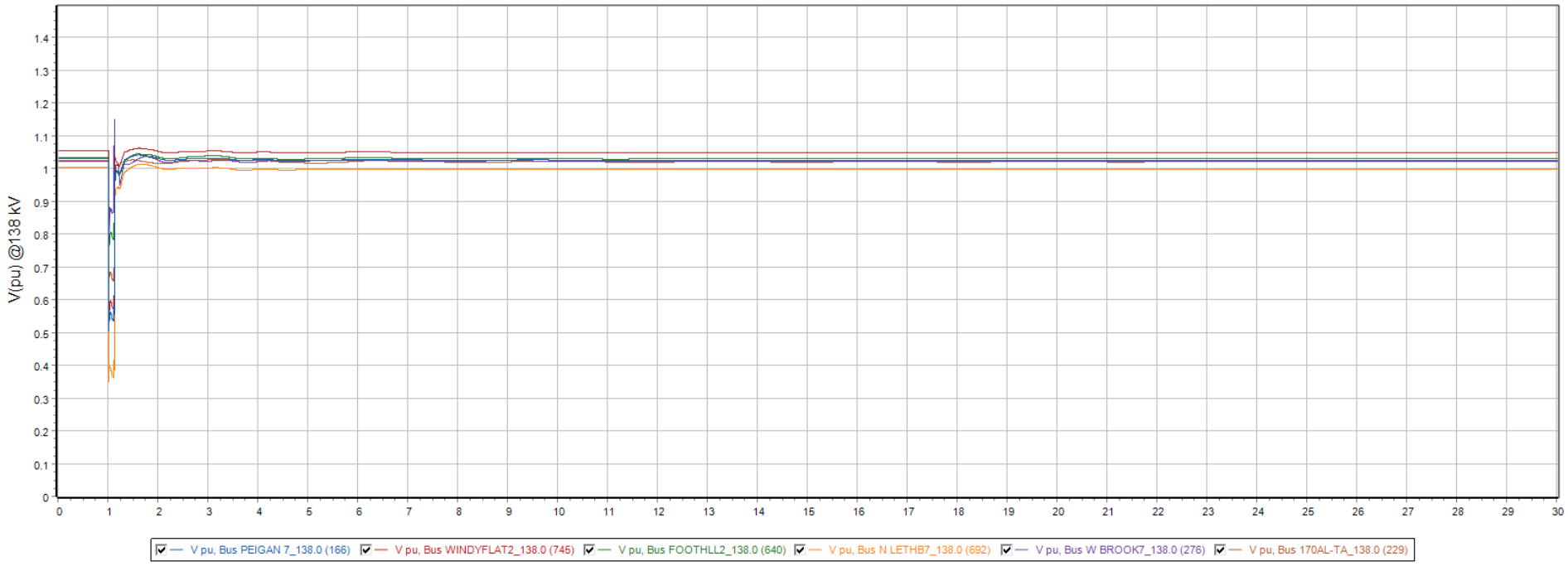
Monitor Gens. Q2



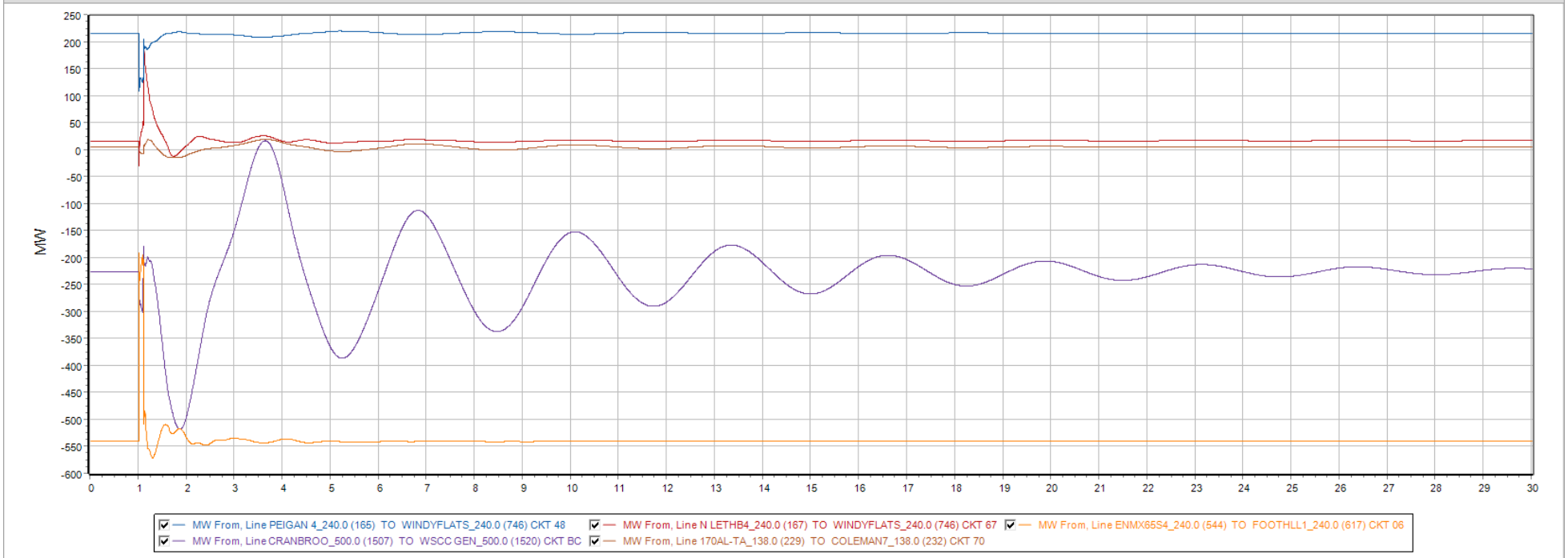


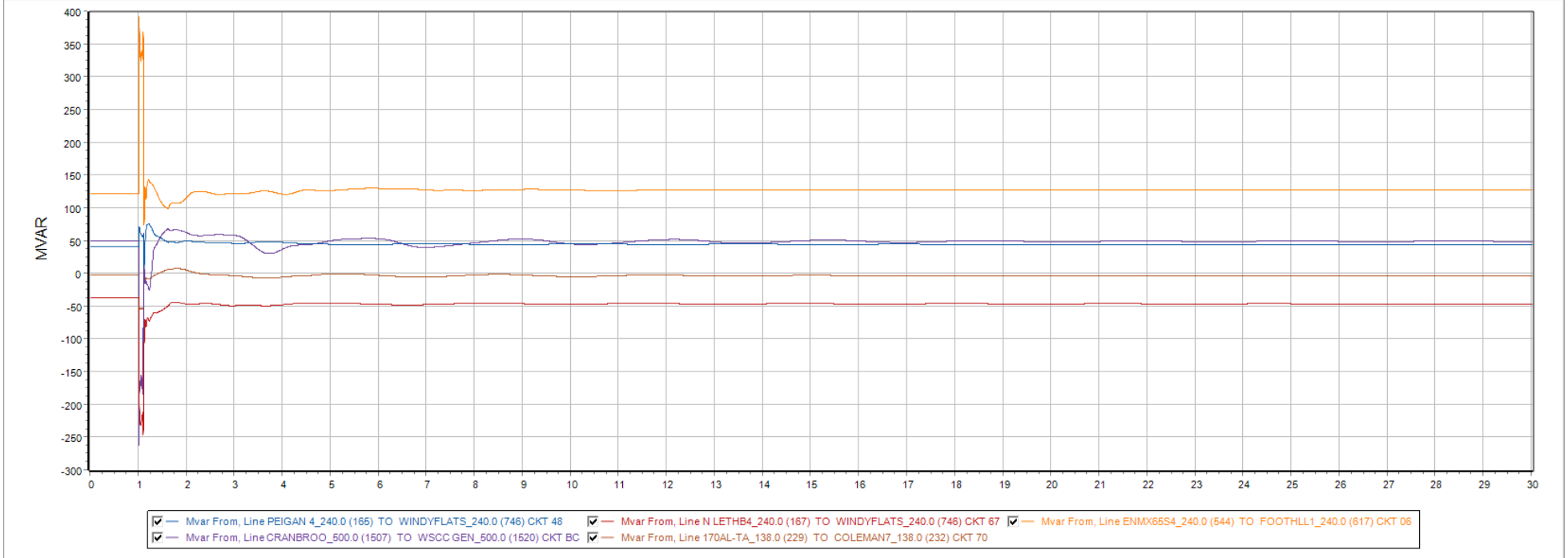
Monitor Bus Volts Q3



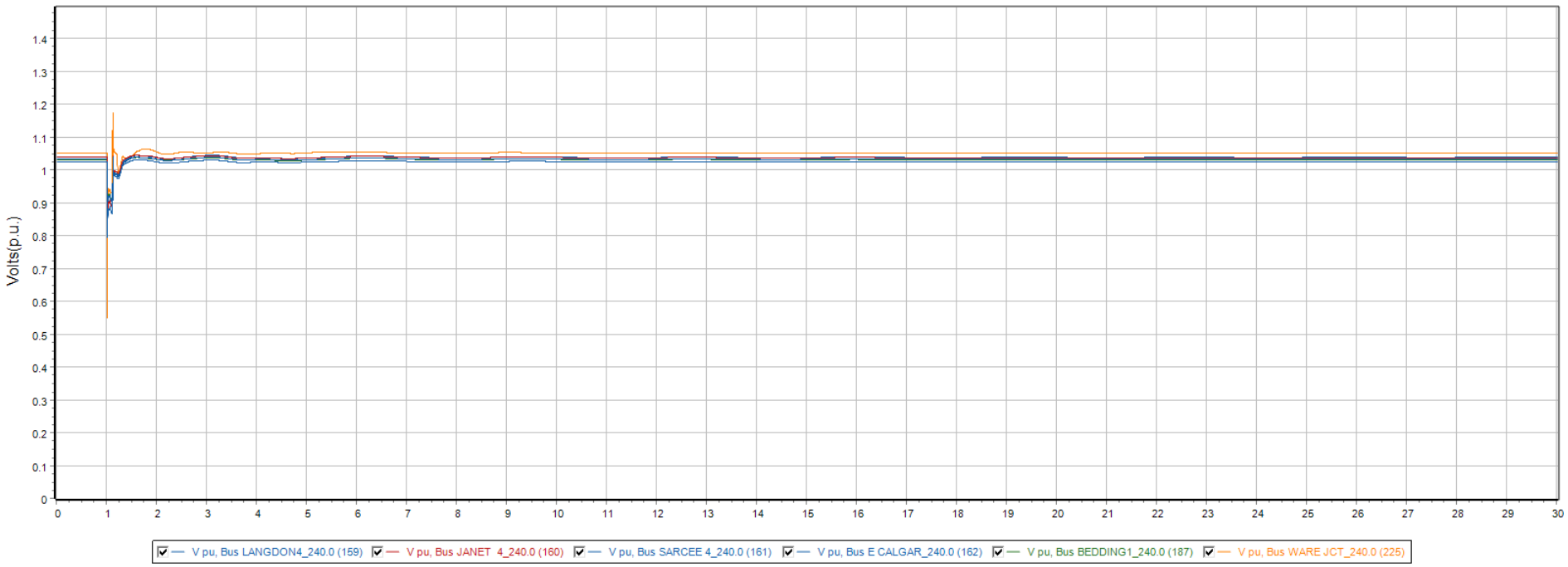


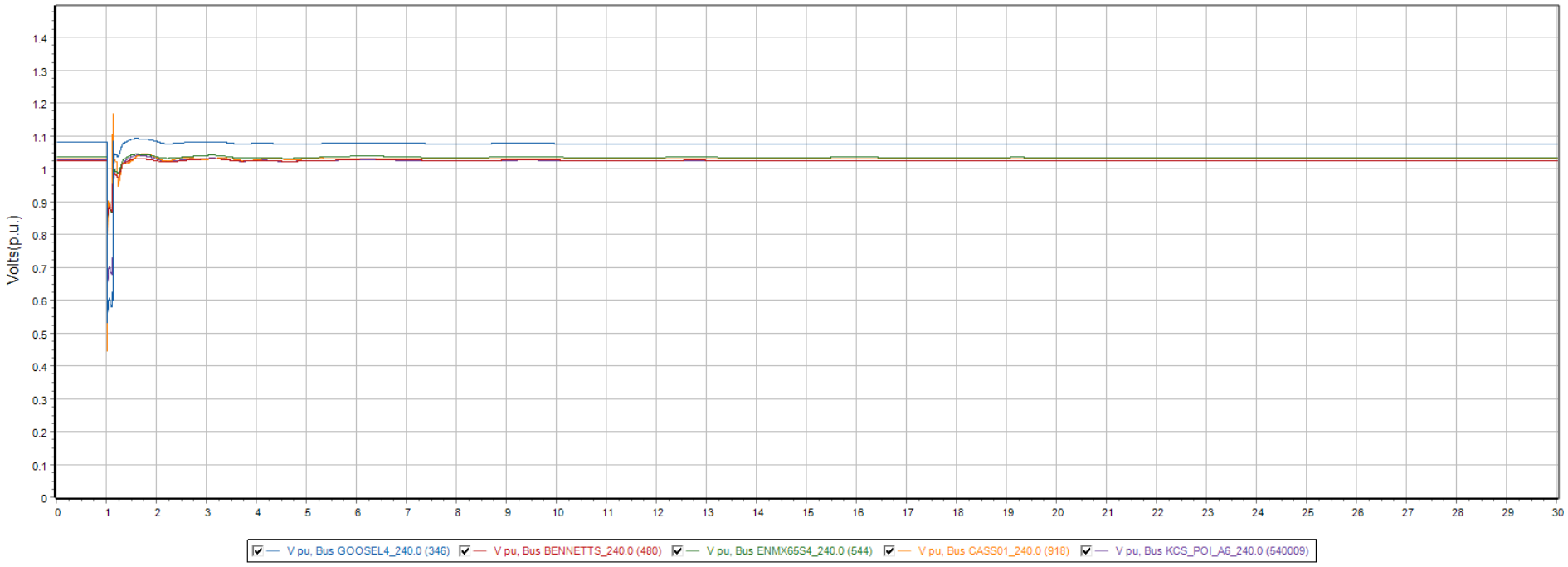
Monitor Line MW & MVAR. Q4



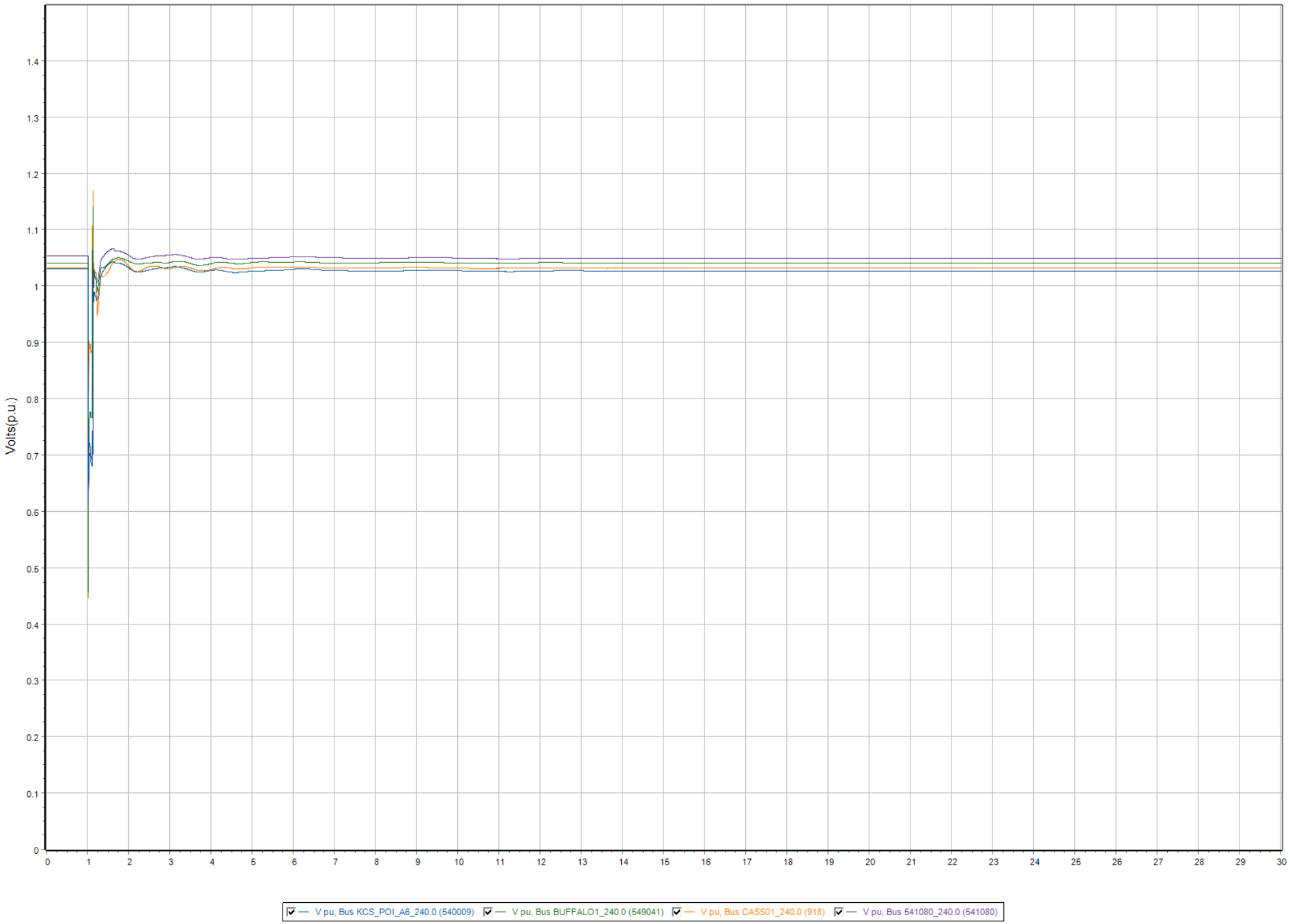


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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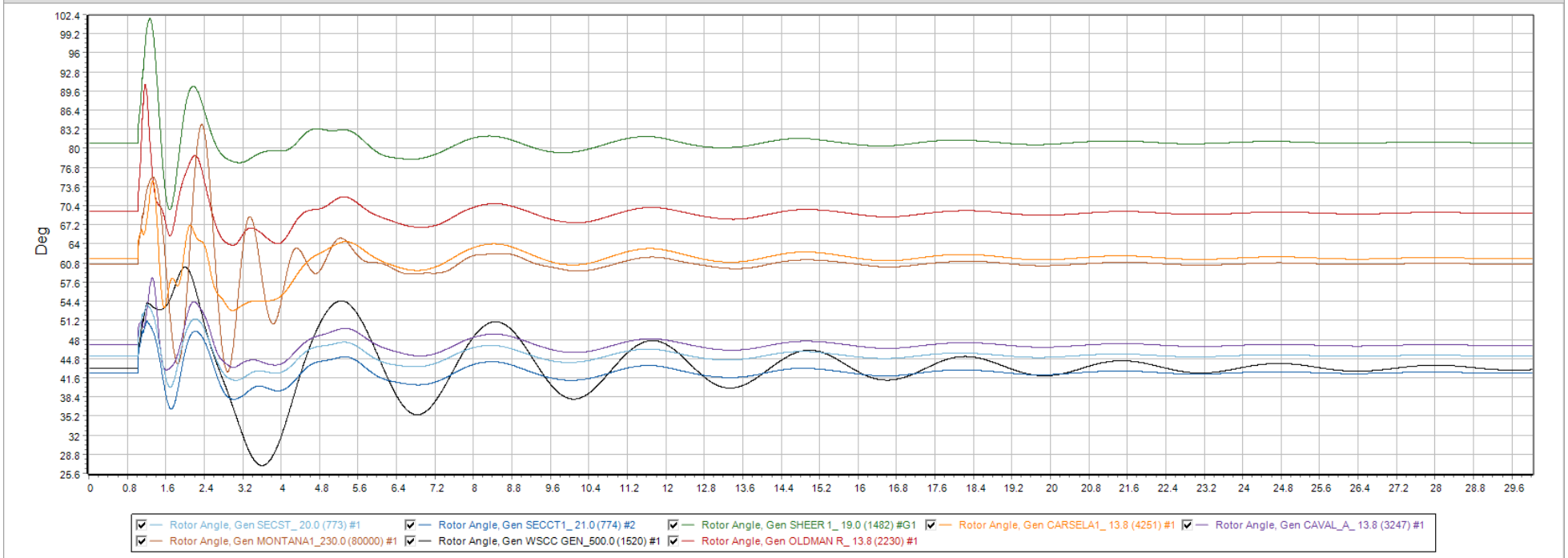
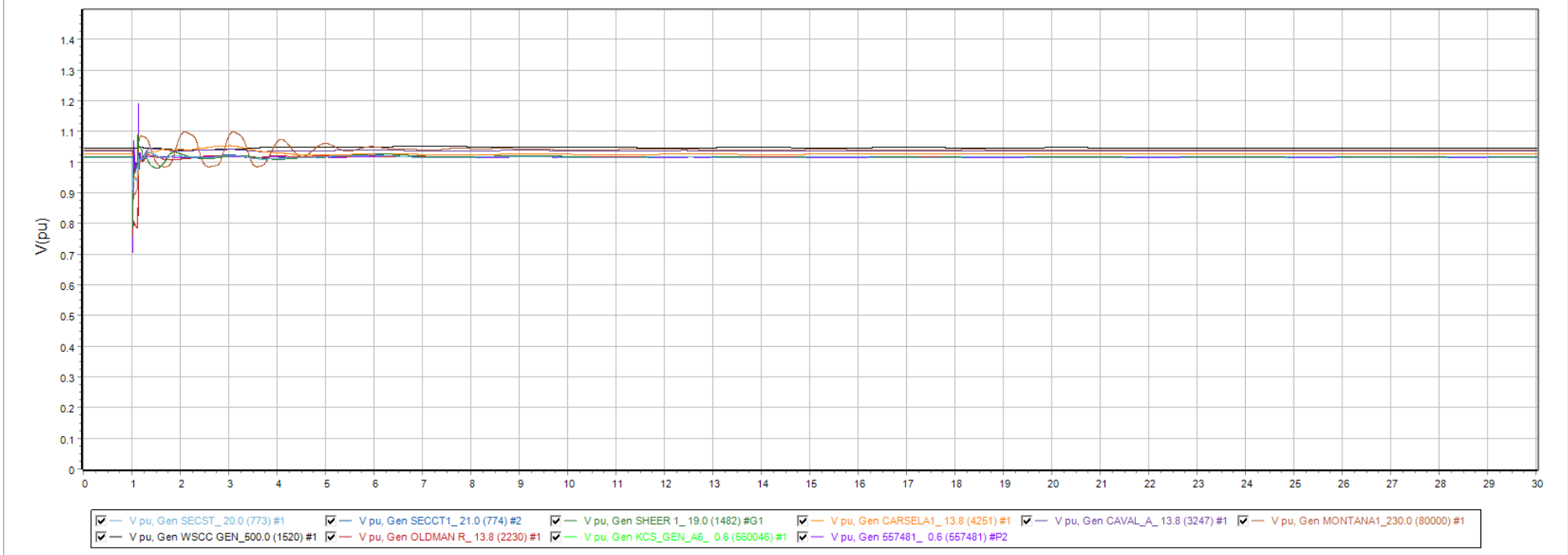
May 16, 2023 21:45:42

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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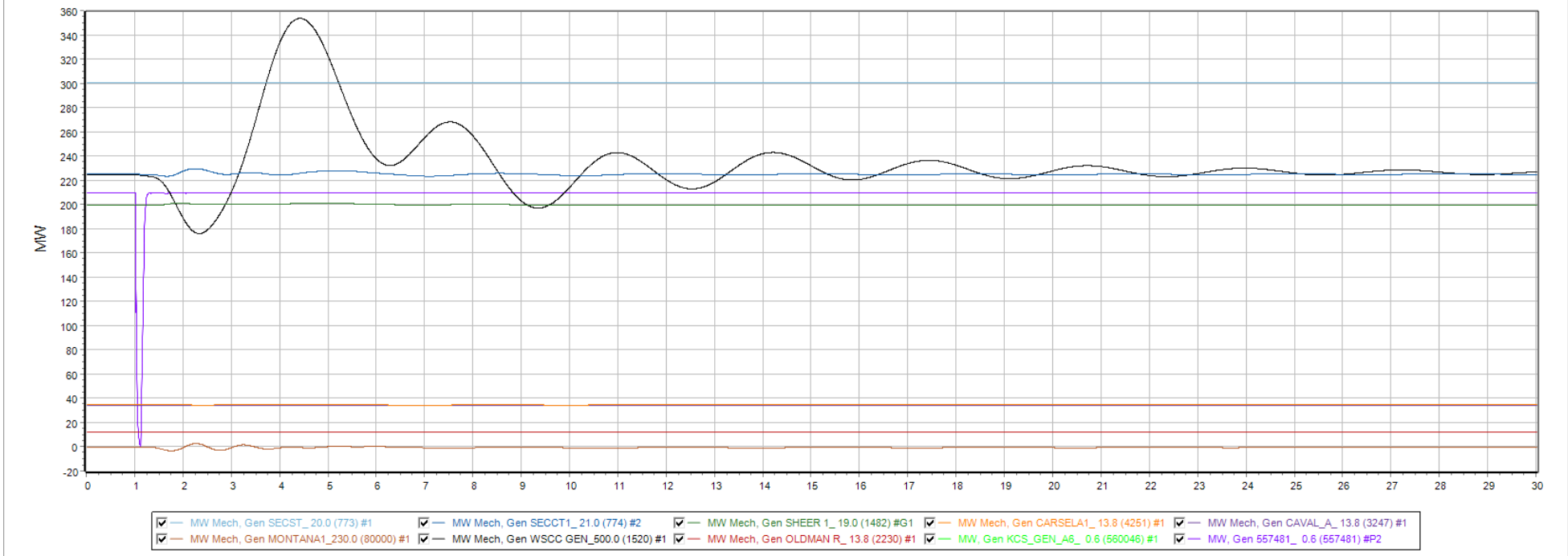
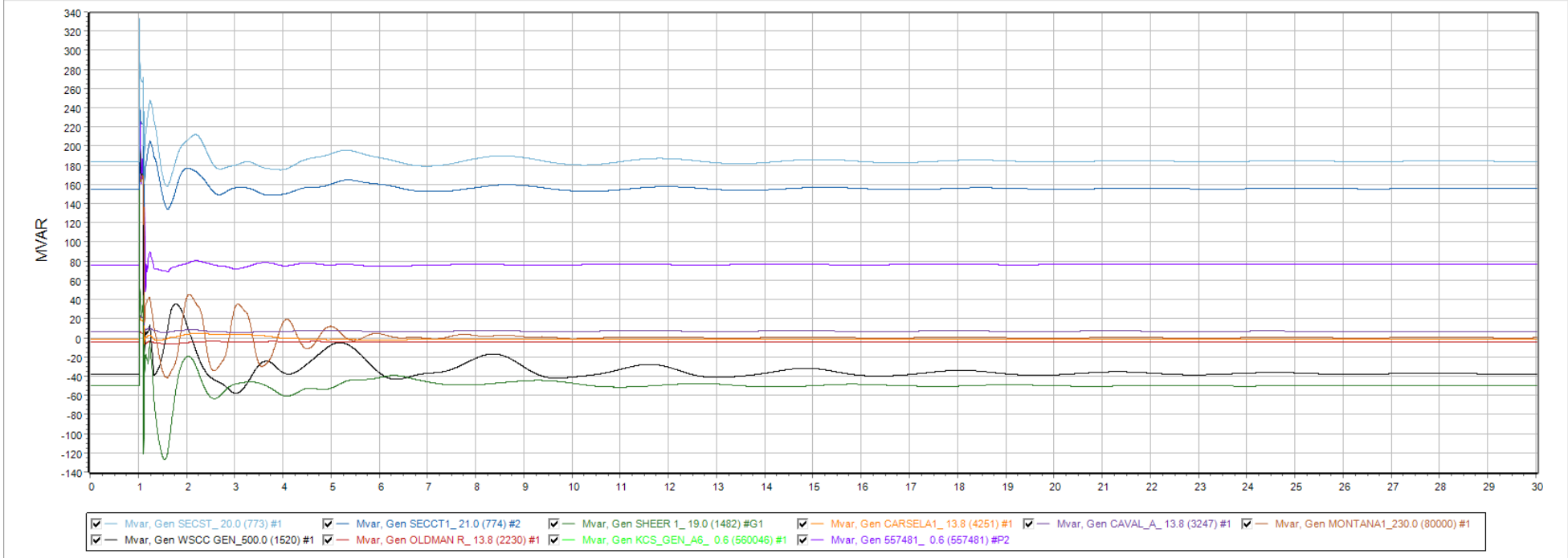
May 16, 2023 21:56:42

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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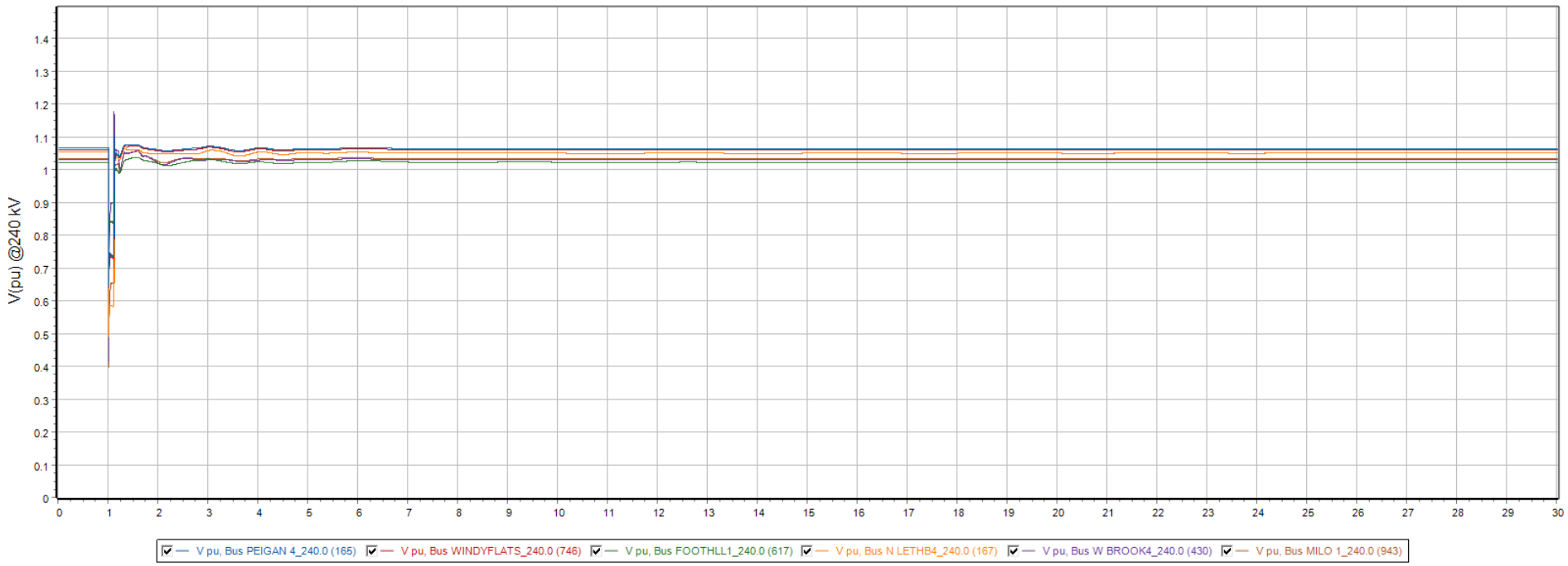
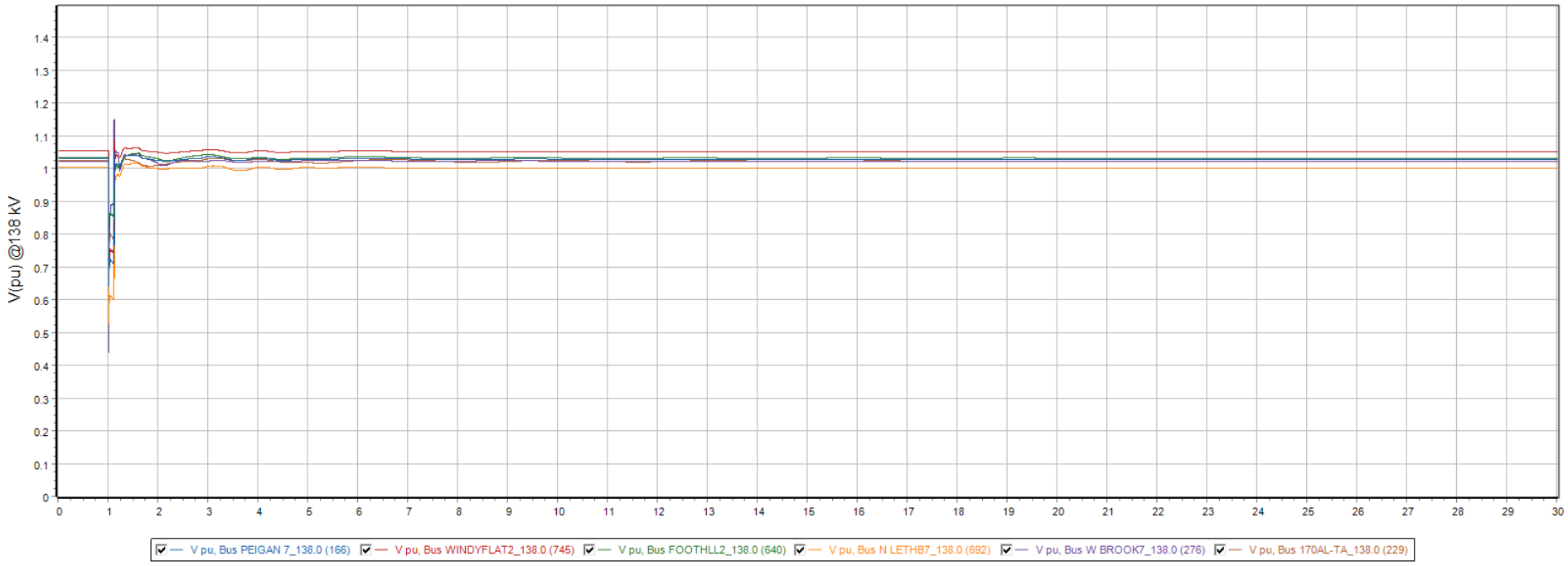
May 16, 2023 21:56:42

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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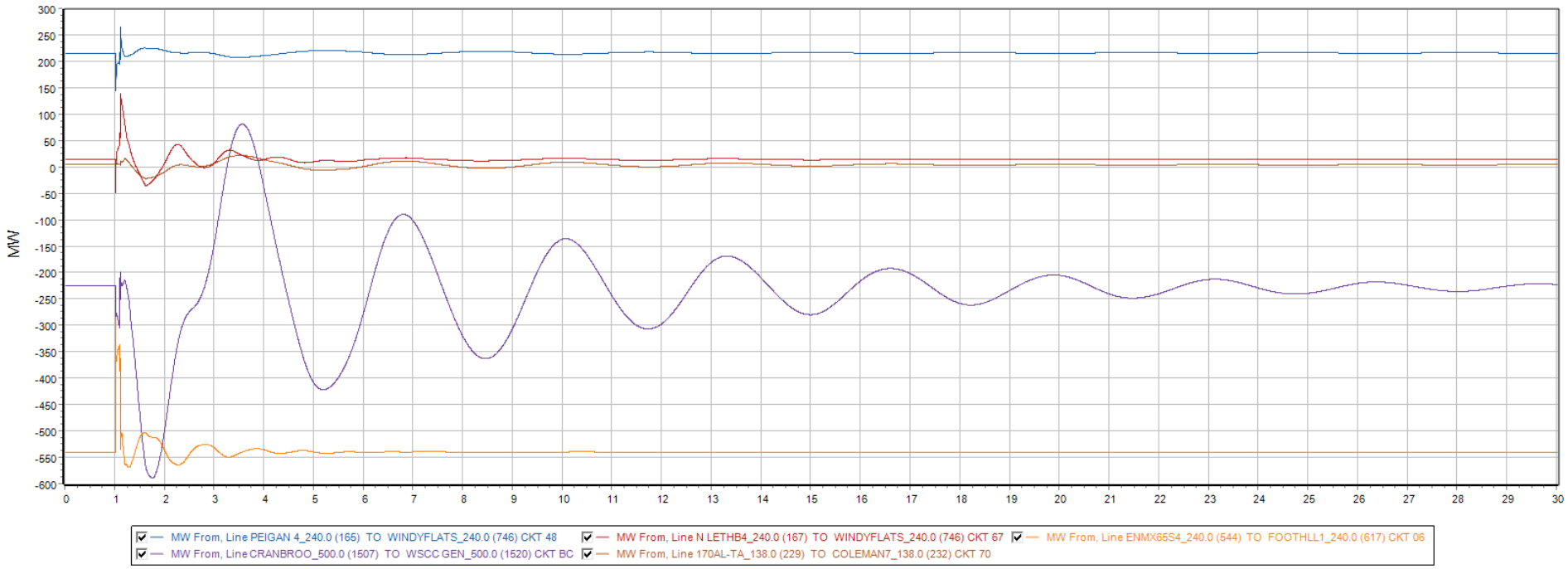
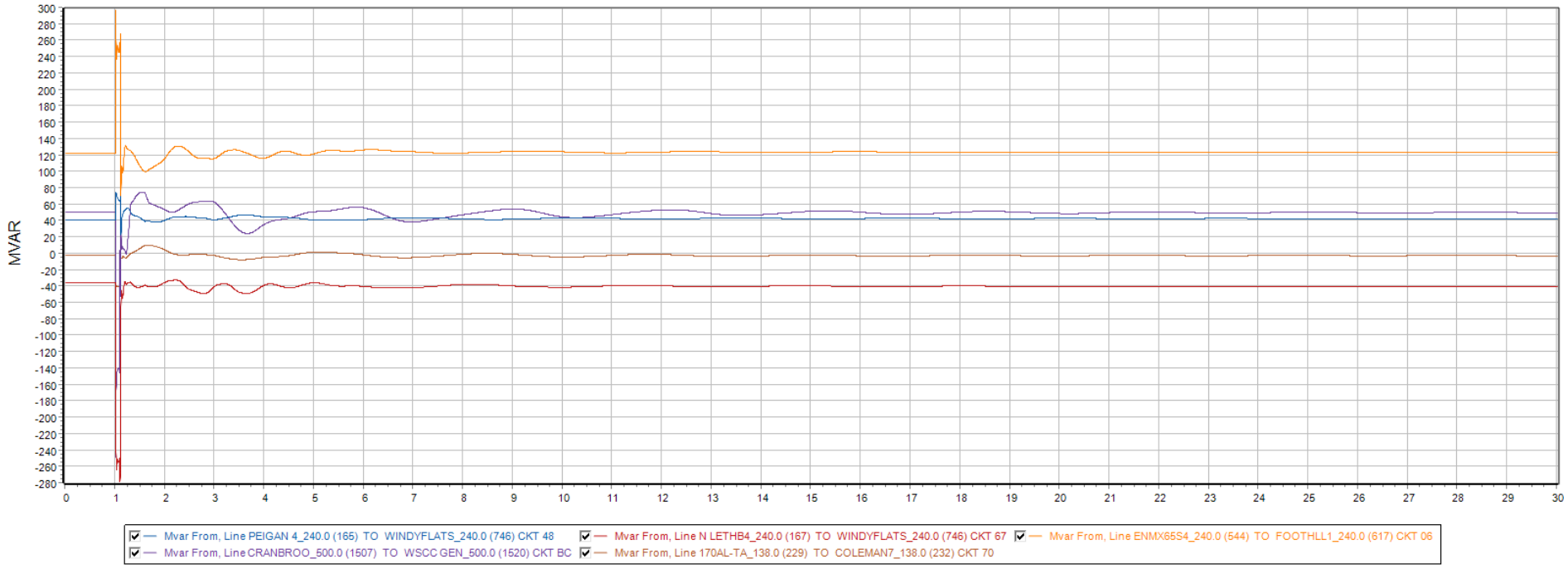
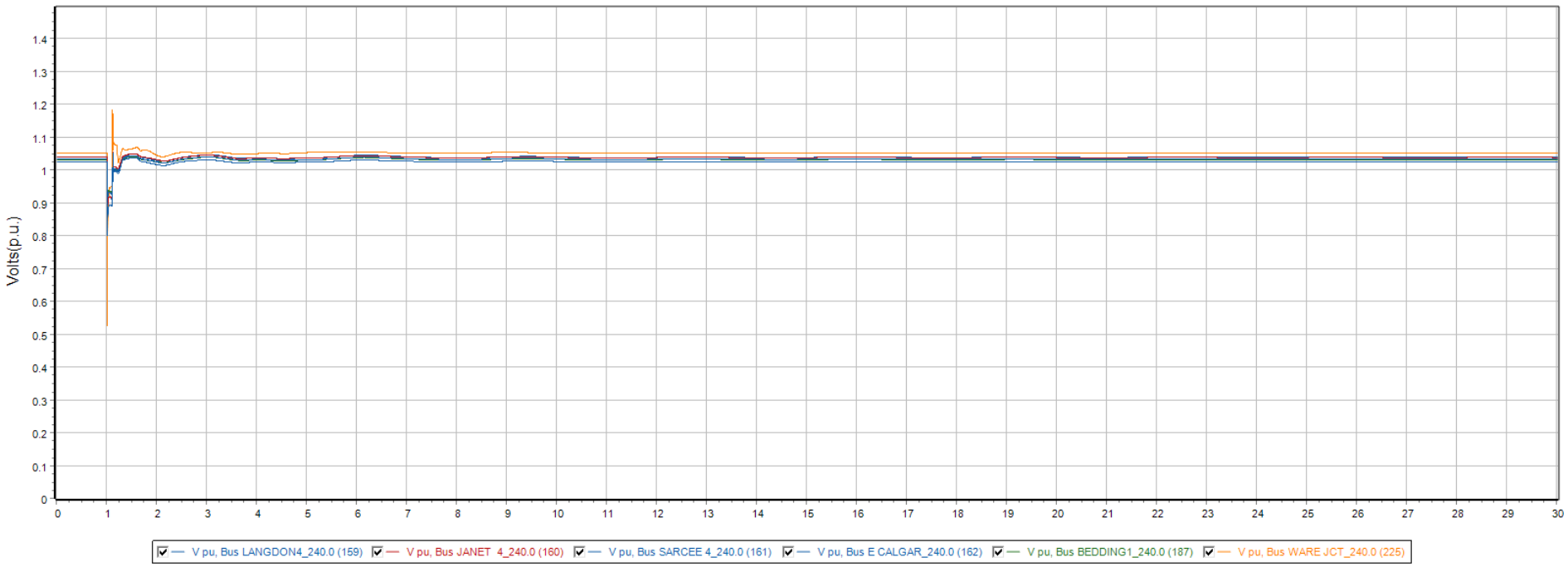
May 16, 2023 21:56:43

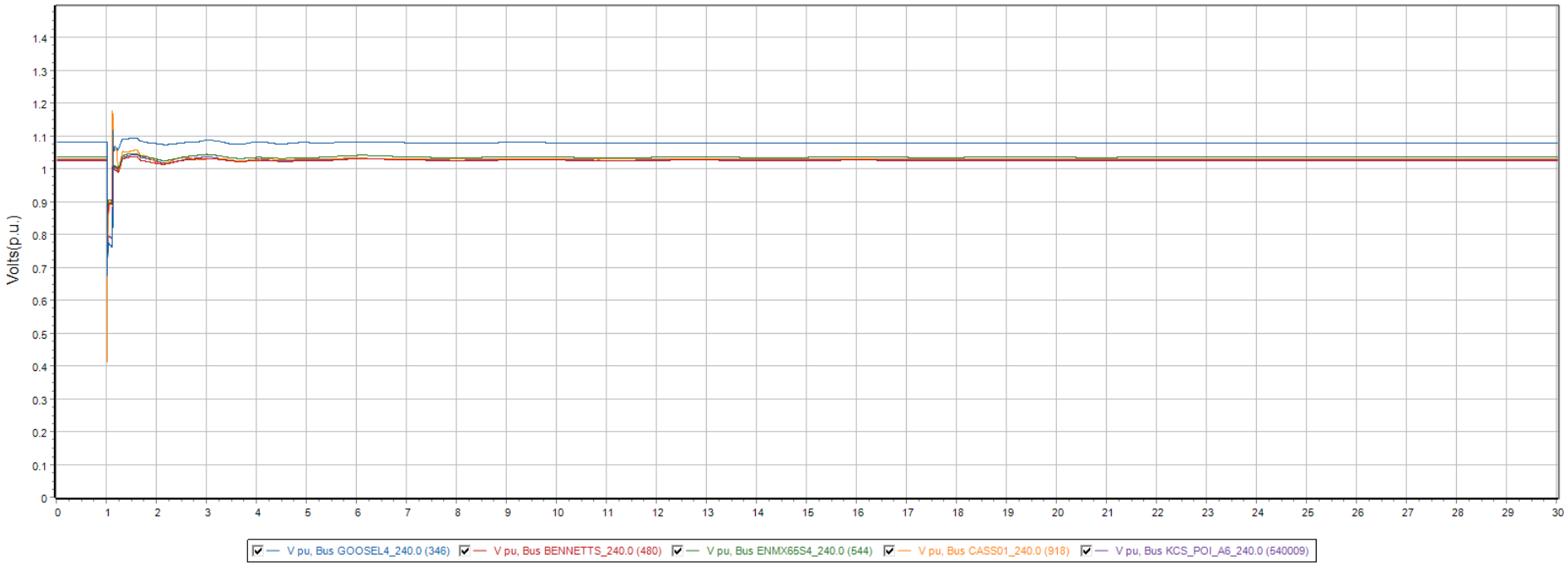
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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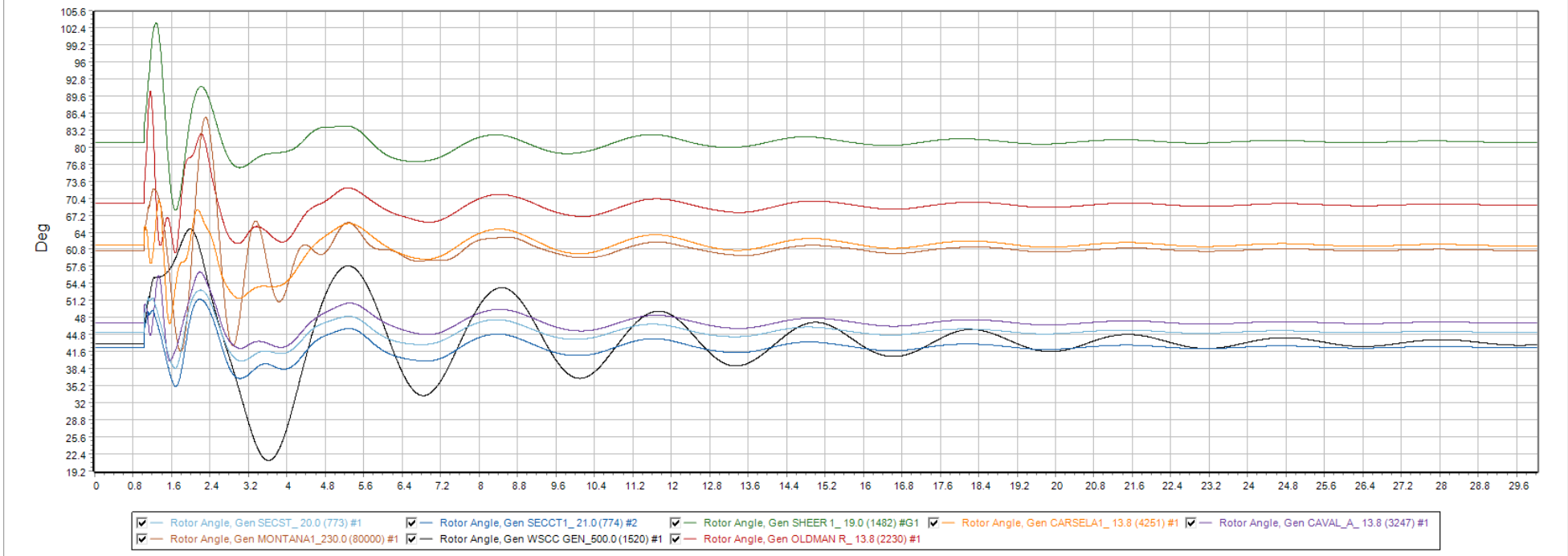
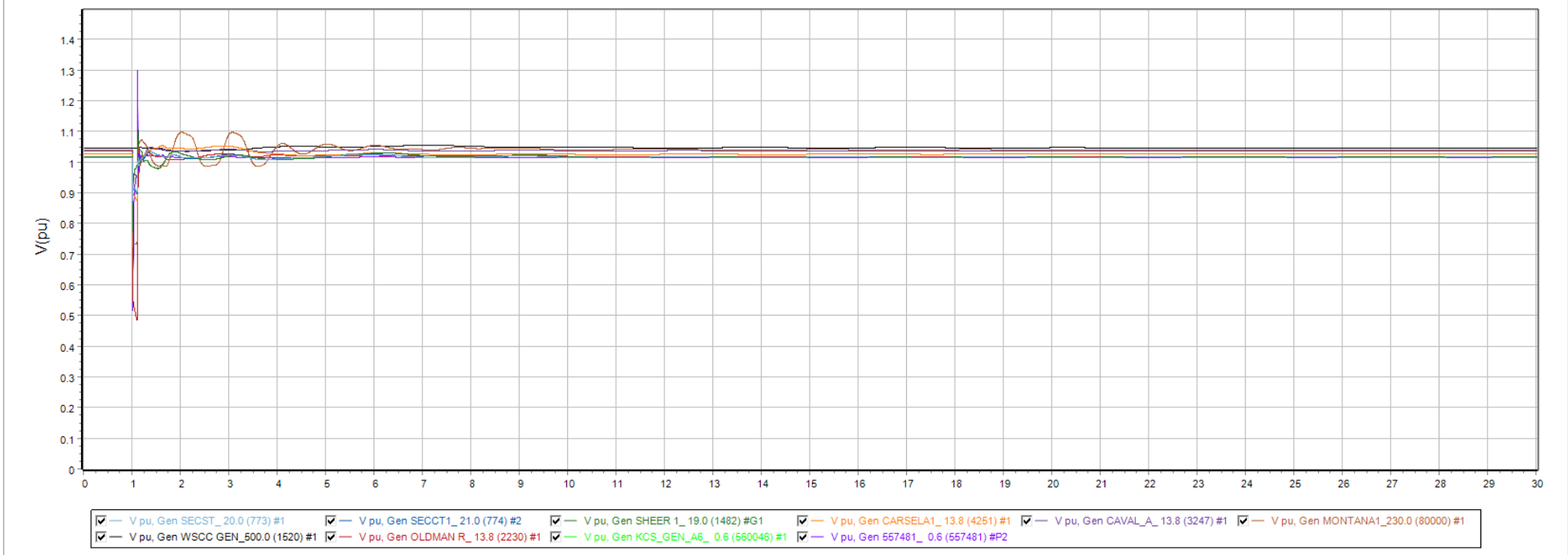
May 16, 2023 21:56:44

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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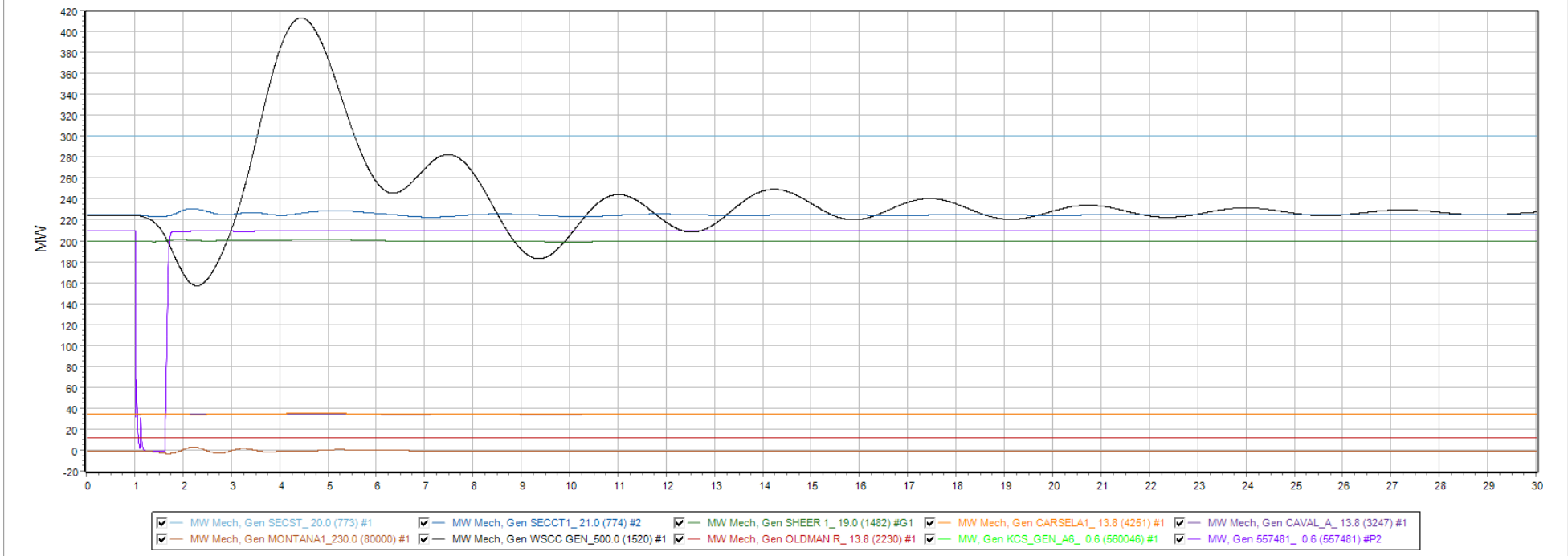
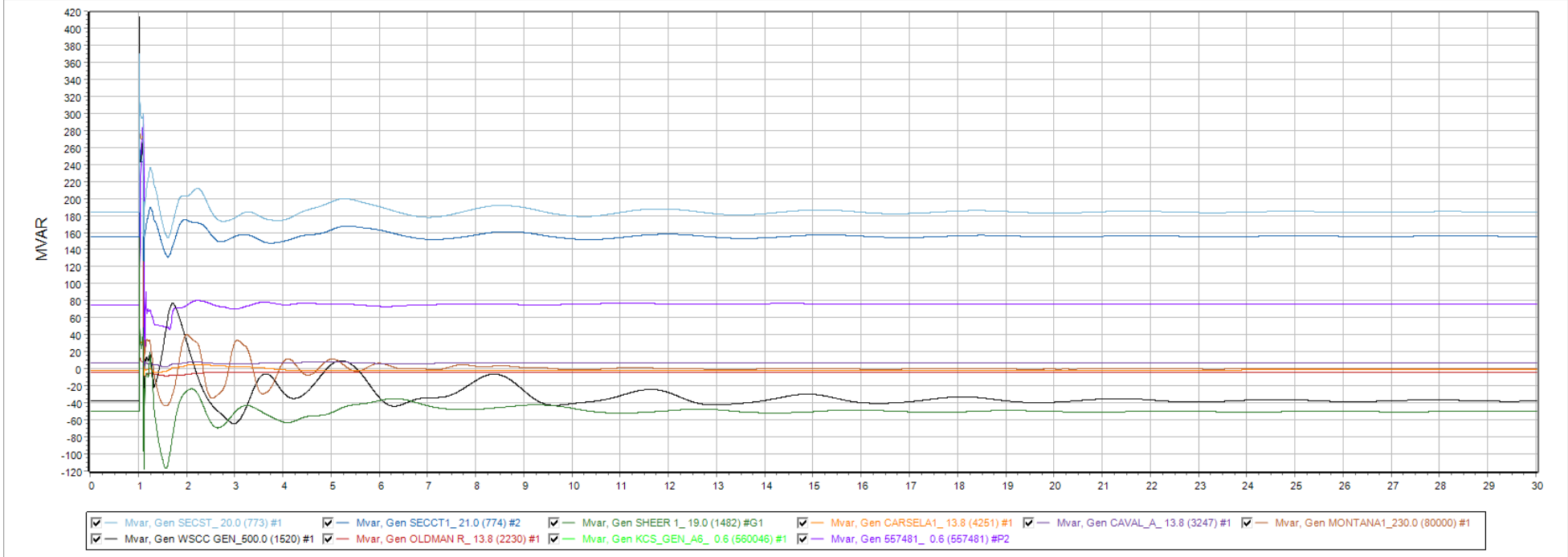
May 16, 2023 22:07:16

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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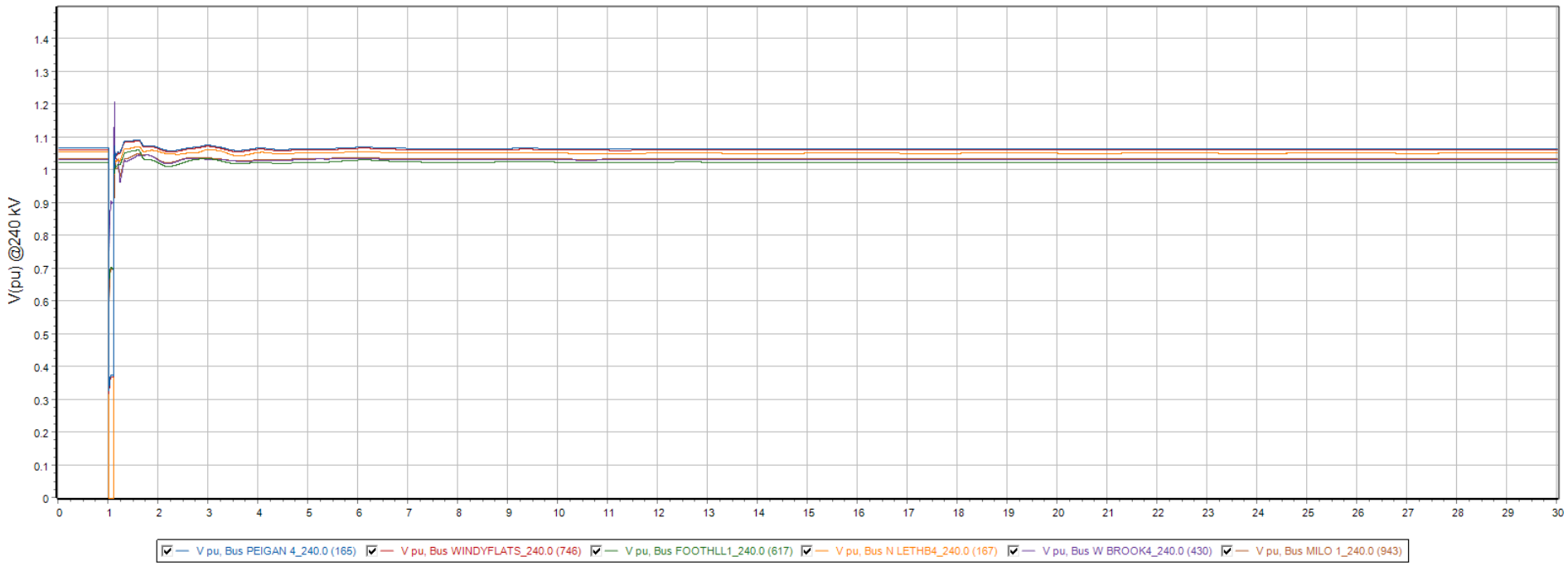
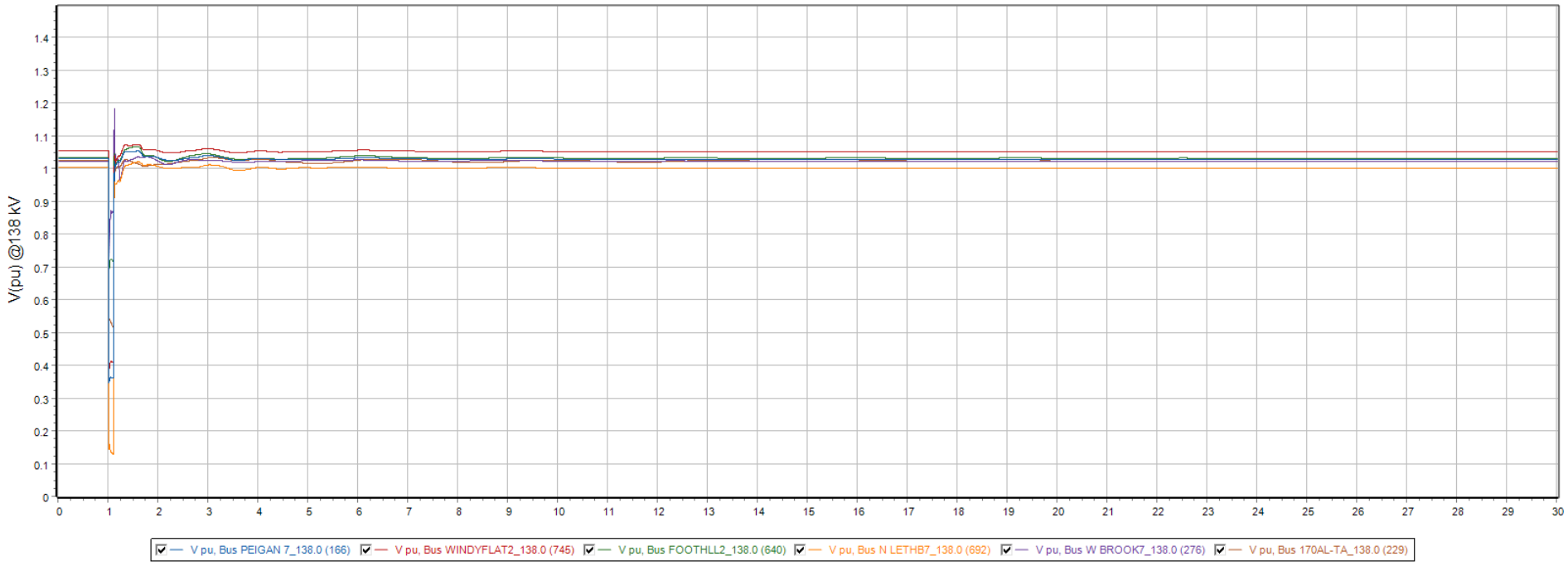
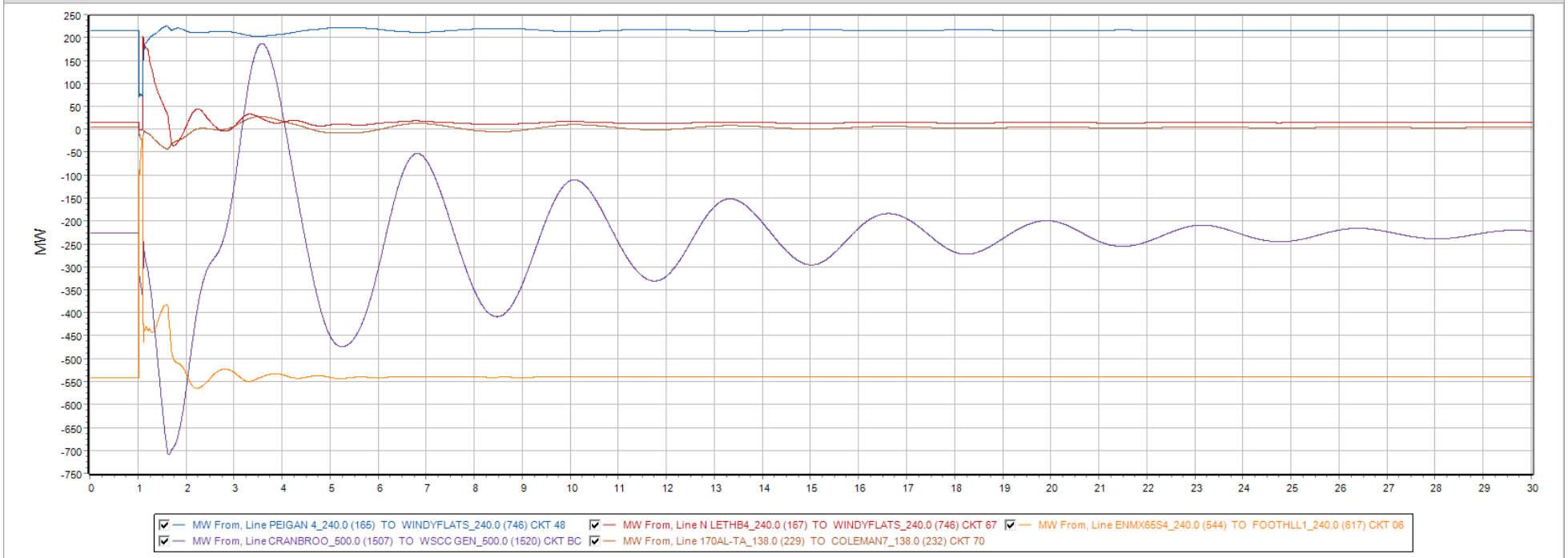
May 16, 2023 22:07:16

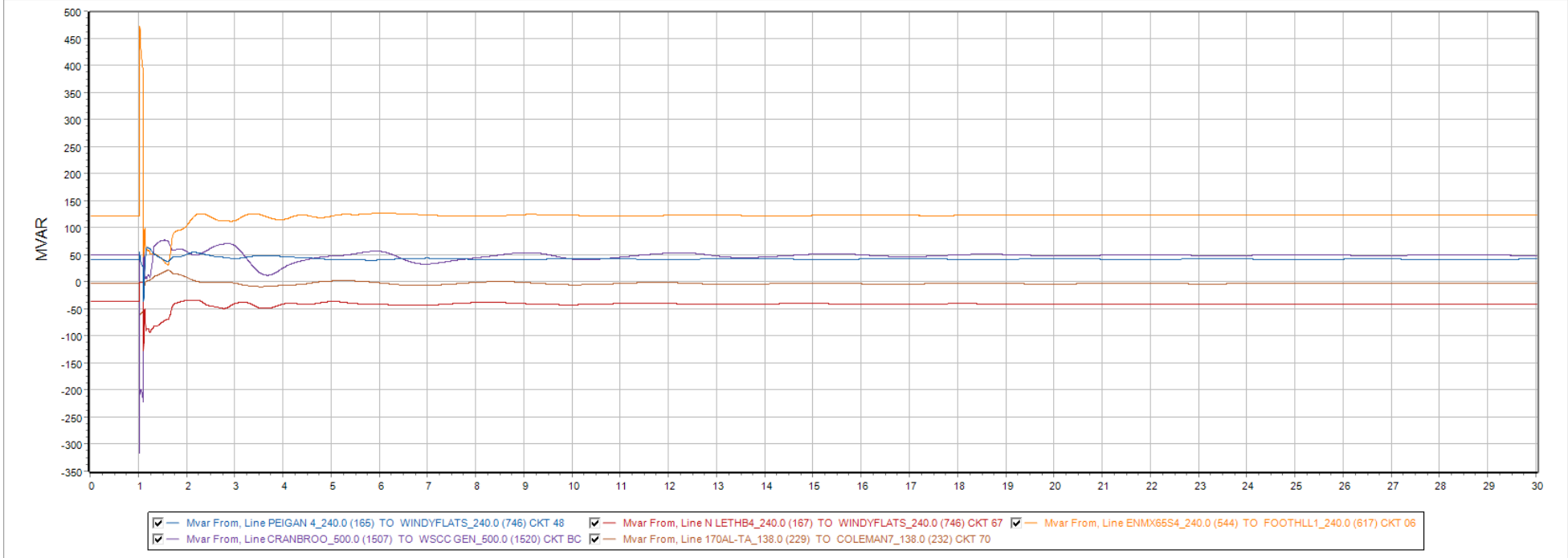
Monitor Bus Volts Q3



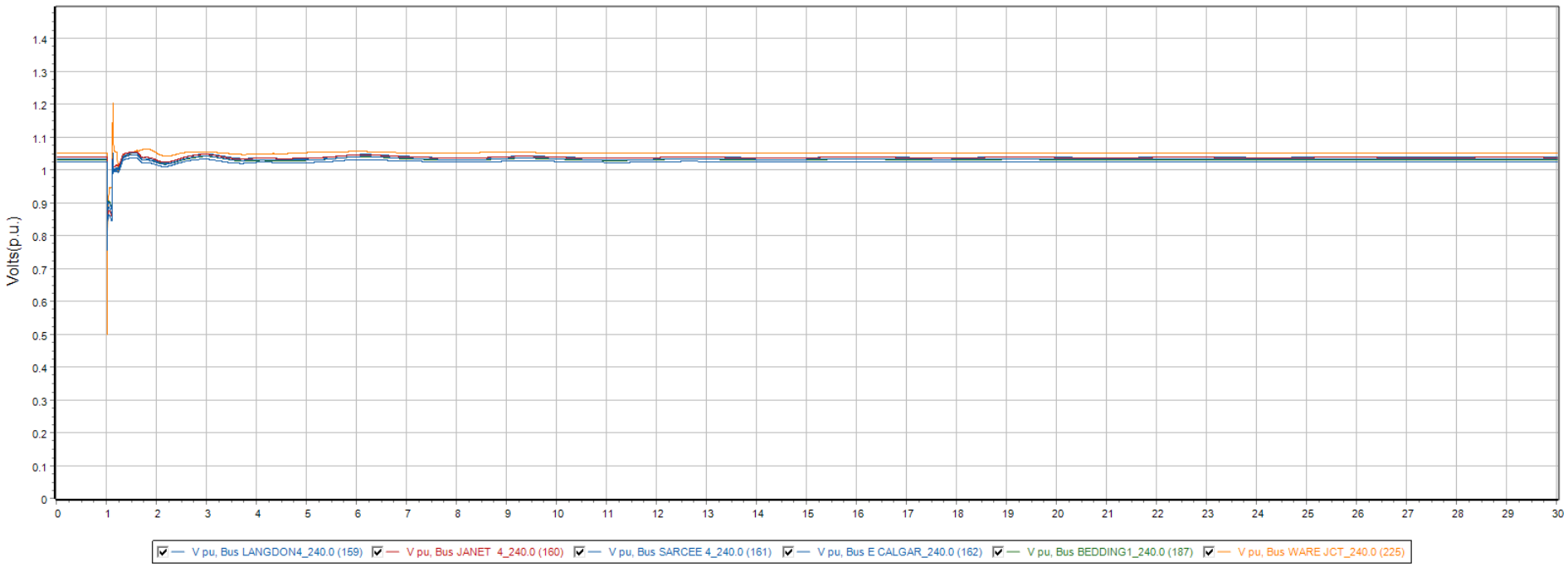


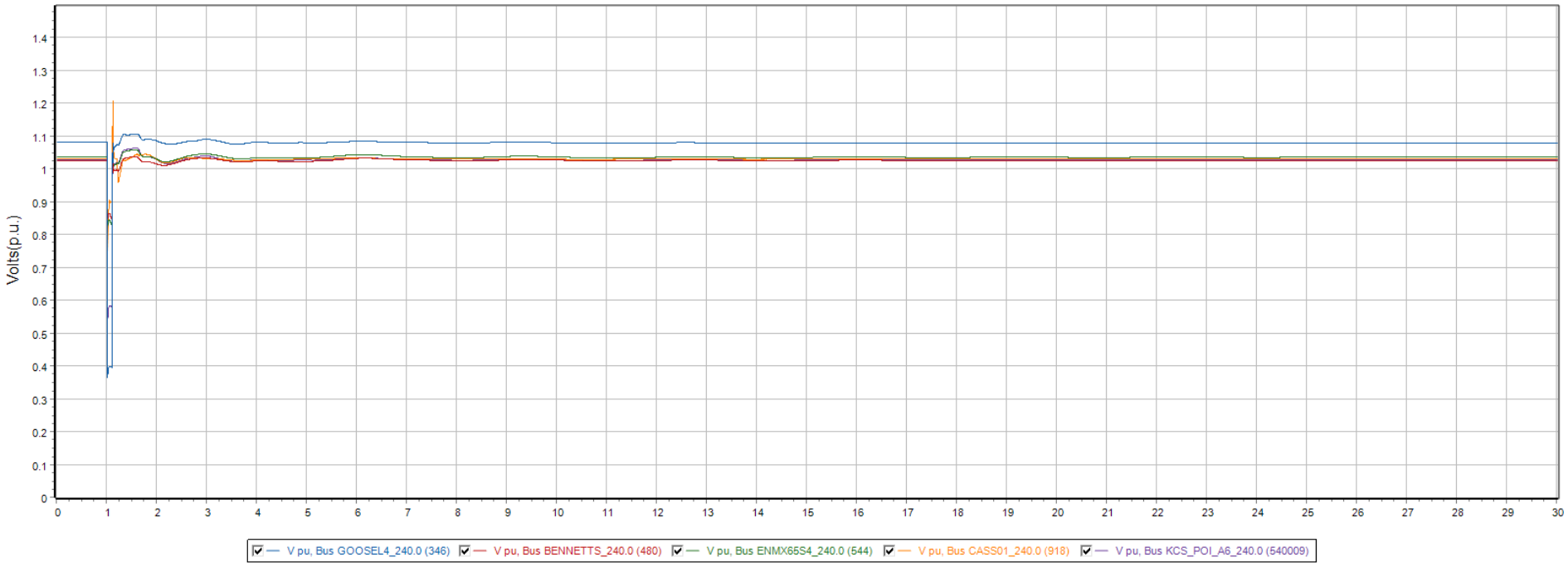
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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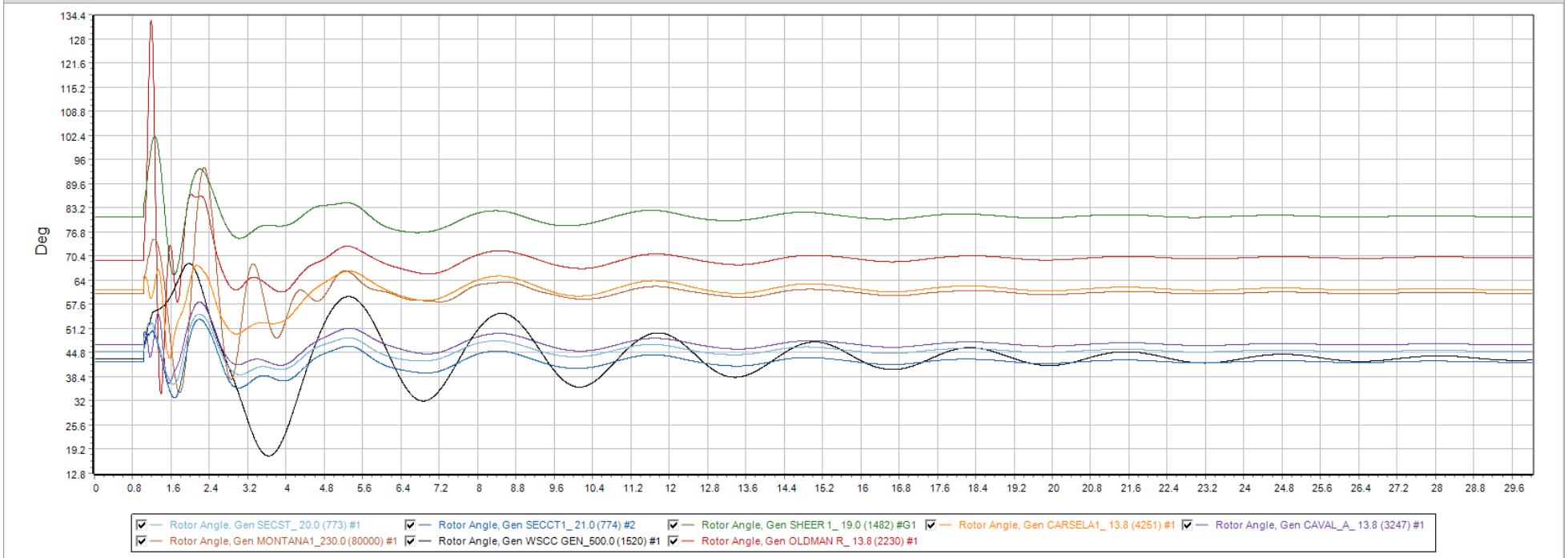
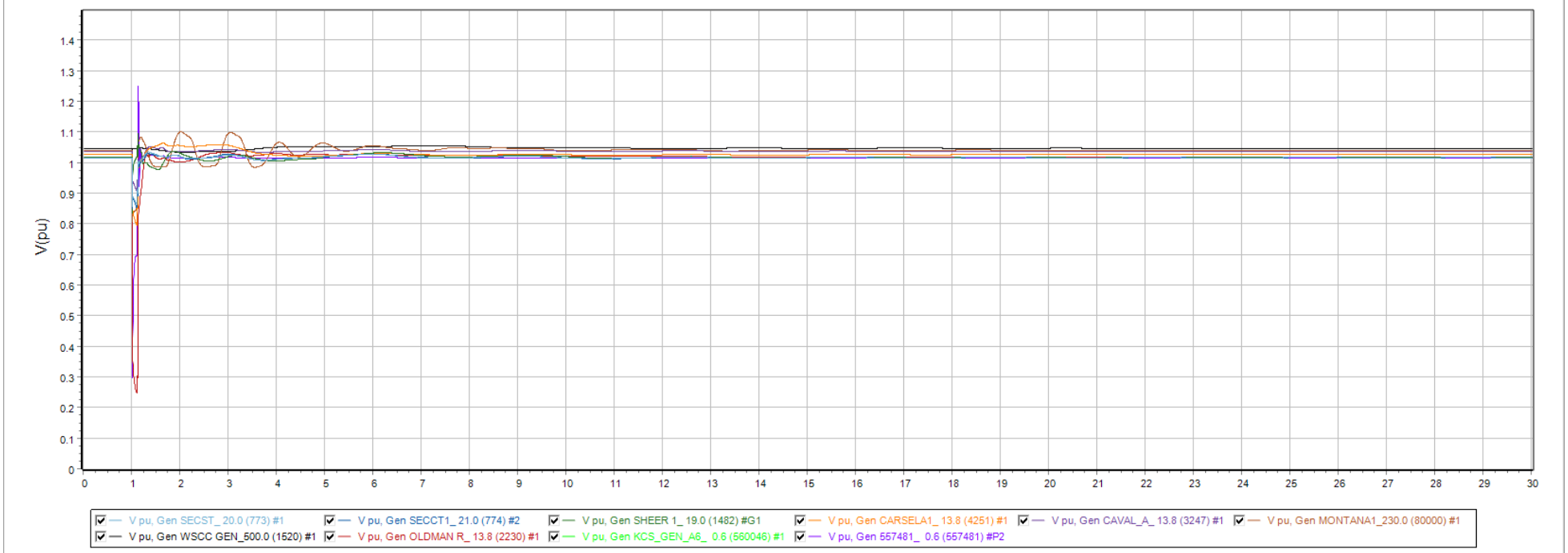
May 16, 2023 22:07:18

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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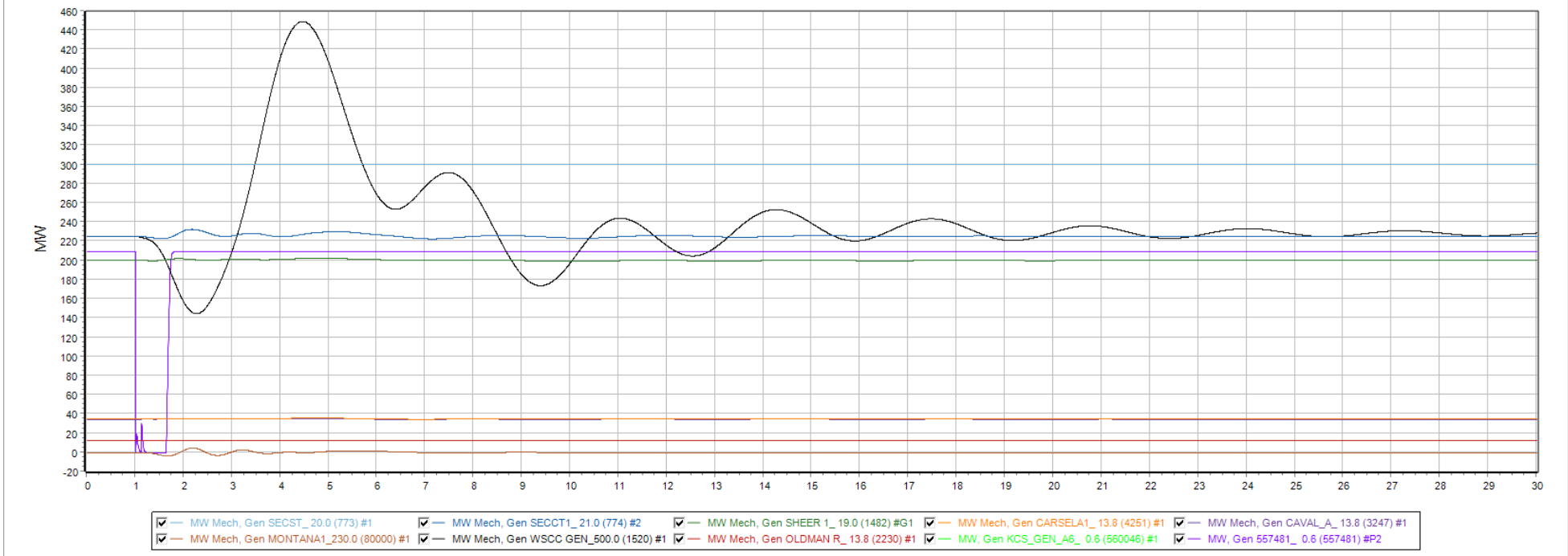
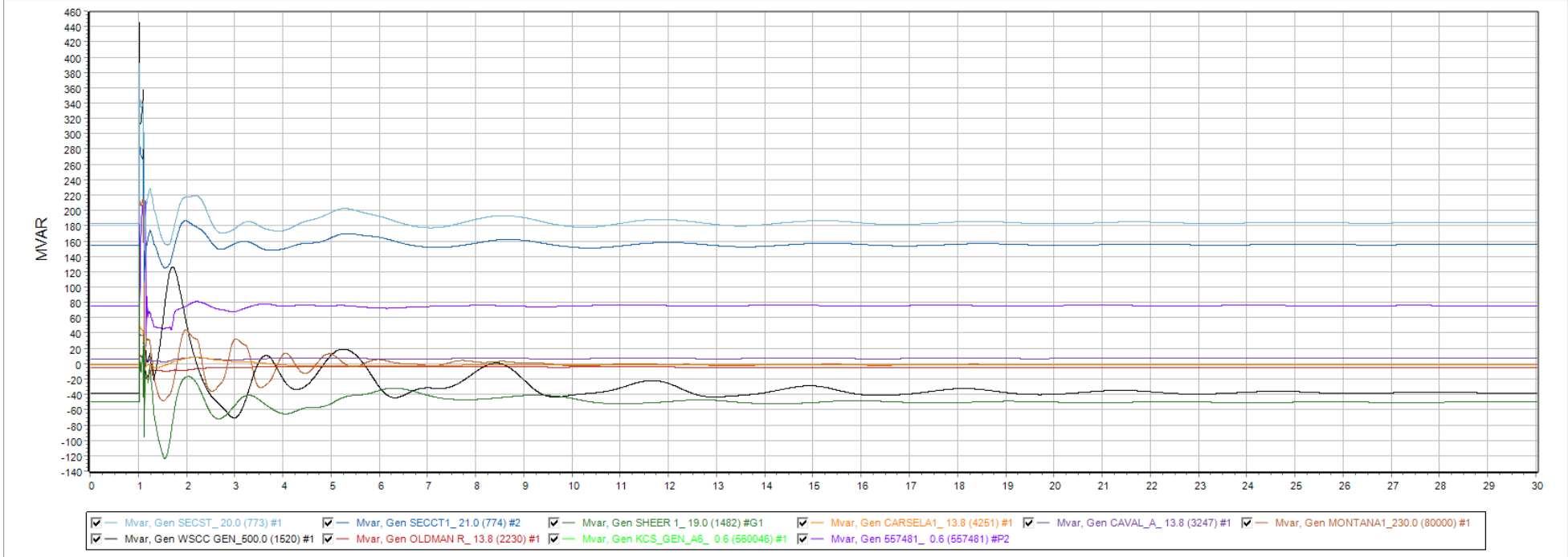
May 16, 2023 22:18:51

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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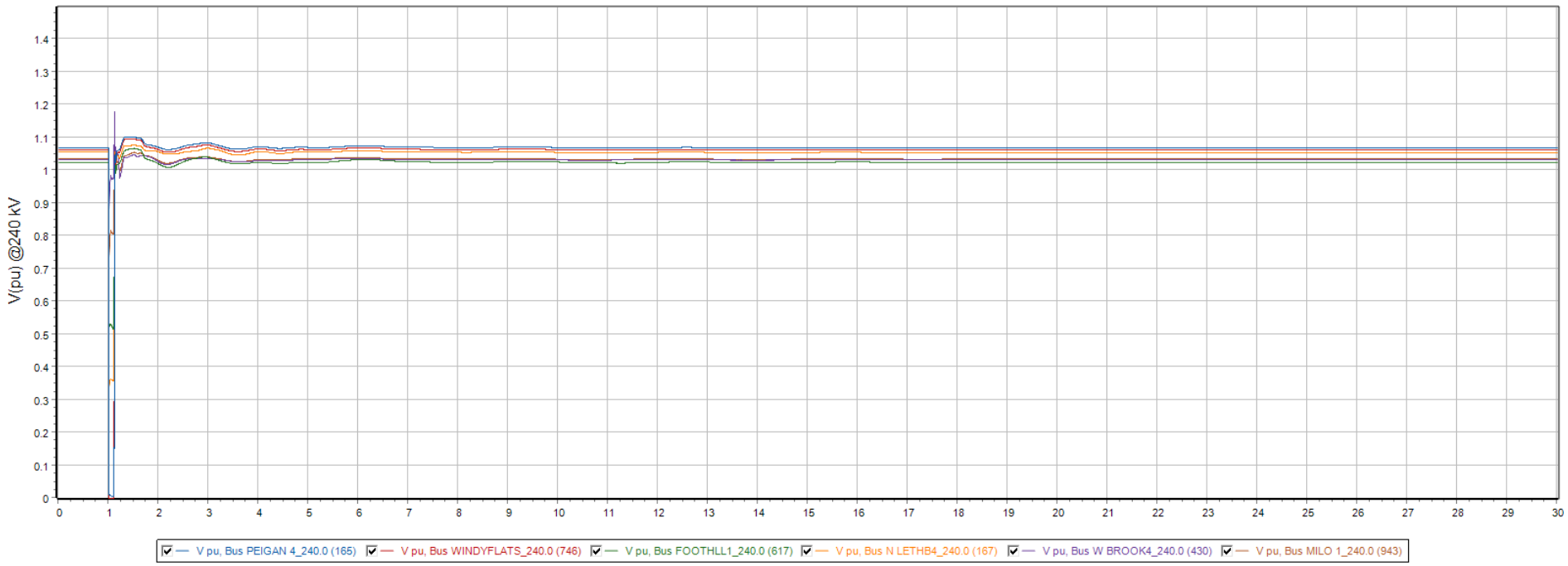
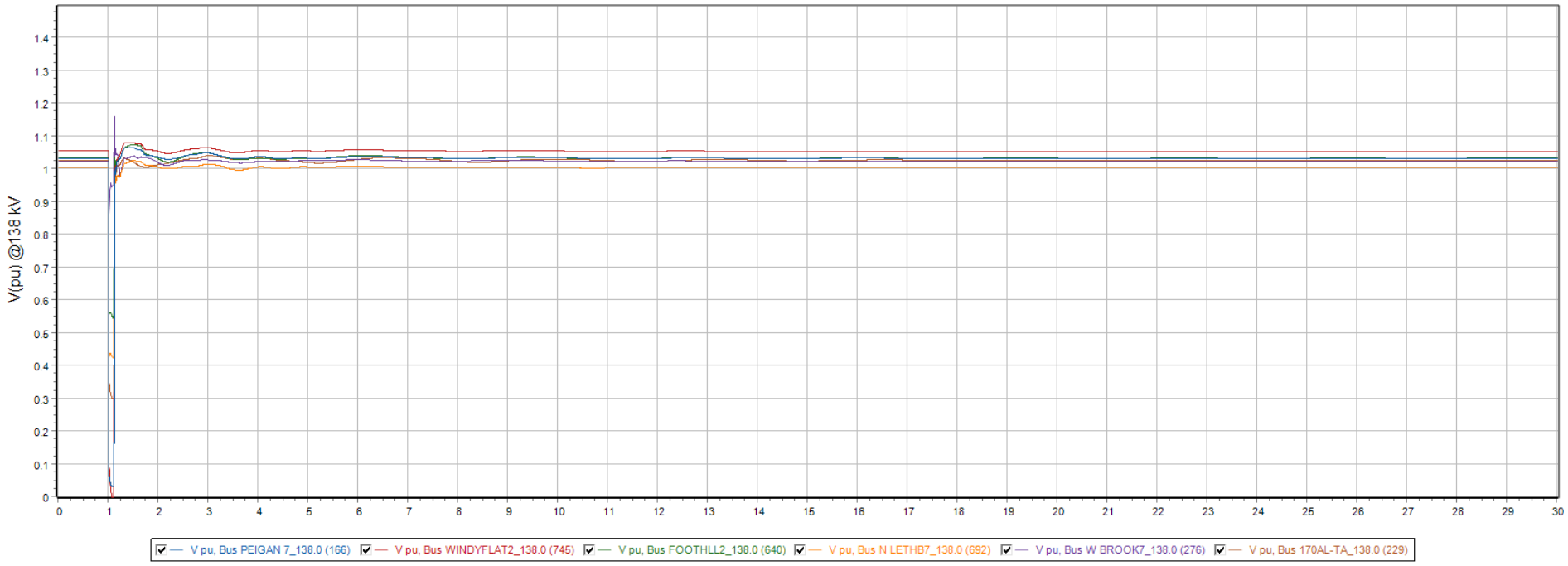
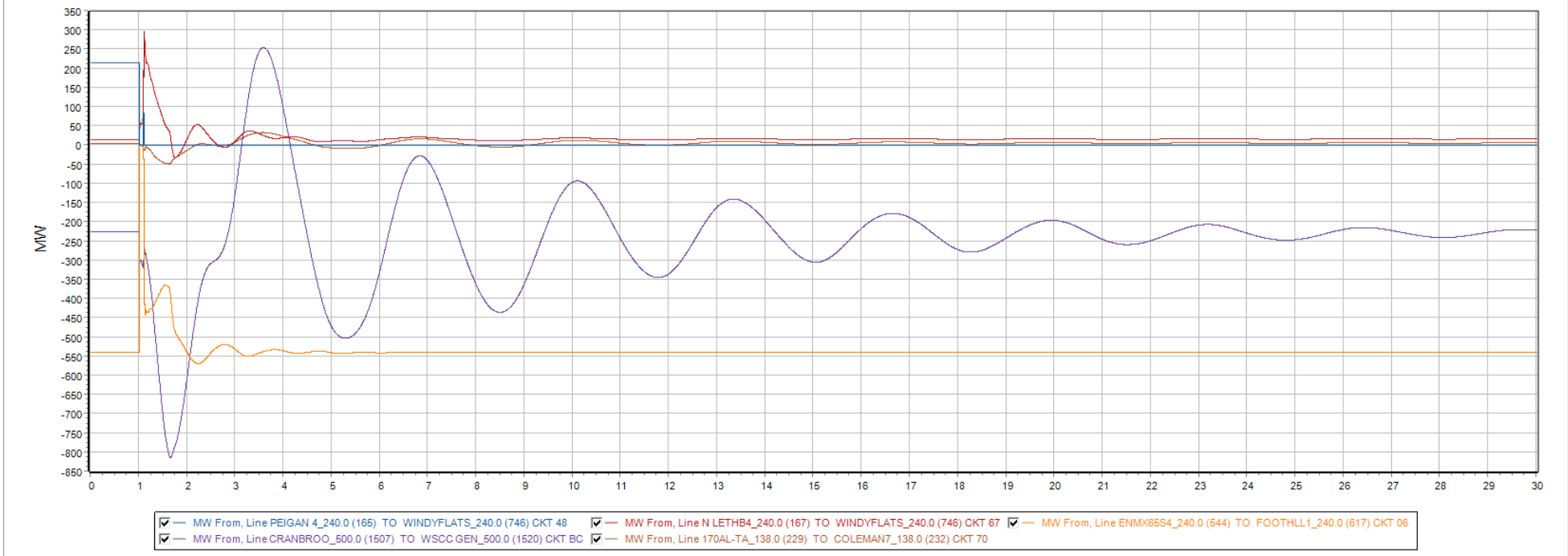
May 16, 2023 22:18:51

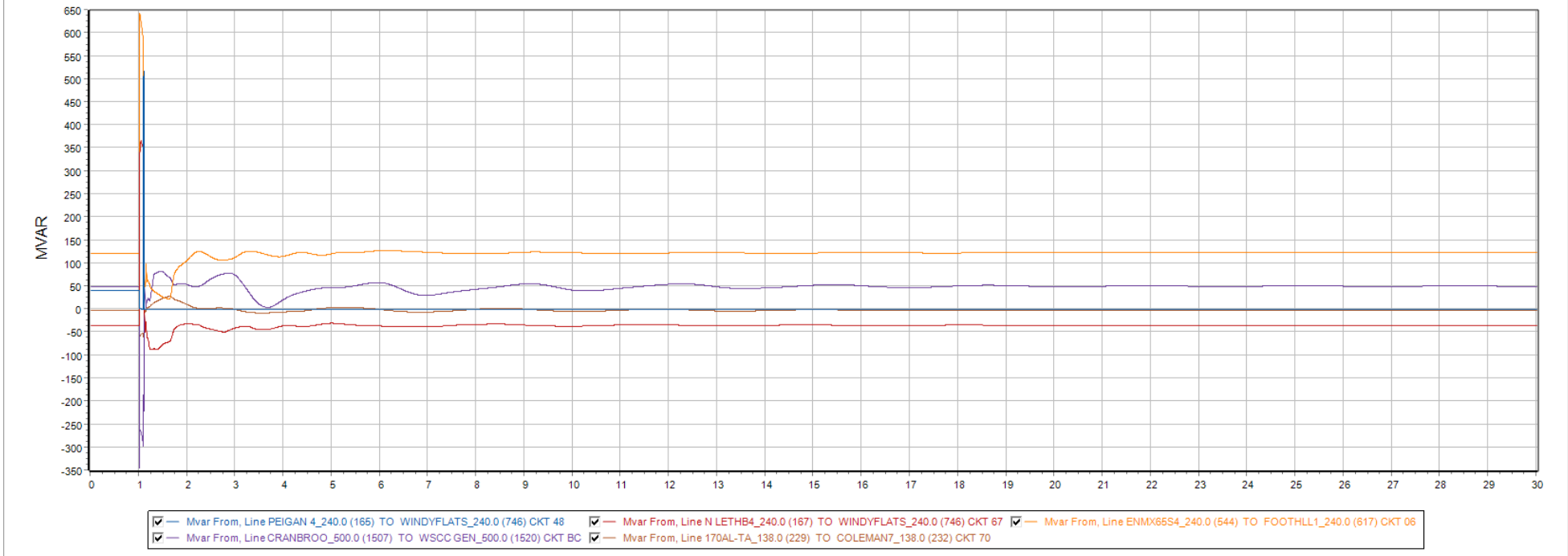
Monitor Bus Volts Q3



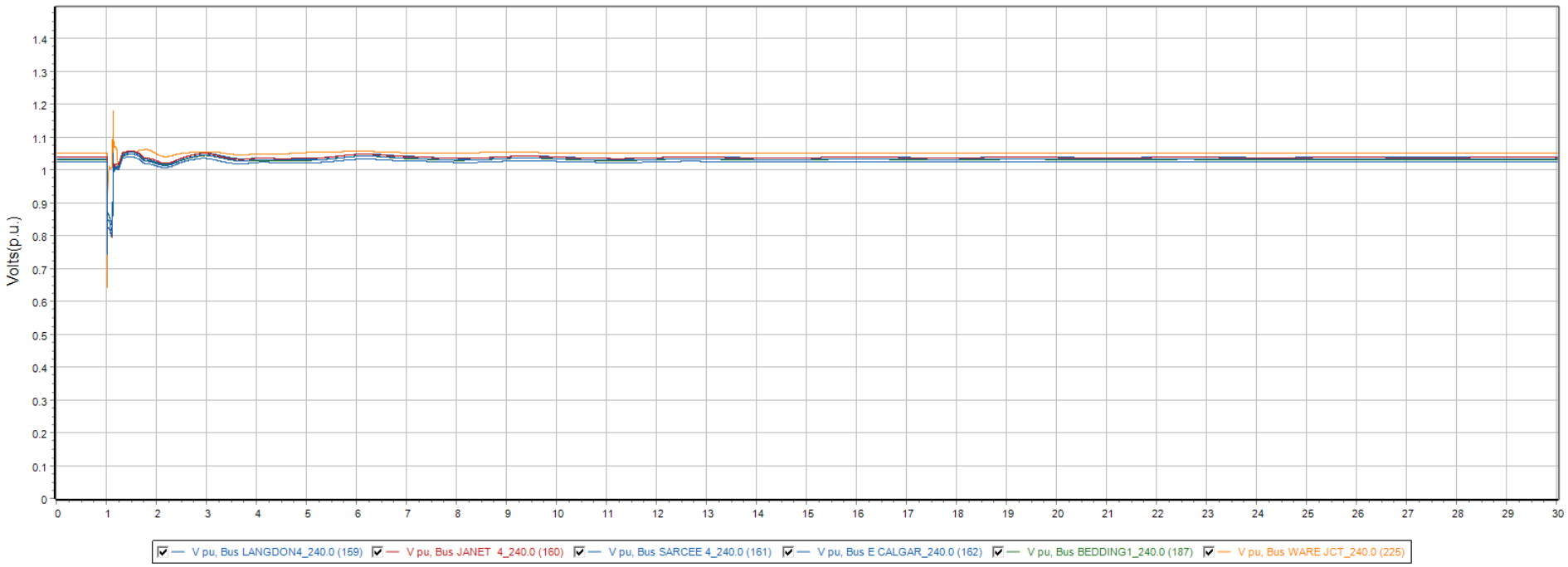


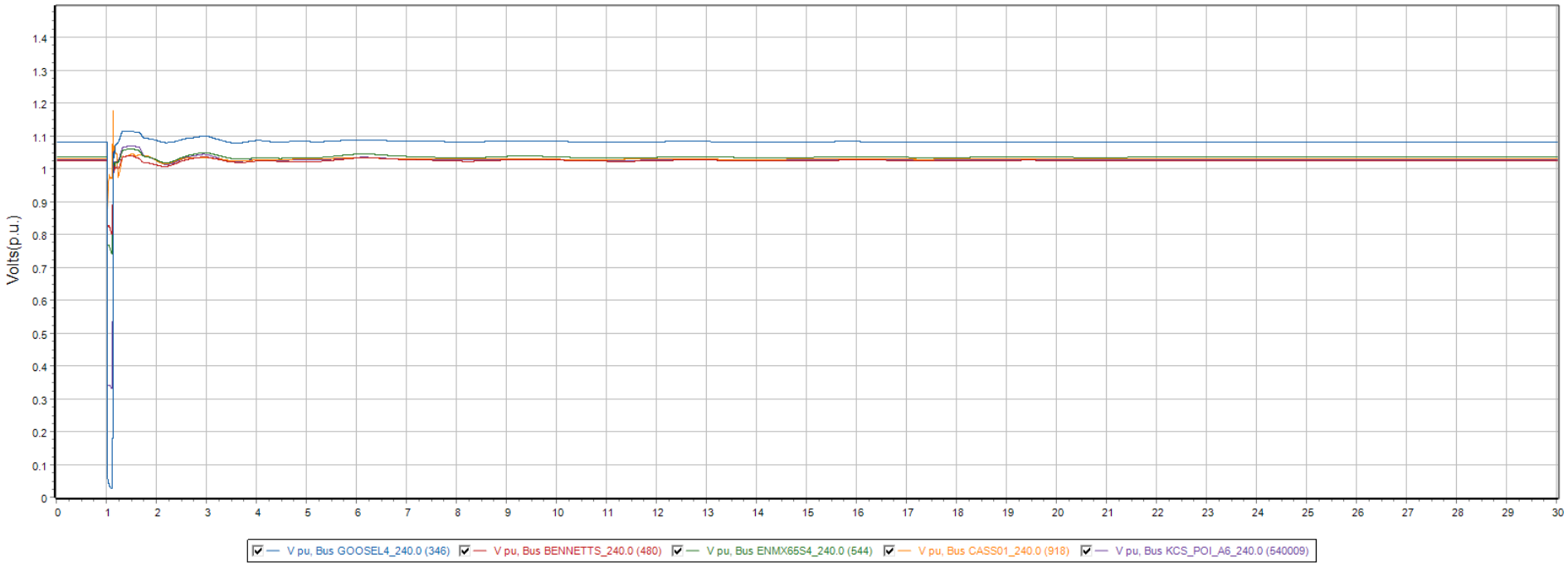
Monitor Line MW & MVAR. Q4



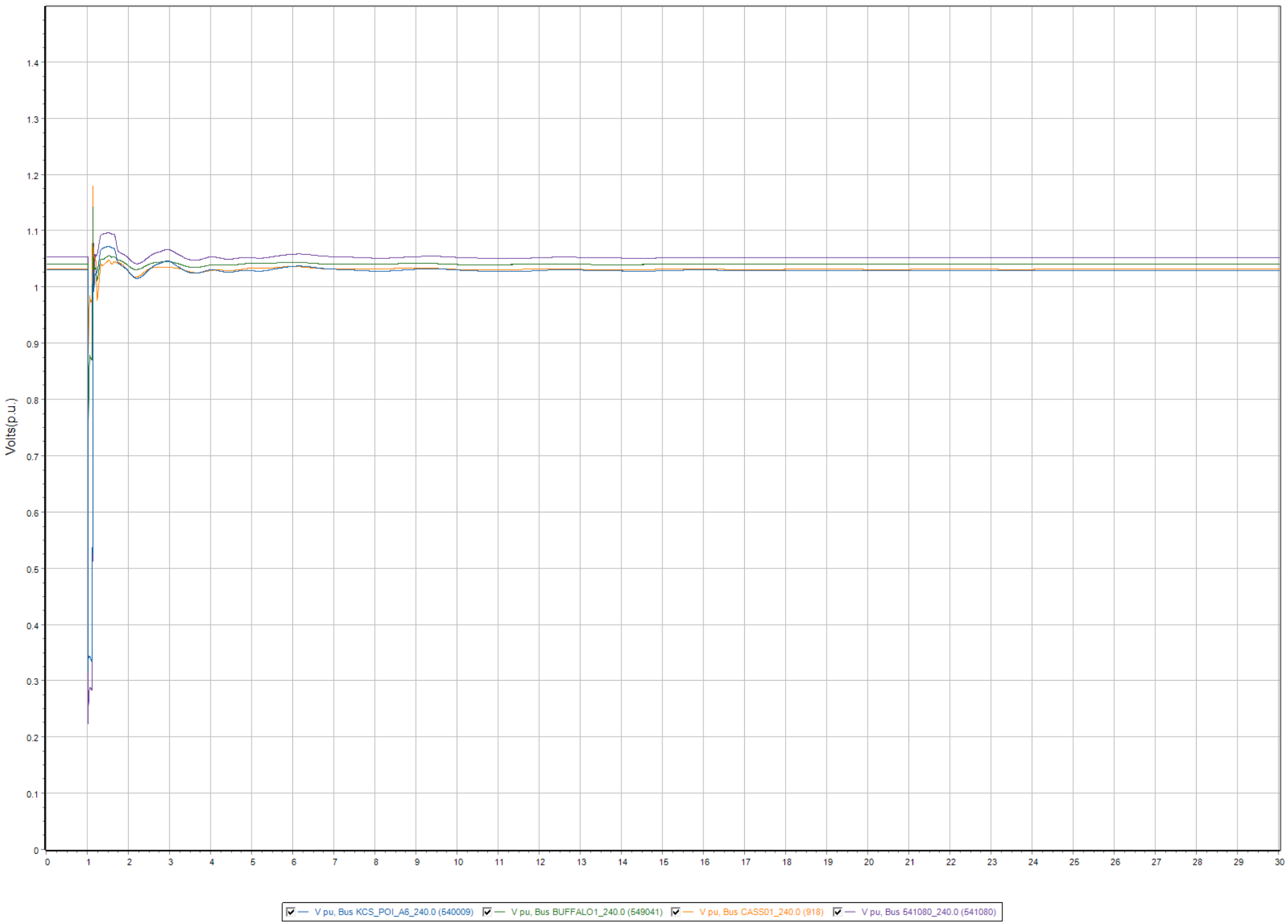


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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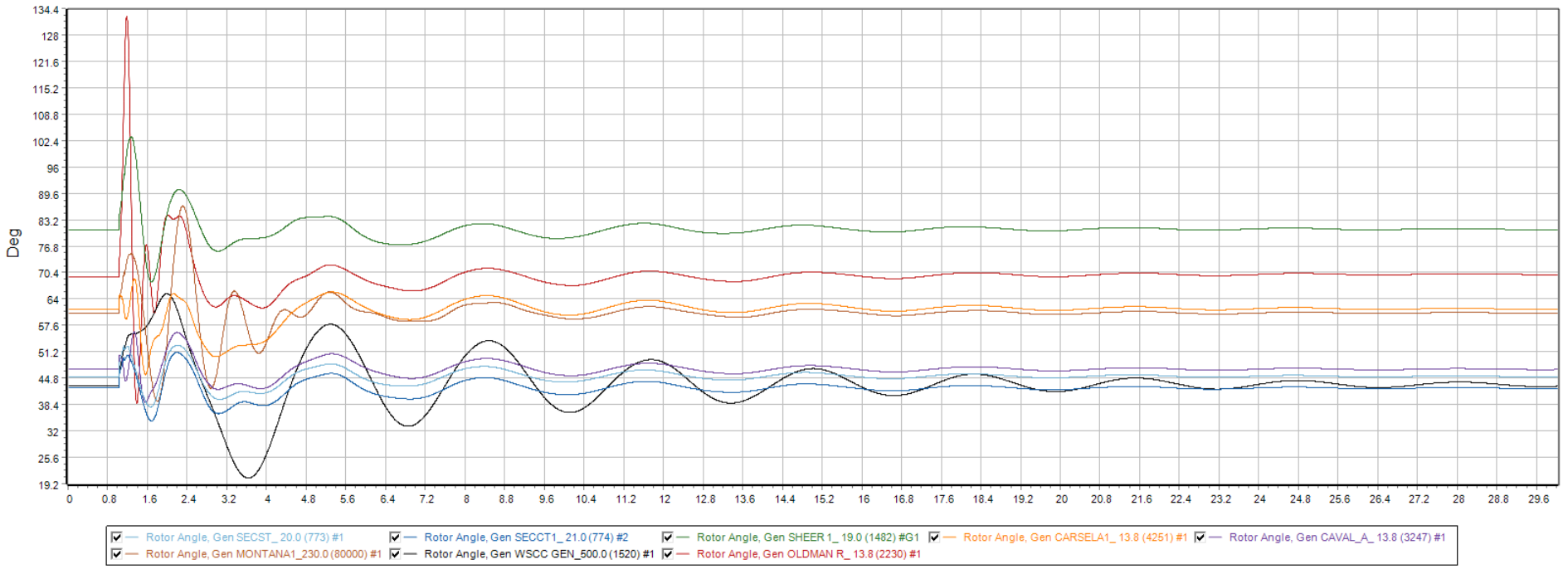
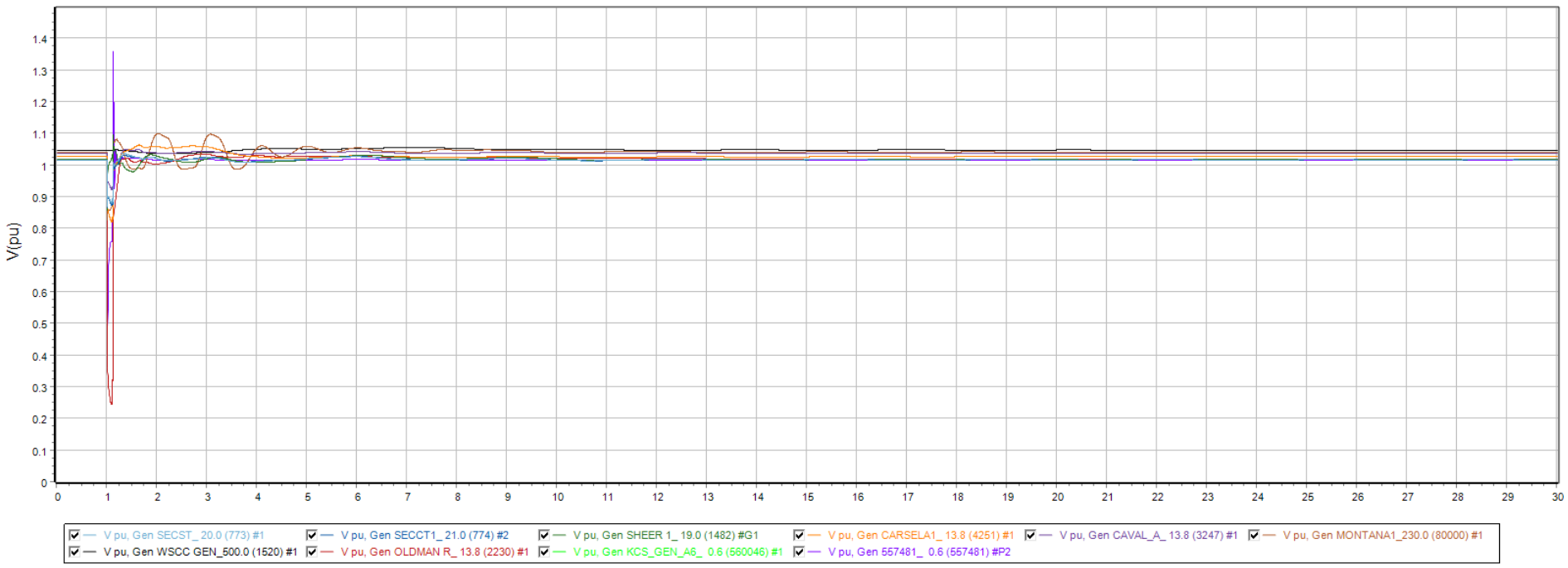
May 16, 2023 22:18:53

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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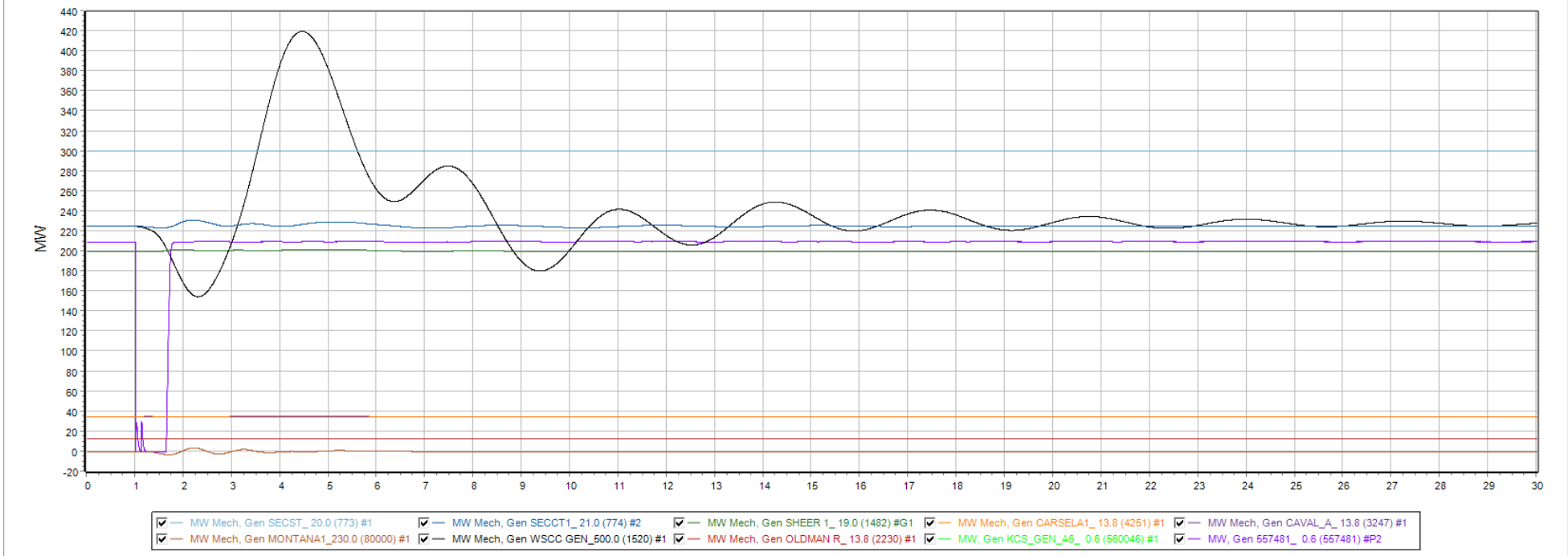
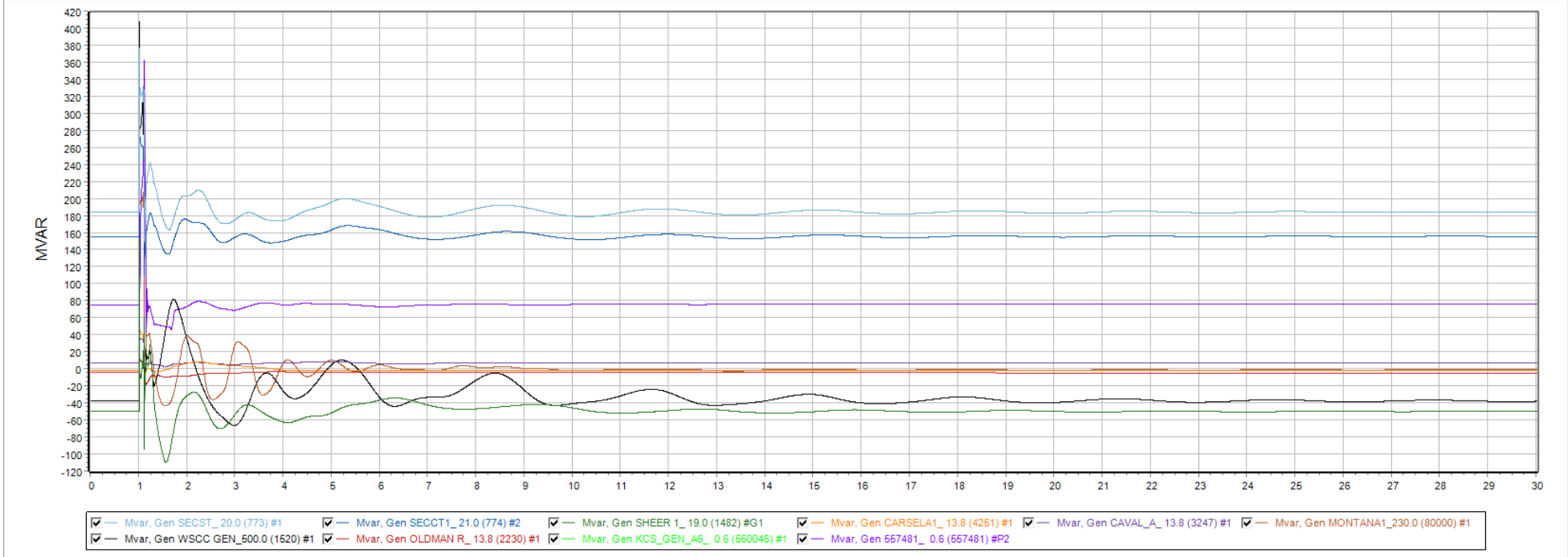
May 16, 2023 22:29:25

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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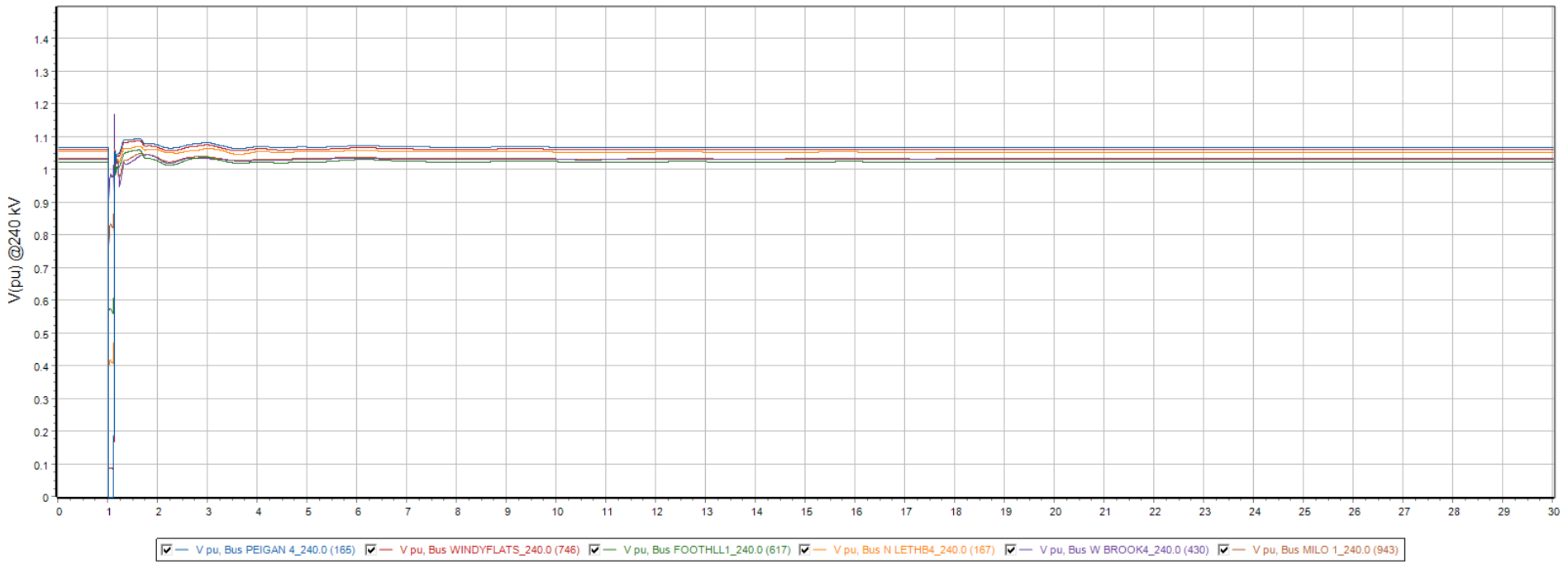
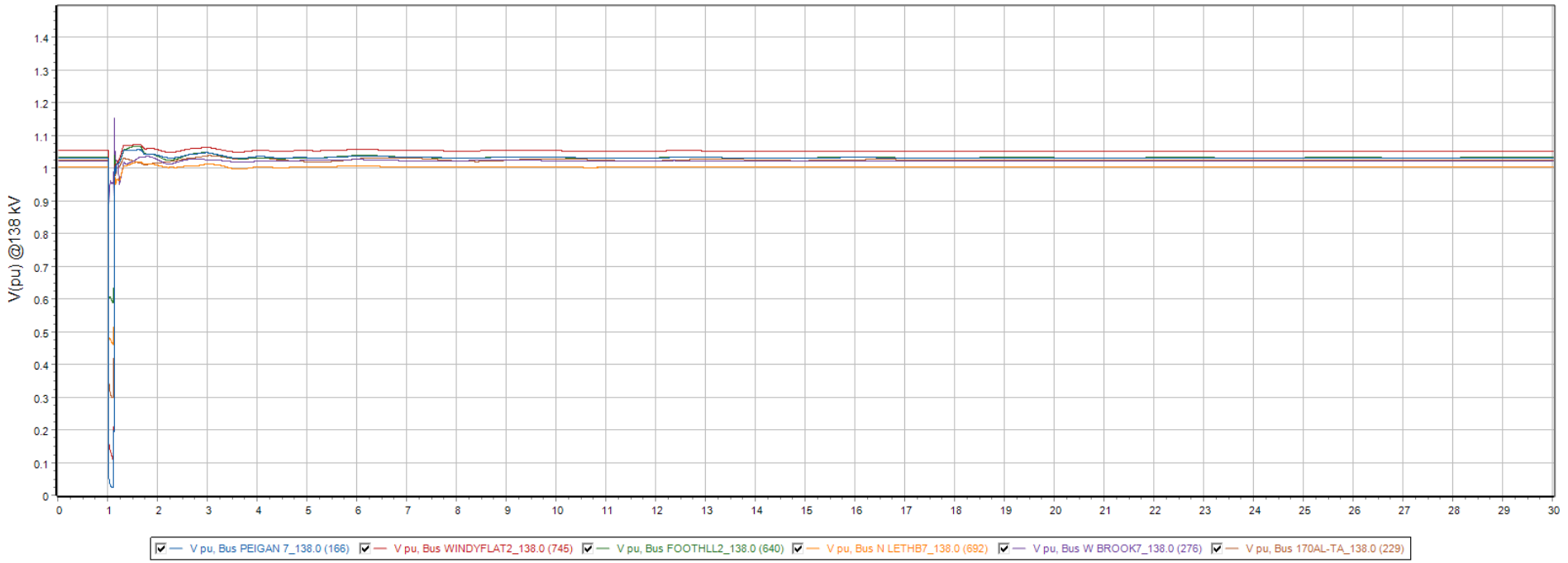
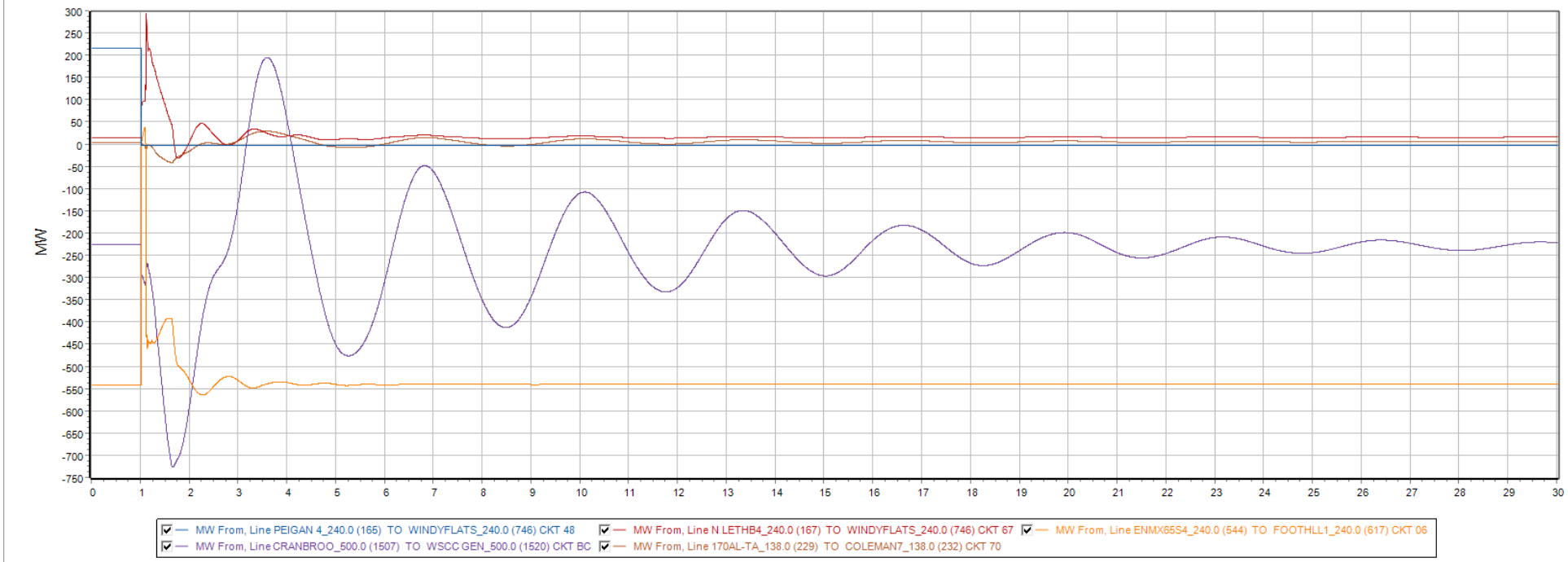
May 16, 2023 22:29:25

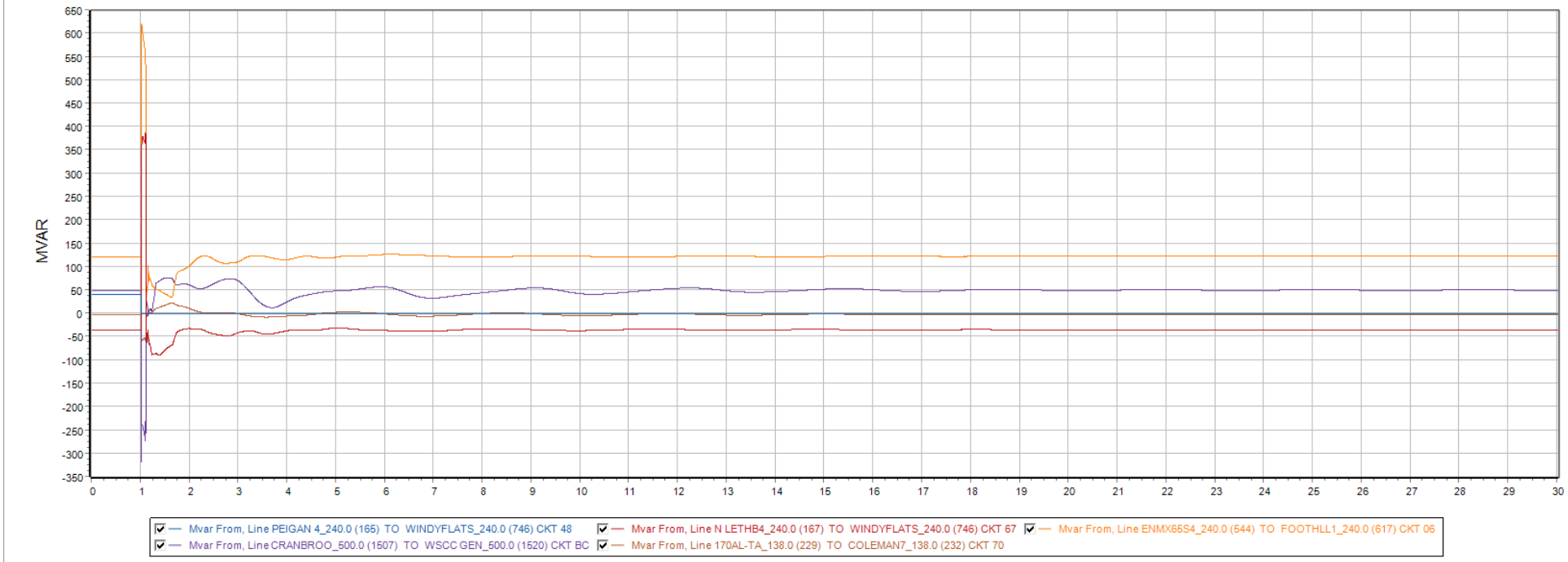
Monitor Bus Volts Q3



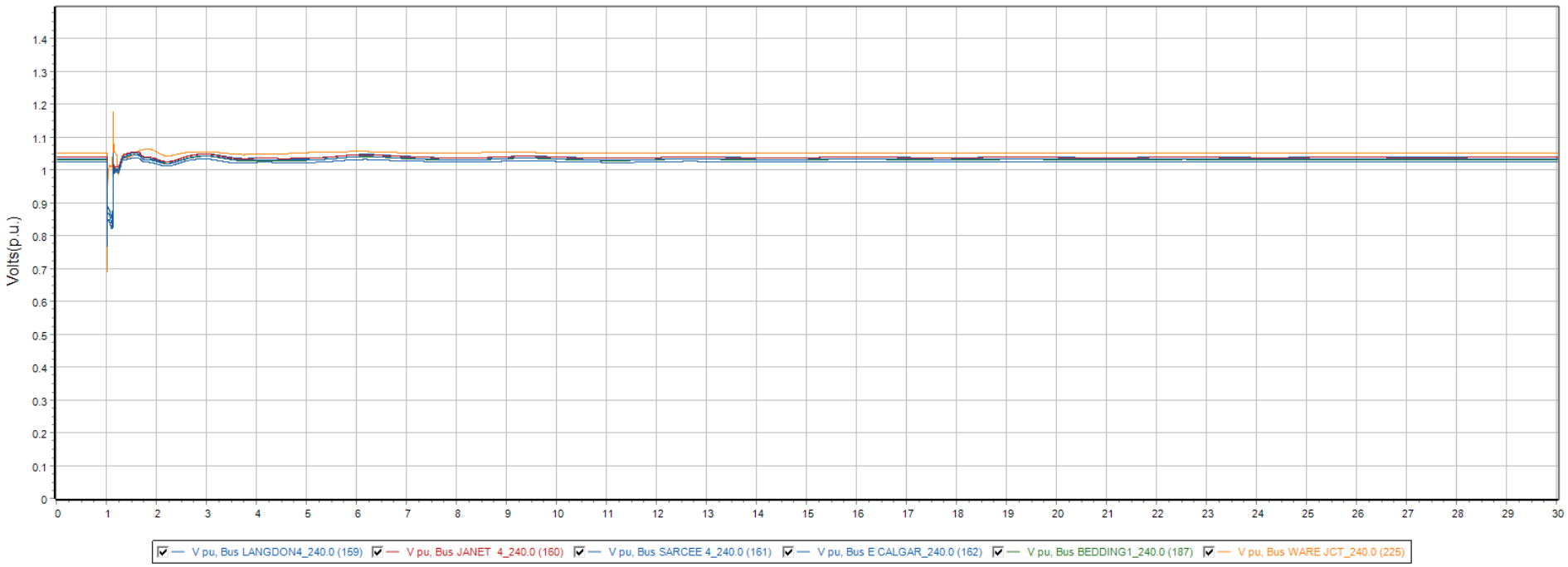


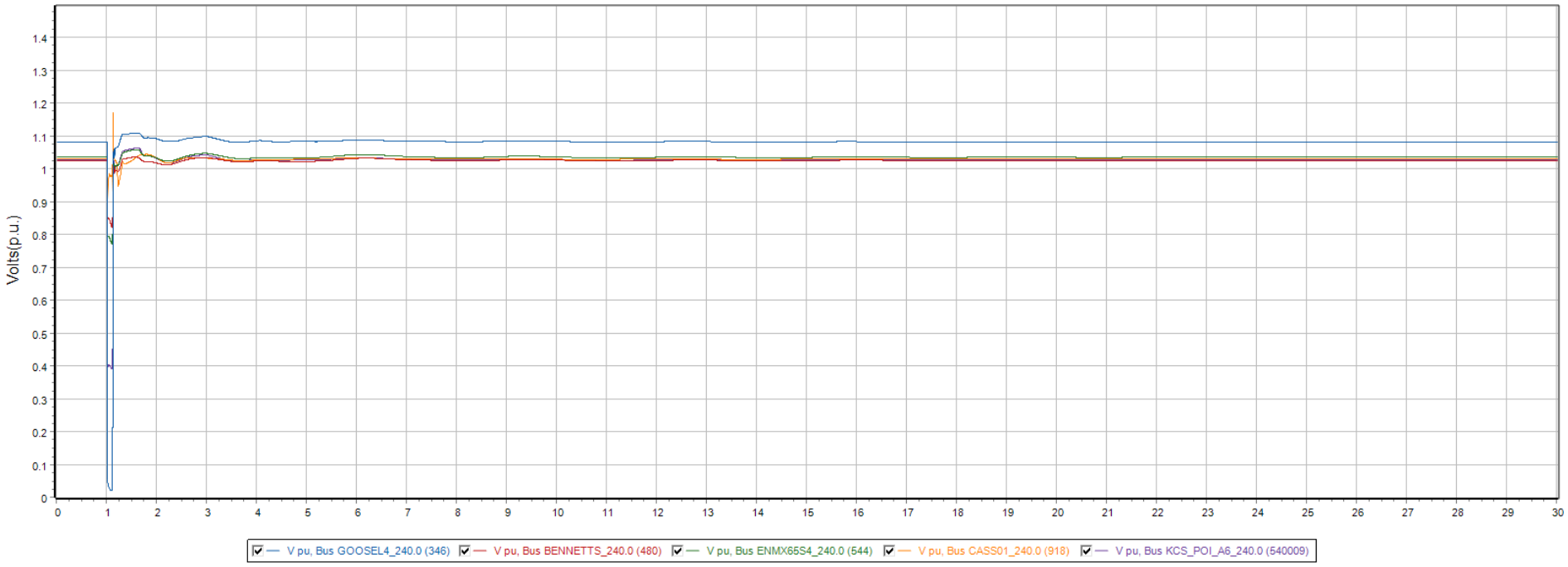
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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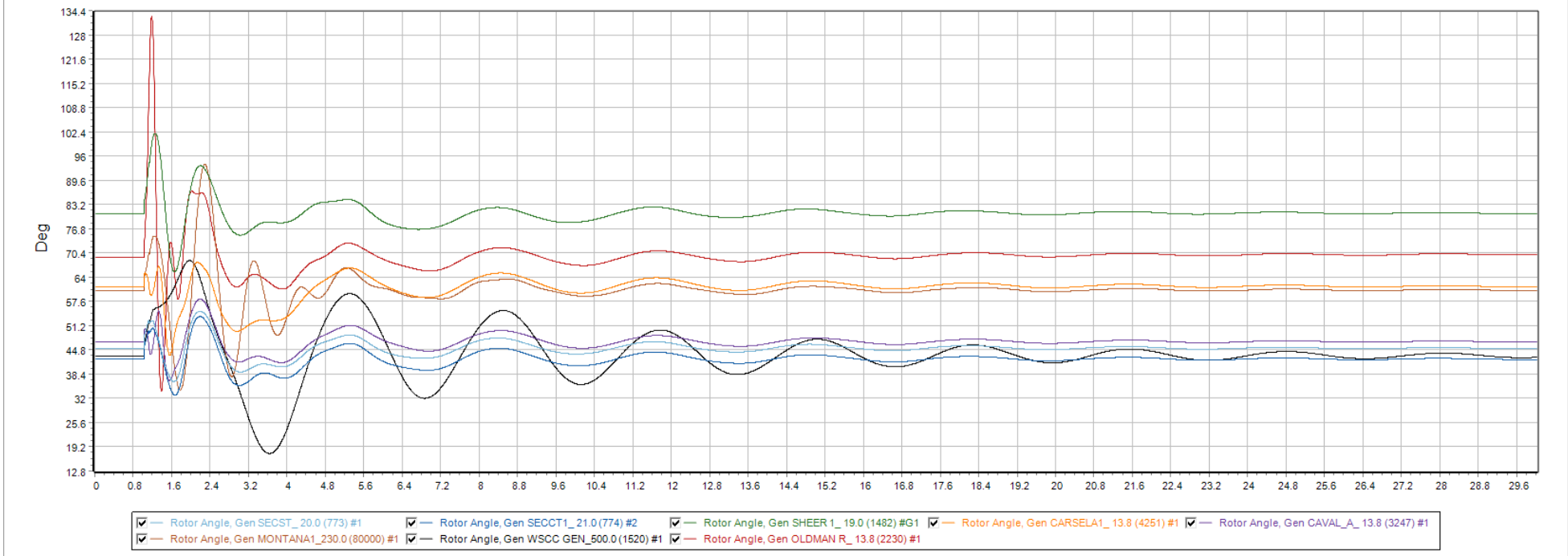
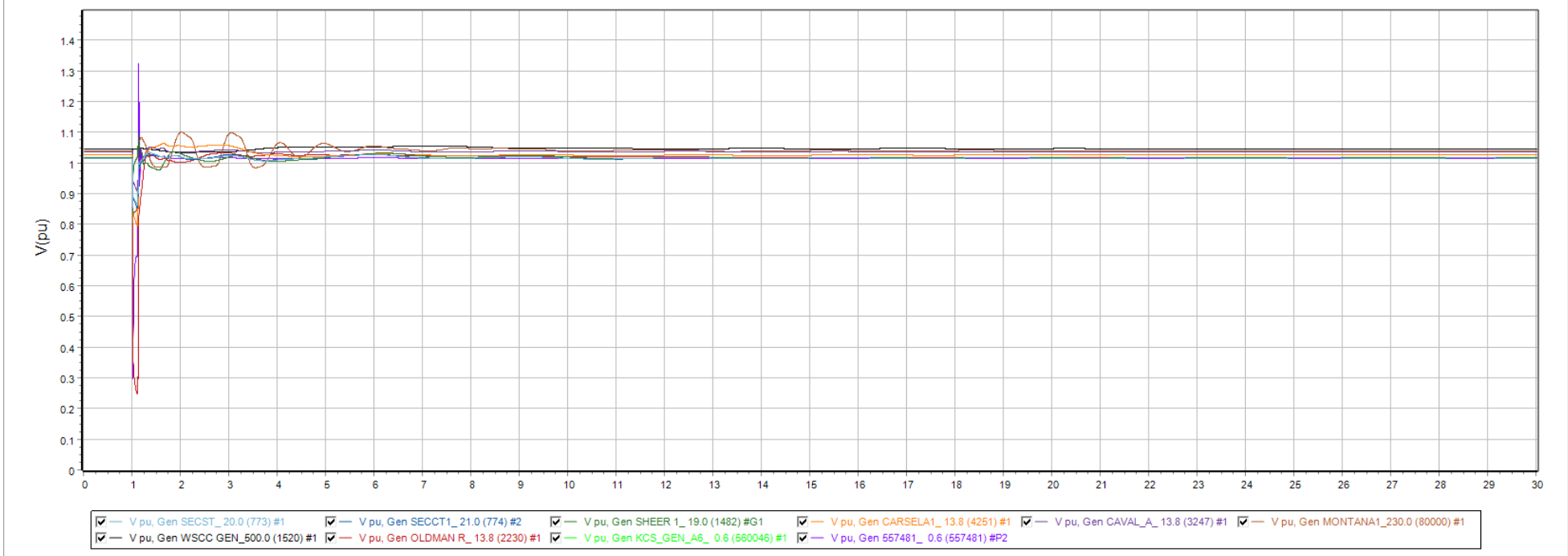
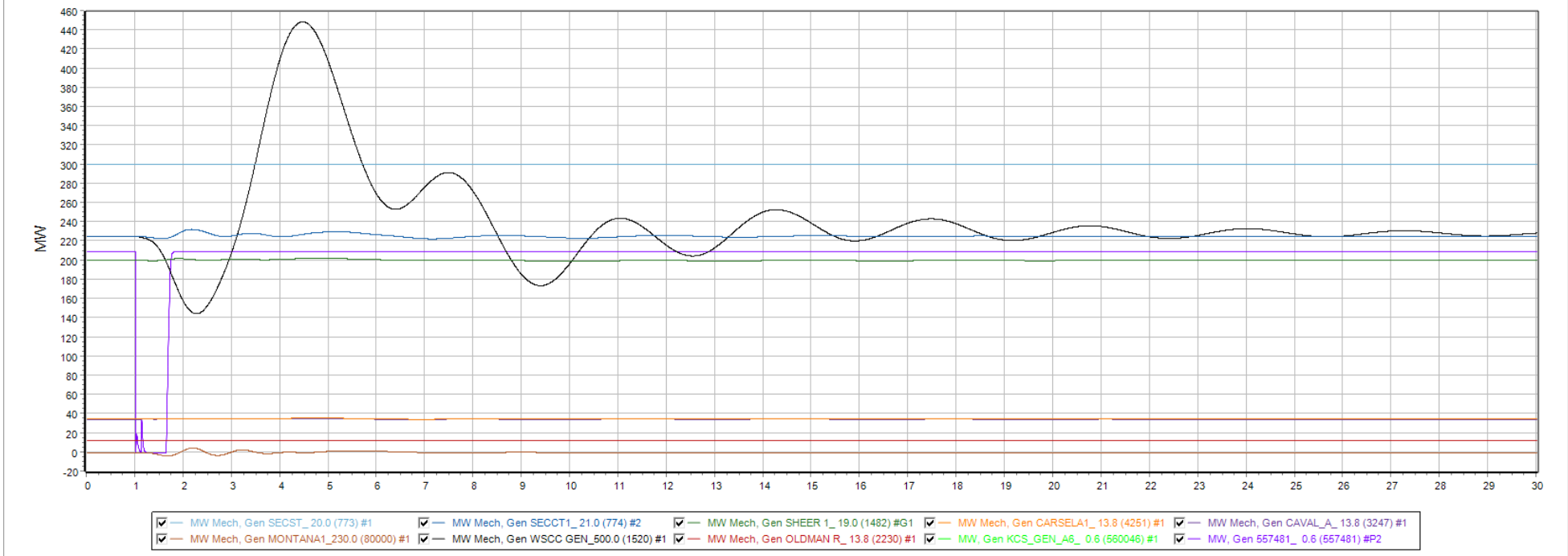
May 16, 2023 22:29:27

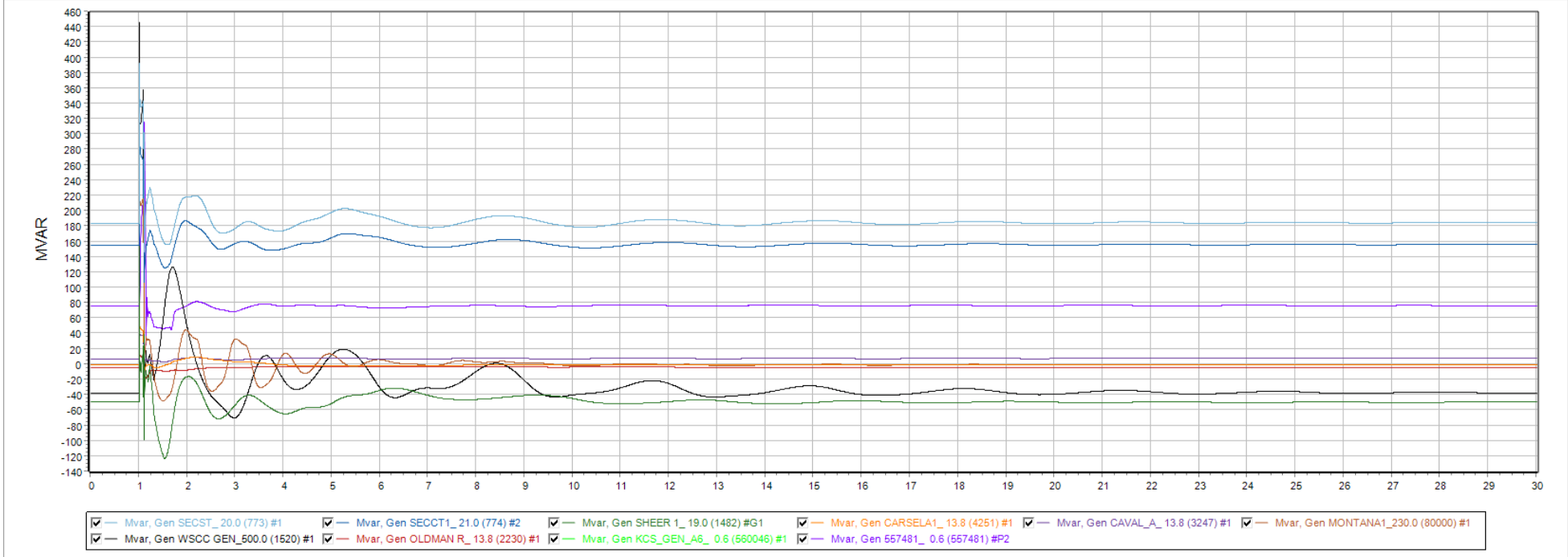
Monitor Gens. Q1





Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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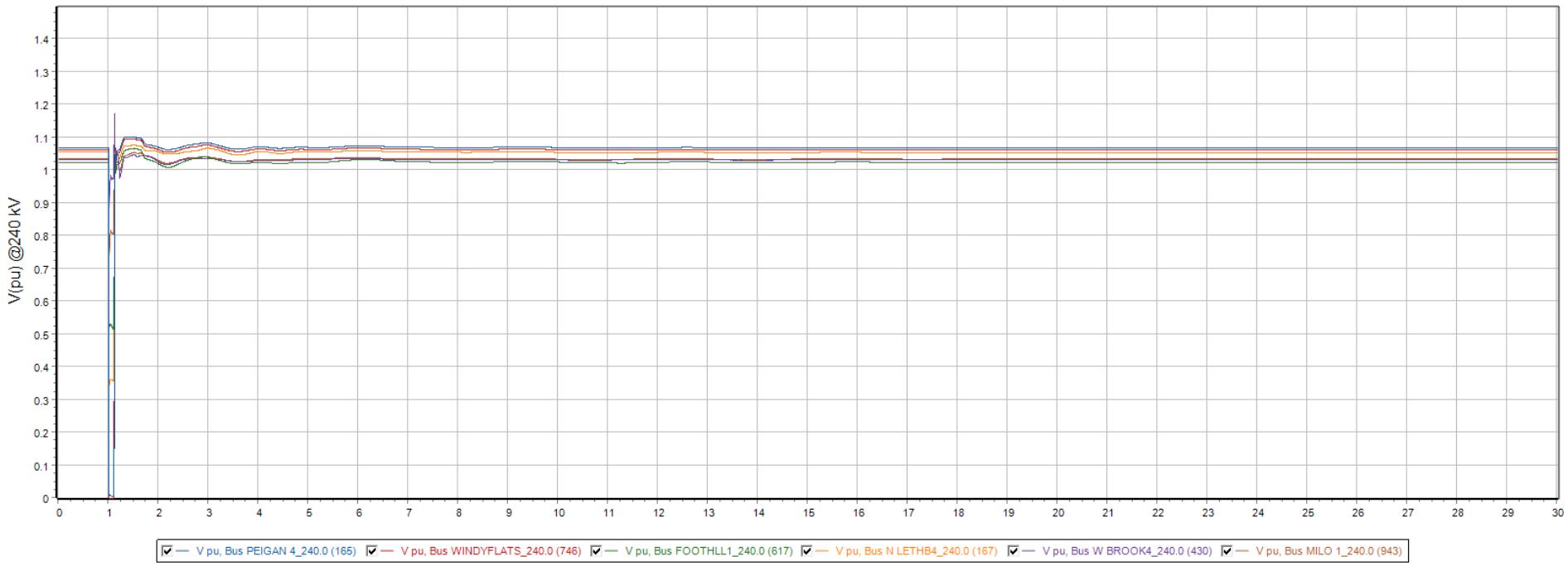
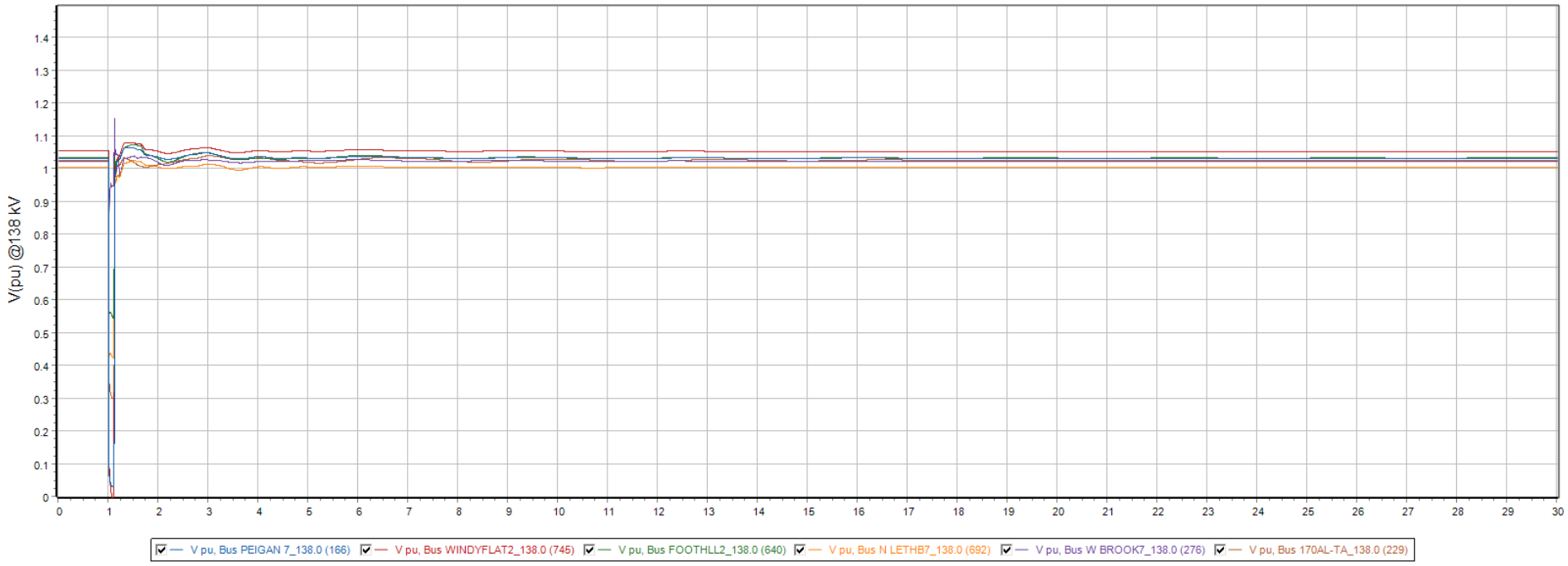
May 16, 2023 22:40:55

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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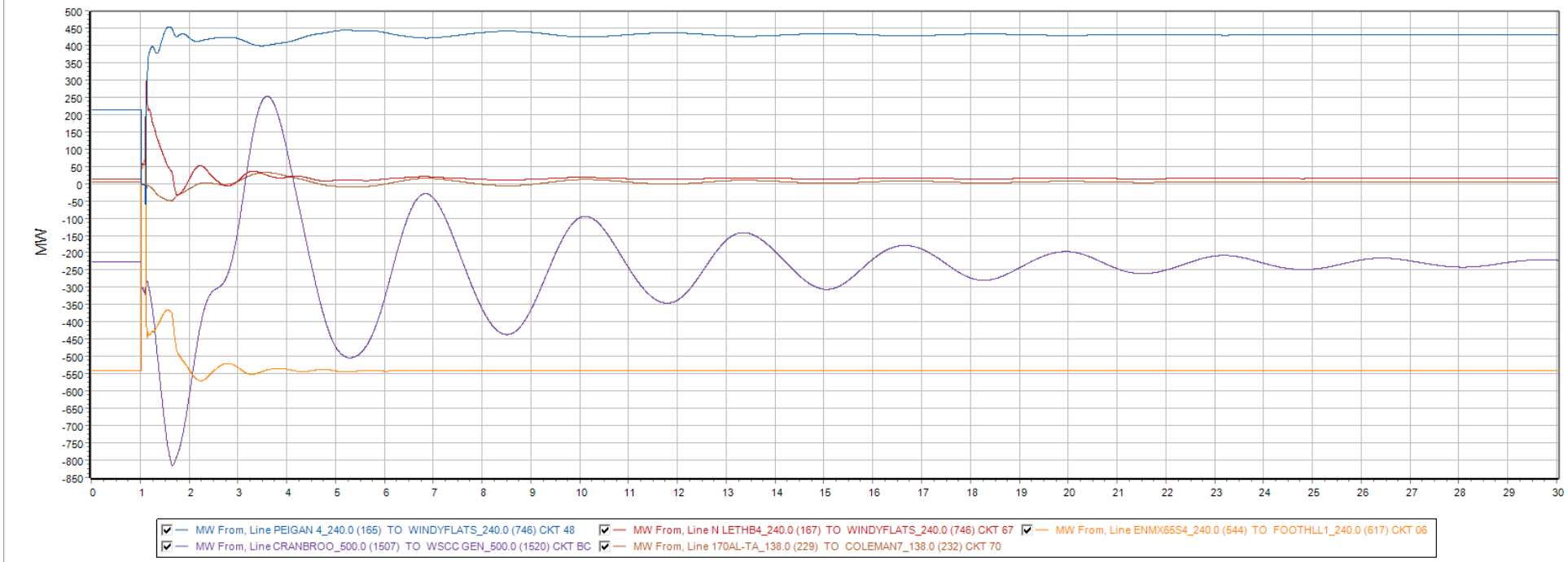
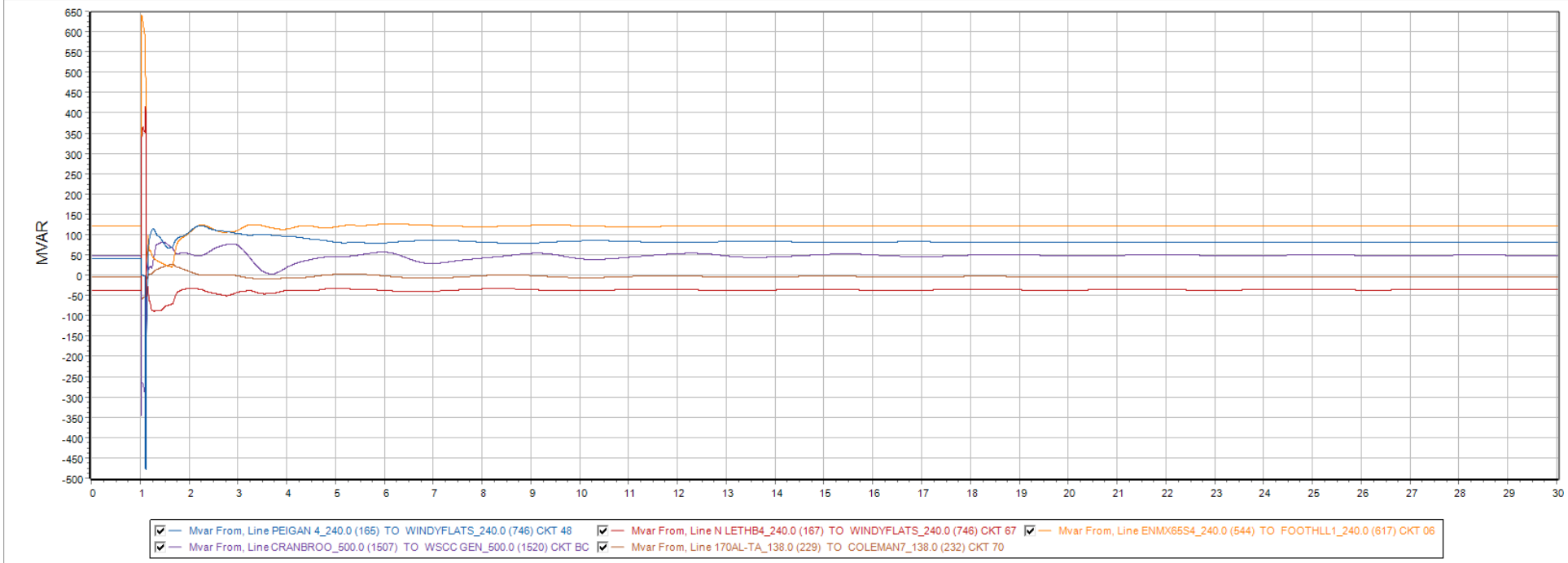
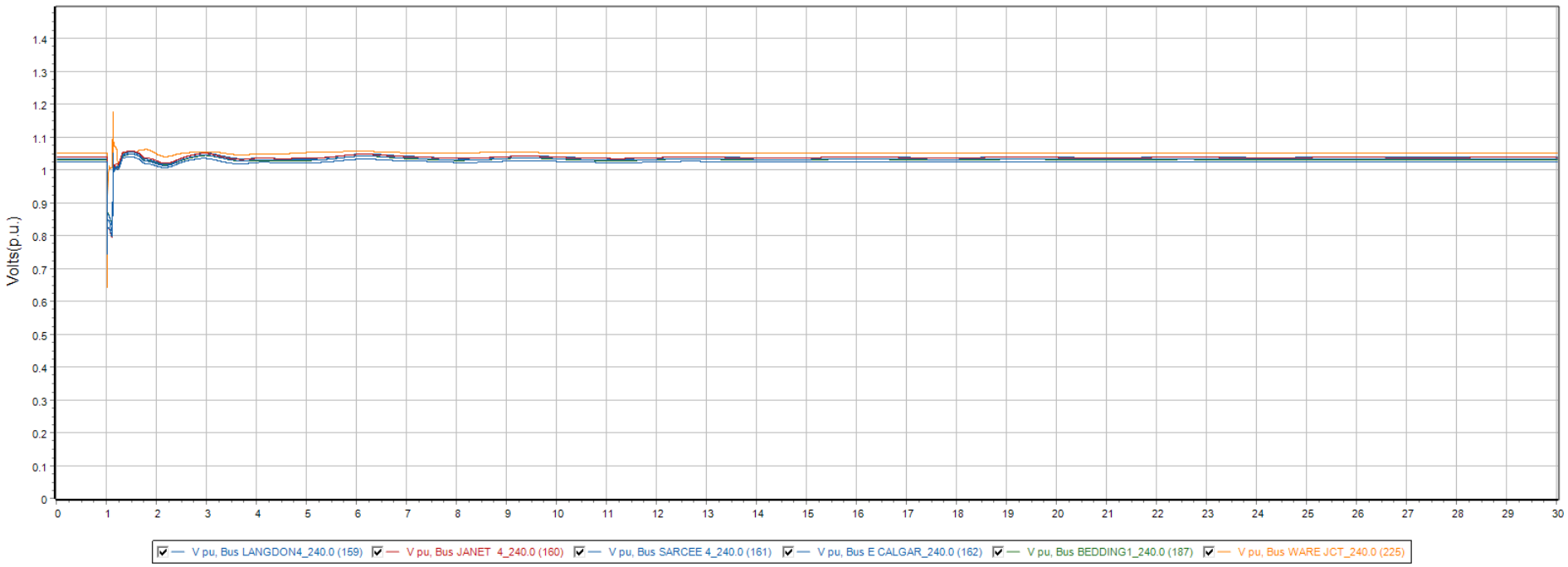
May 16, 2023 22:40:55

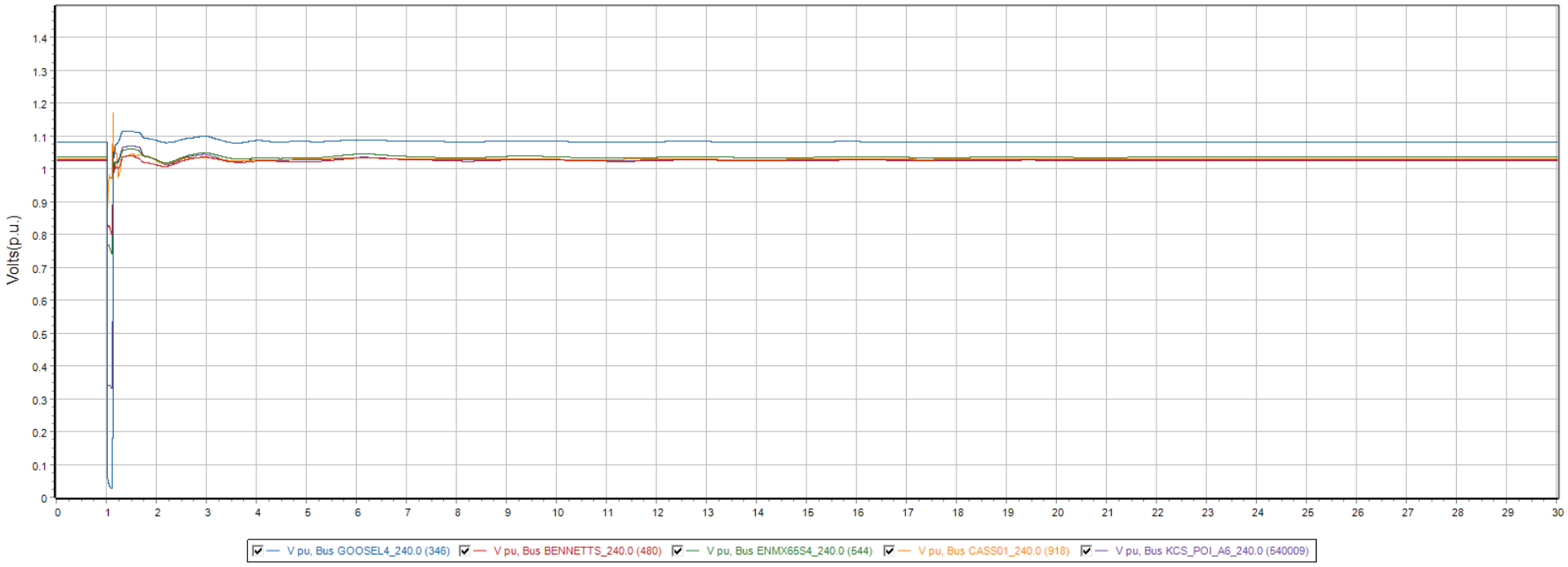
Monitor Line MW & MVAR. Q4



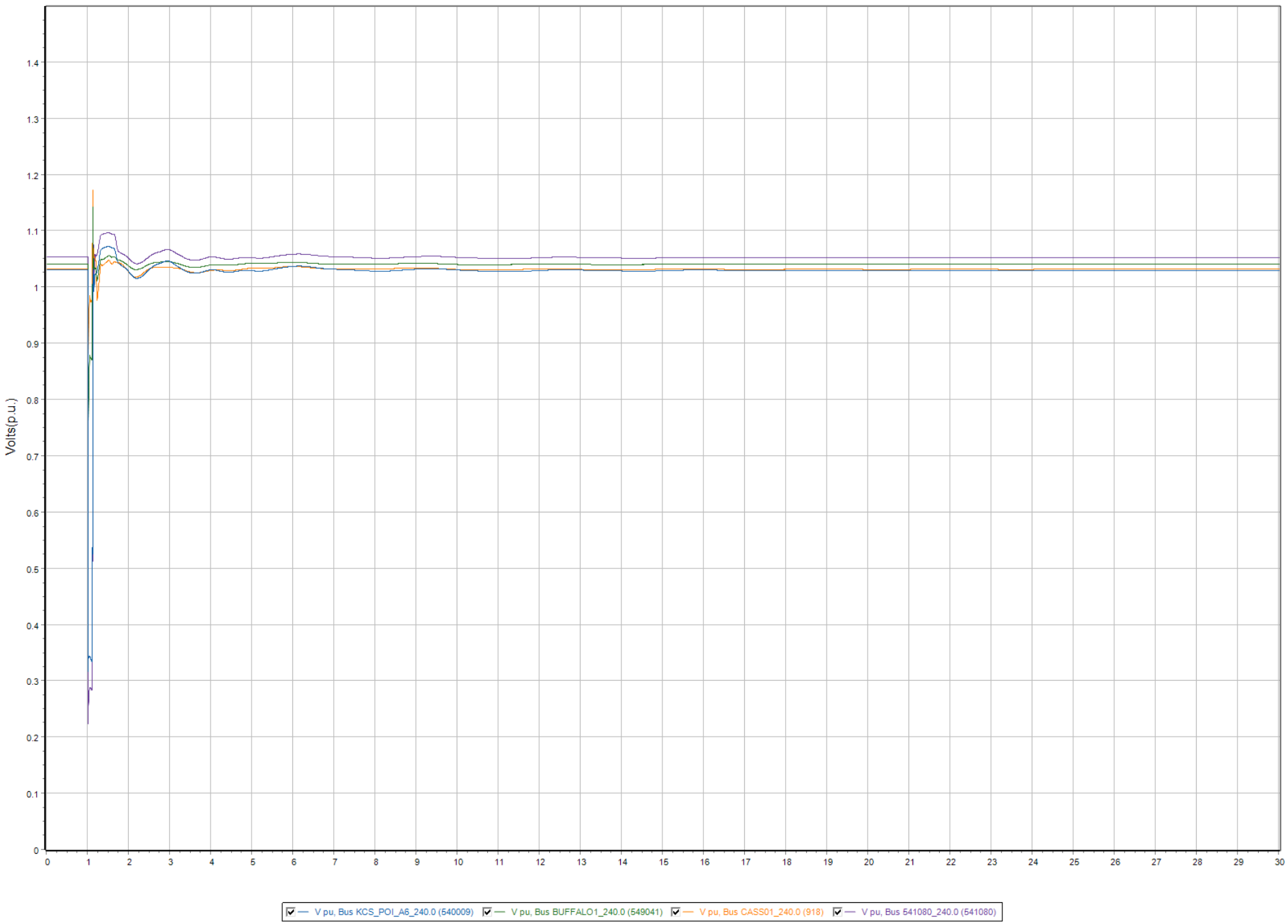


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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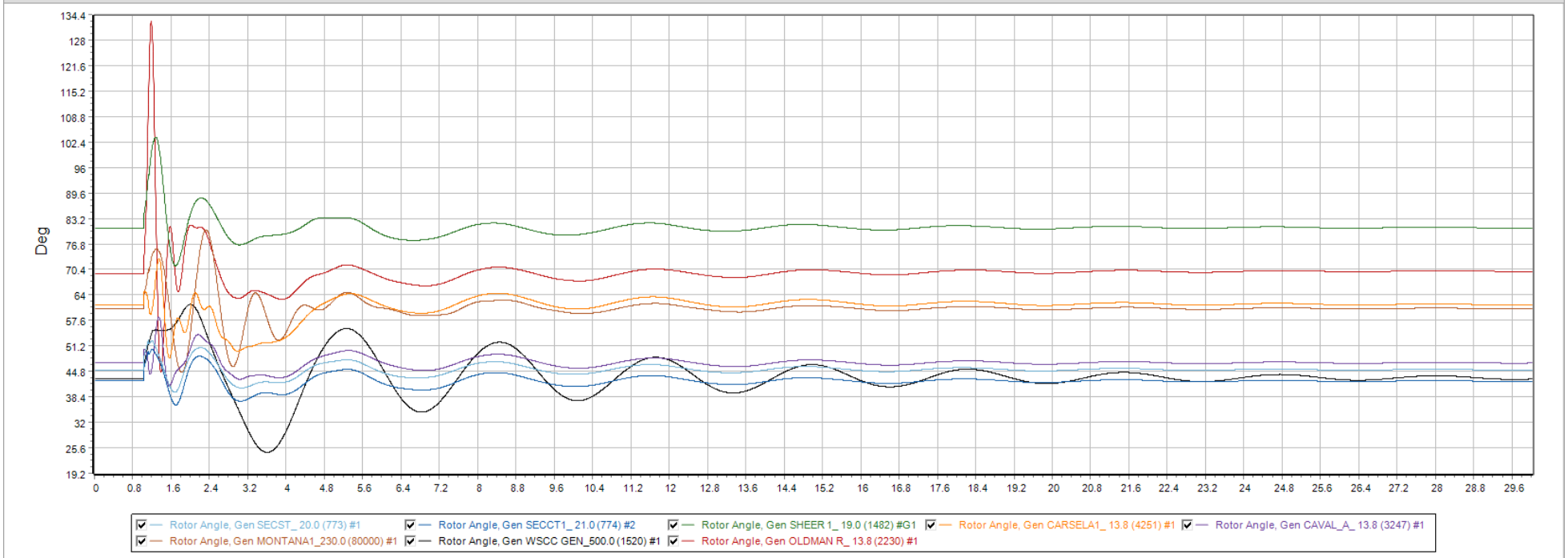
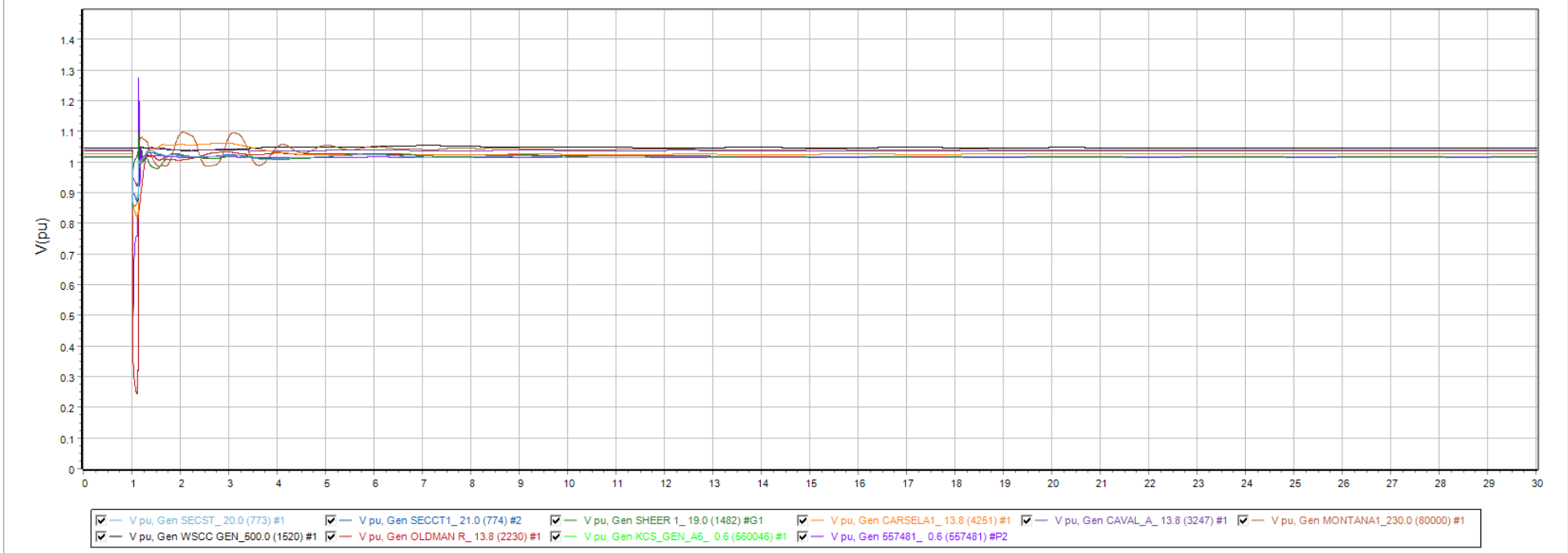
May 16, 2023 22:40:56

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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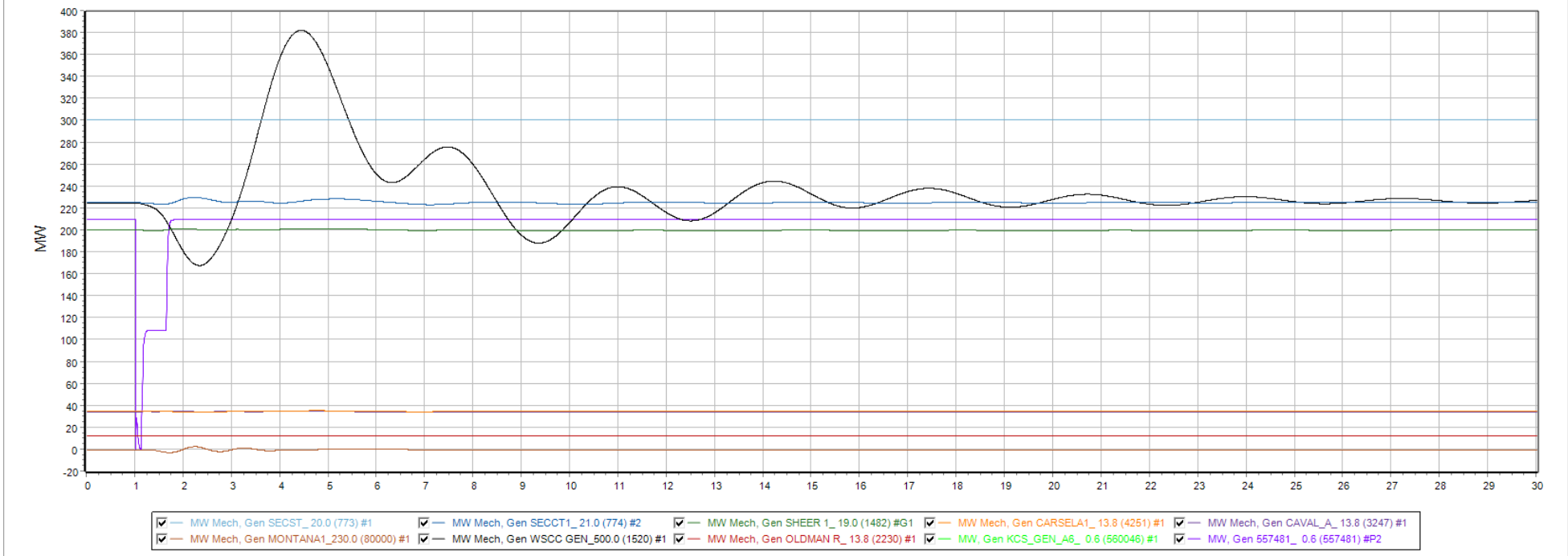
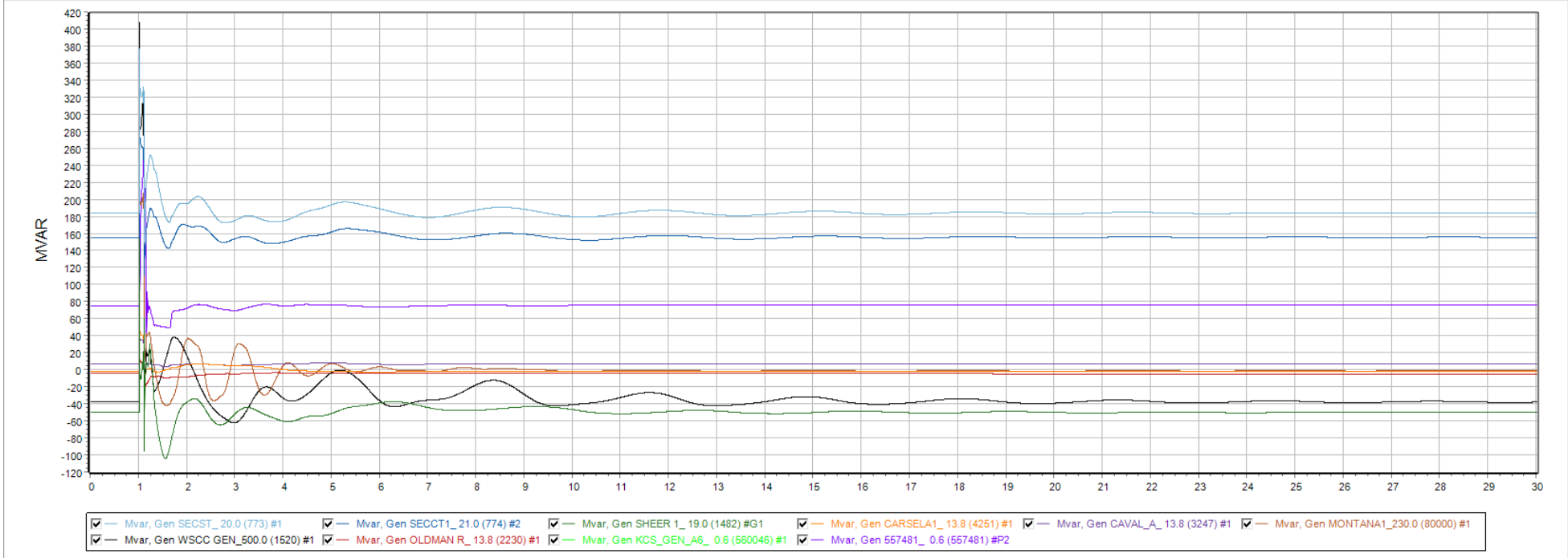
May 16, 2023 22:51:44

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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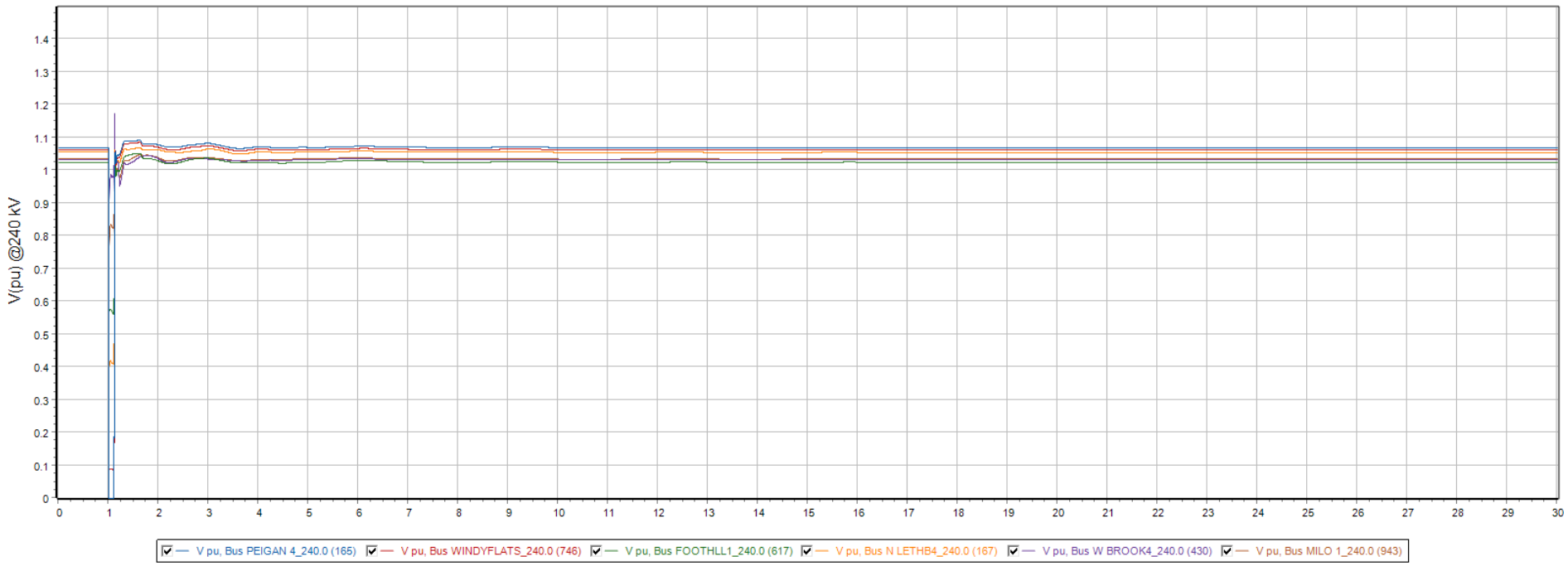
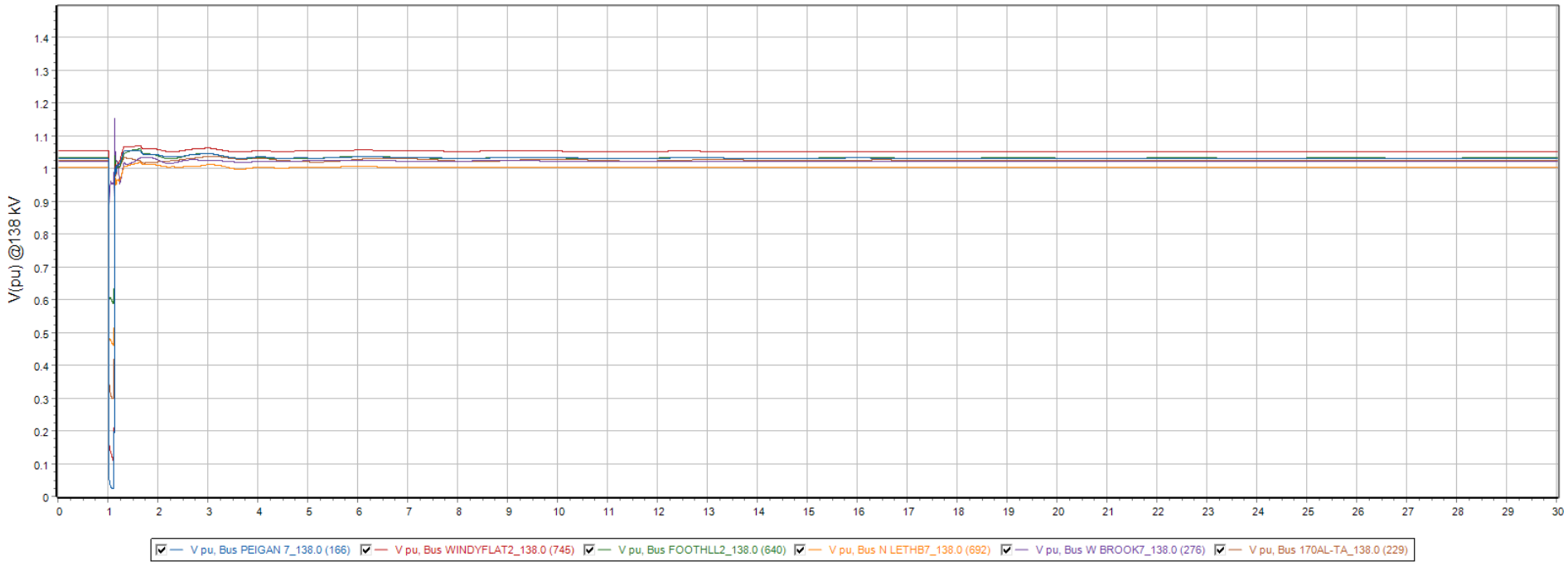
May 16, 2023 22:51:45

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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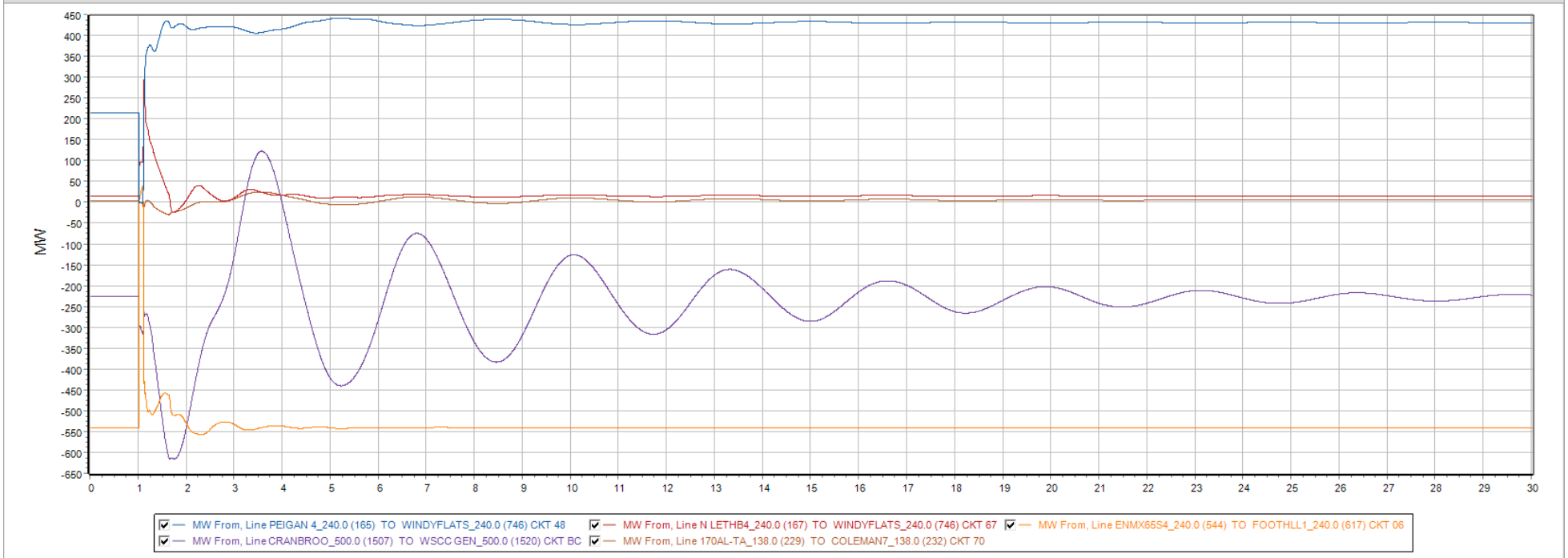
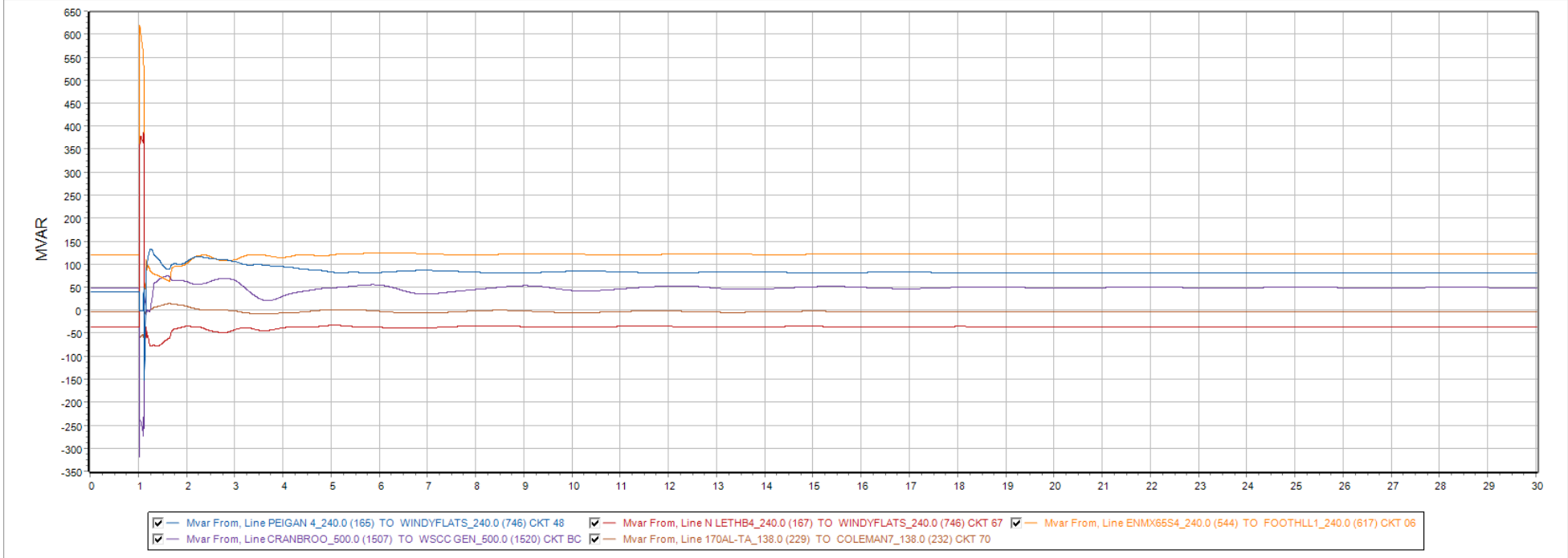
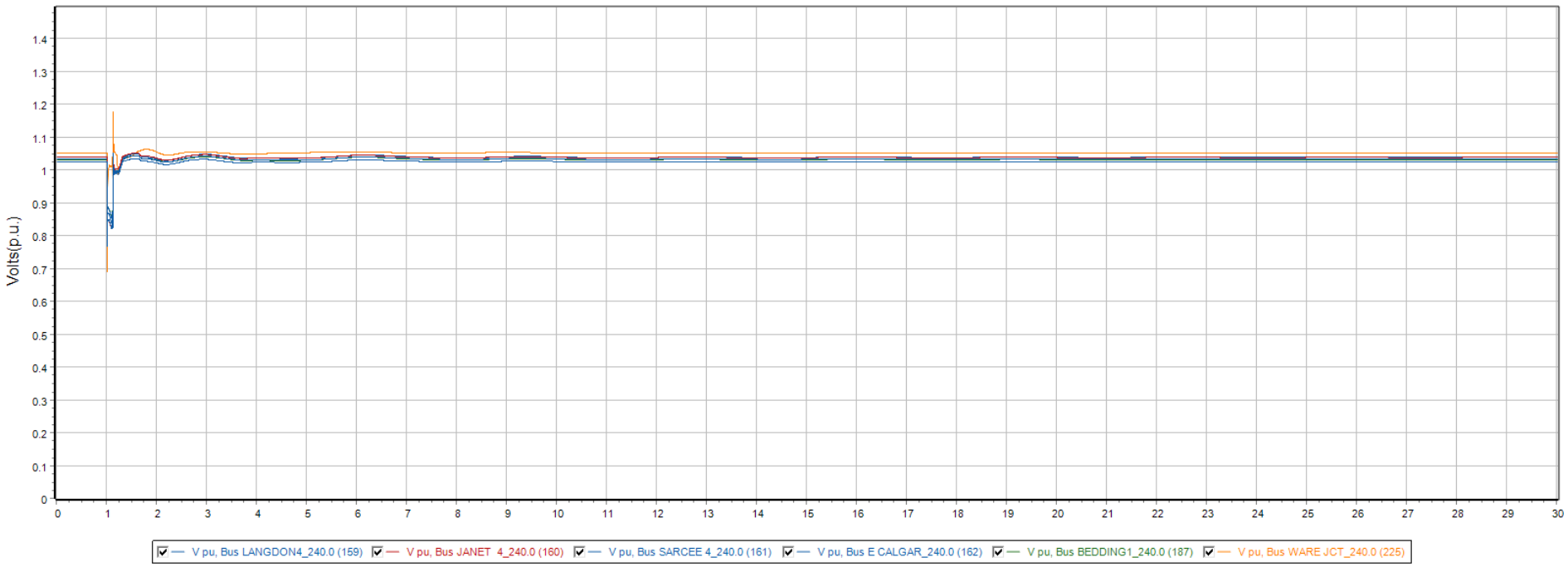
May 16, 2023 22:51:45

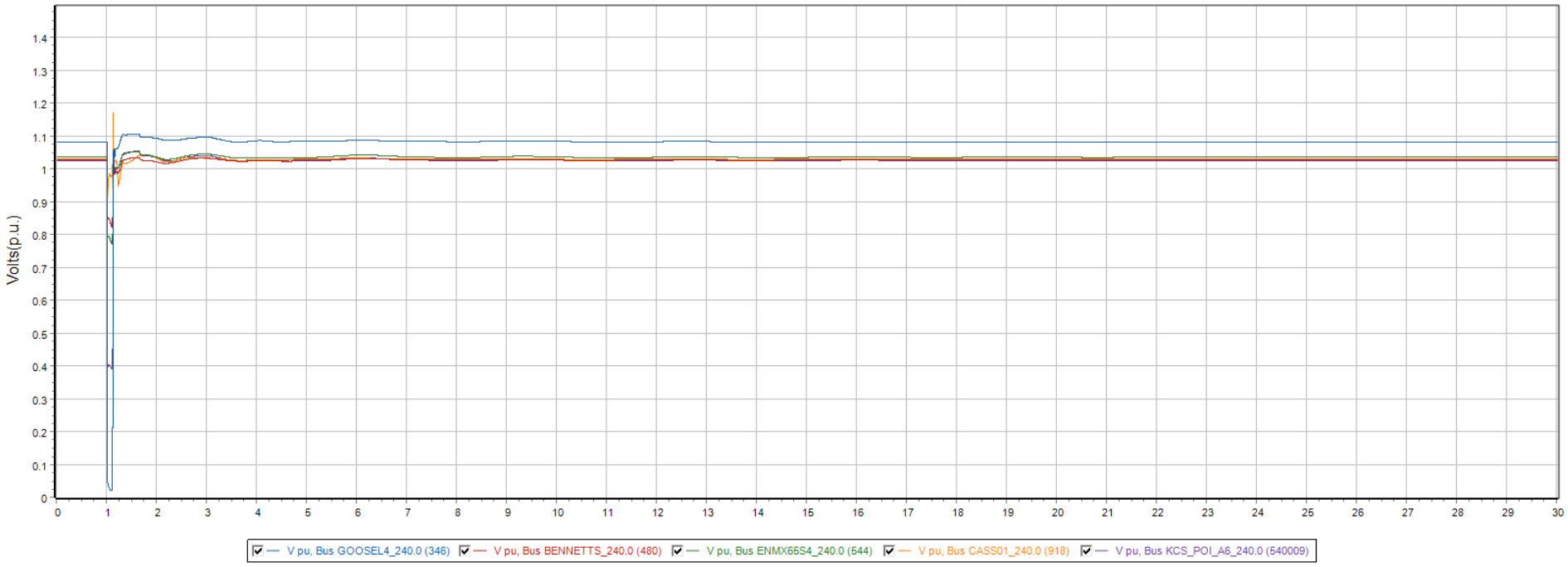
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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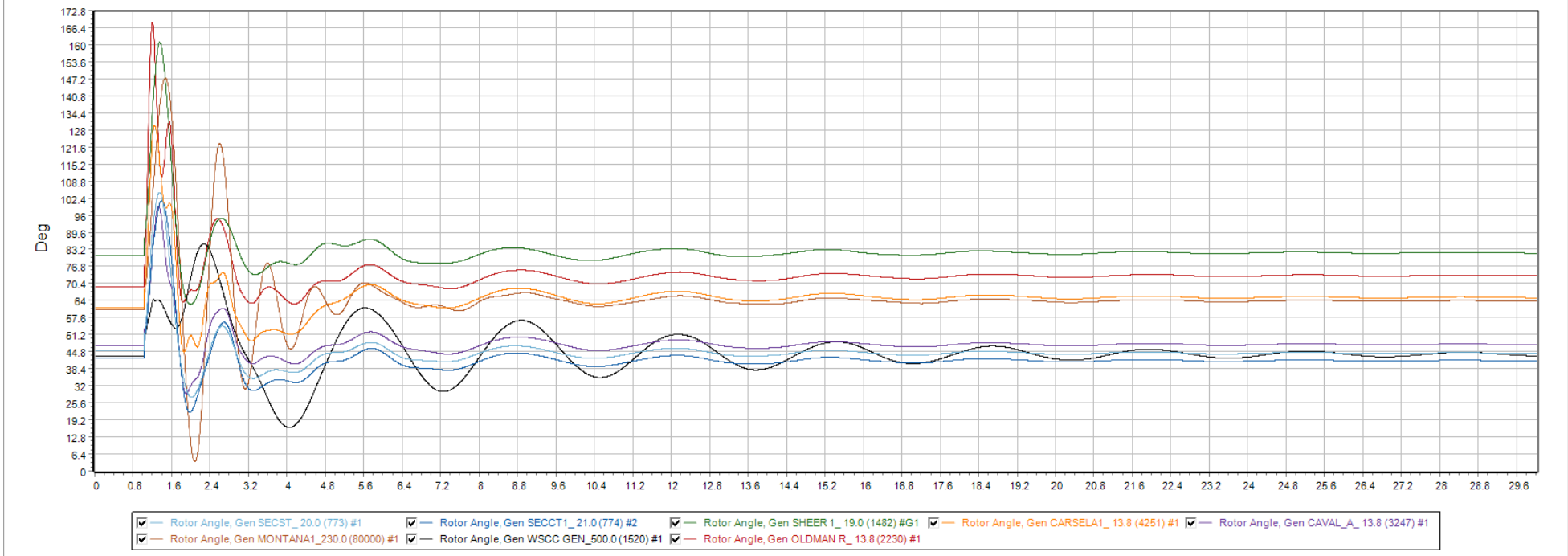
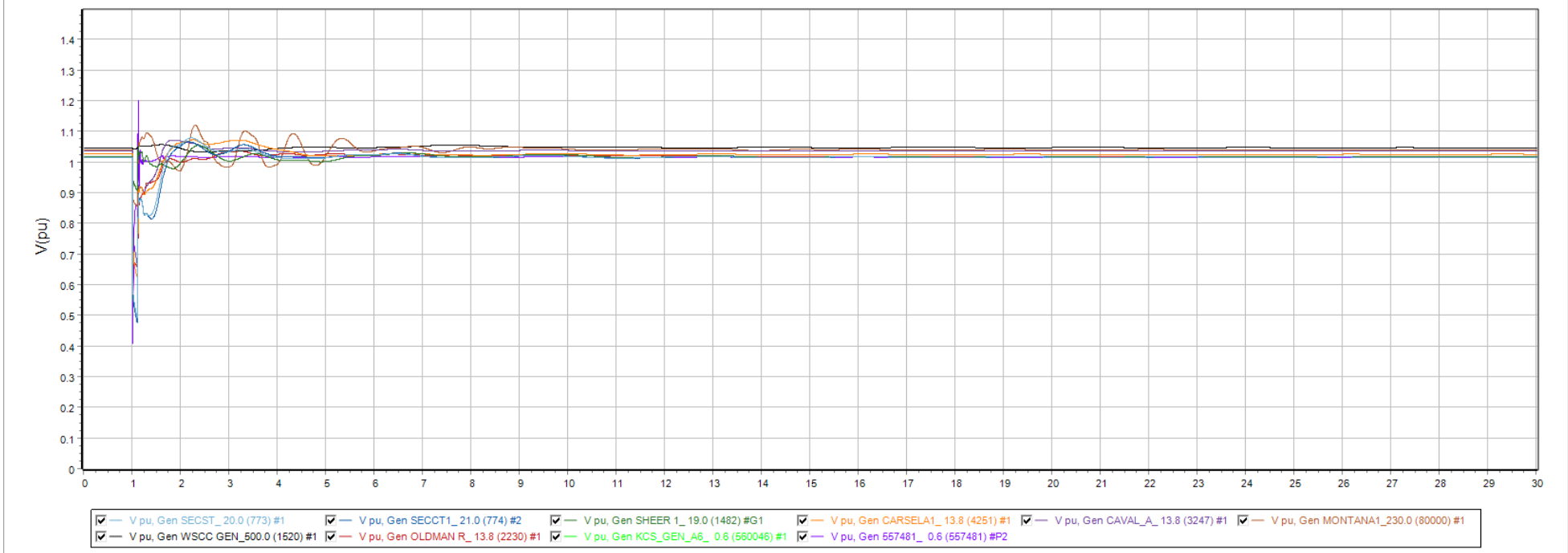
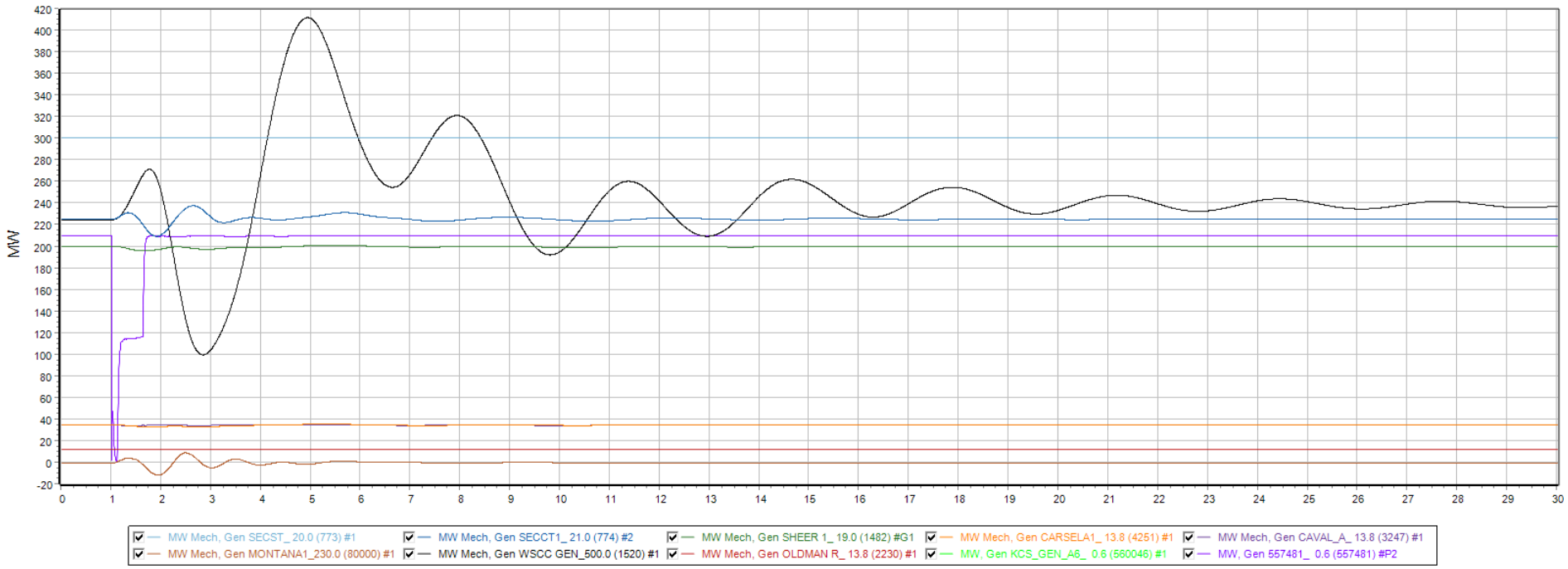
May 16, 2023 22:51:46

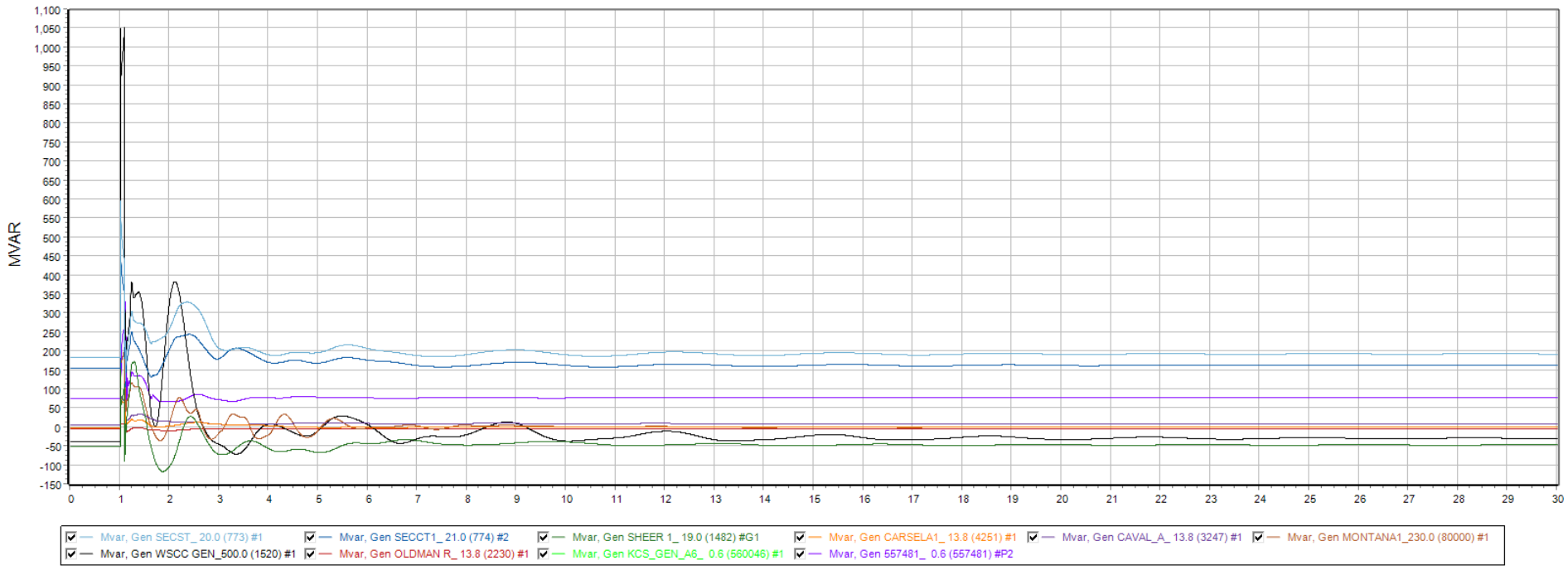
Monitor Gens. Q1



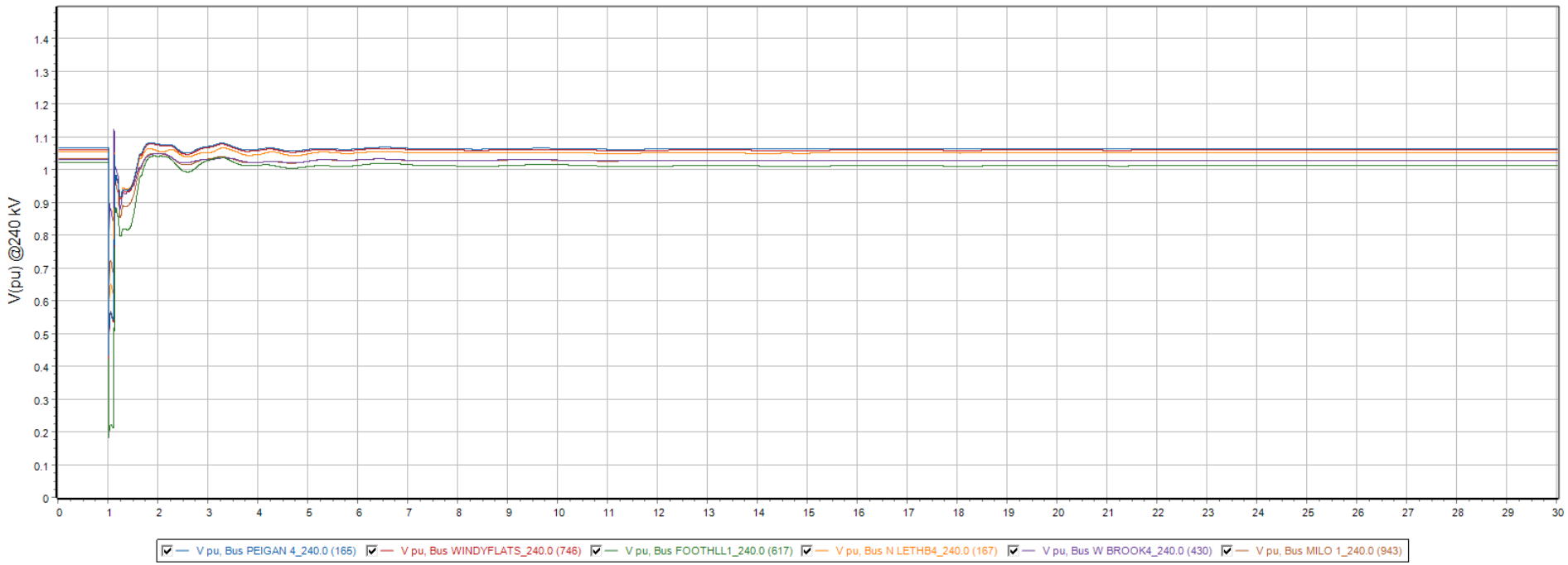


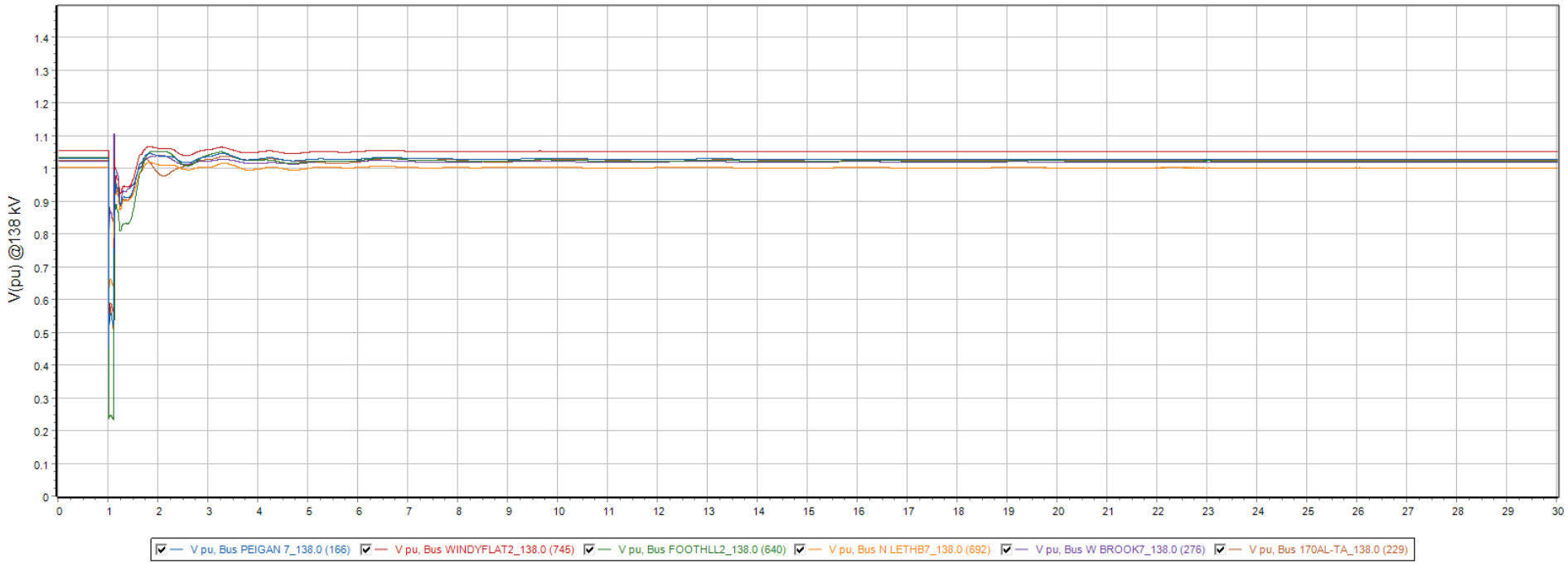
Monitor Gens. Q2





Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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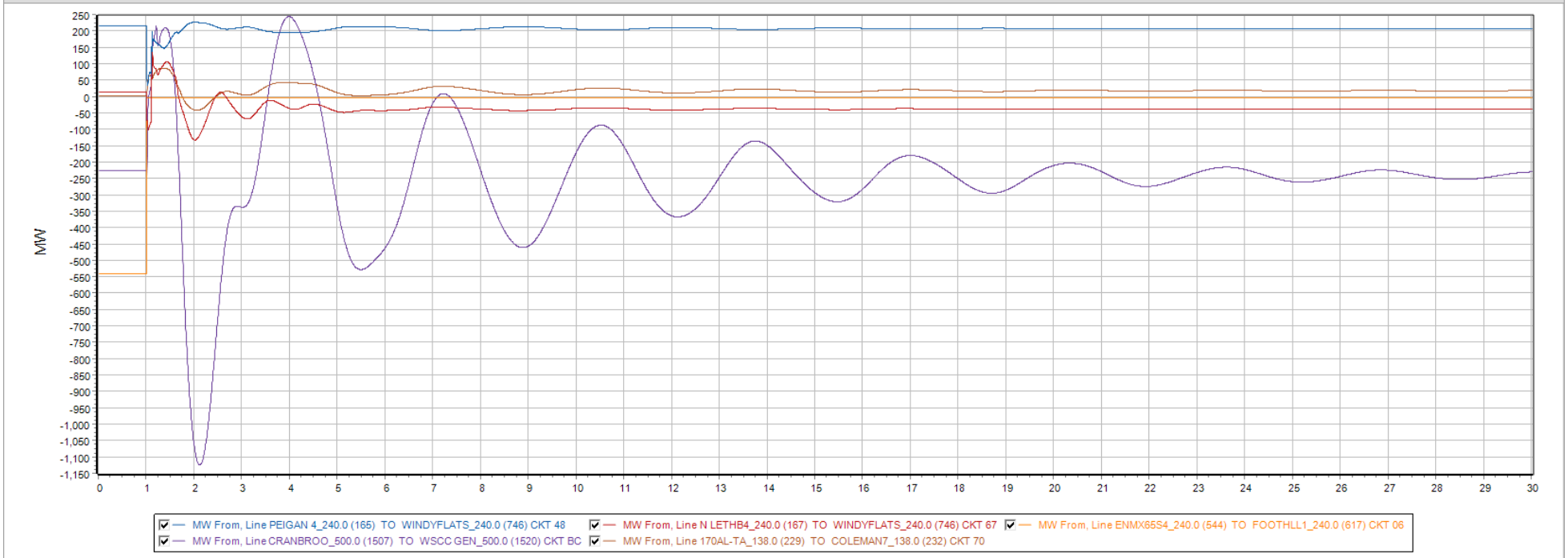
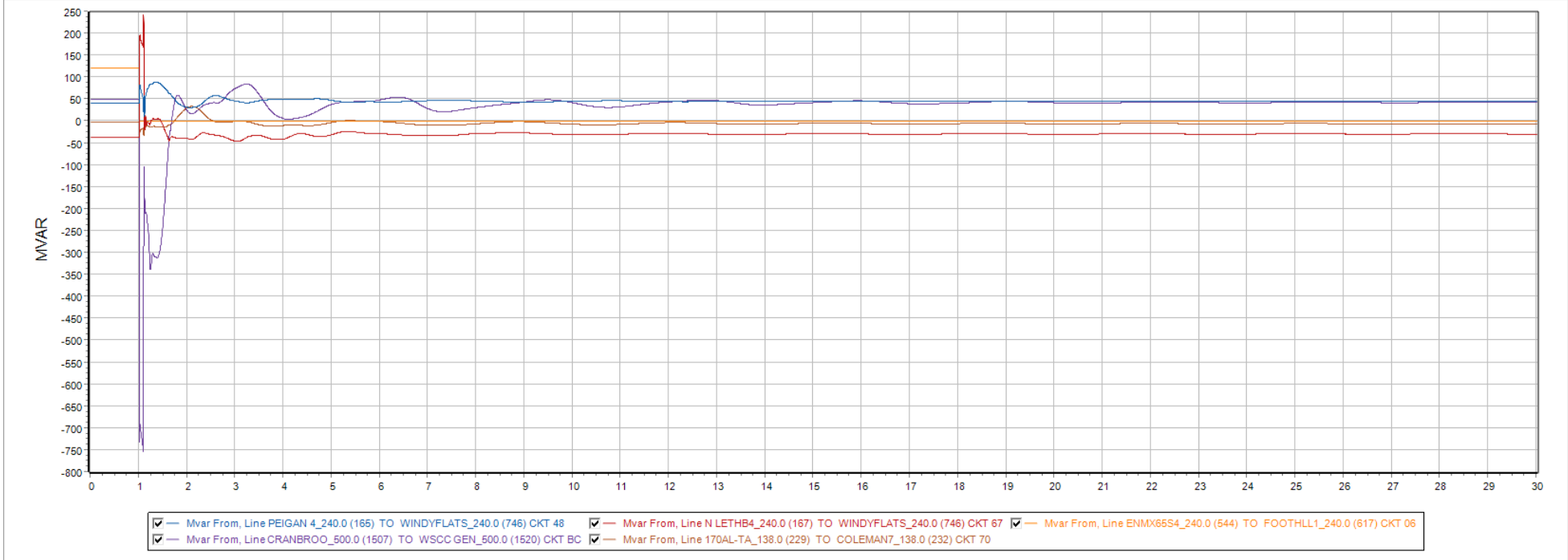
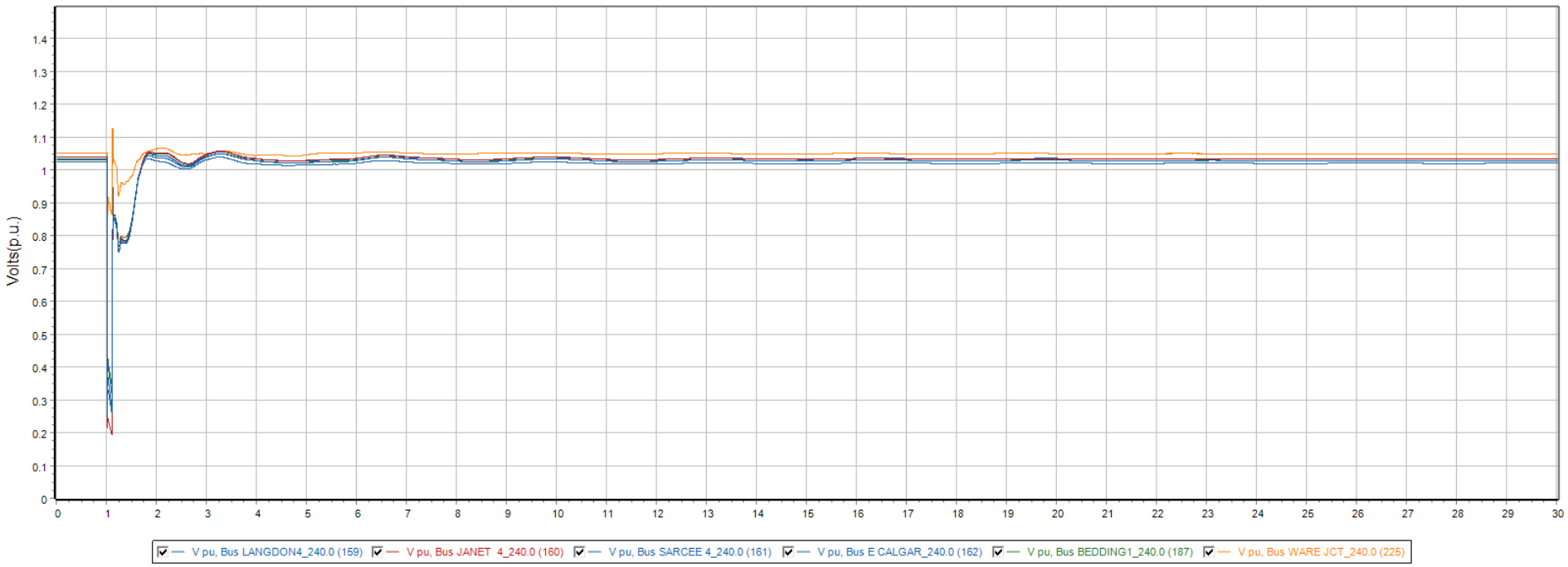
May 16, 2023 23:00:21

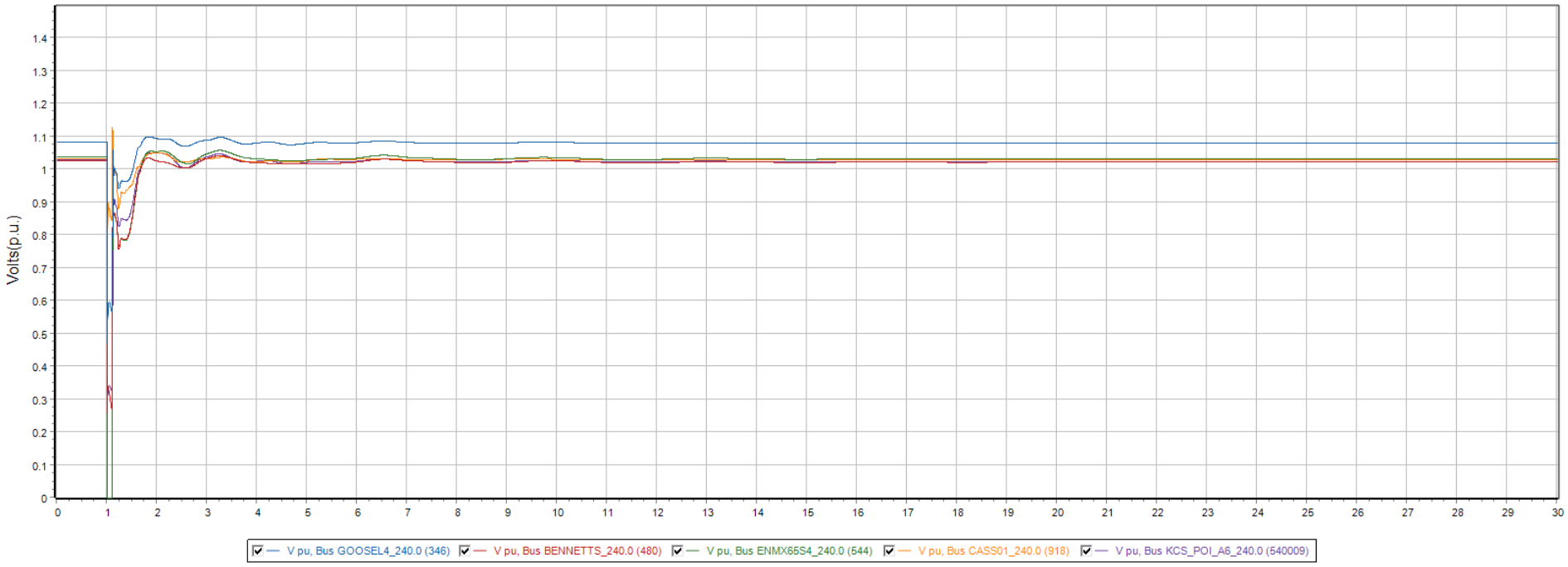
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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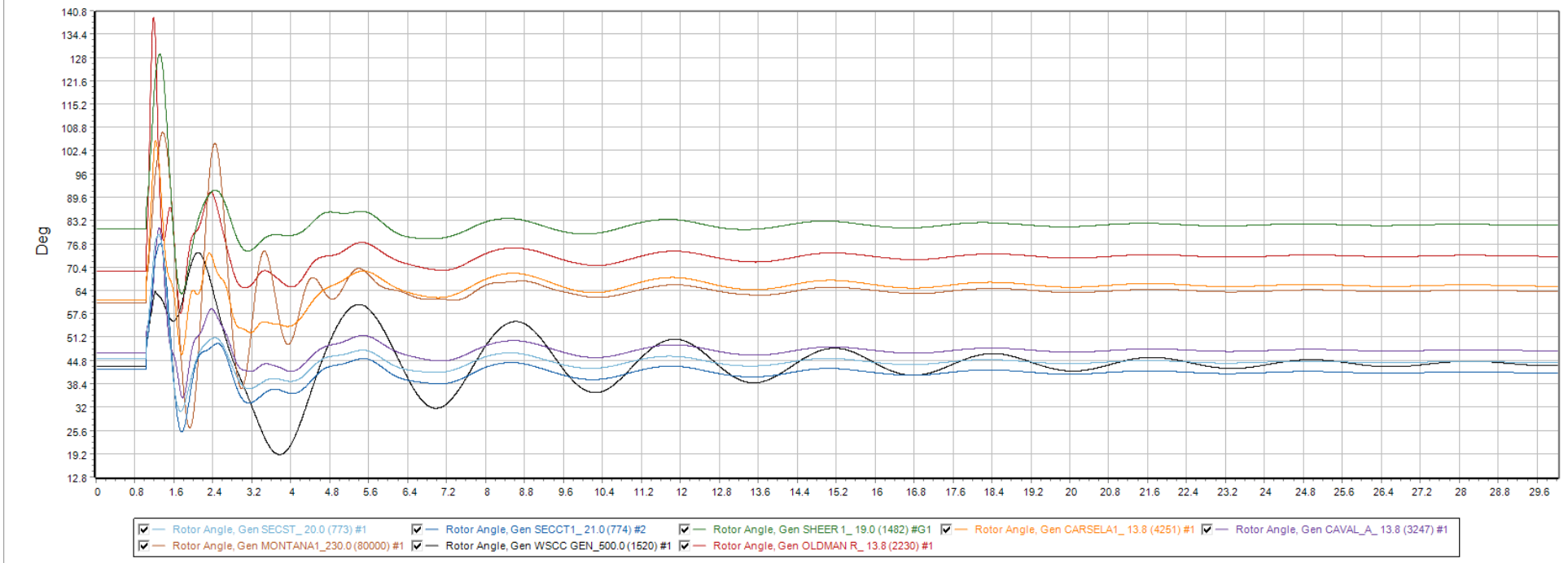
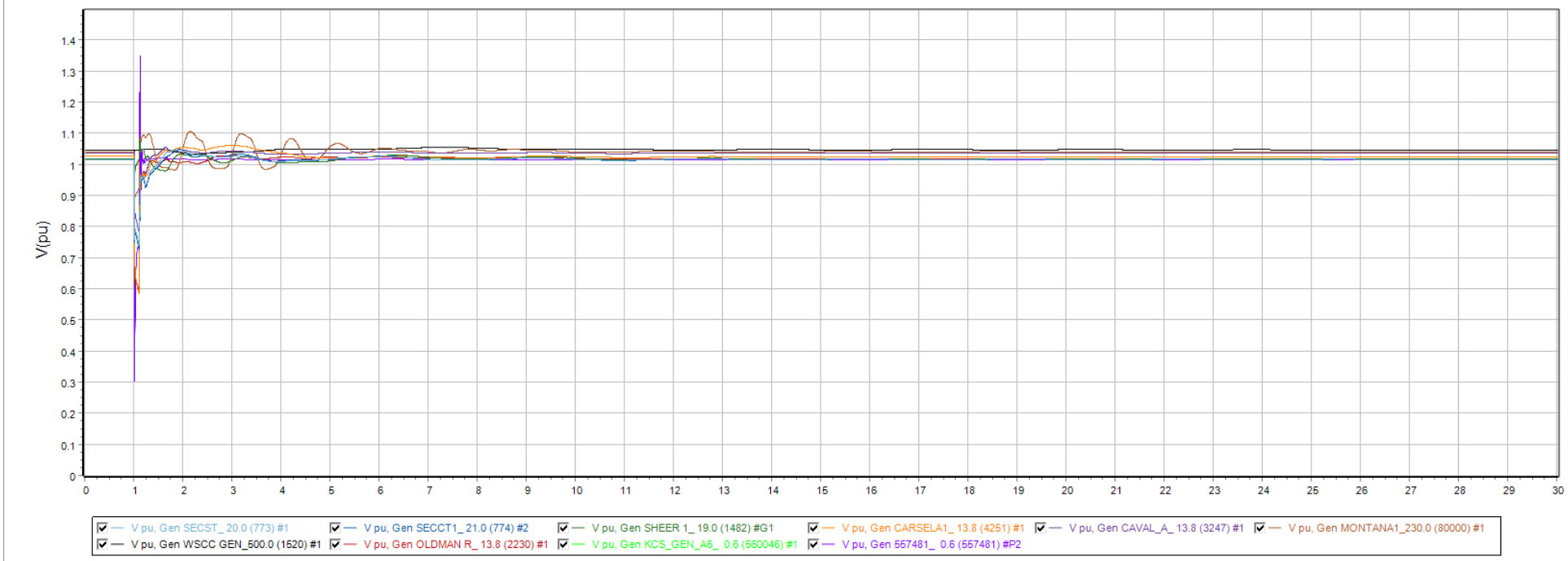
May 16, 2023 23:00:23

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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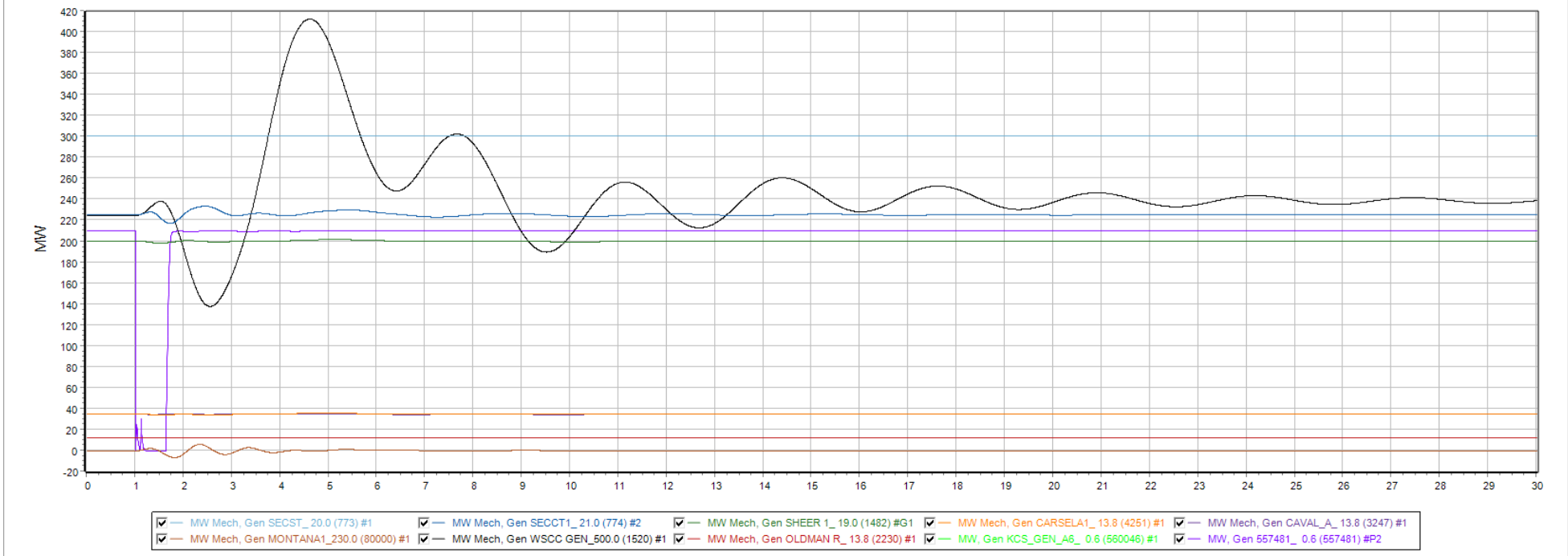
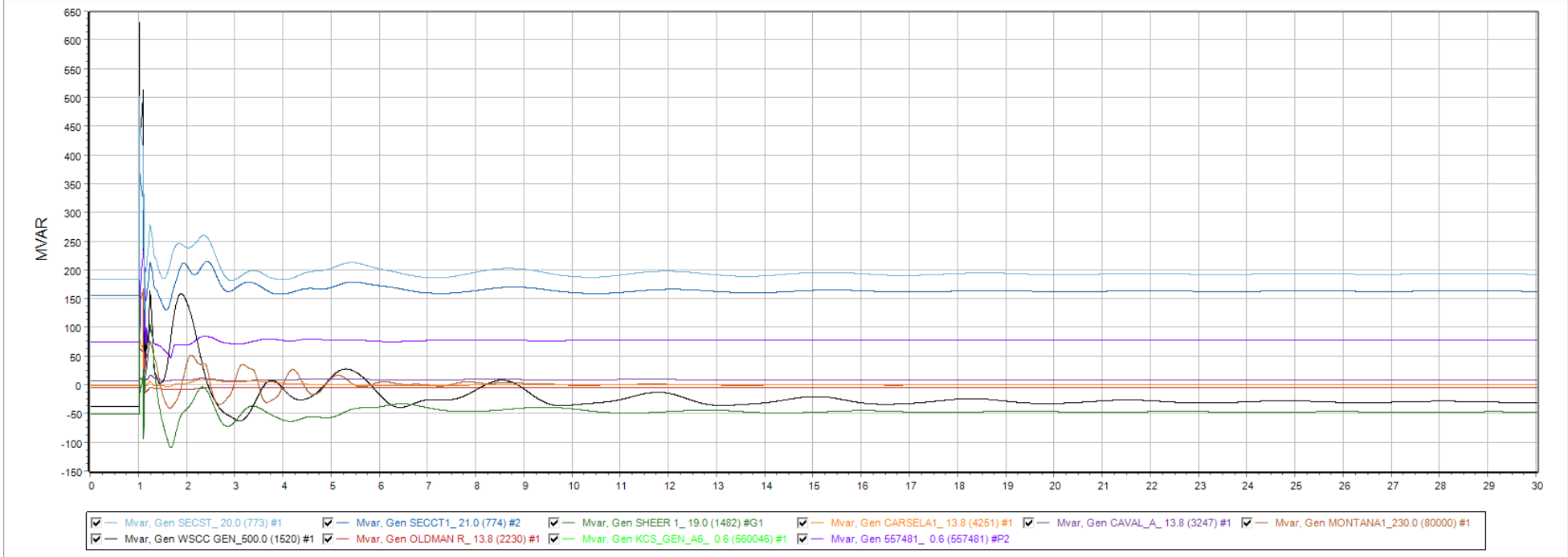
May 16, 2023 23:08:50

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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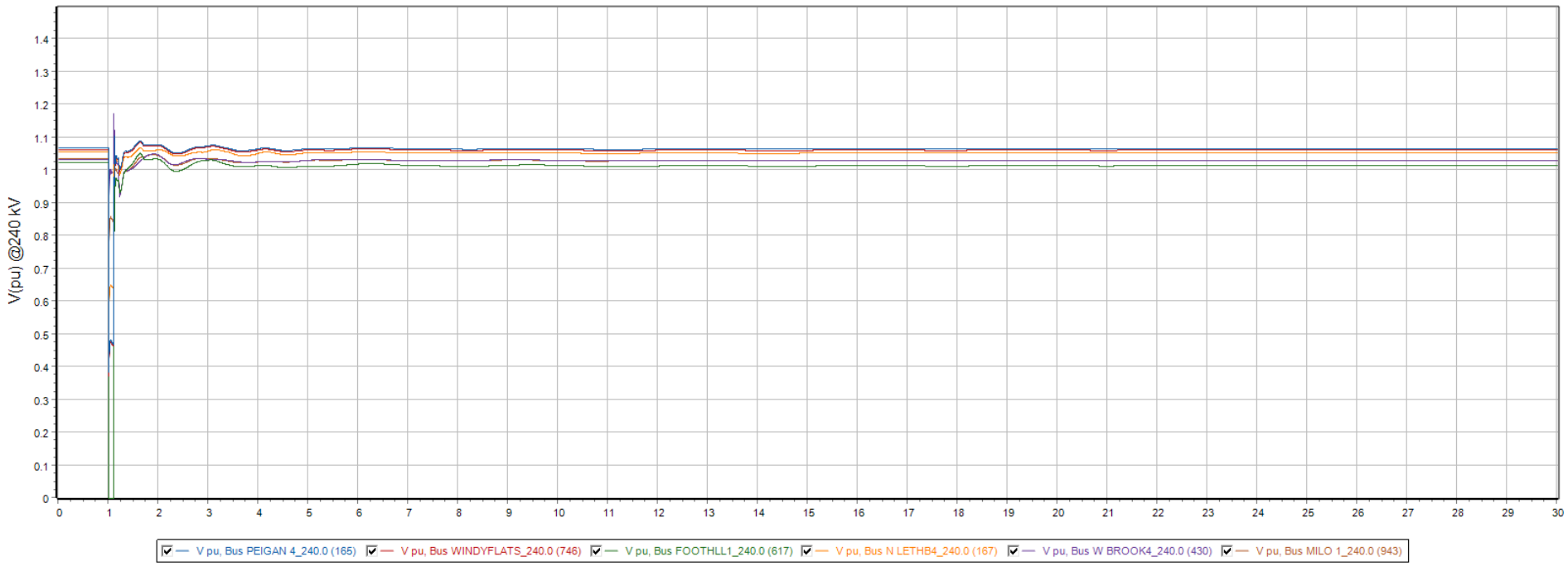
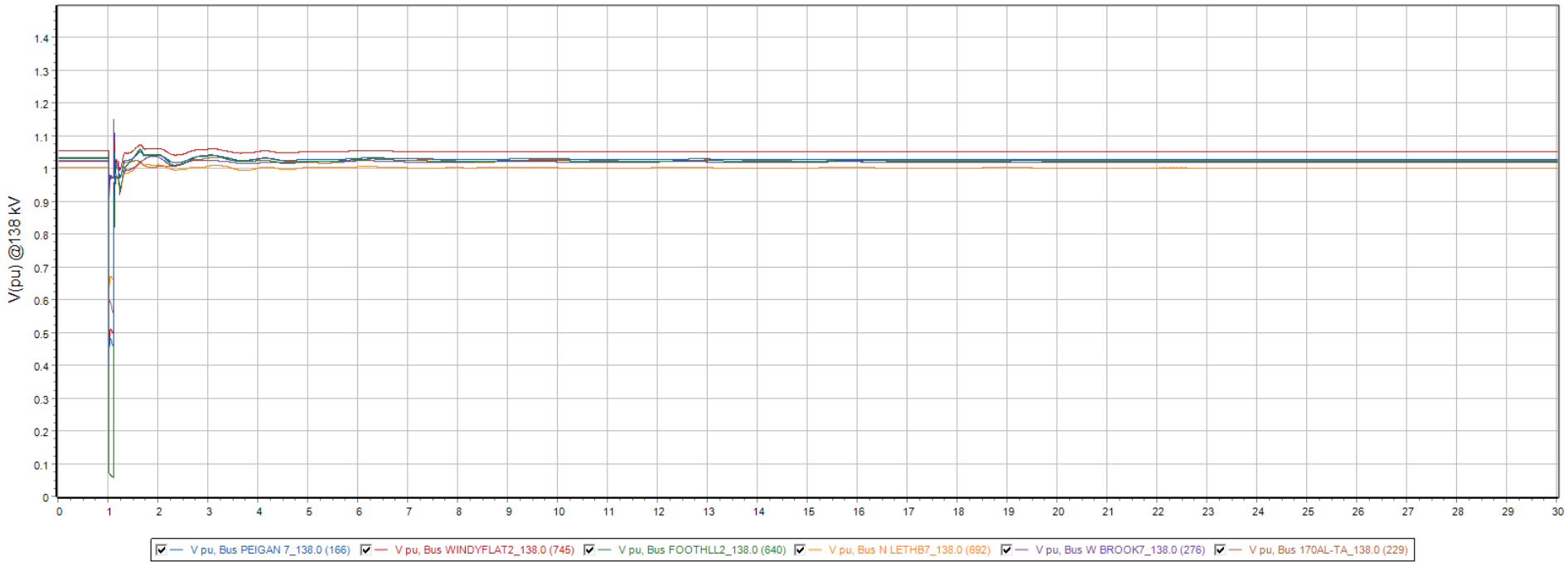
May 16, 2023 23:08:51

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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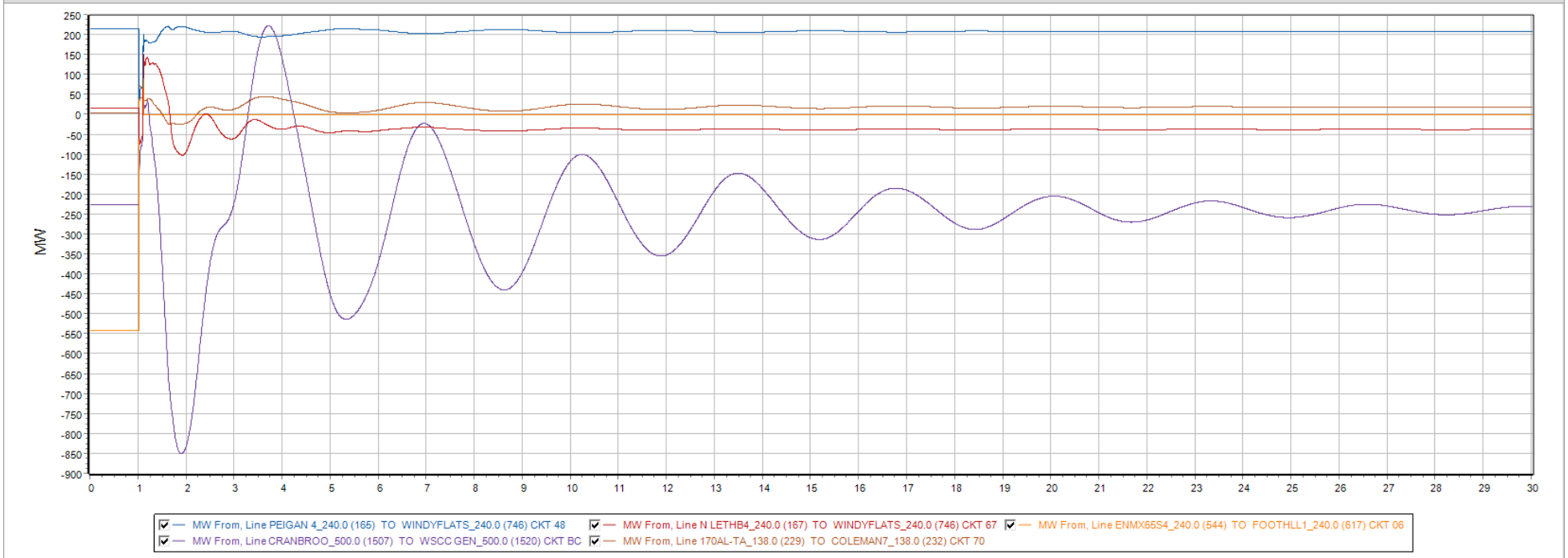
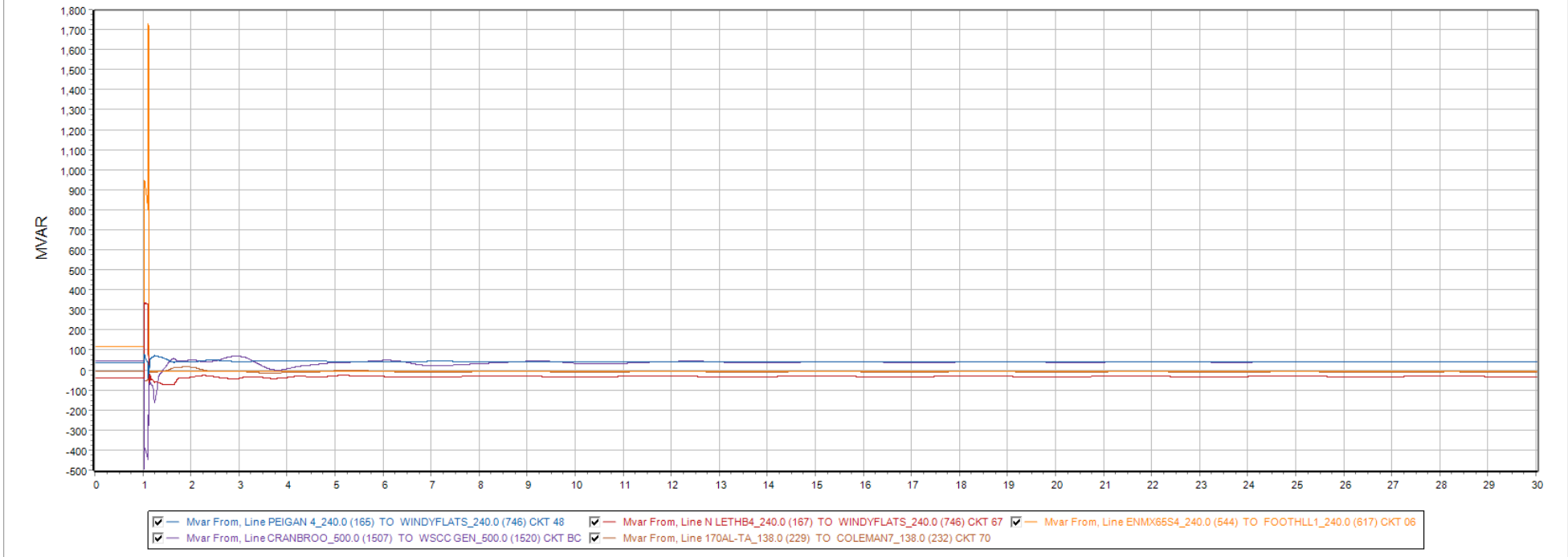
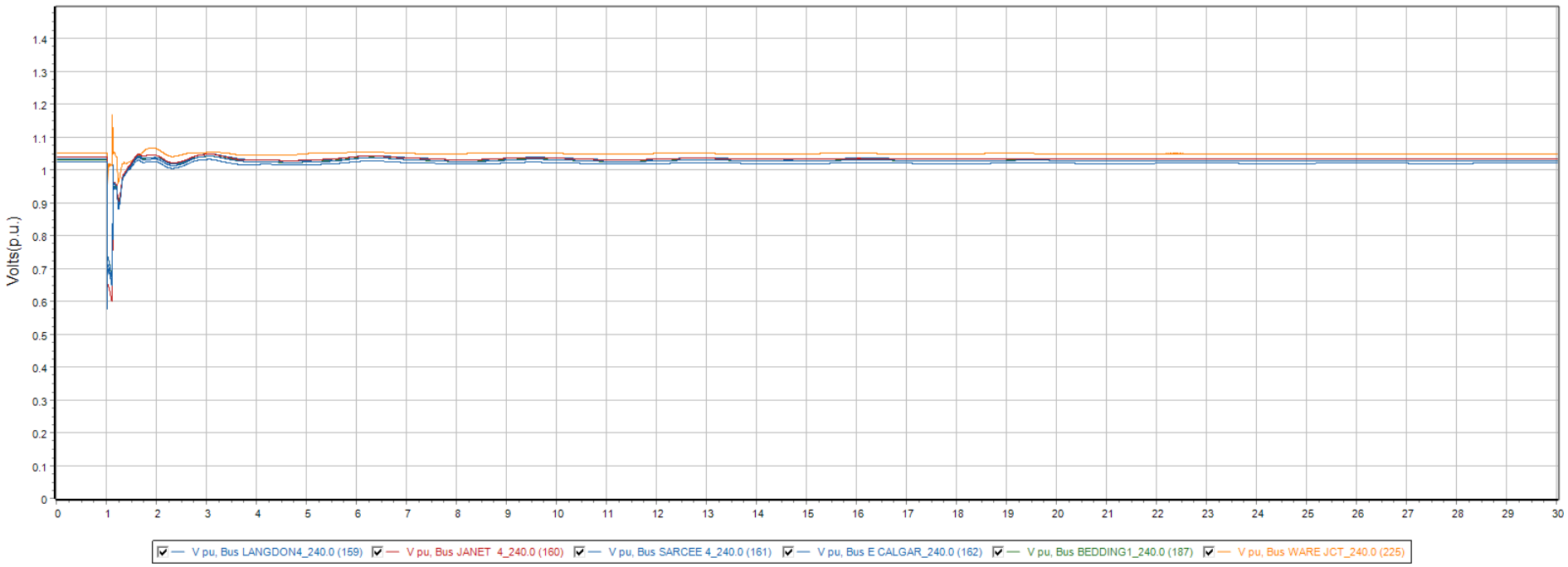
May 16, 2023 23:08:51

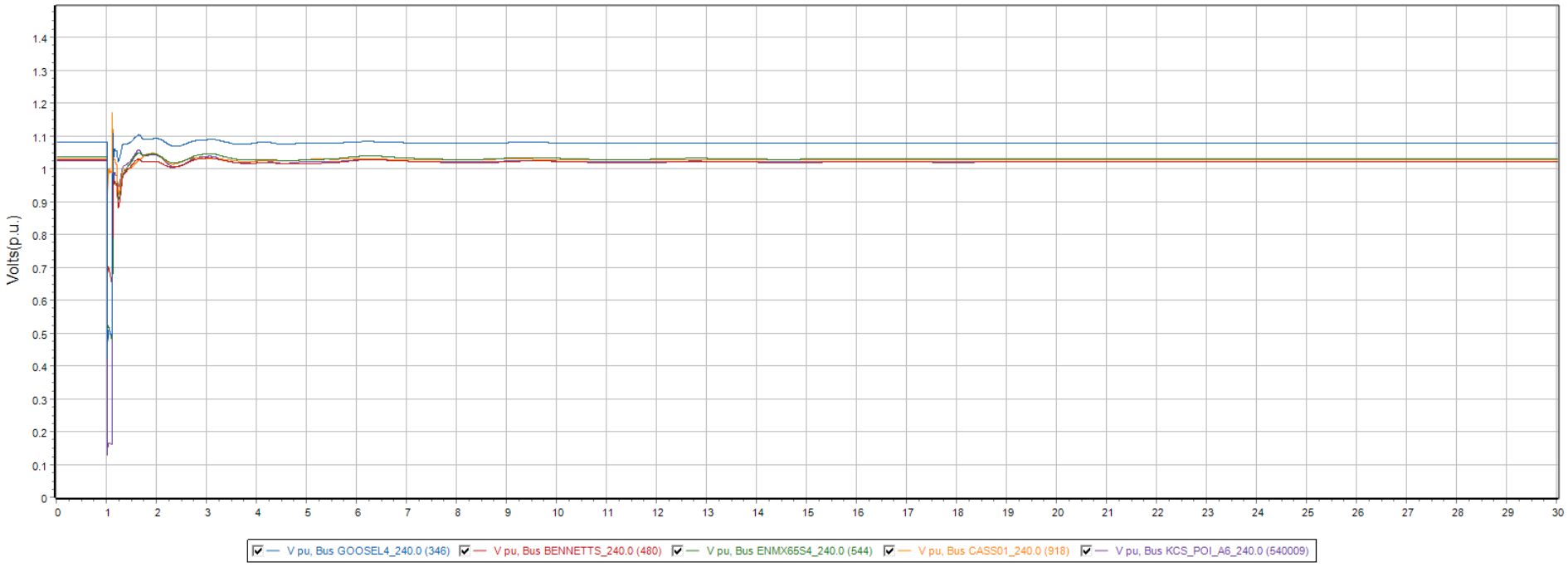
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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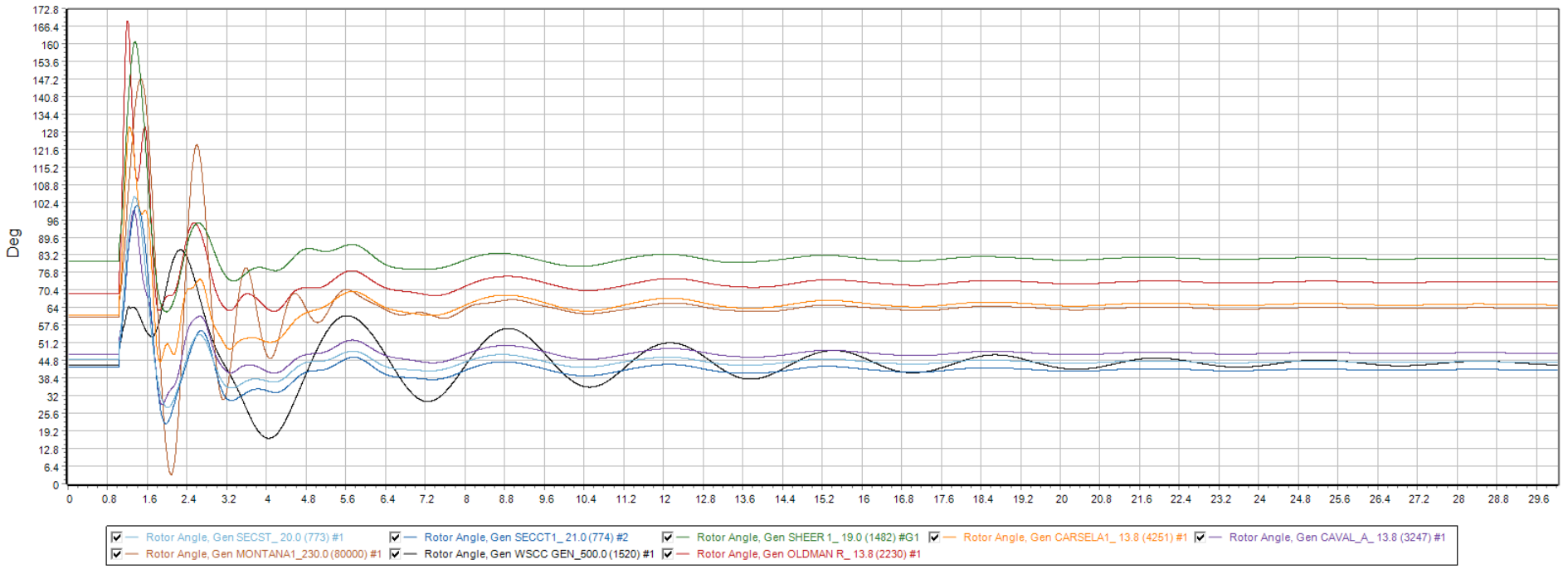
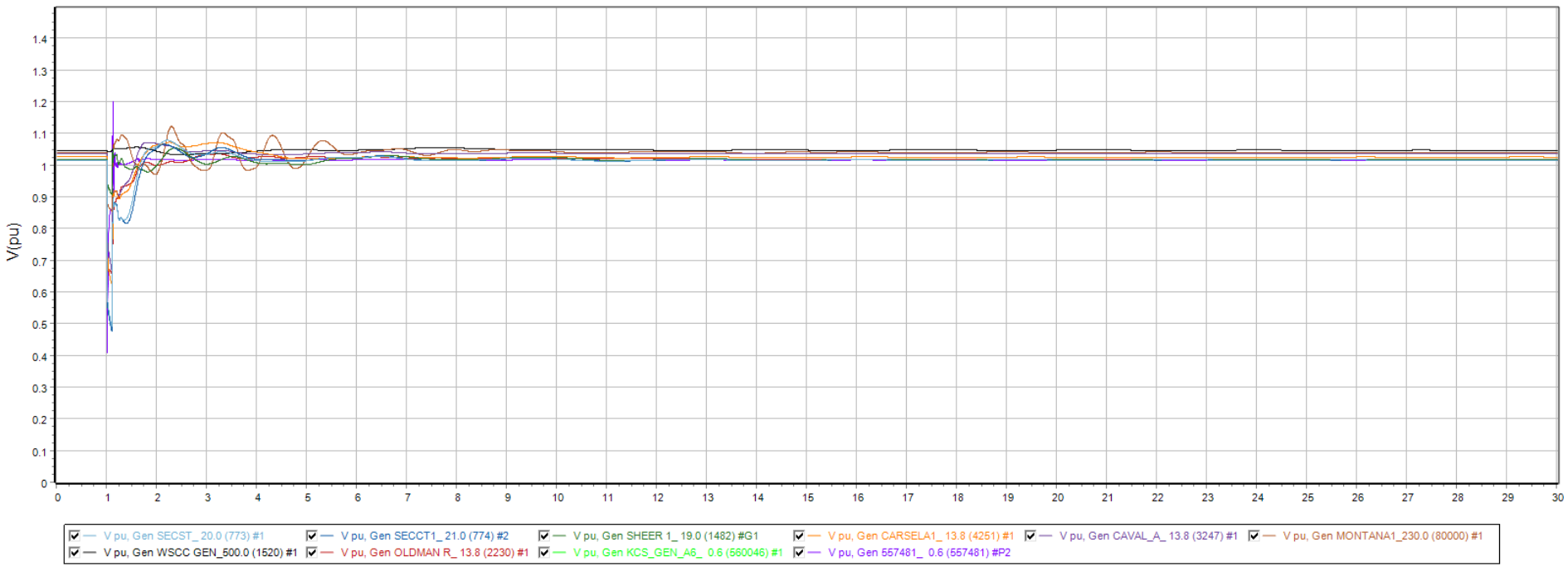
May 16, 2023 23:08:52

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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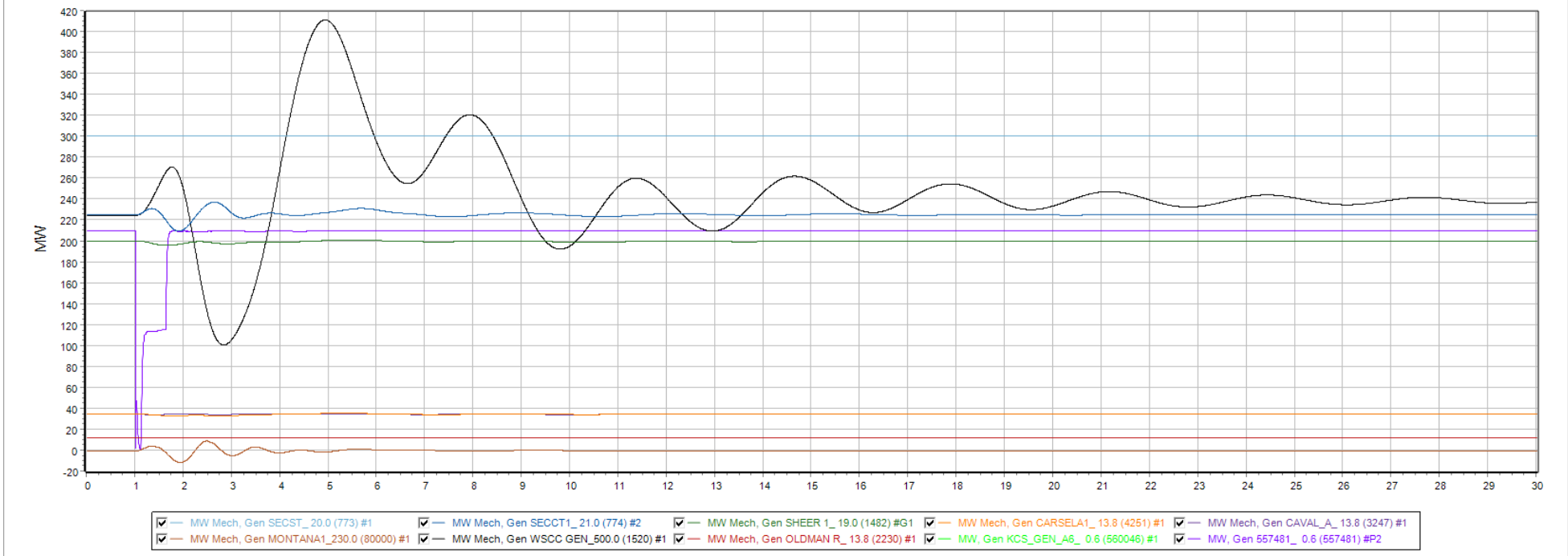
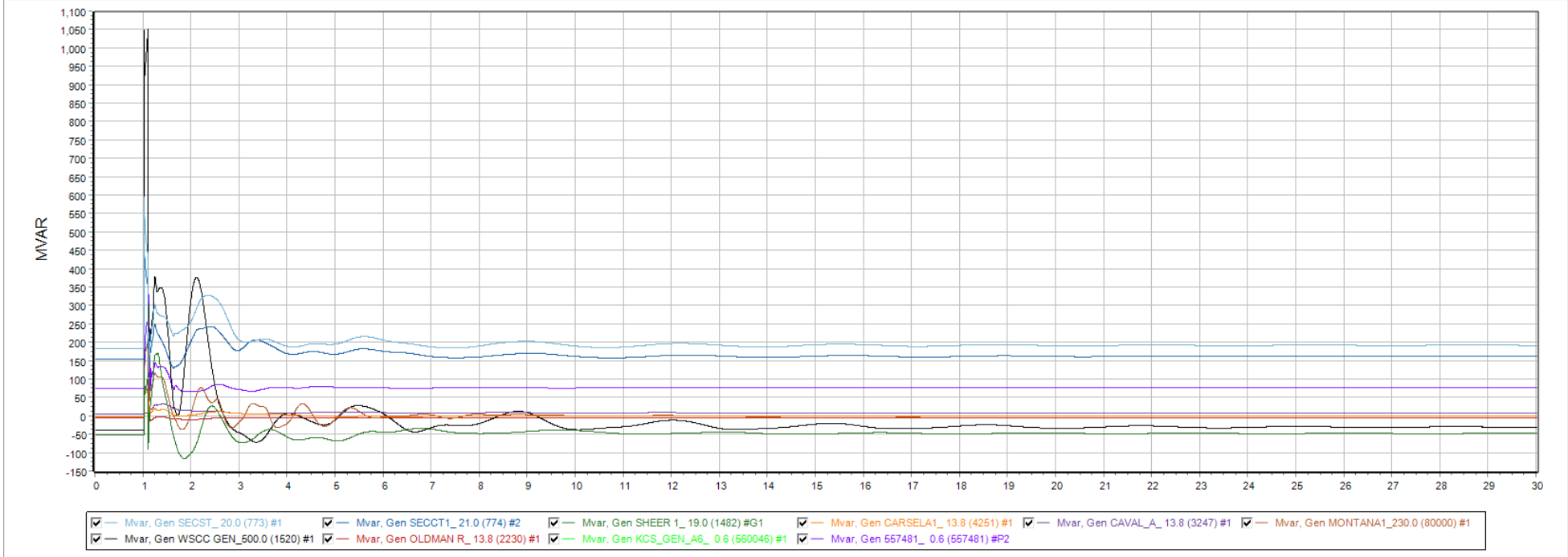
May 16, 2023 23:43:11

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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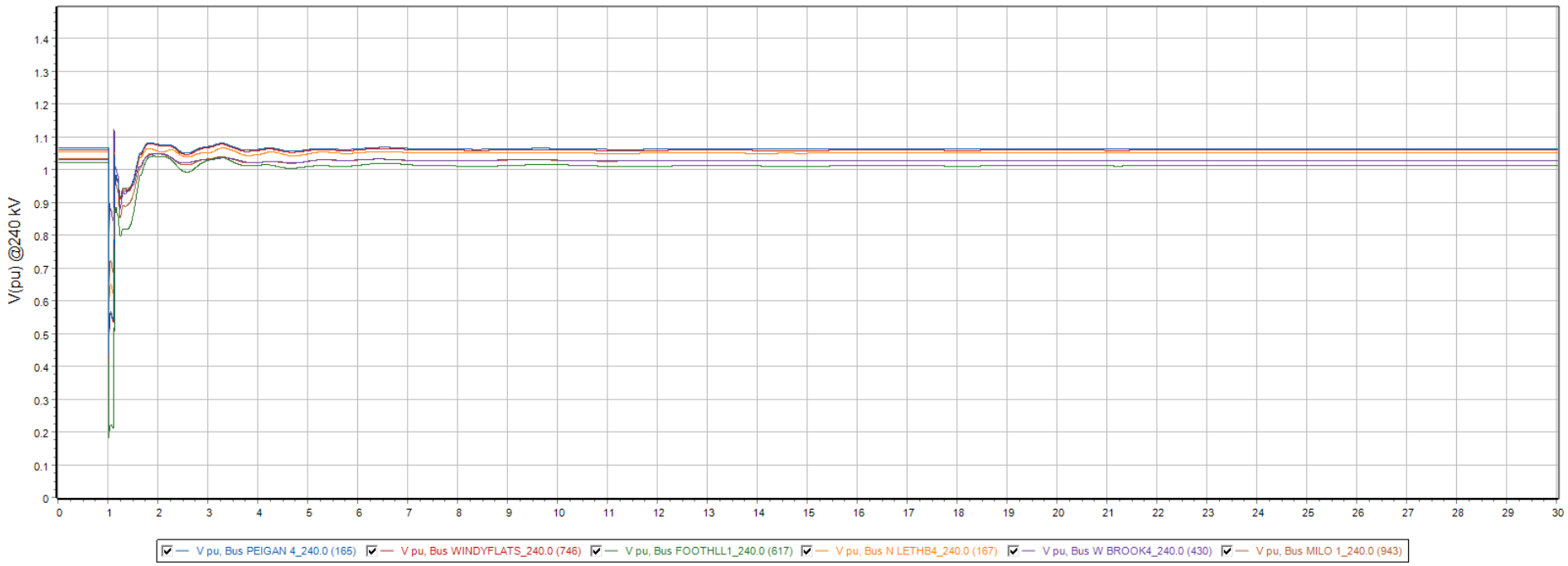
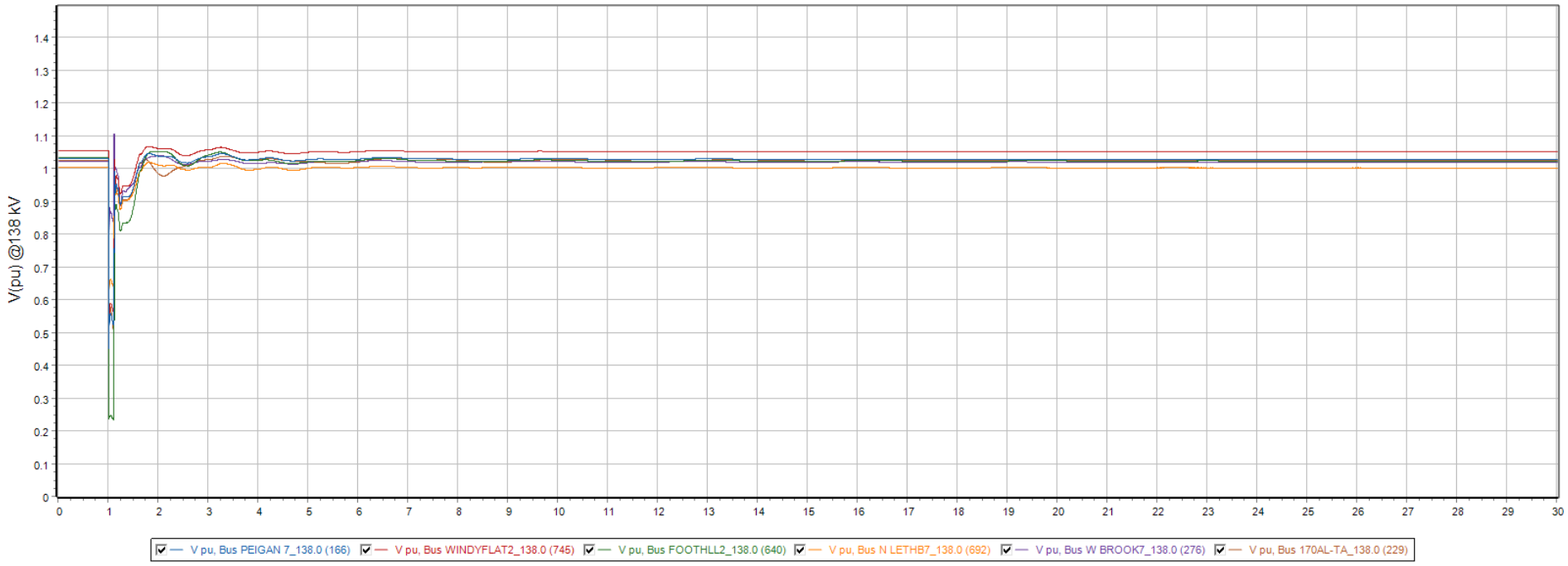
May 16, 2023 23:43:12

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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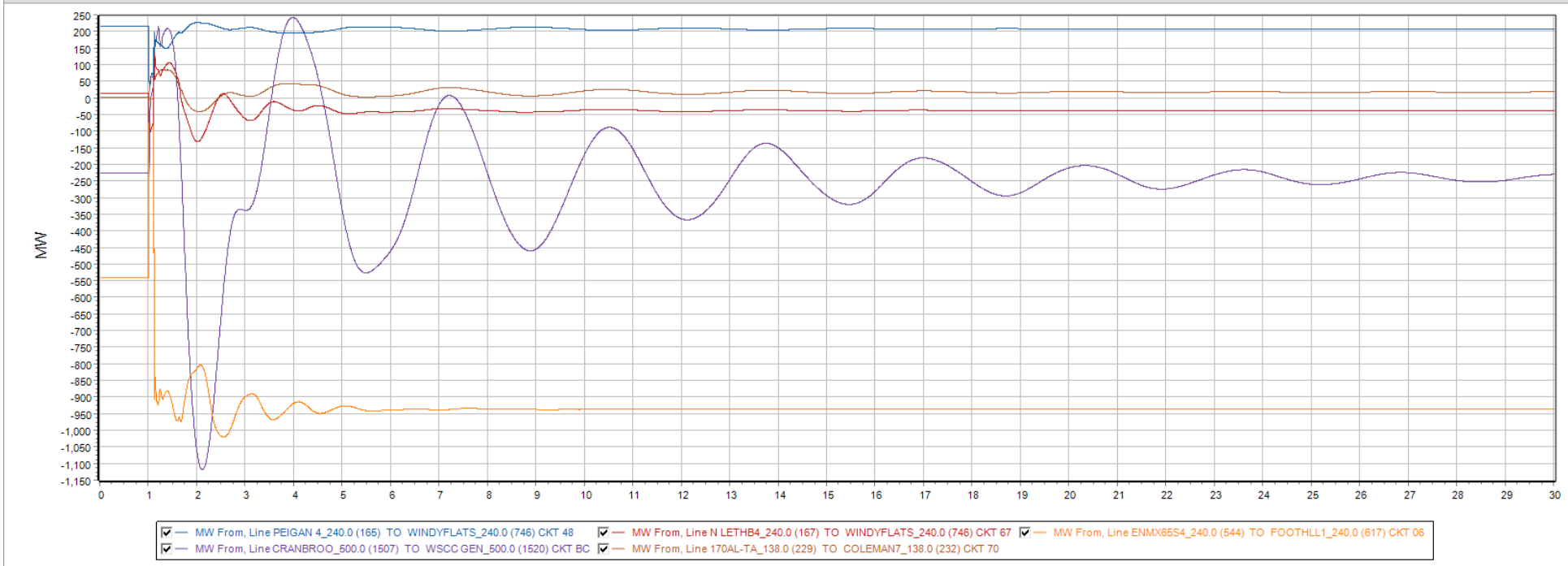
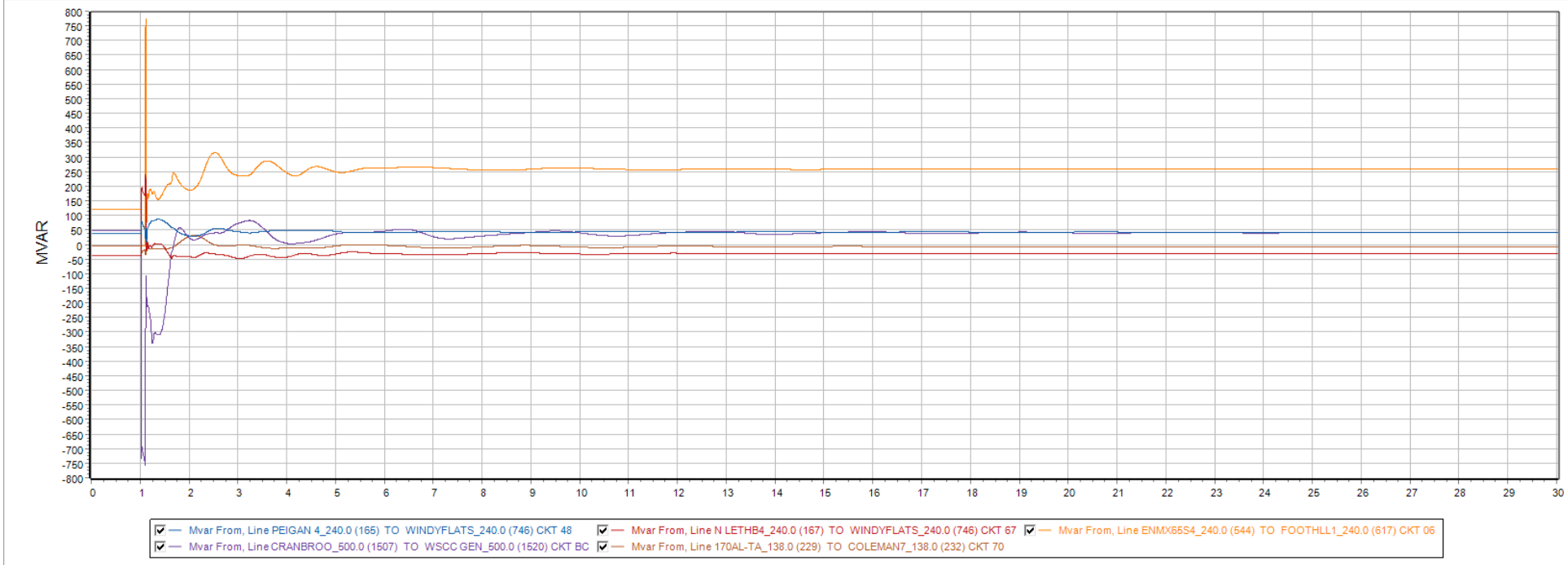
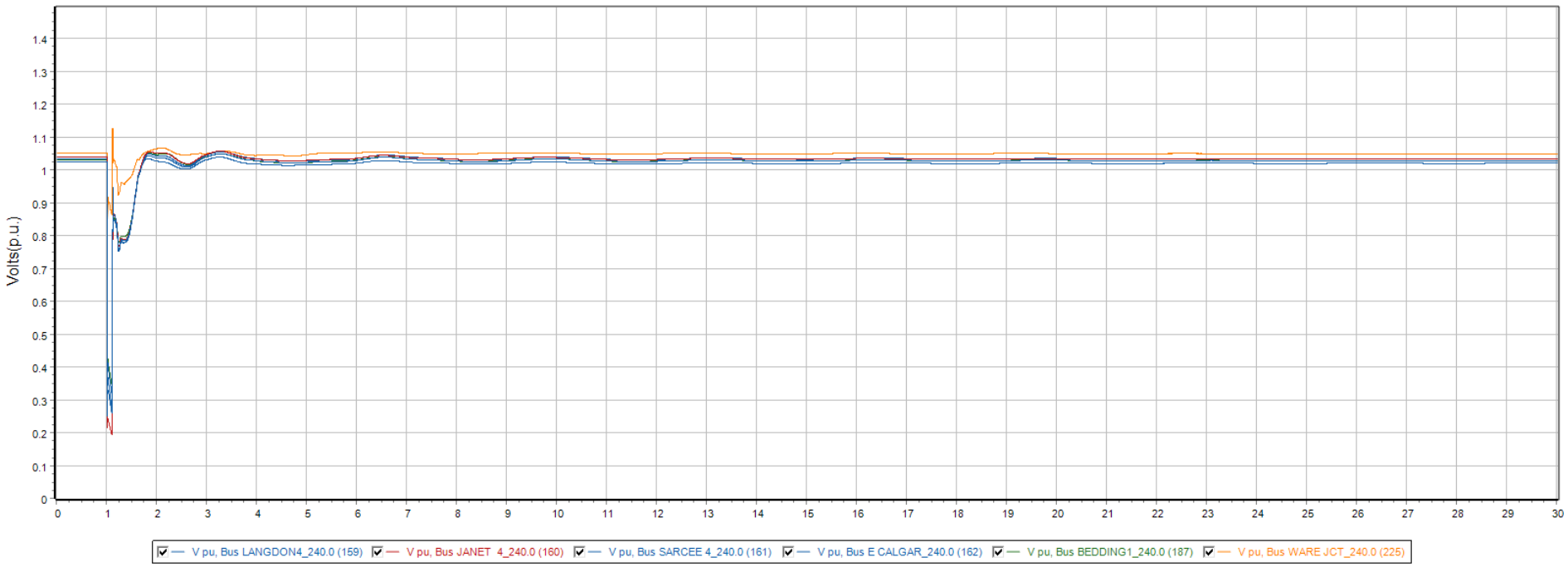
May 16, 2023 23:43:12

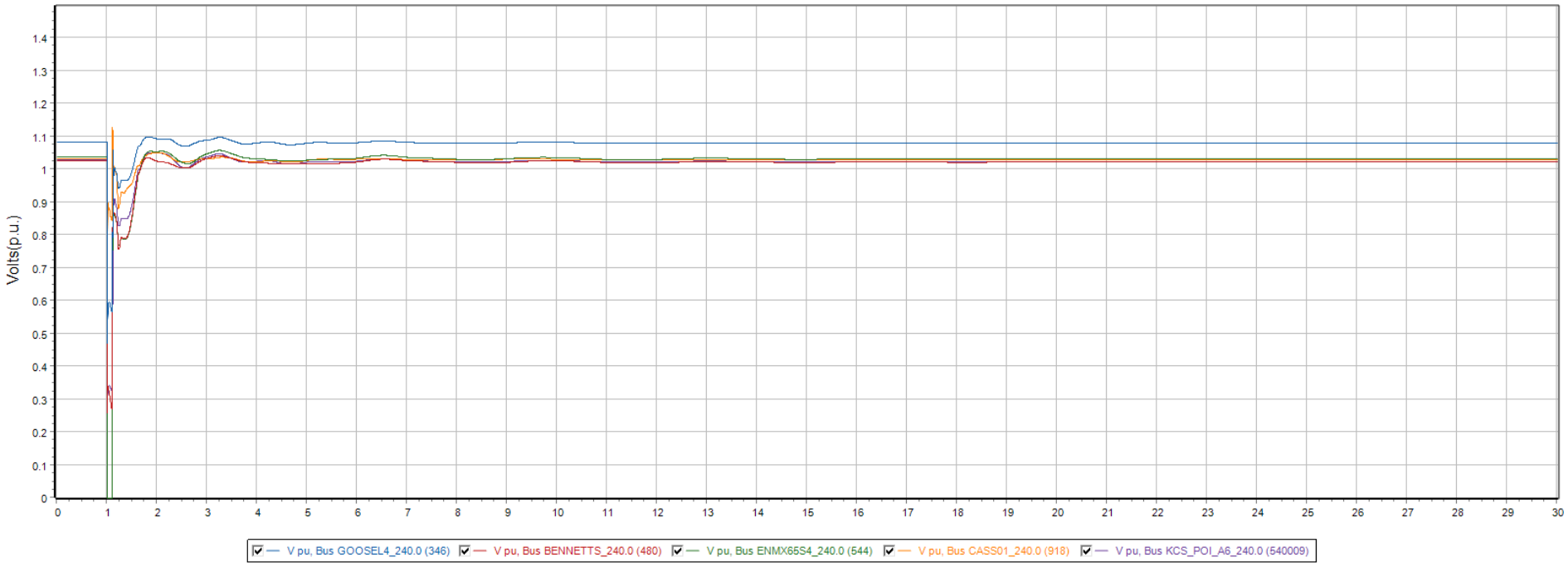
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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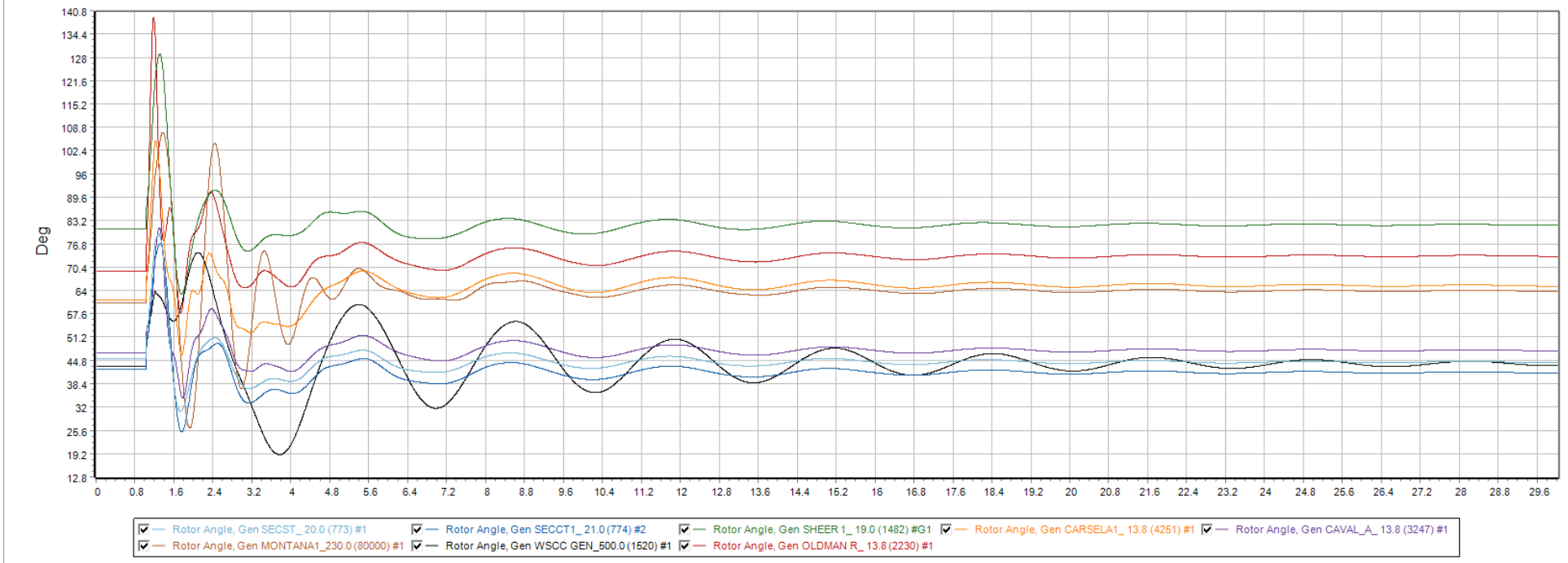
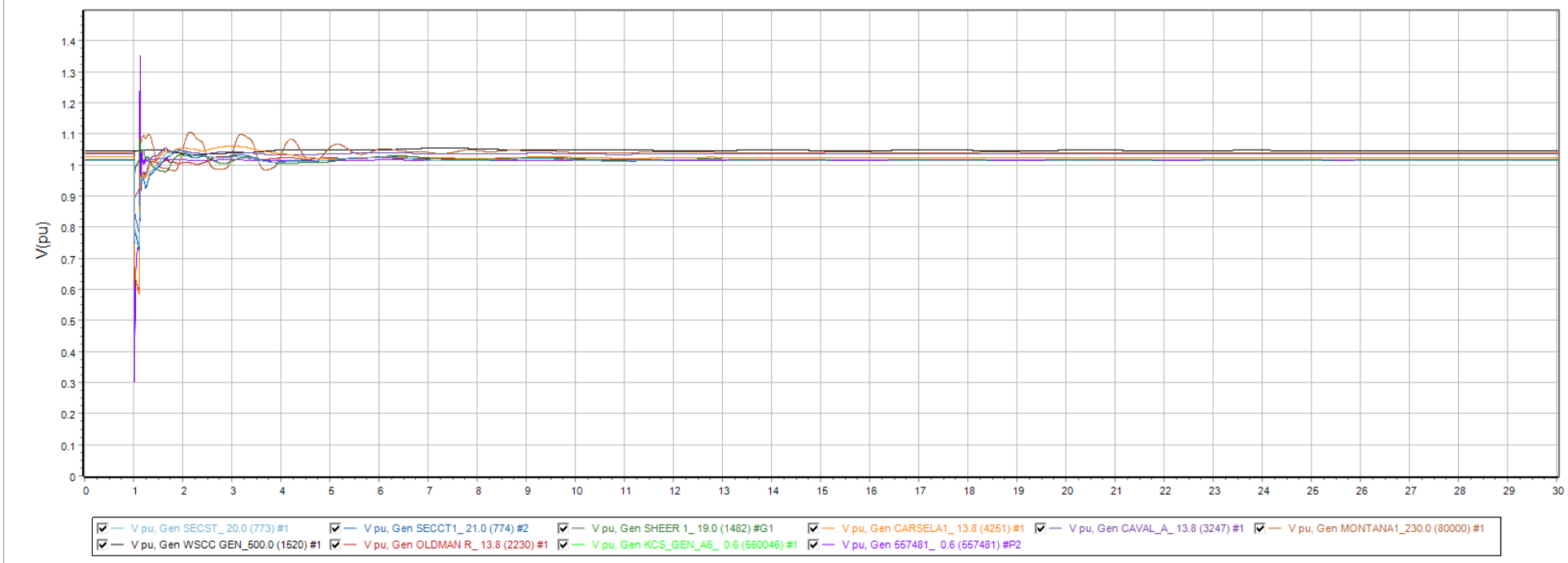
May 16, 2023 23:43:13

Monitor Gens. Q1





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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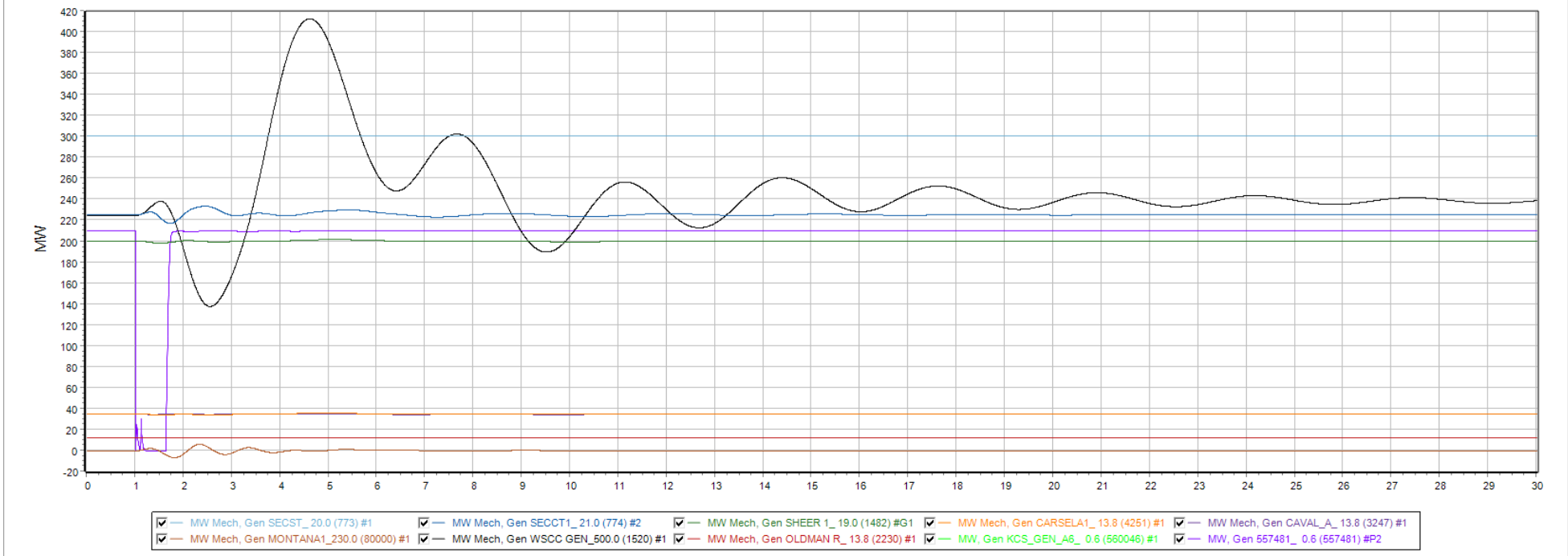
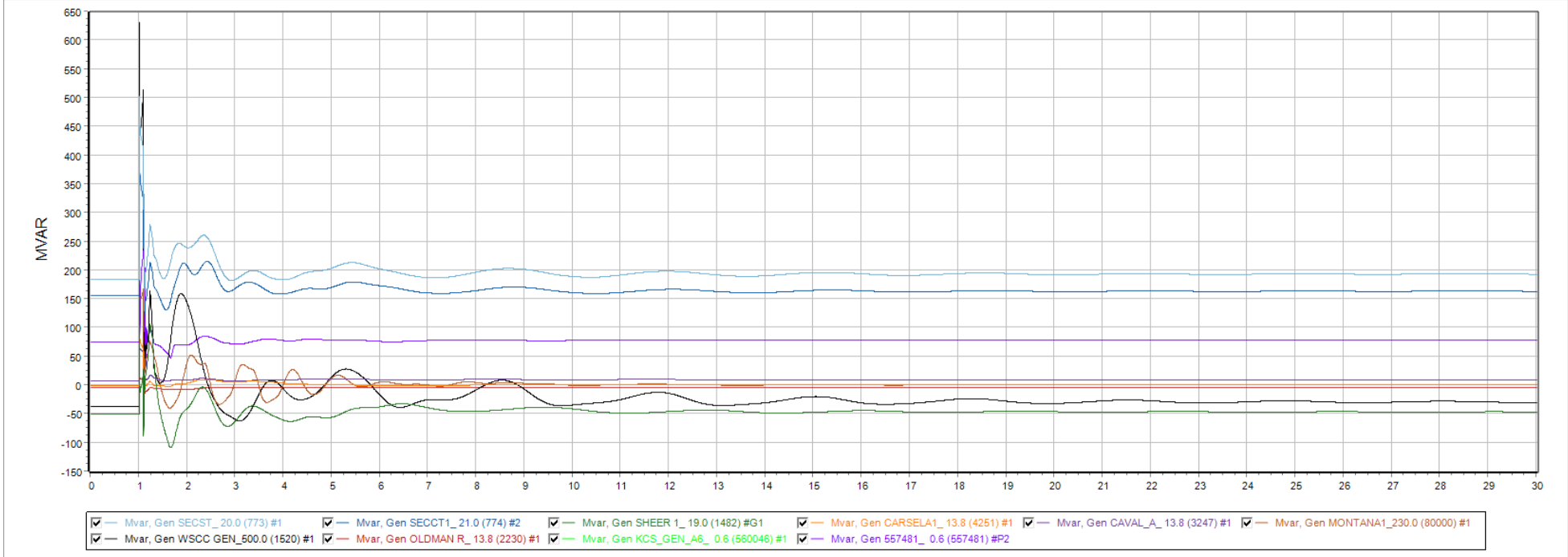
May 16, 2023 23:49:21

Monitor Gens. Q2





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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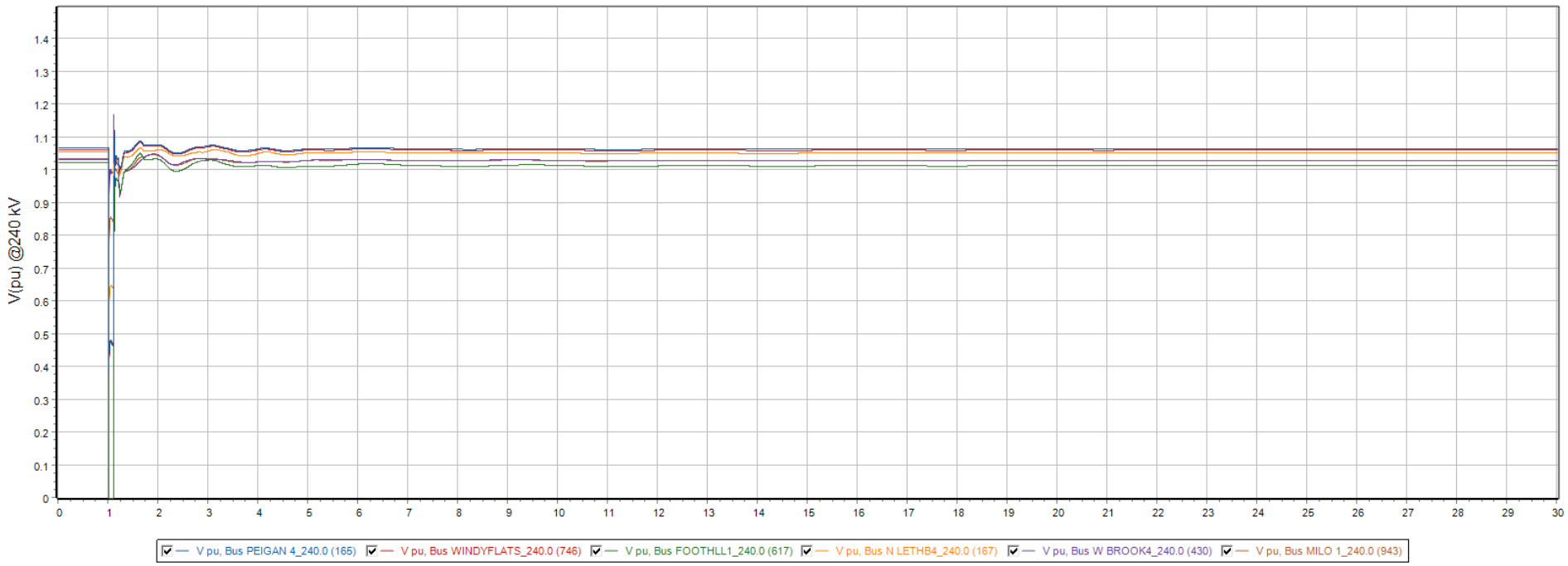
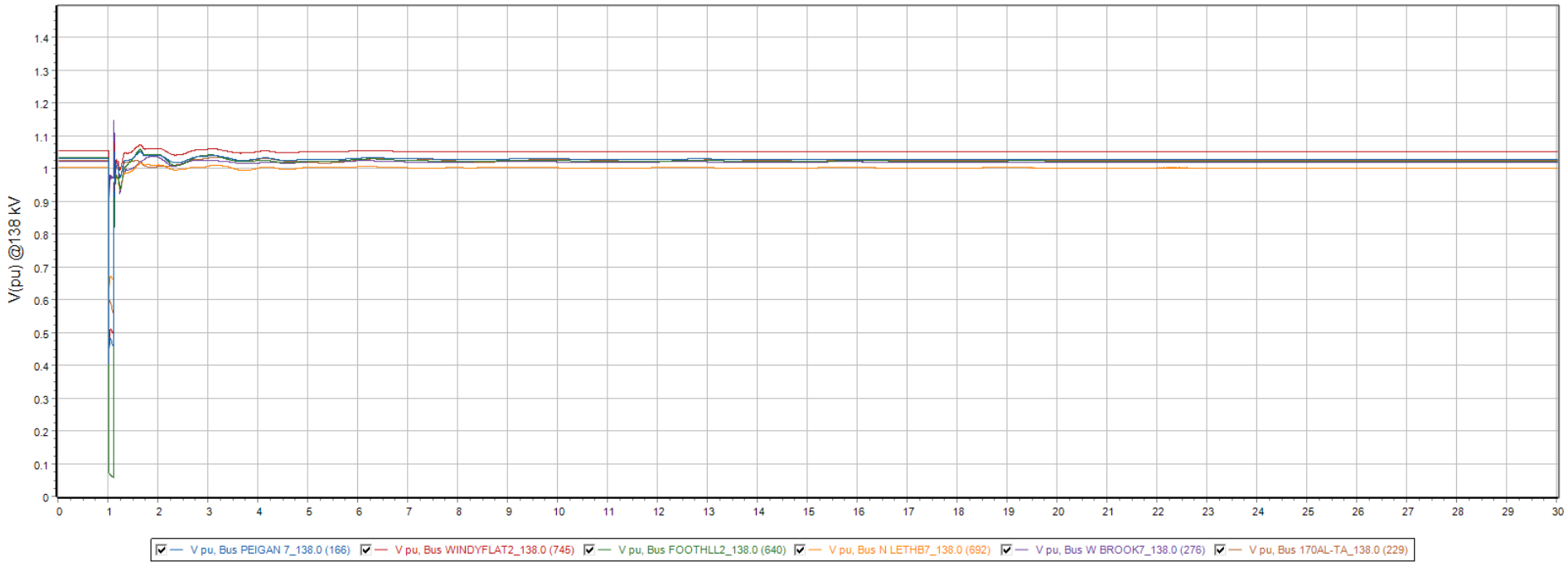
May 16, 2023 23:49:22

Monitor Bus Volts Q3





SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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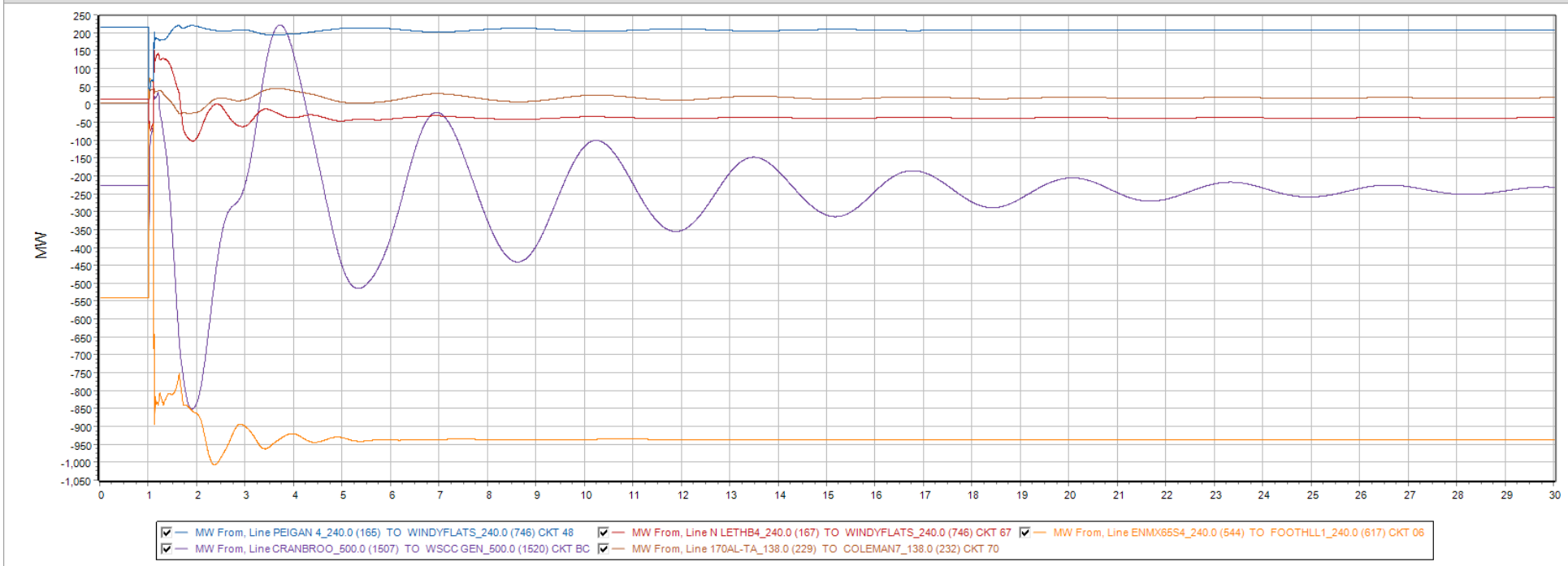
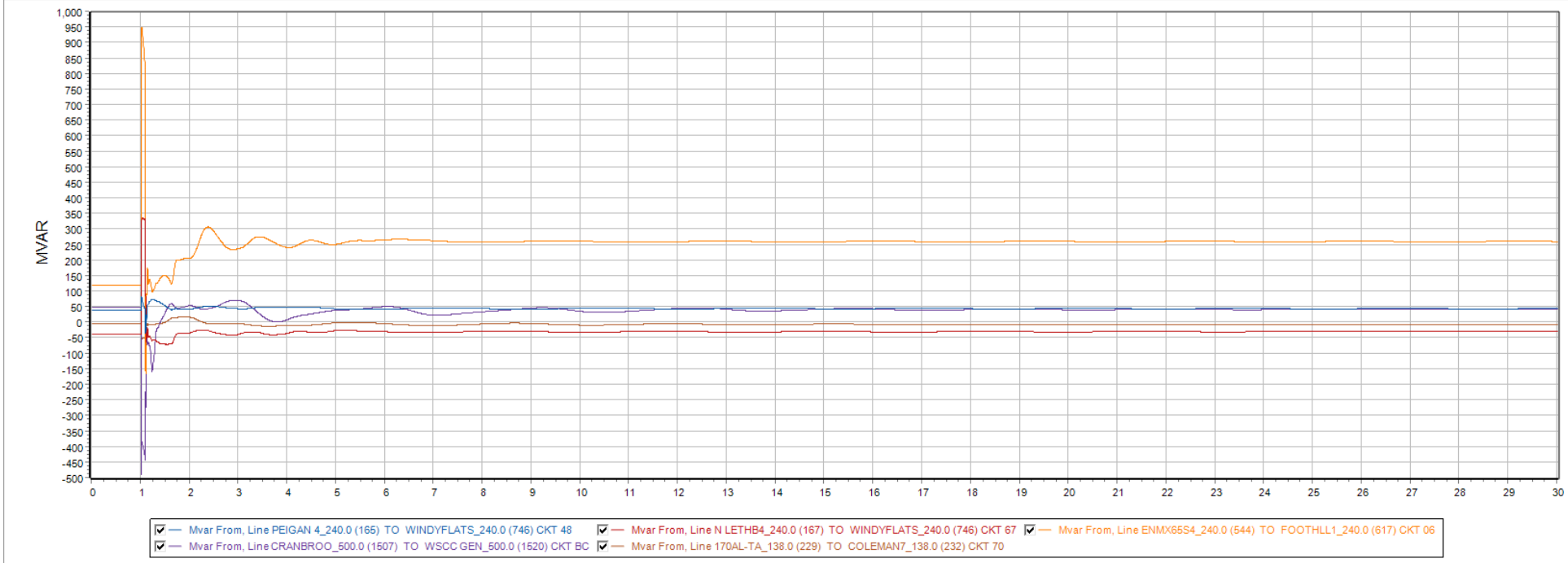
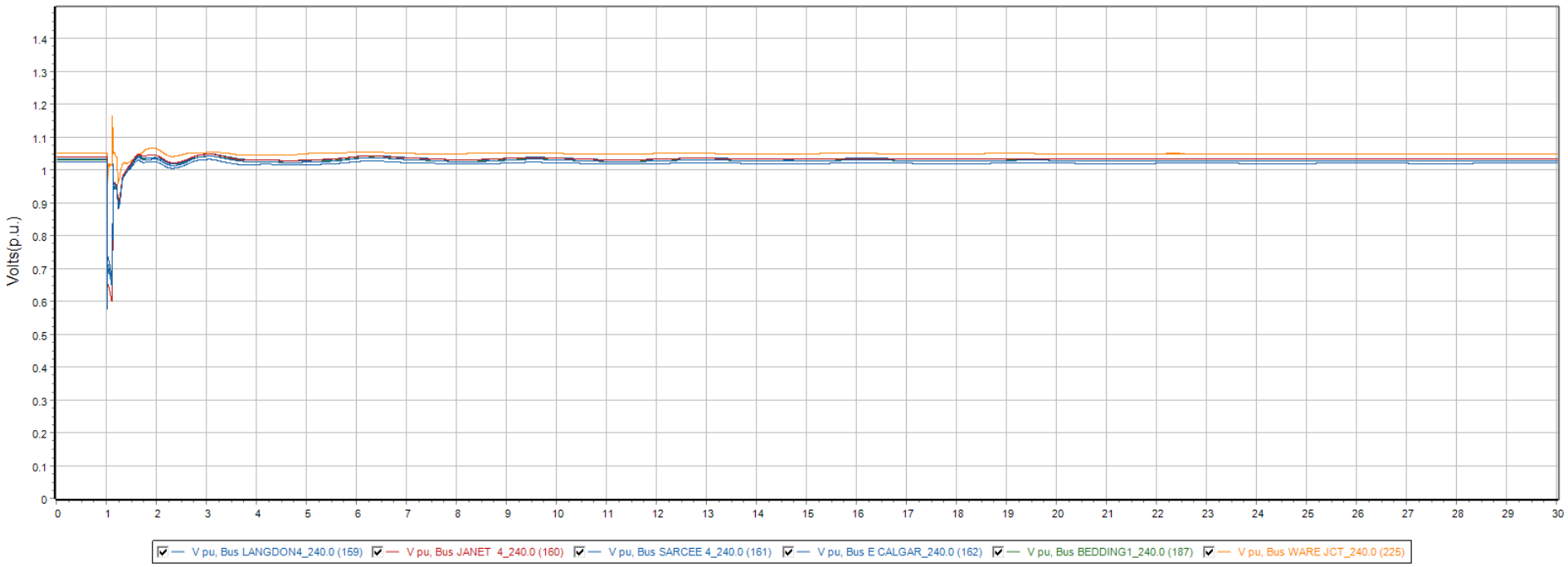
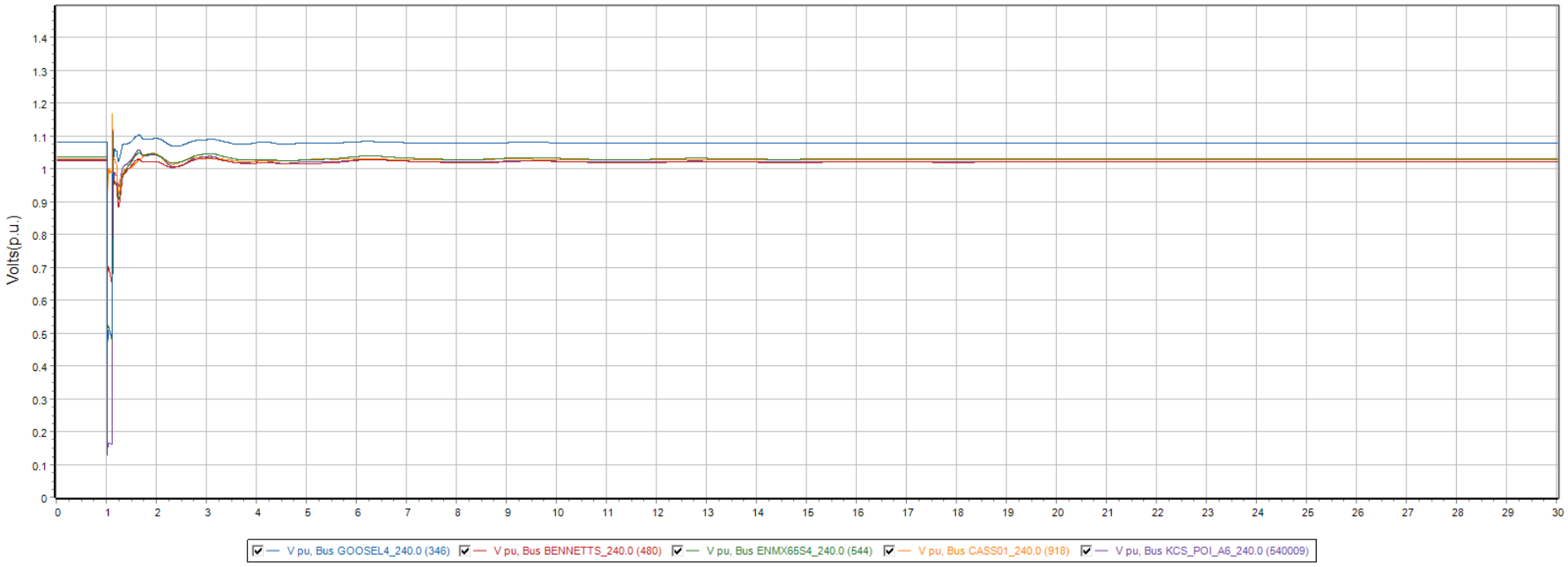
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC04_2025SP_POST-Project-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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2025 SUMMER LIGHT SENSITIVITY

Single Line Diagrams P2445
POST-PROJECT Transient
Stability Response SC08

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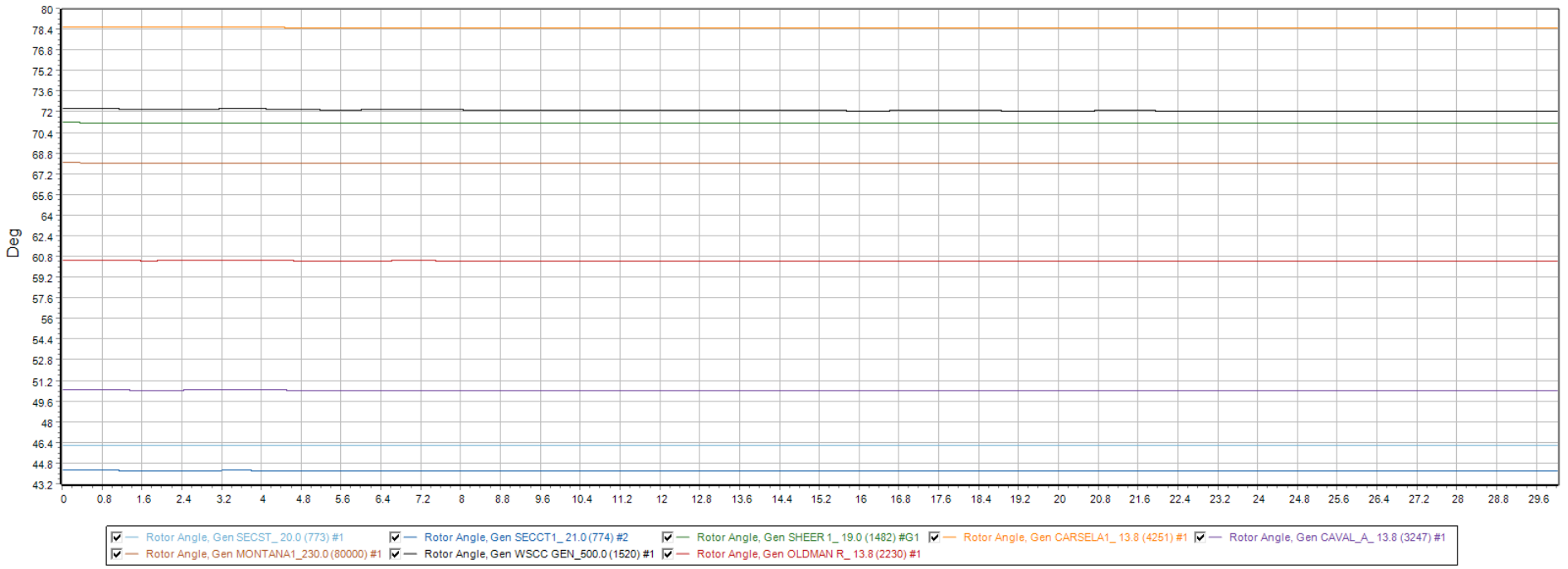
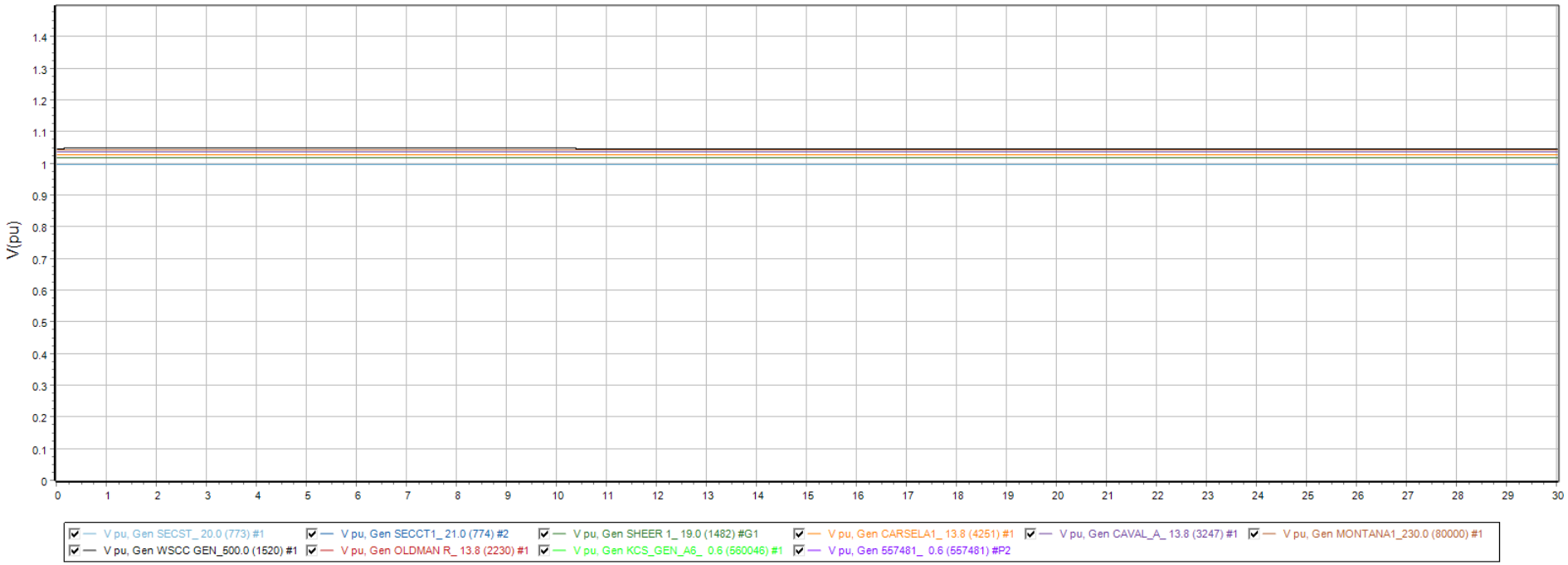
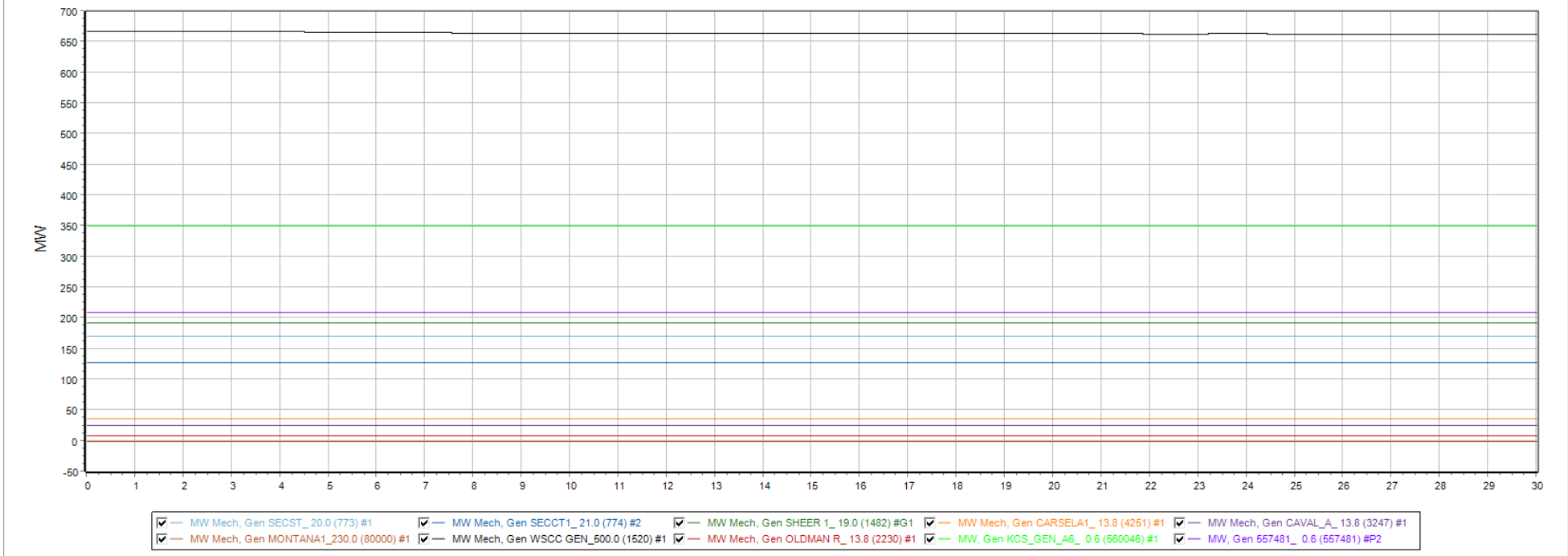
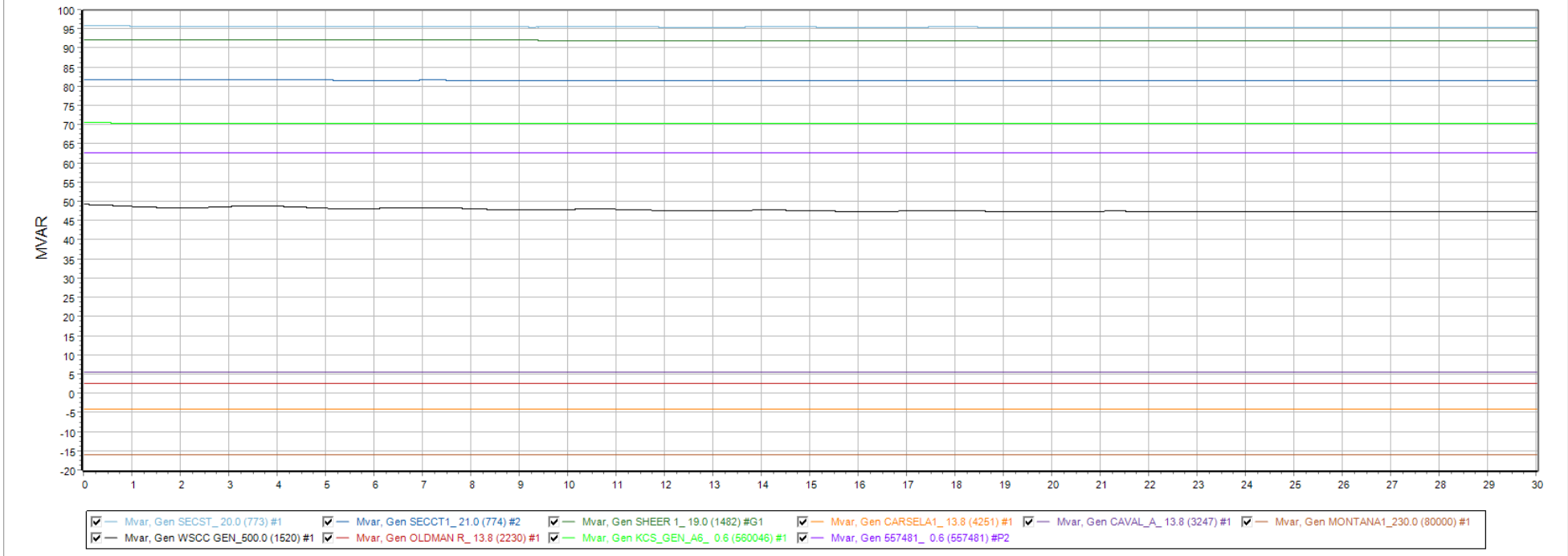
Monitor Gens. Q1



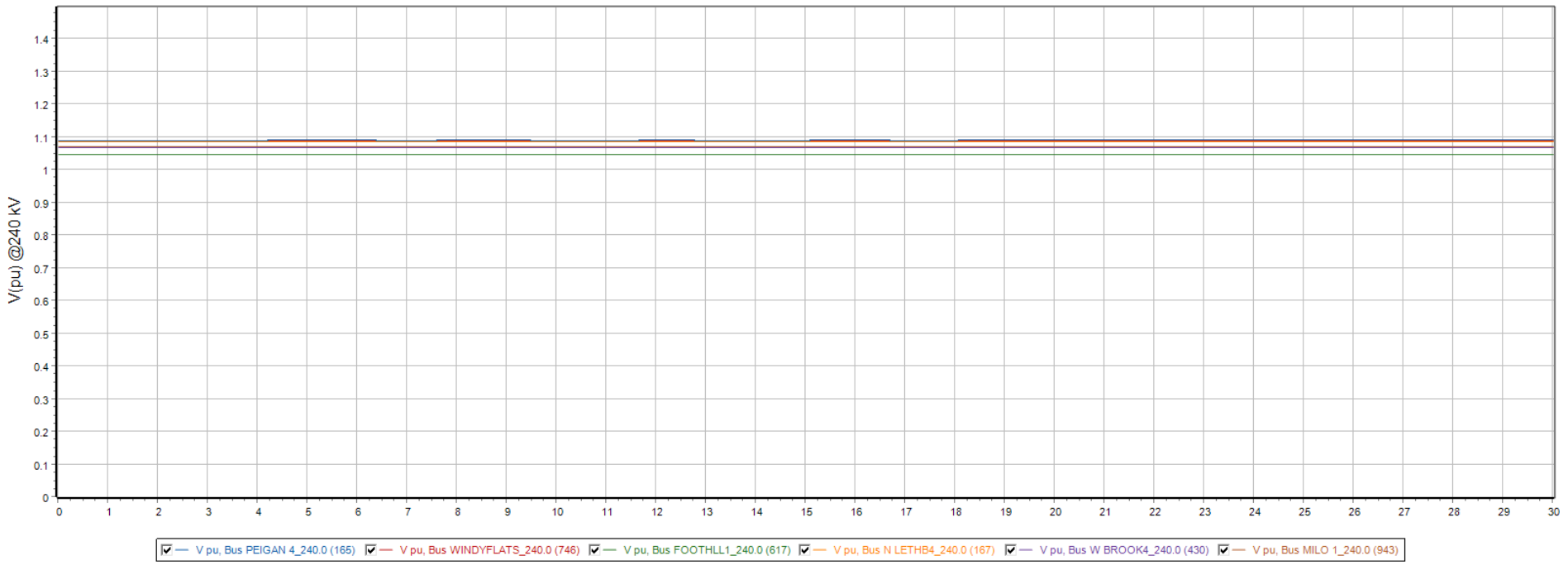


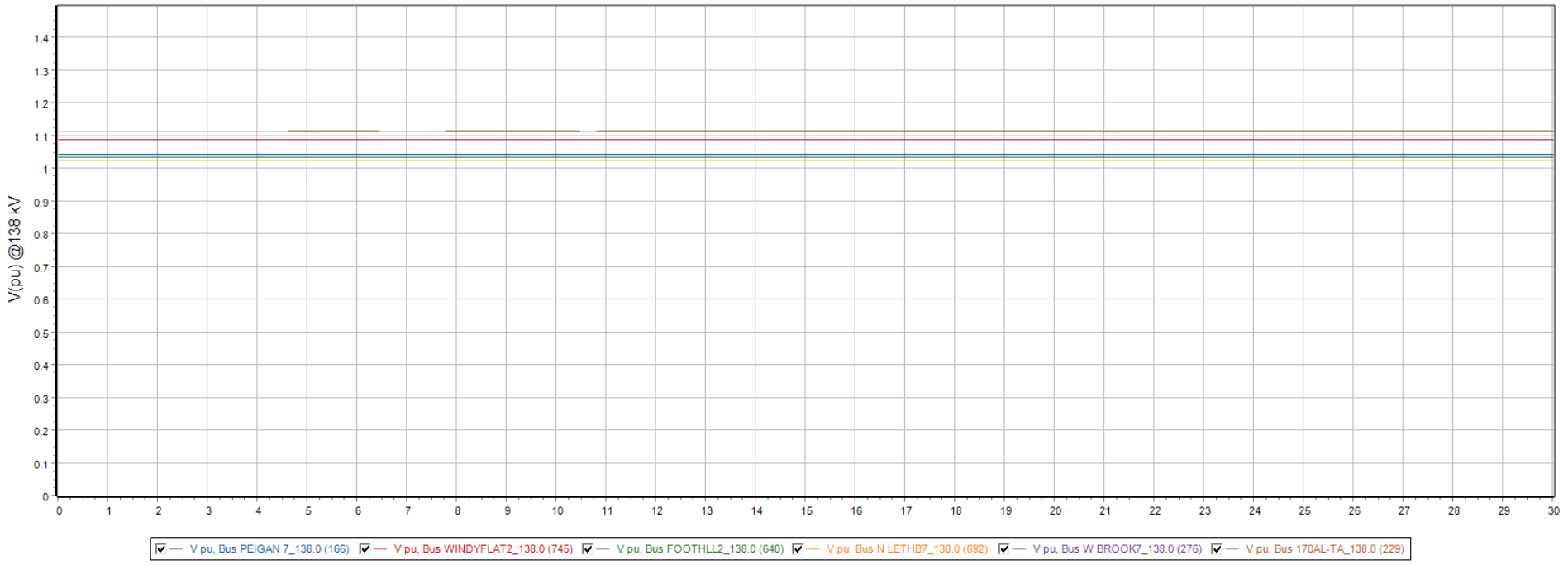
Monitor Gens. Q2



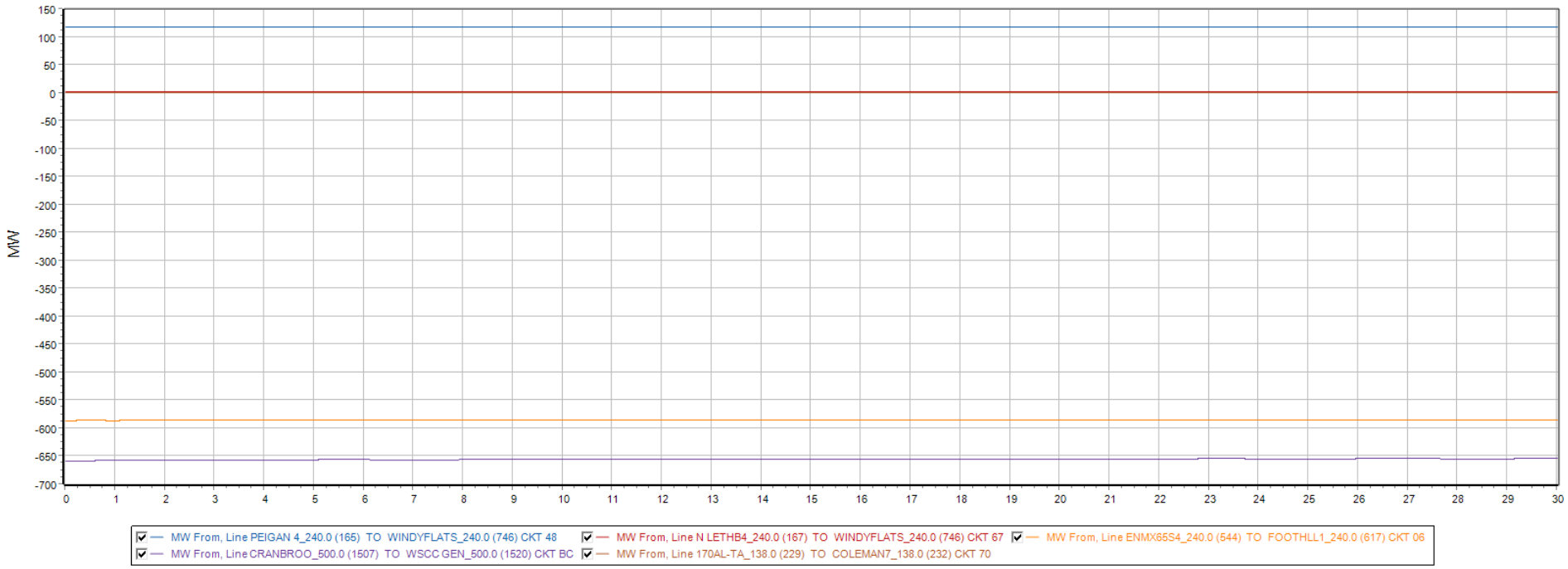


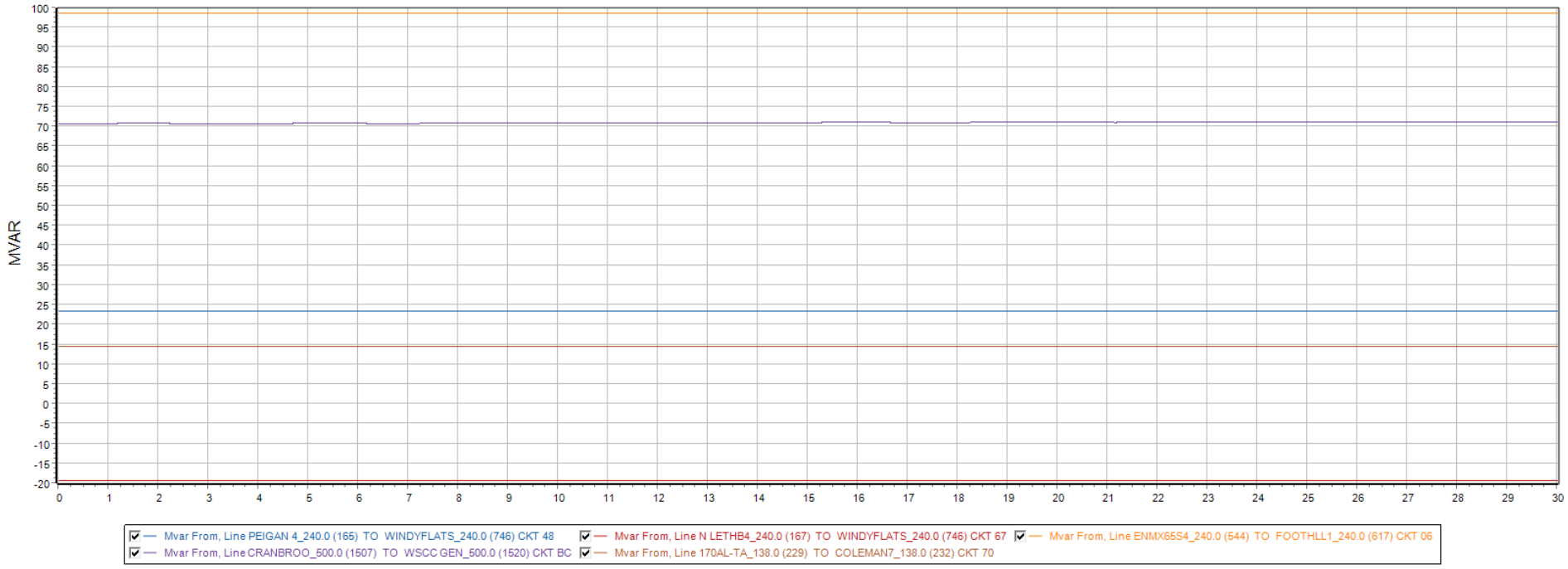
Monitor Bus Volts Q3



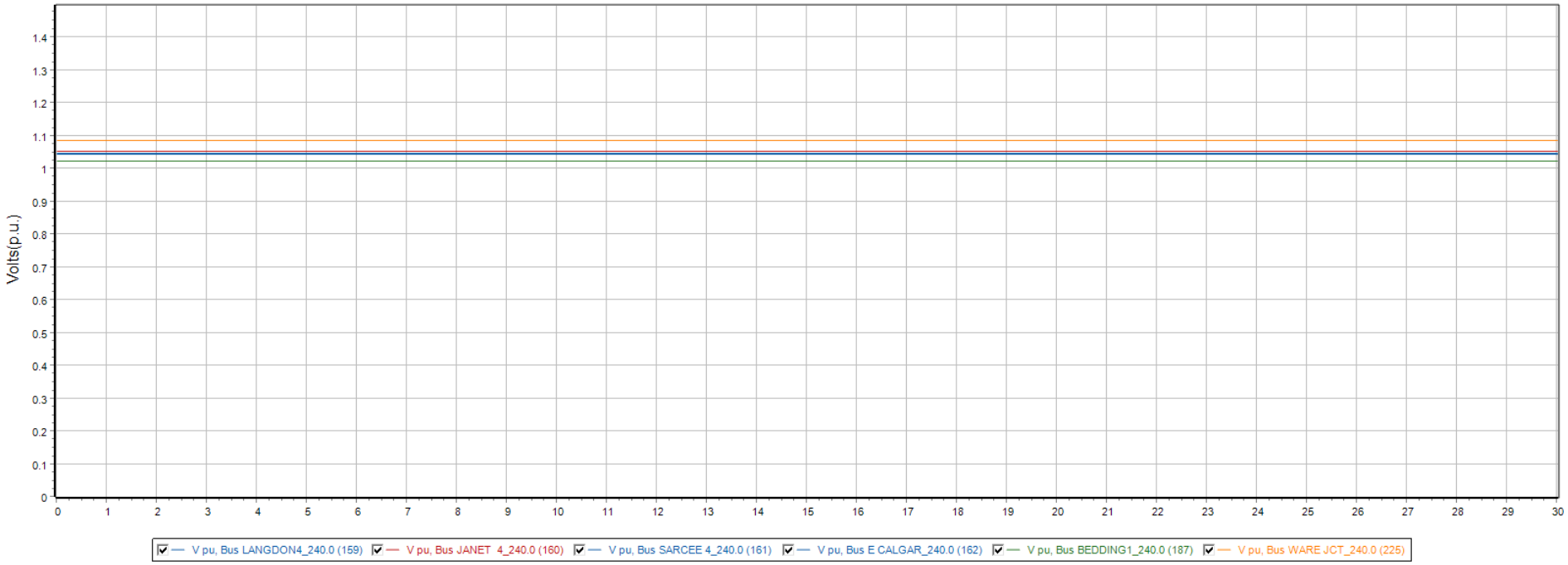


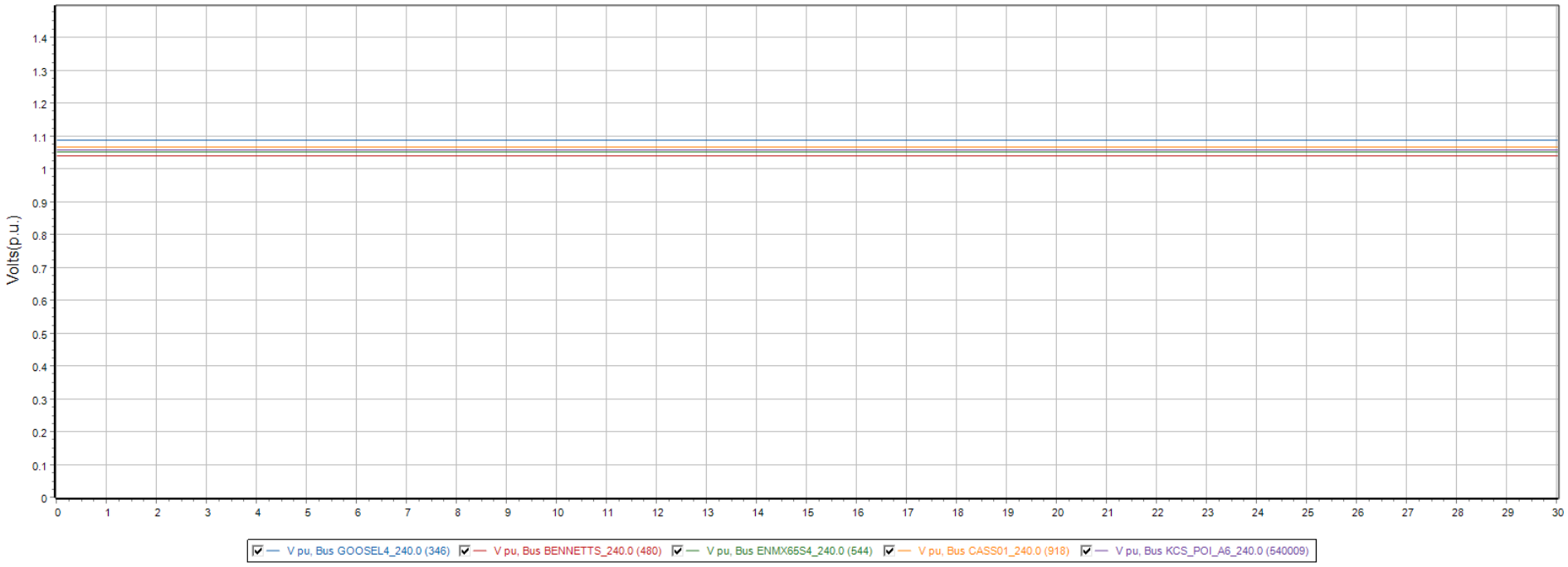
Monitor Line MW & MVAR. Q4



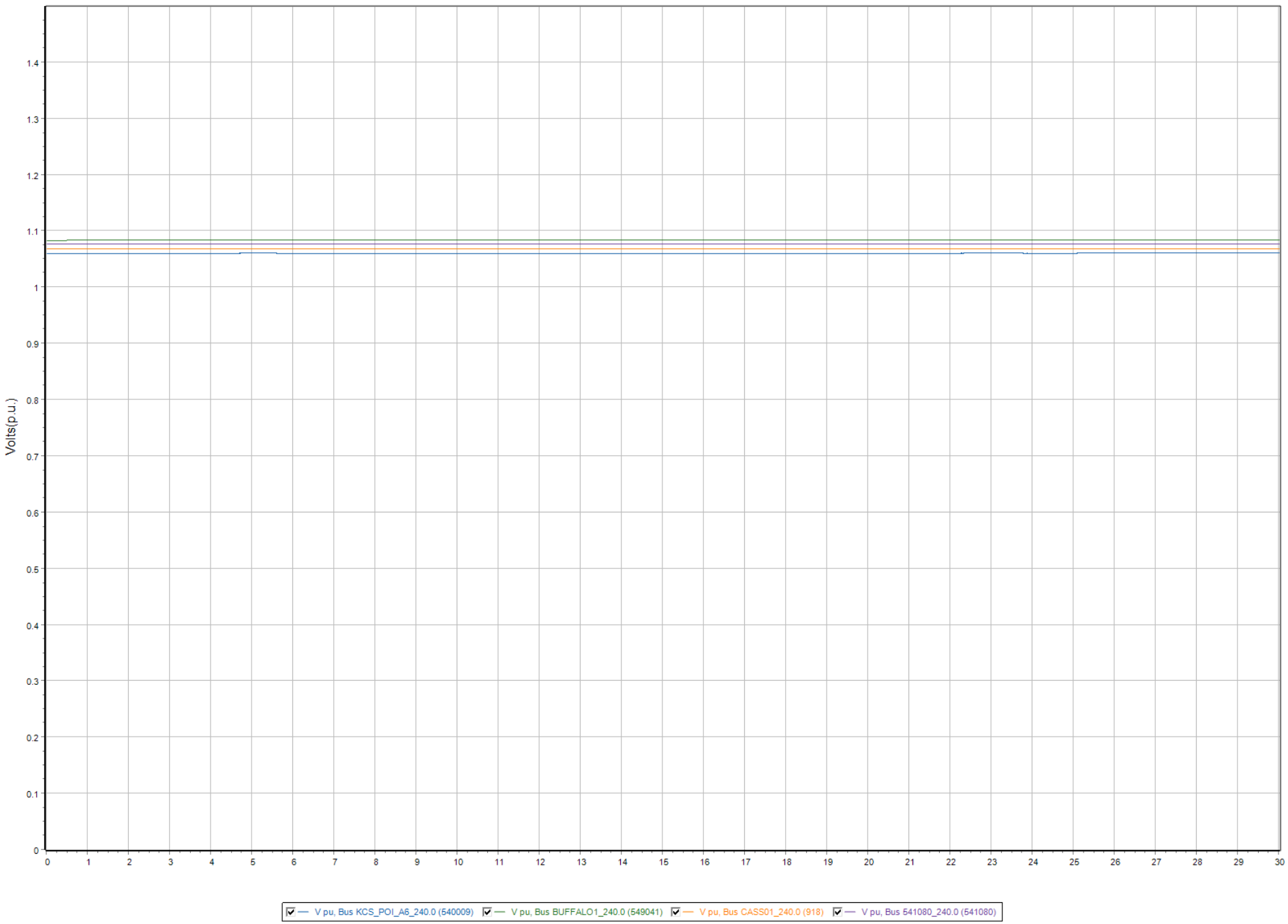


Additional 240 kV Bus Volts

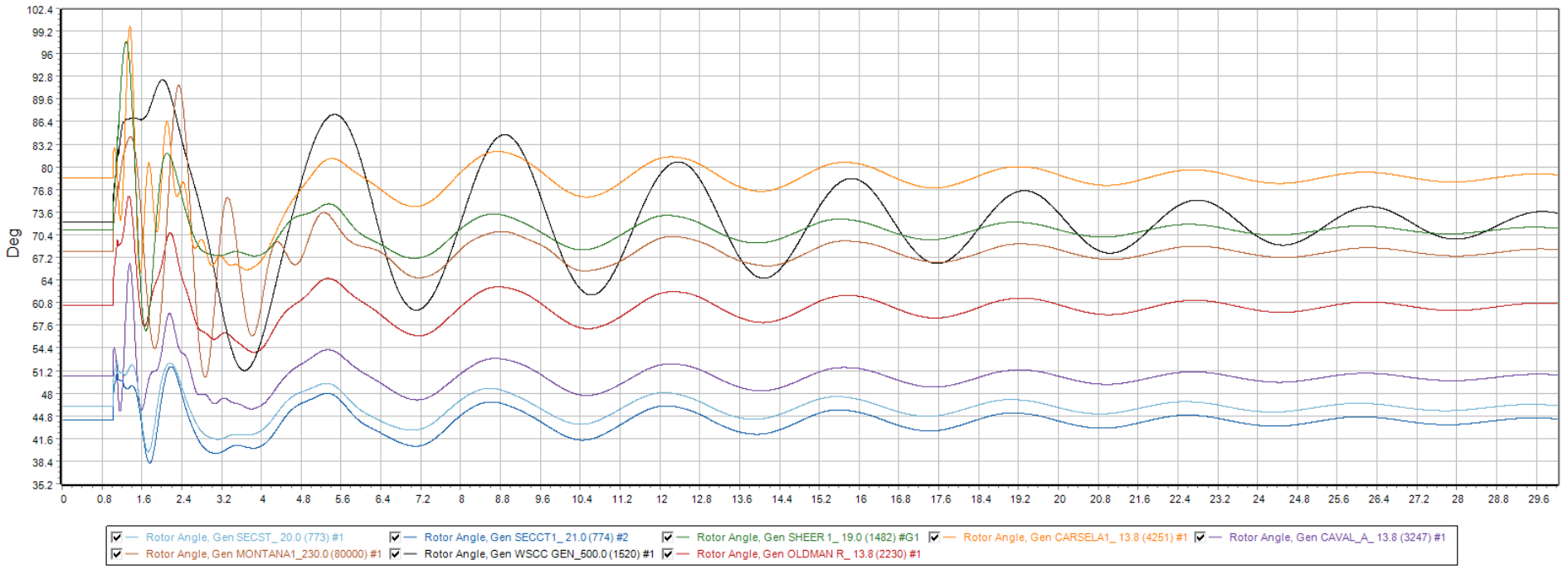


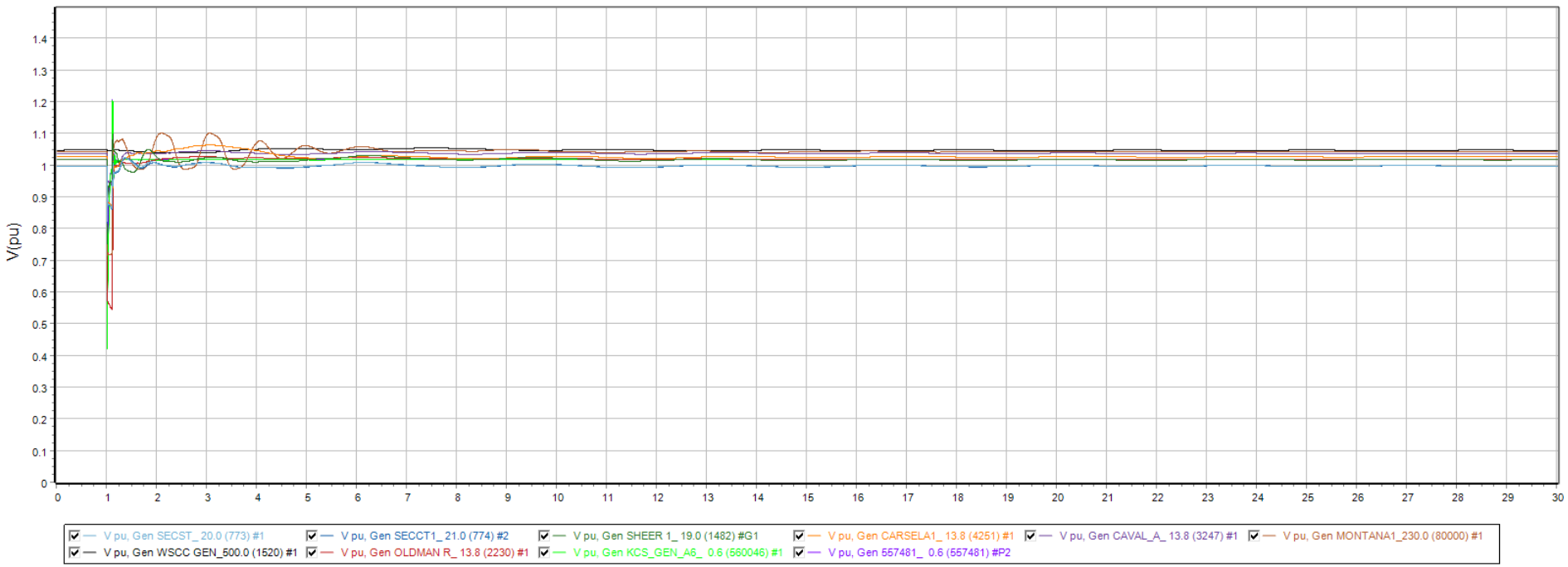


Large Project 240 kV Bus Volts



Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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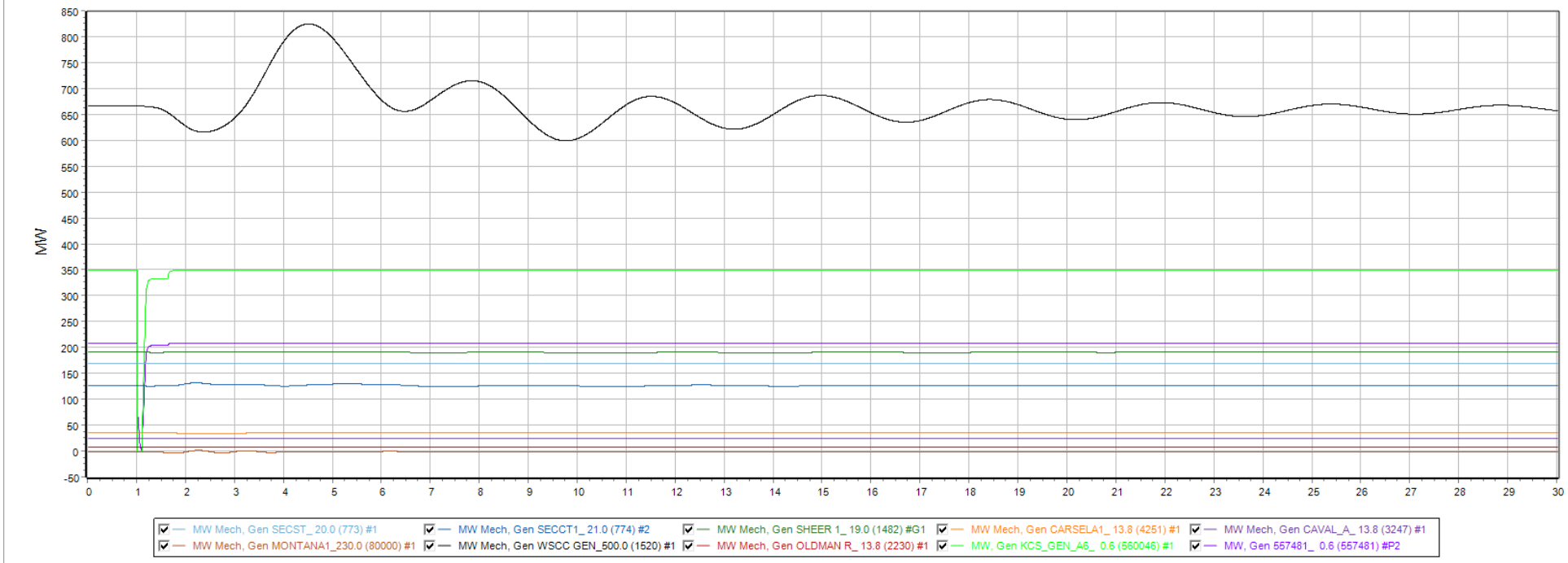
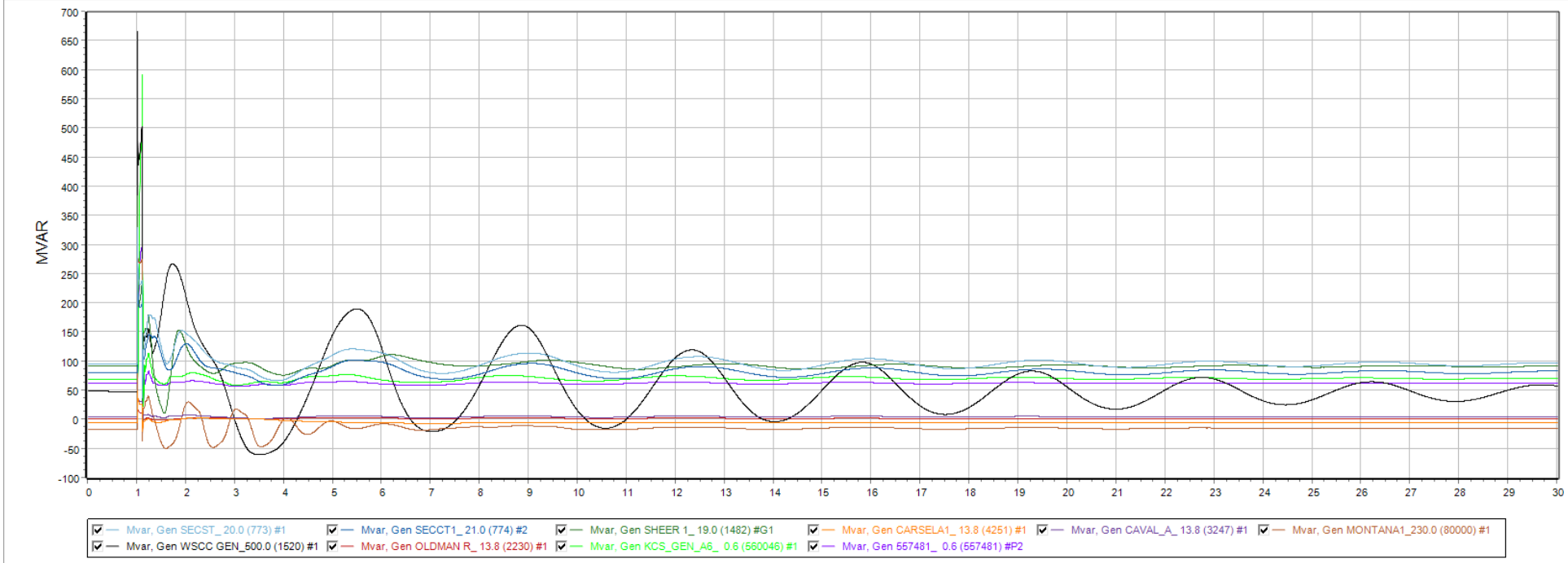
Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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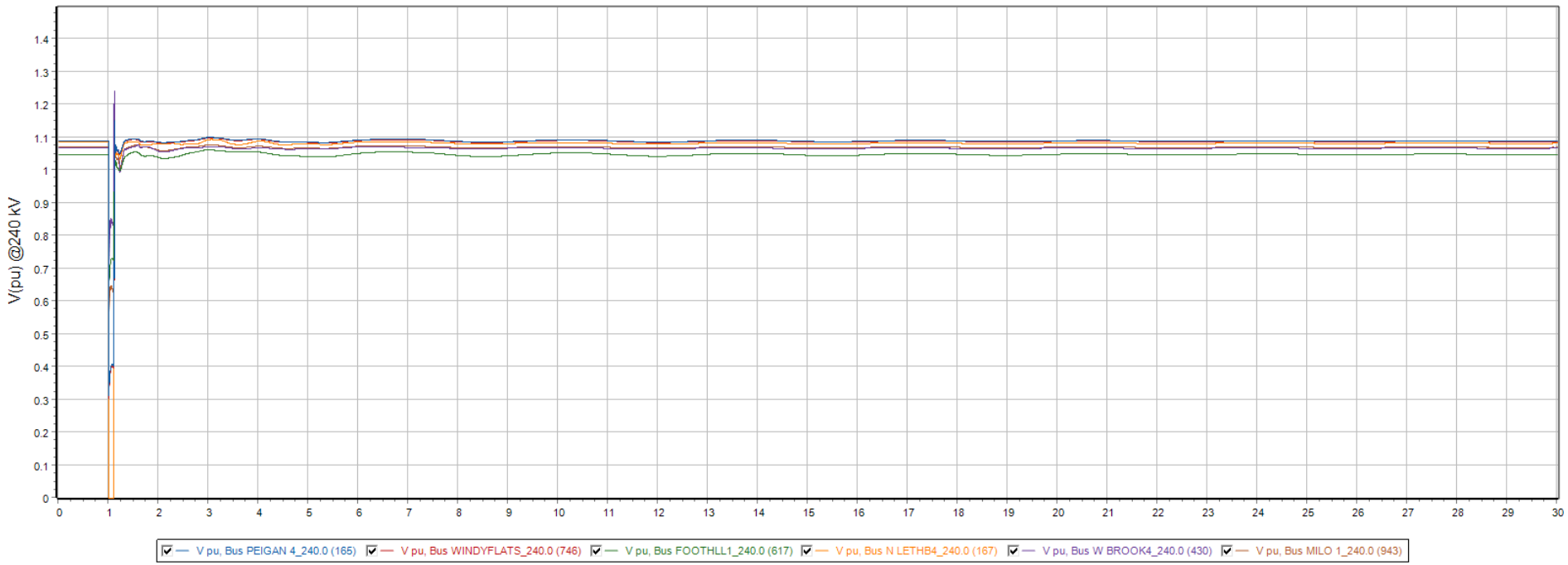
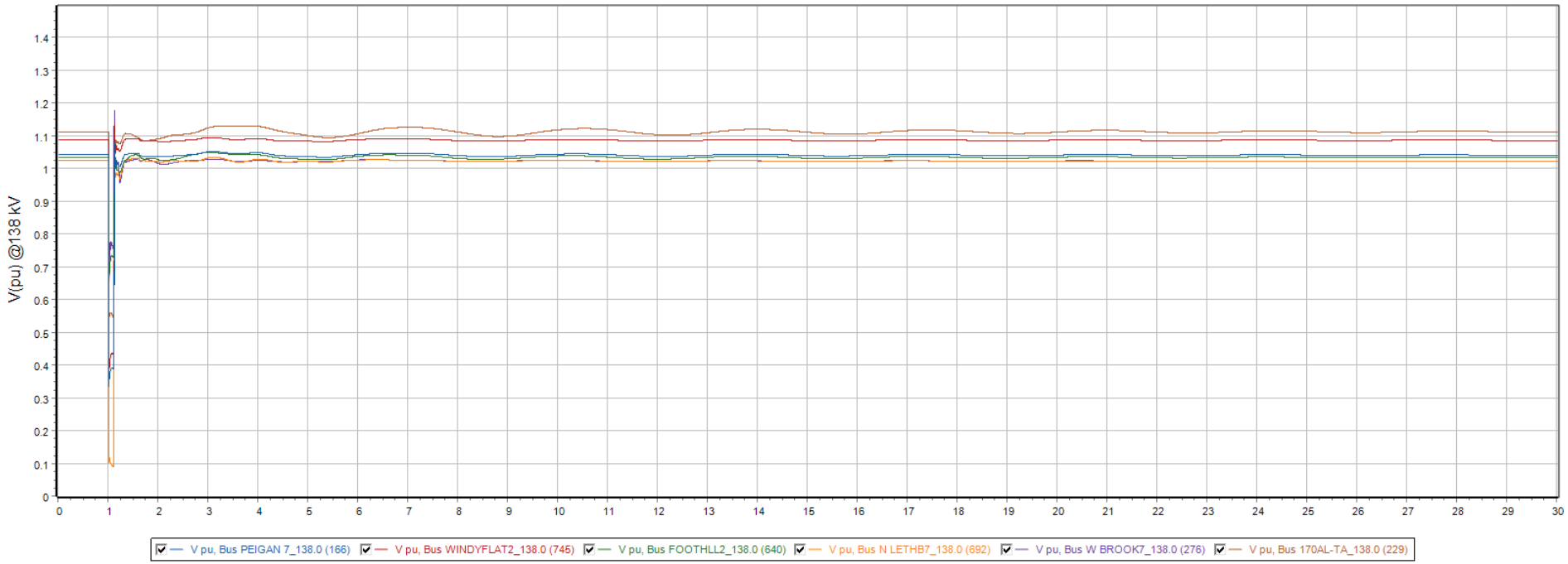
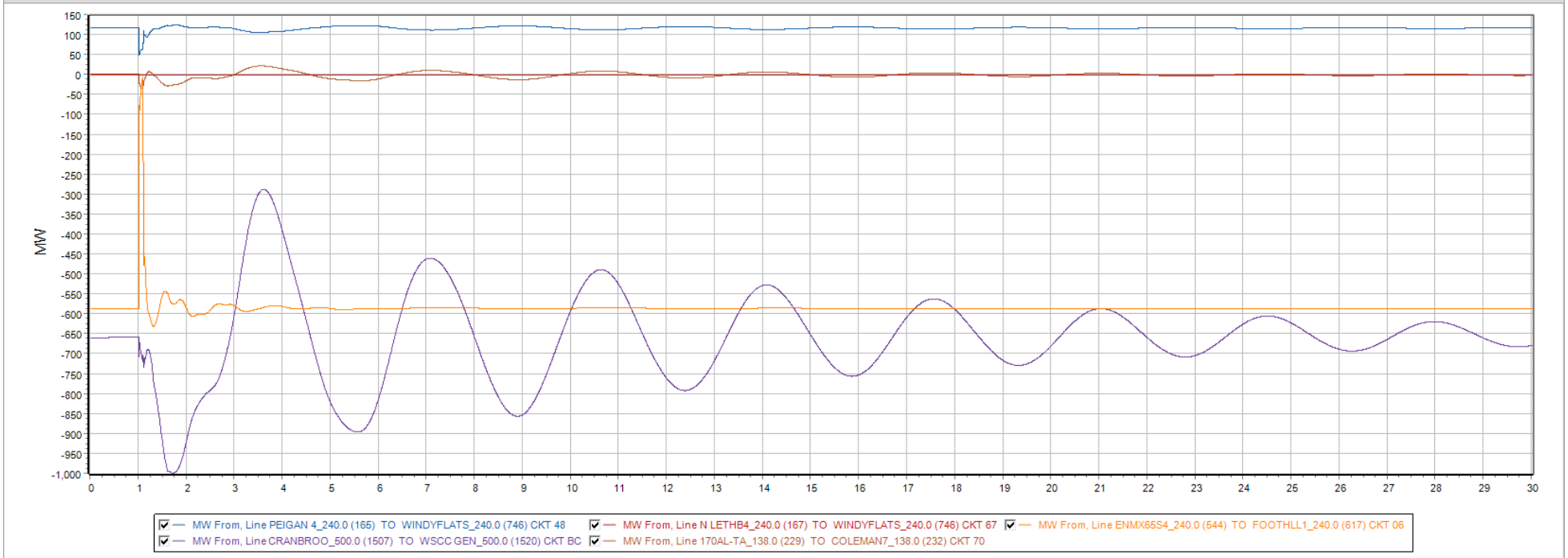
May 16, 2023 20:33:20

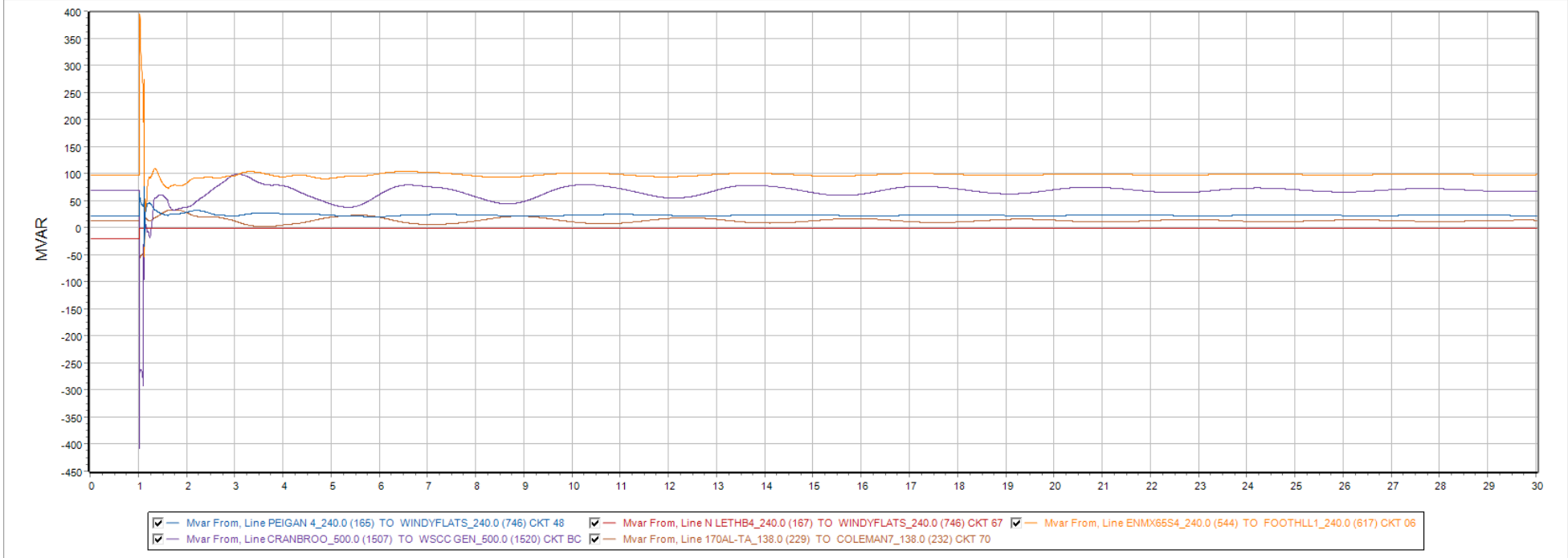
Monitor Bus Volts Q3



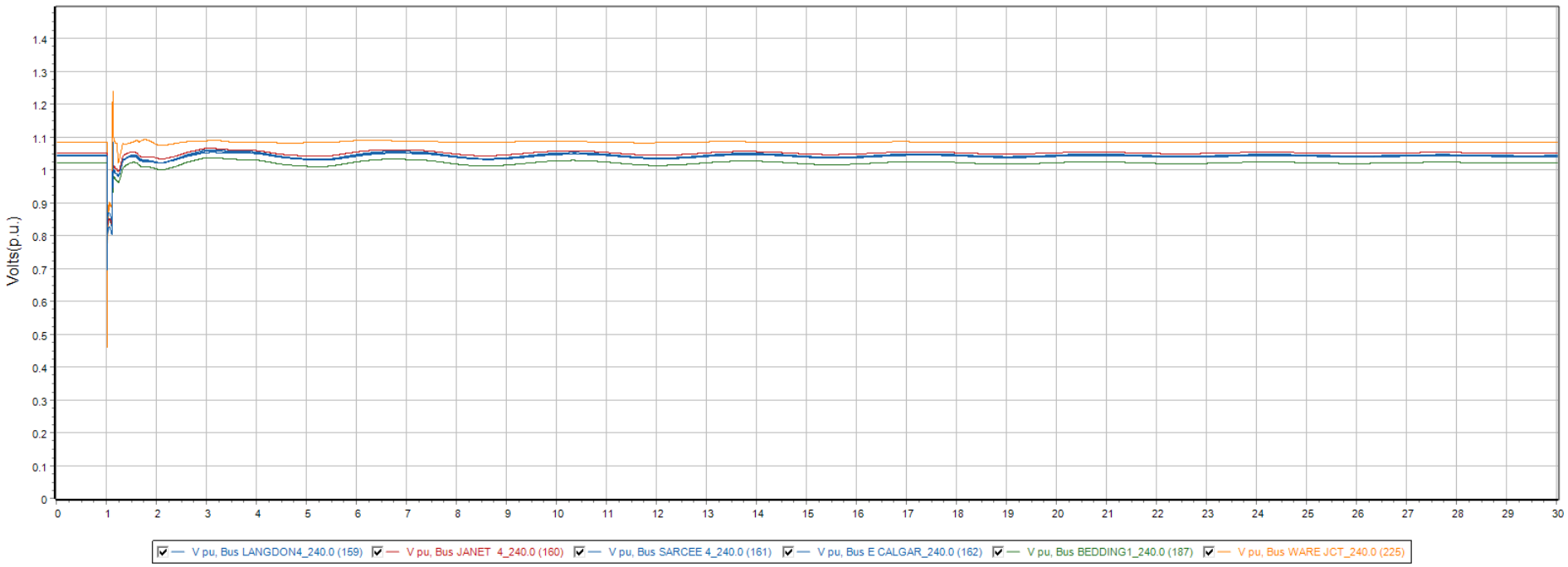


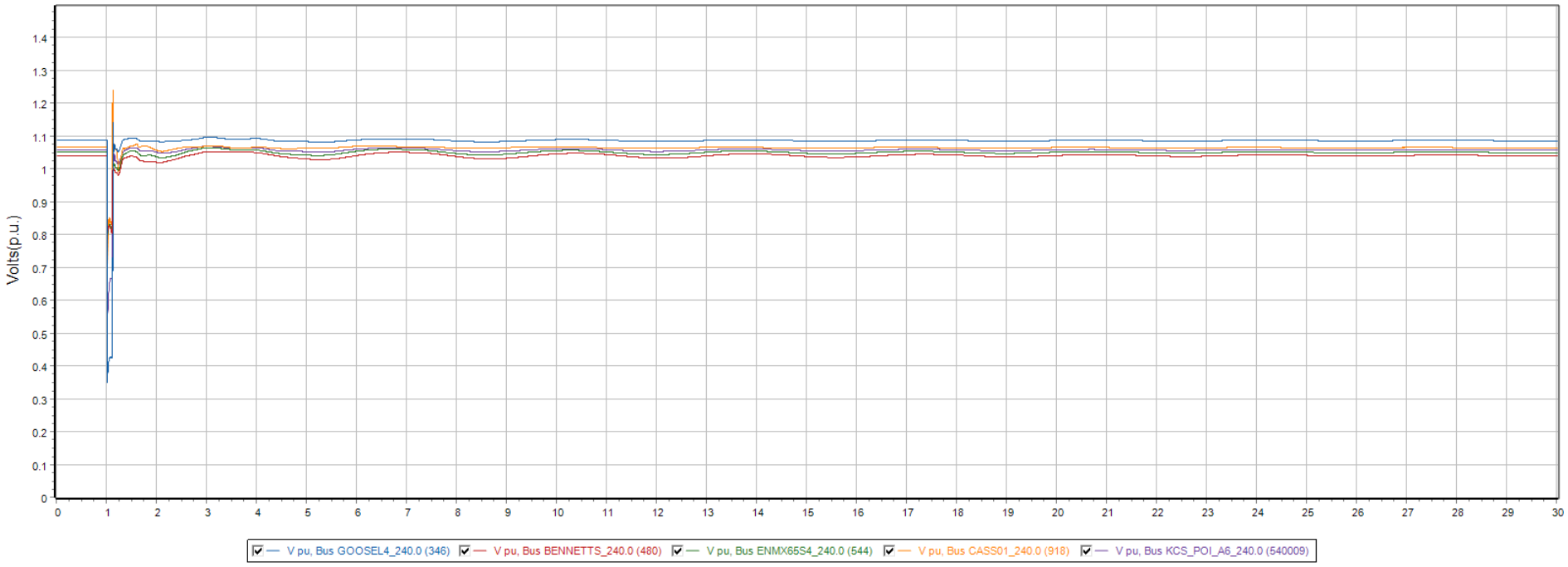
Monitor Line MW & MVAR. Q4



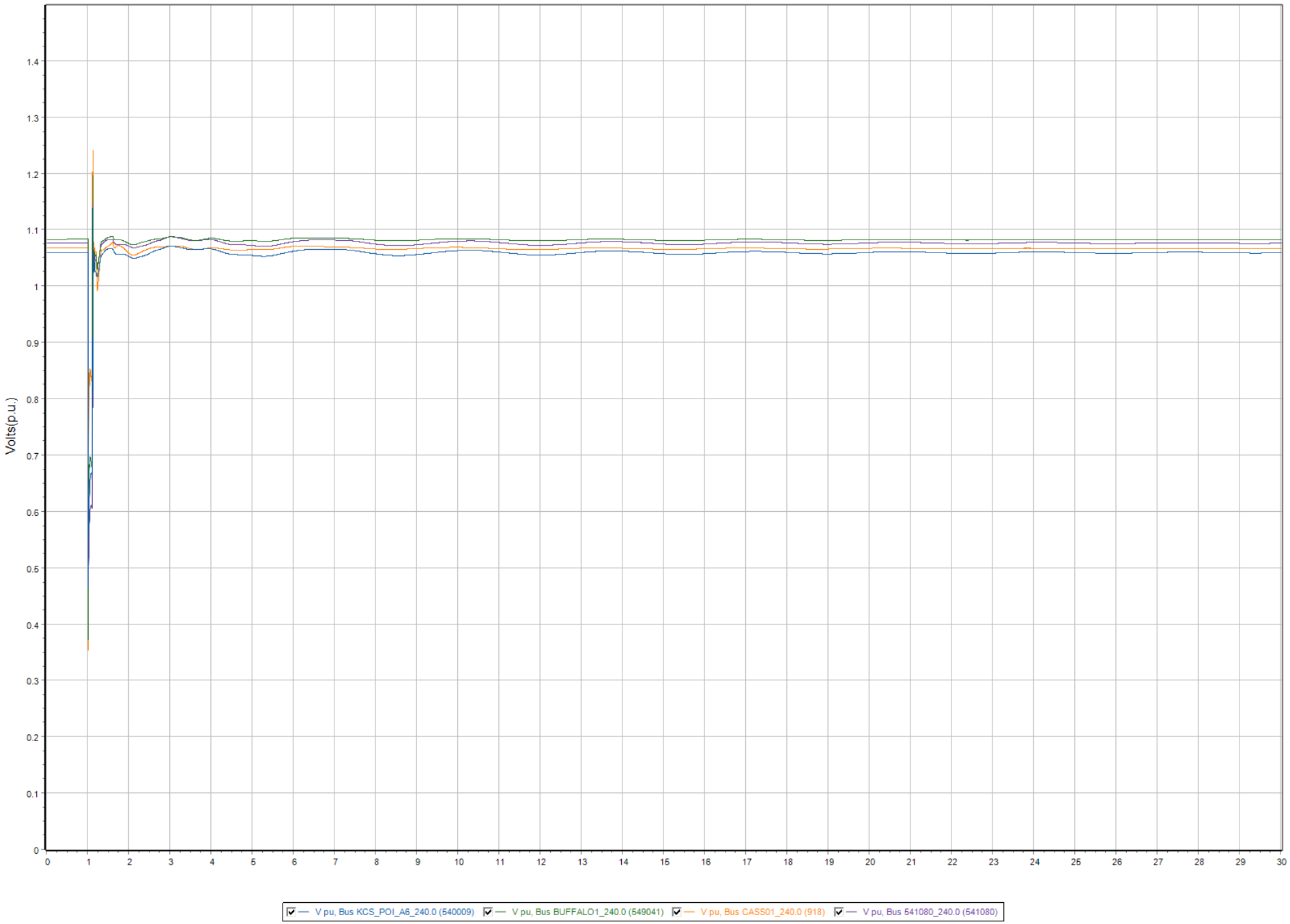


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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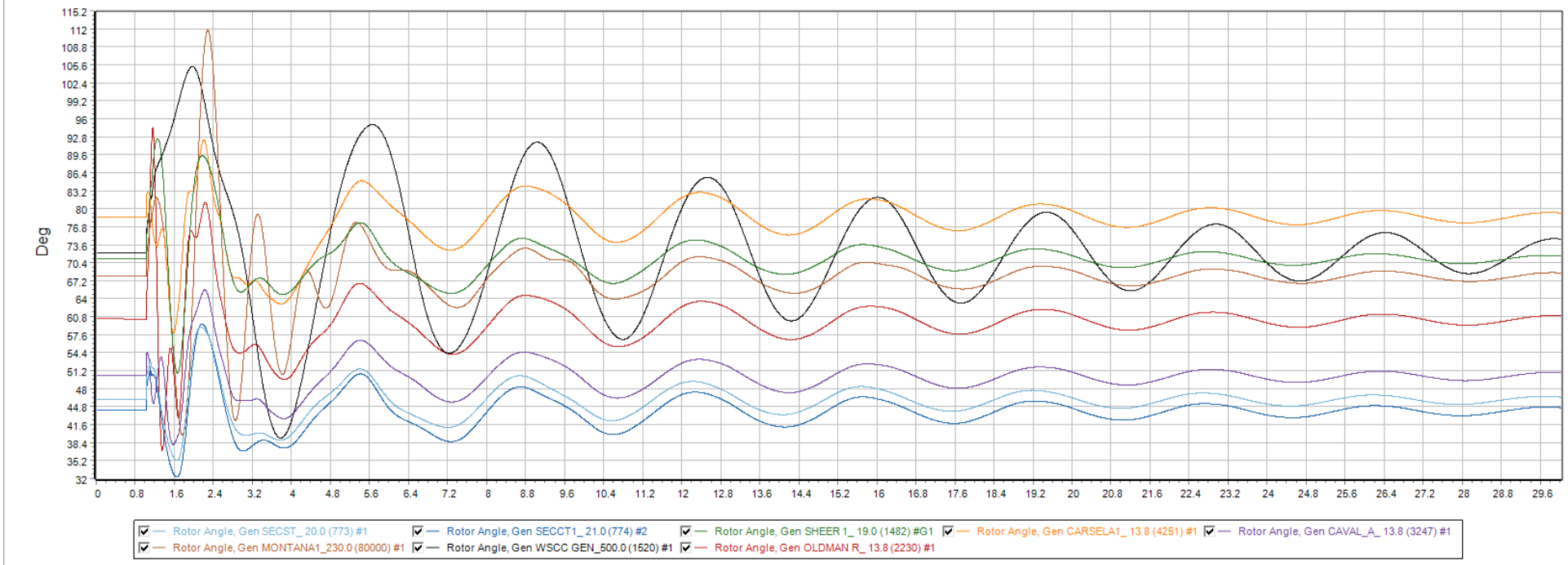
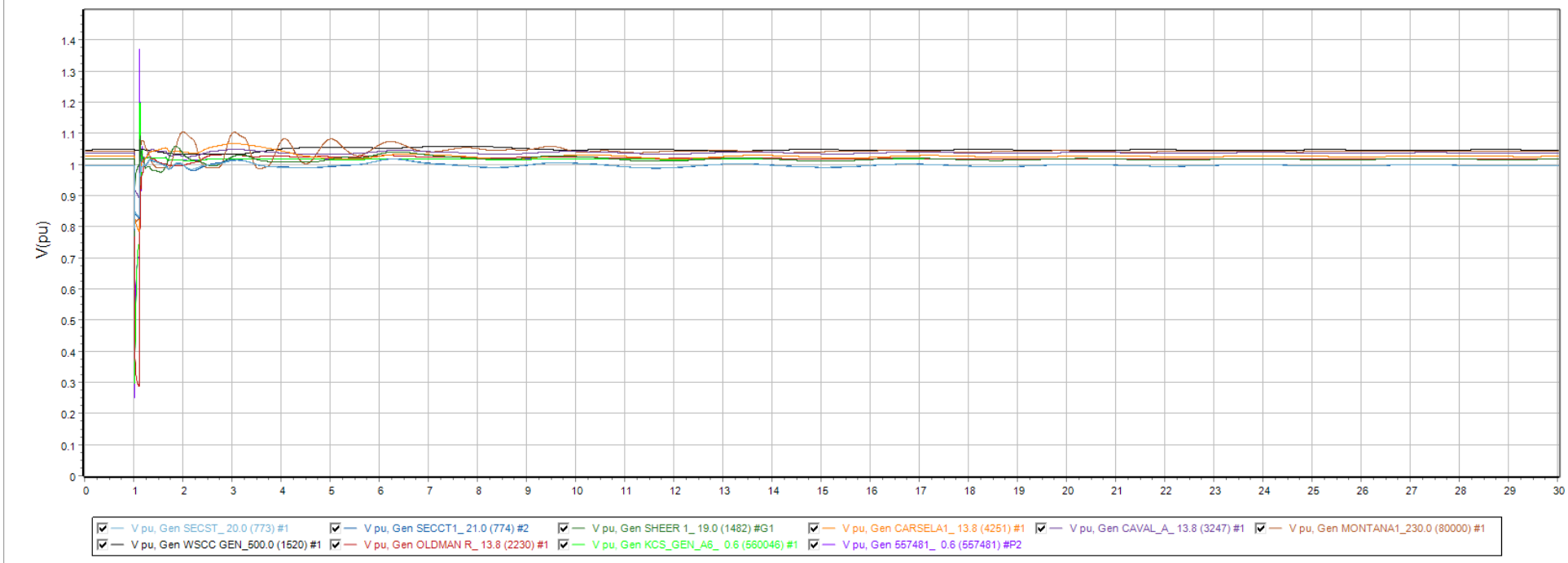
Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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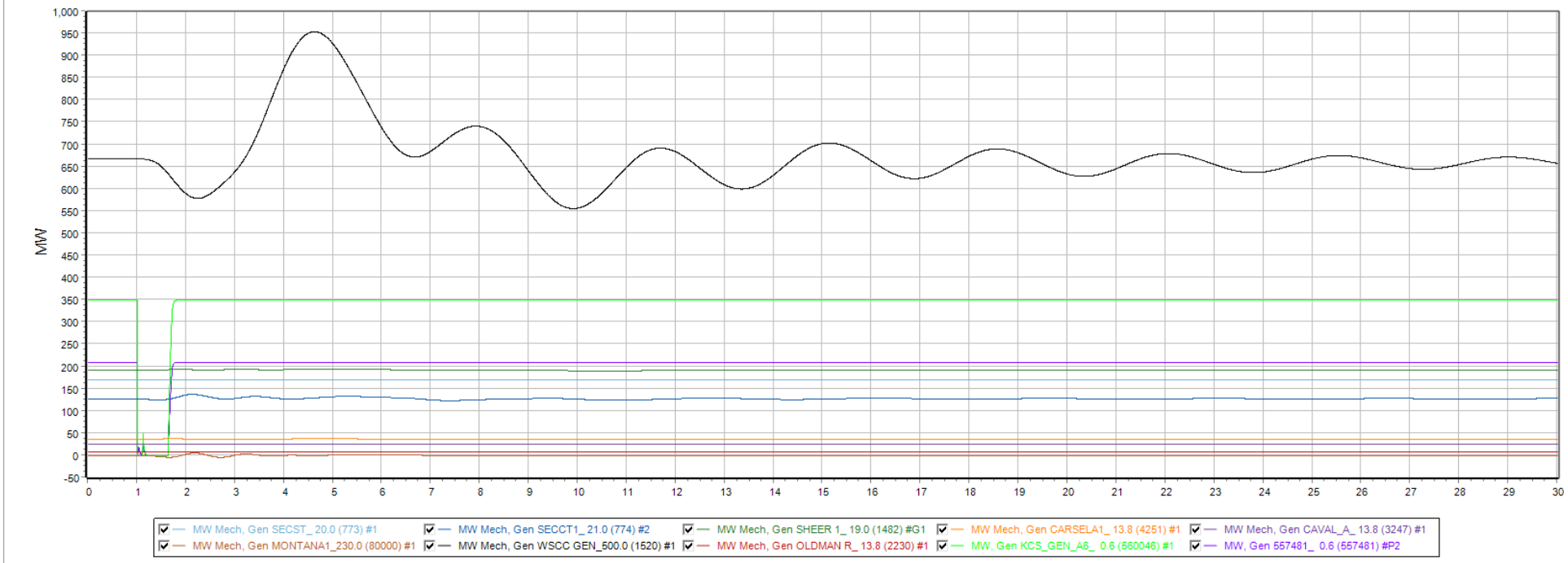
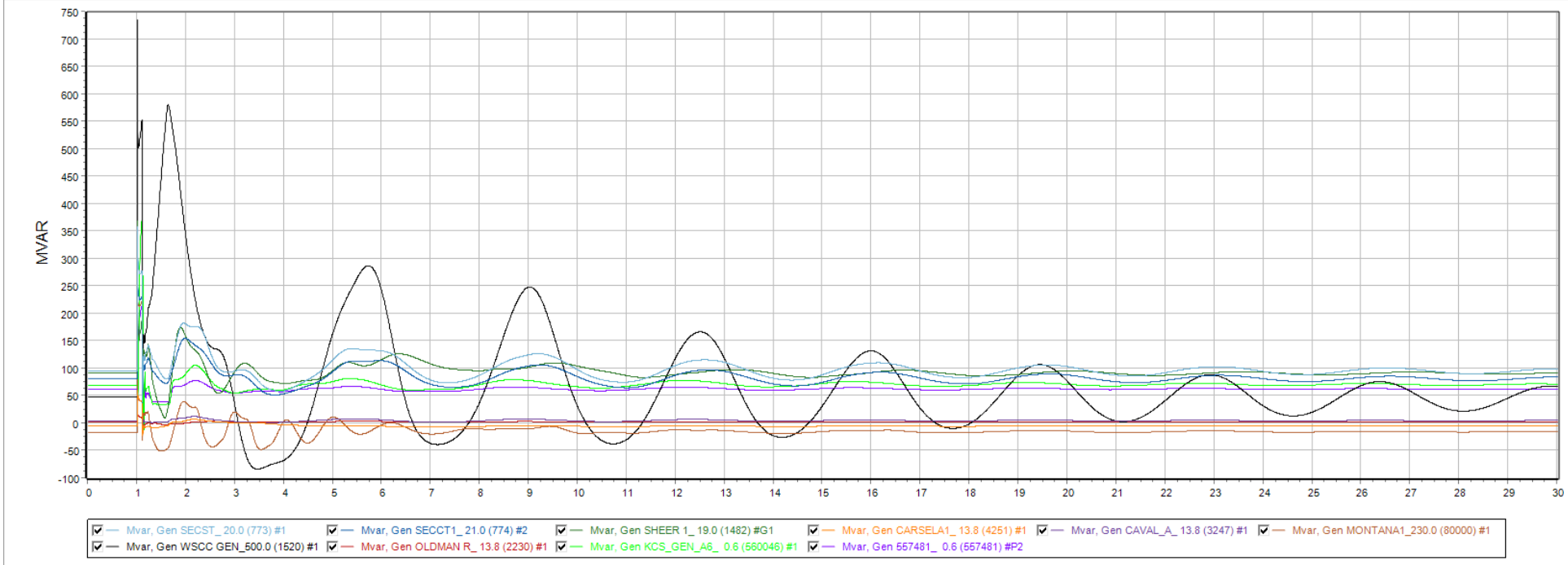
Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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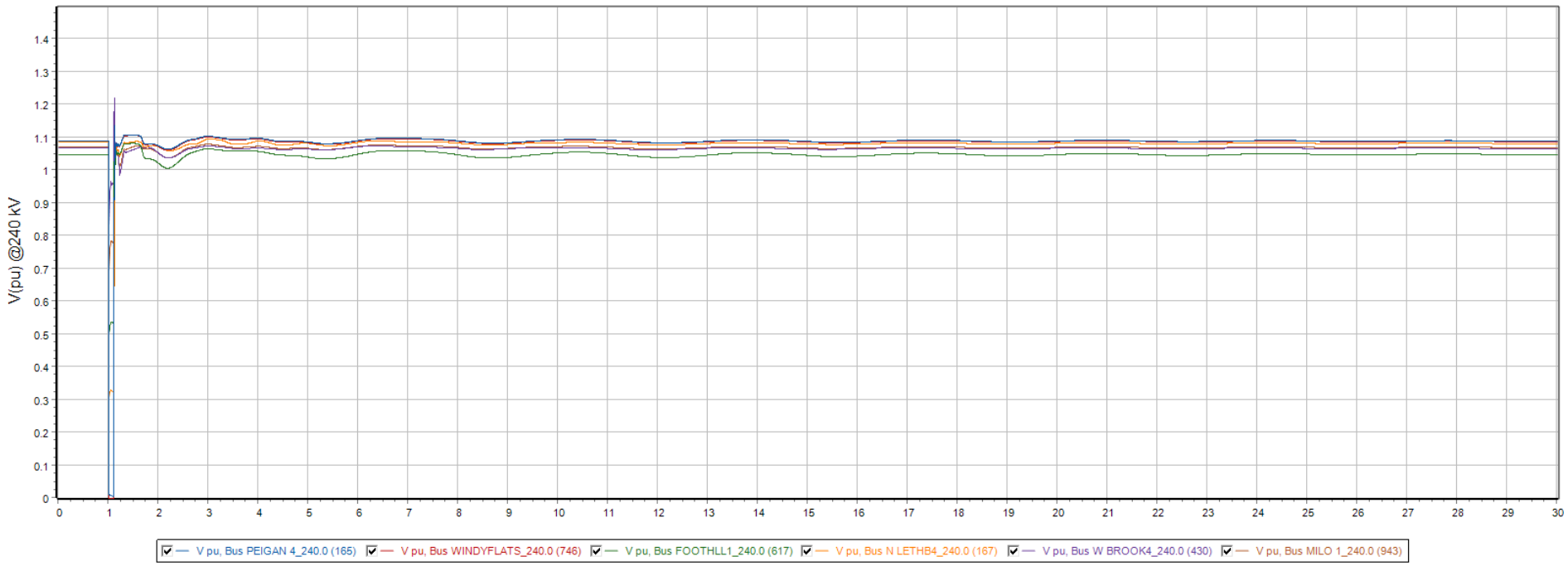
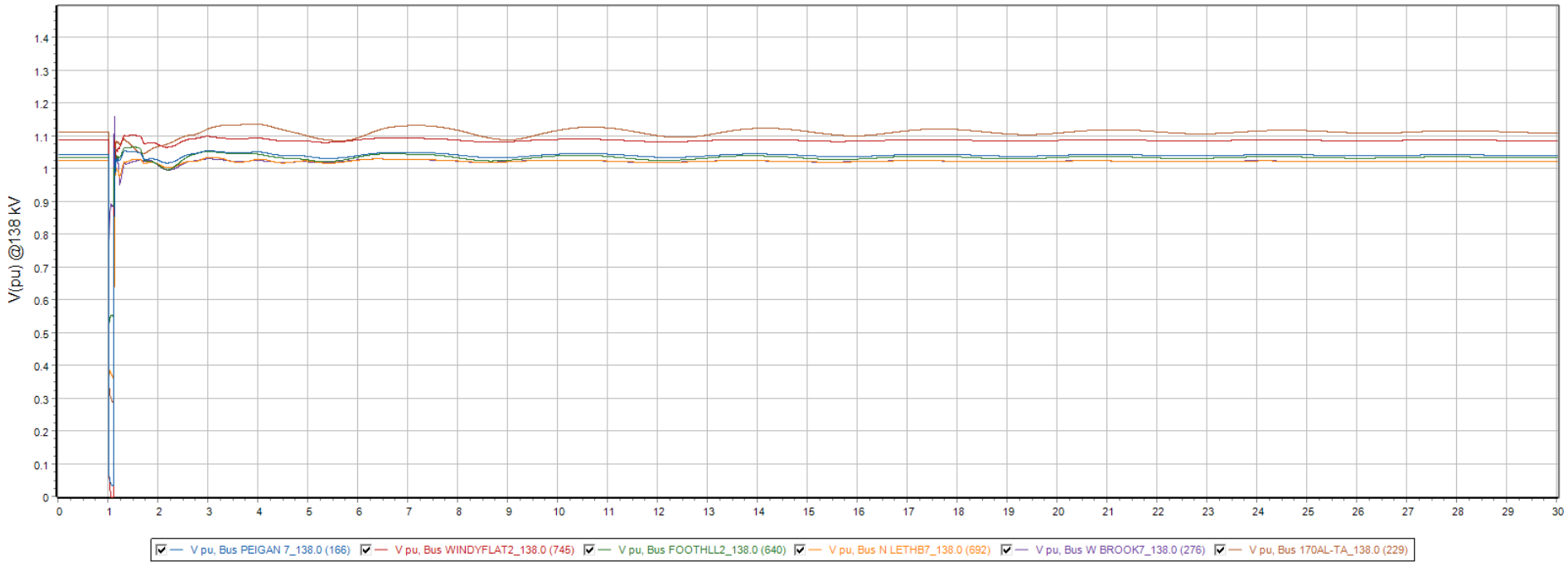
May 16, 2023 20:43:45

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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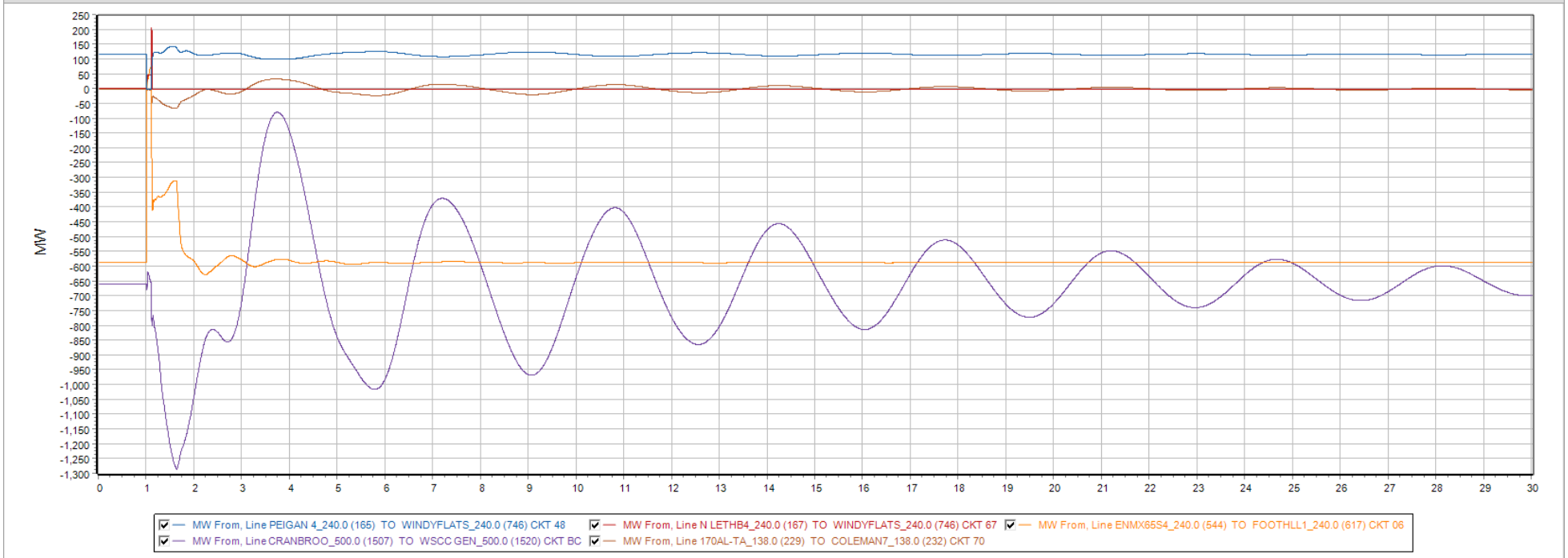
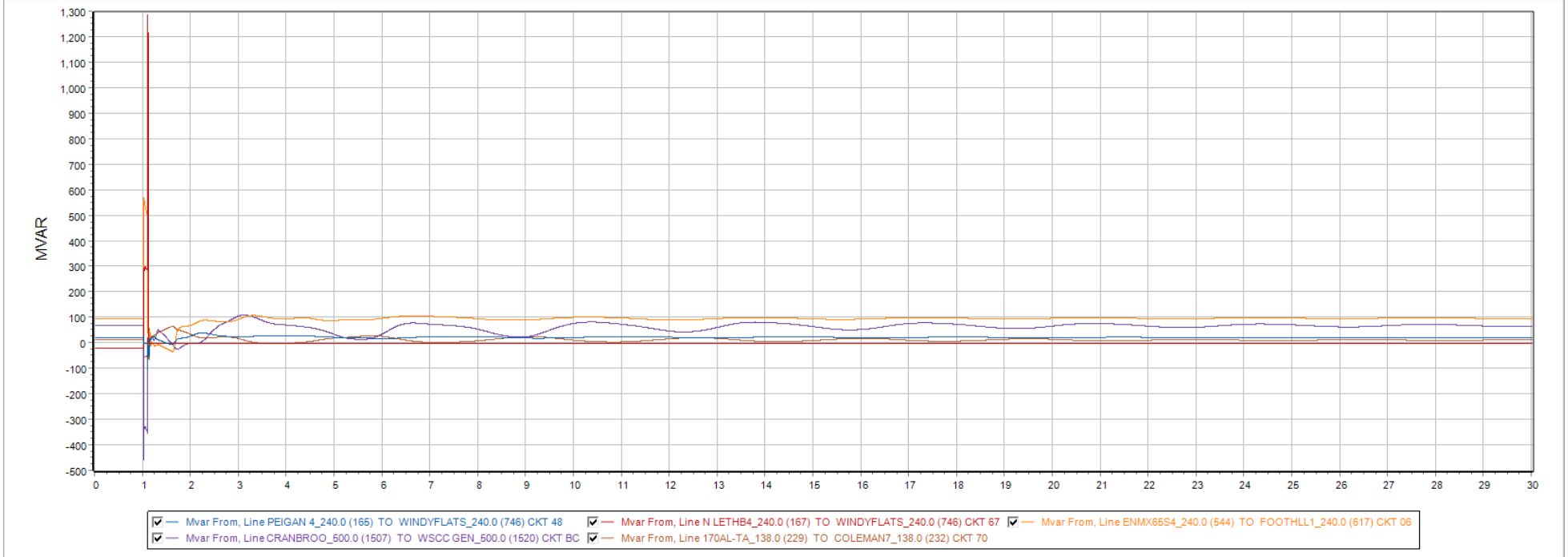
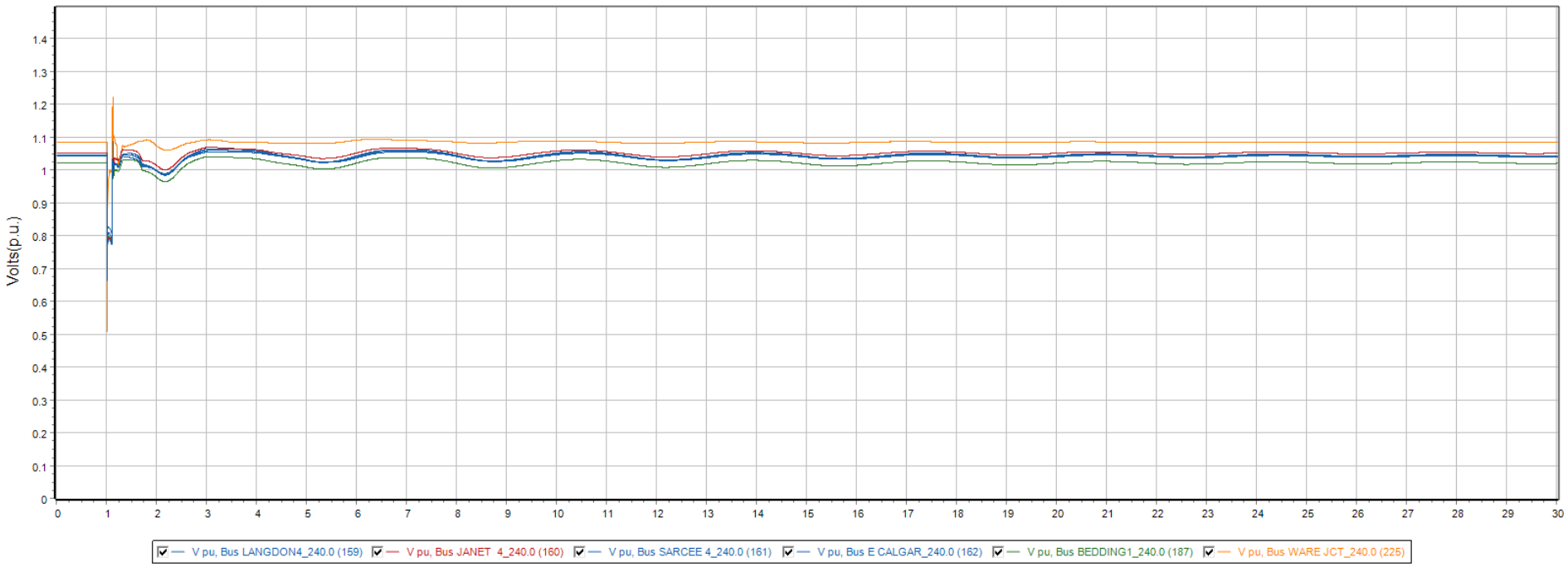
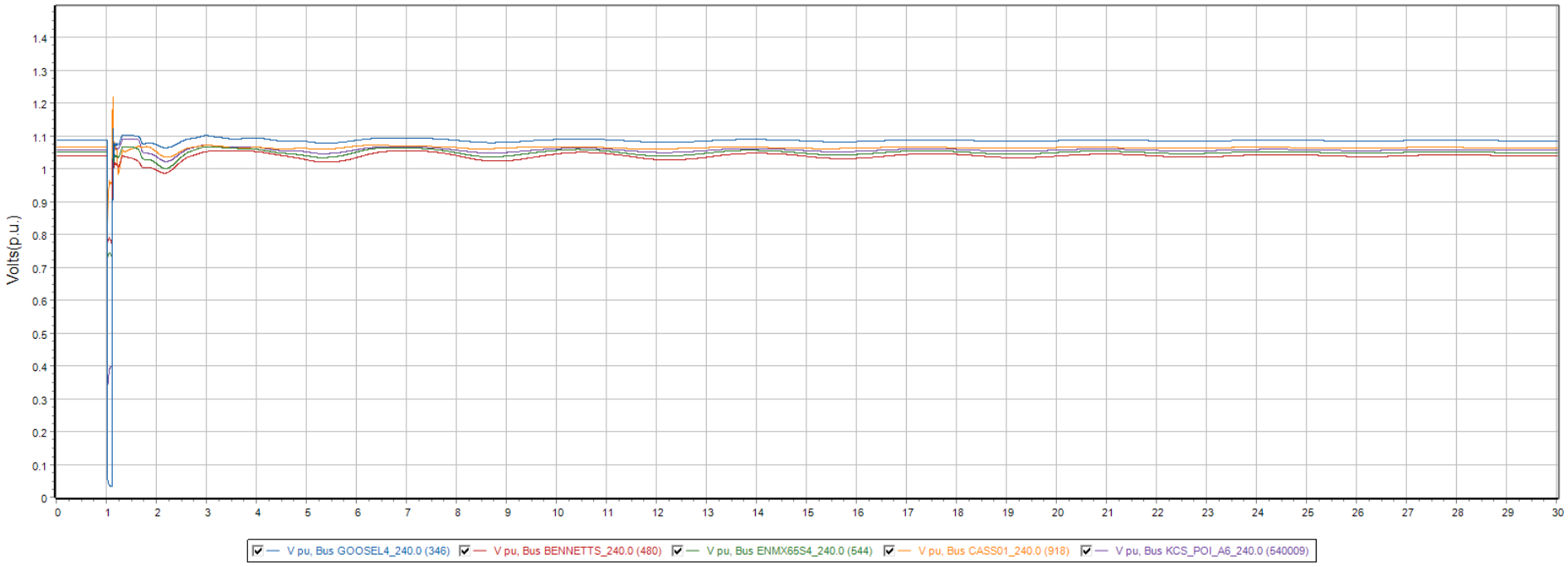
Monitor Line MW & MVAR. Q4



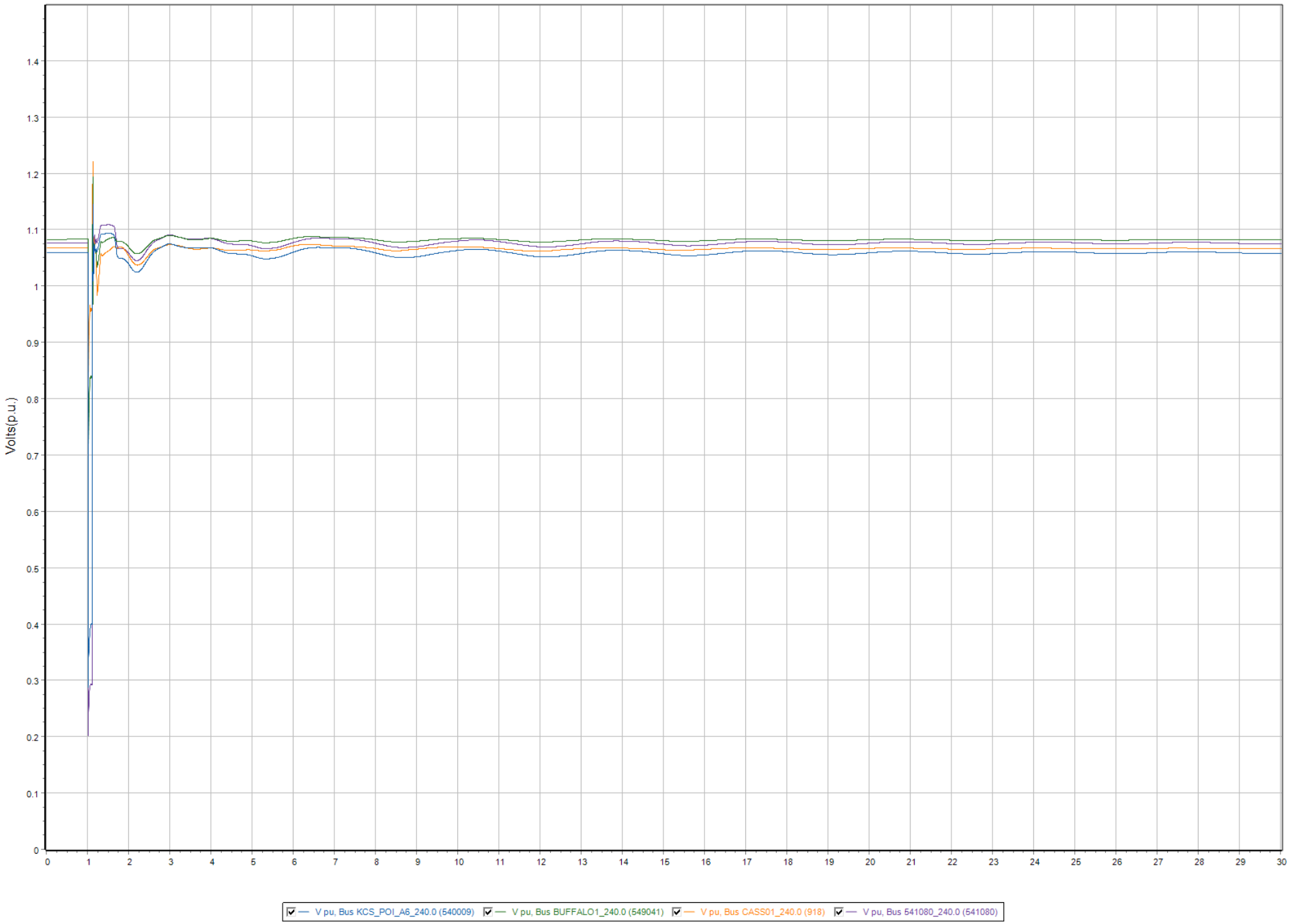


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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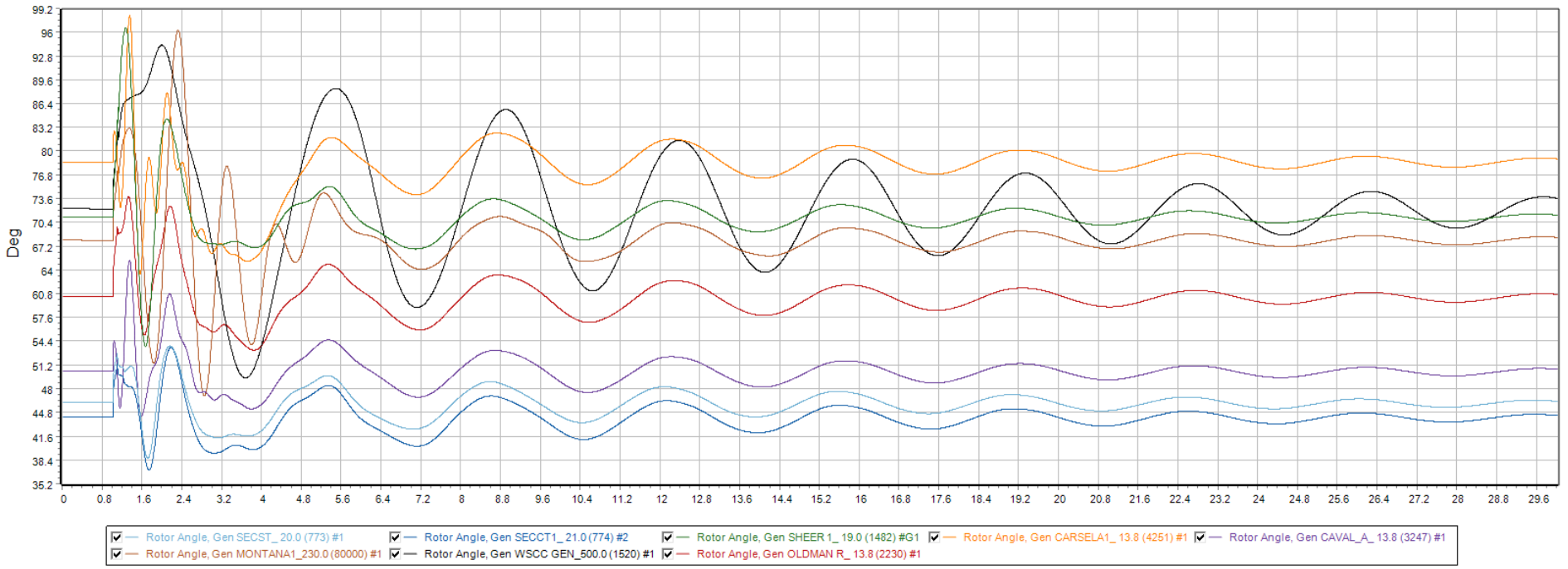
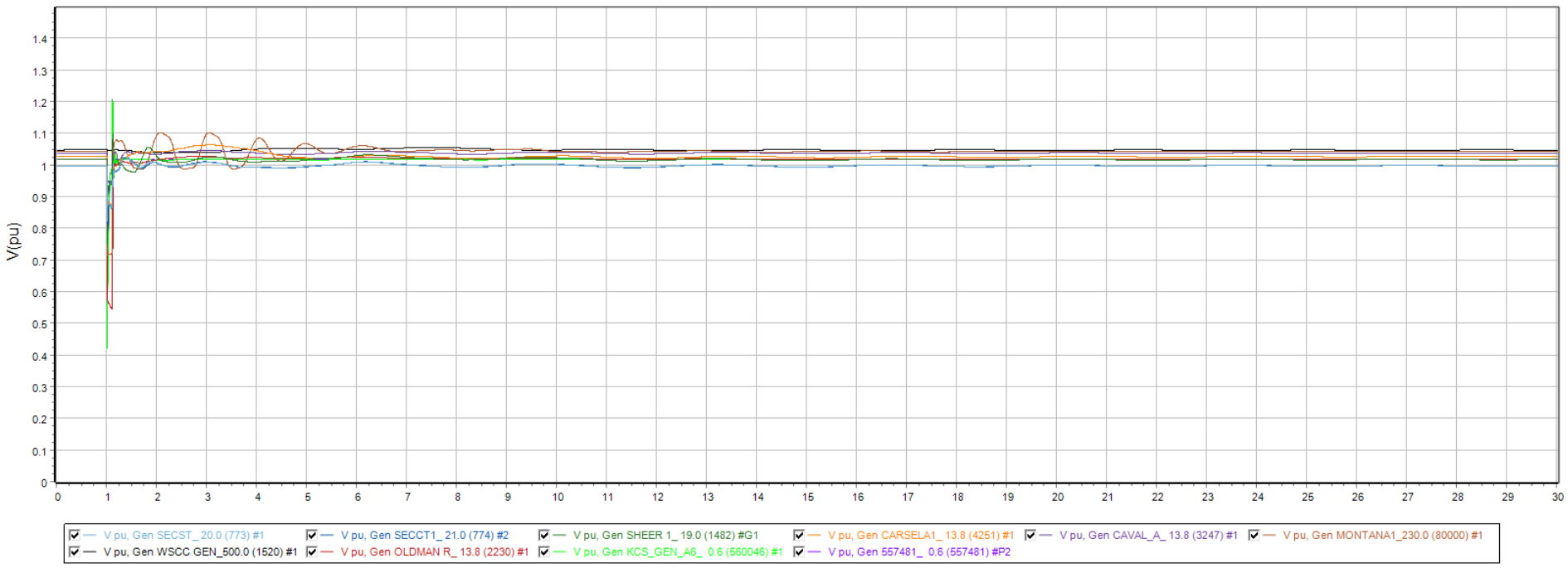
Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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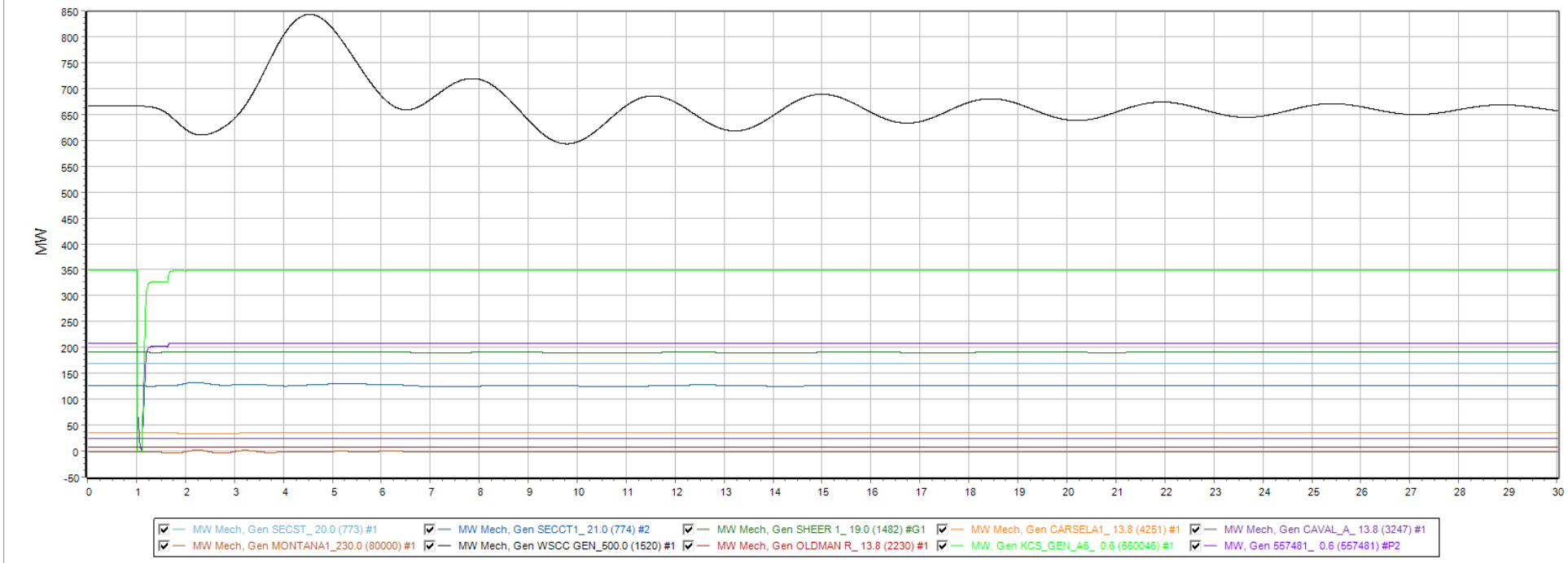
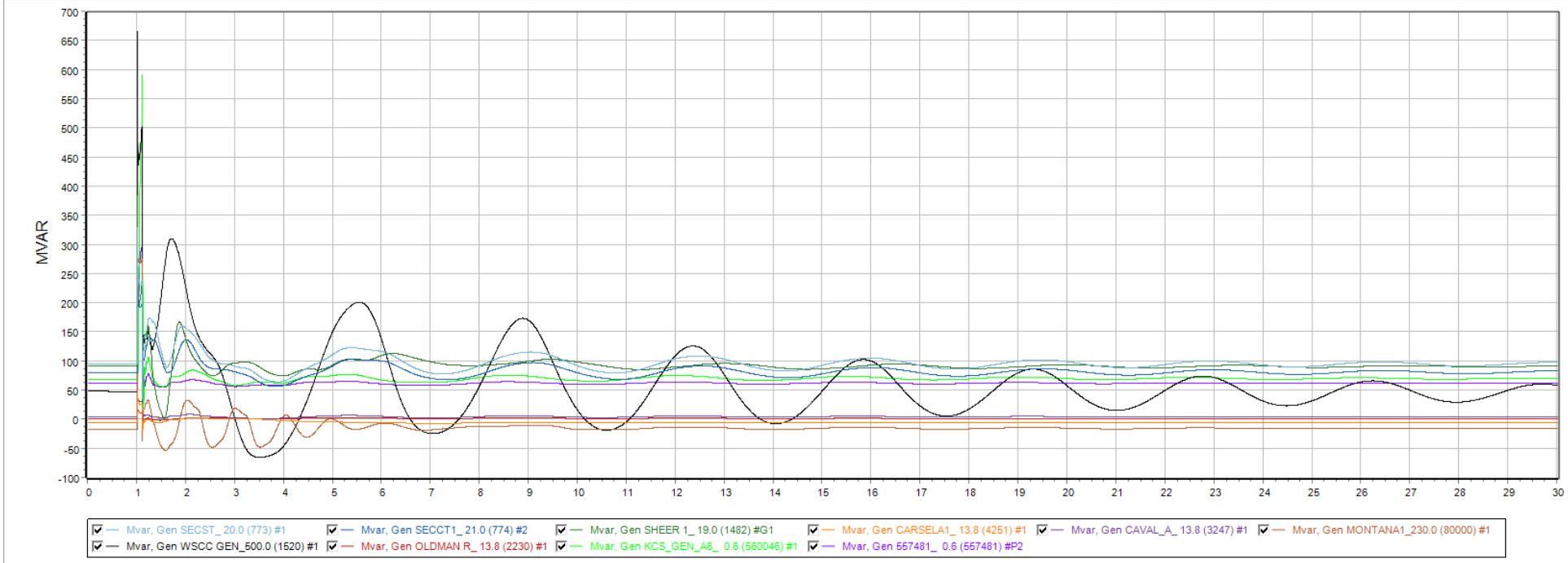
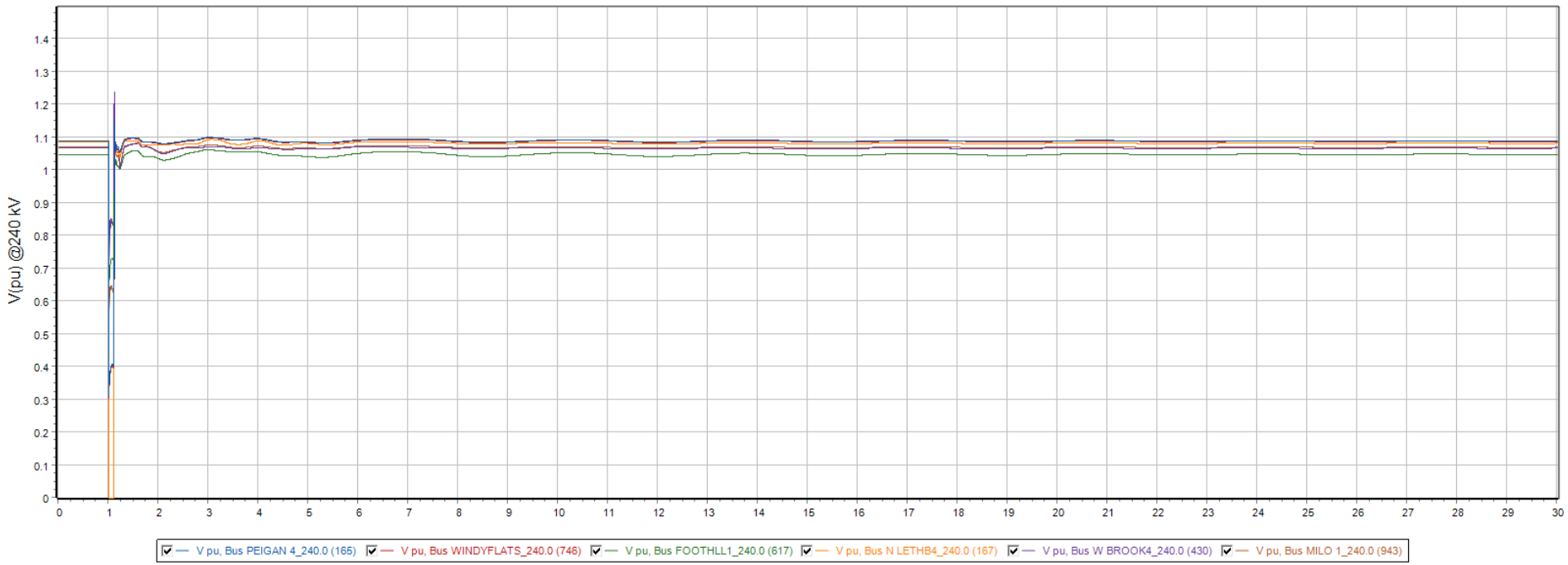
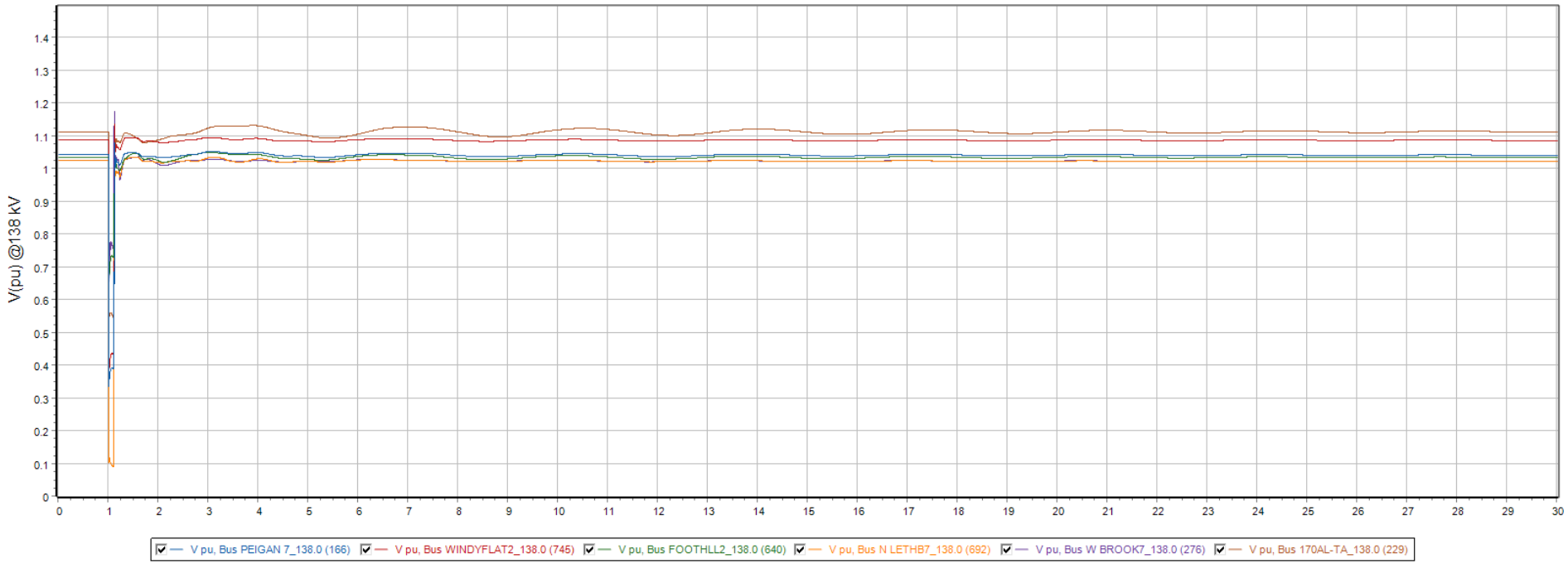
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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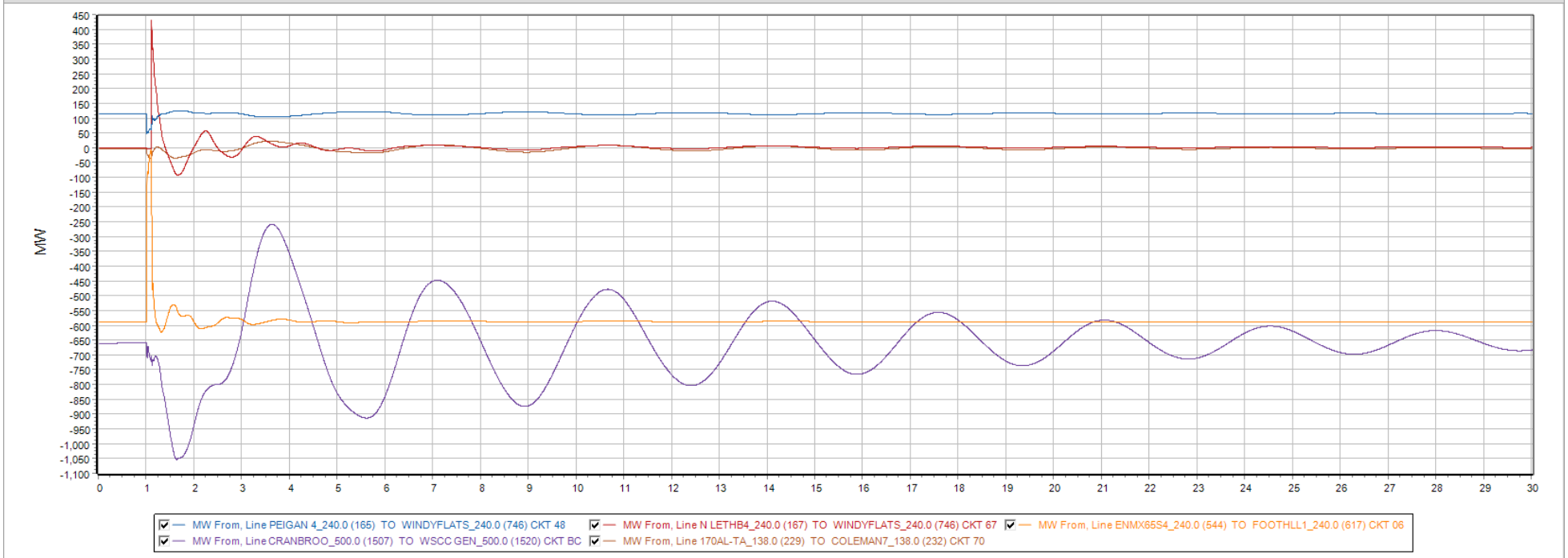
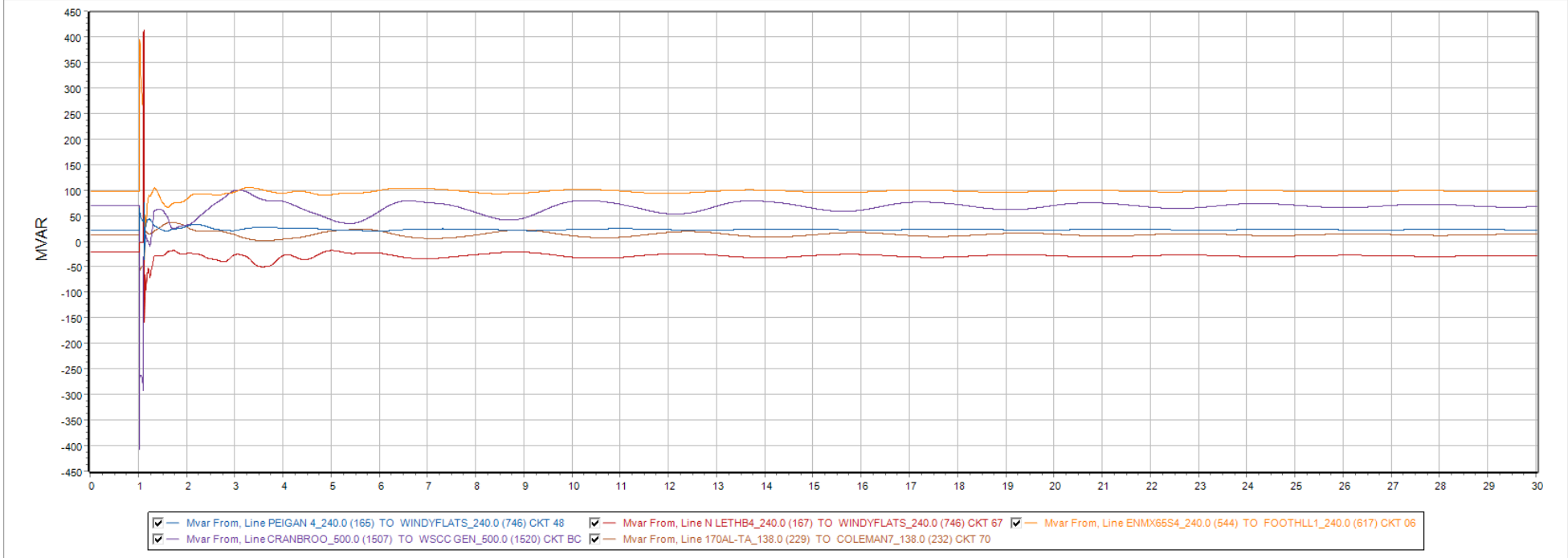
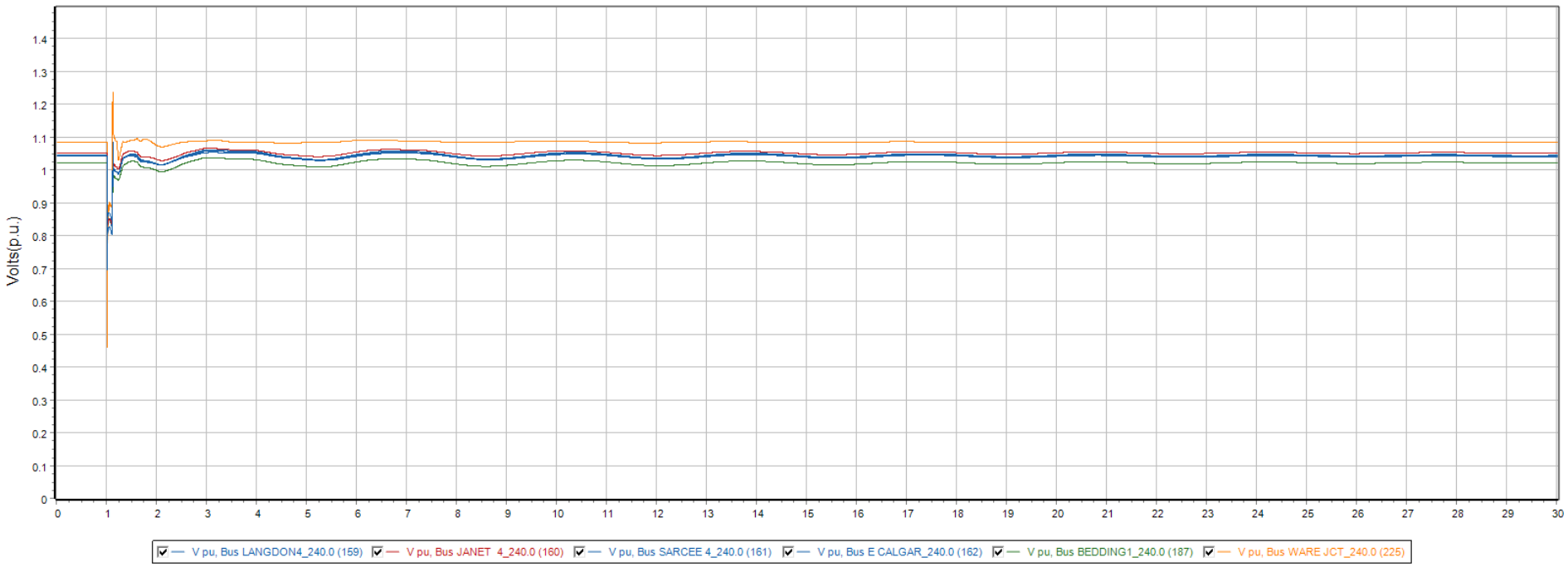
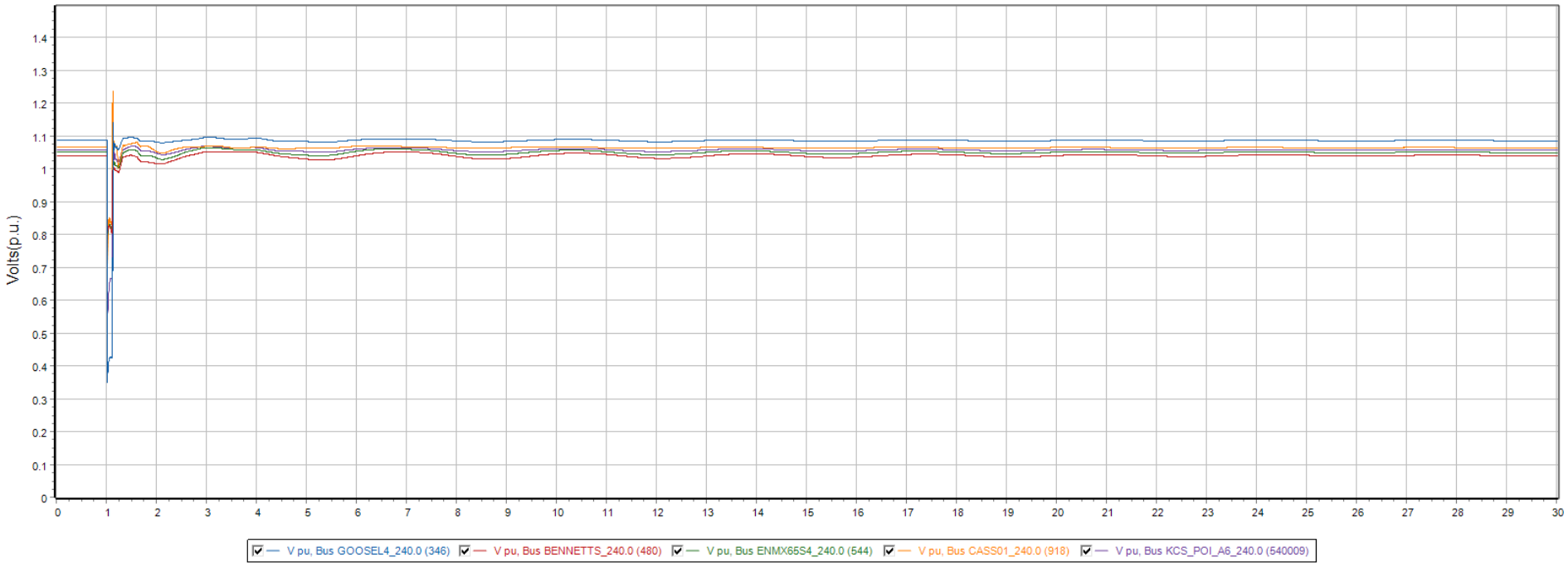
Monitor Line MW & MVAR. Q4



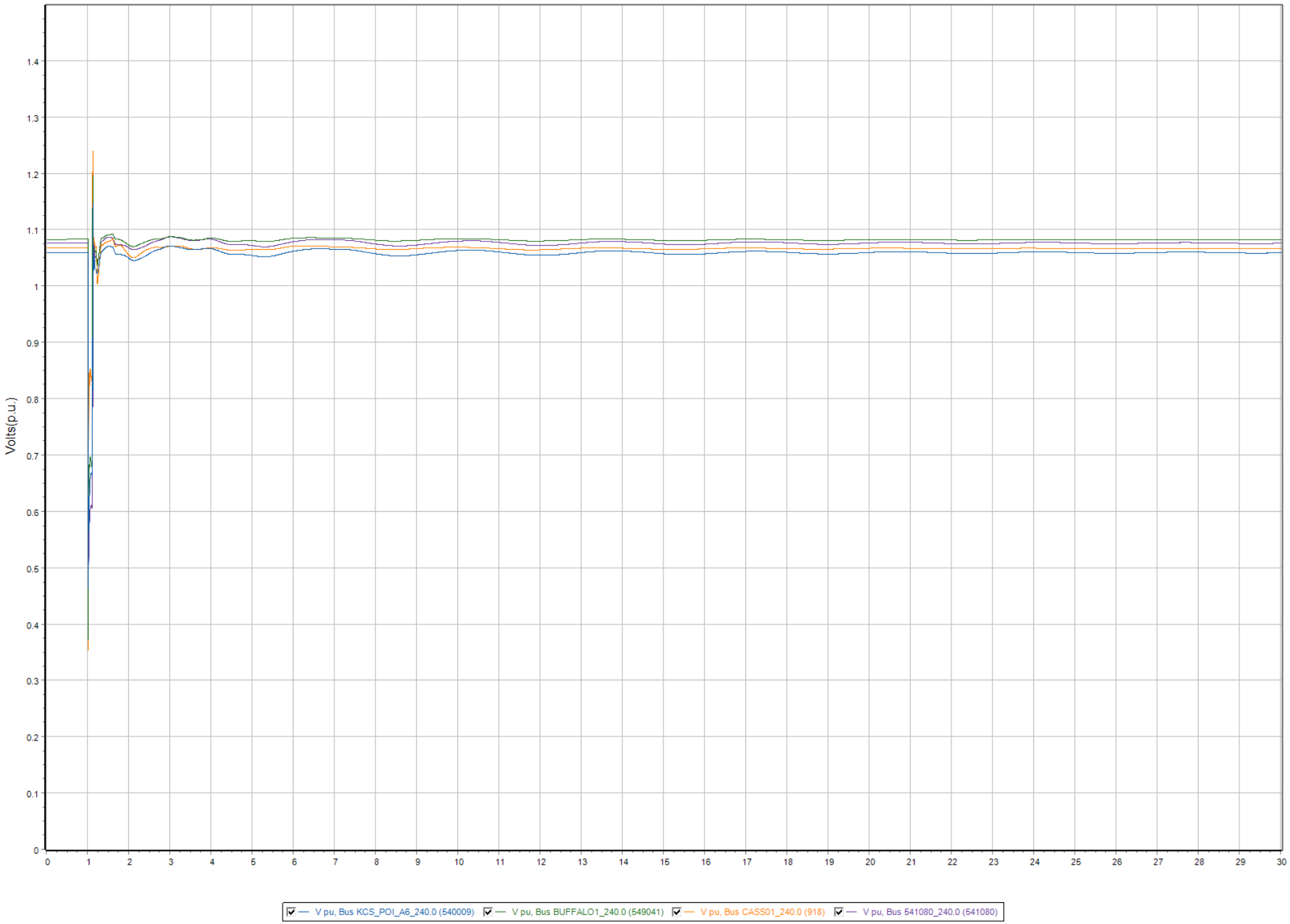


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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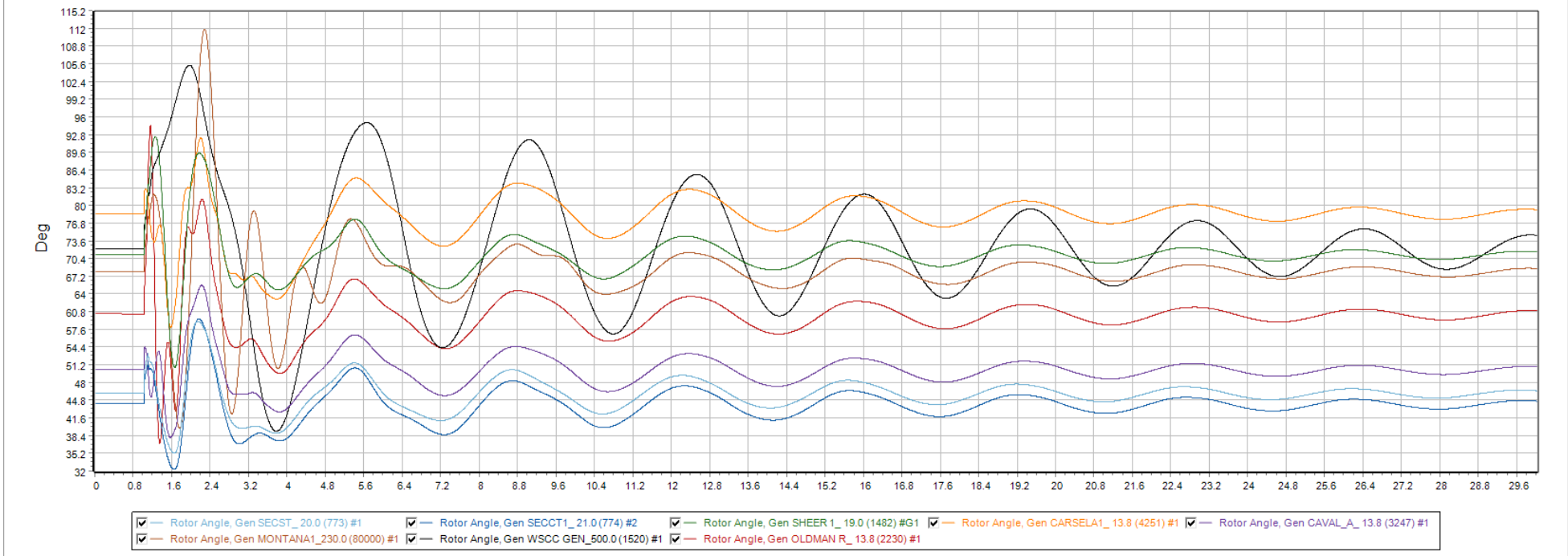
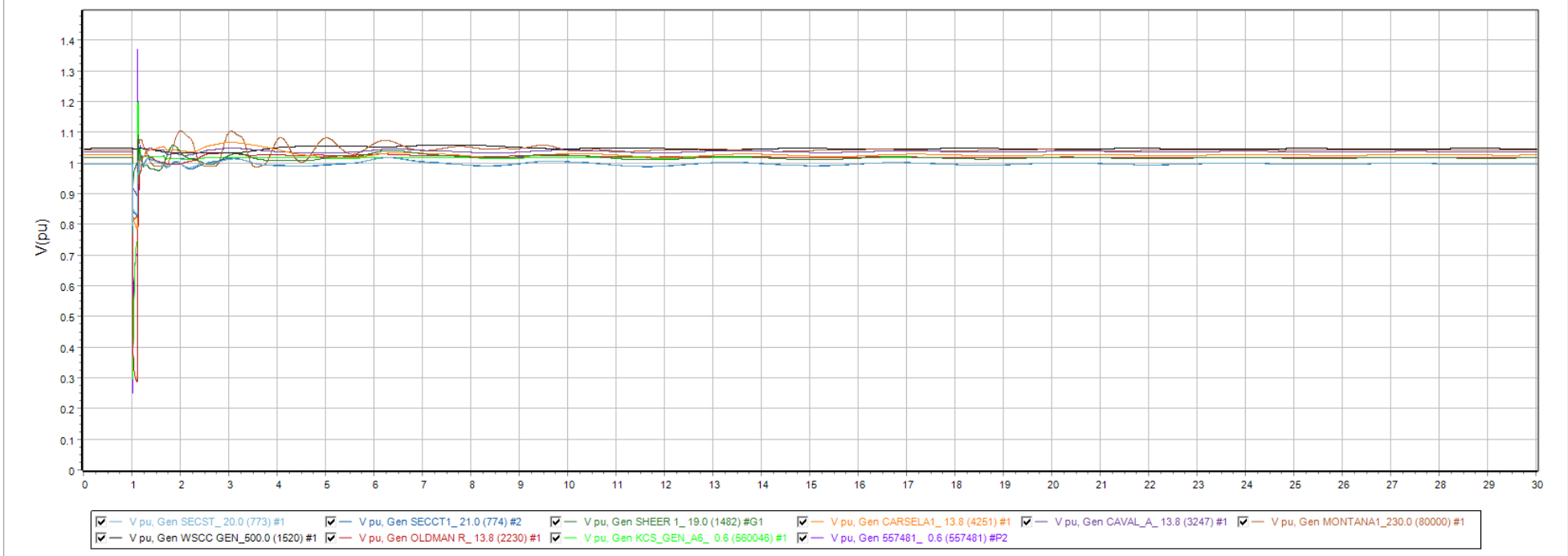
Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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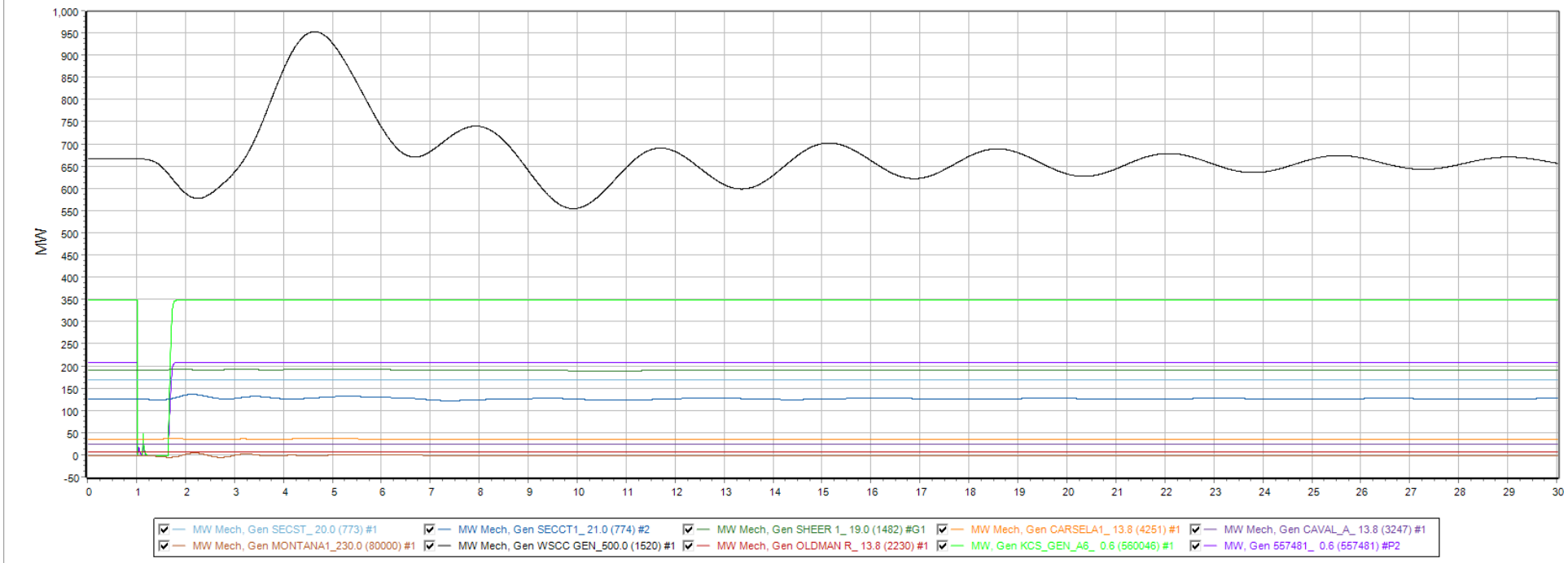
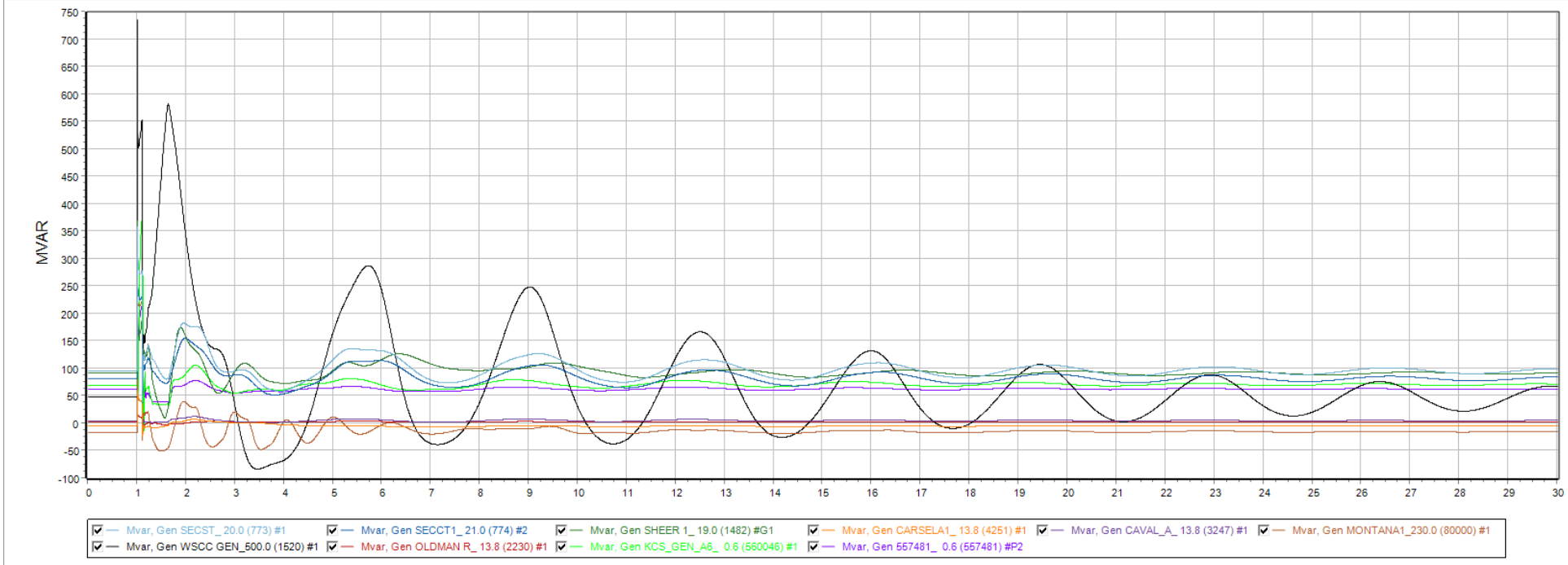
May 16, 2023 21:03:30

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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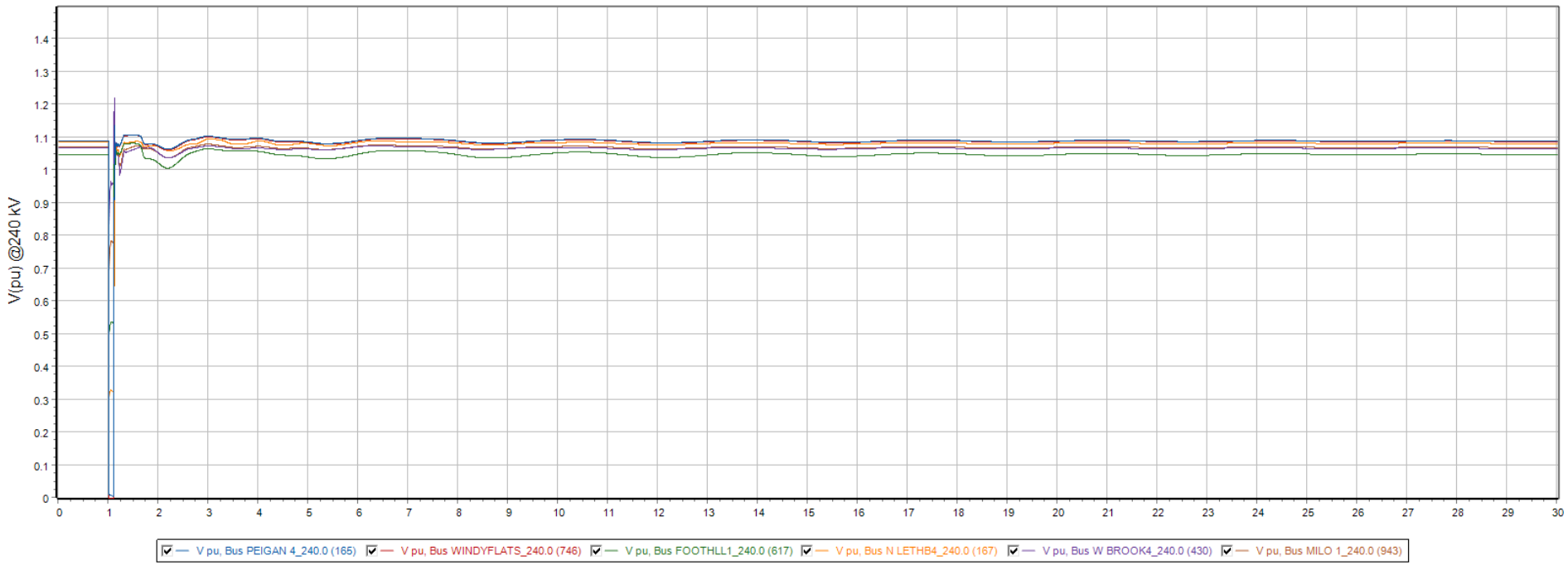
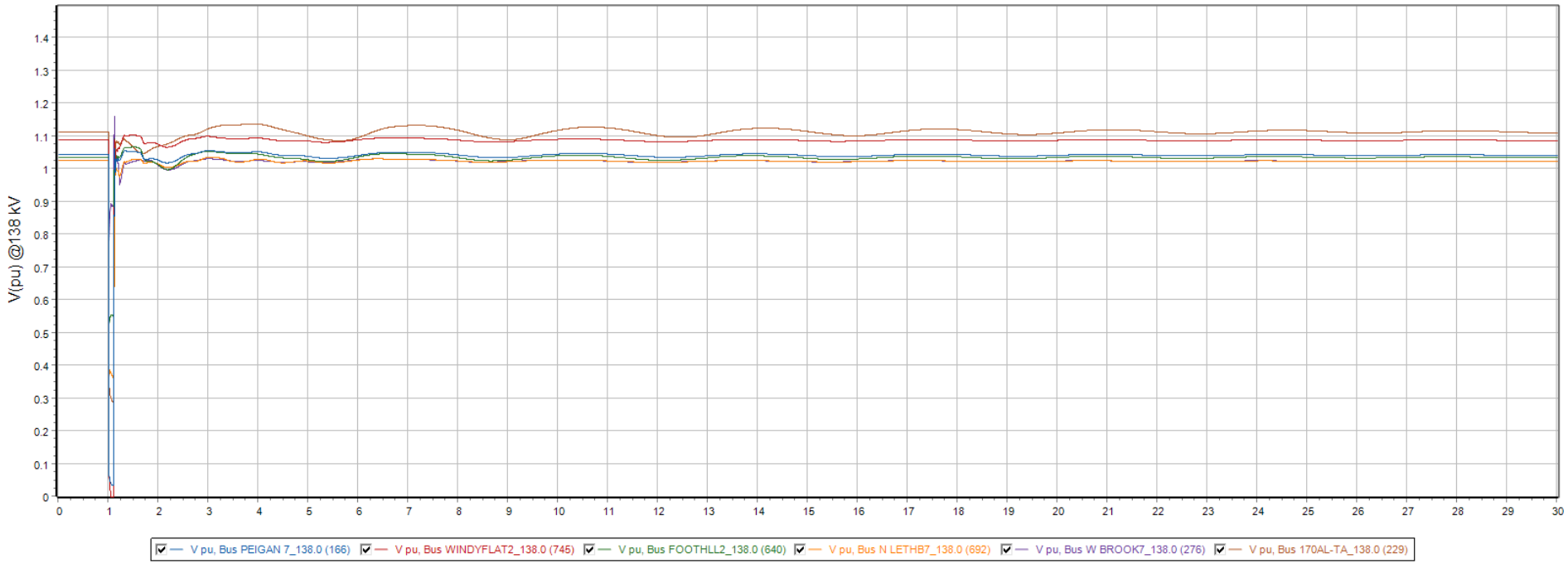
May 16, 2023 21:03:31

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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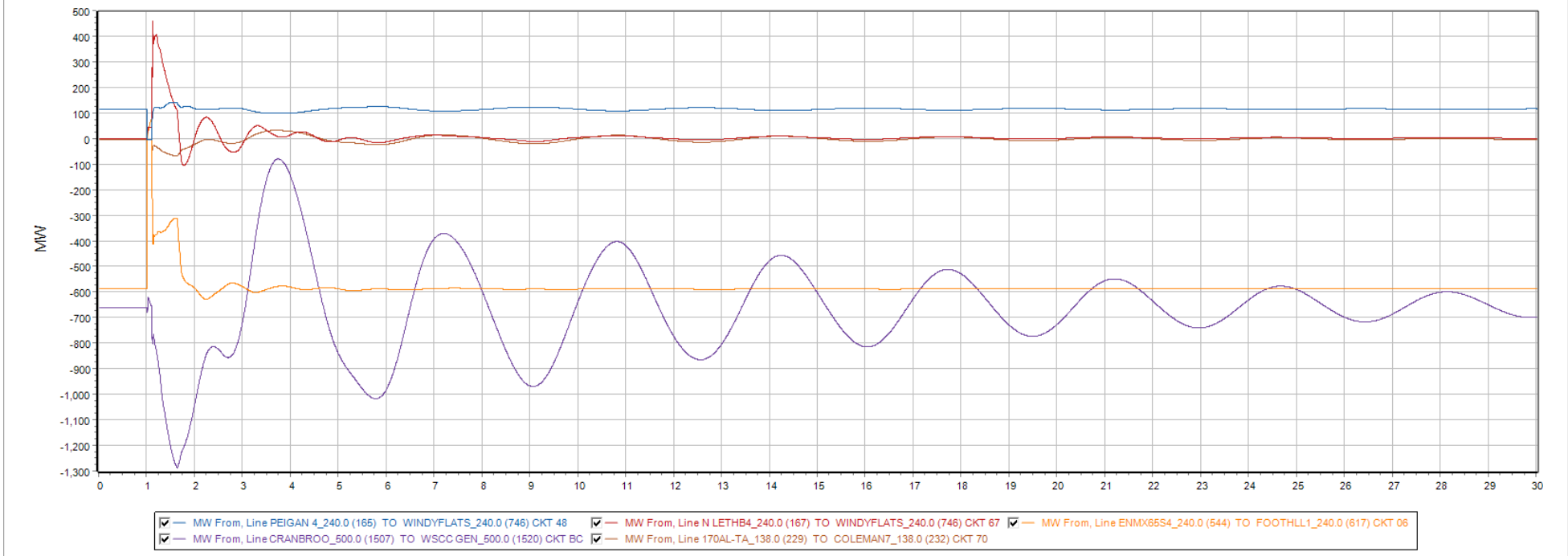
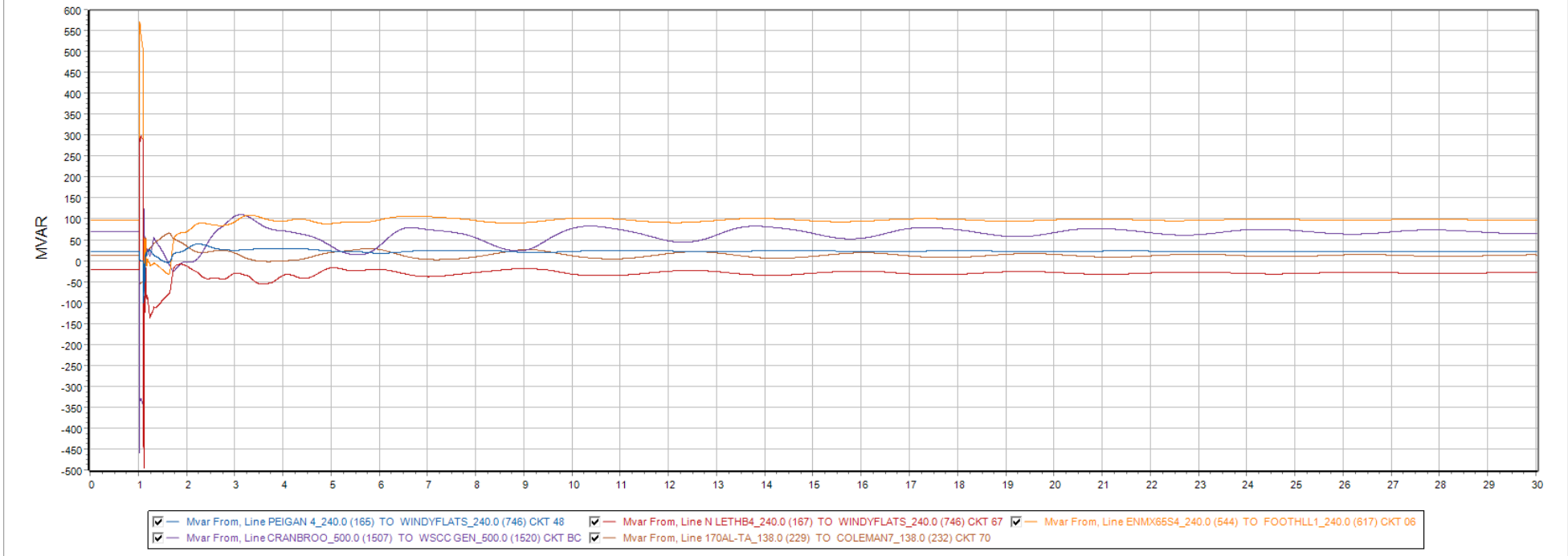
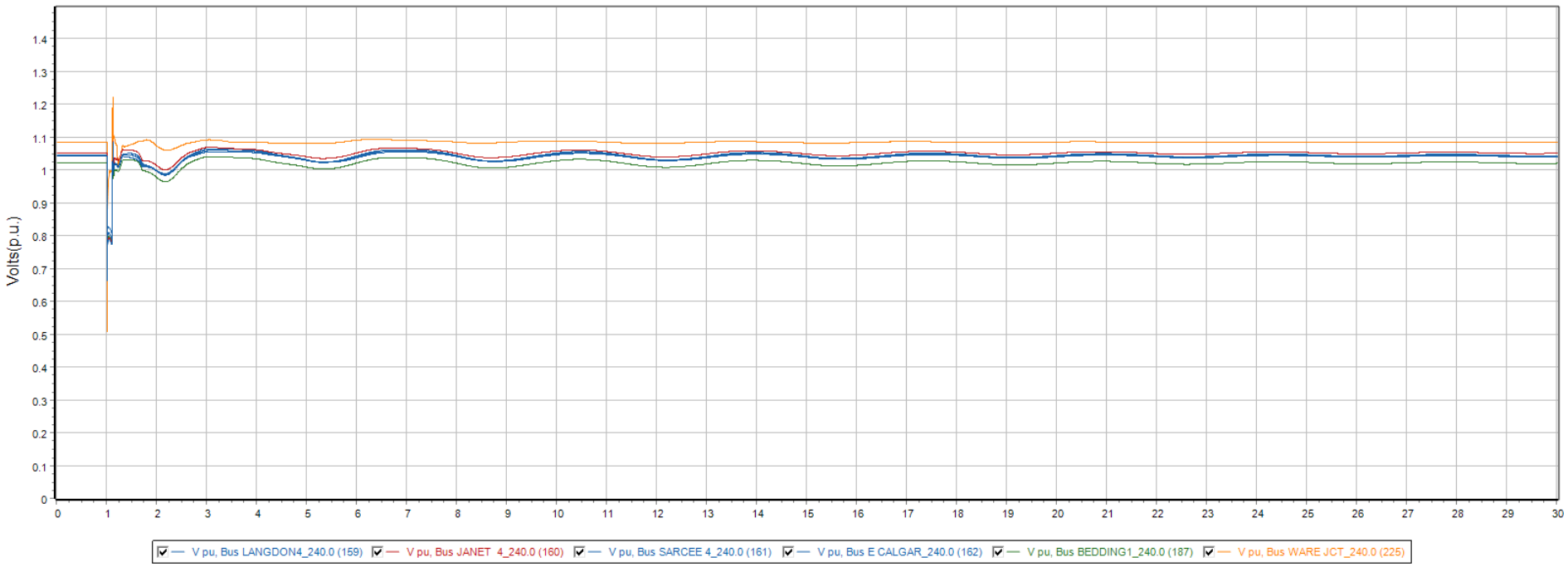
May 16, 2023 21:03:31

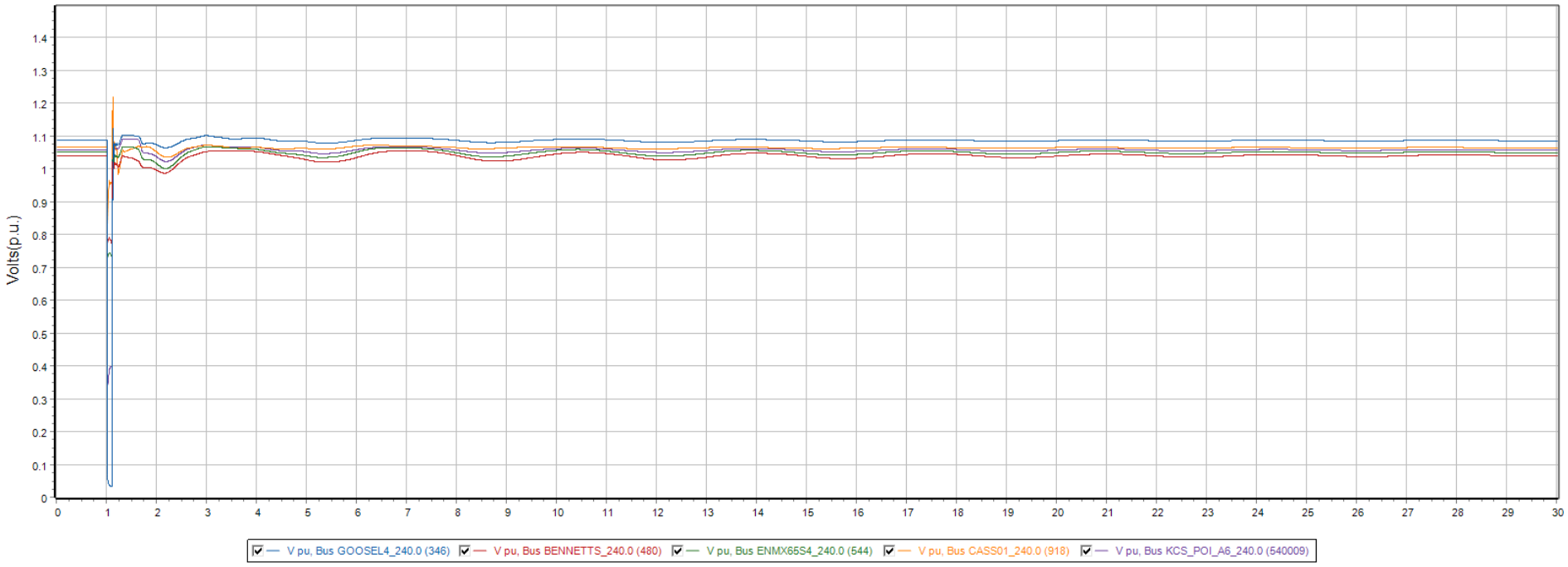
Monitor Line MW & MVAR. Q4



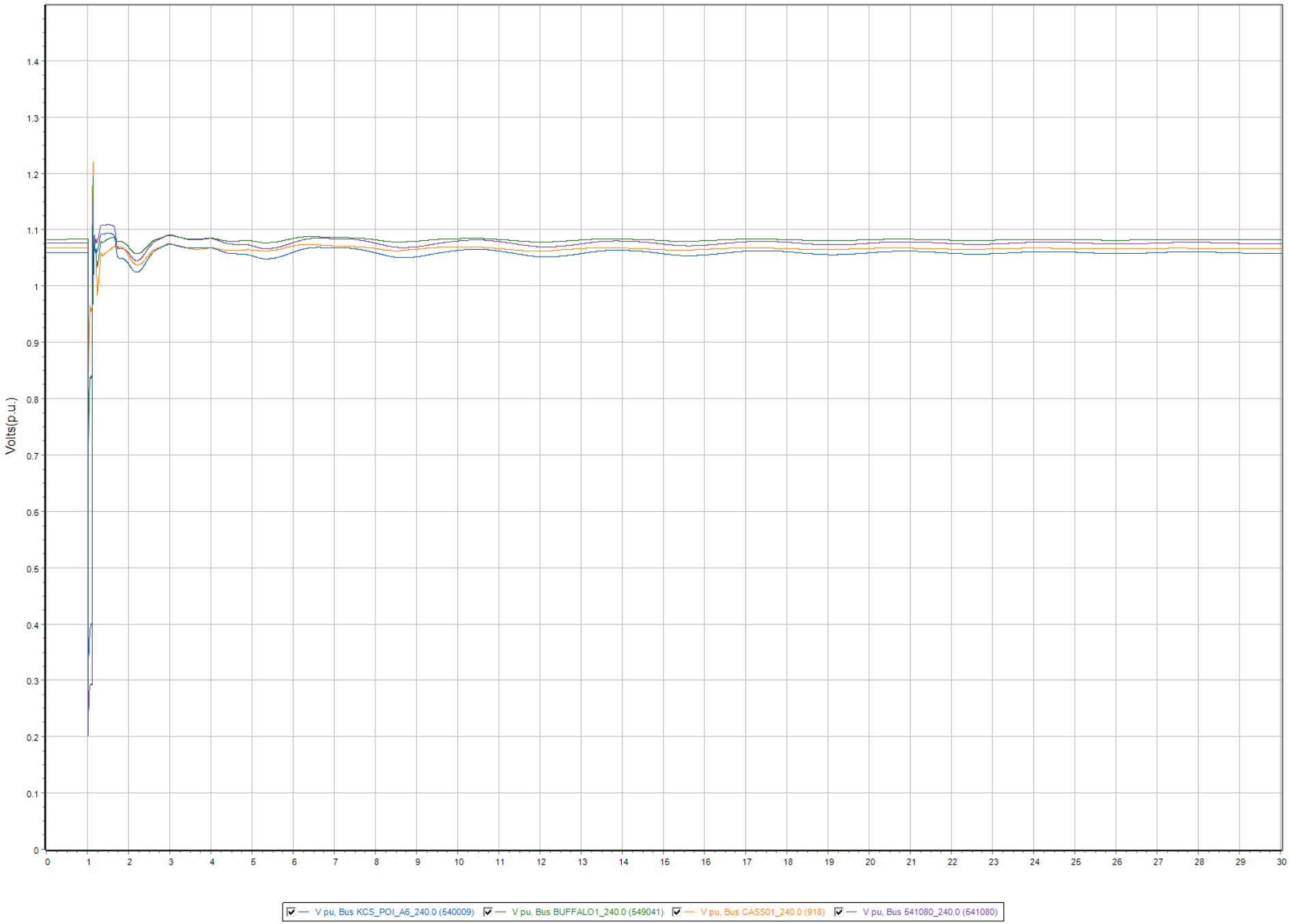


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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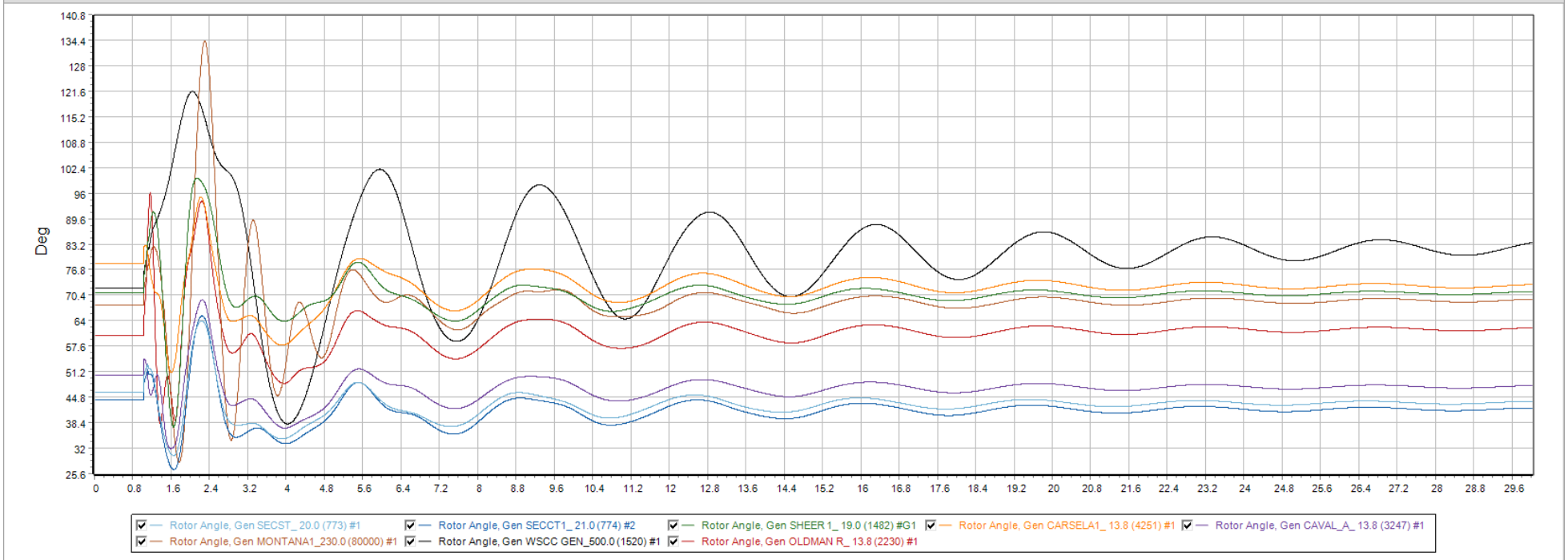
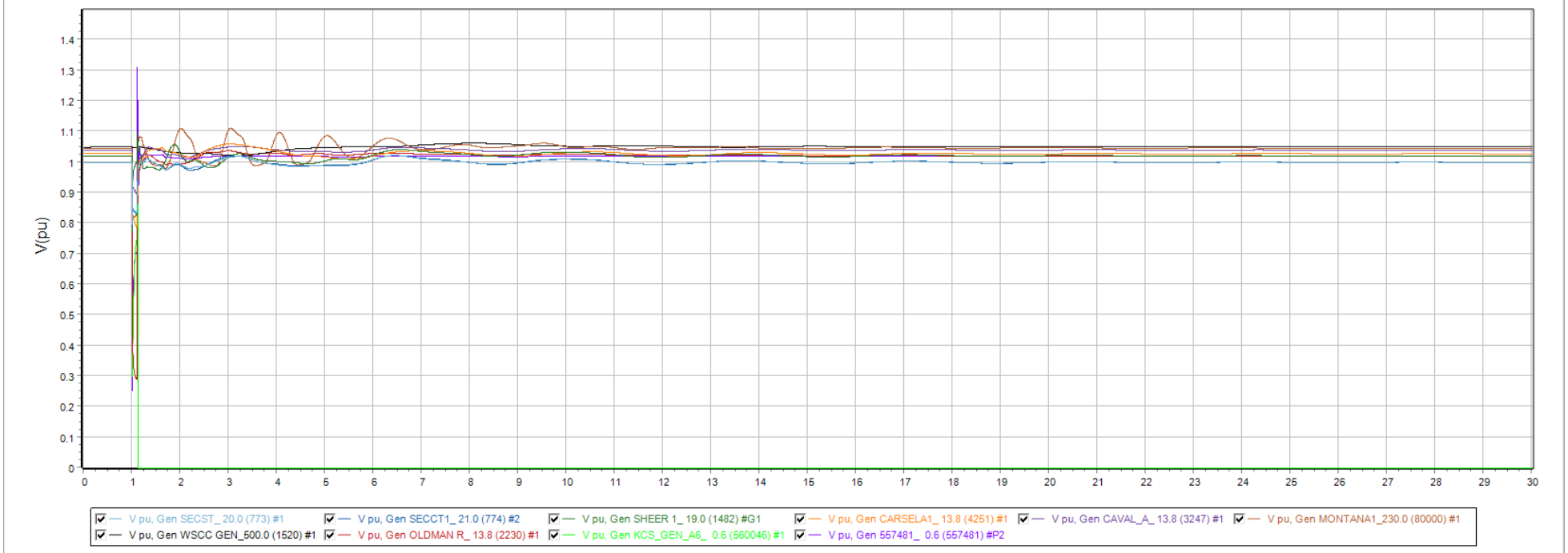
May 16, 2023 21:03:32

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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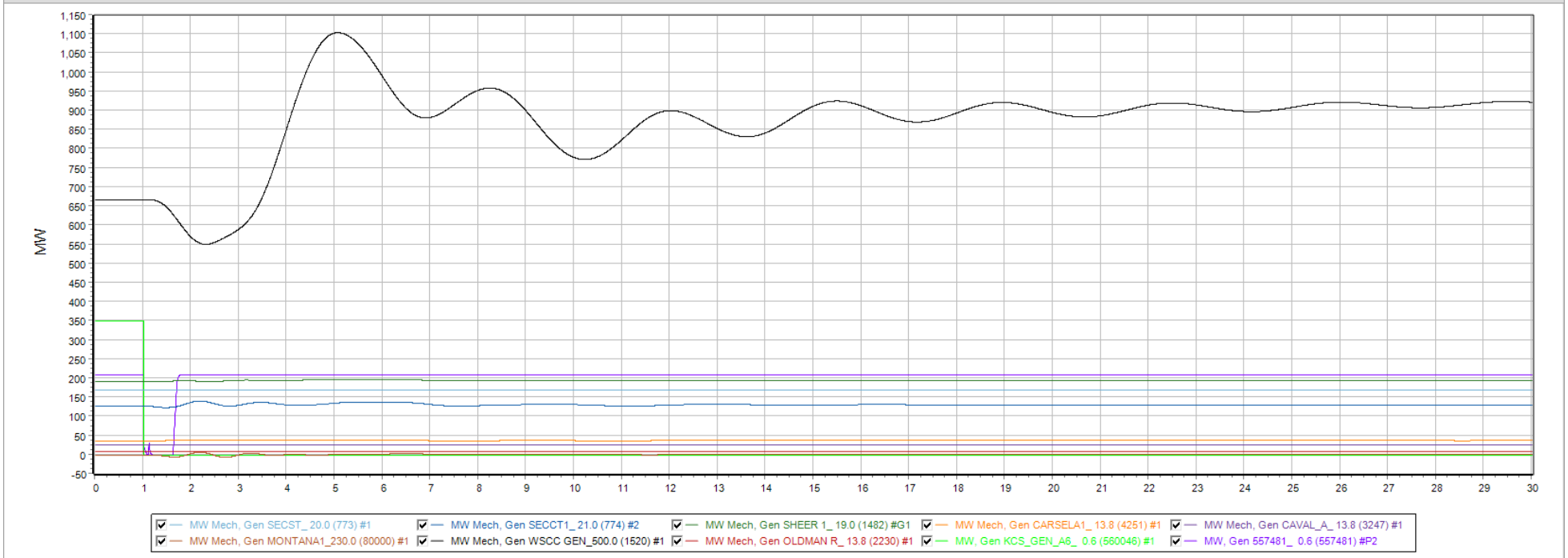
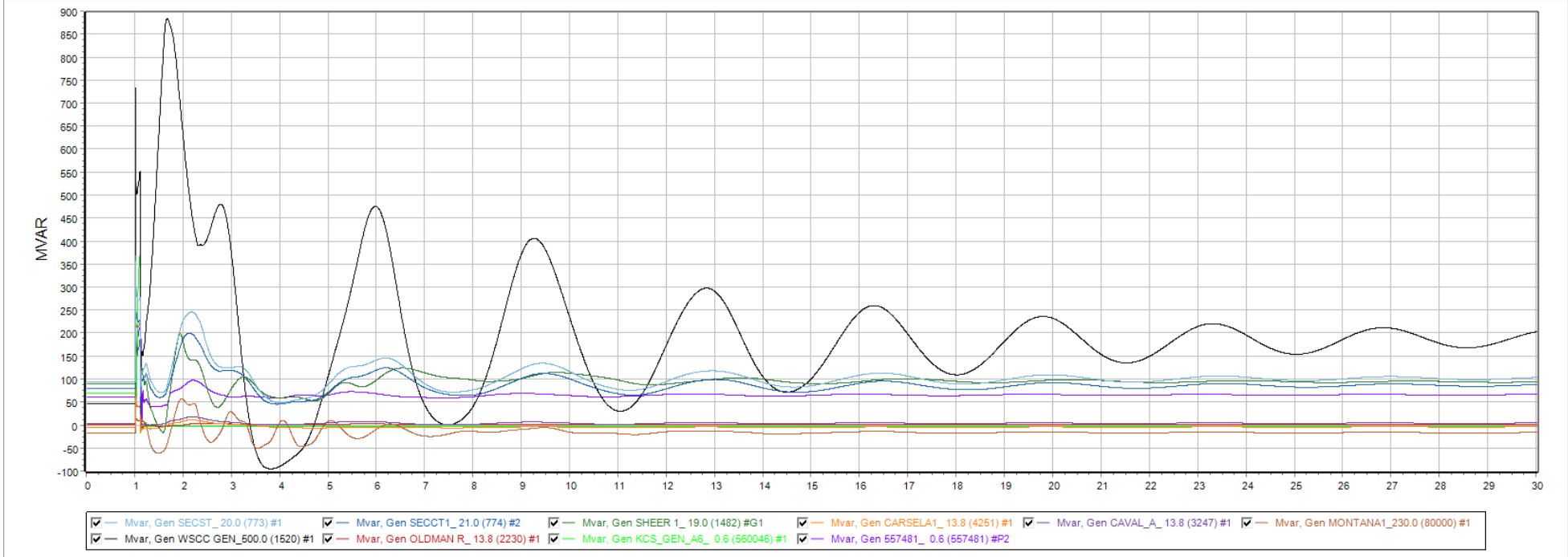
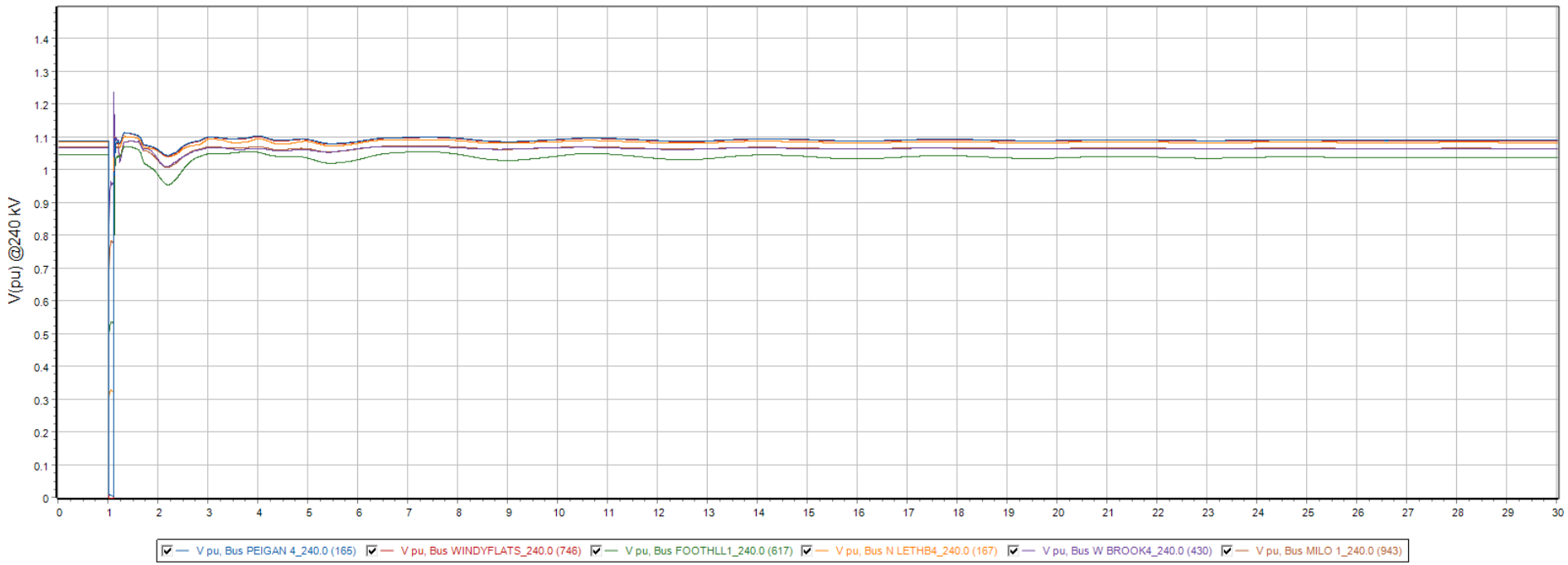
May 16, 2023 23:24:04

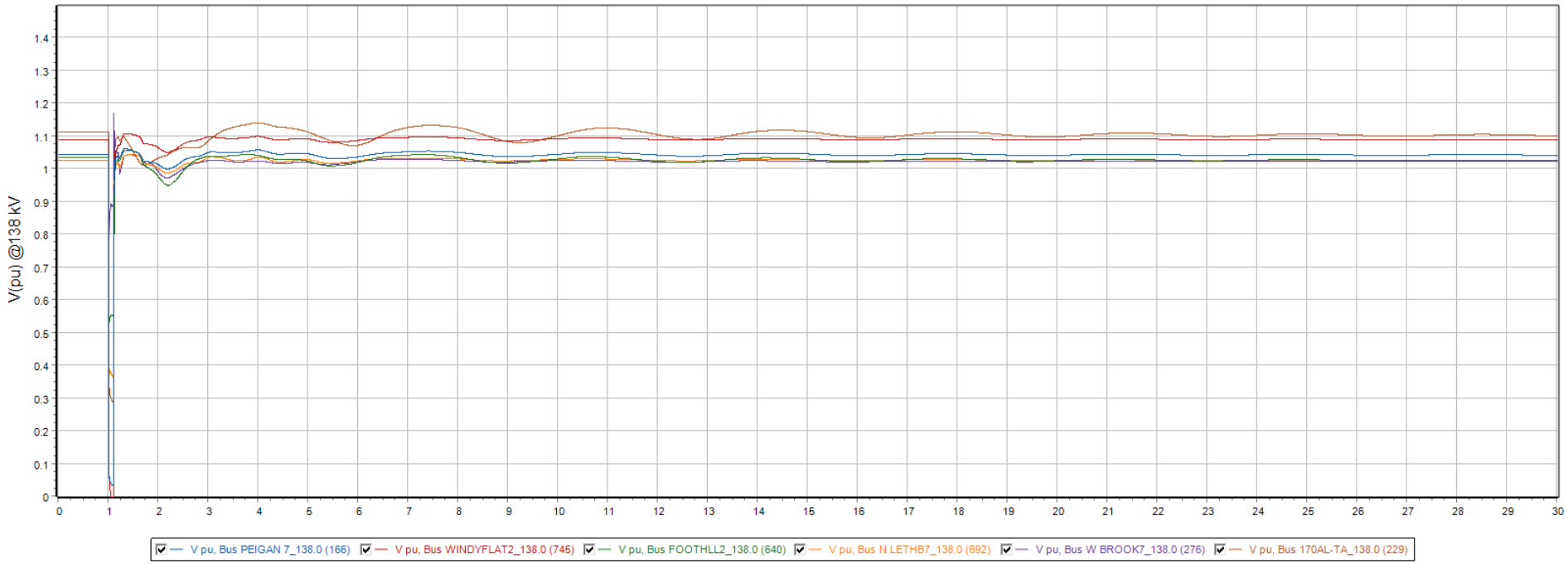
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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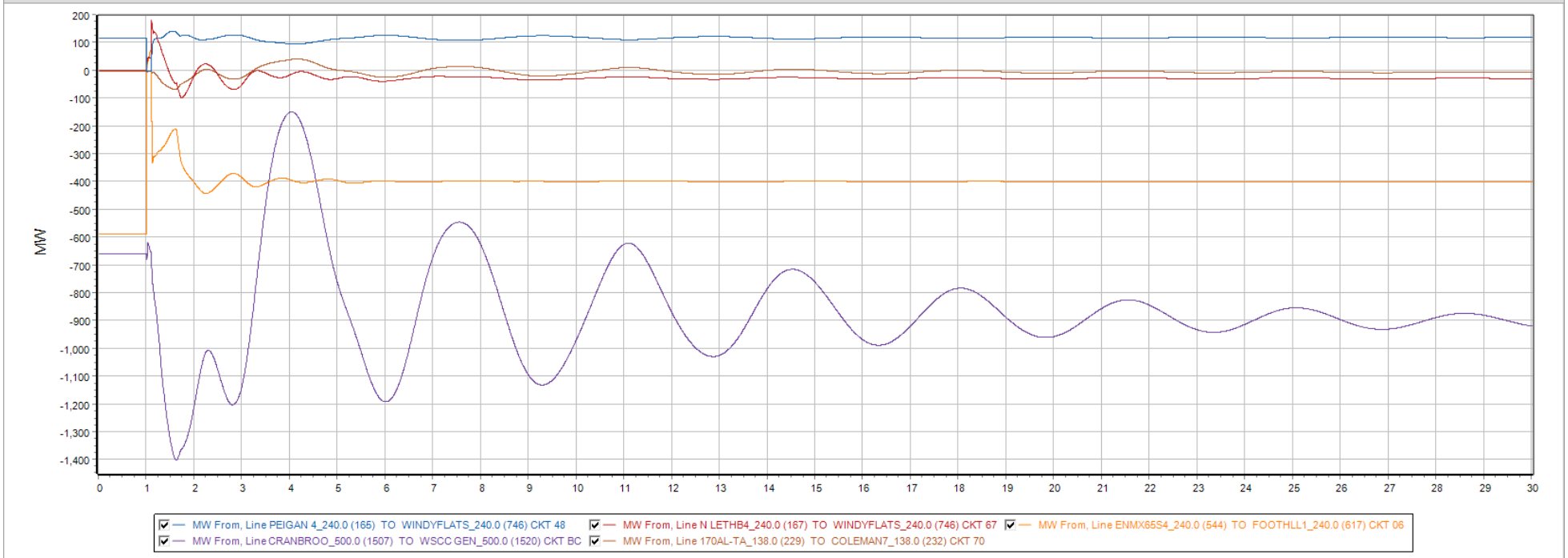
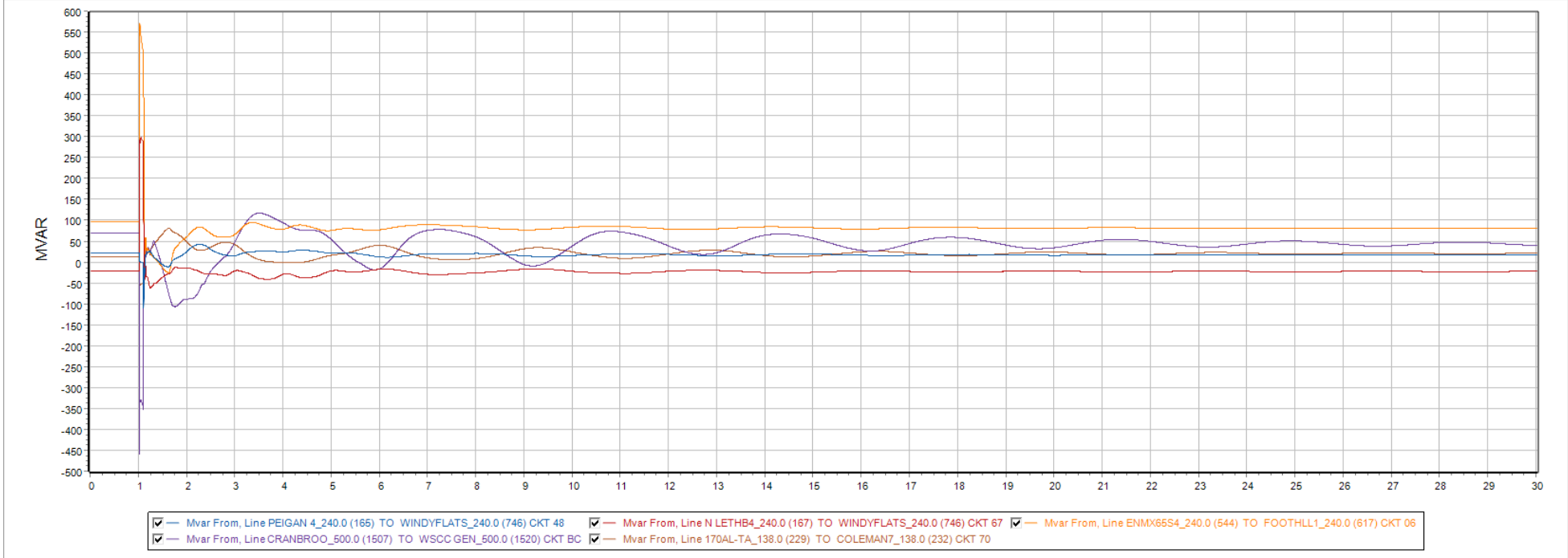
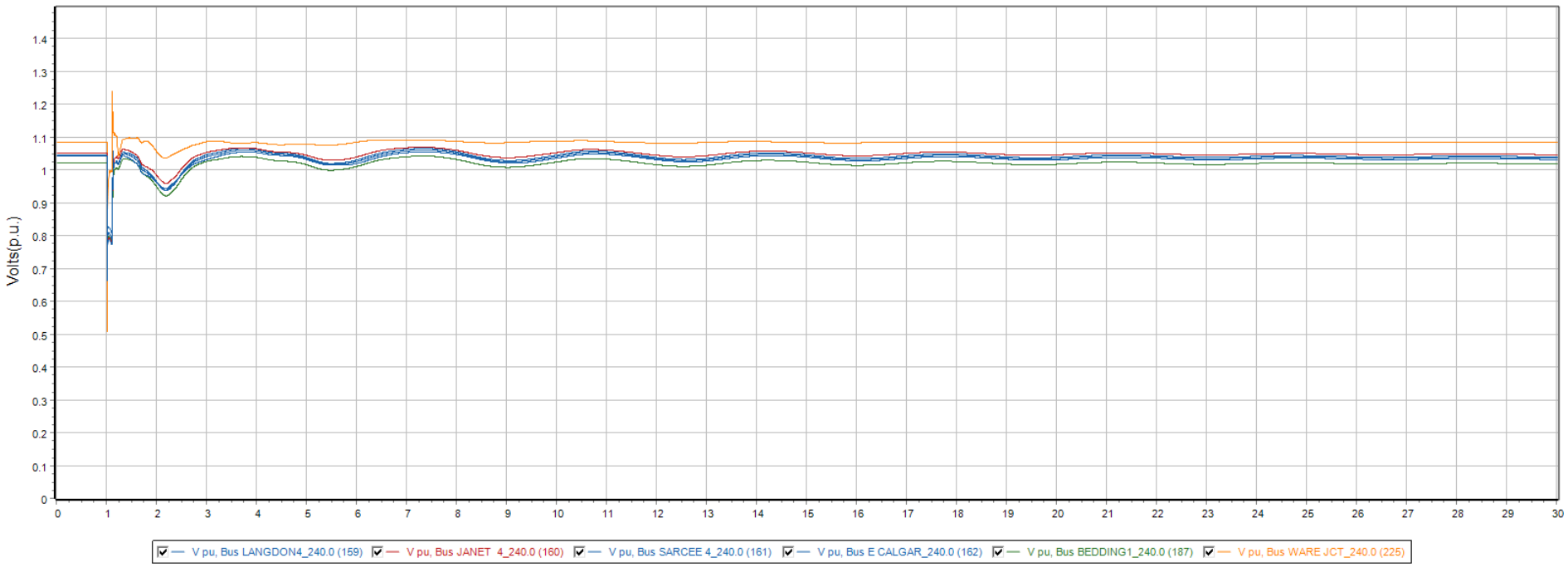
May 16, 2023 23:24:05

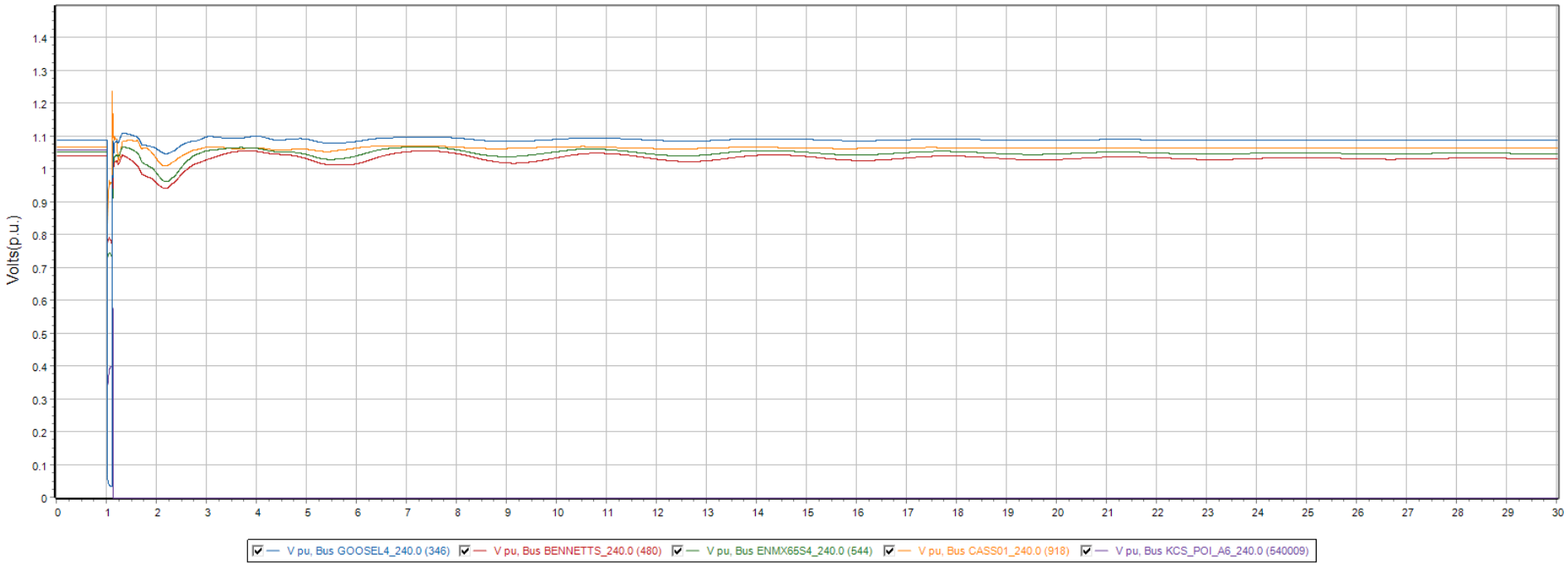
Monitor Line MW & MVAR. Q4



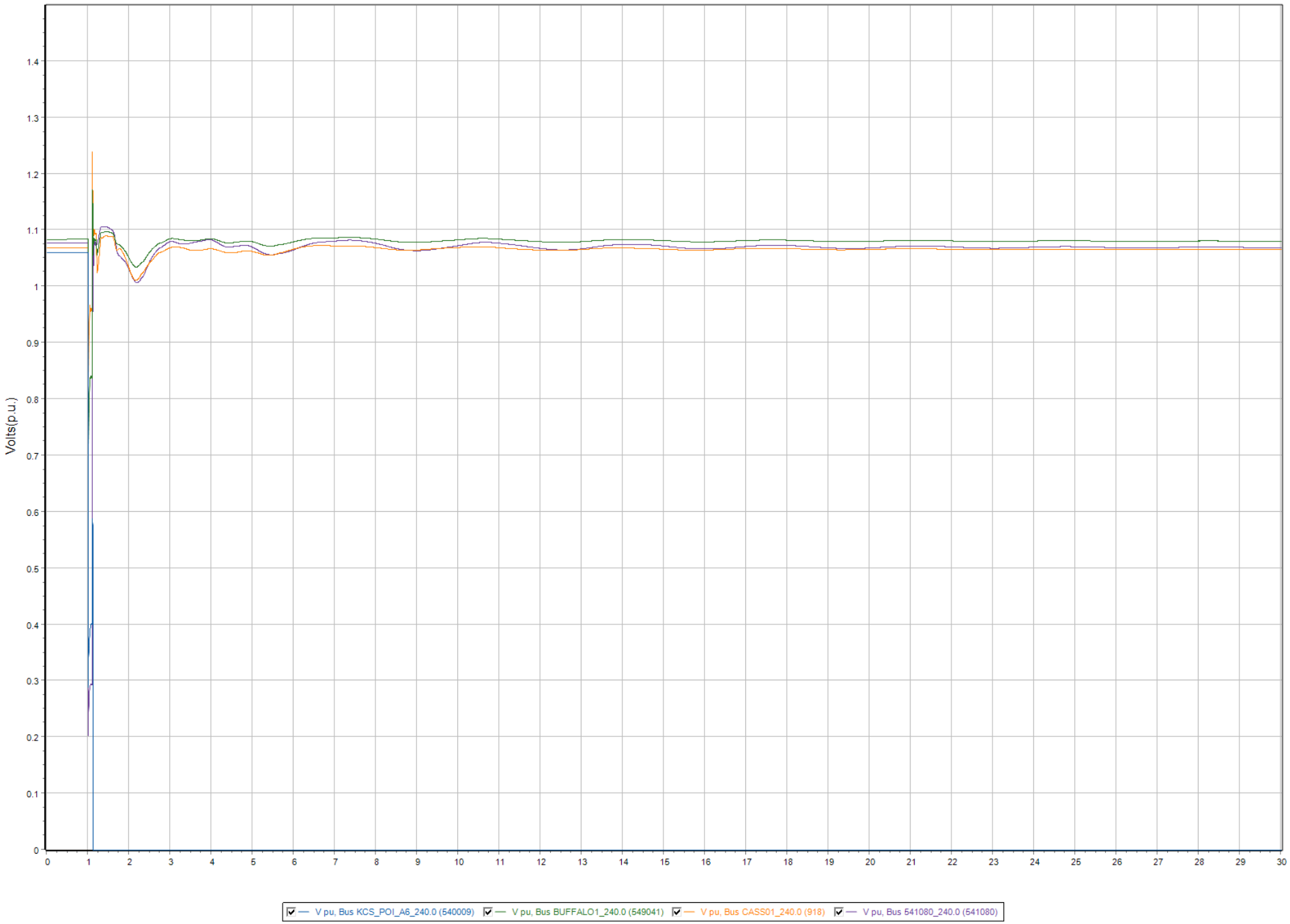


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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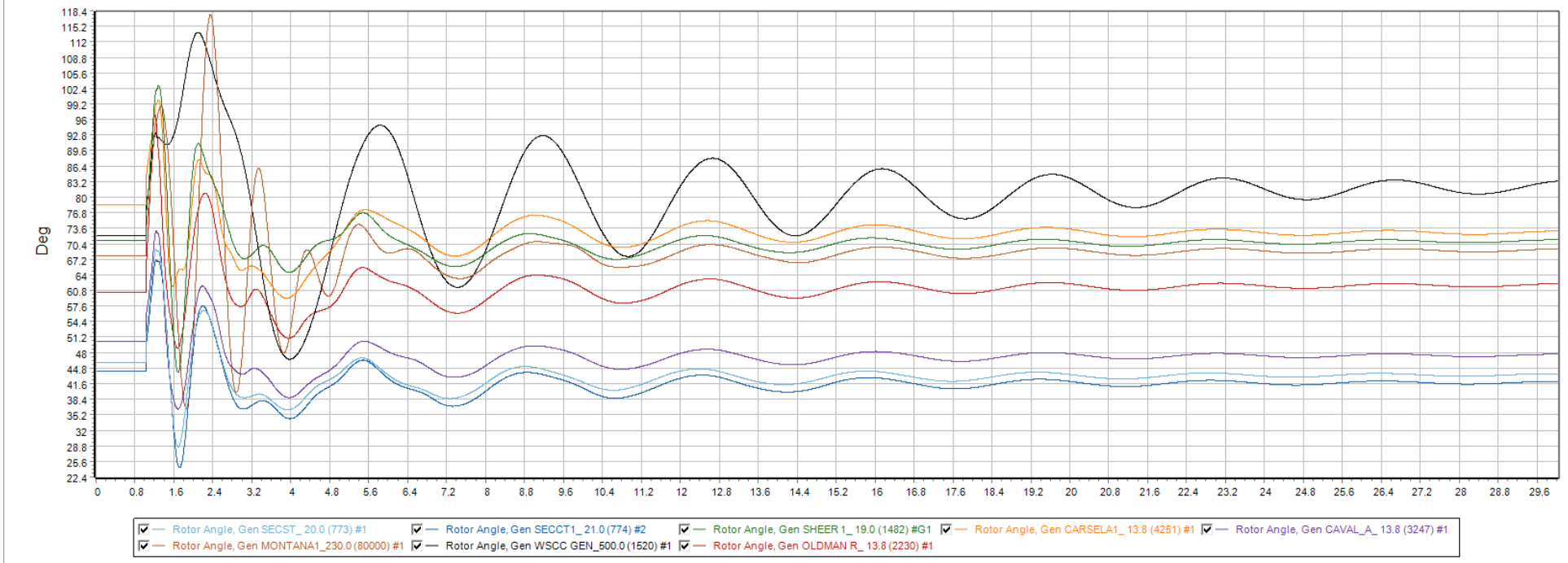
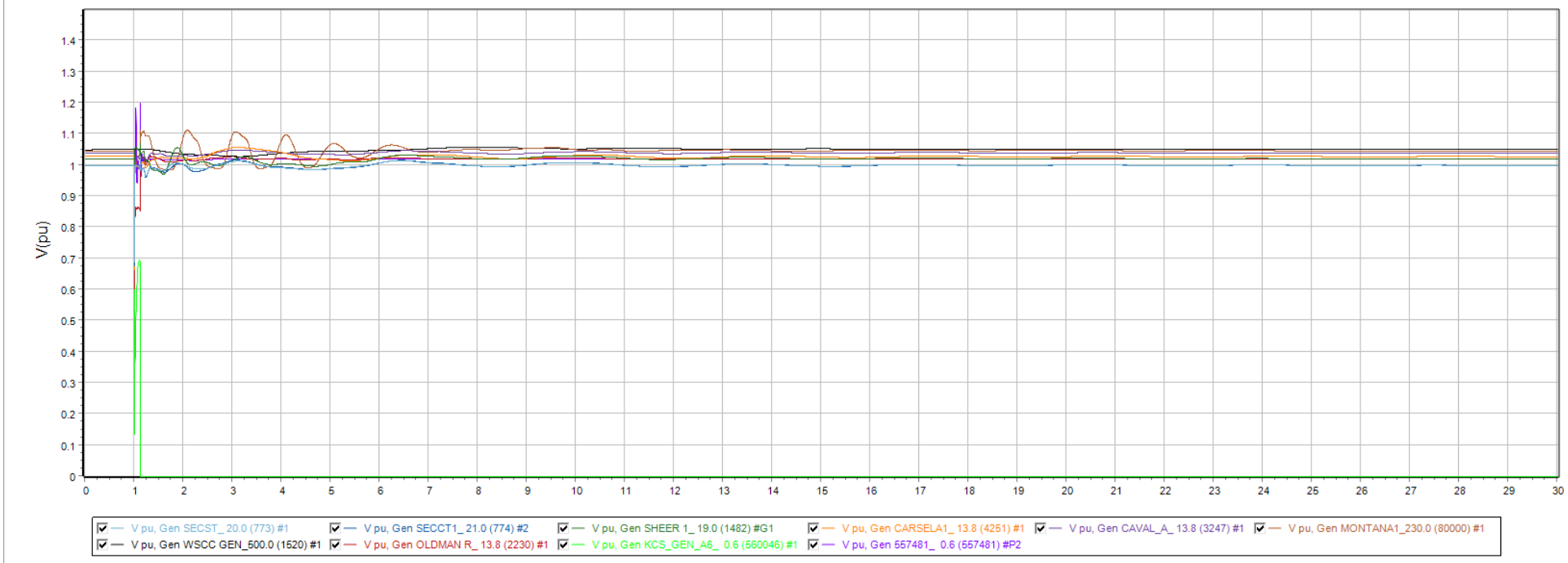
May 16, 2023 23:24:06

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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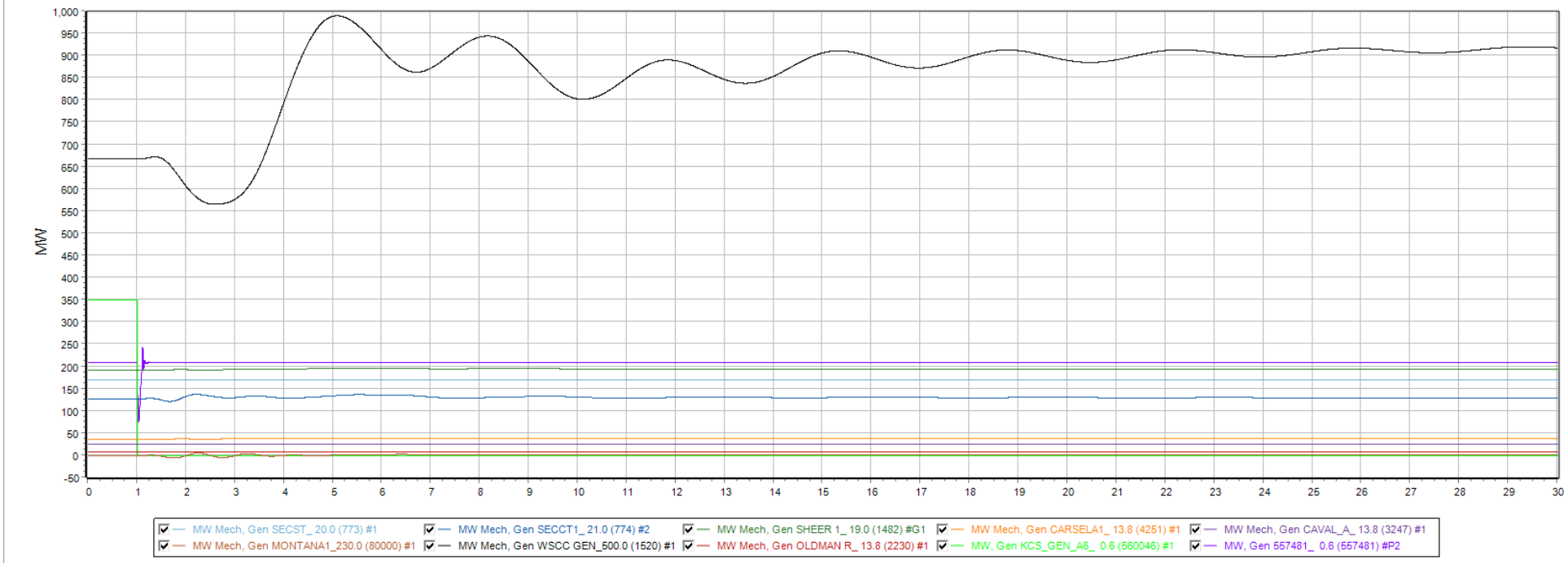
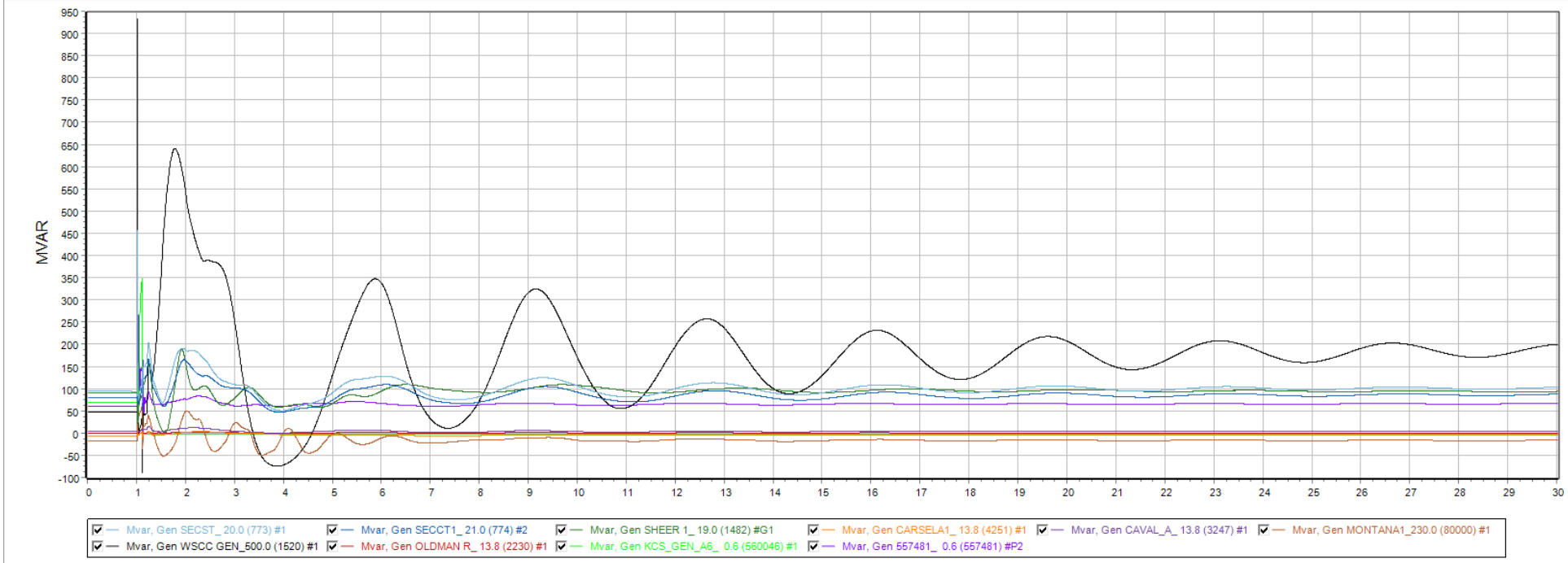
May 16, 2023 23:33:58

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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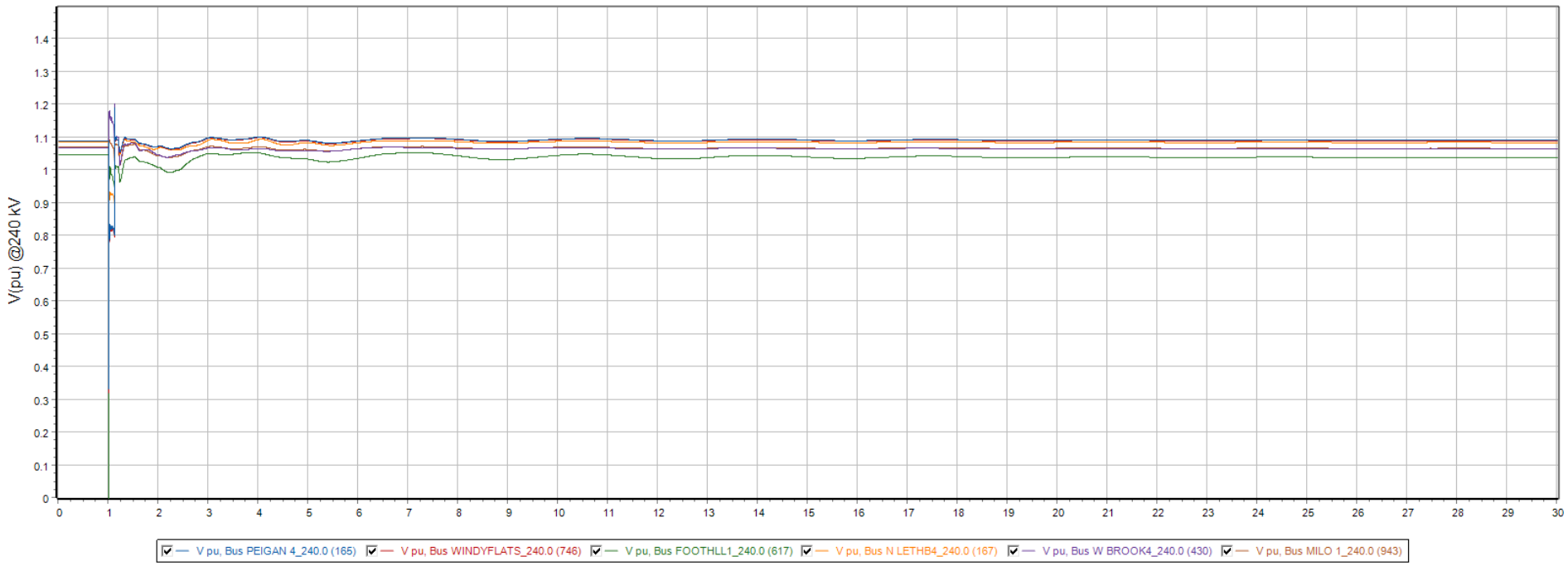
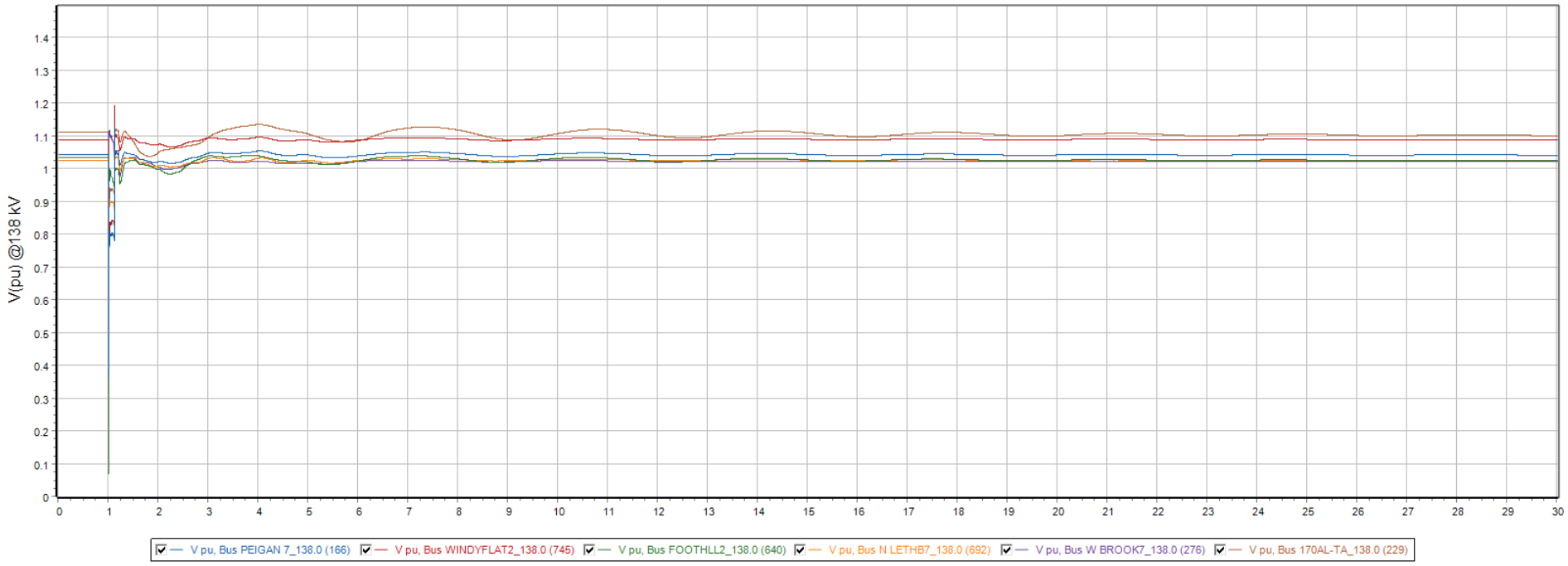
May 16, 2023 23:33:58

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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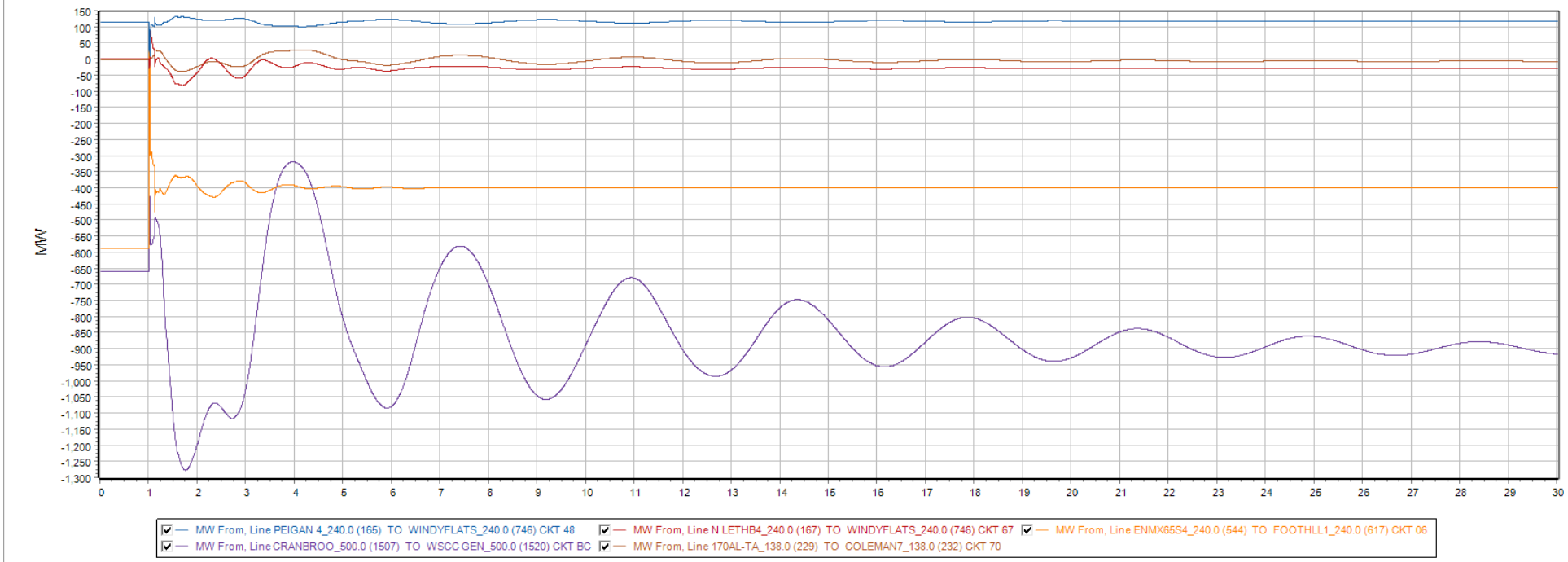
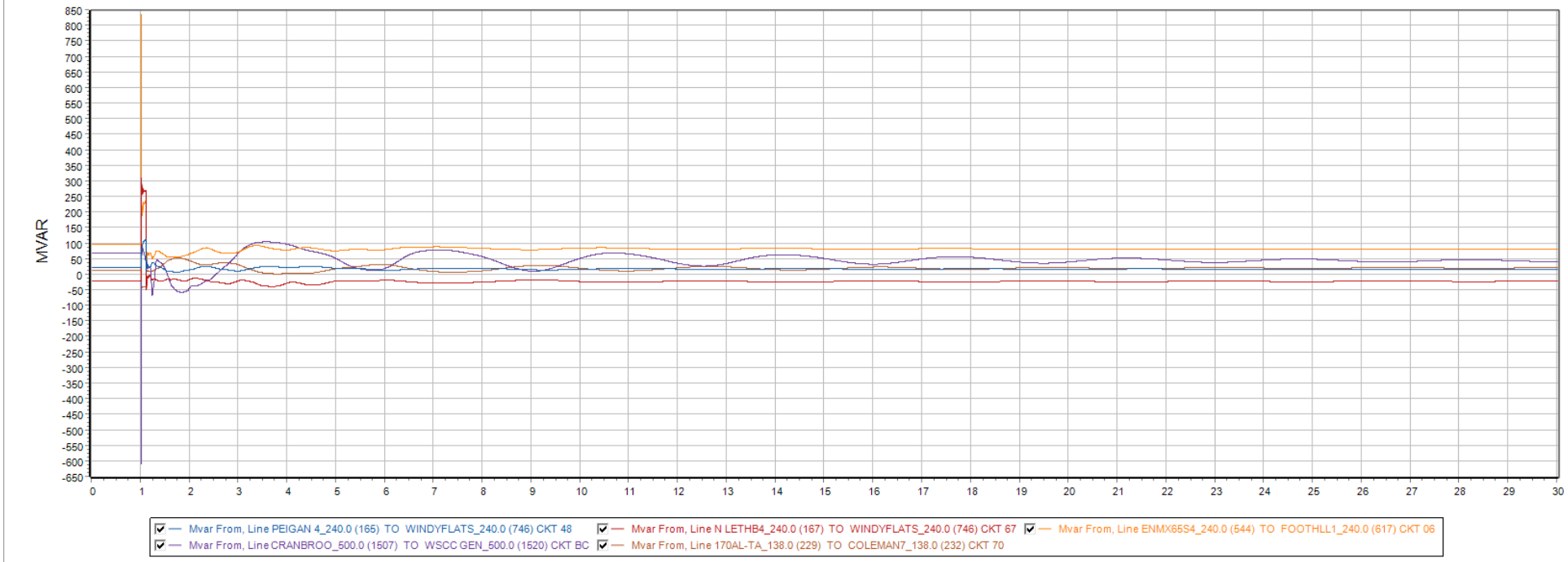
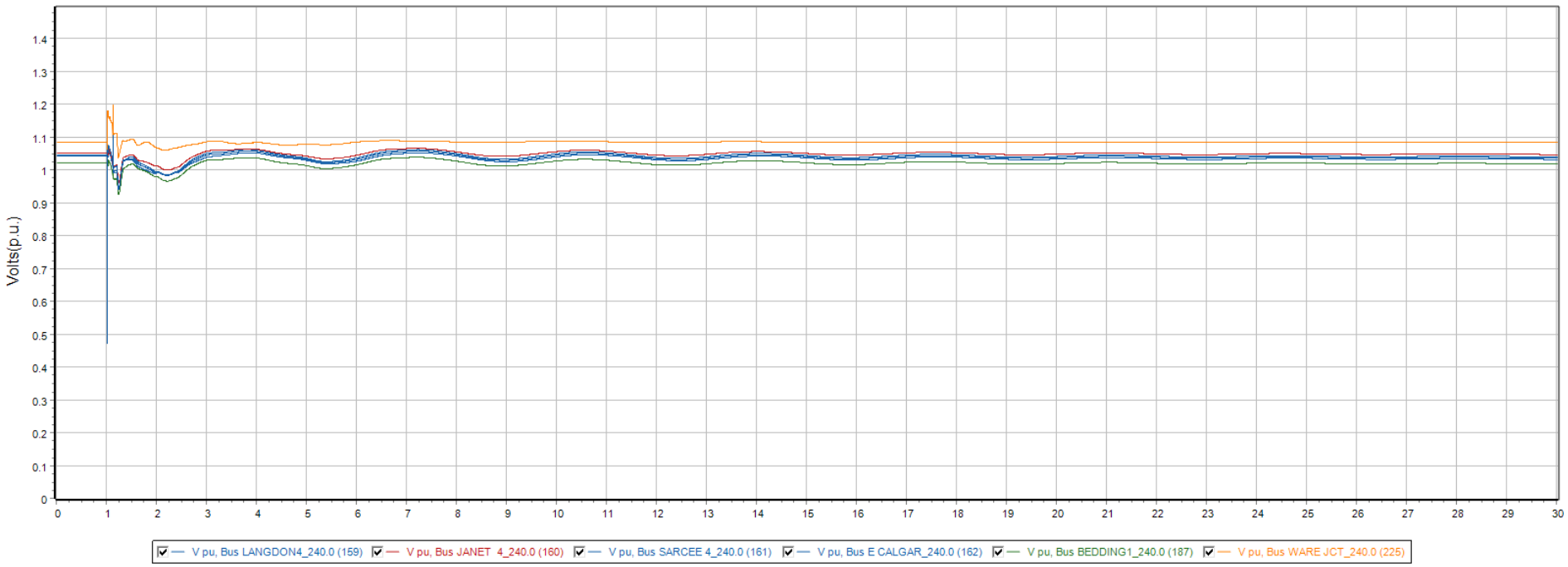
May 16, 2023 23:33:59

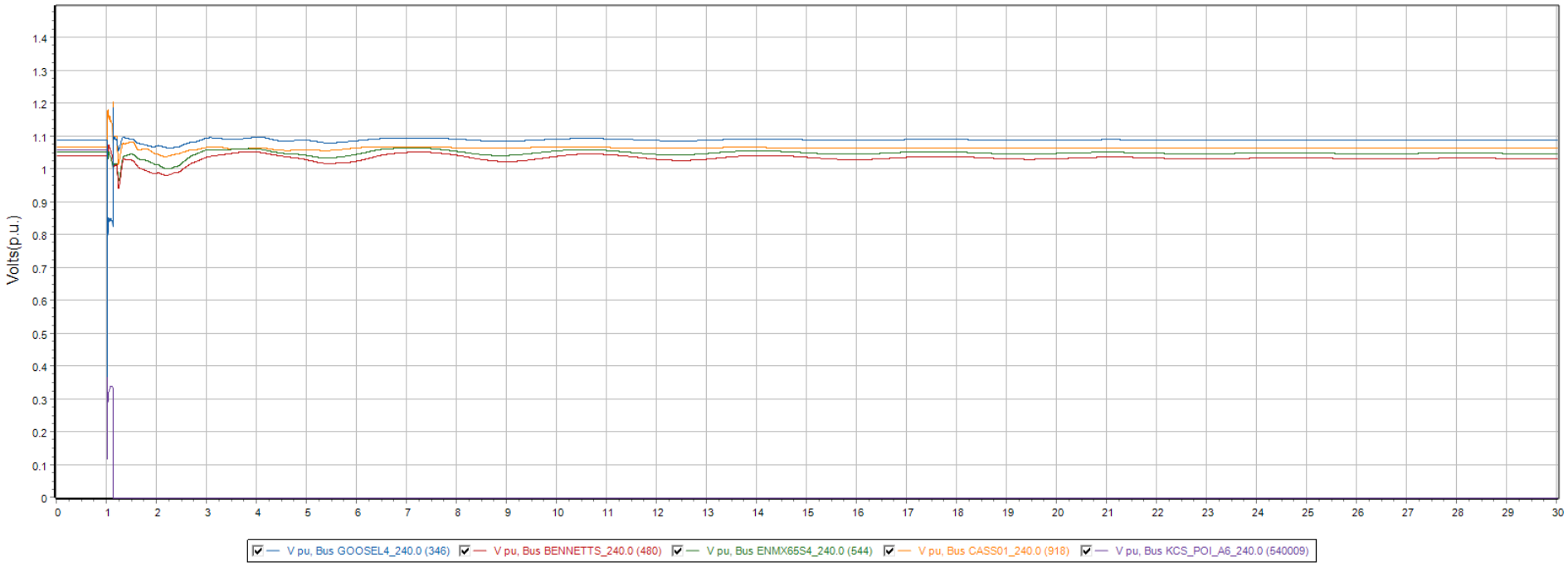
Monitor Line MW & MVAR. Q4



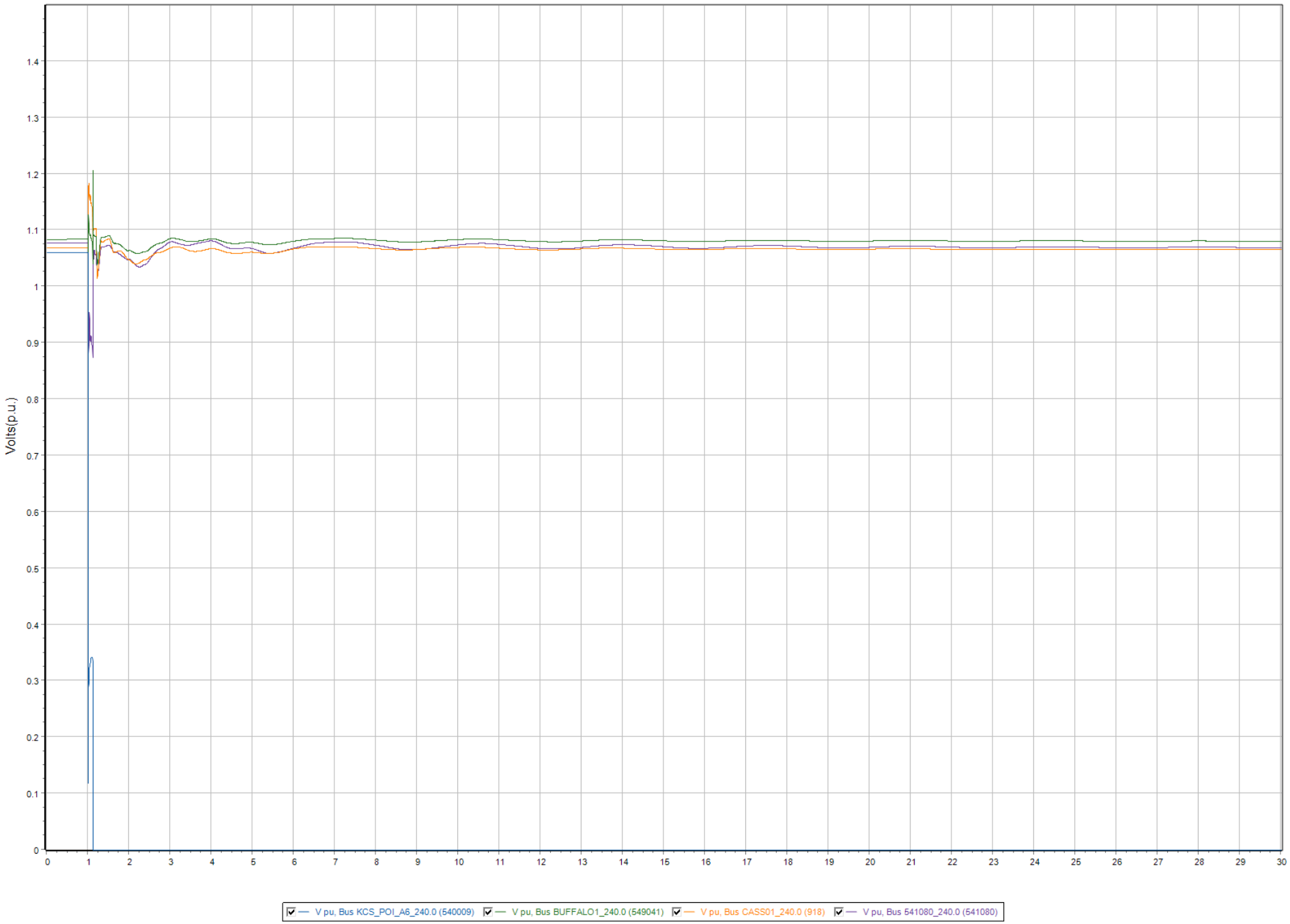


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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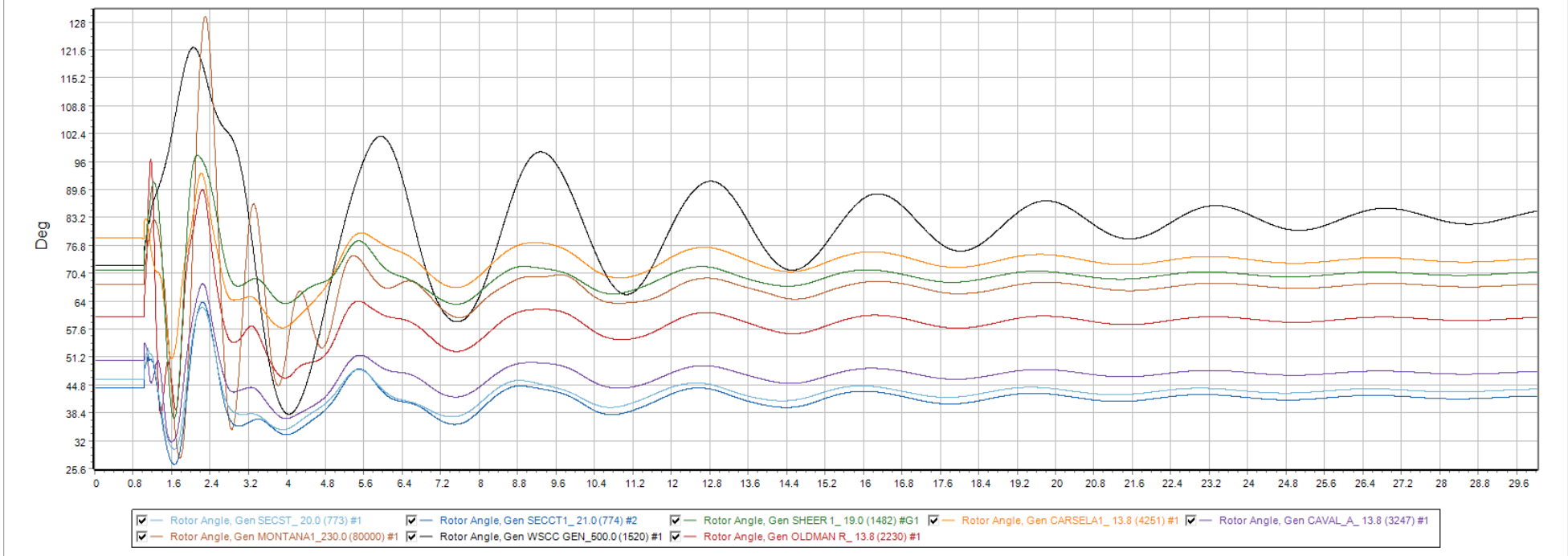
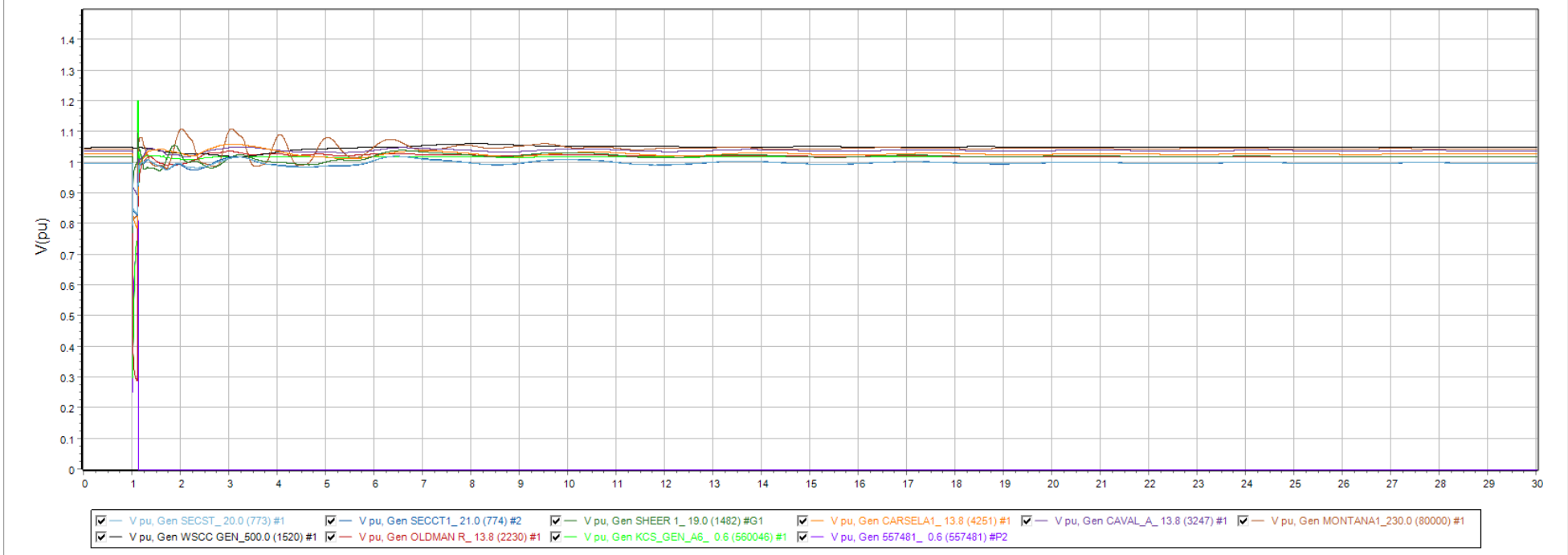
May 16, 2023 23:34:01

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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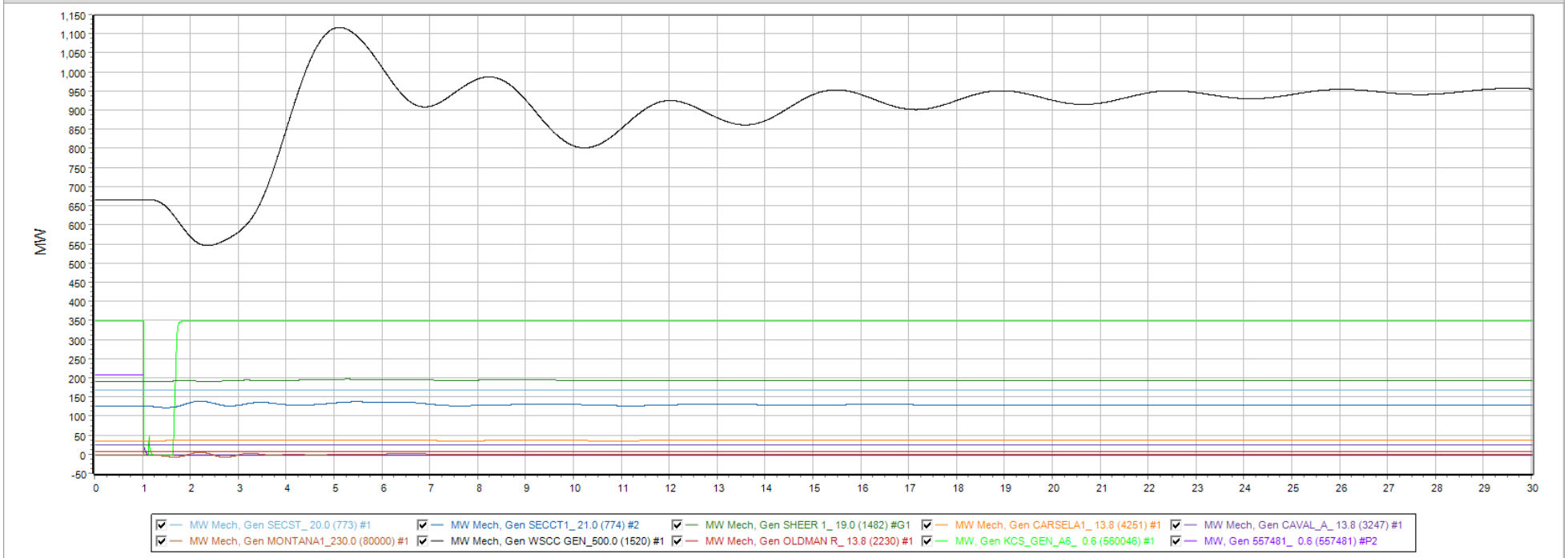
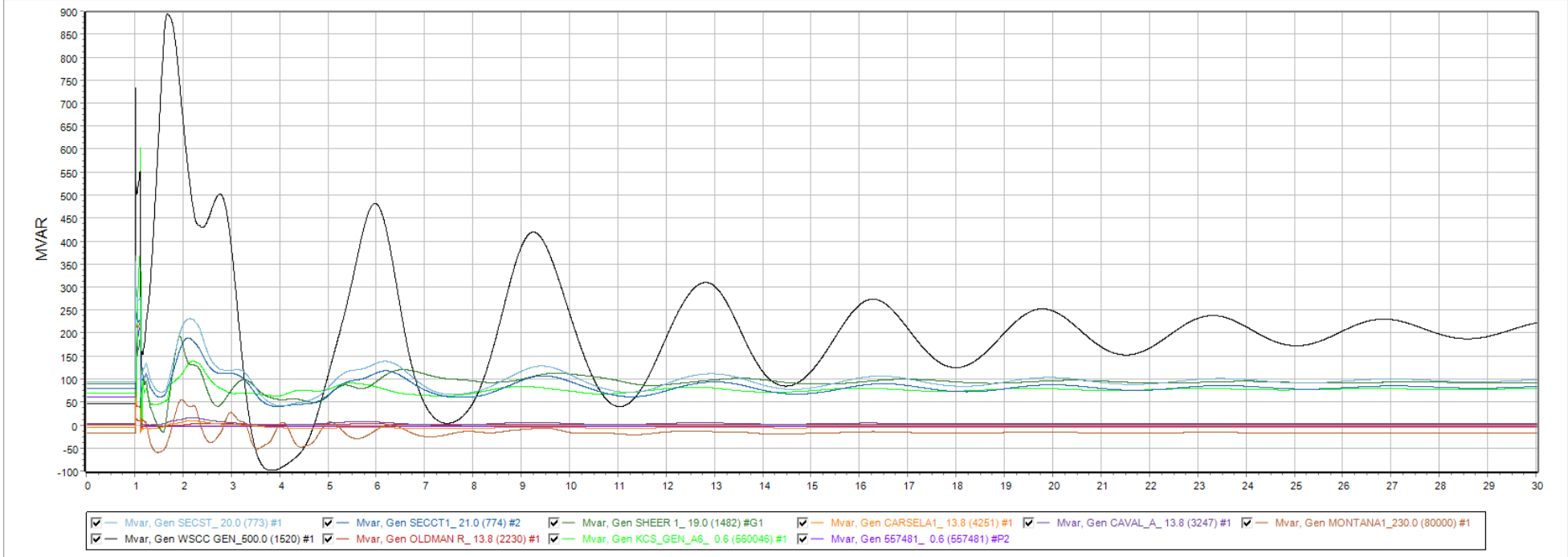
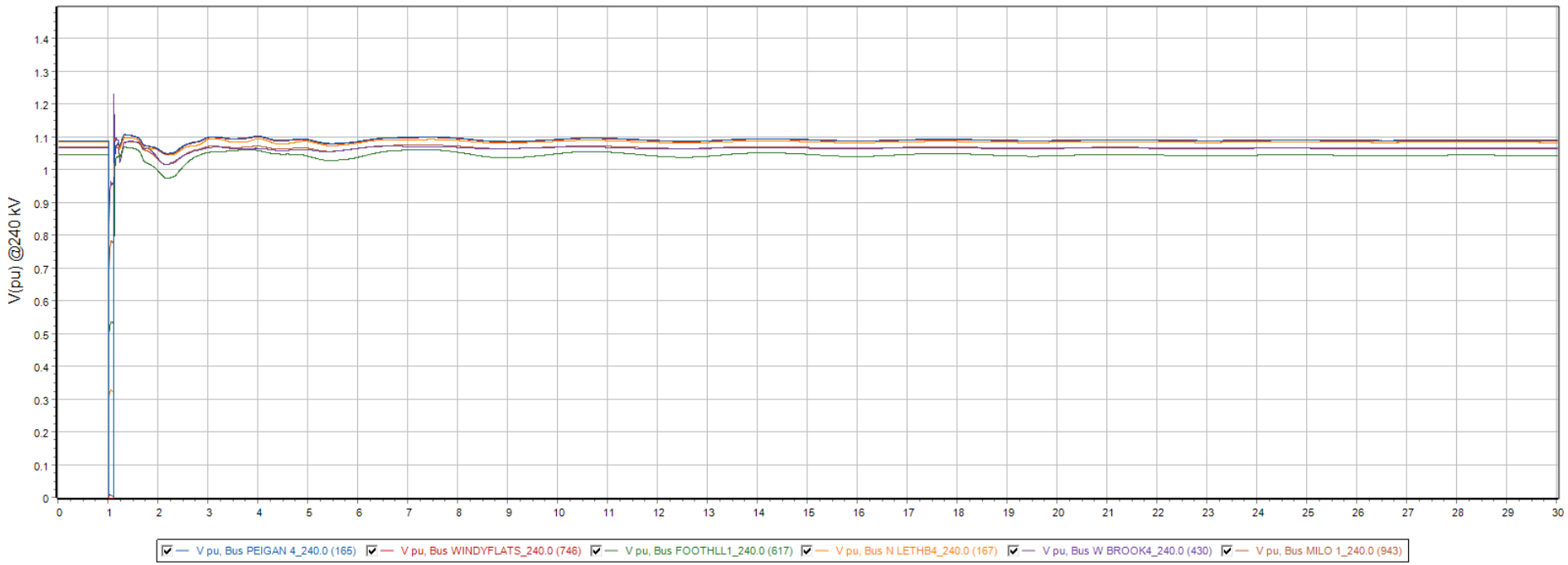
May 16, 2023 21:15:10

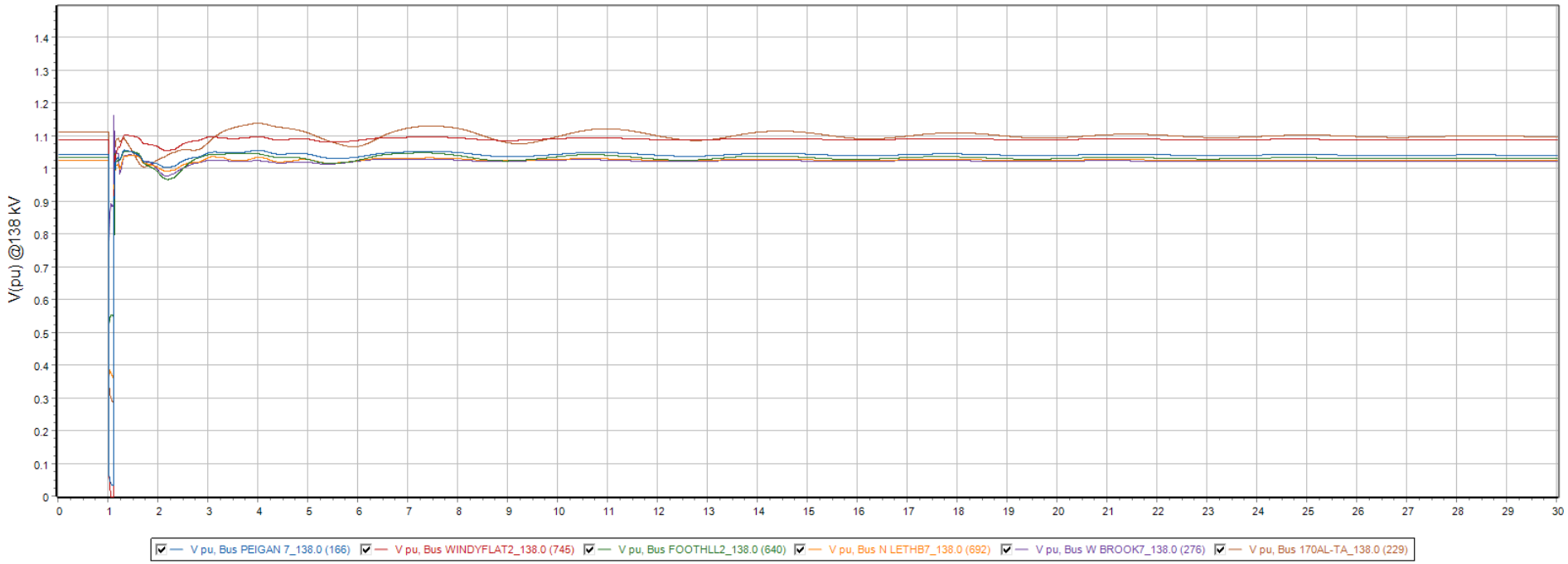
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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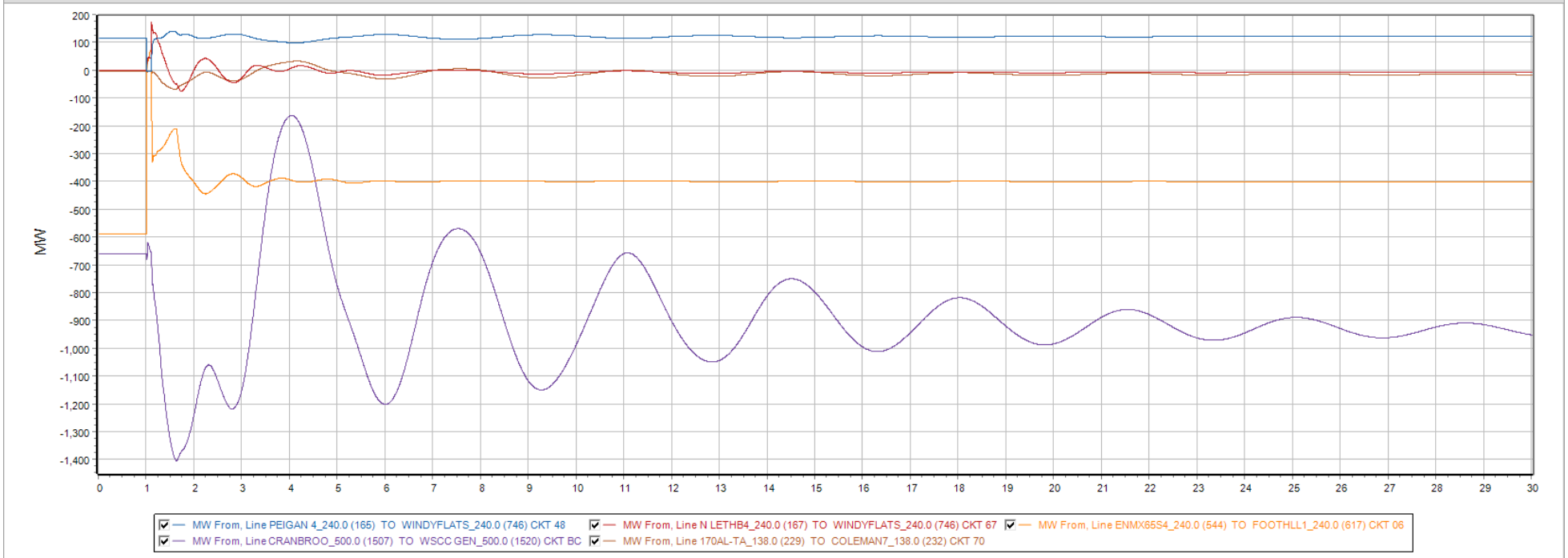
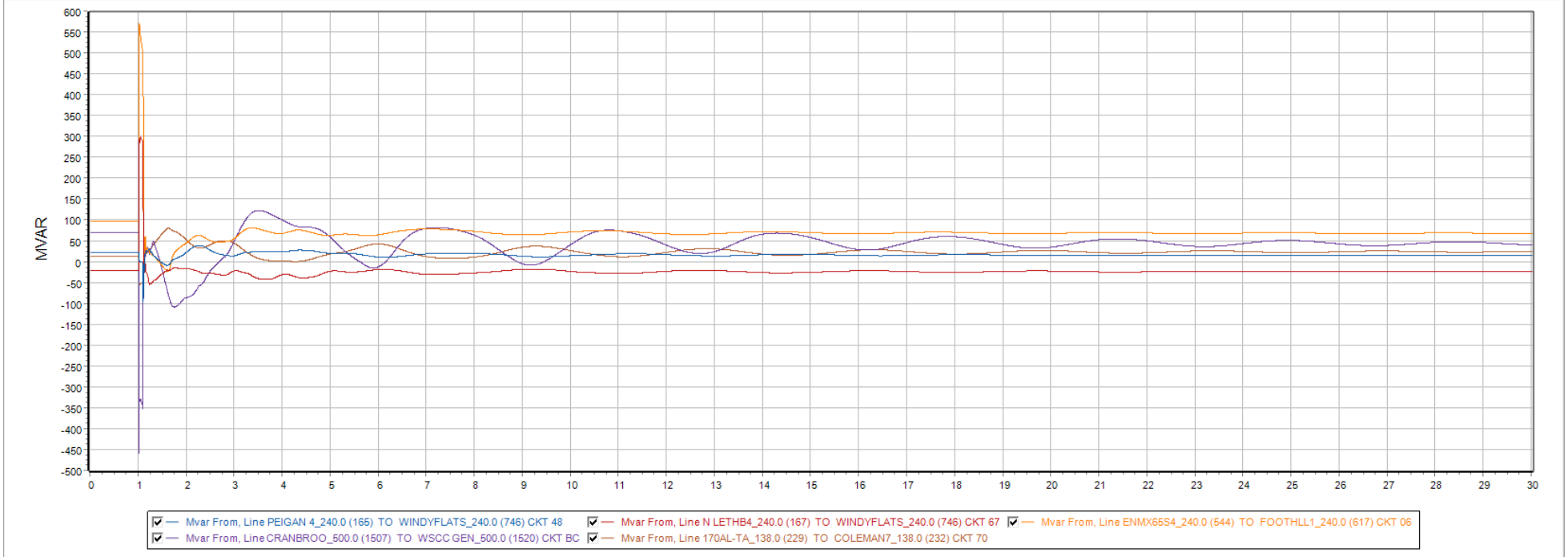
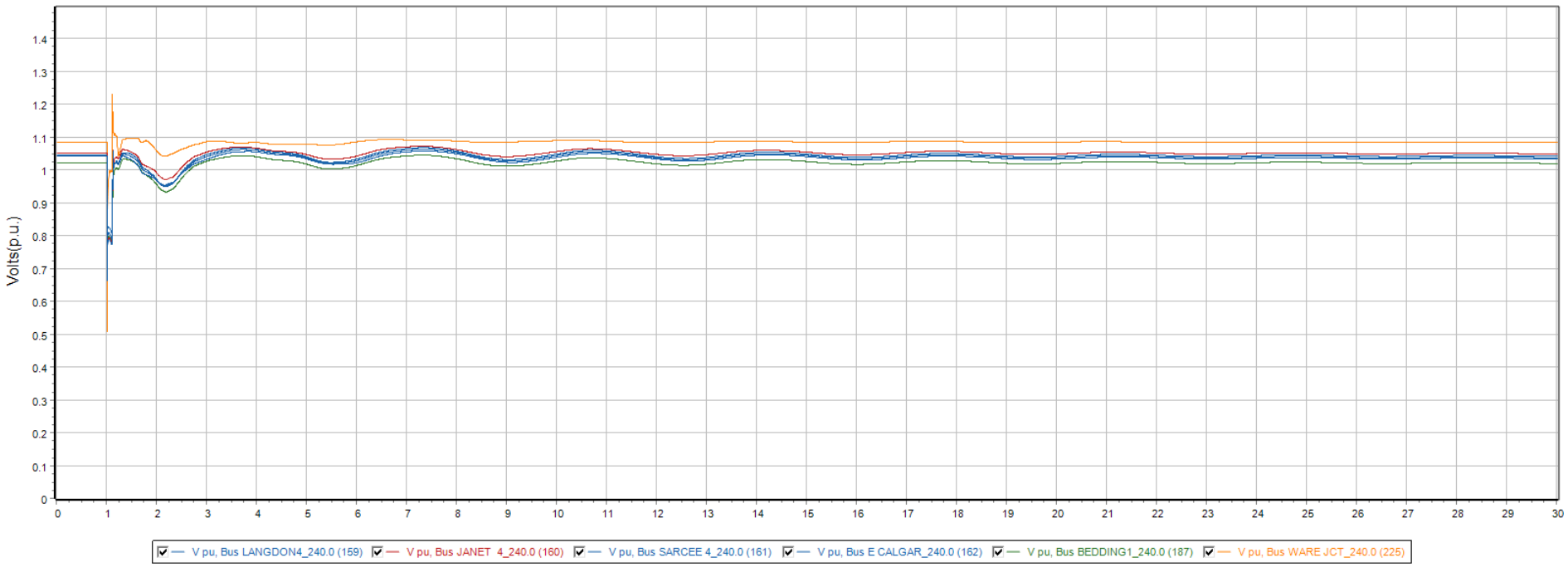
May 16, 2023 21:15:12

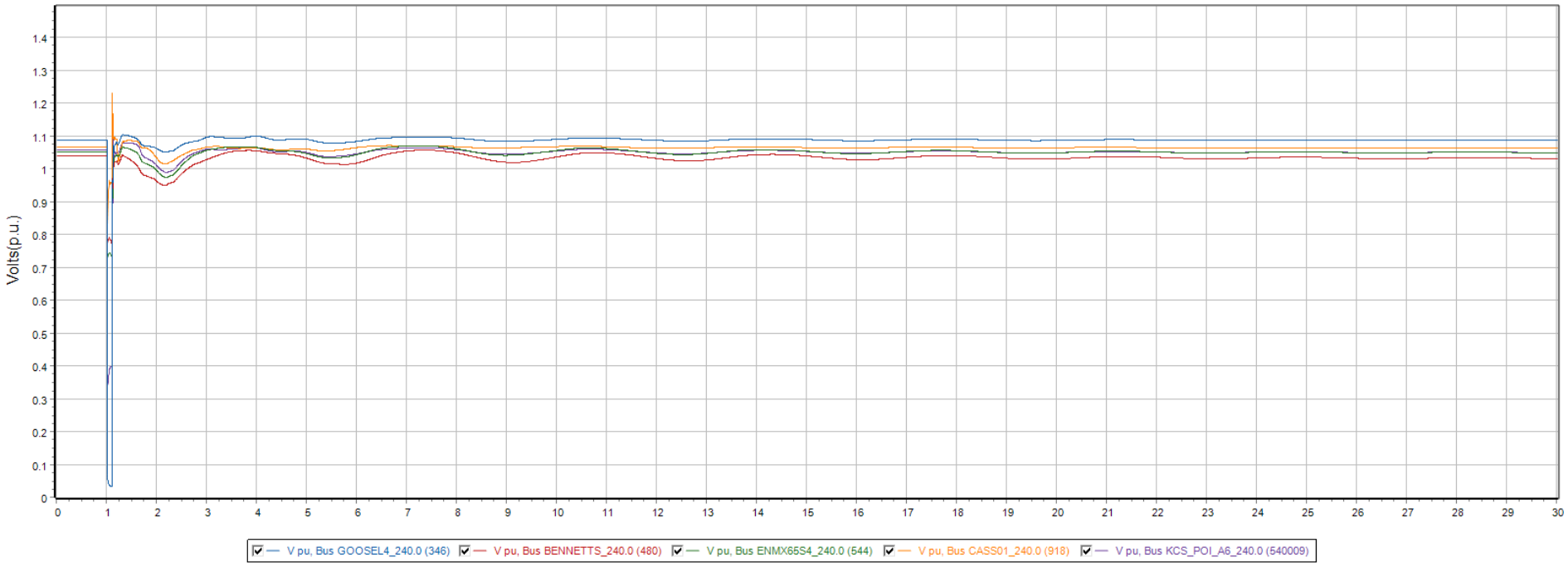
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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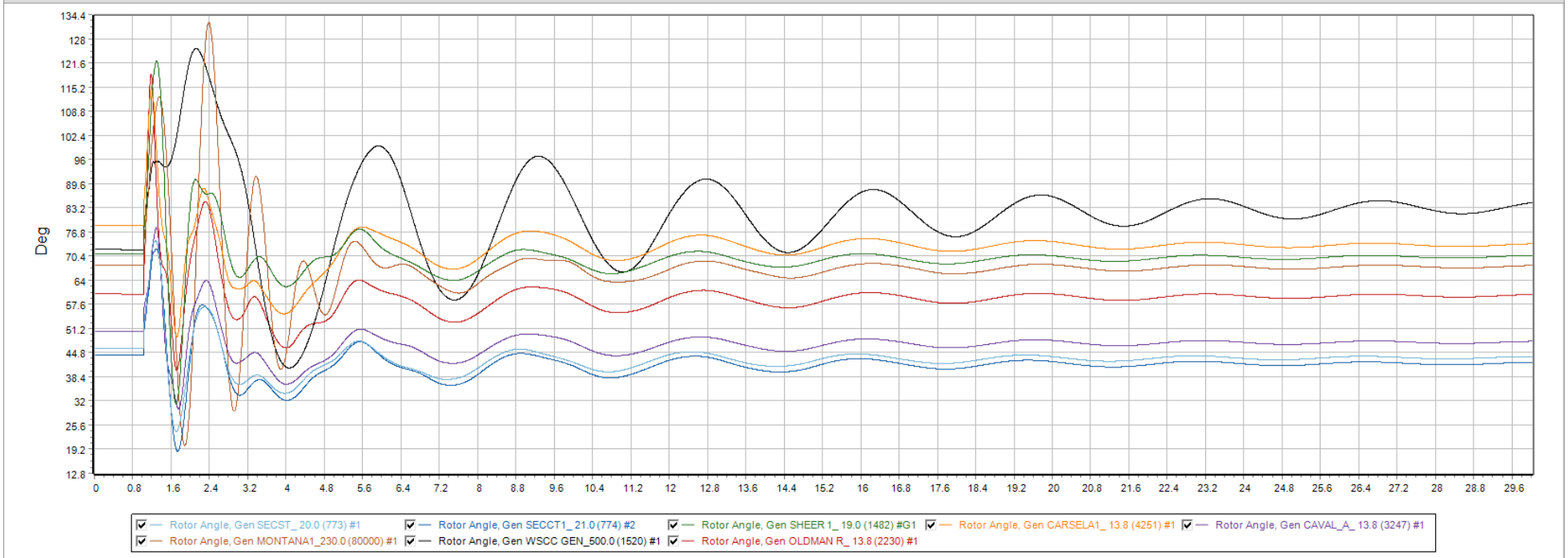
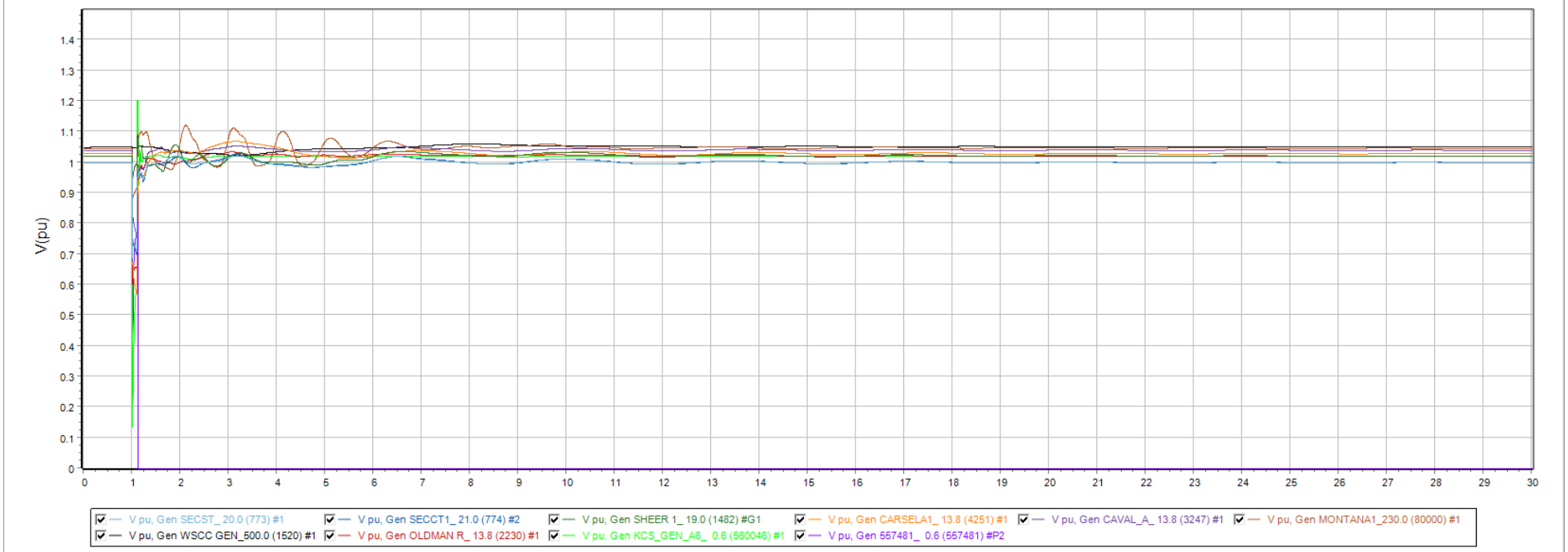
May 16, 2023 21:15:13

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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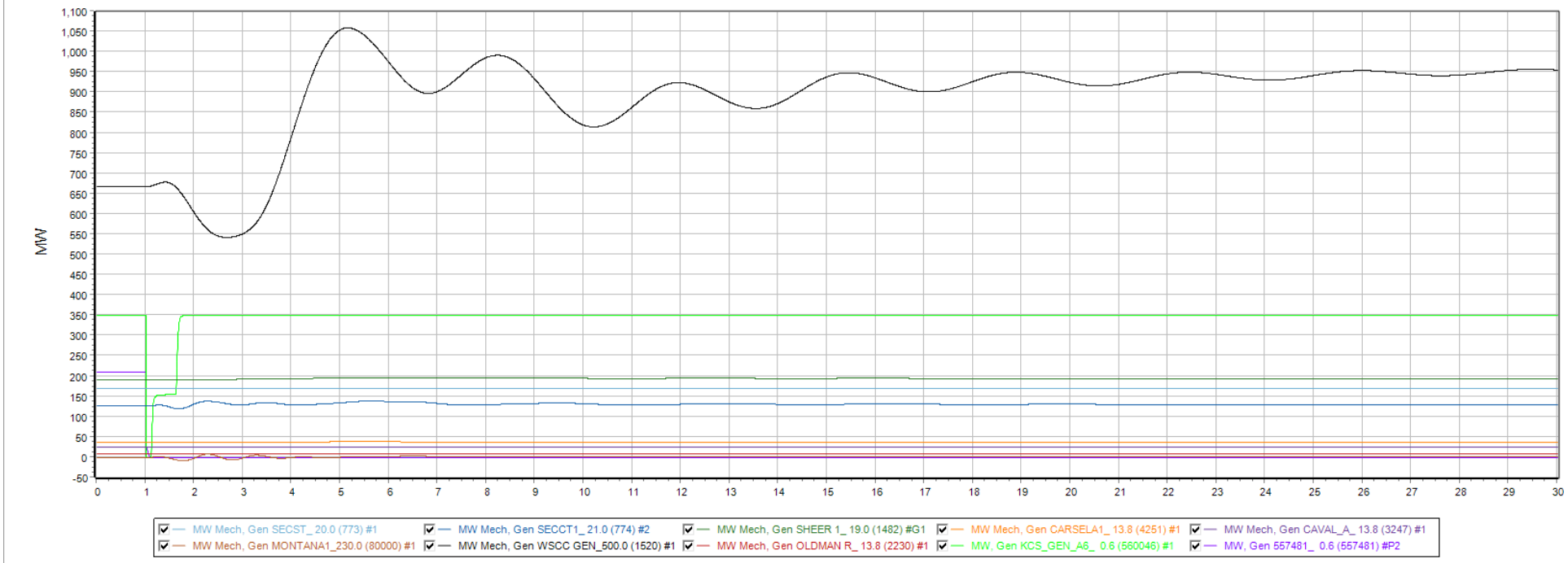
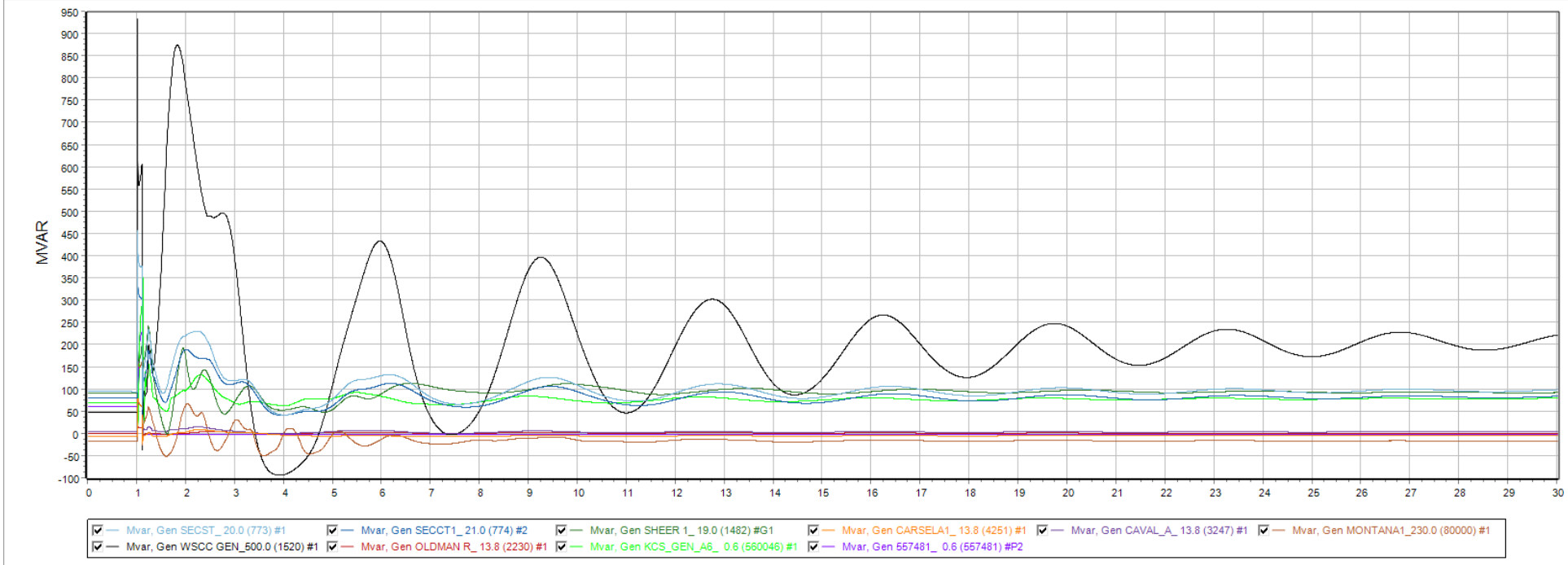
May 16, 2023 21:25:48

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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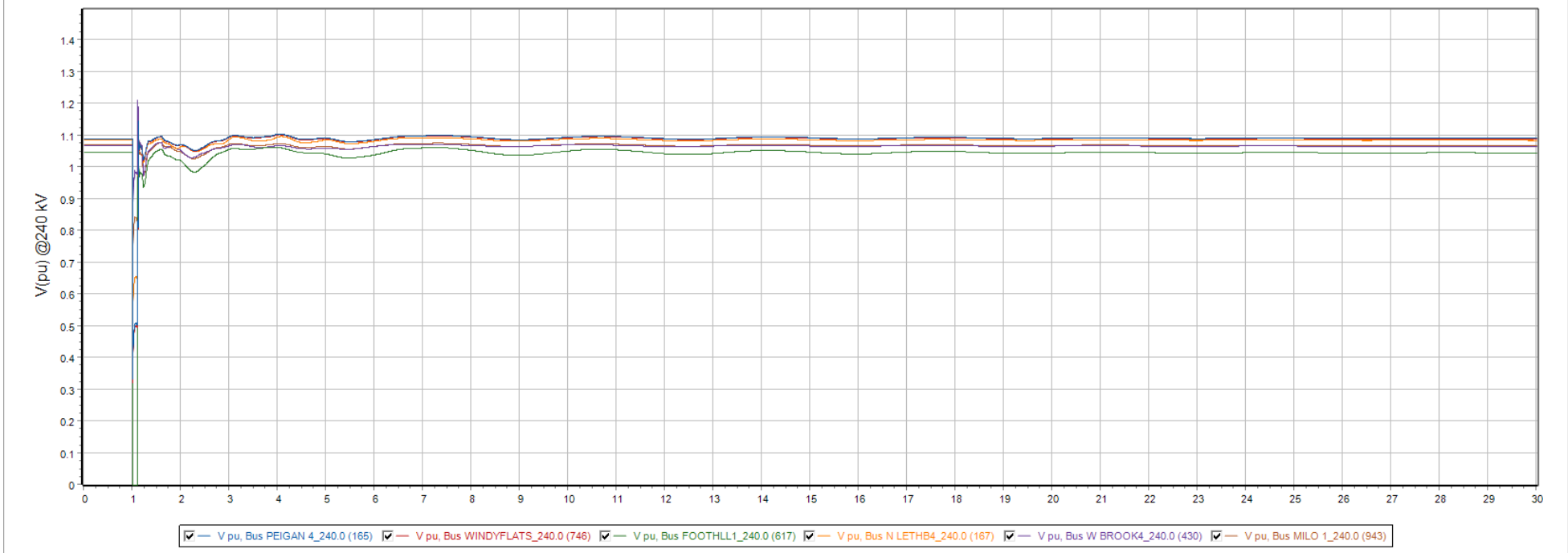
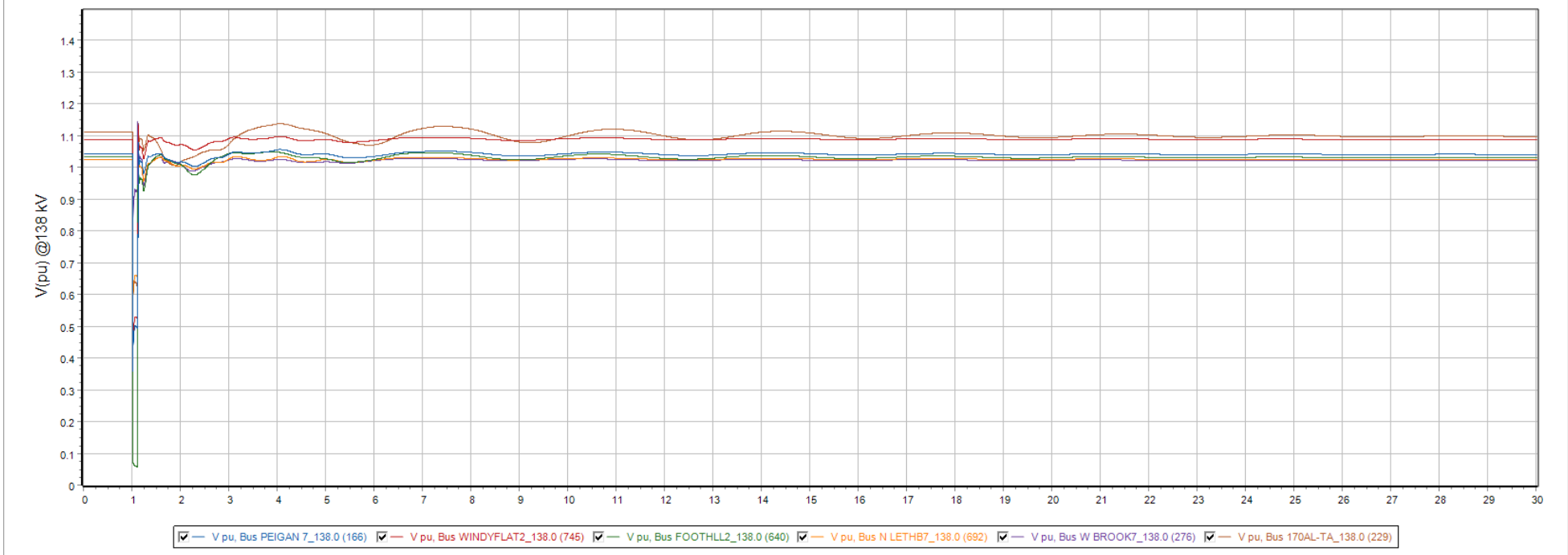
May 16, 2023 21:25:48

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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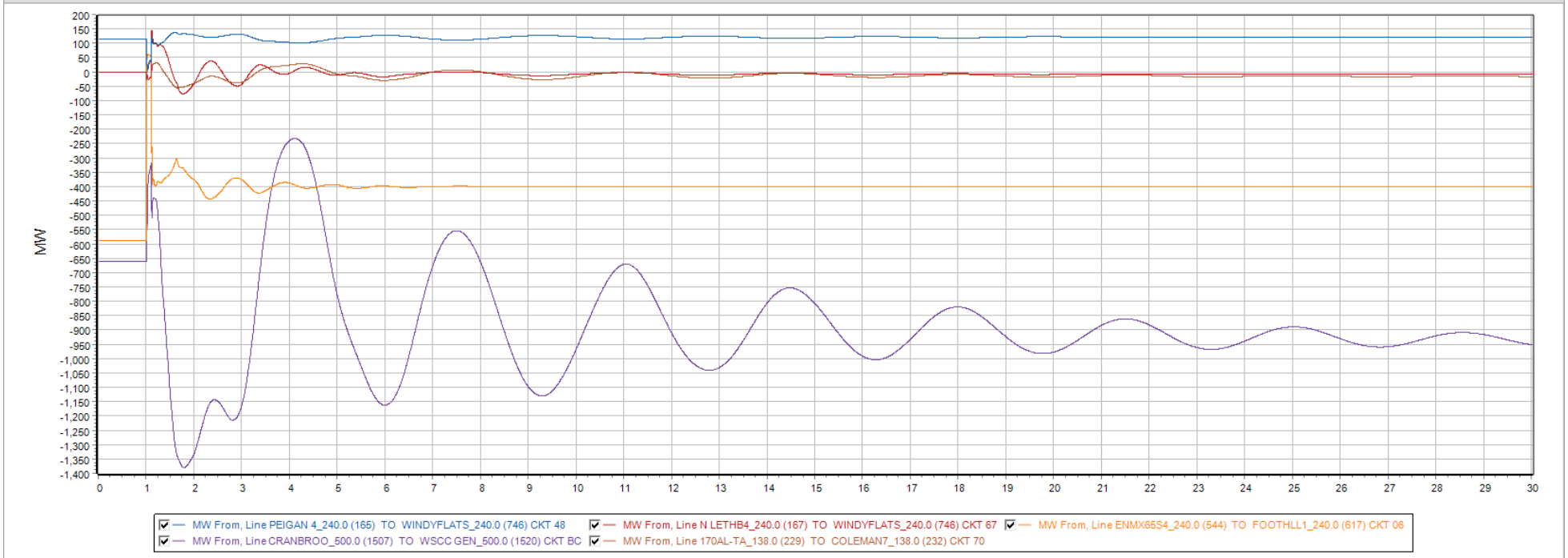
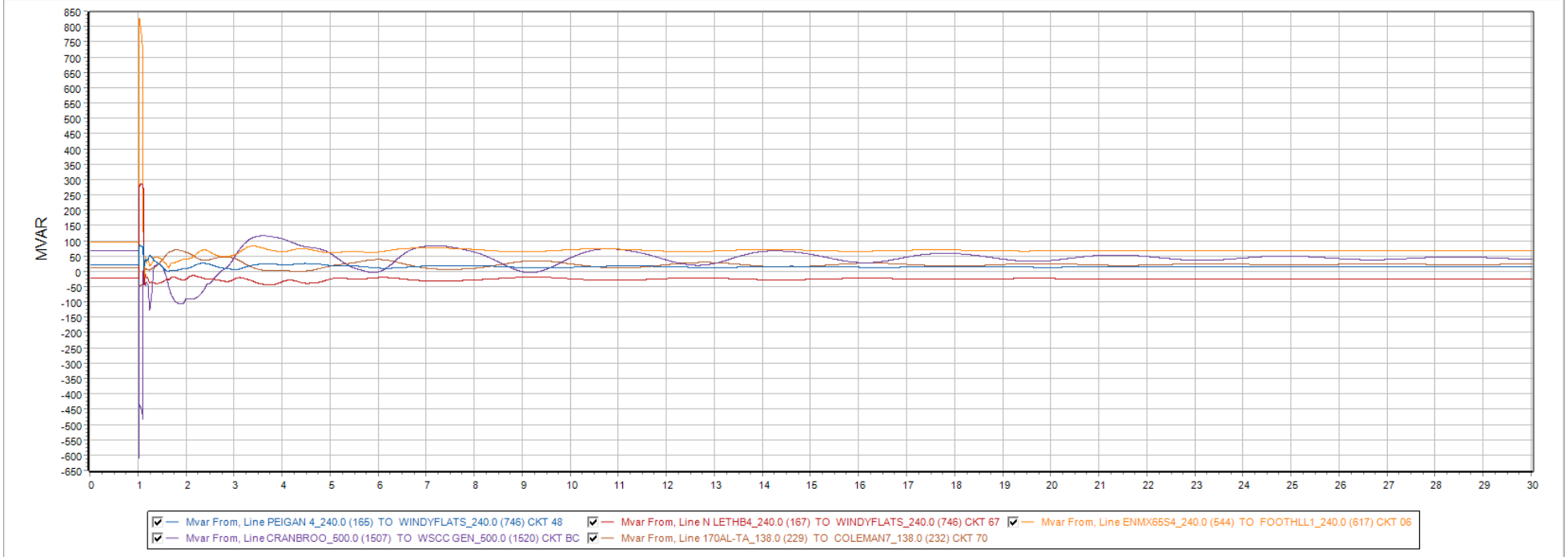
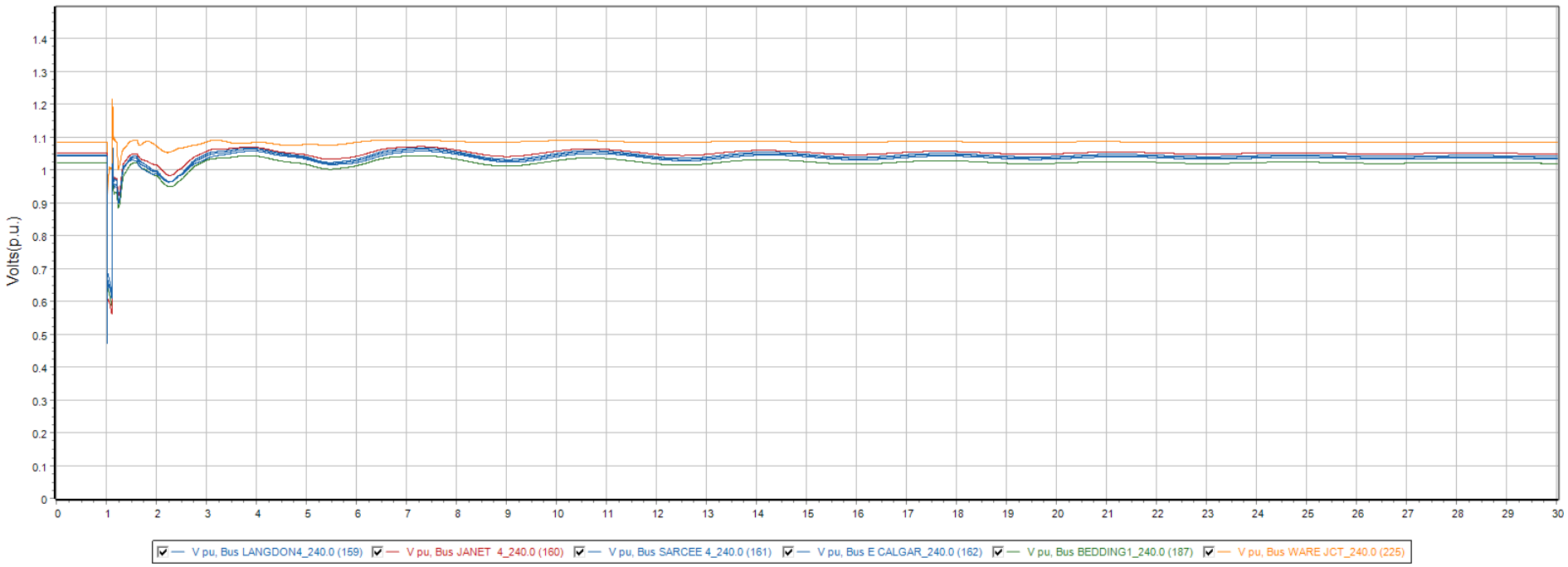
May 16, 2023 21:25:49

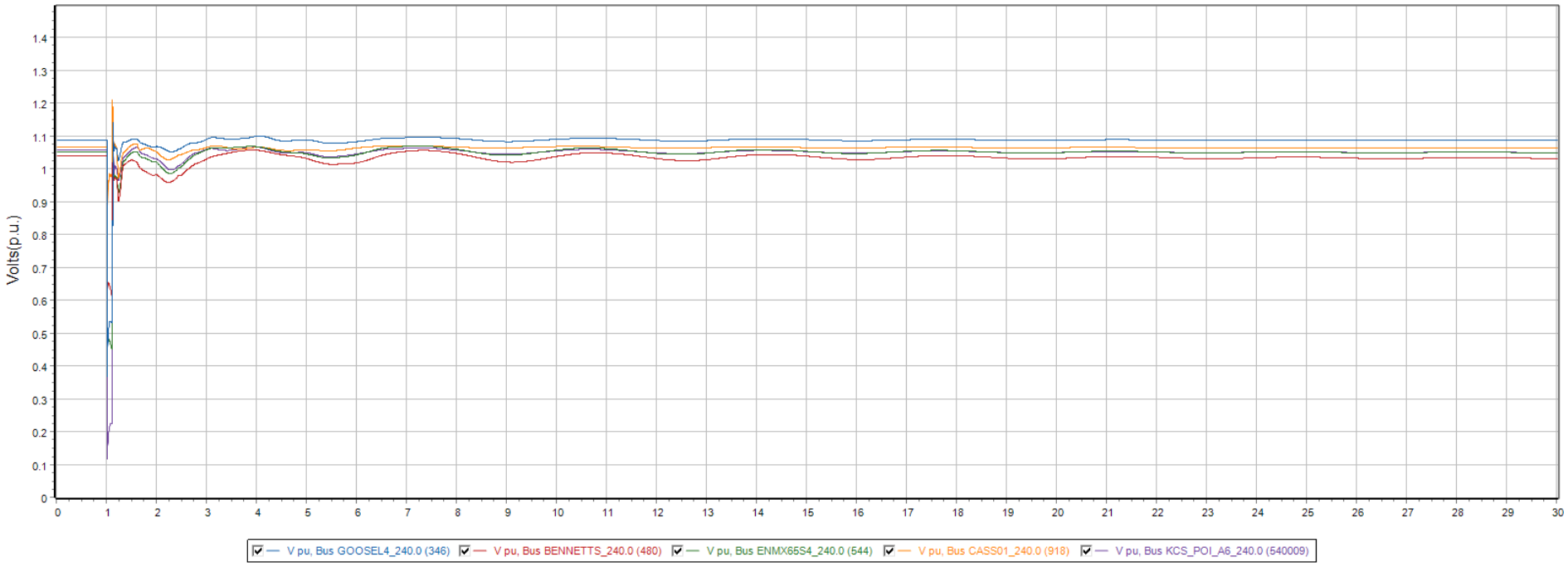
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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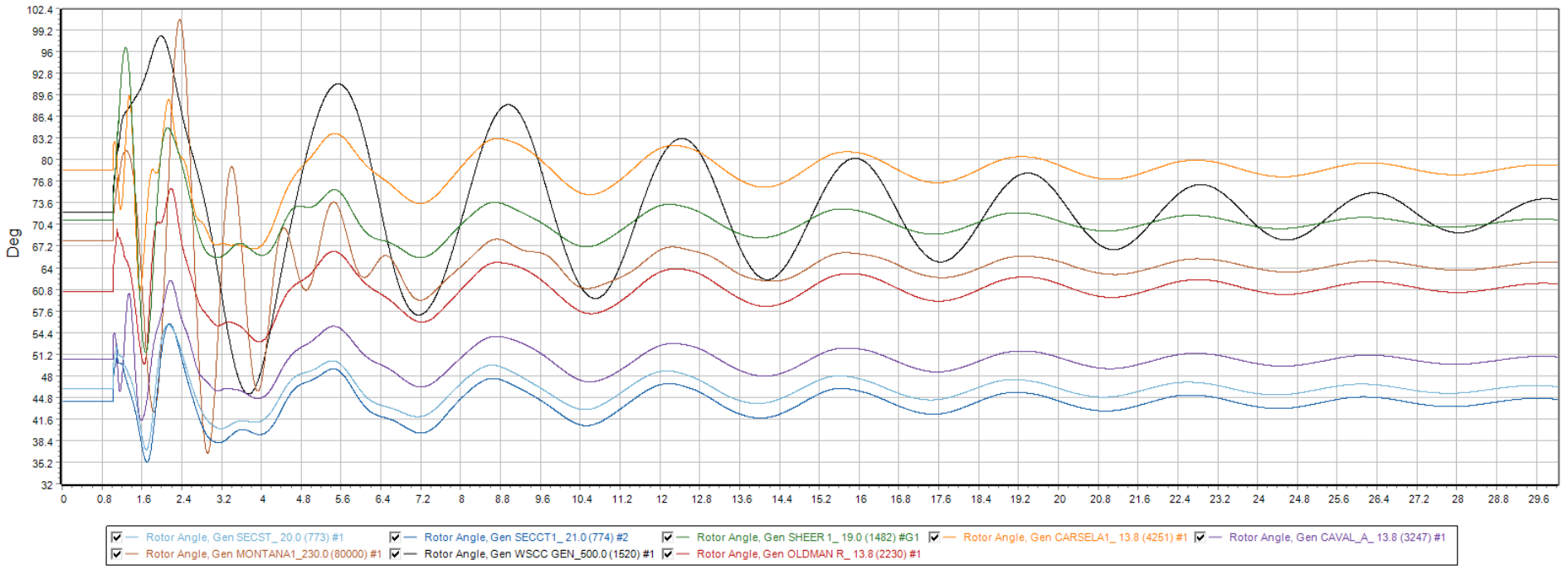
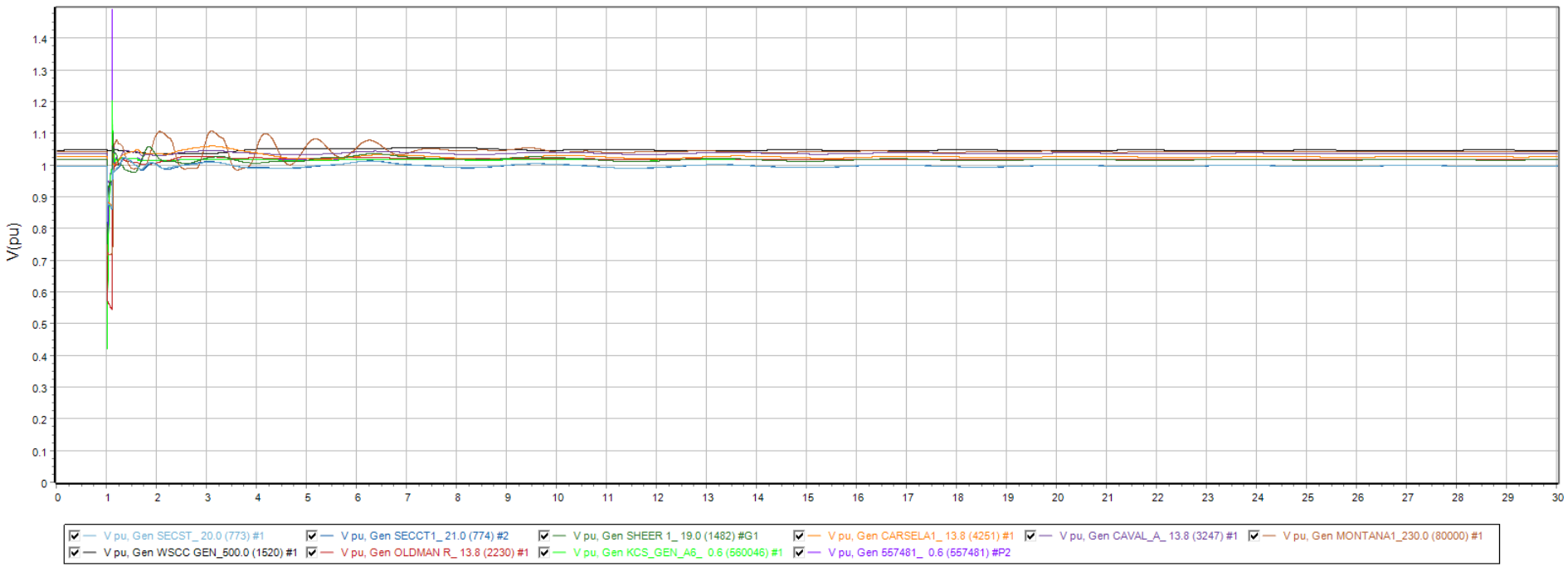
May 16, 2023 21:25:50

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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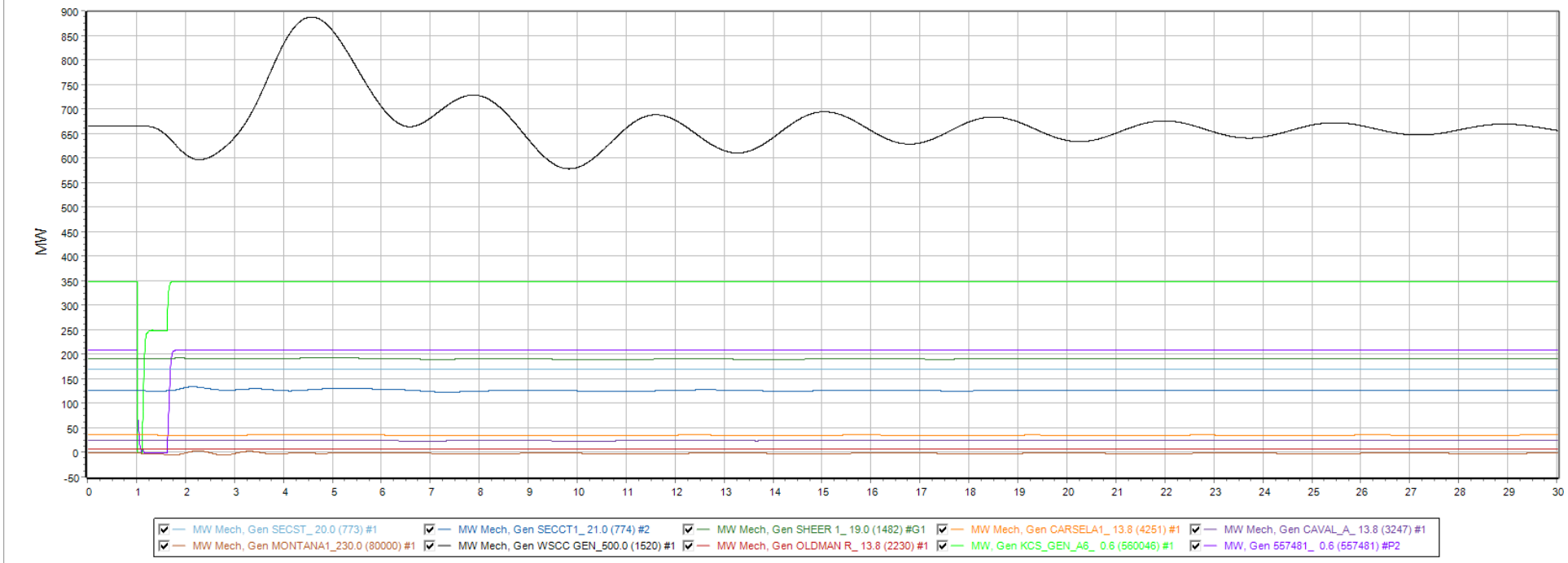
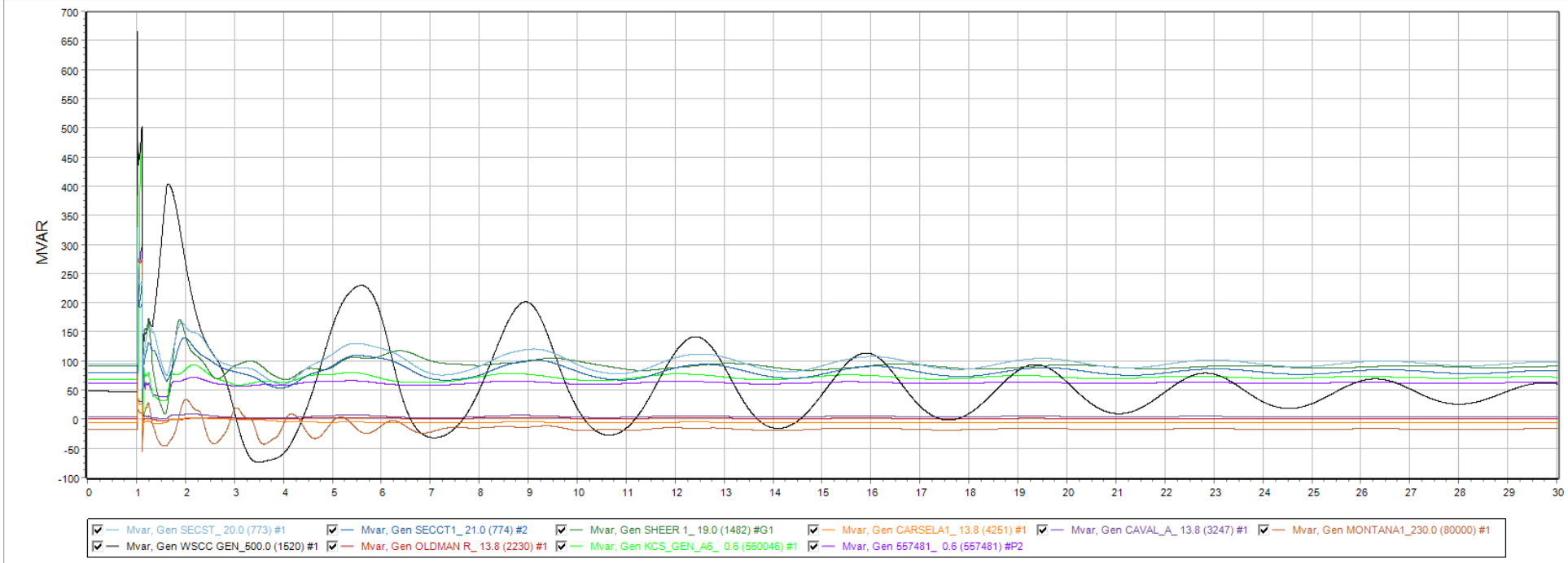
May 16, 2023 21:36:03

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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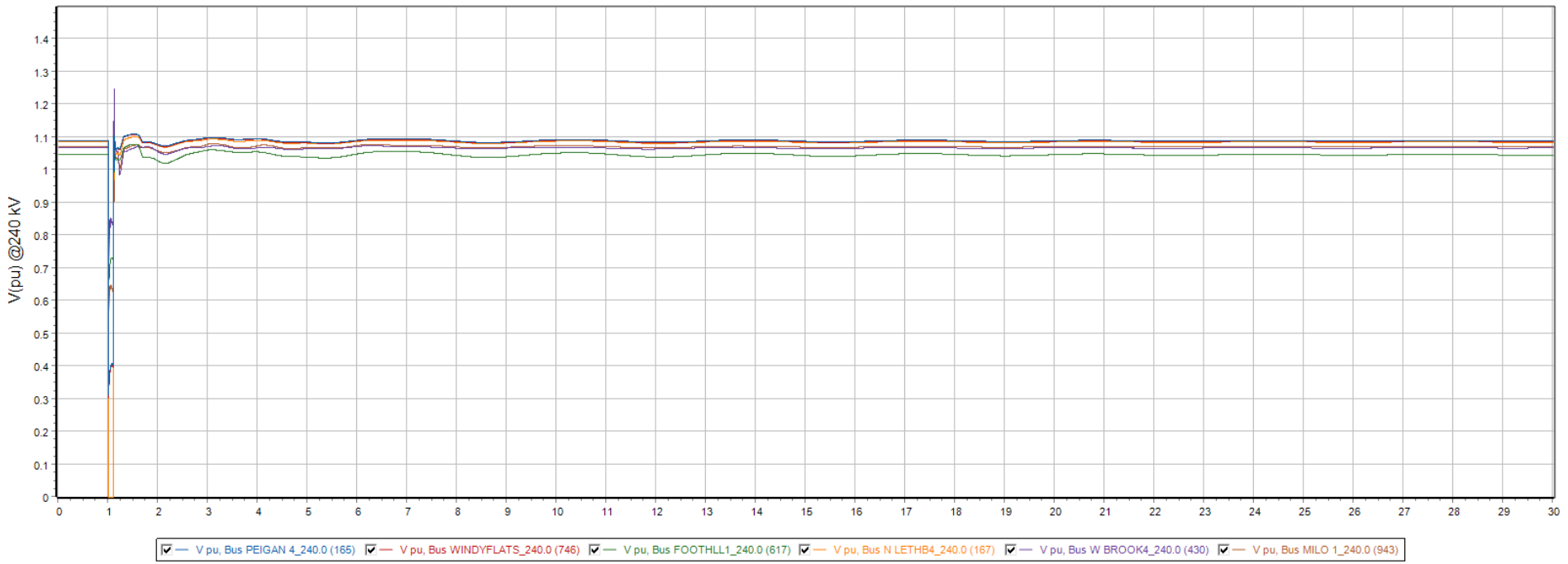
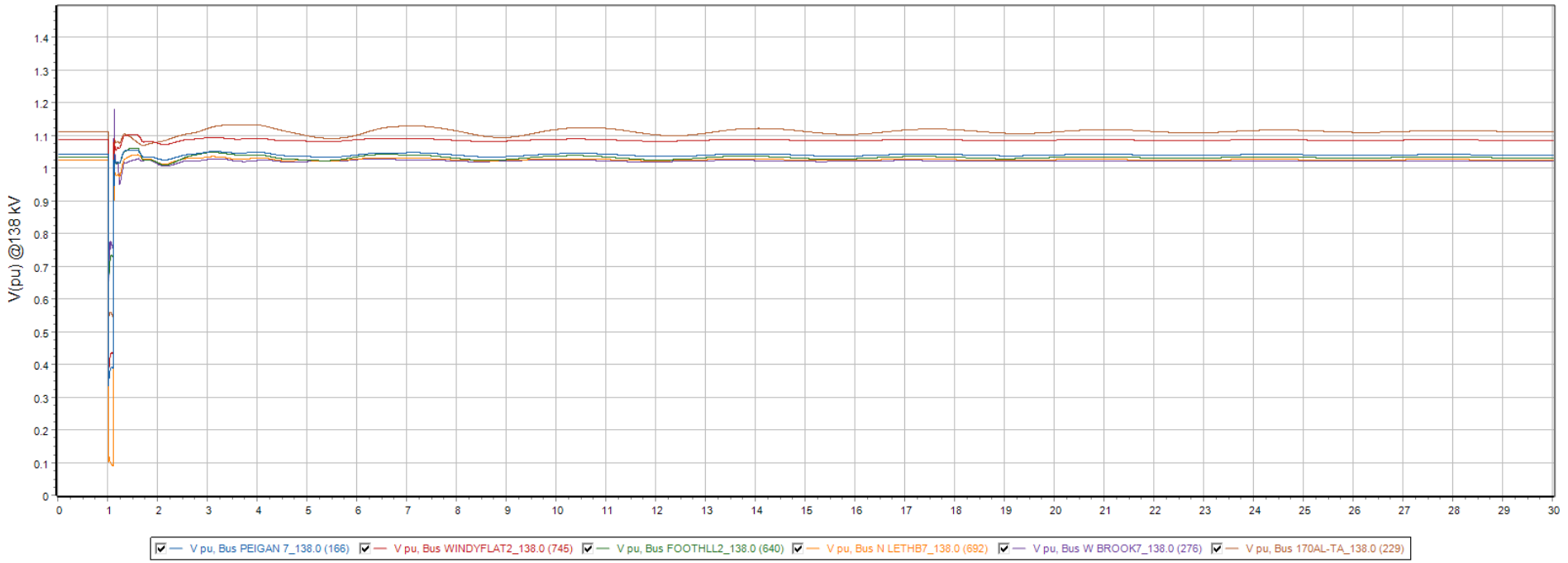
May 16, 2023 21:36:04

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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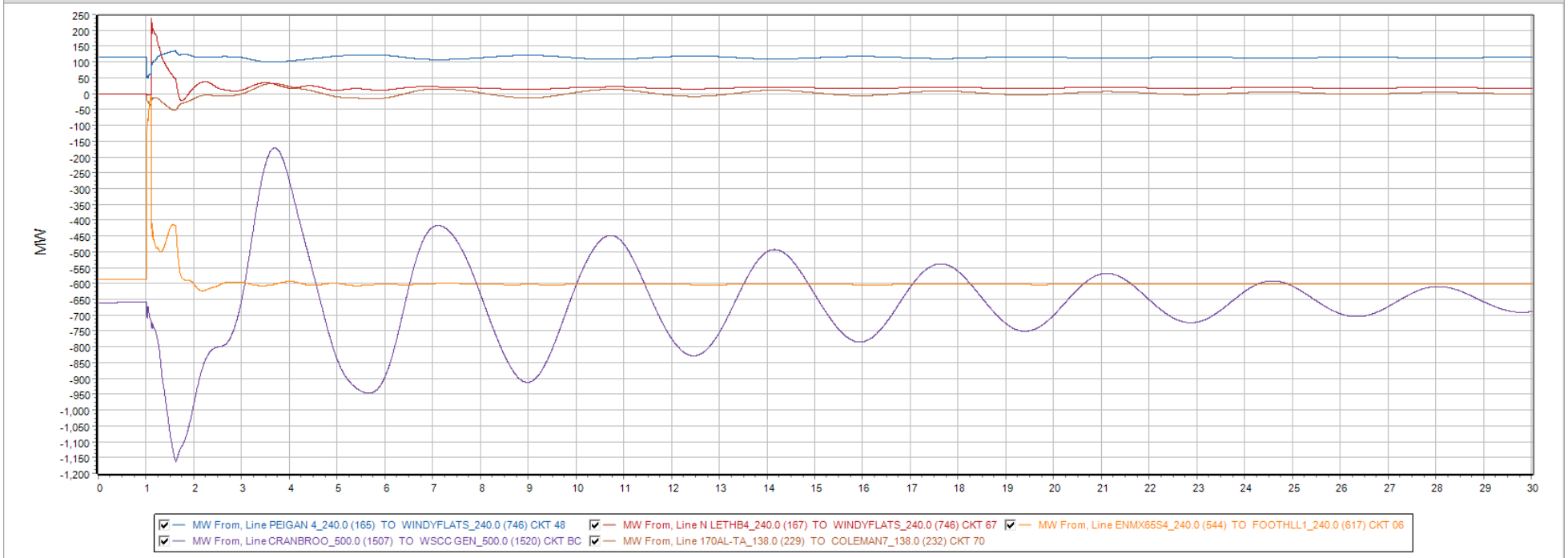
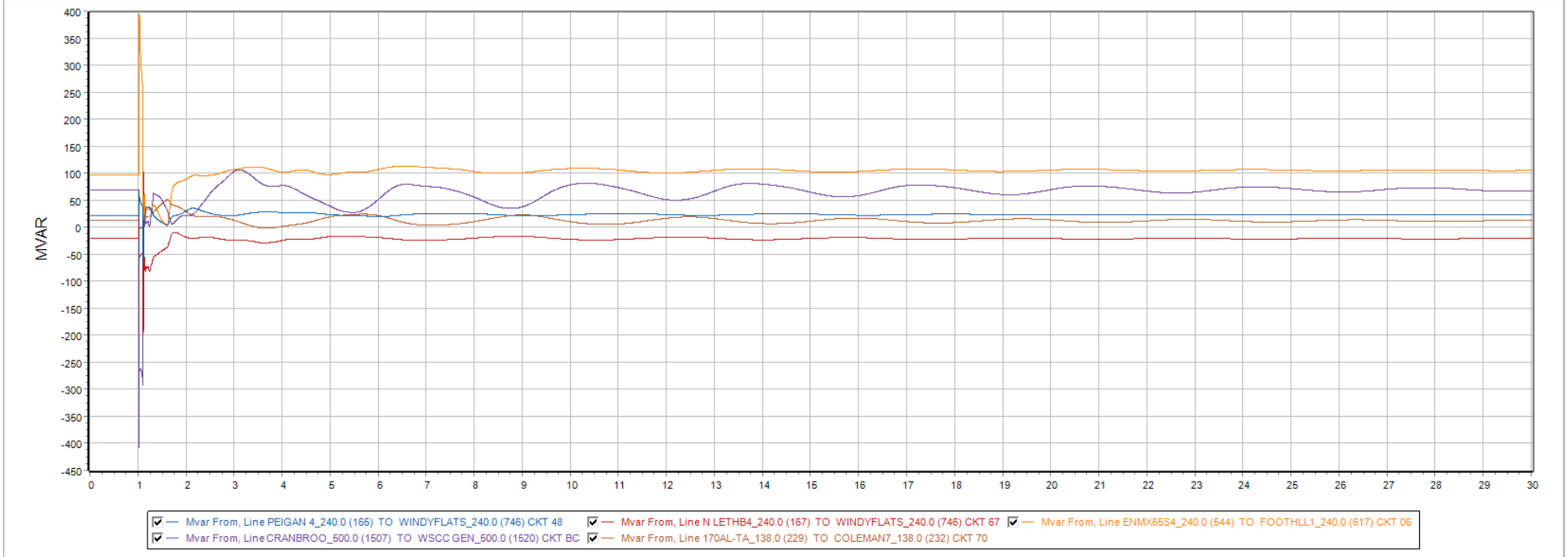
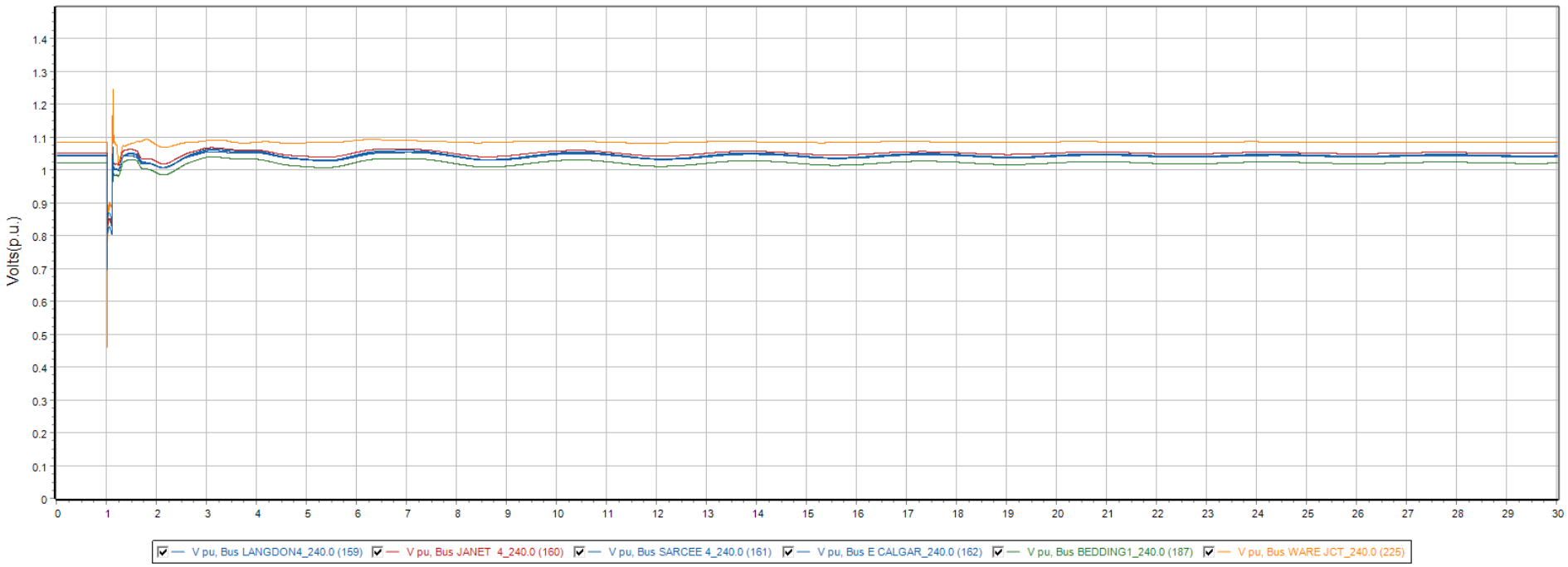
May 16, 2023 21:36:04

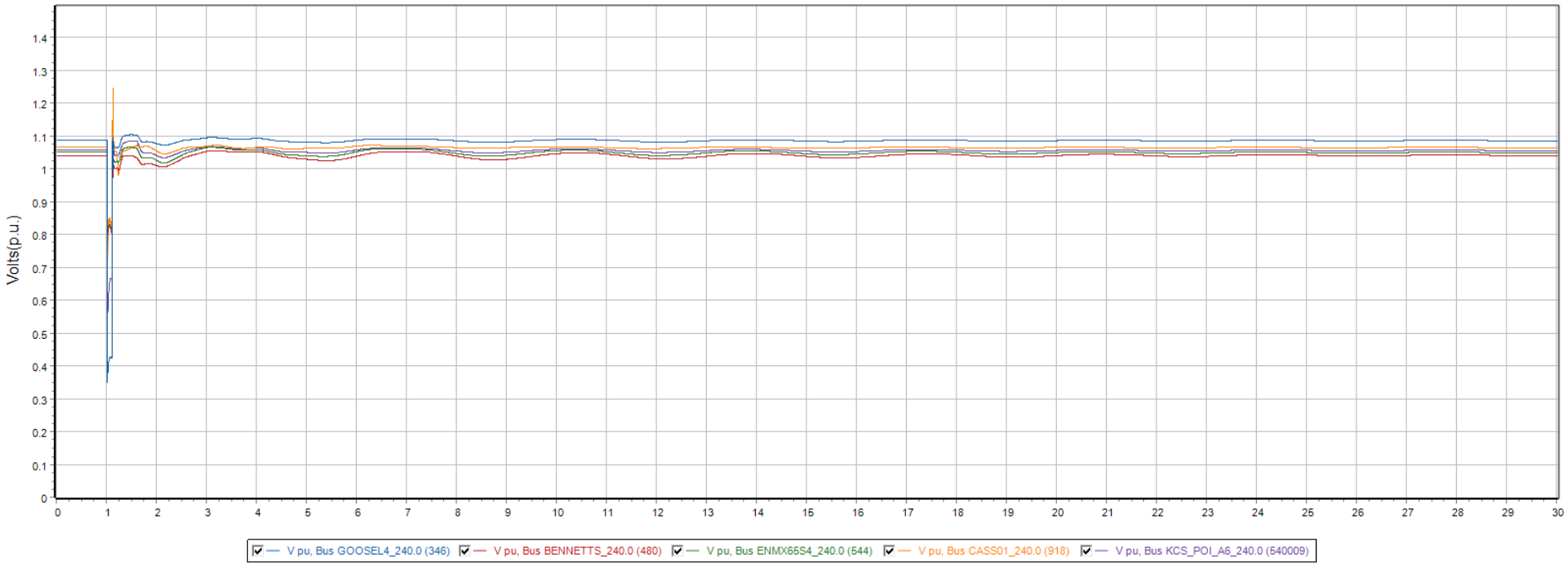
Monitor Line MW & MVAR. Q4



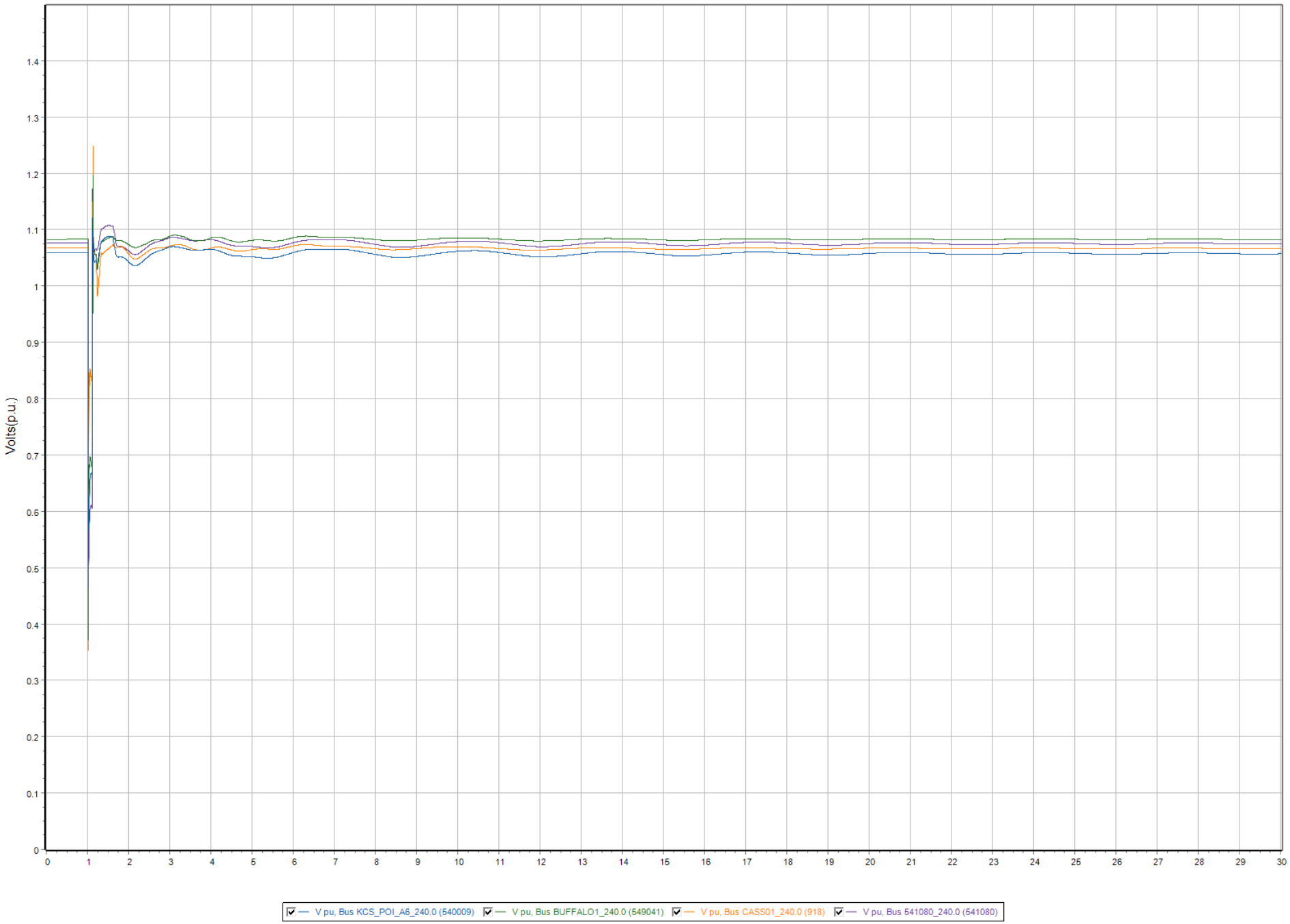


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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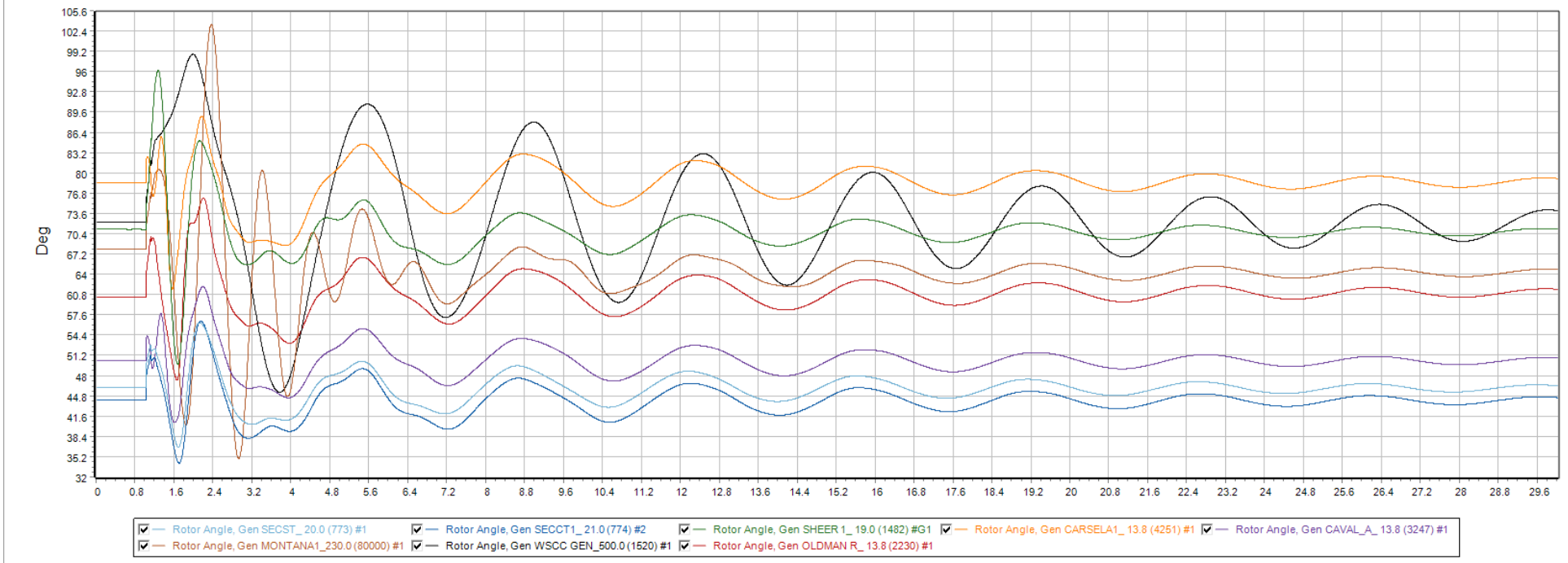
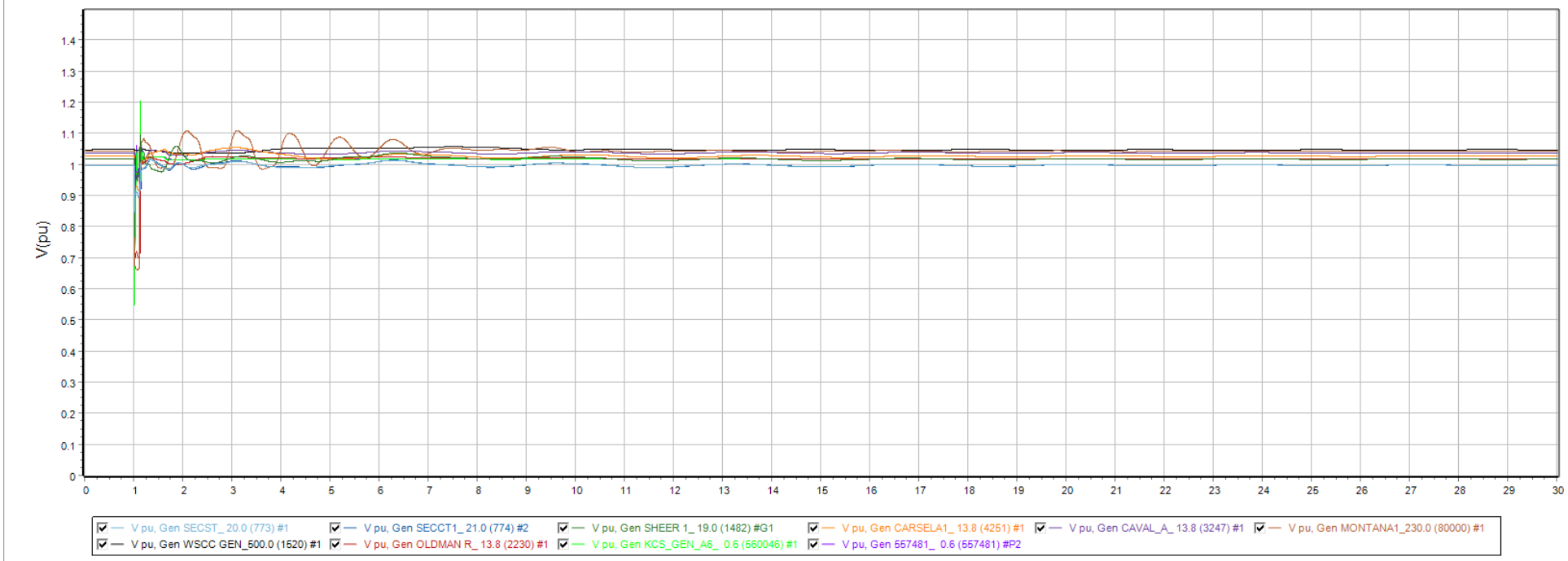
May 16, 2023 21:36:06

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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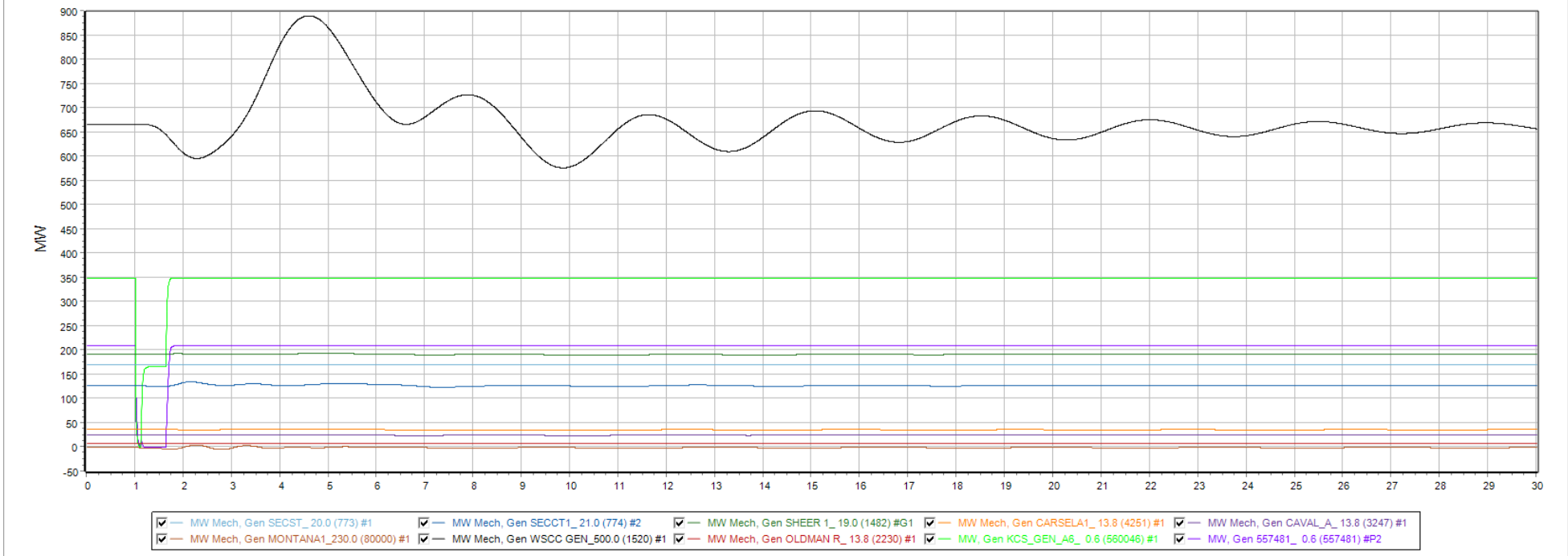
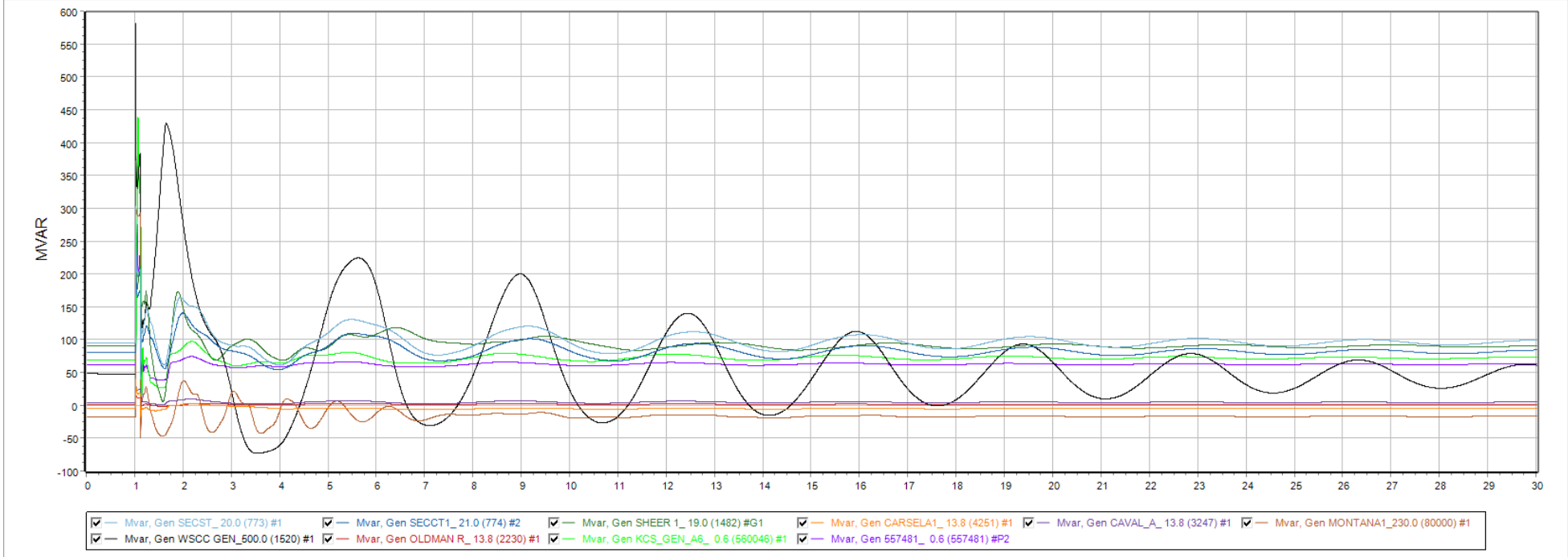
May 16, 2023 21:46:37

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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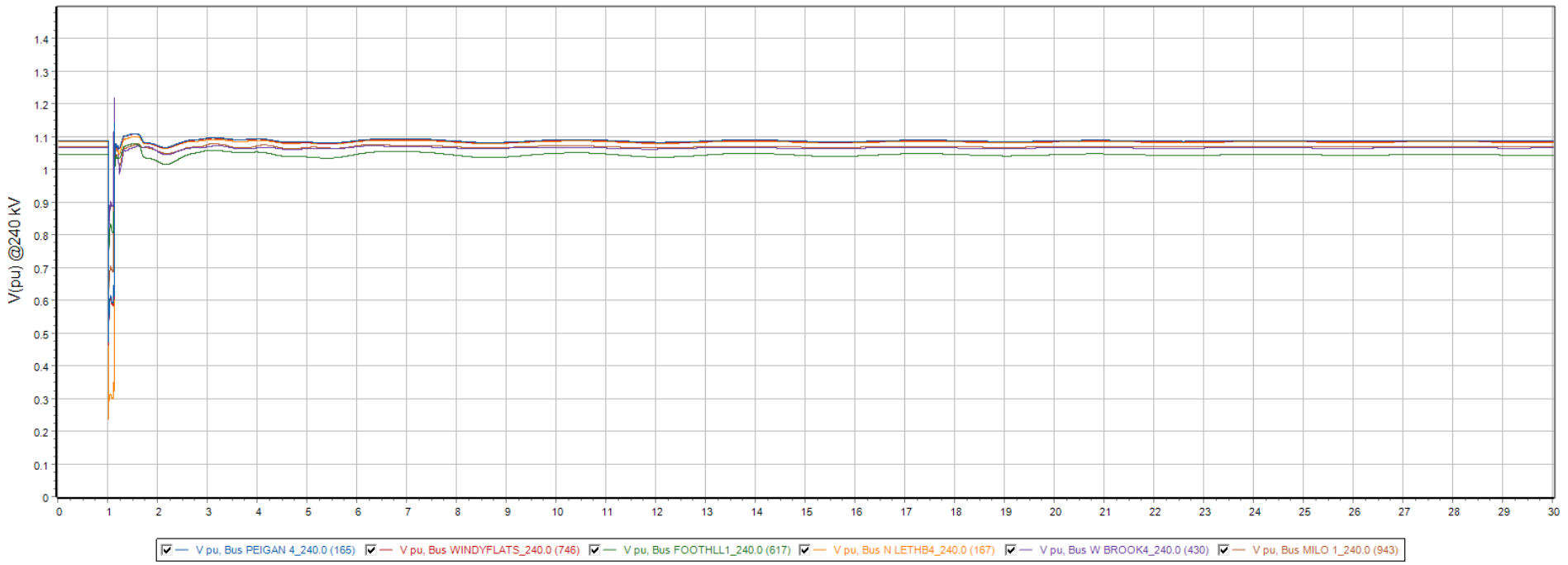
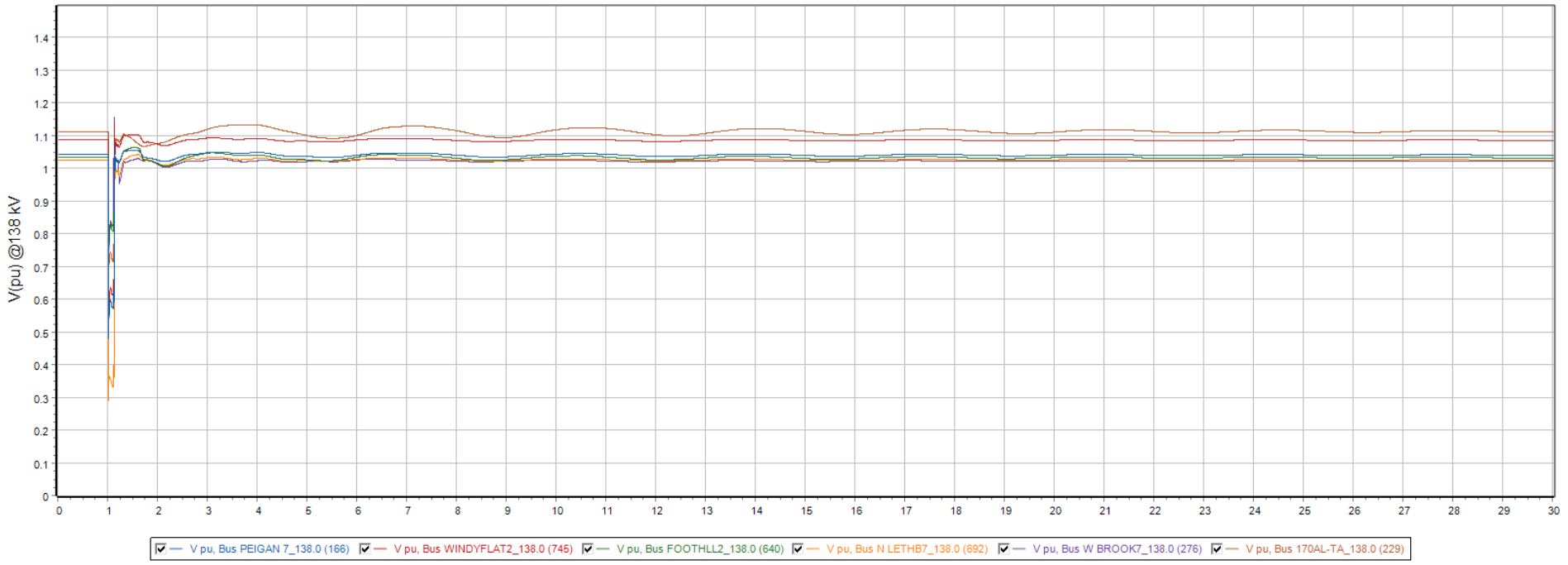
May 16, 2023 21:46:38

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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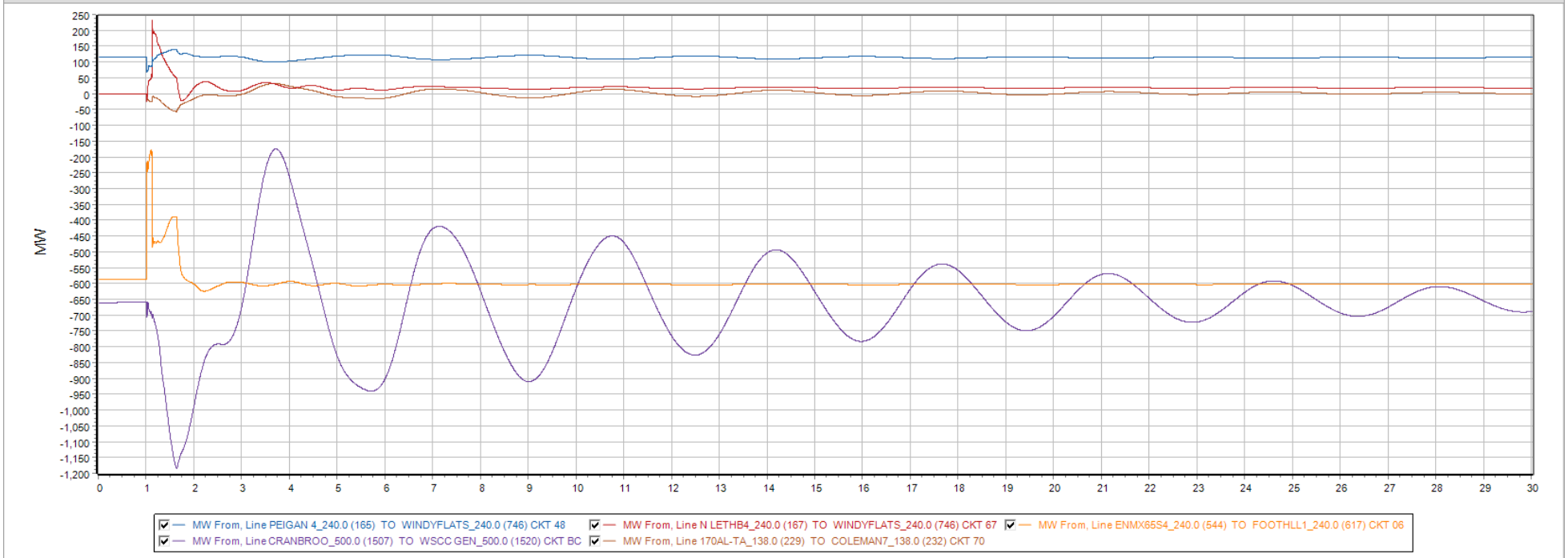
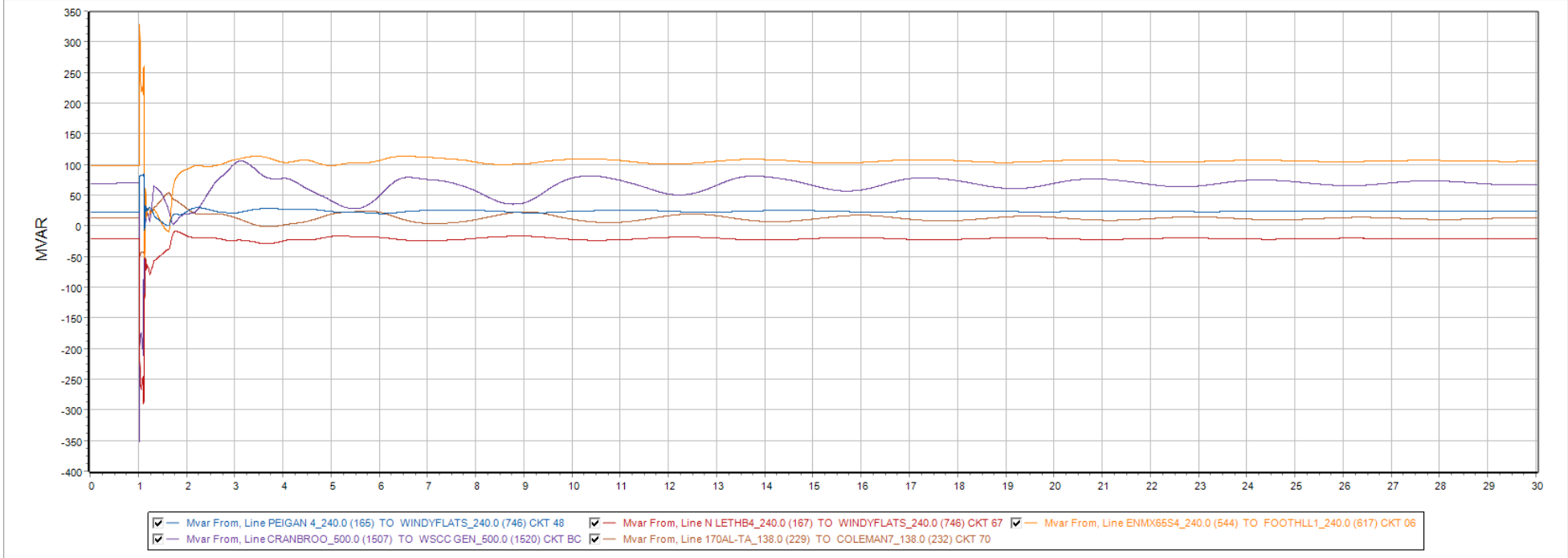
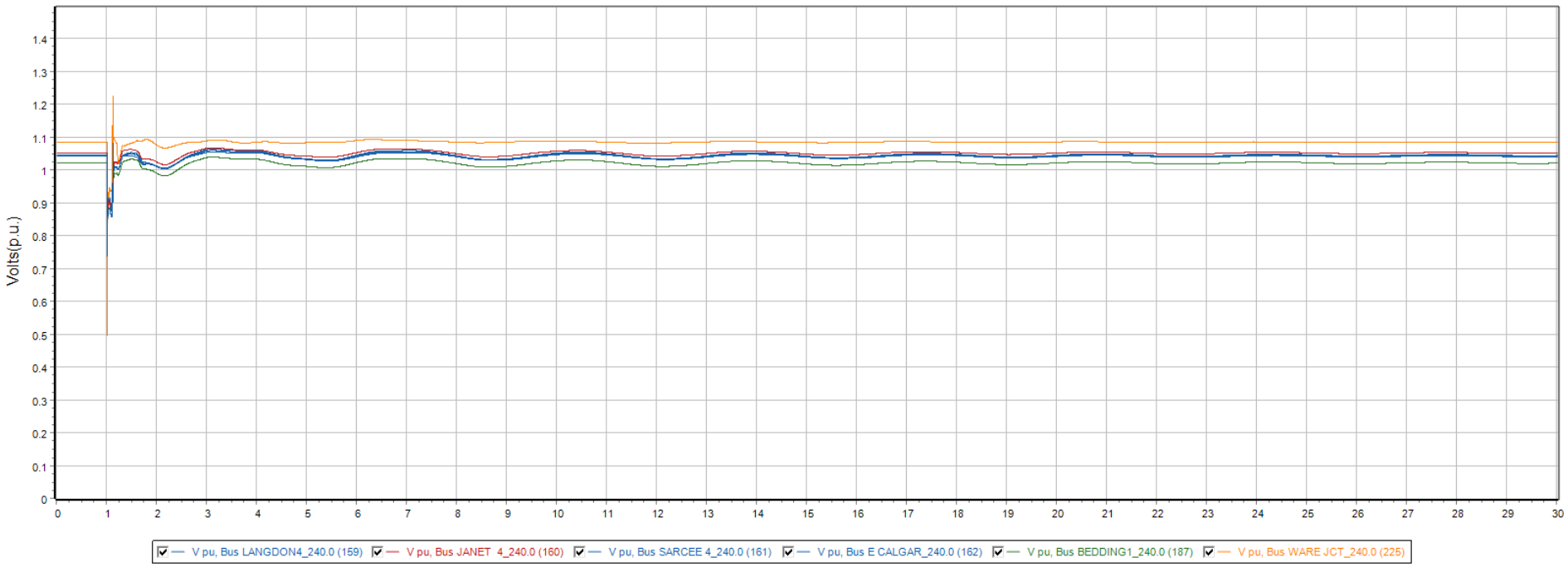
May 16, 2023 21:46:38

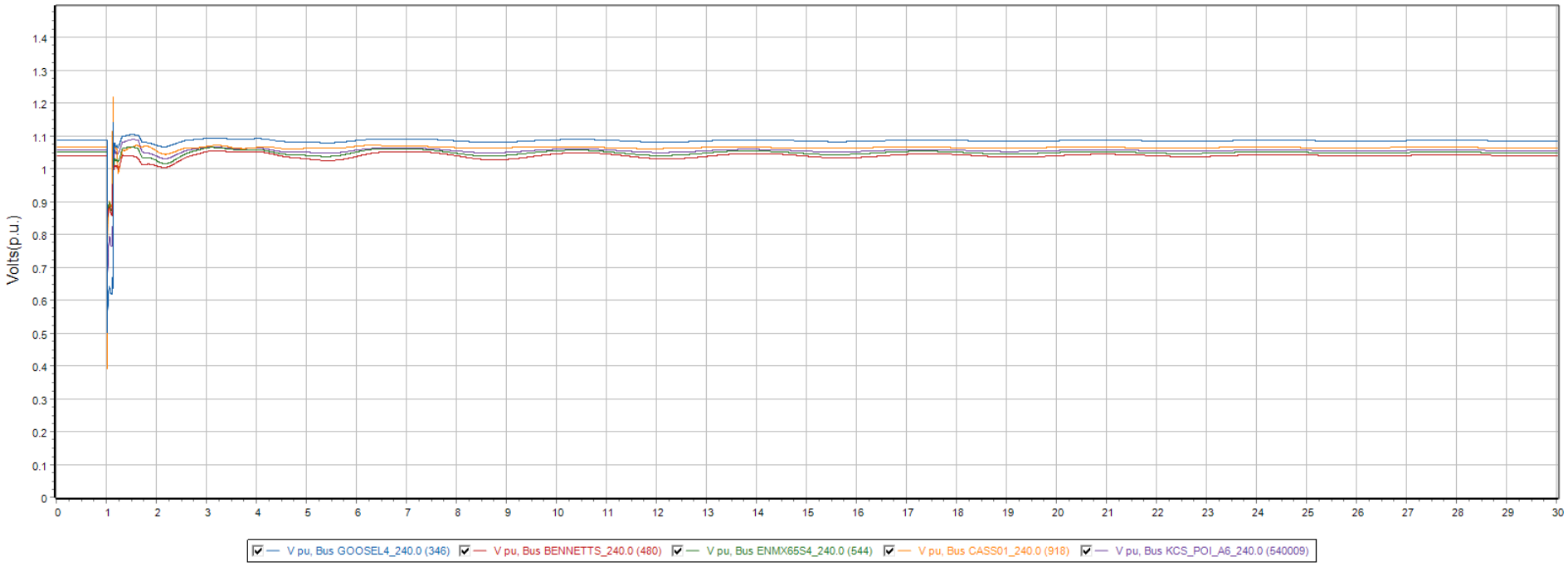
Monitor Line MW & MVAR. Q4



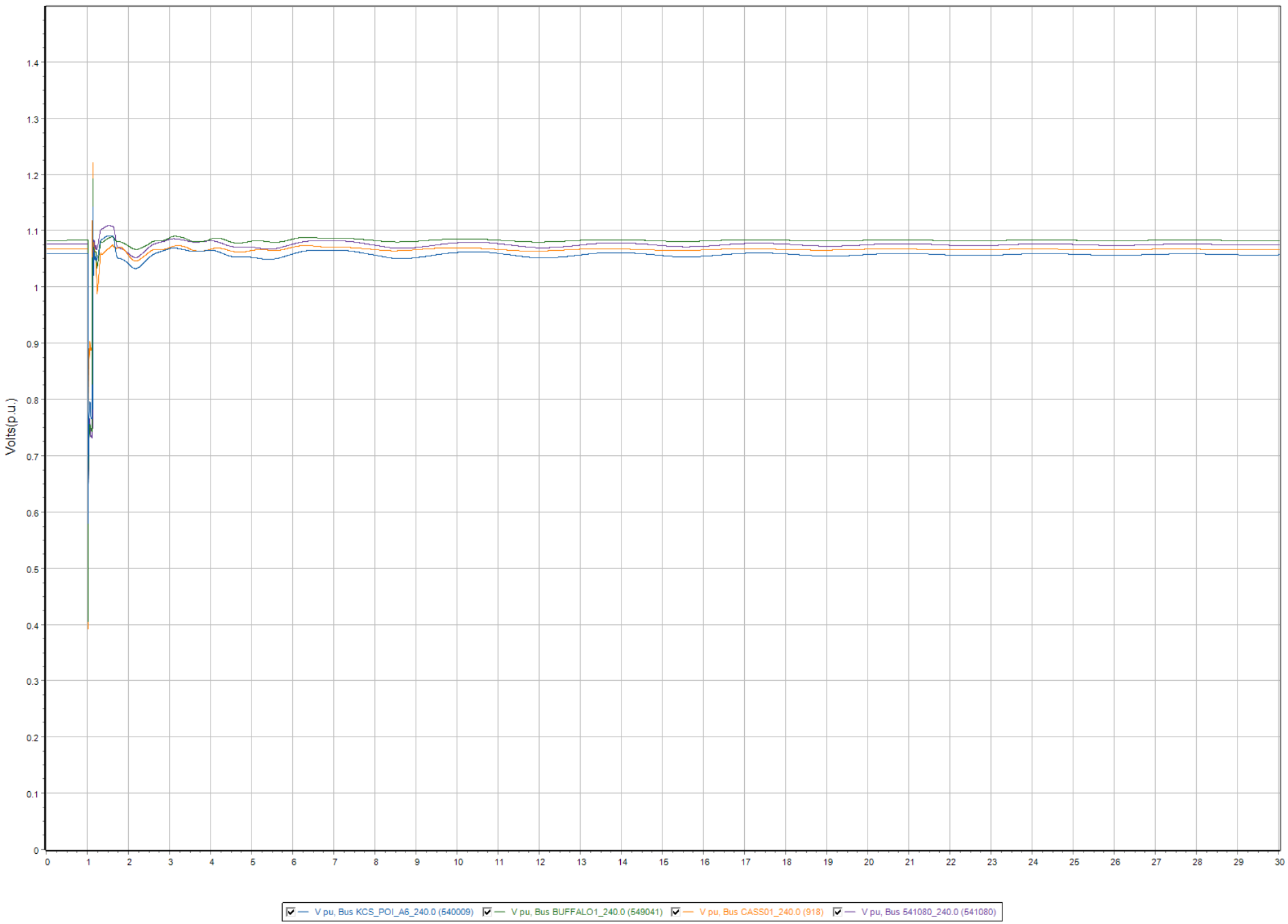


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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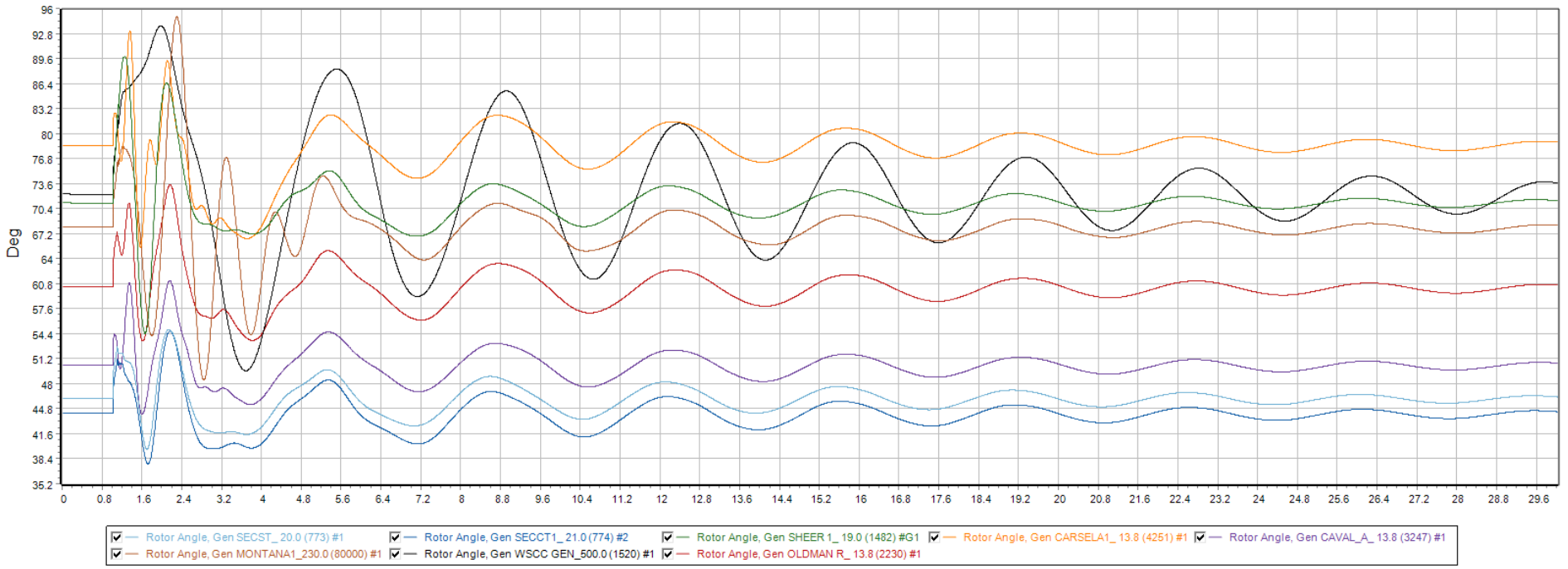
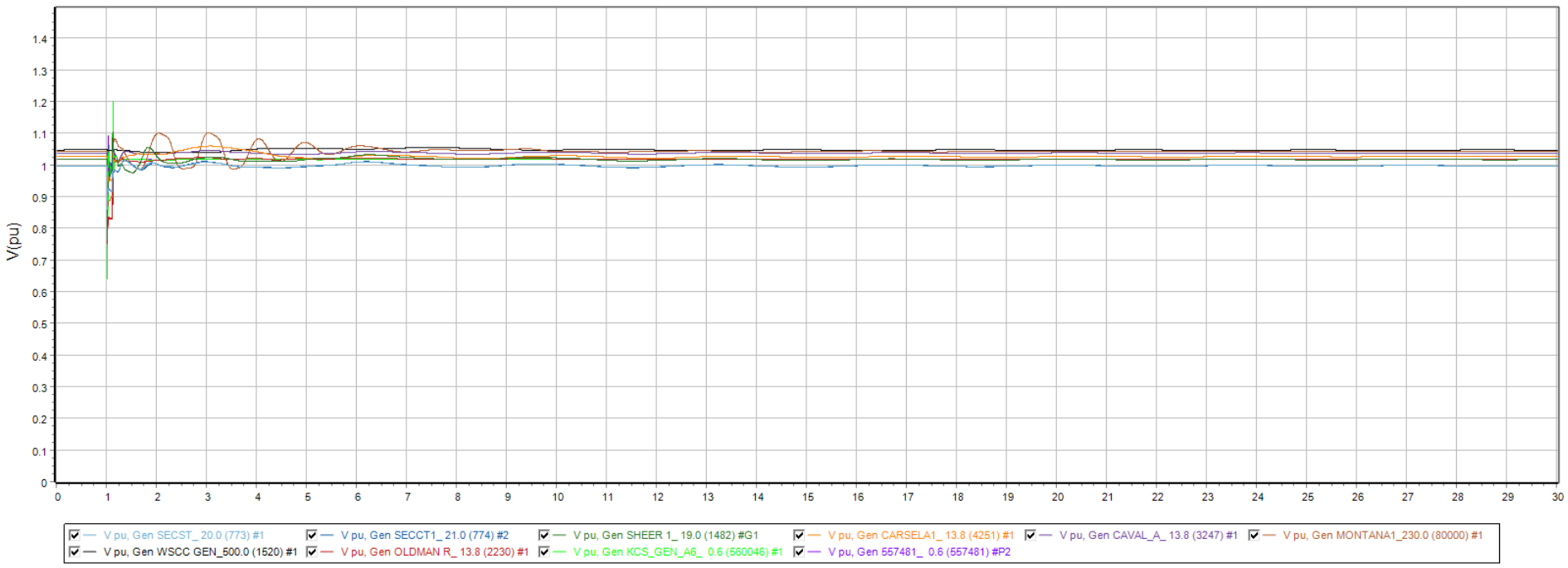
May 16, 2023 21:46:40

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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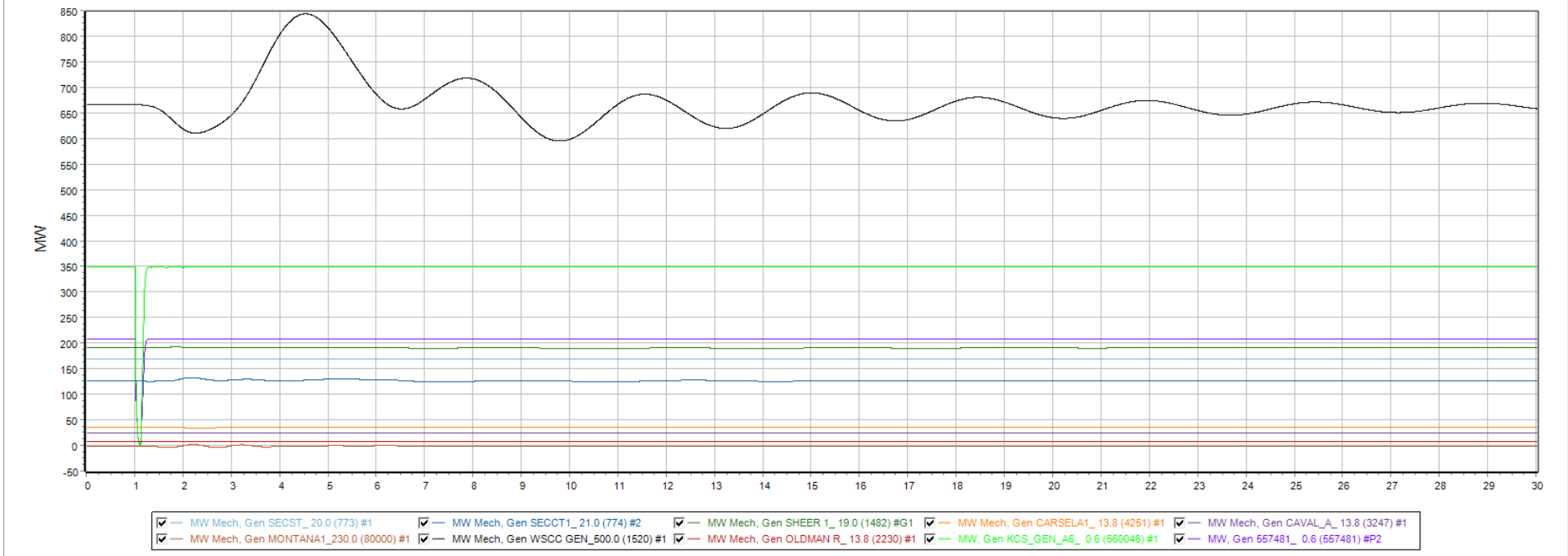
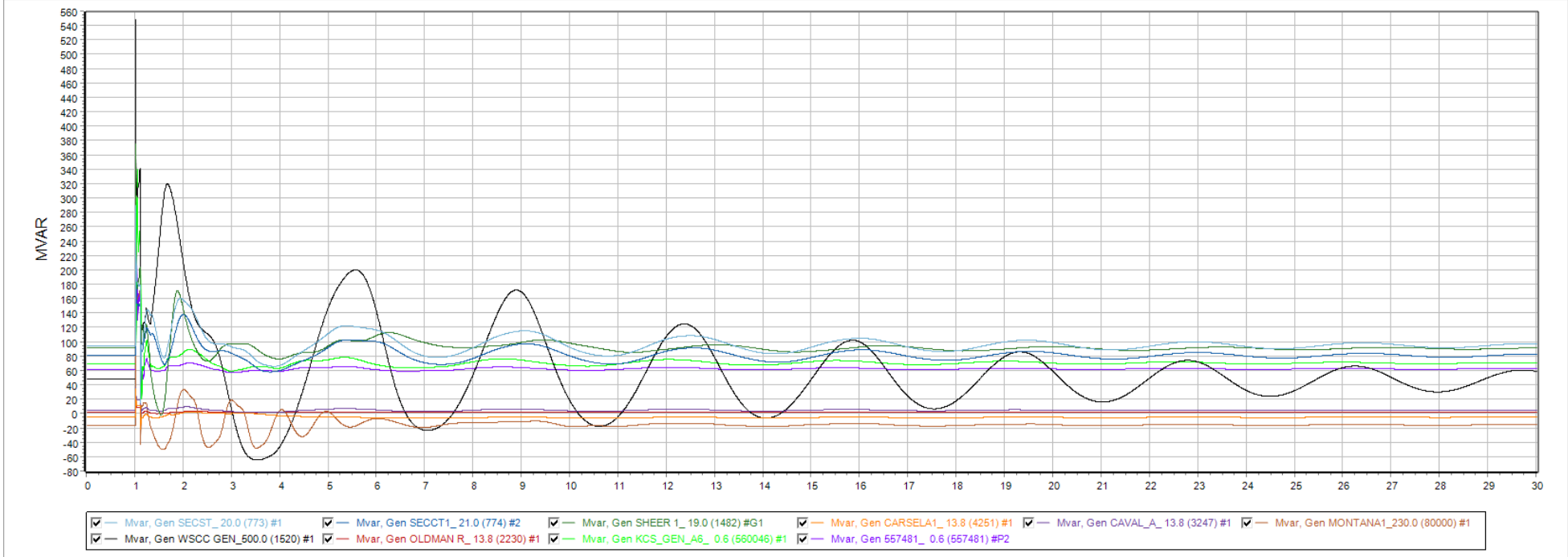
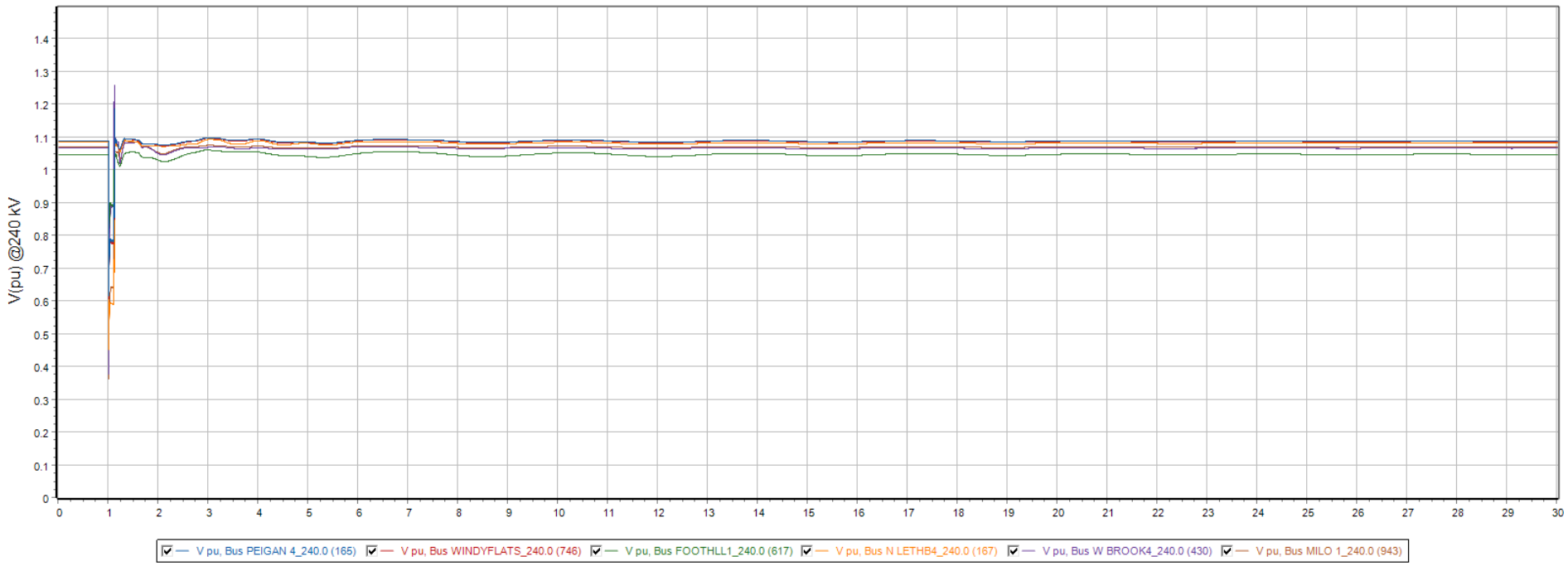
May 16, 2023 21:57:08

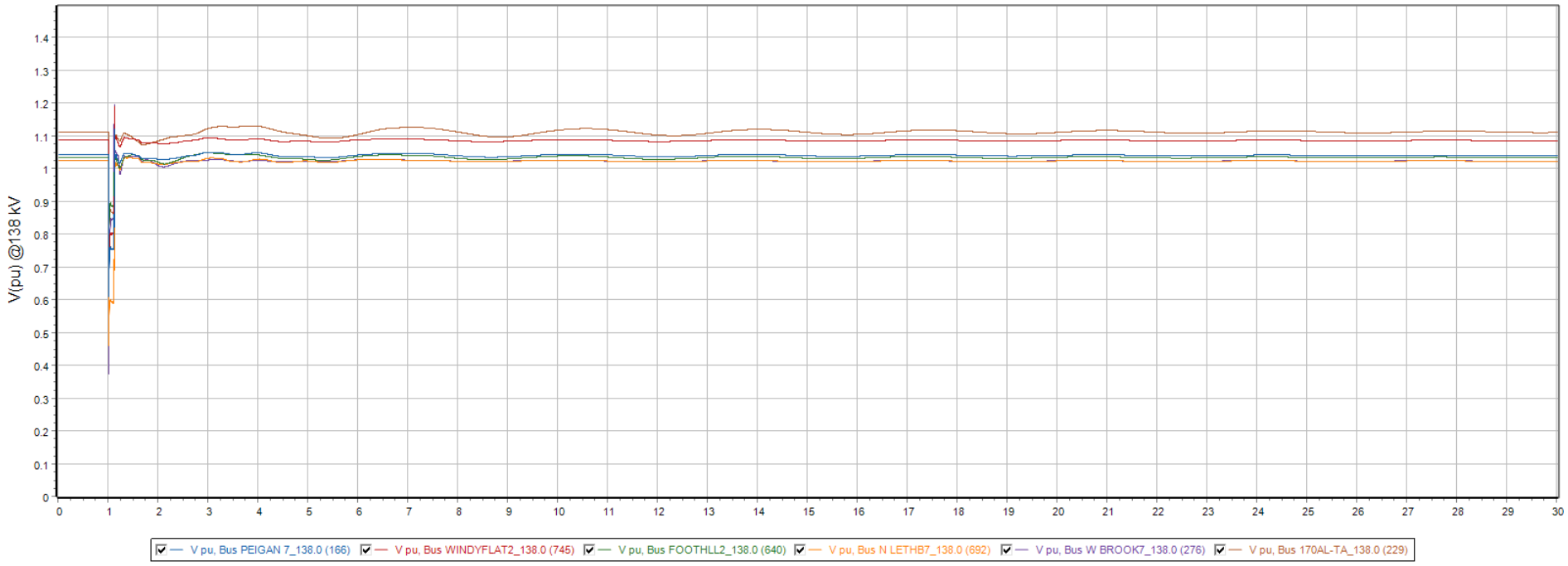
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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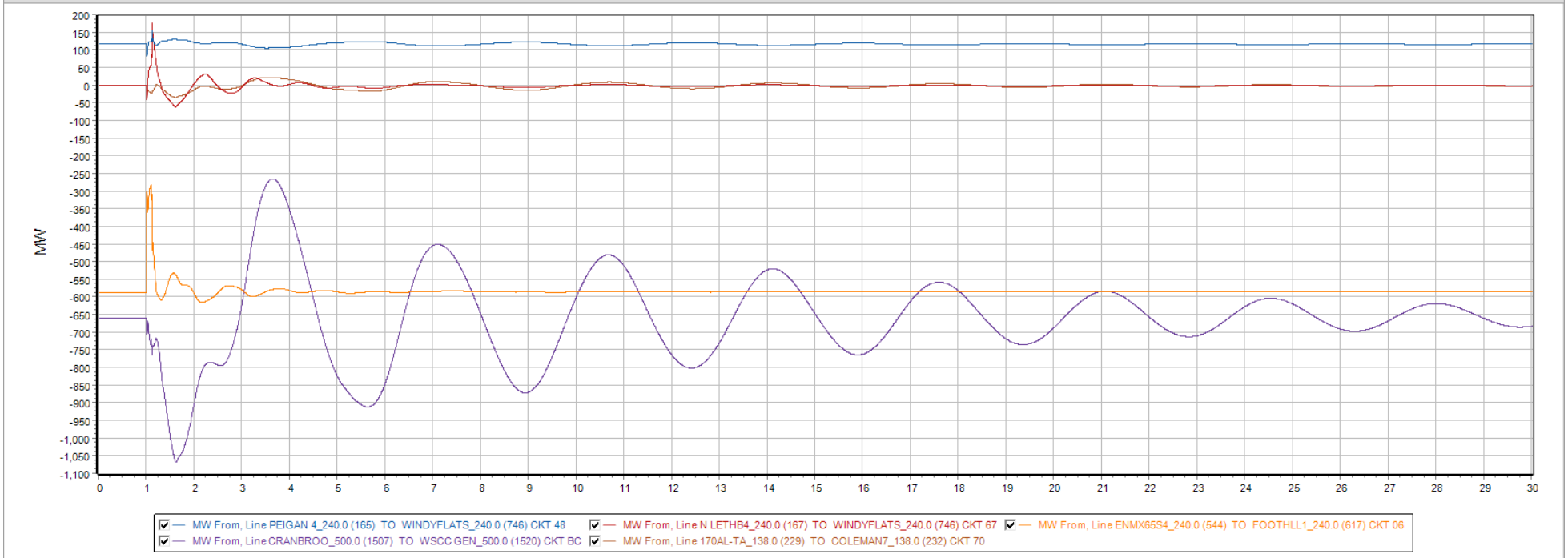
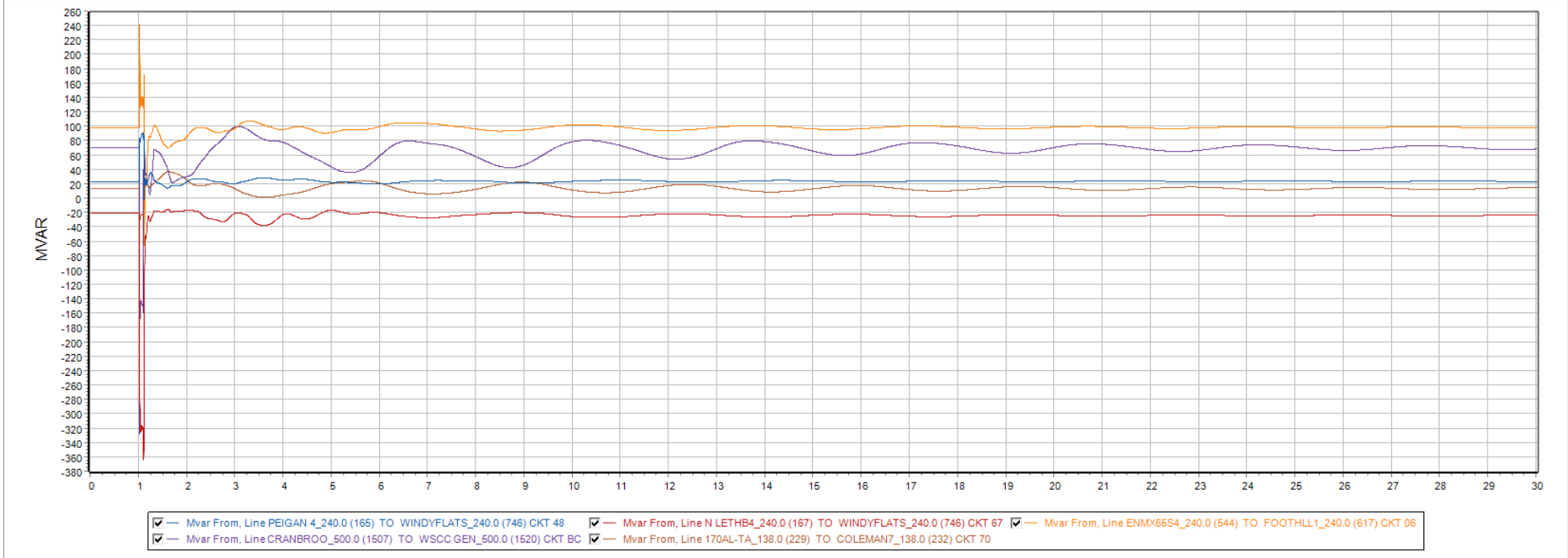
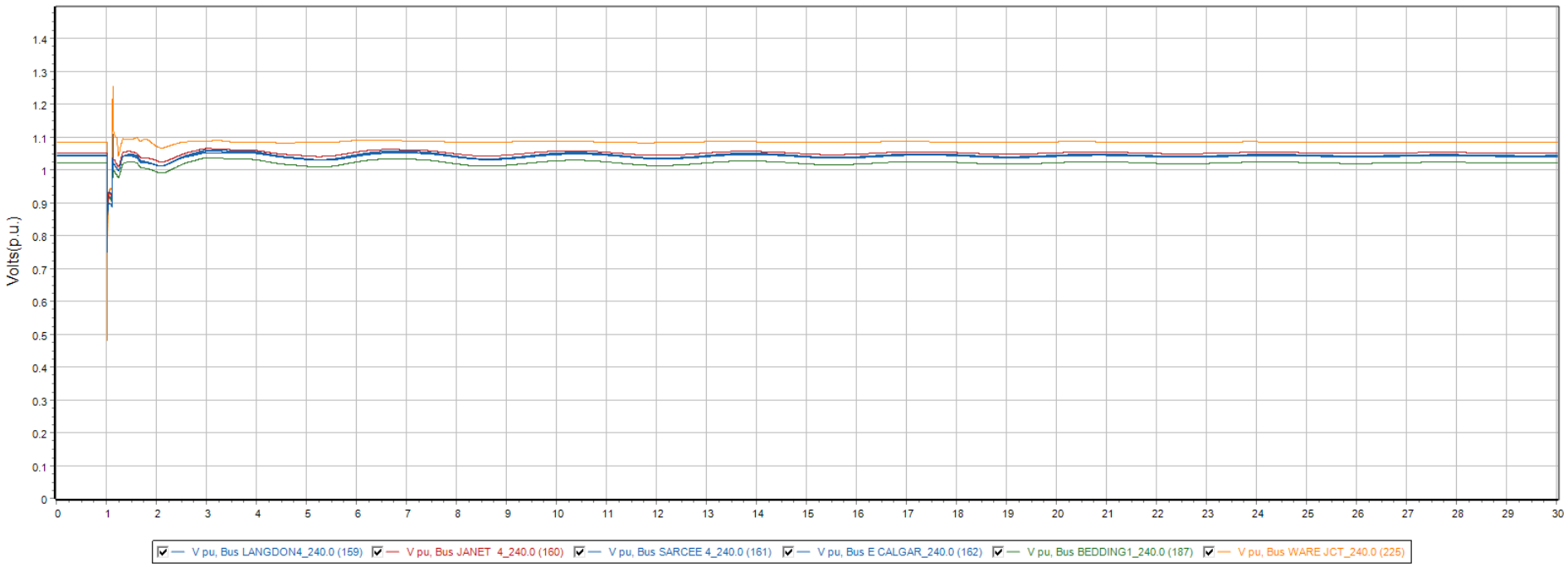
May 16, 2023 21:57:09

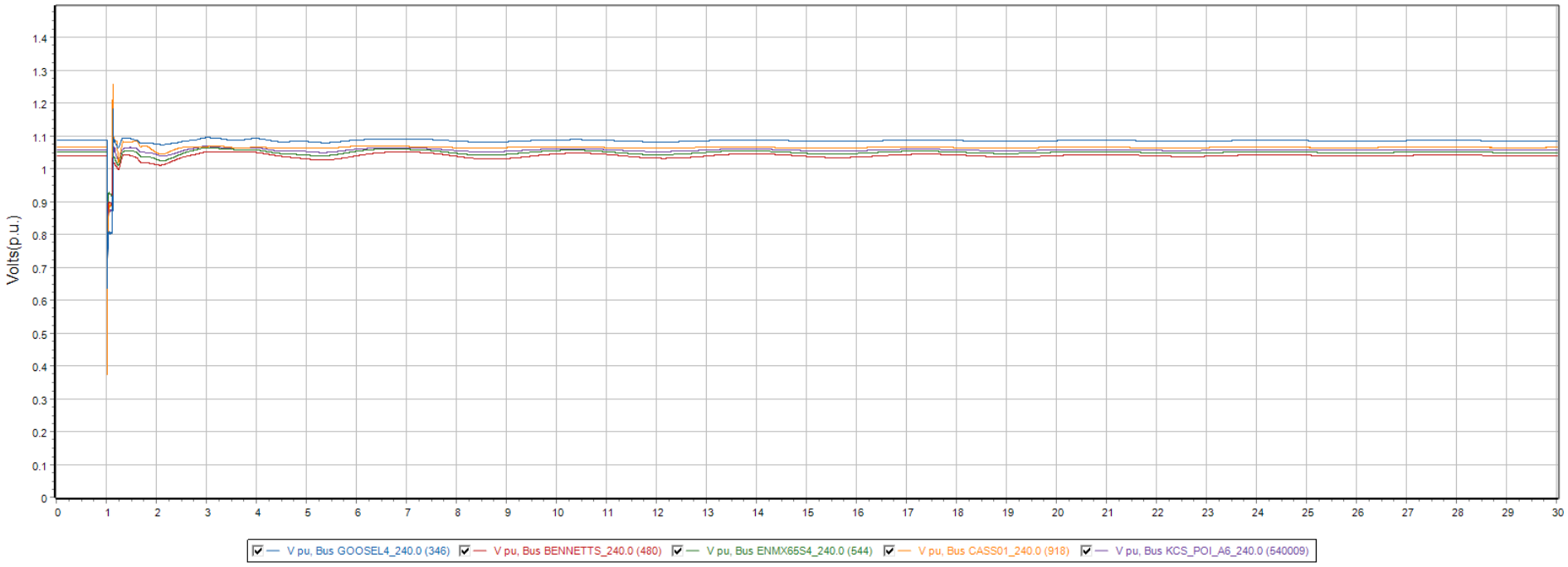
Monitor Line MW & MVAR. Q4



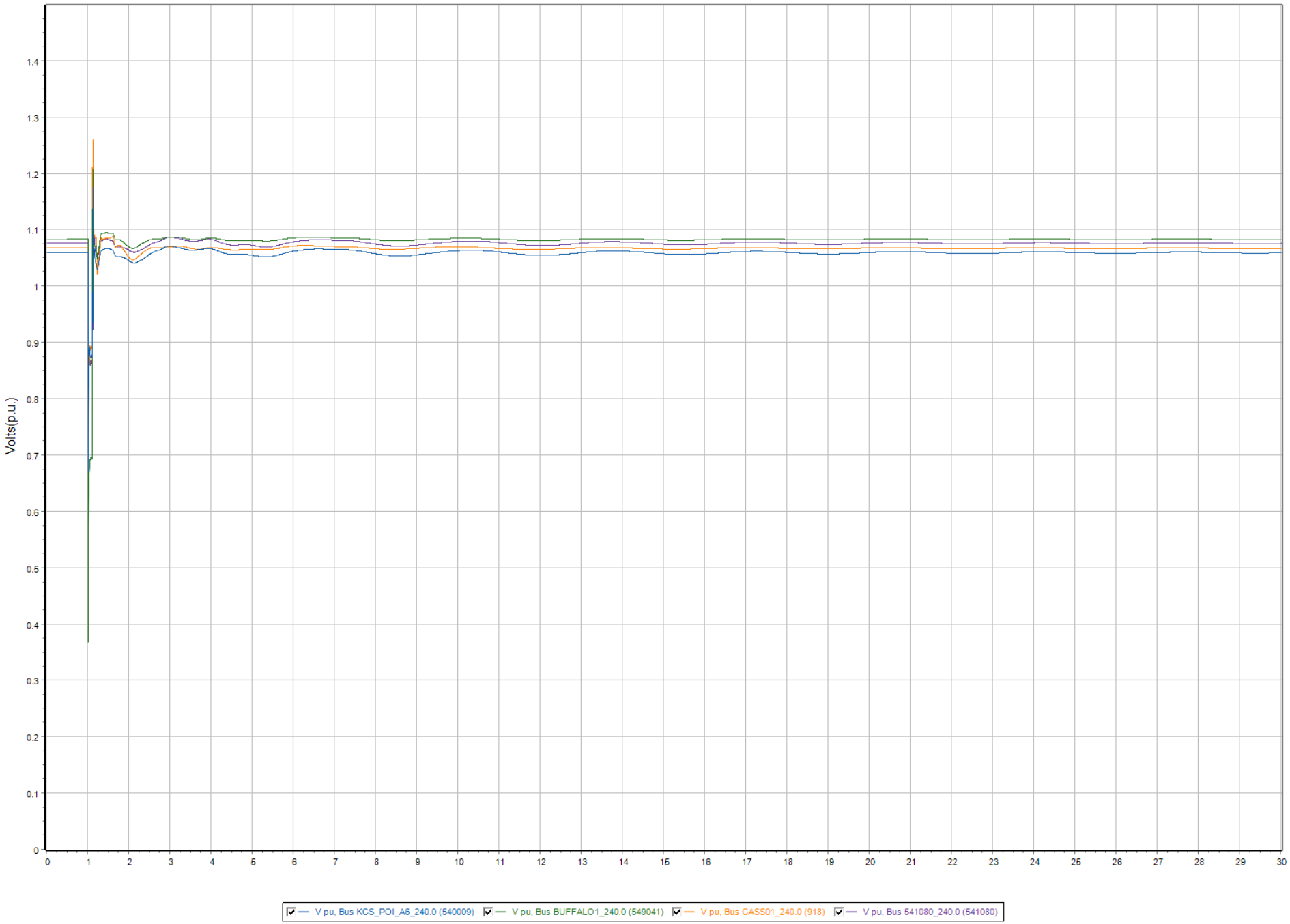


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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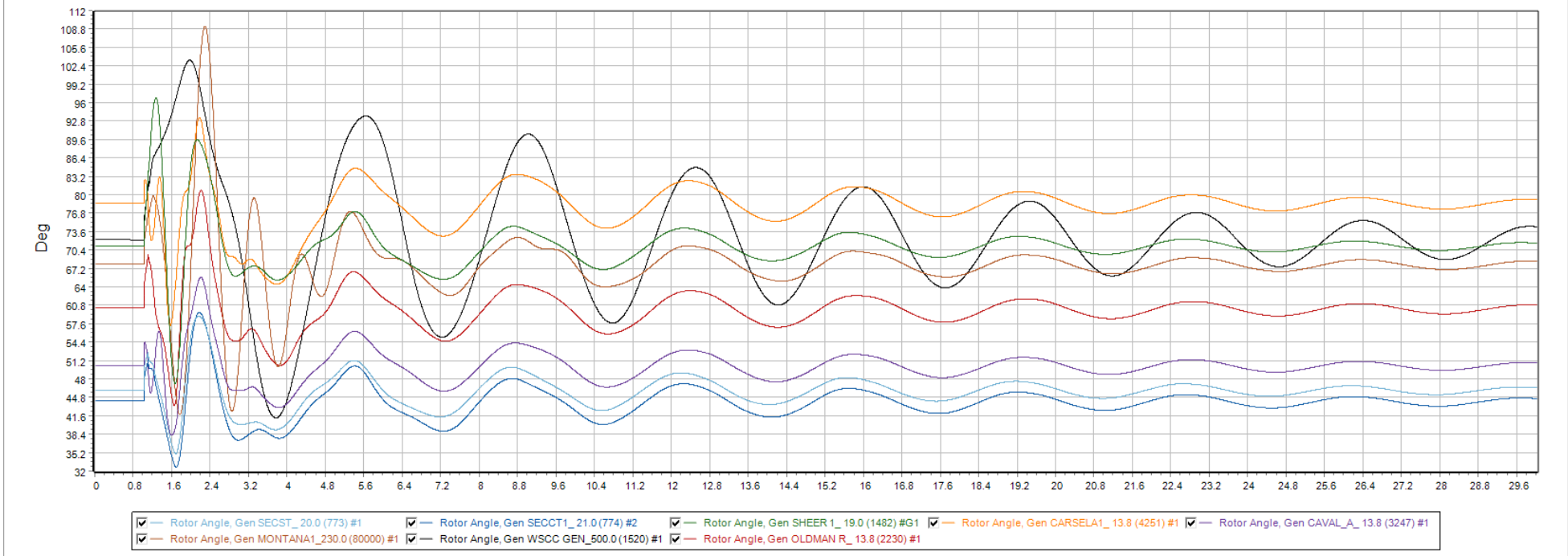
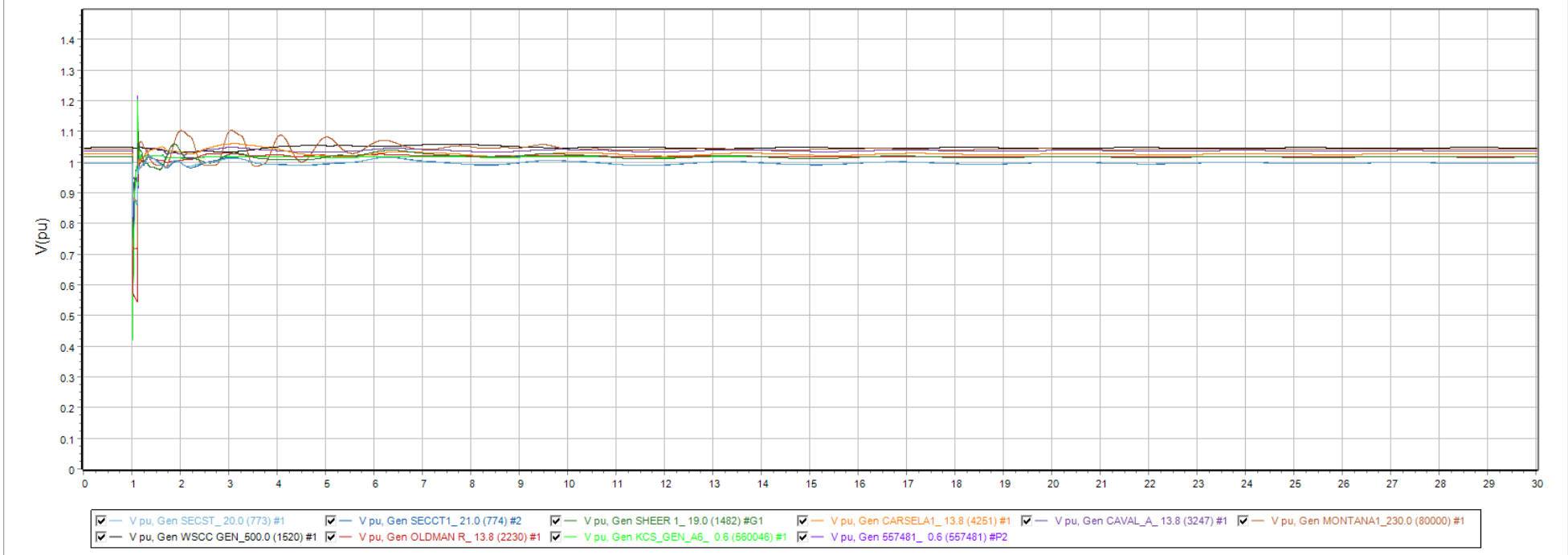
May 16, 2023 21:57:10

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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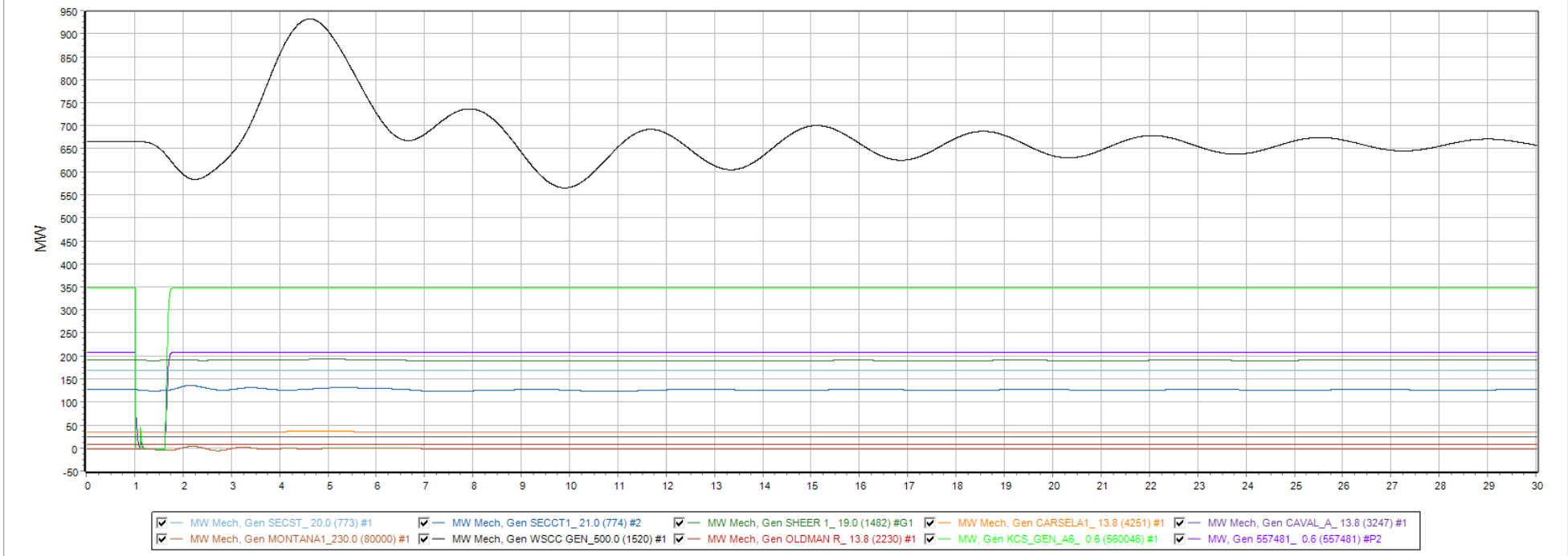
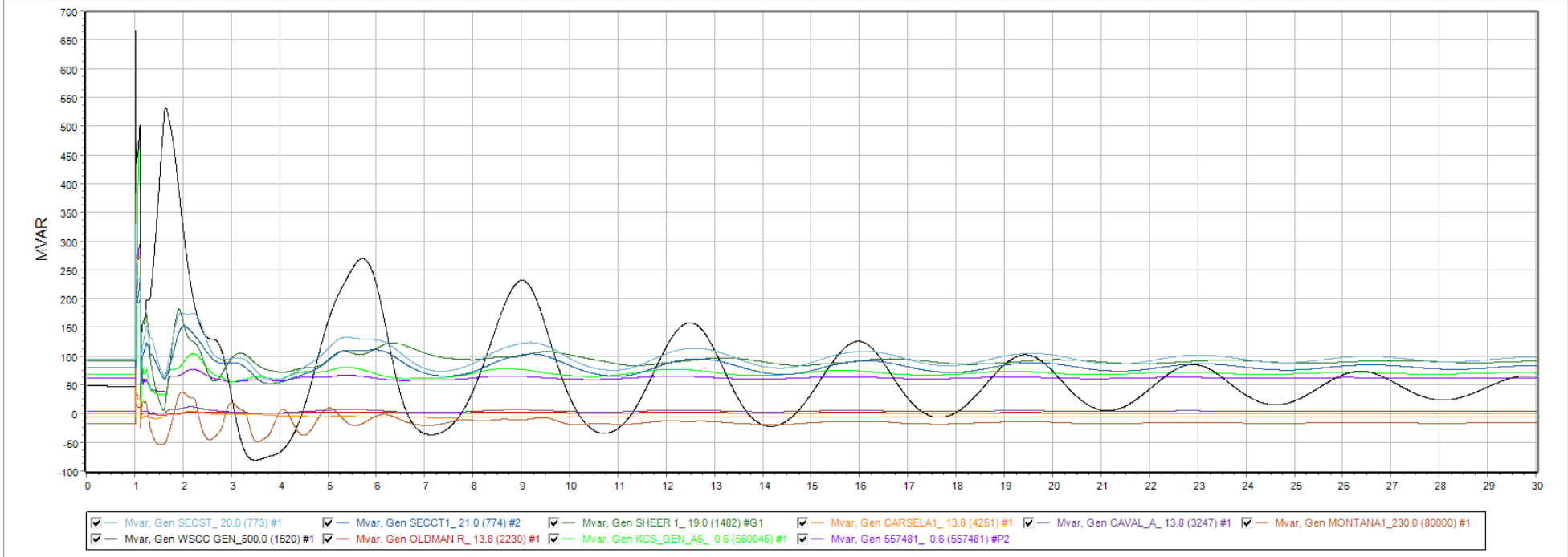
May 16, 2023 22:06:44

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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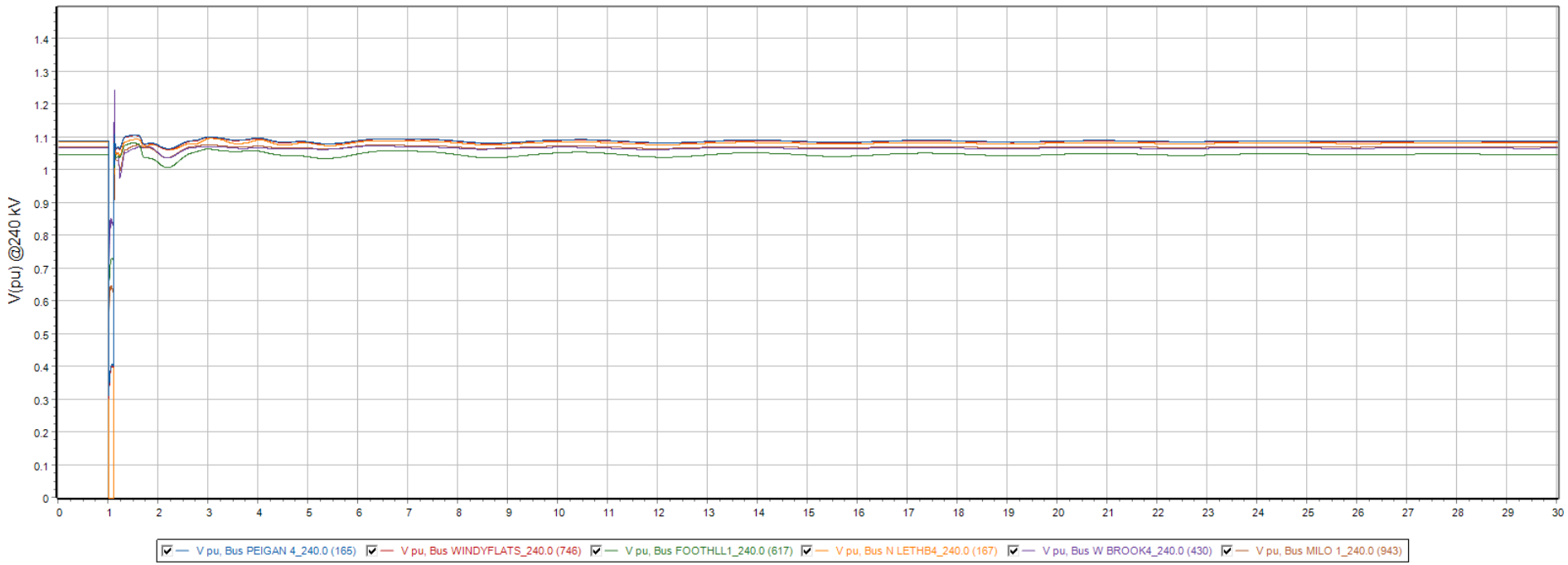
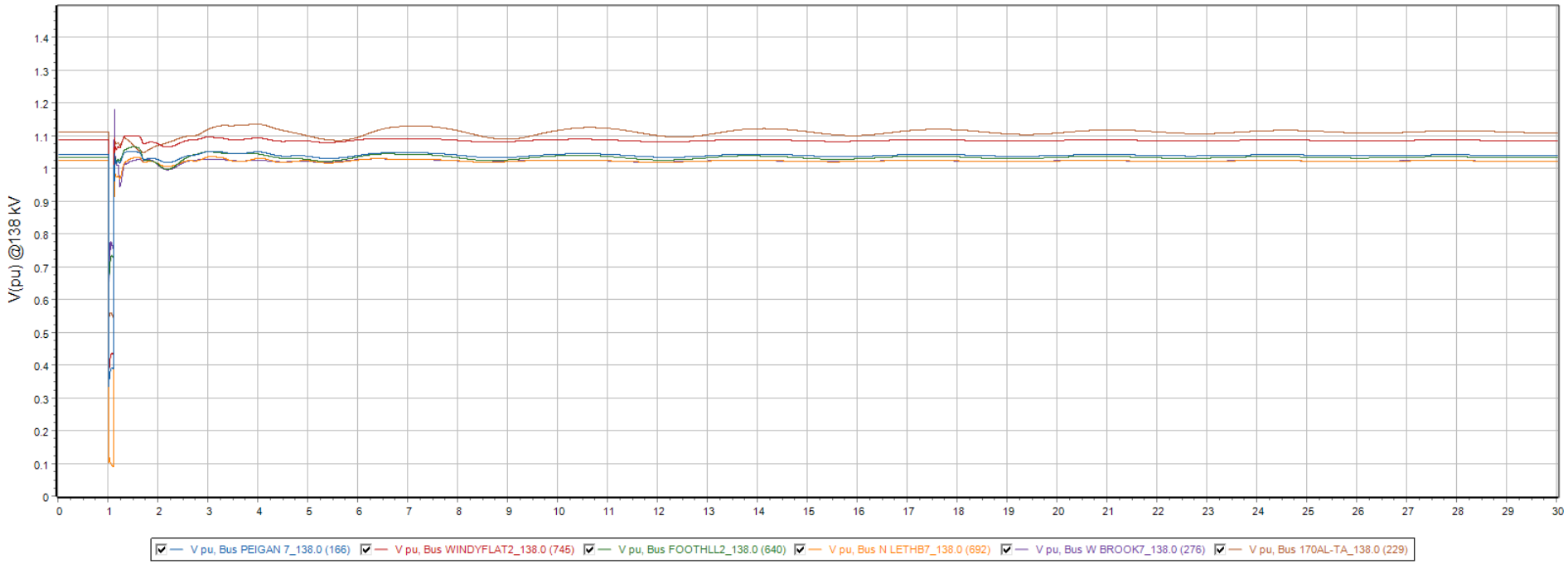
May 16, 2023 22:06:45

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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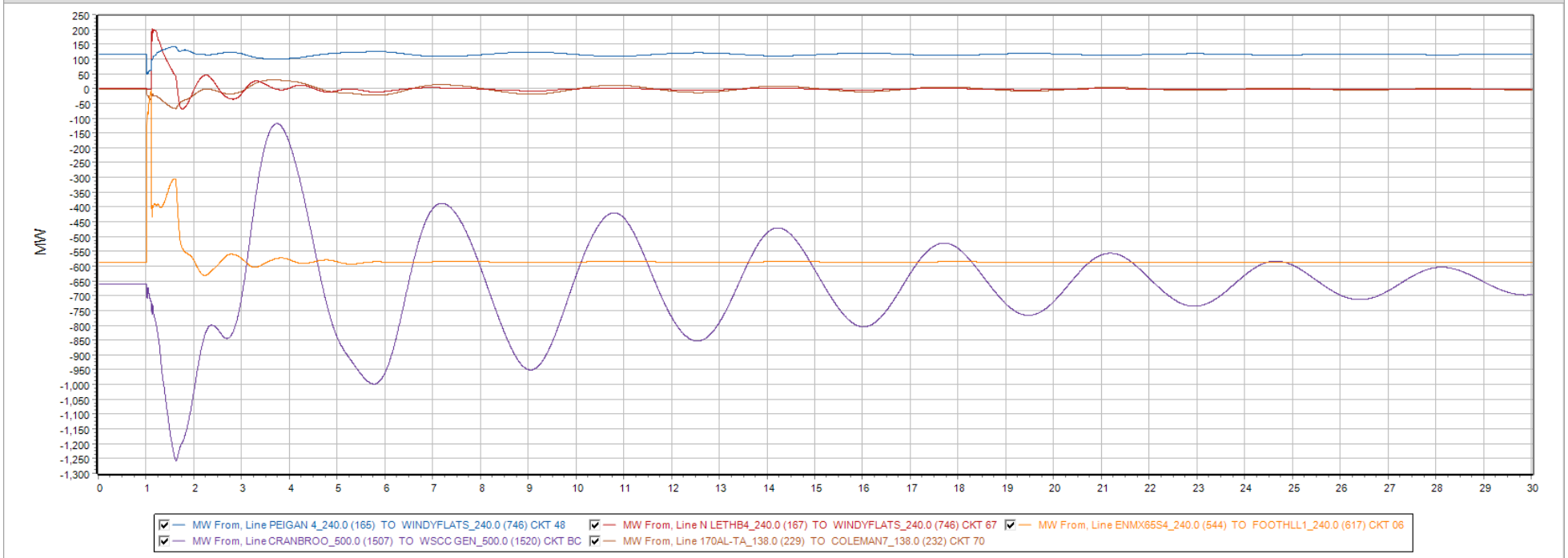
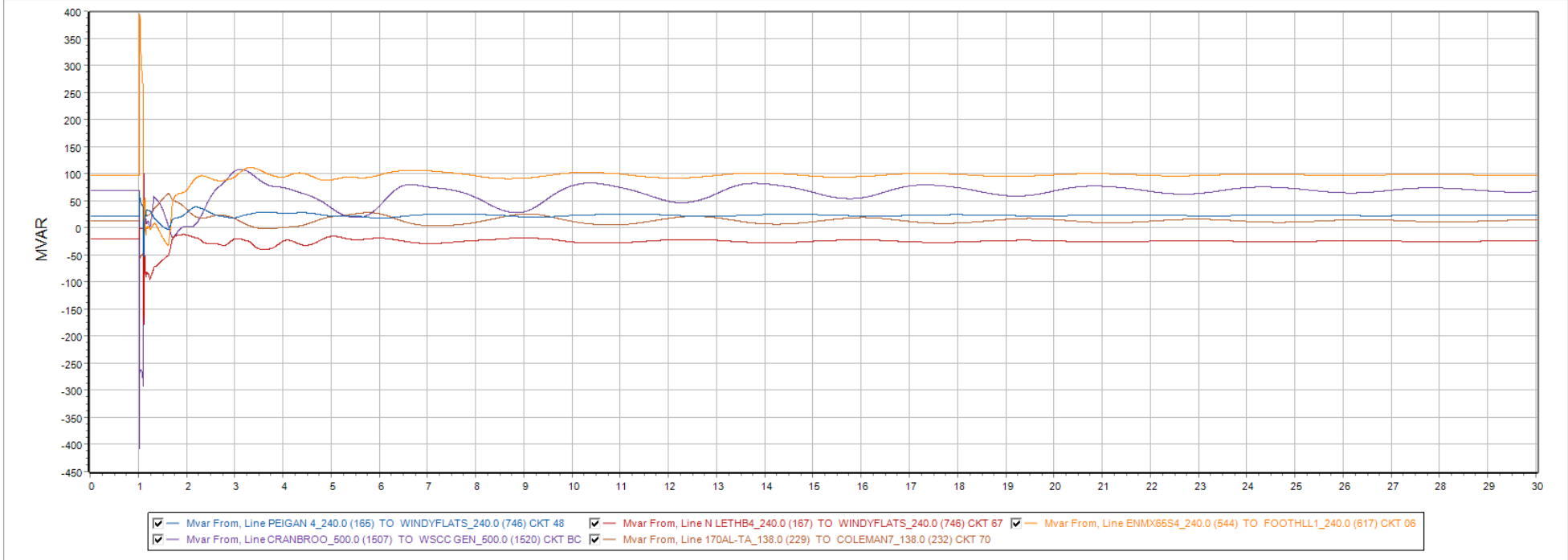
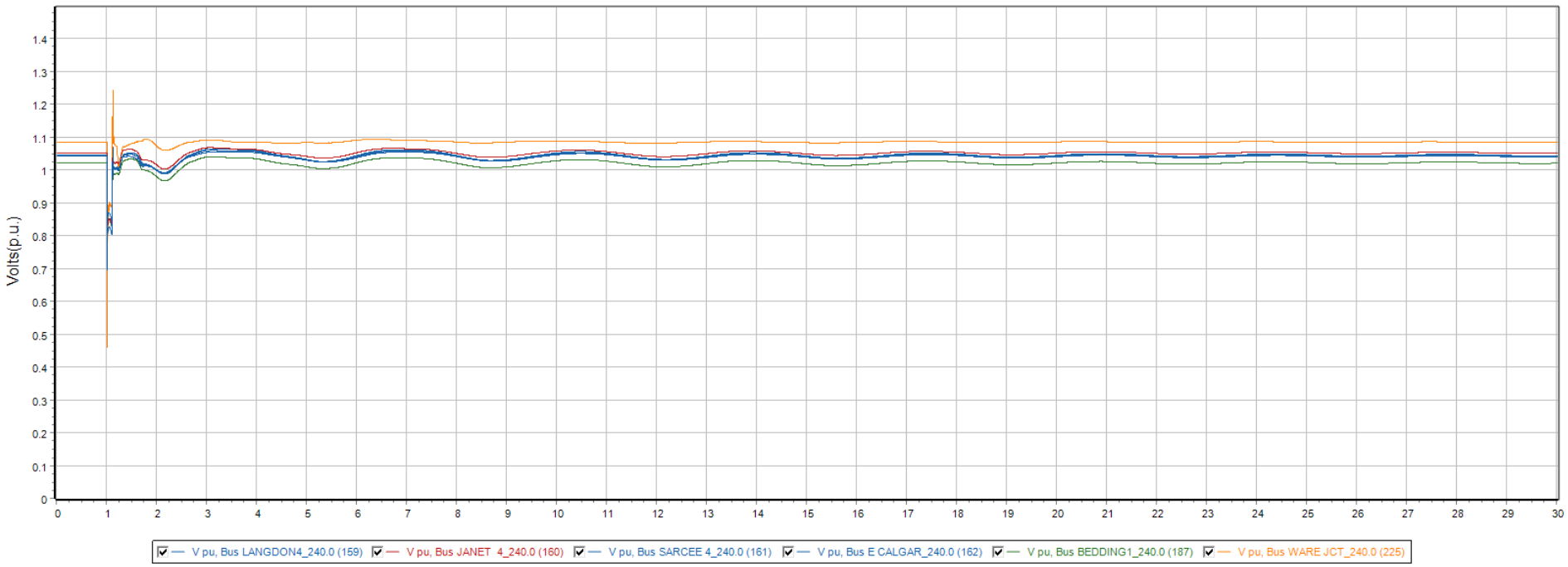
May 16, 2023 22:06:45

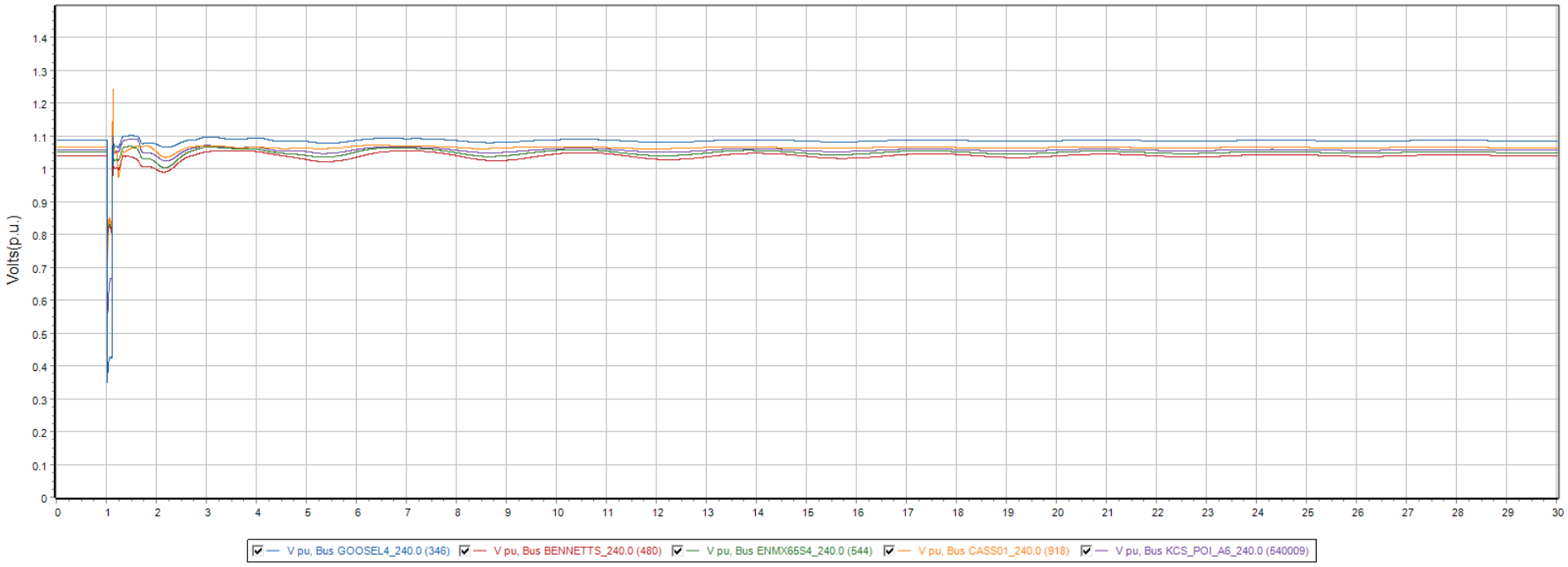
Monitor Line MW & MVAR. Q4



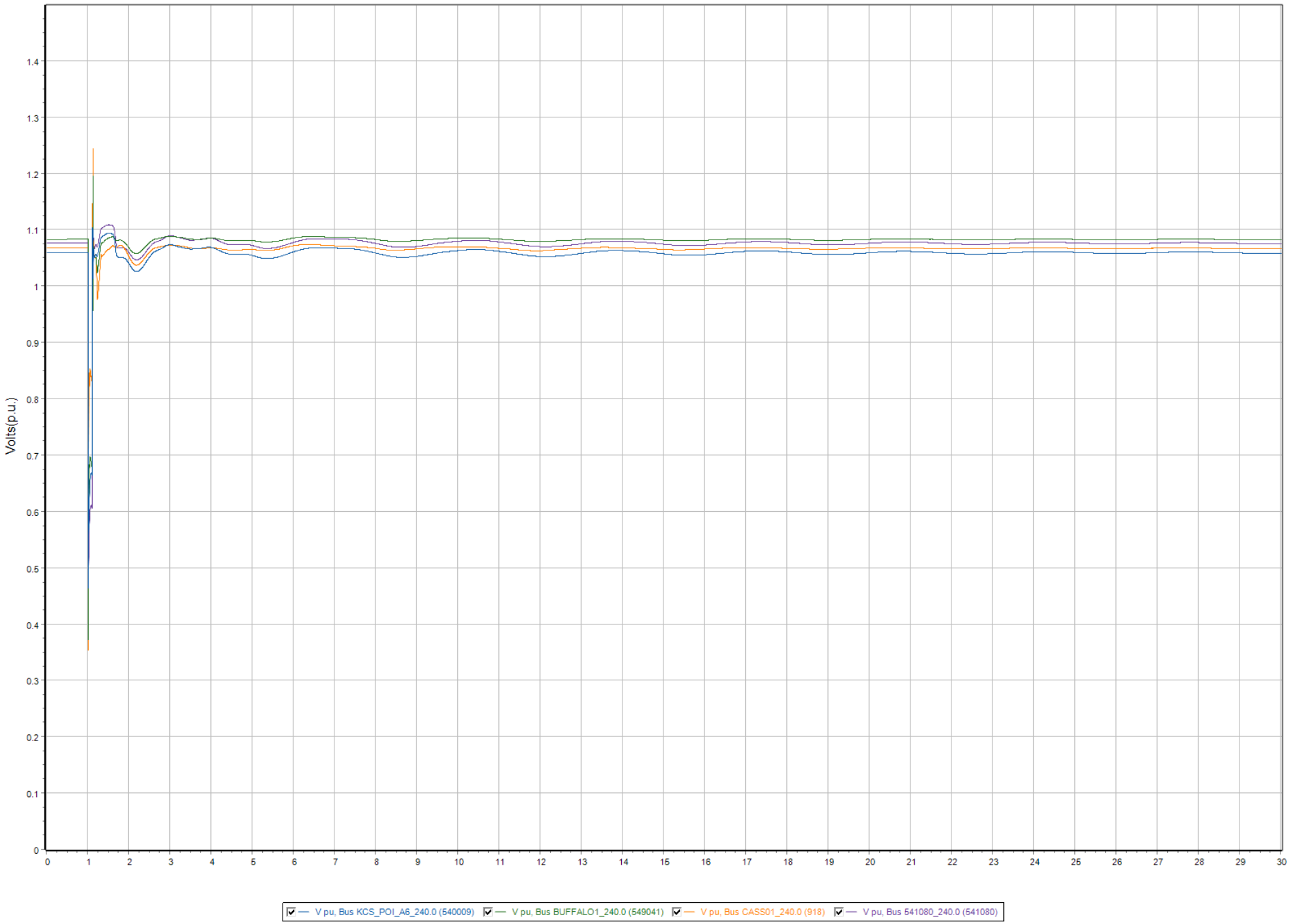


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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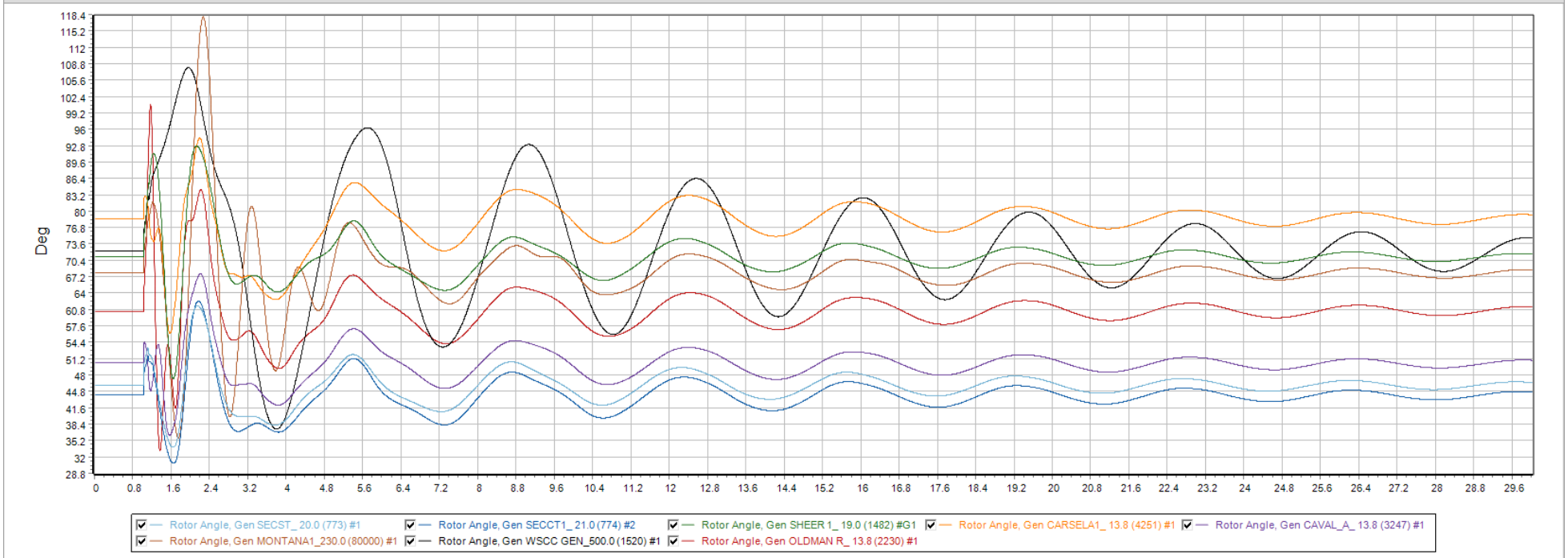
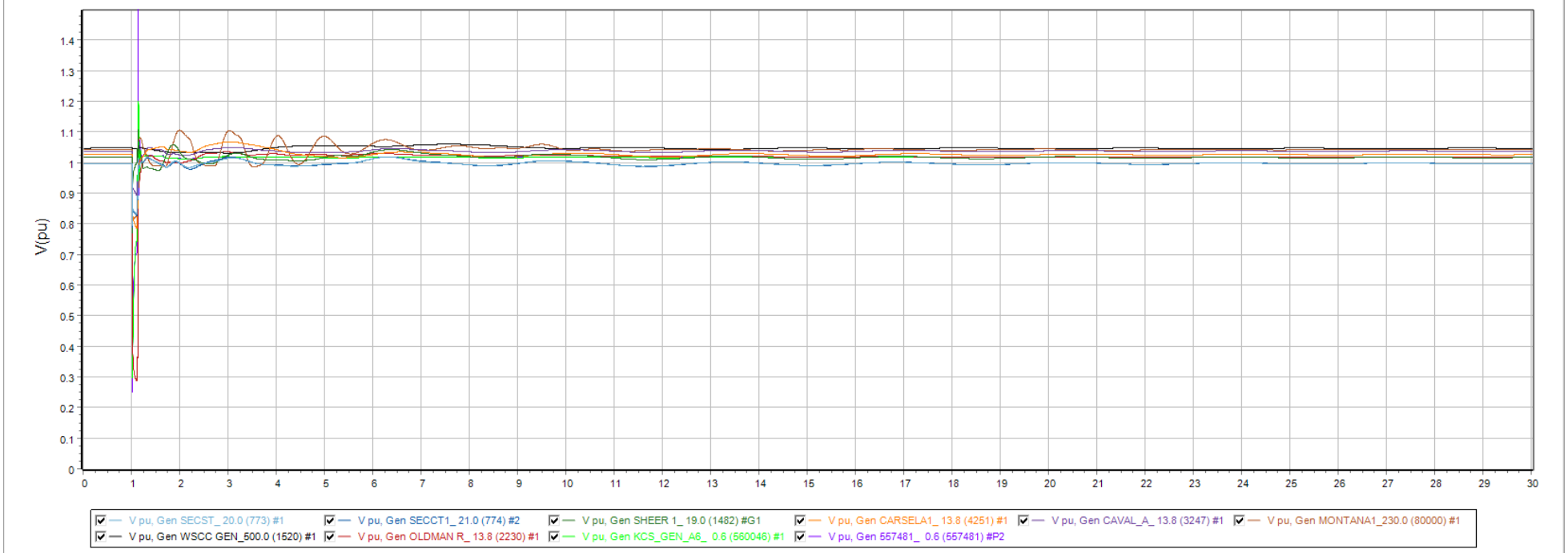
May 16, 2023 22:06:47

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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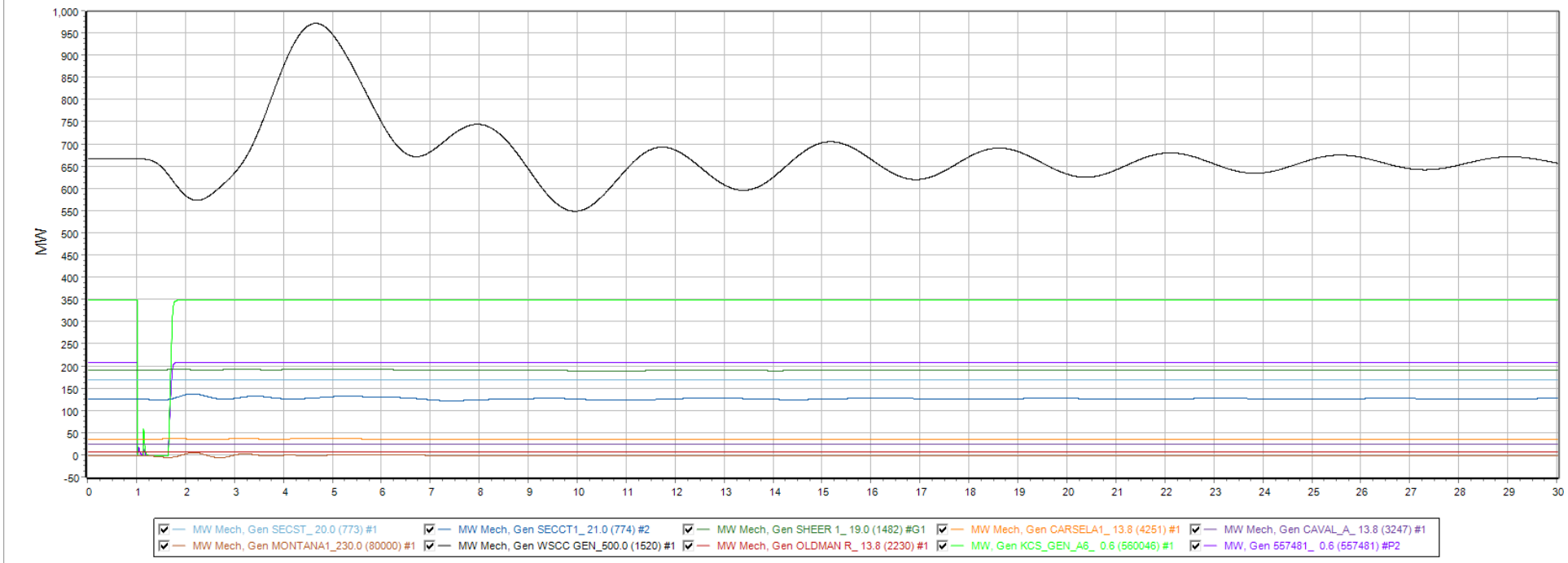
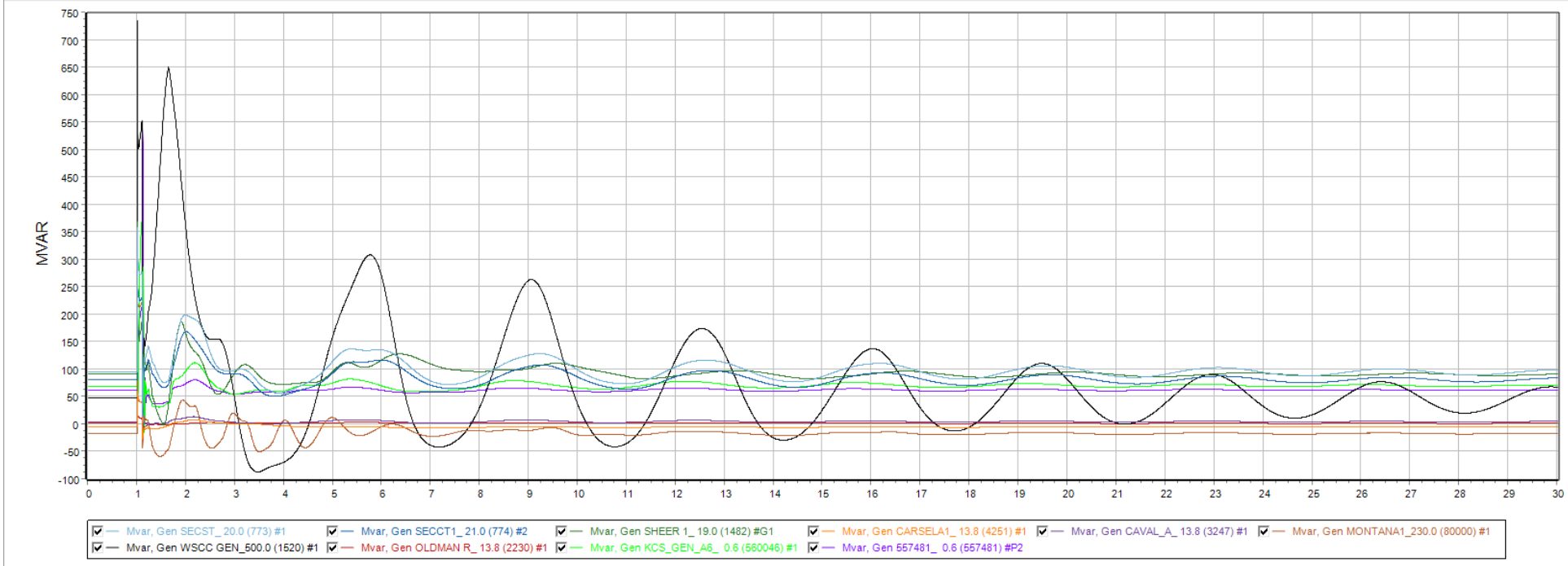
May 16, 2023 22:17:20

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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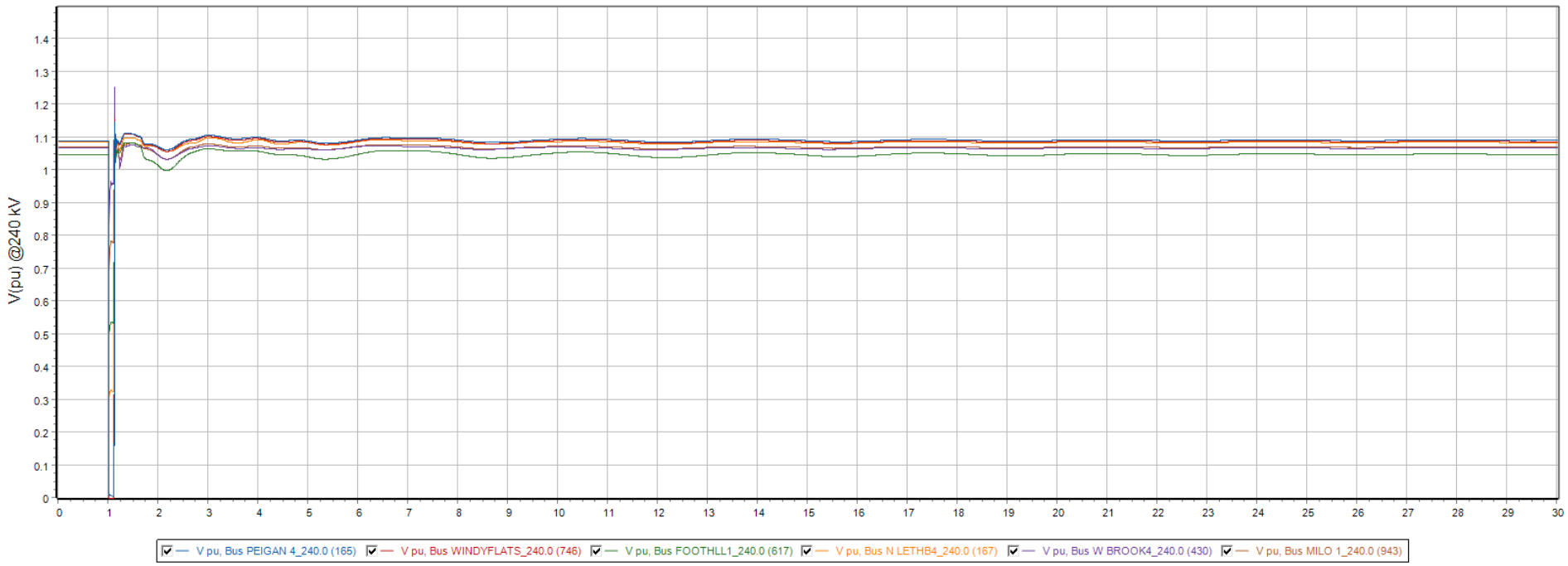
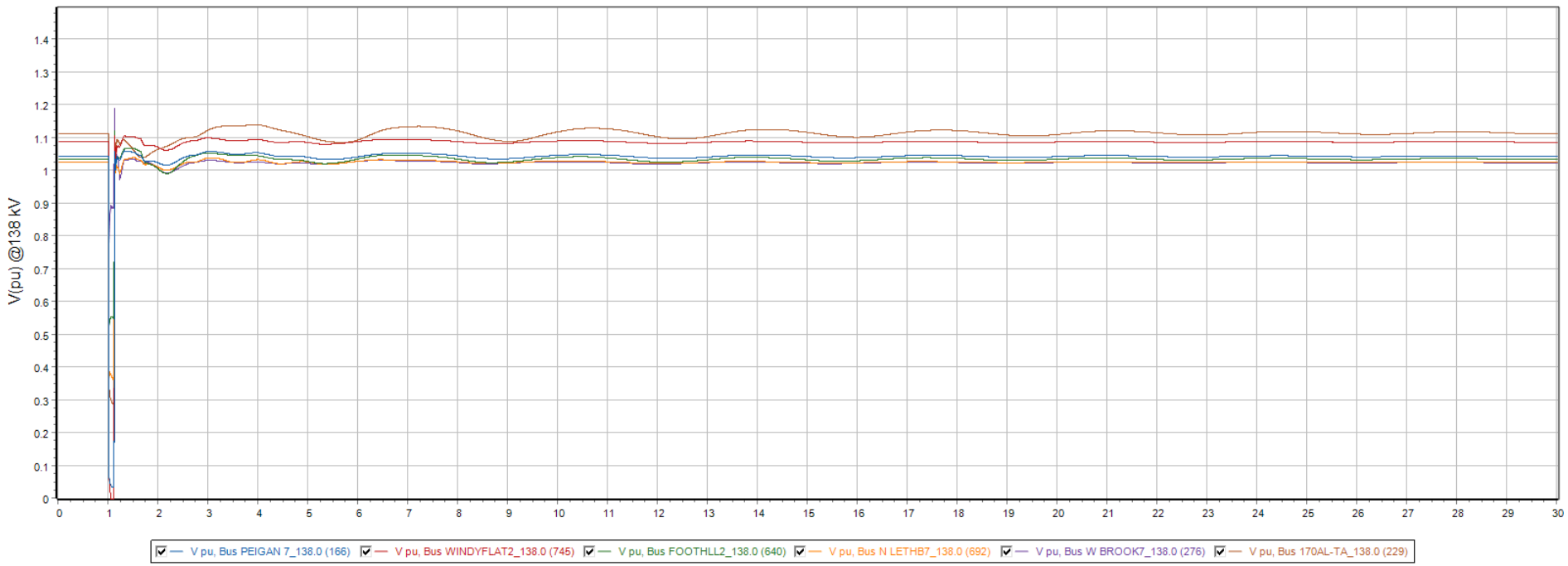
May 16, 2023 22:17:20

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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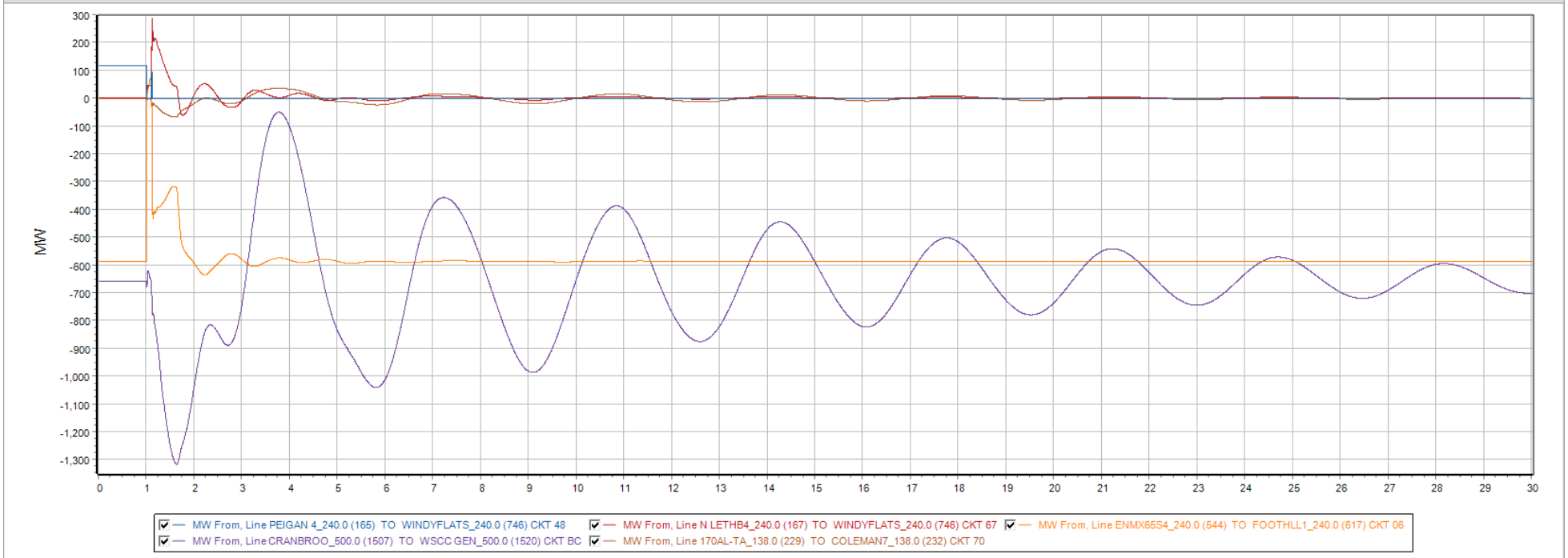
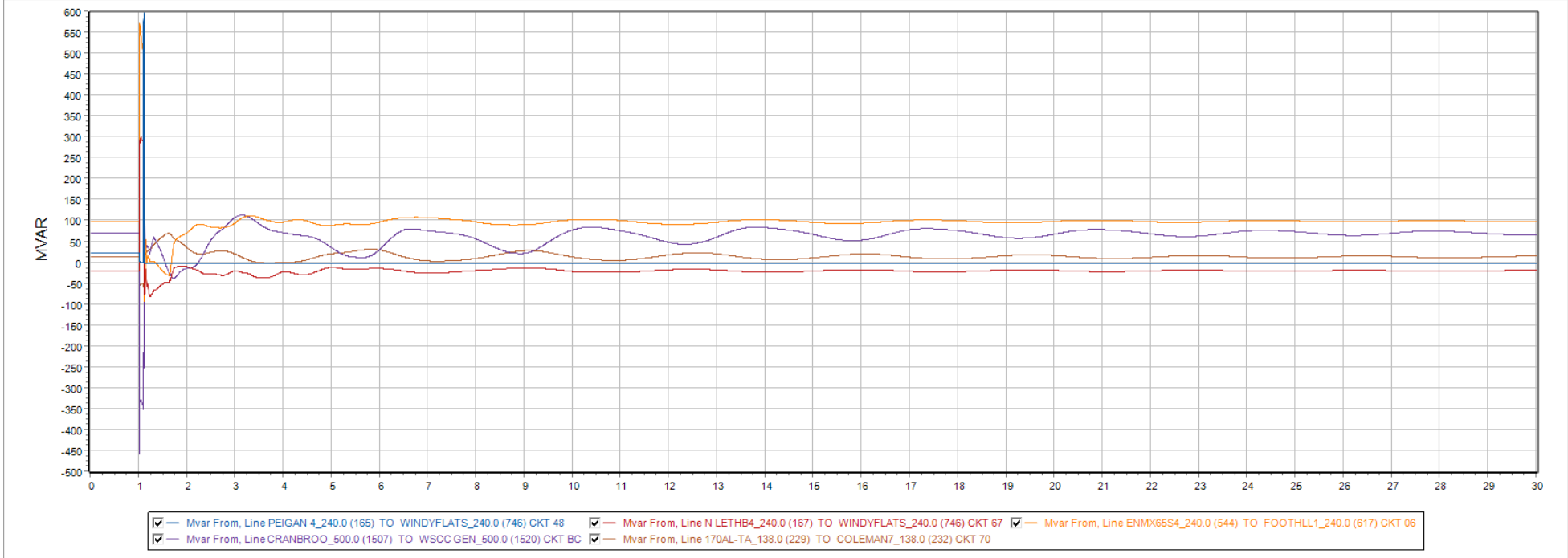
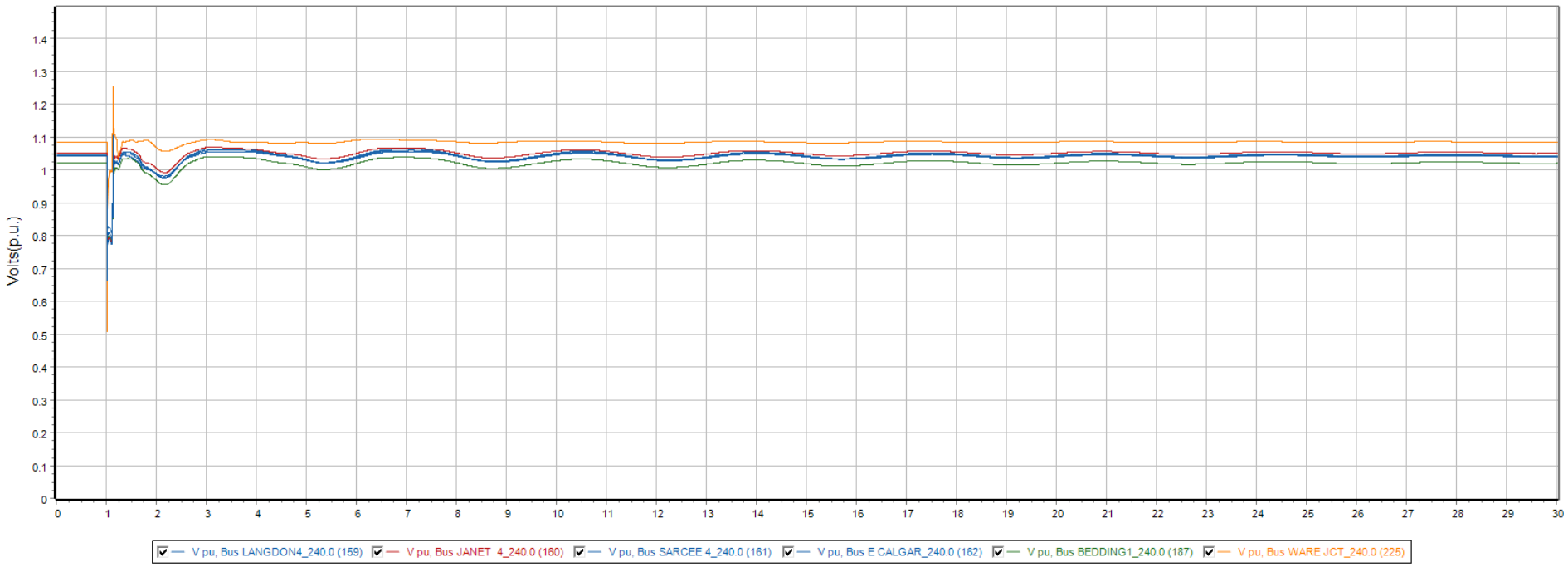
May 16, 2023 22:17:21

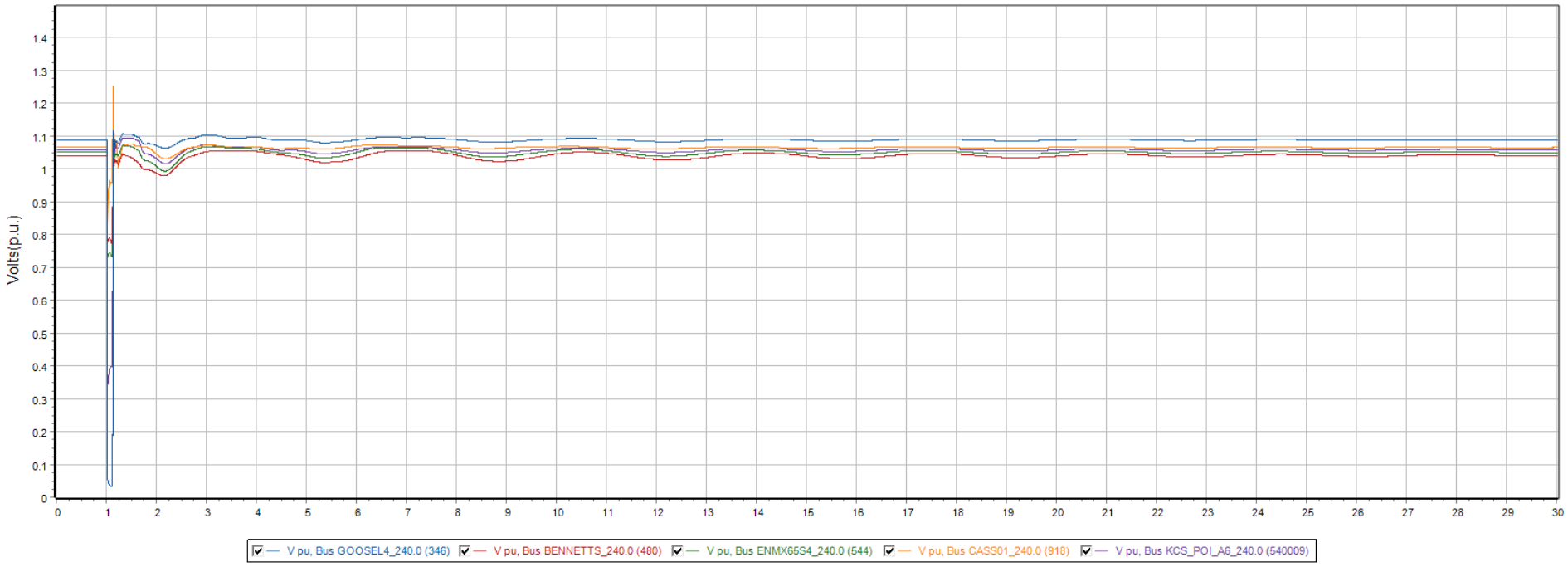
Monitor Line MW & MVAR. Q4



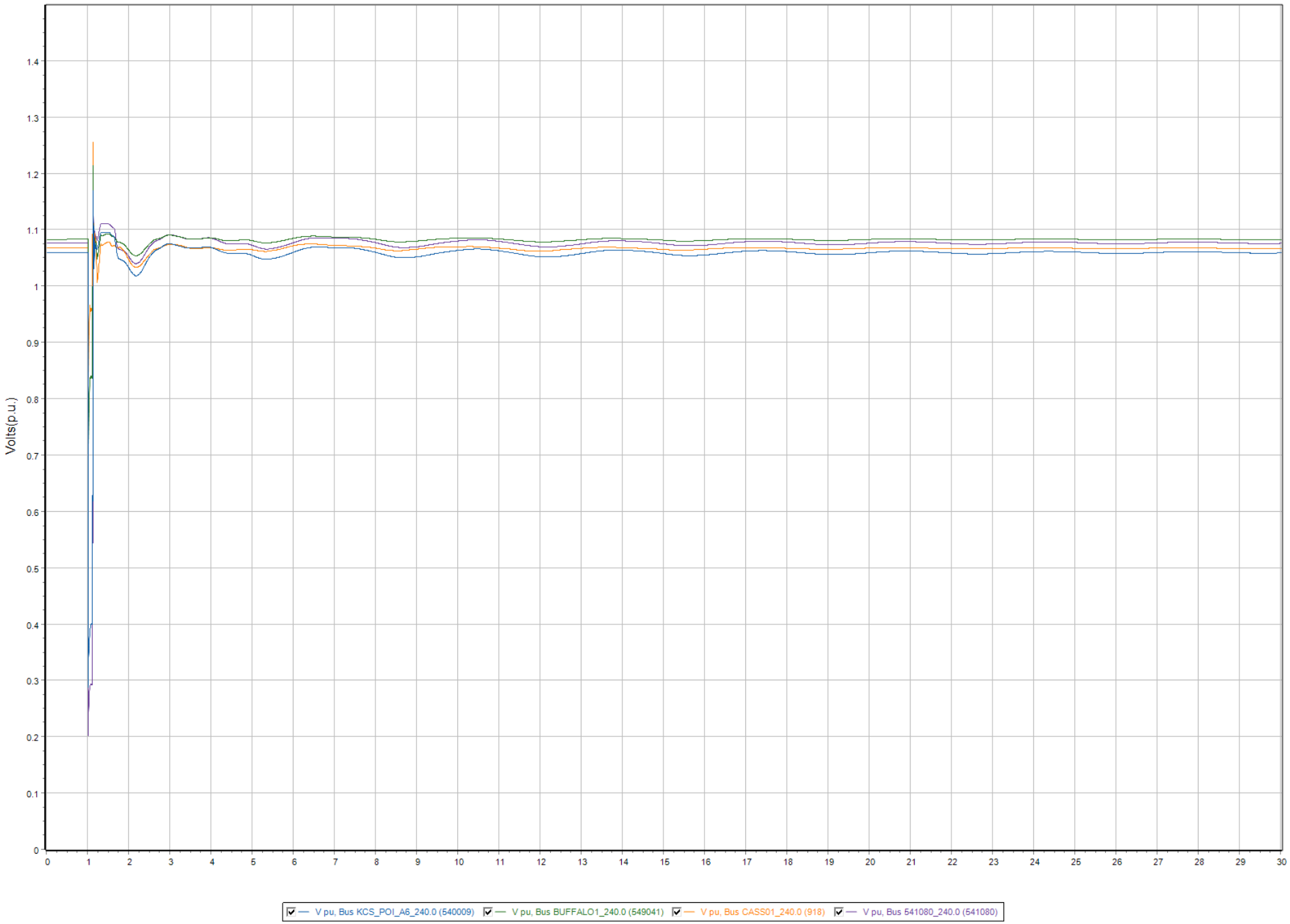


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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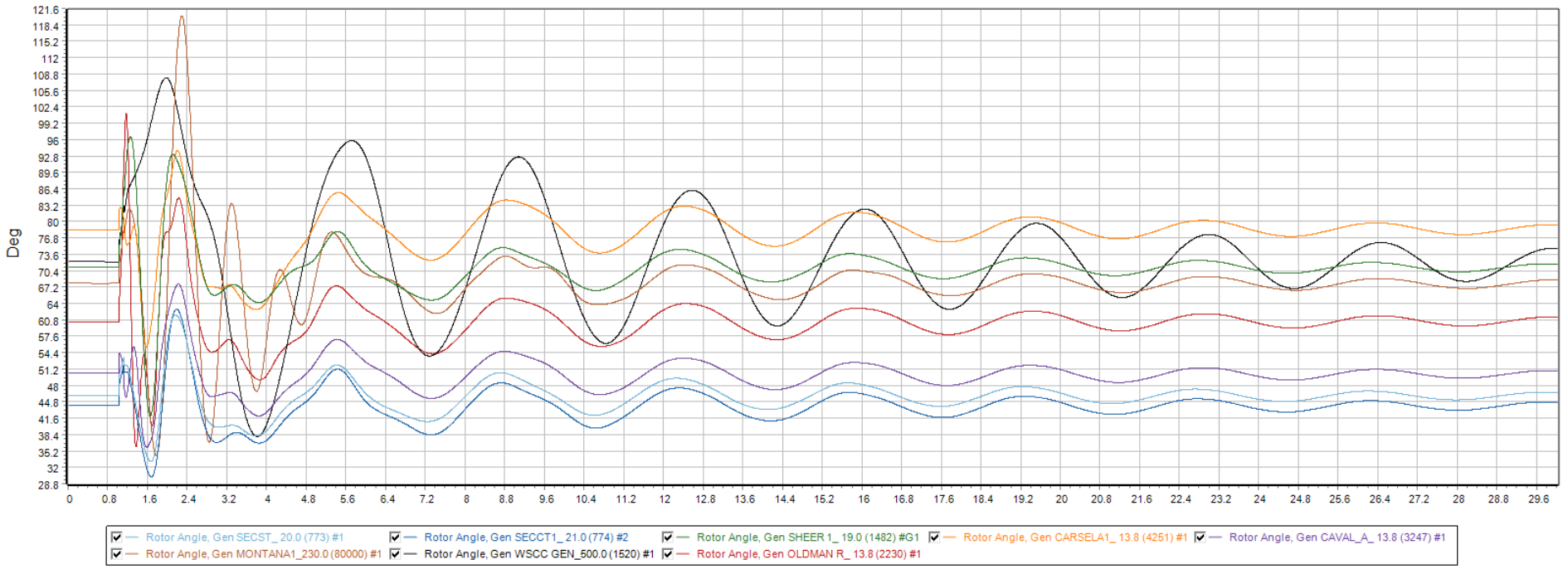
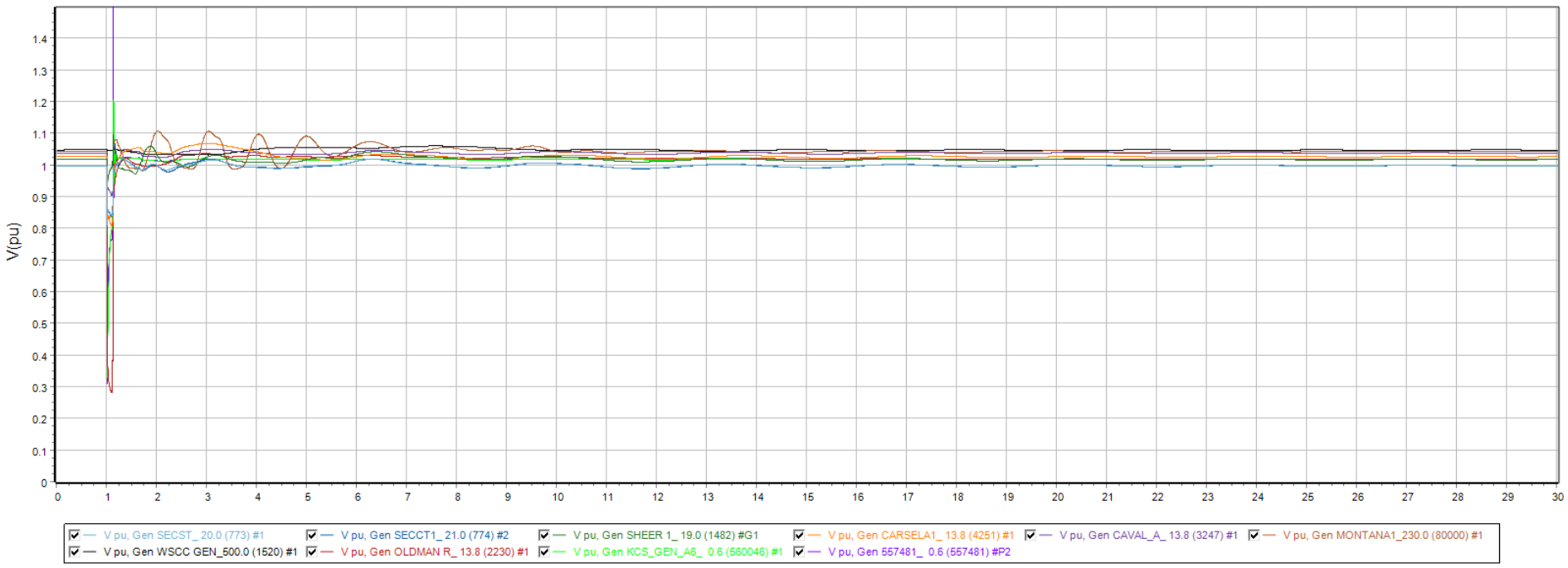
May 16, 2023 22:17:22

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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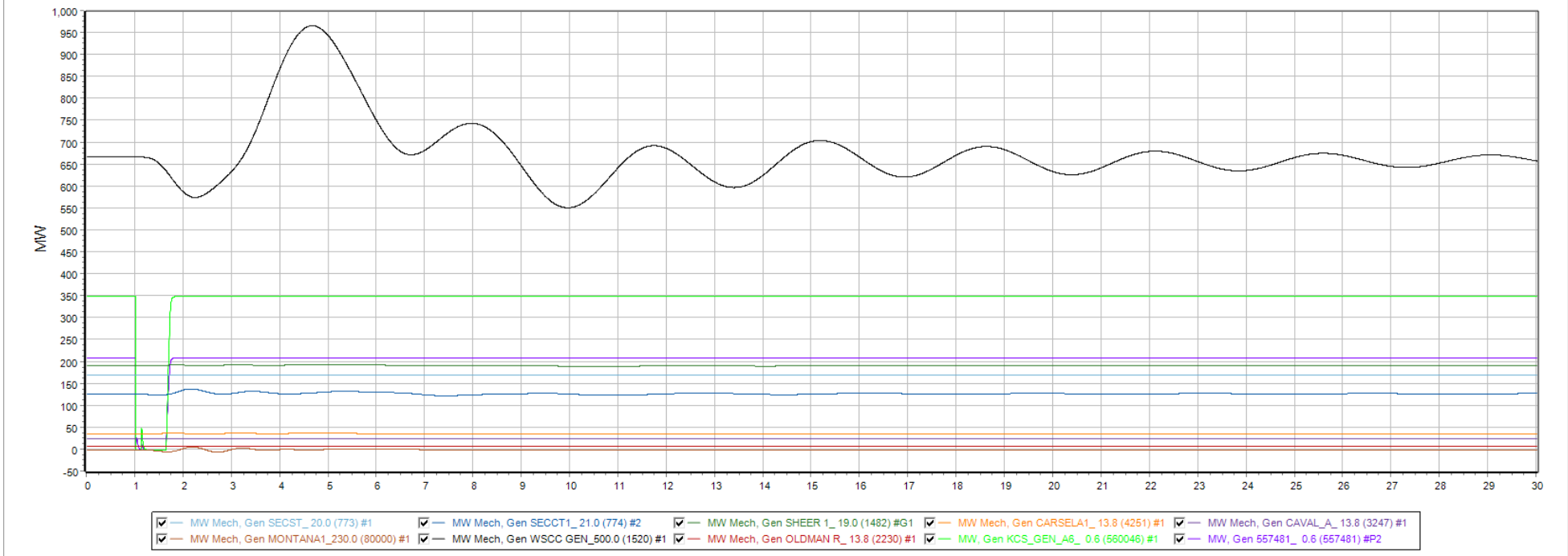
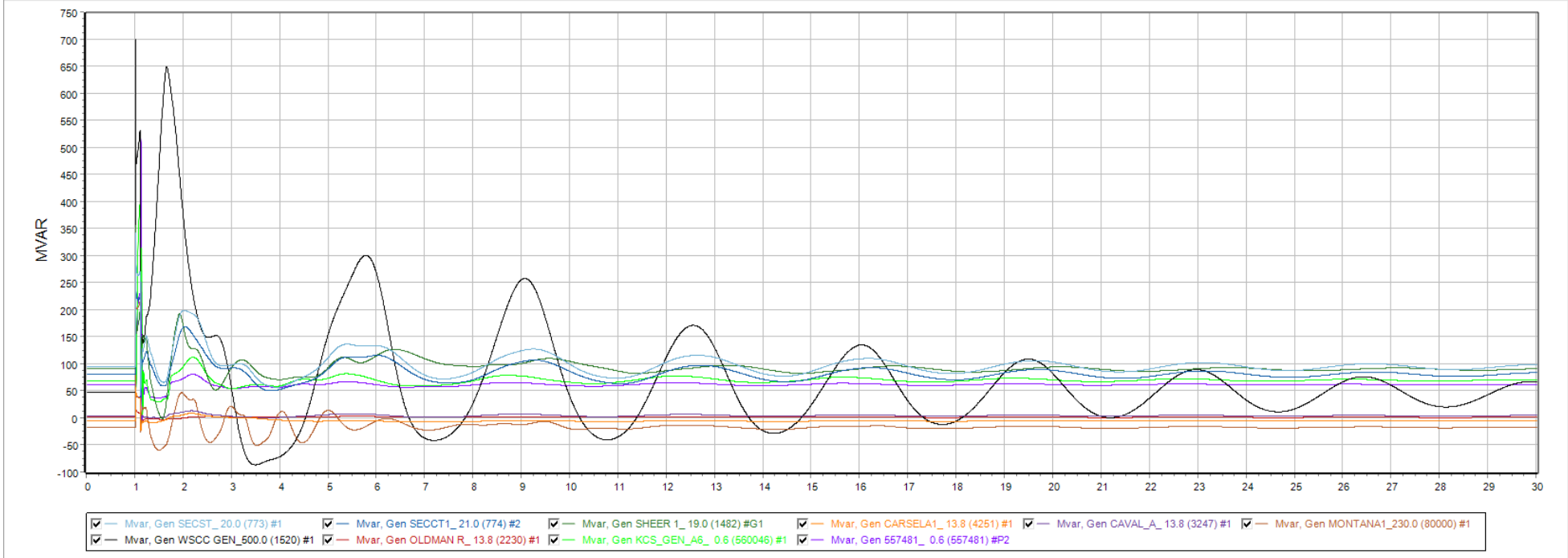
May 16, 2023 22:26:59

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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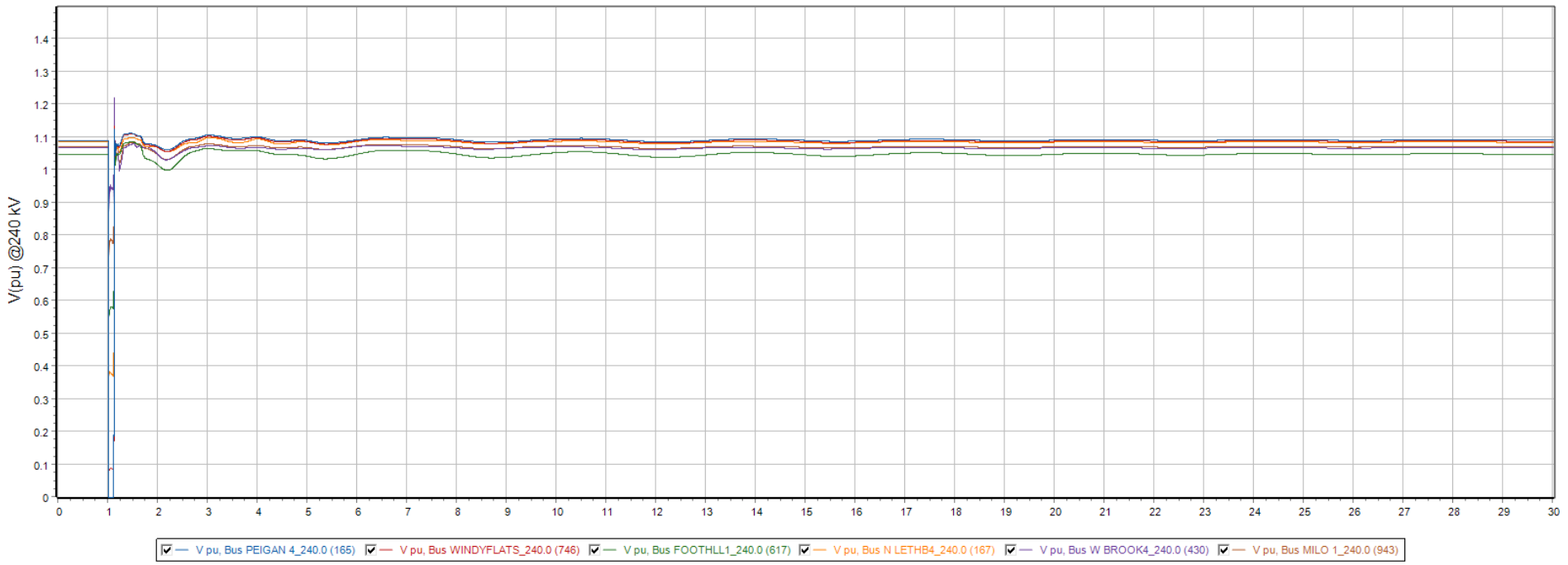
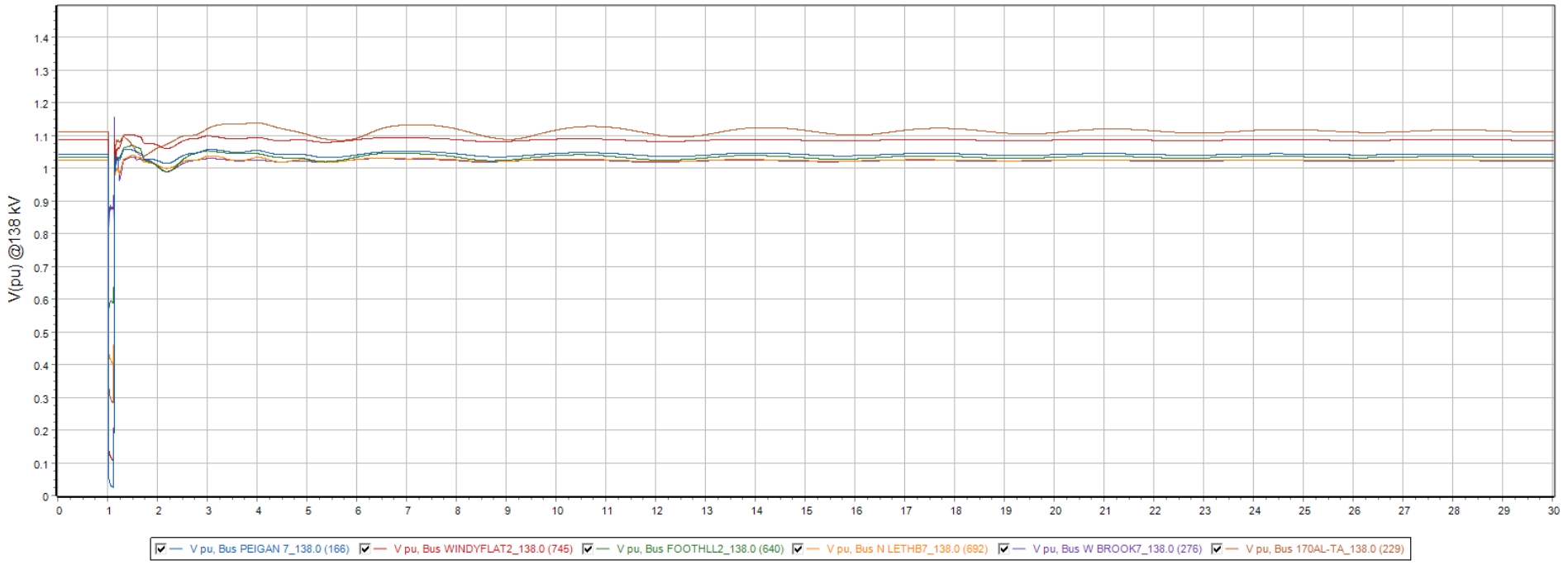
May 16, 2023 22:27:00

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 068 - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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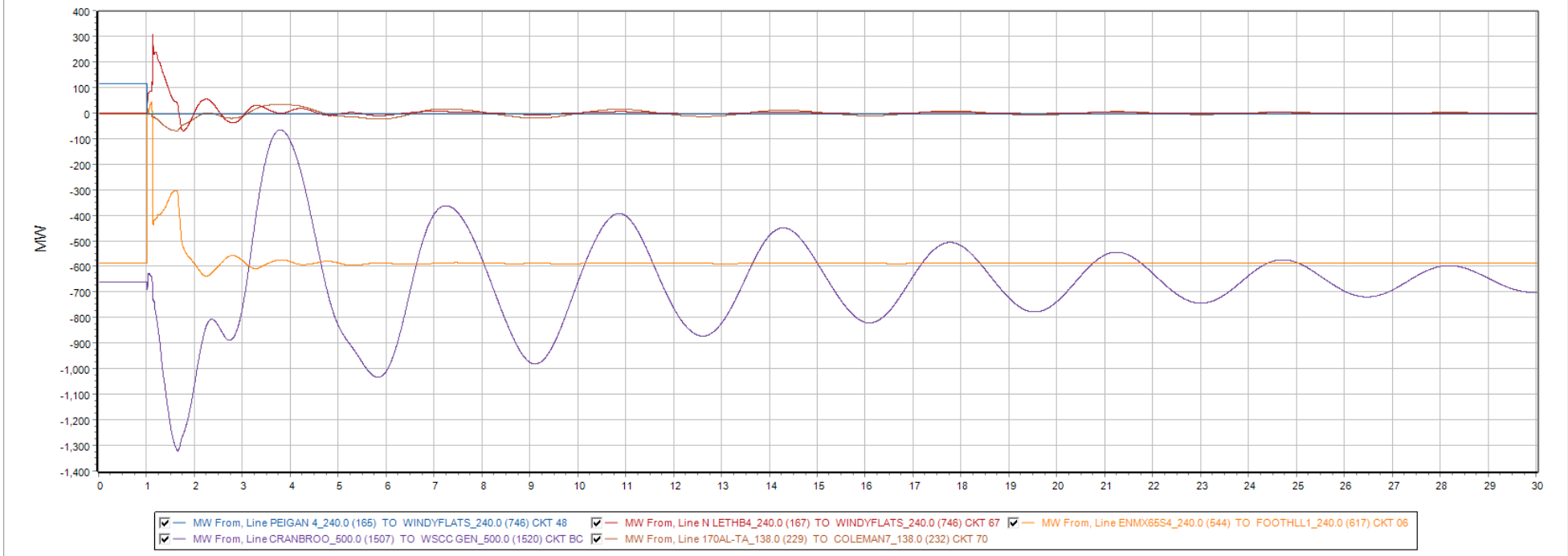
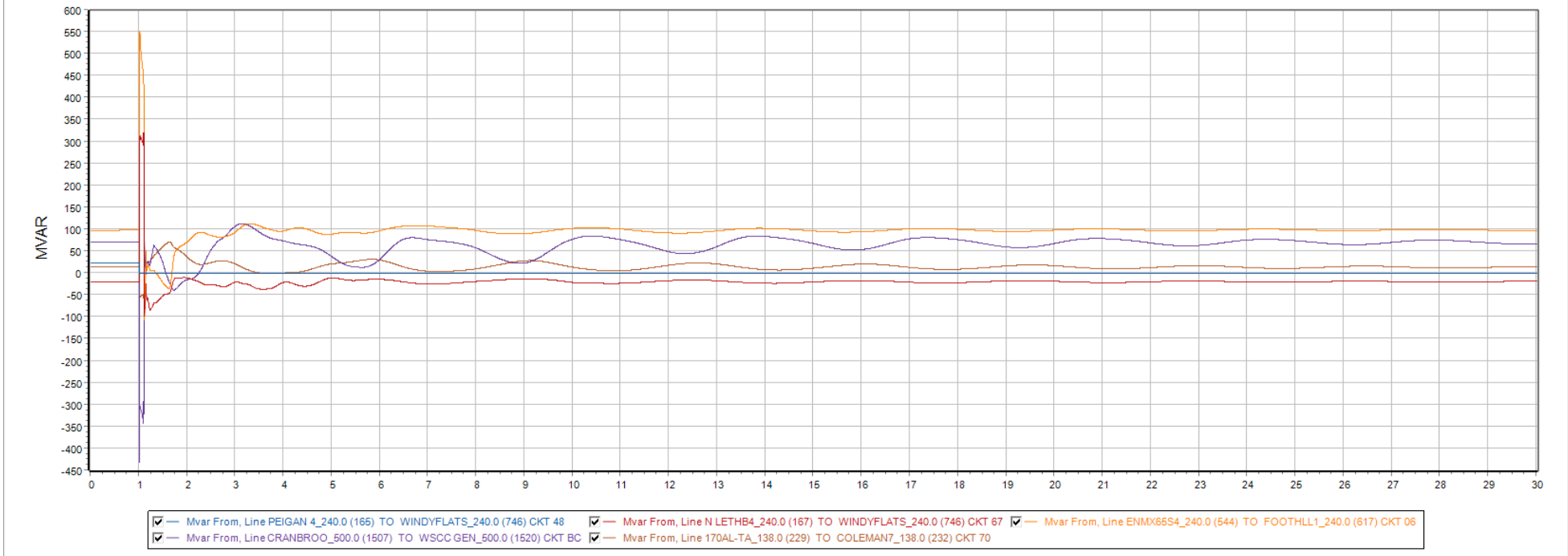
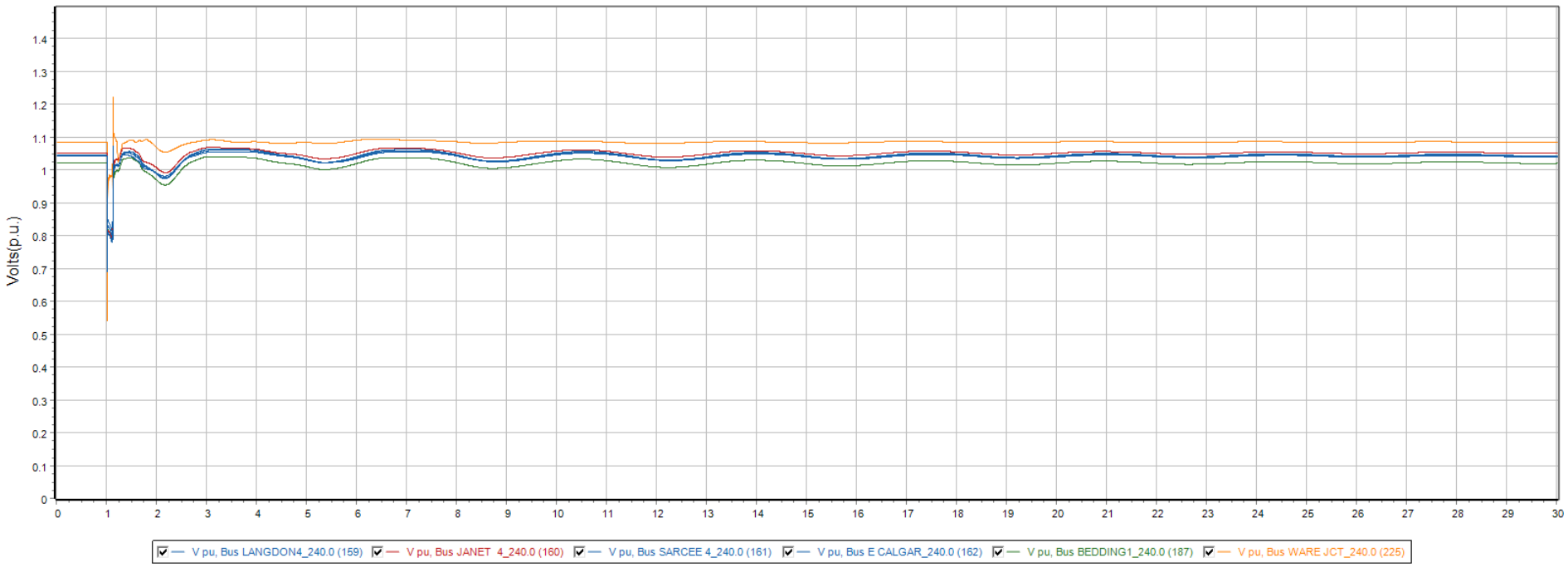
May 16, 2023 22:27:00

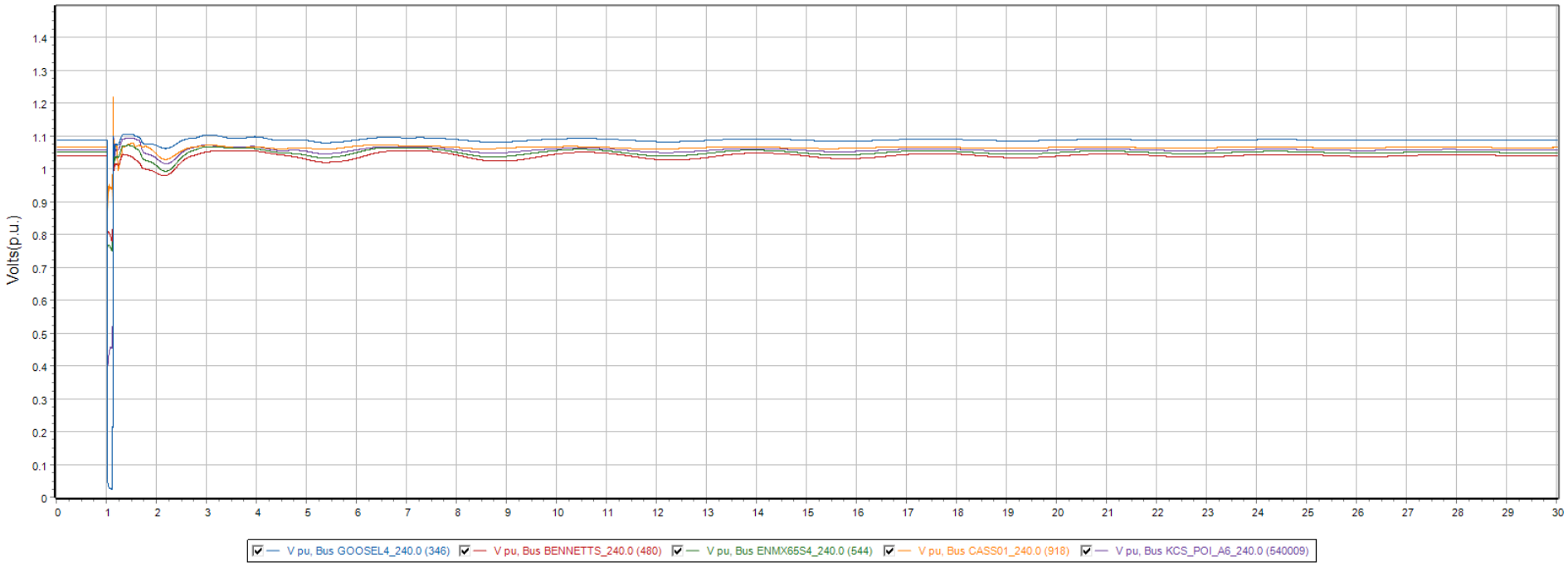
Monitor Line MW & MVAR. Q4



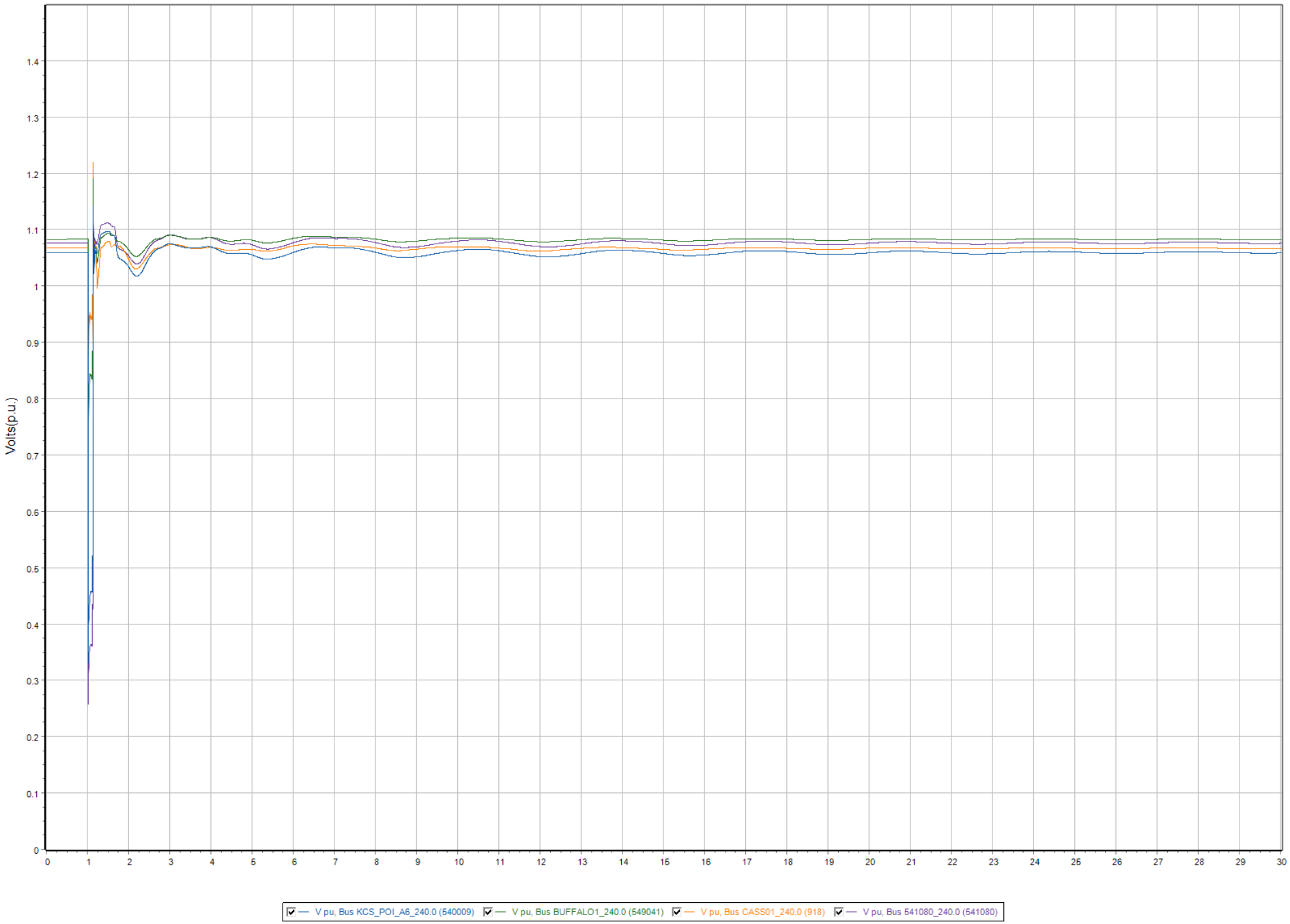


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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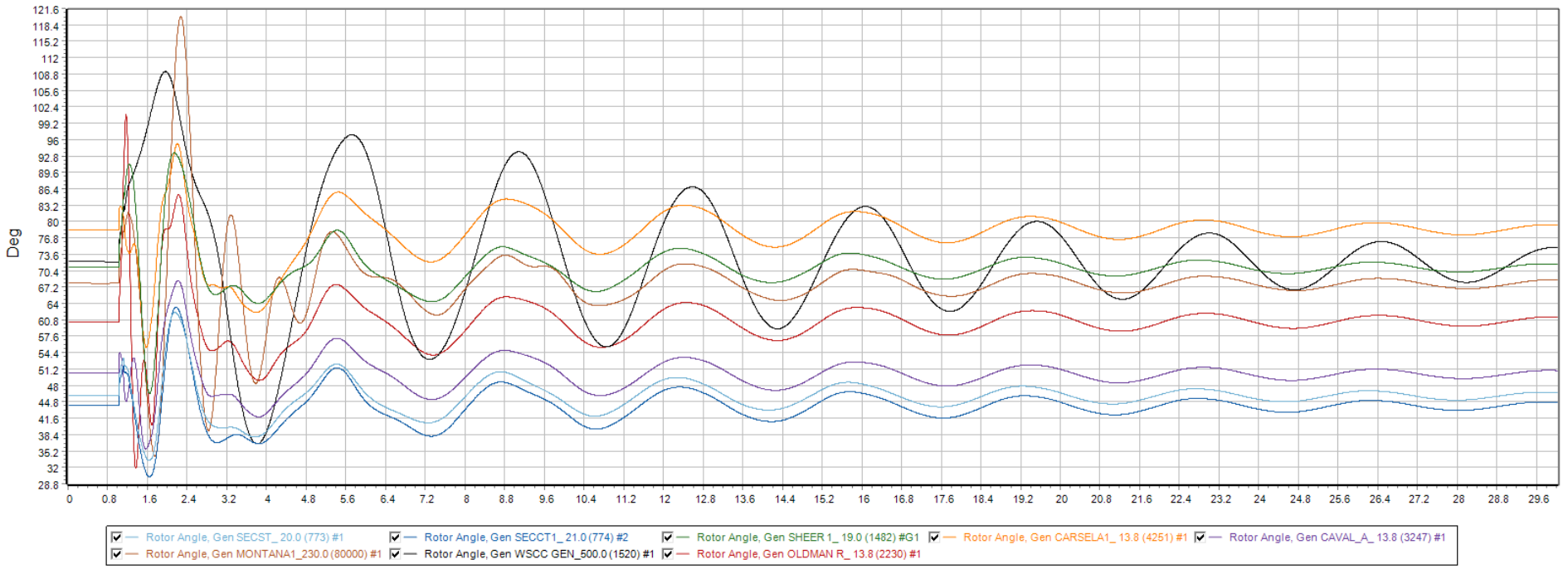
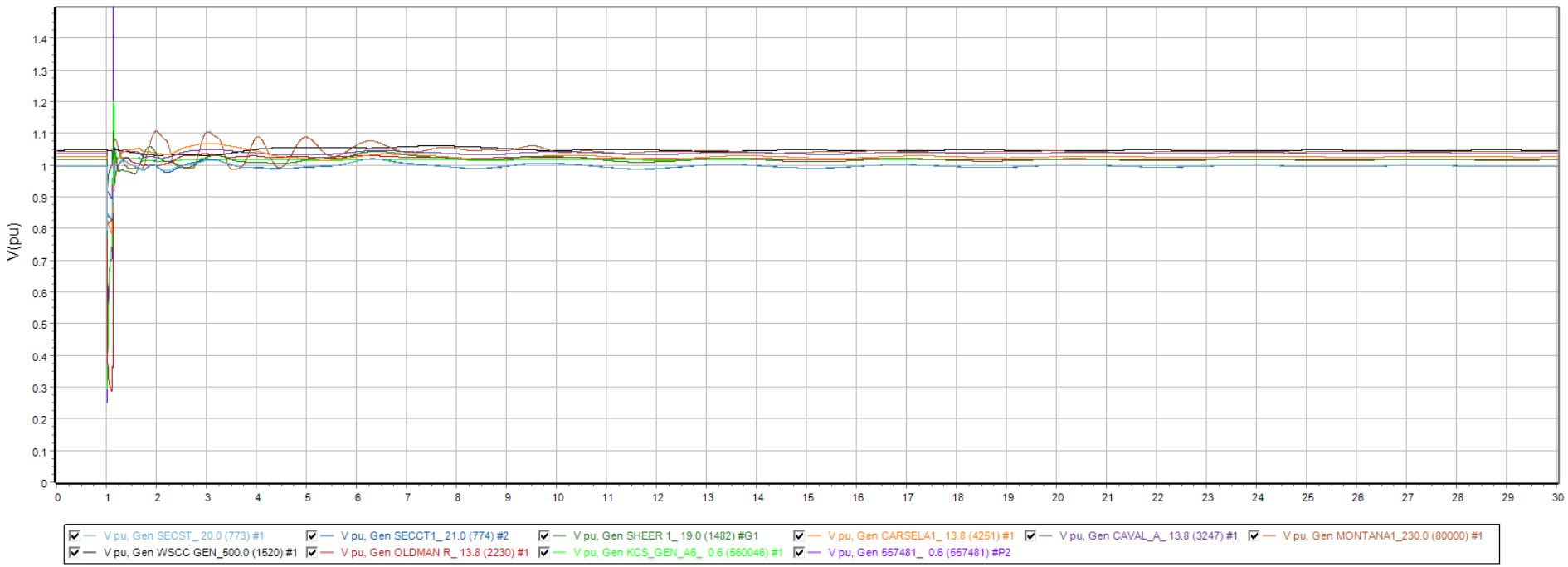
May 16, 2023 22:27:02

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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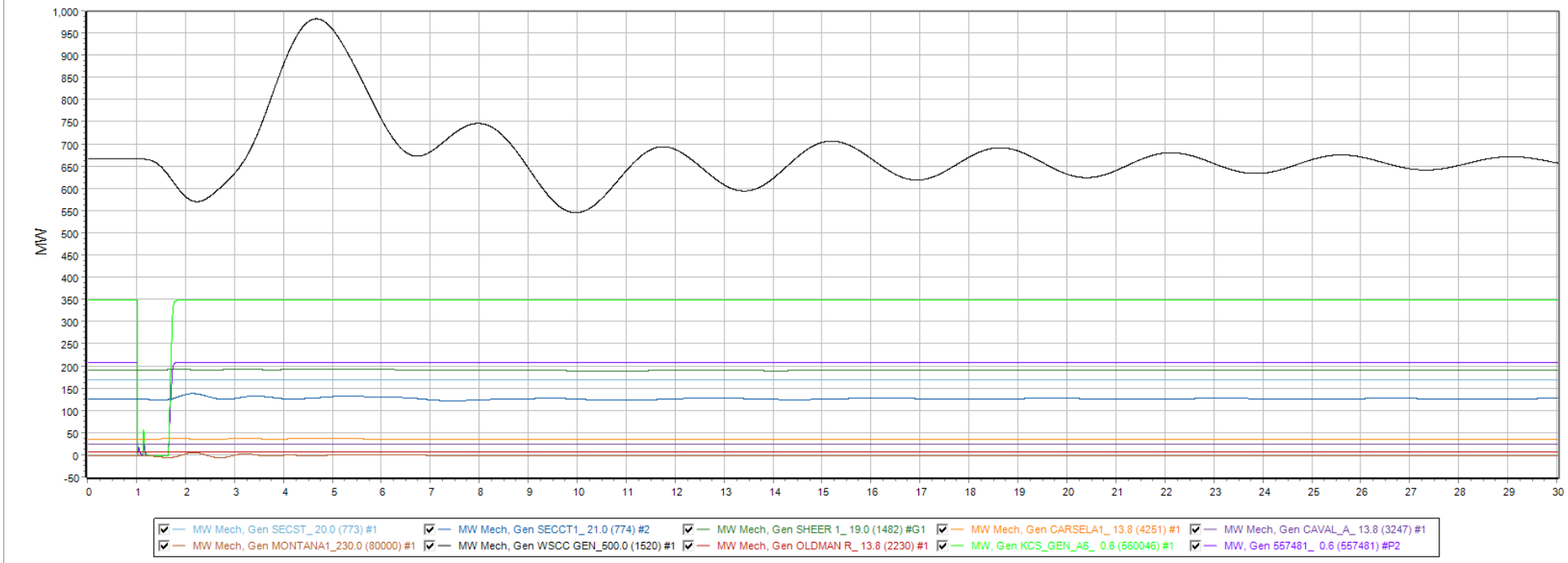
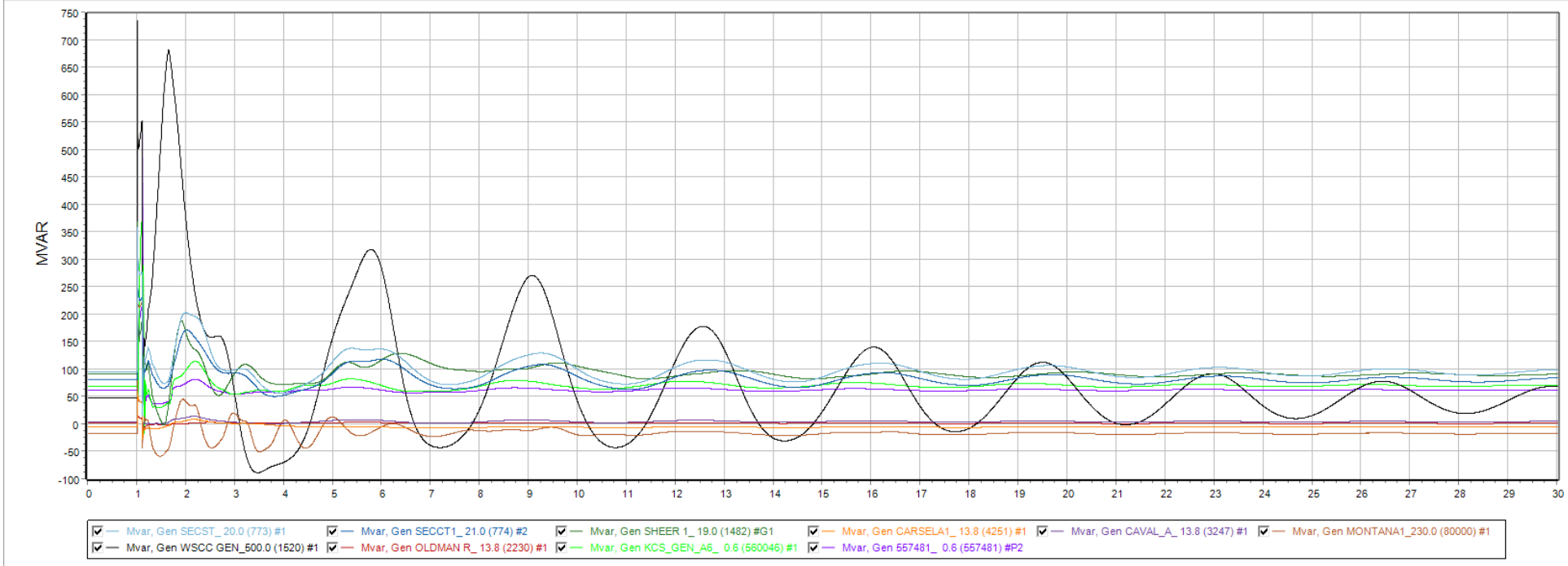
May 16, 2023 22:37:36

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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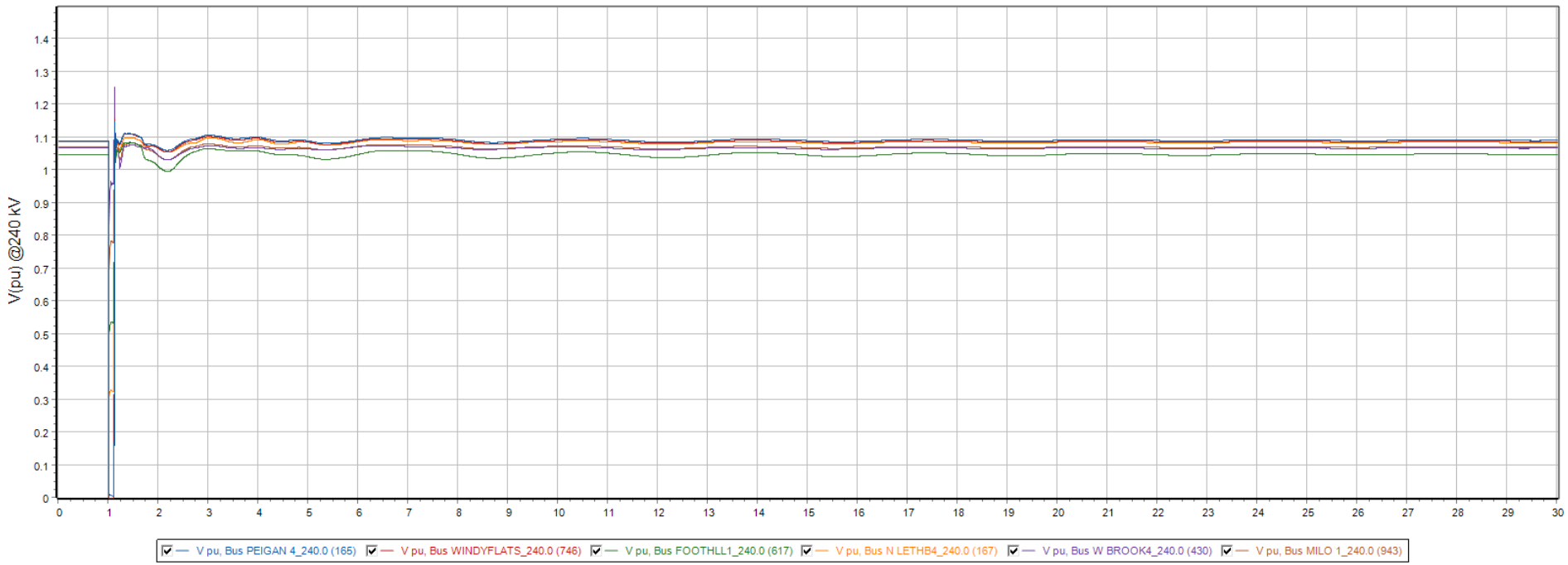
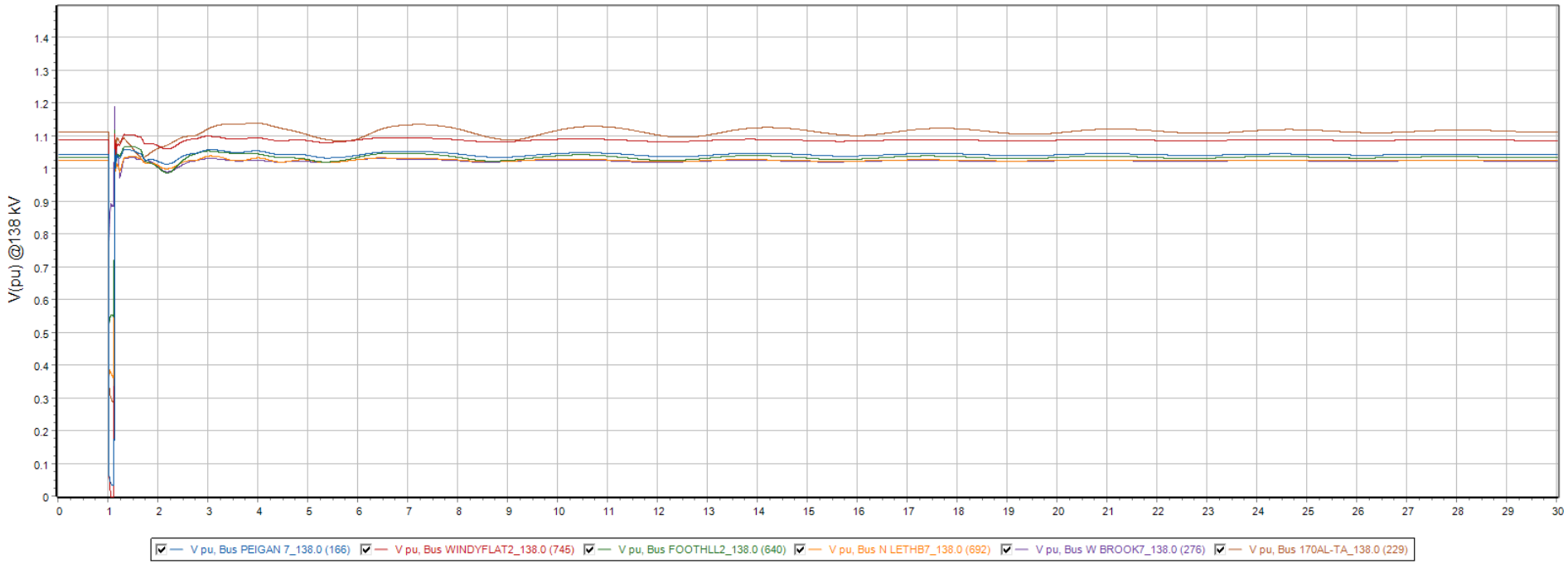
May 16, 2023 22:37:36

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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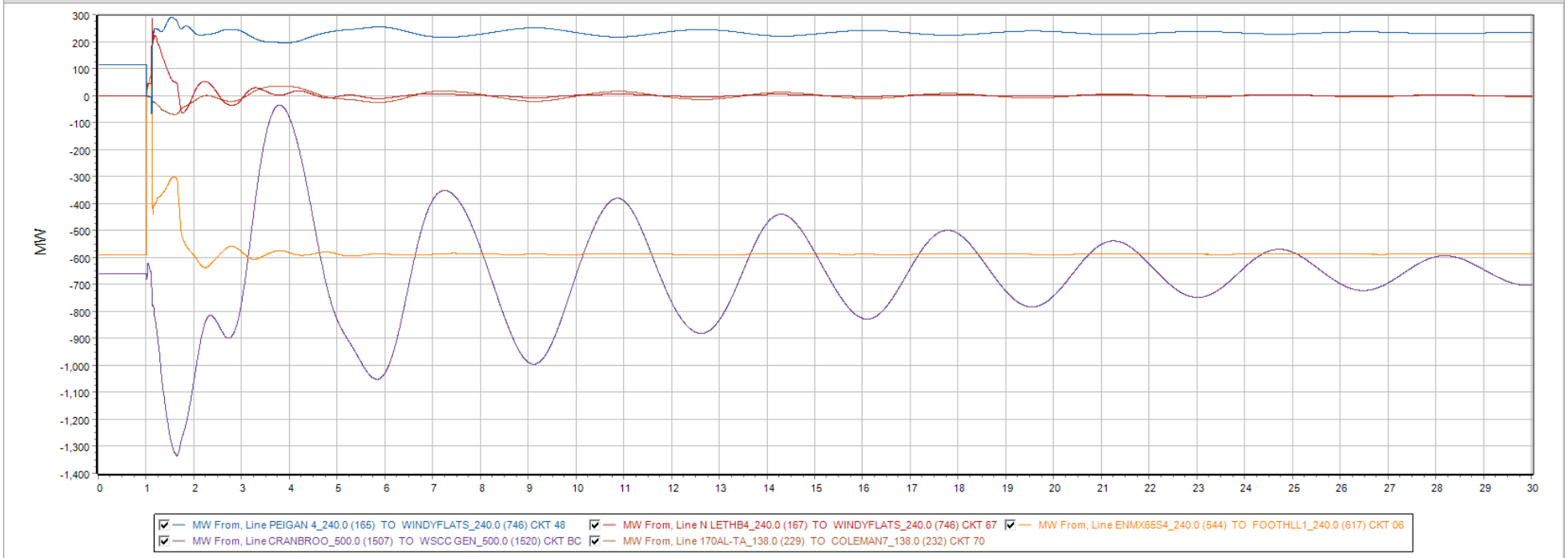
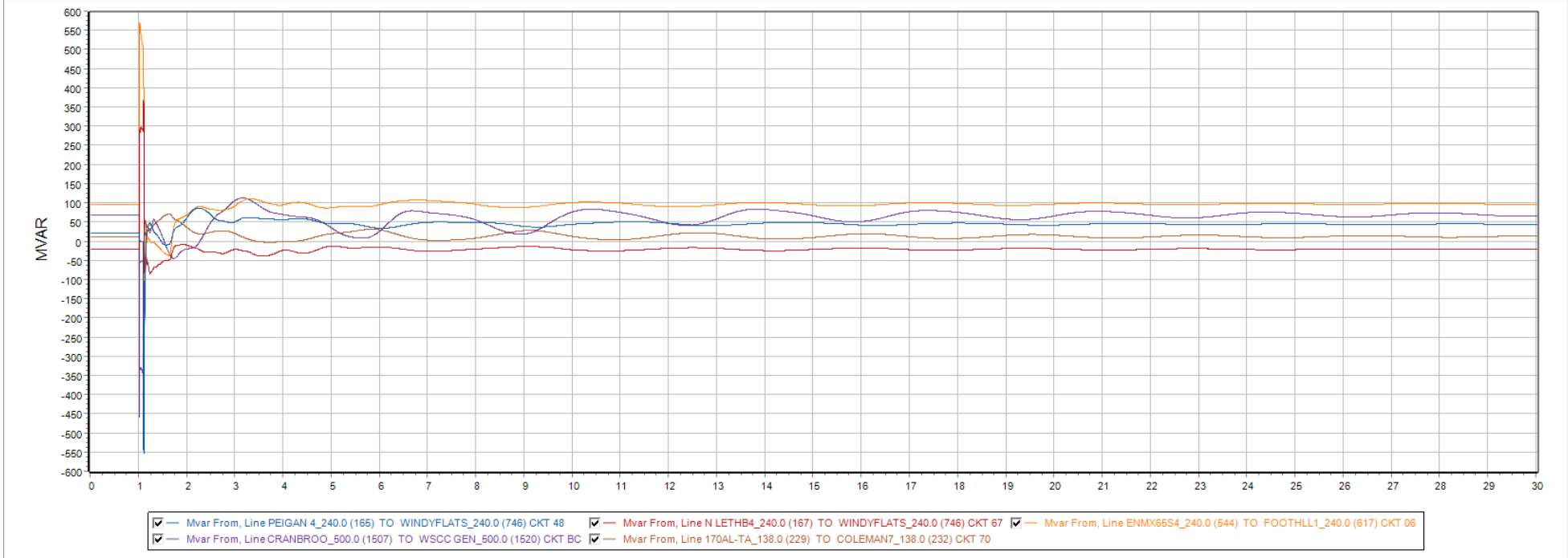
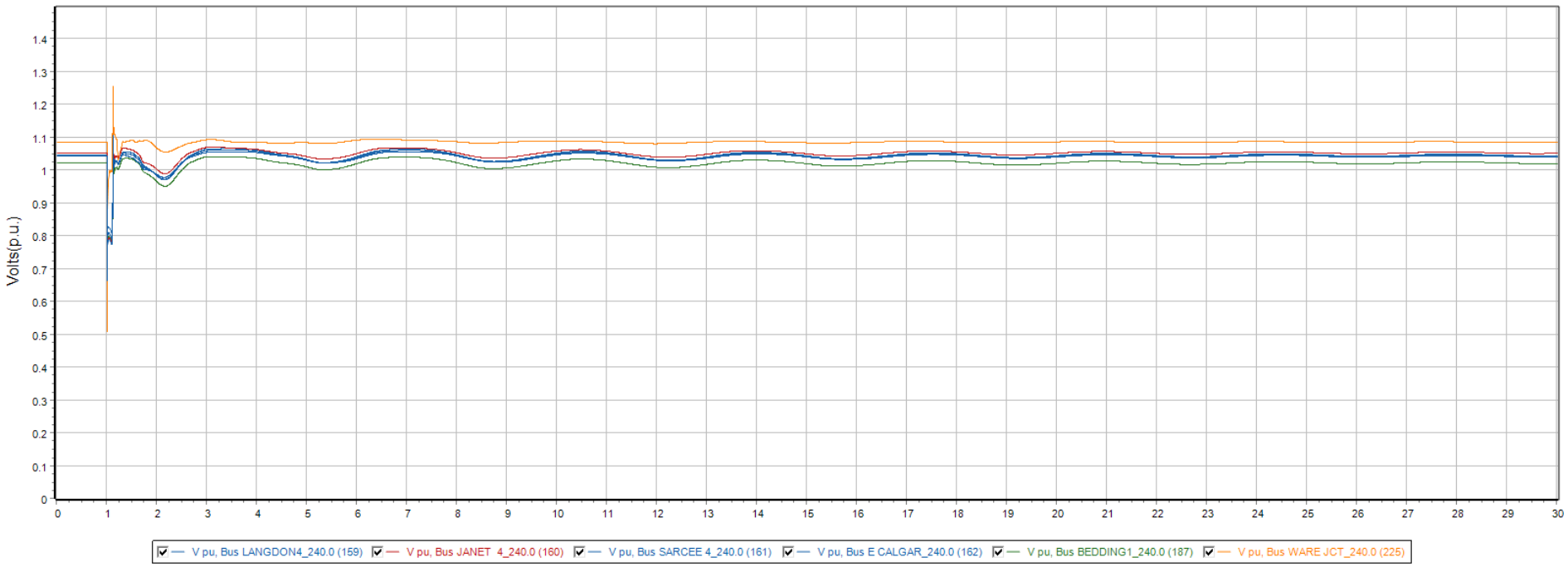
May 16, 2023 22:37:37

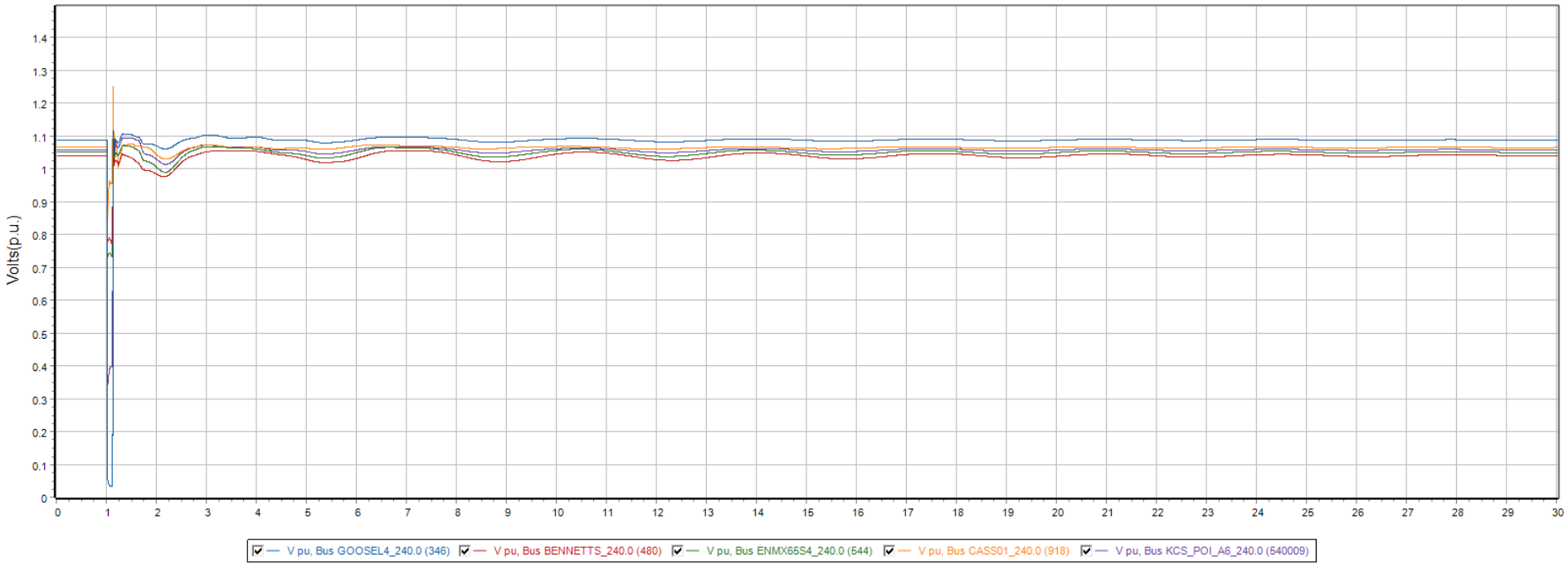
Monitor Line MW & MVAR. Q4



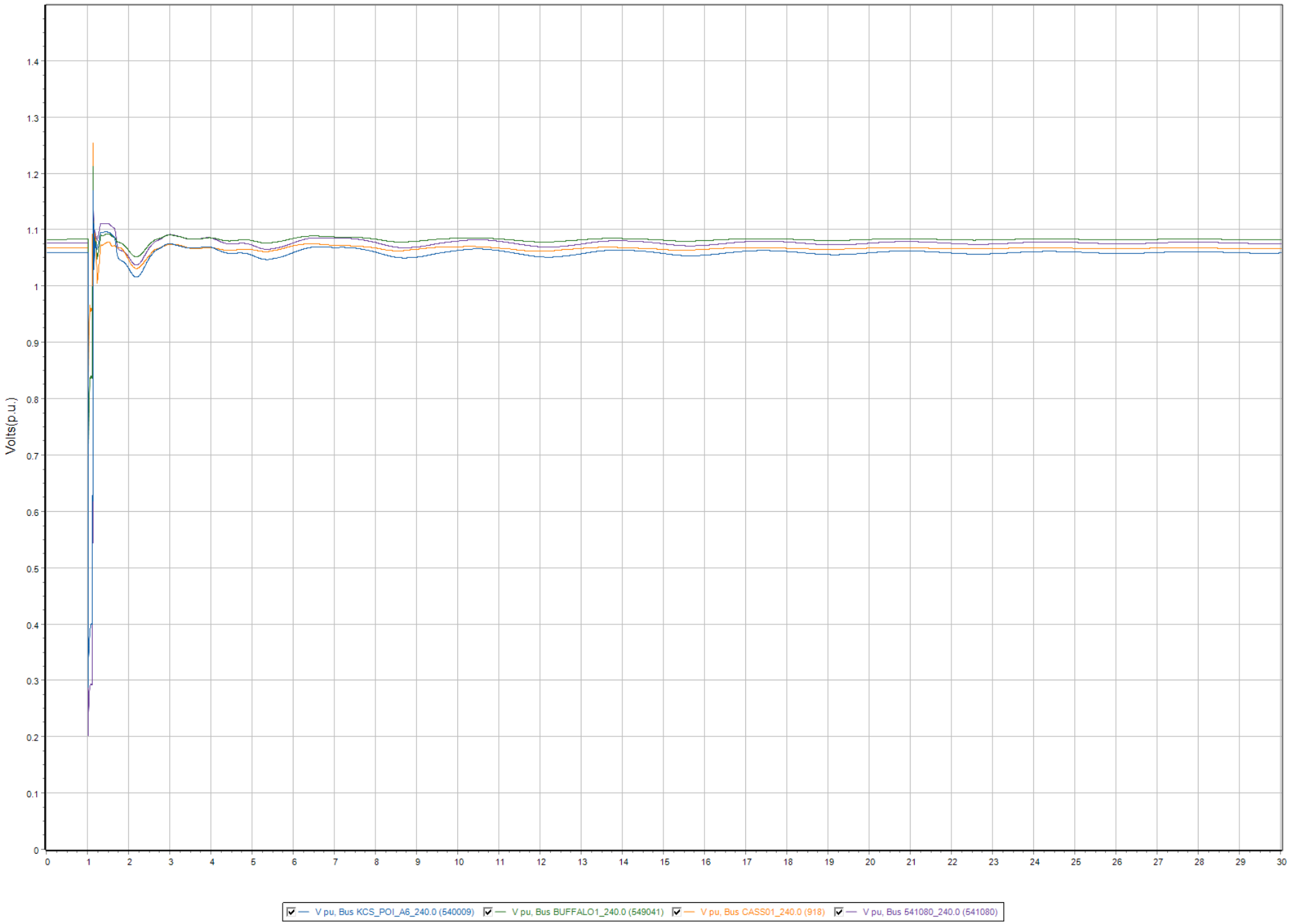


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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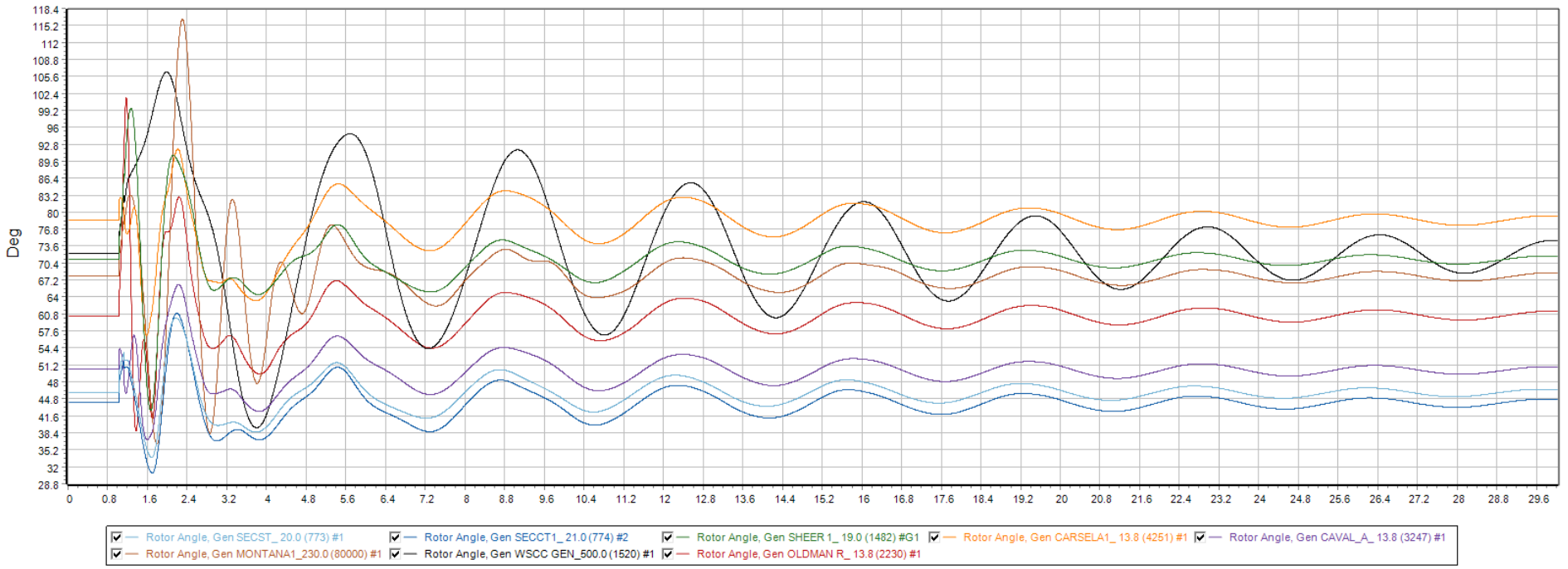
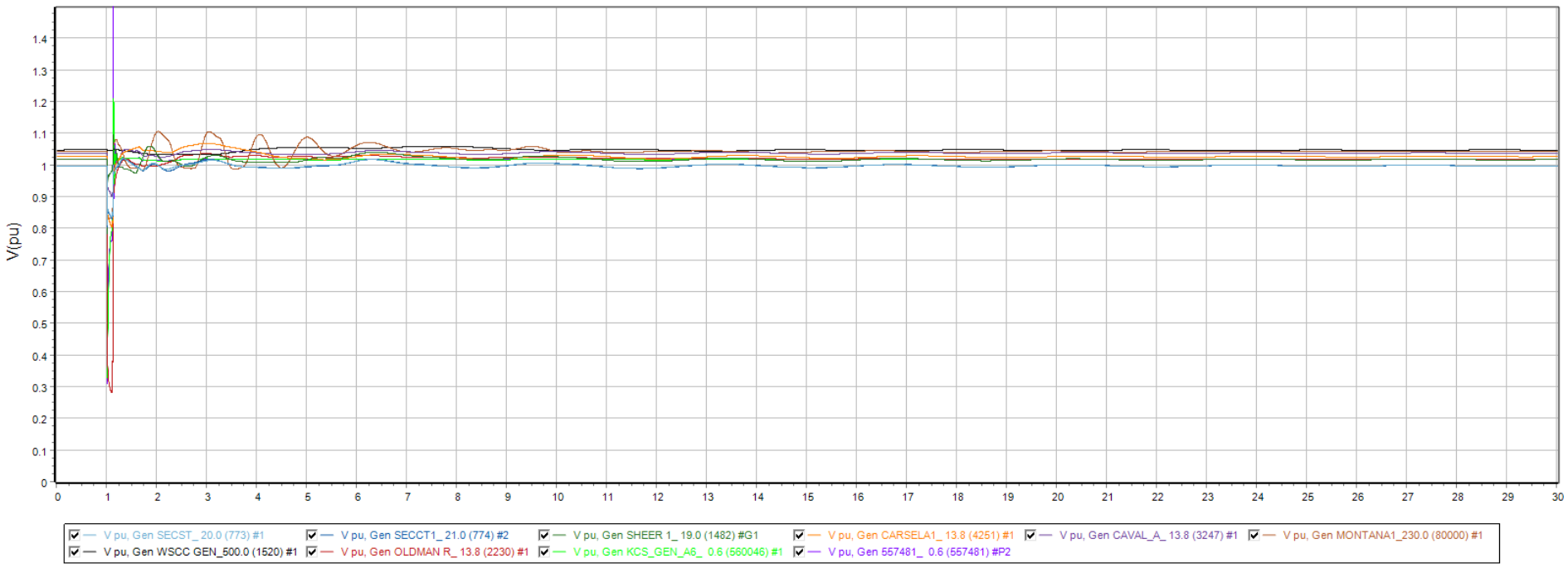
May 16, 2023 22:37:38

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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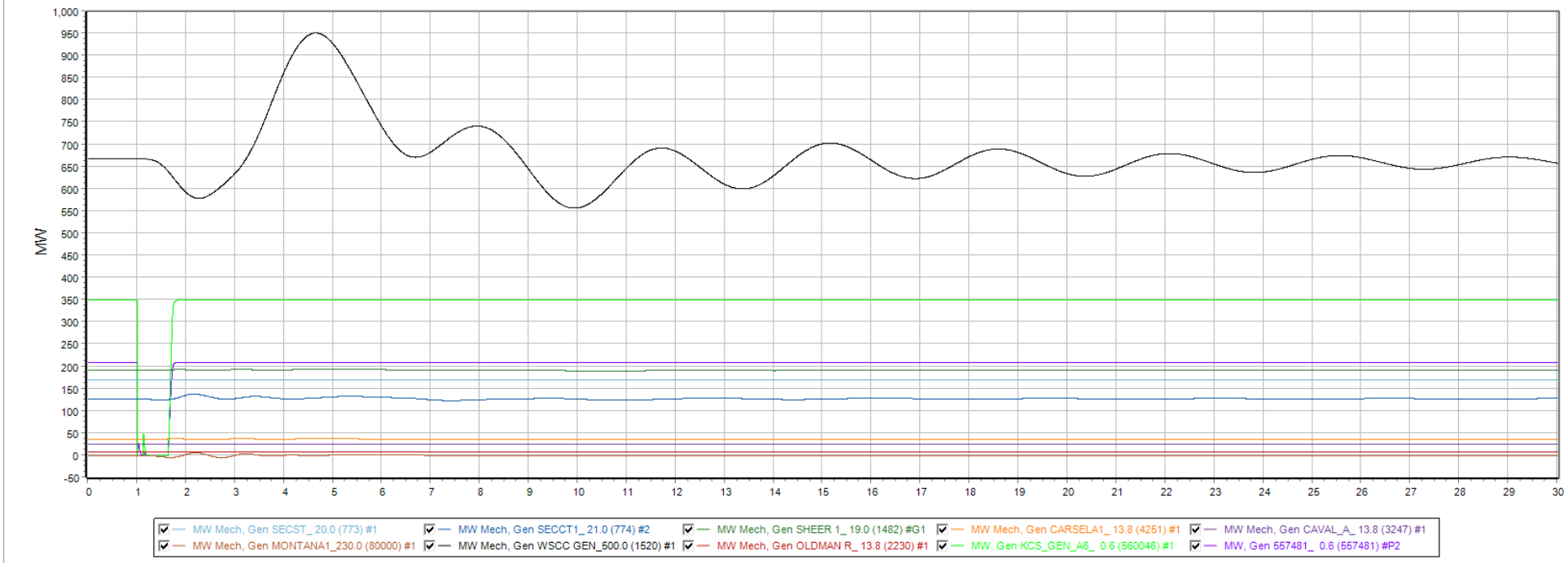
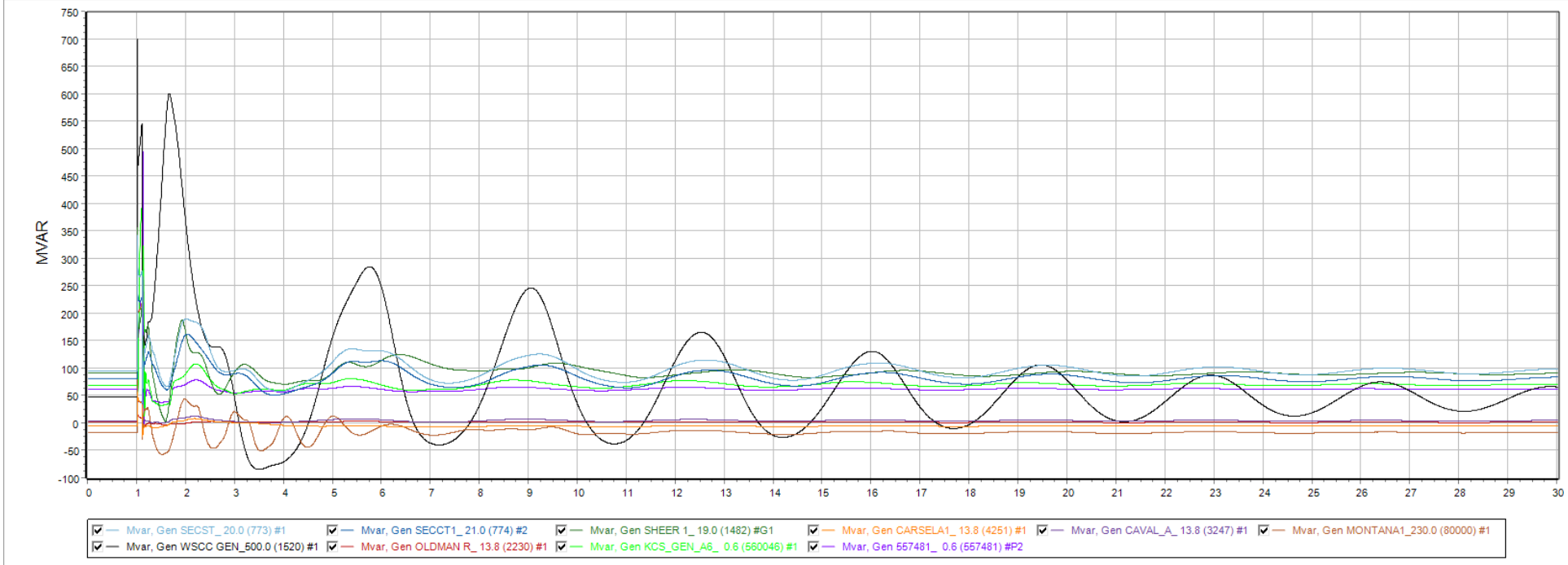
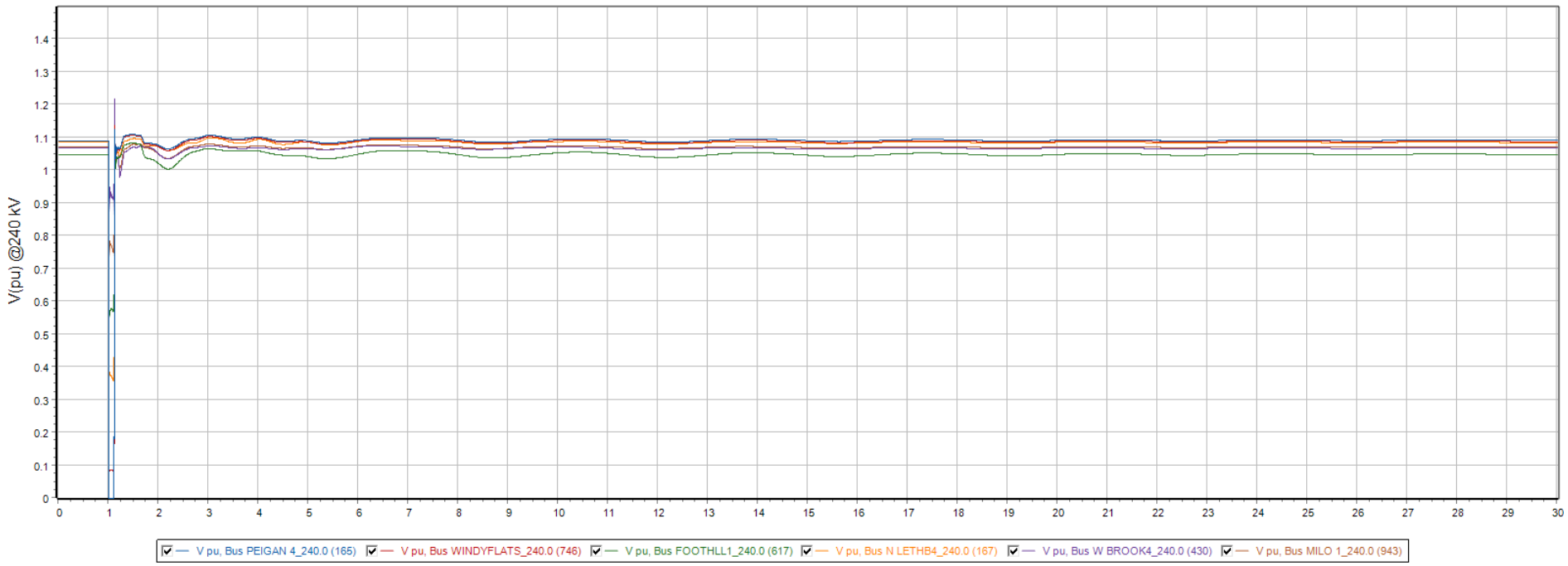
May 16, 2023 22:47:18

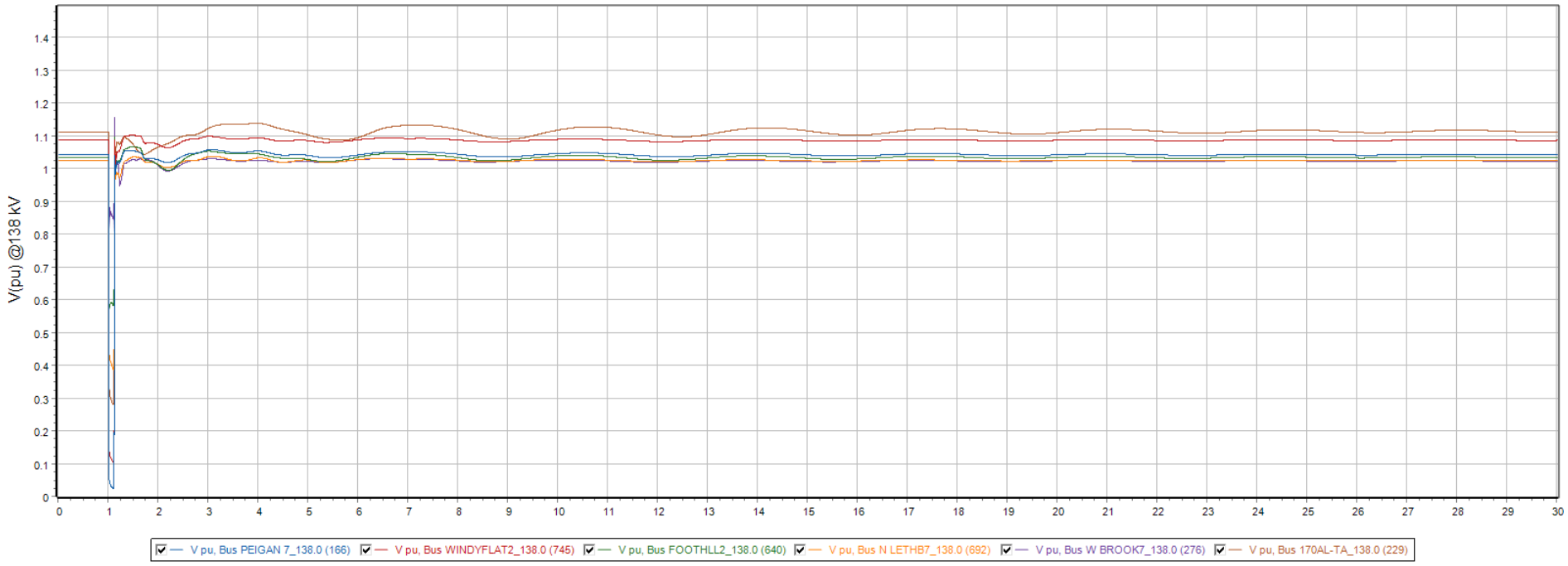
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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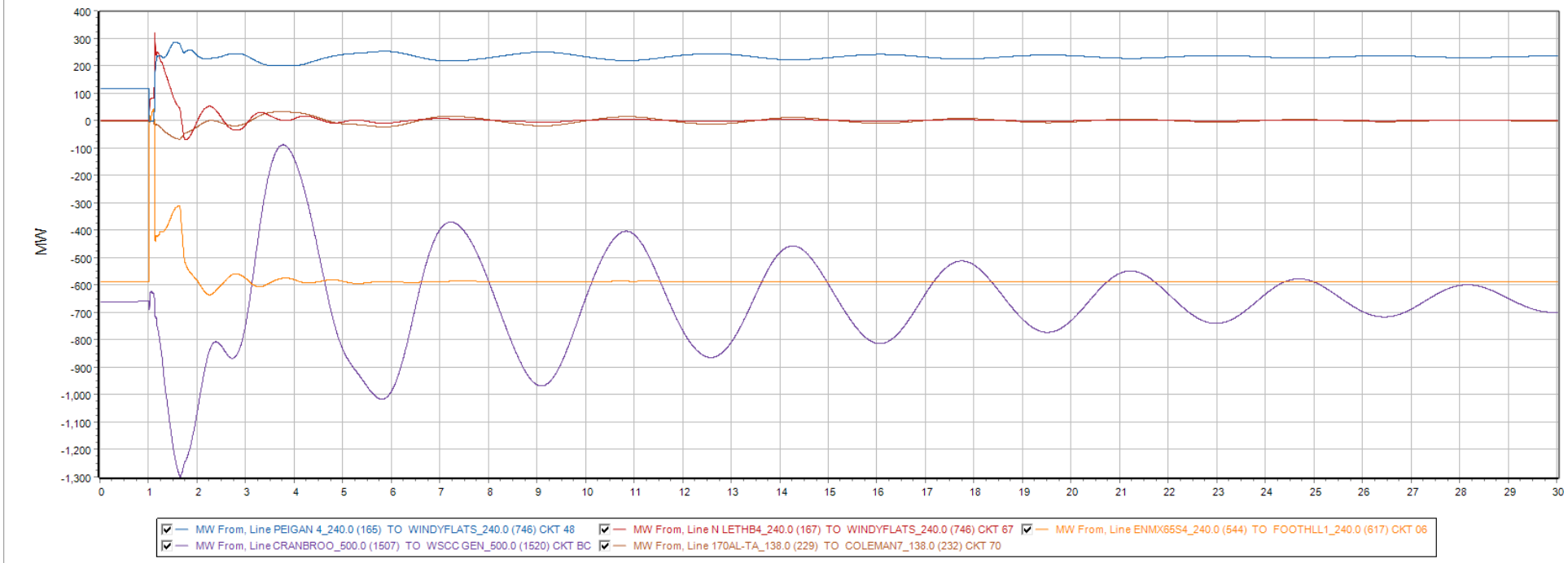
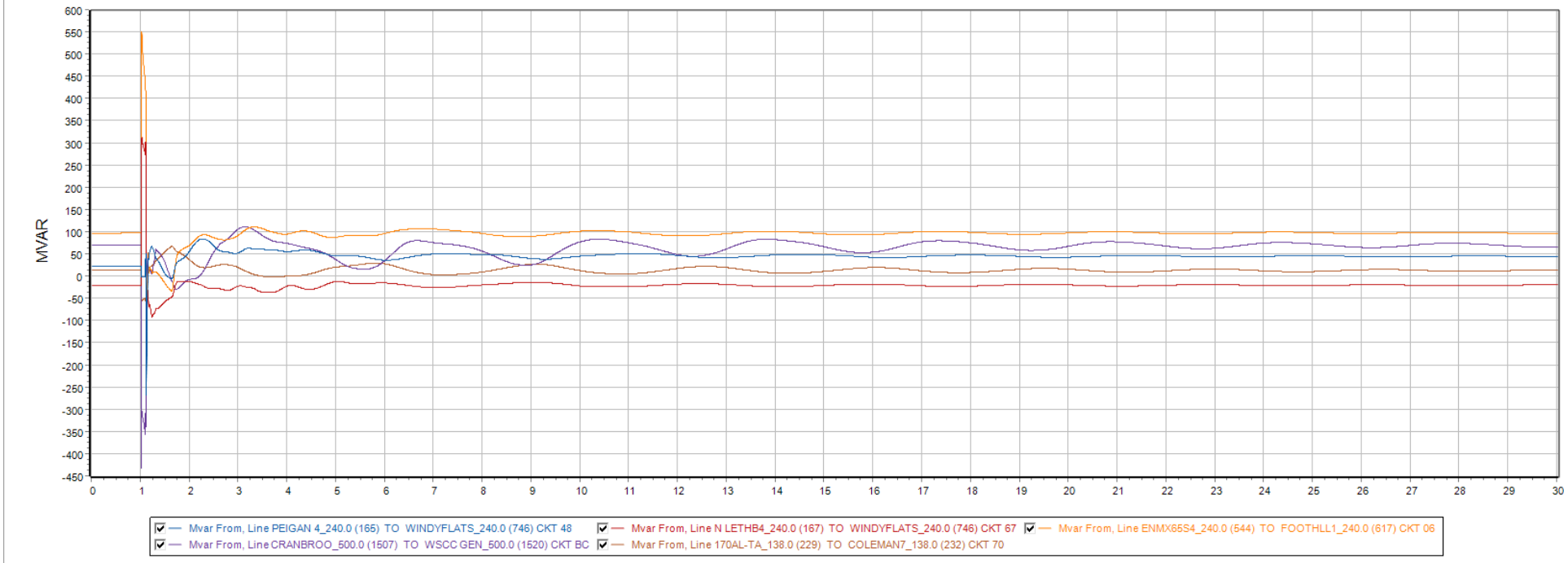
May 16, 2023 22:47:20

Monitor Line MW & MVAR. Q4





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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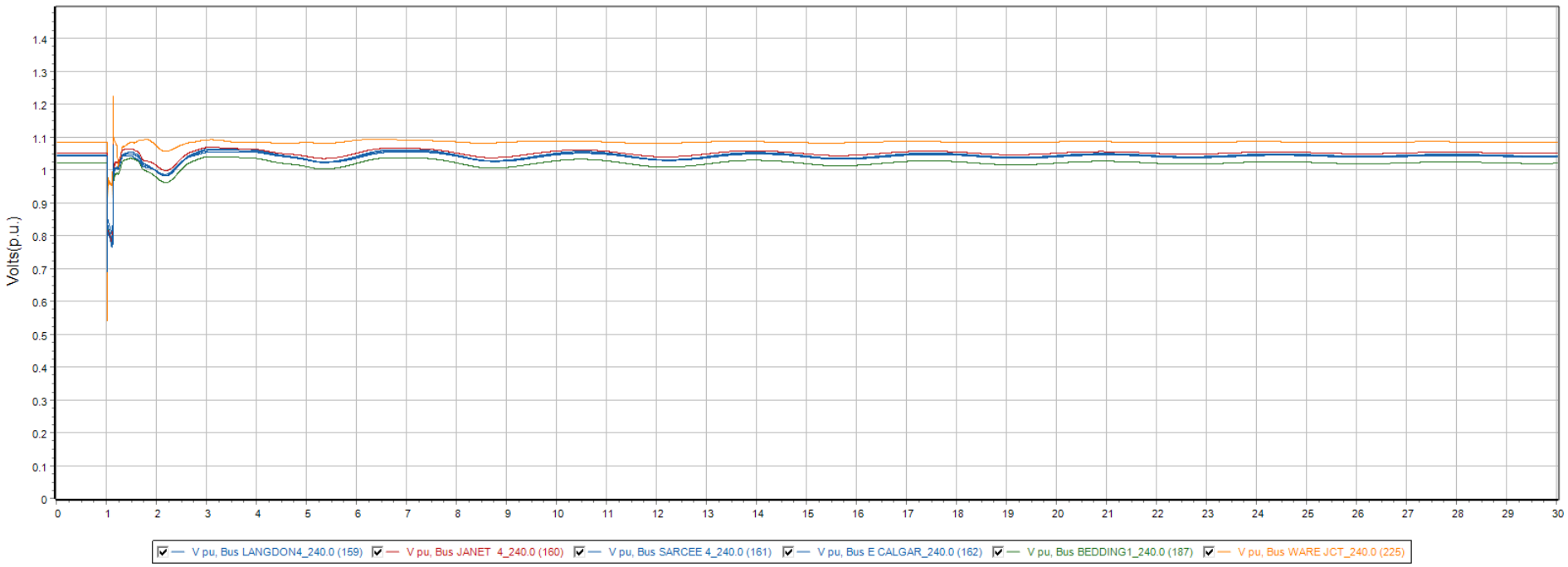
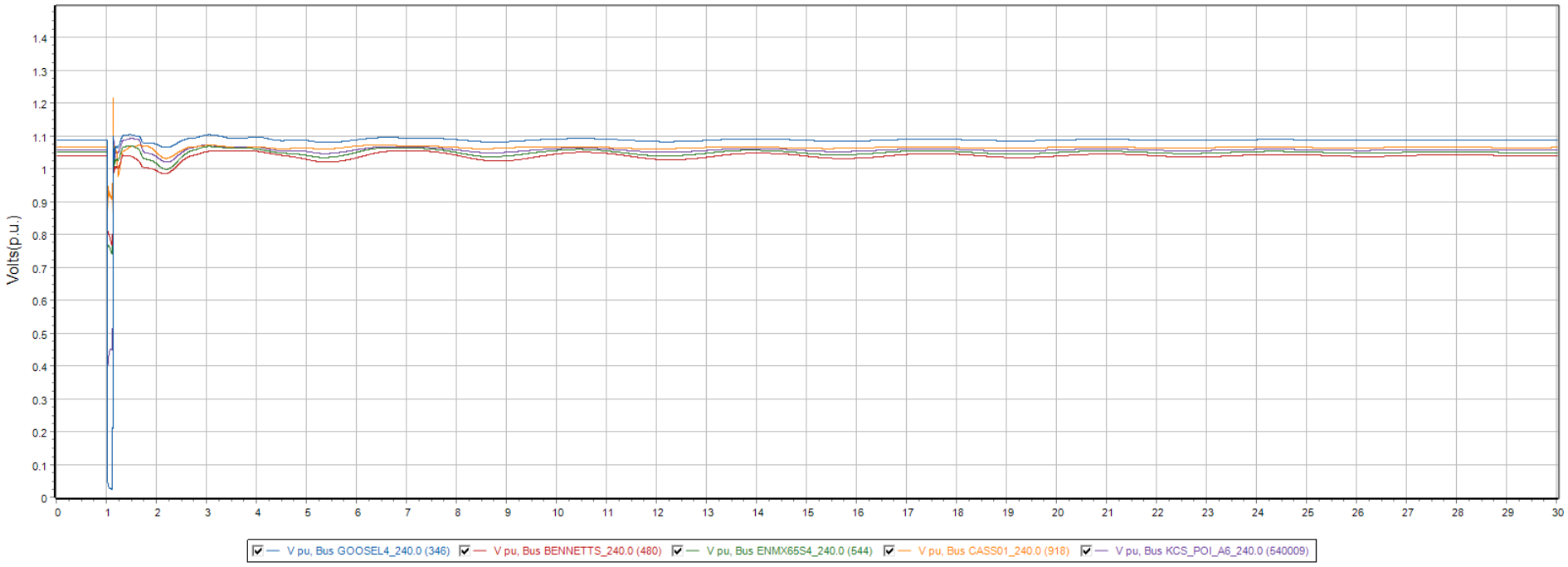
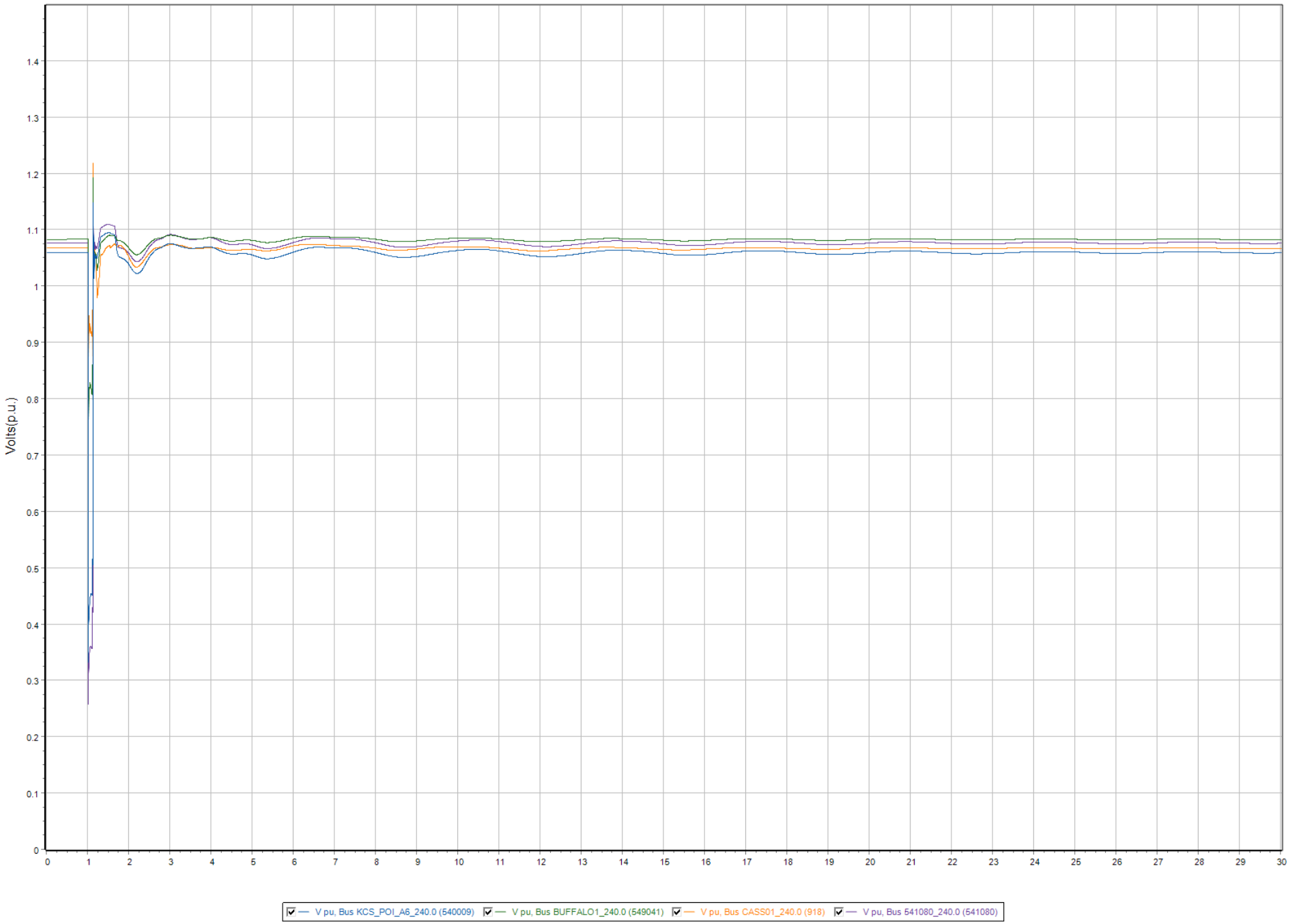
May 16, 2023 22:47:20

Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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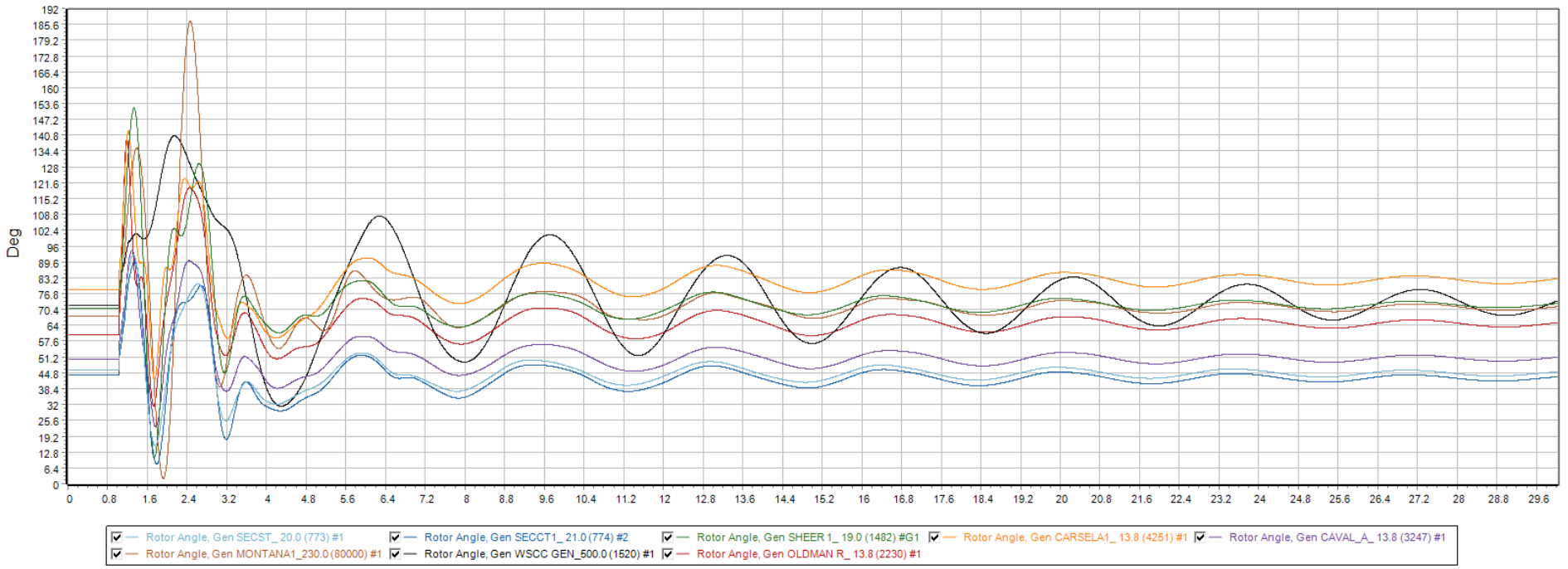
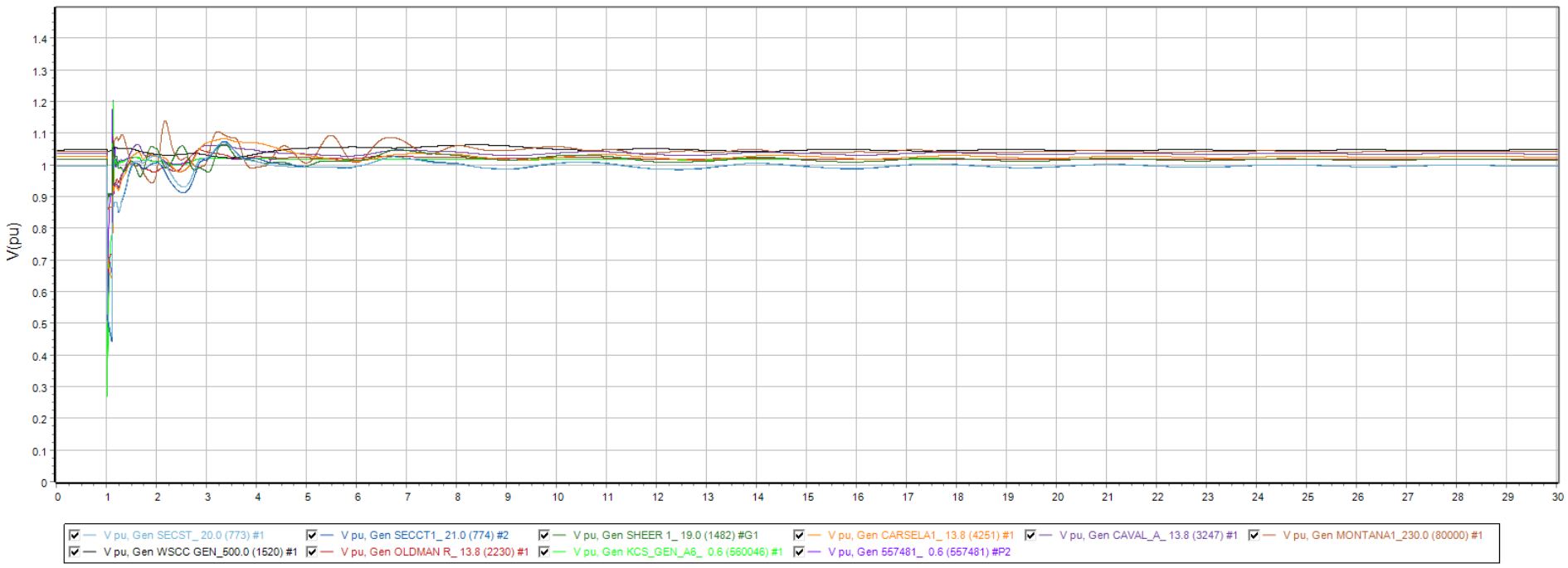
May 16, 2023 22:47:21

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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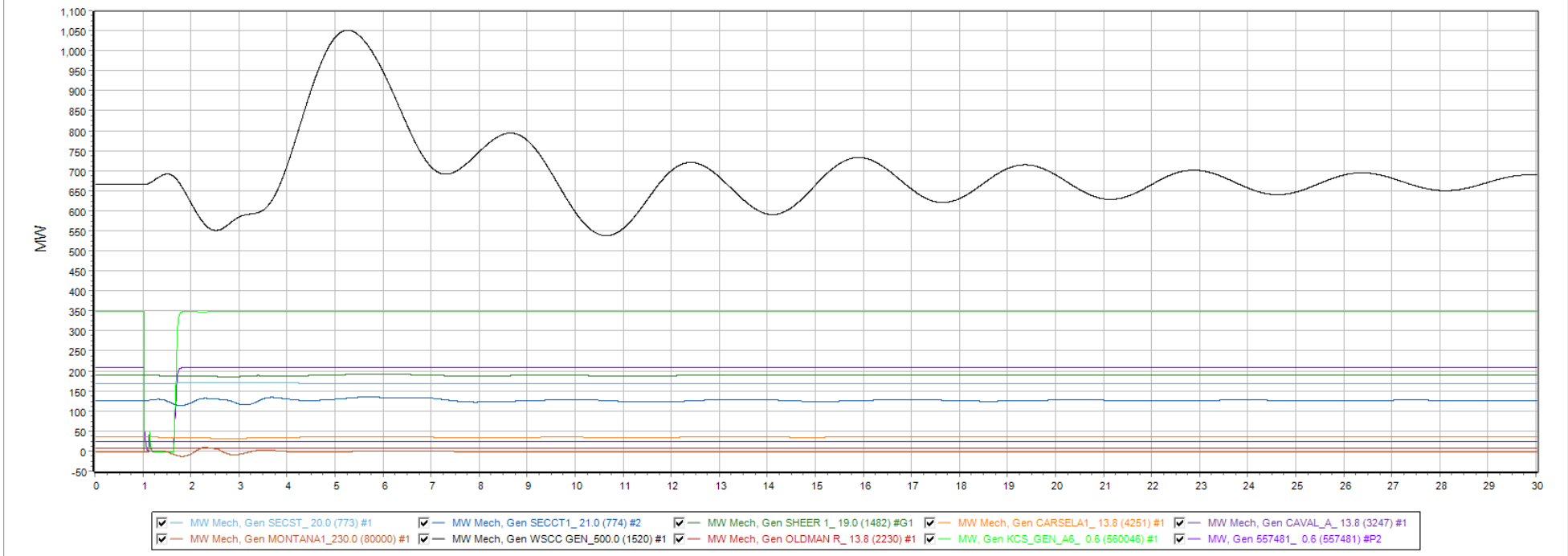
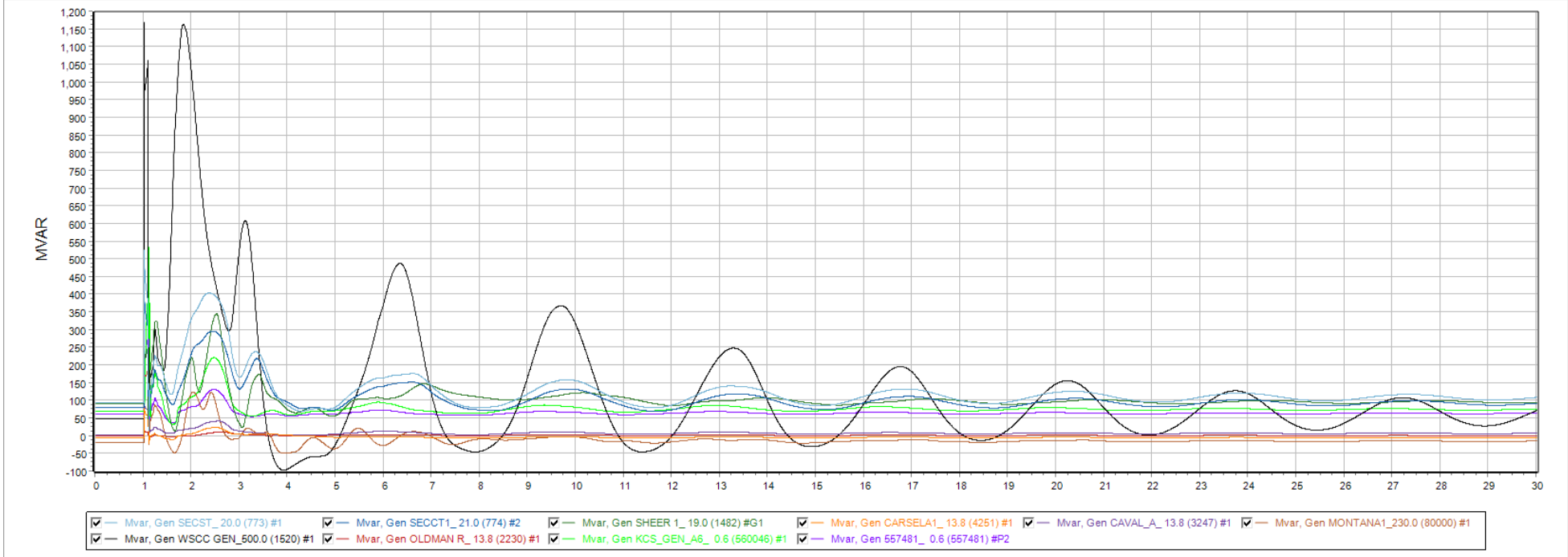
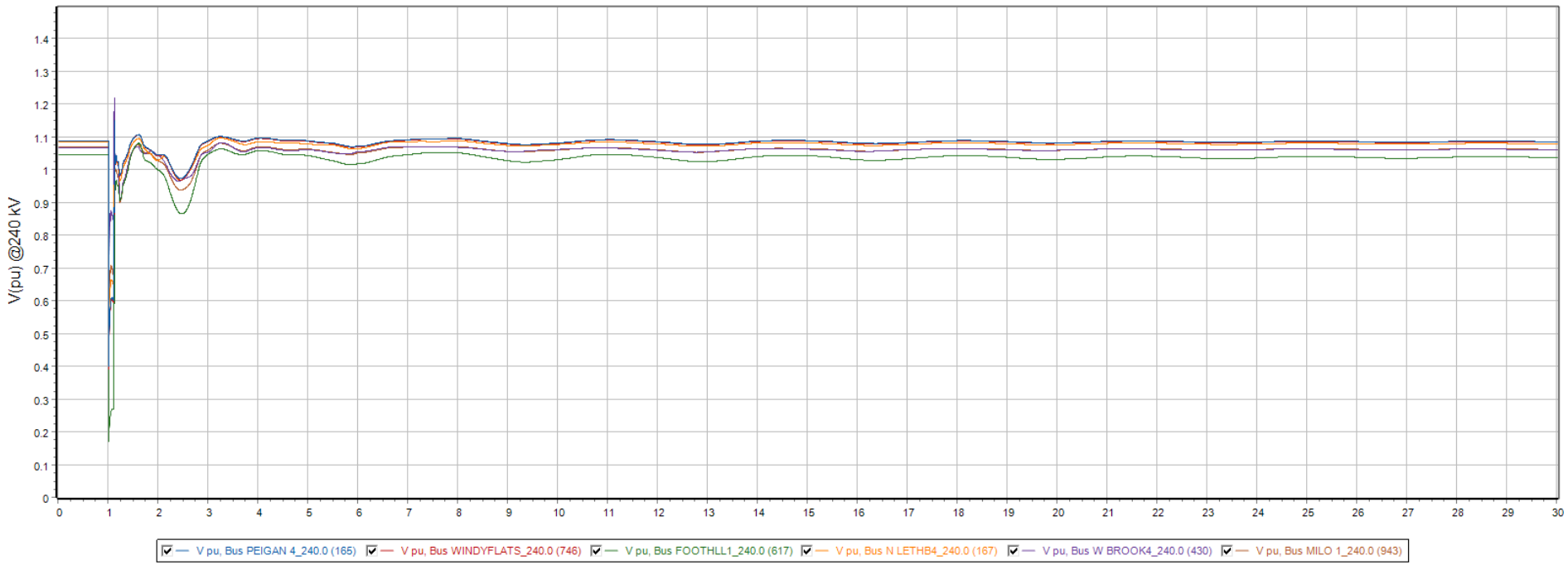
May 16, 2023 22:55:22

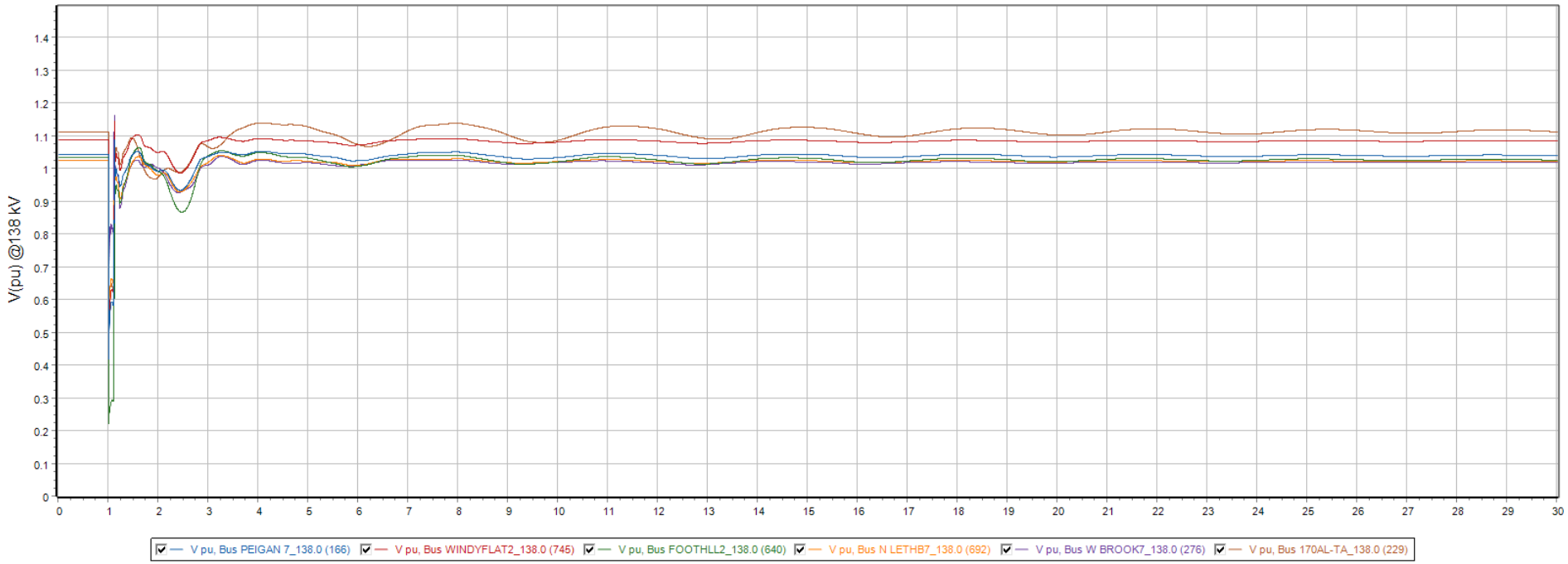
Monitor Gens. Q2





Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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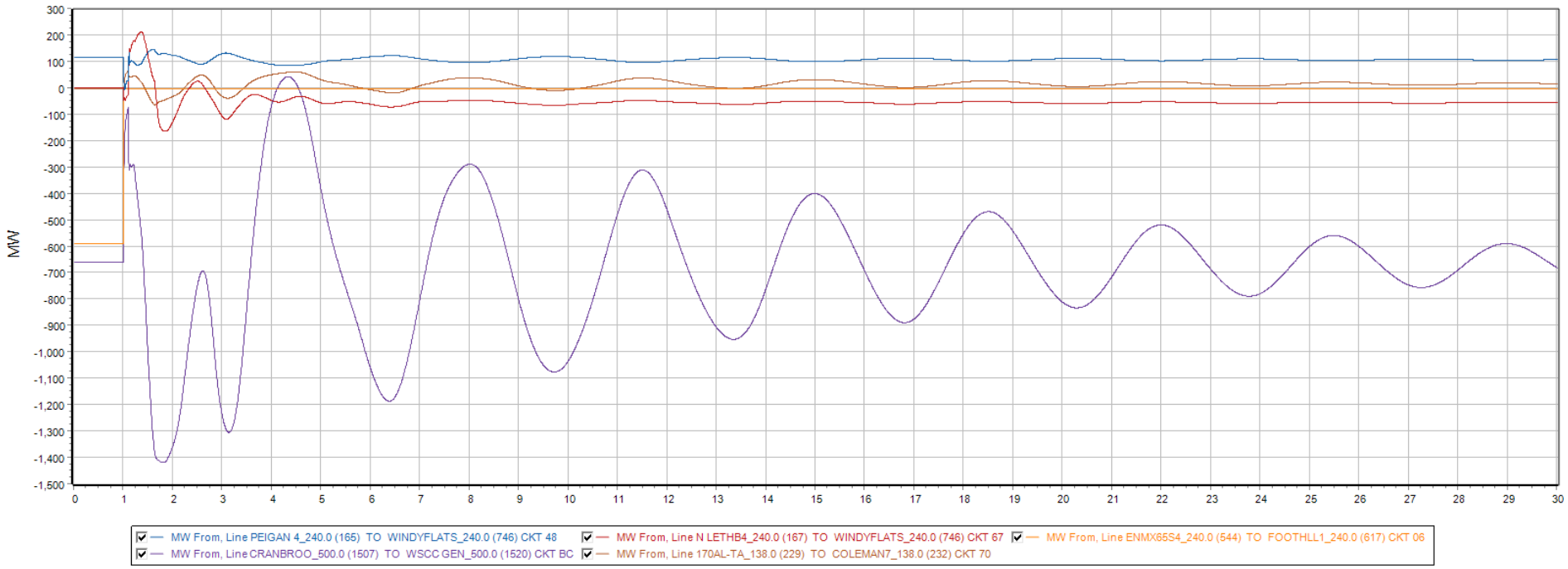
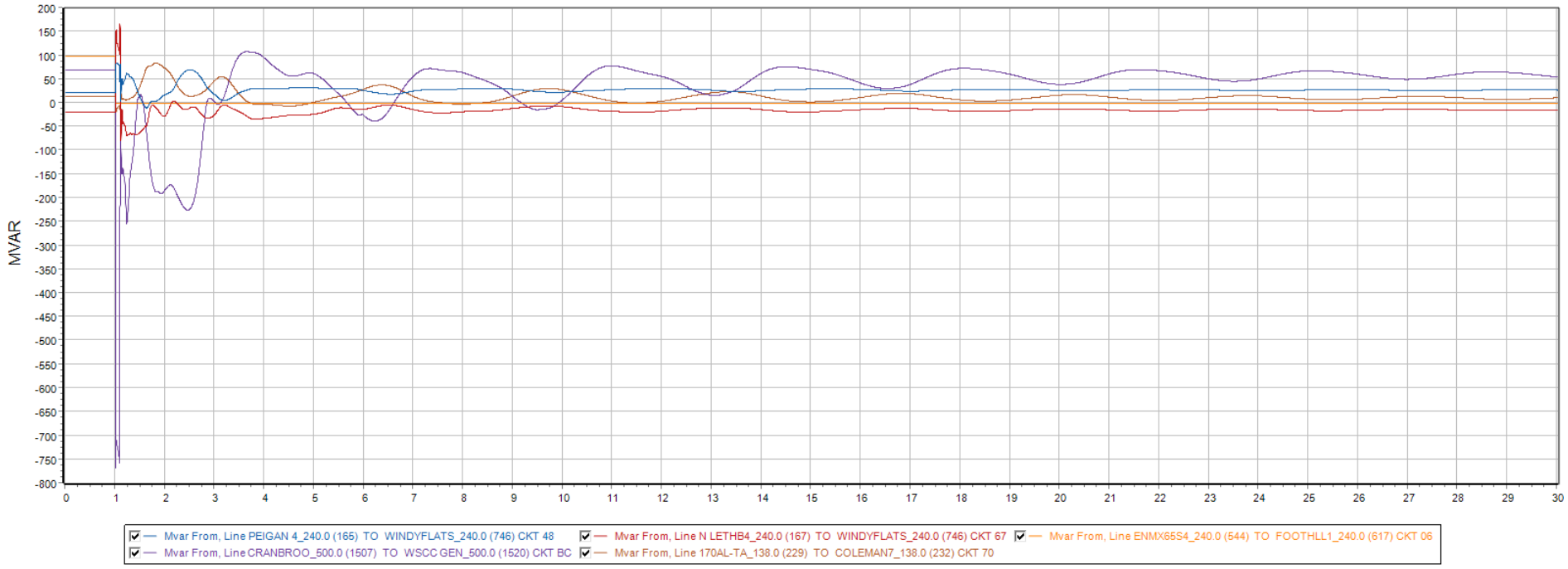
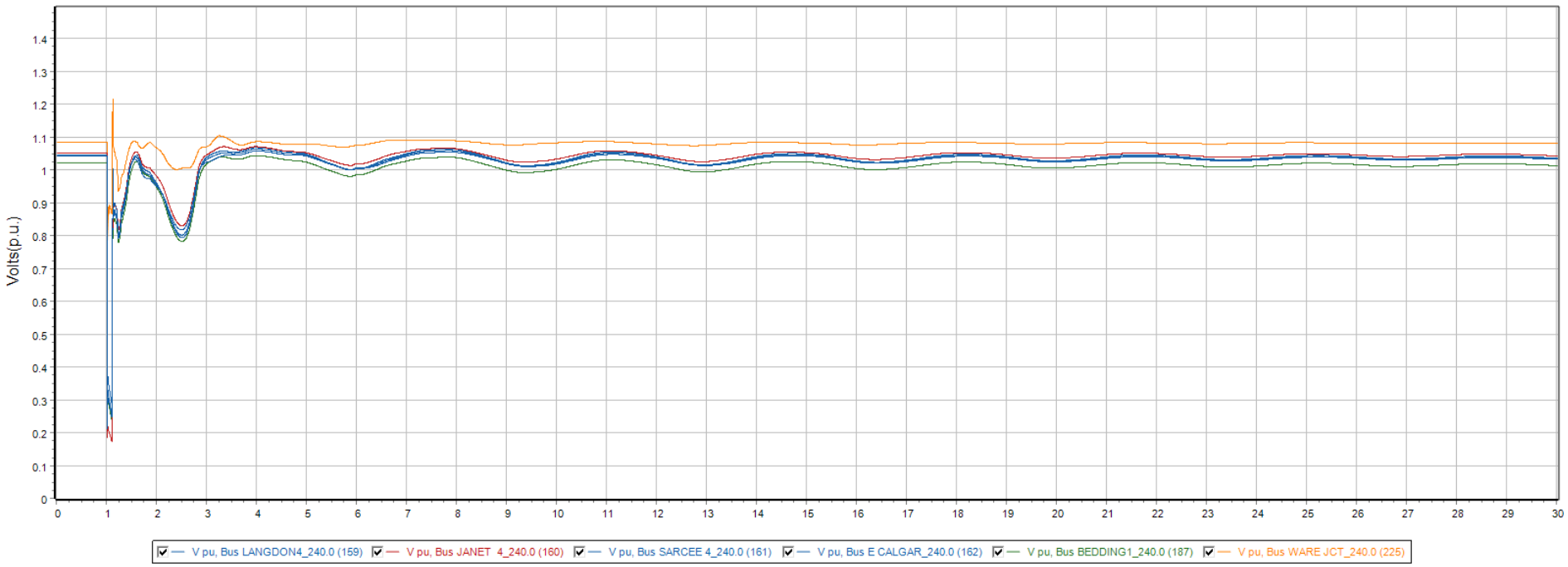
May 16, 2023 22:55:24

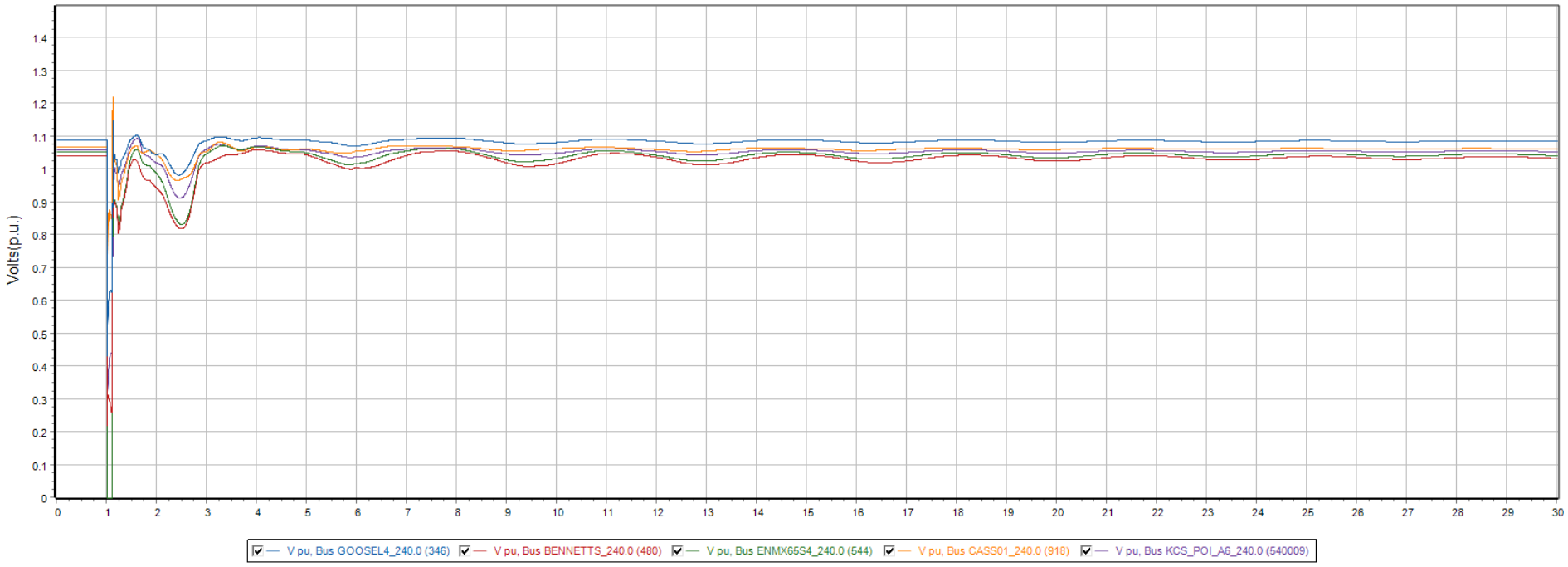
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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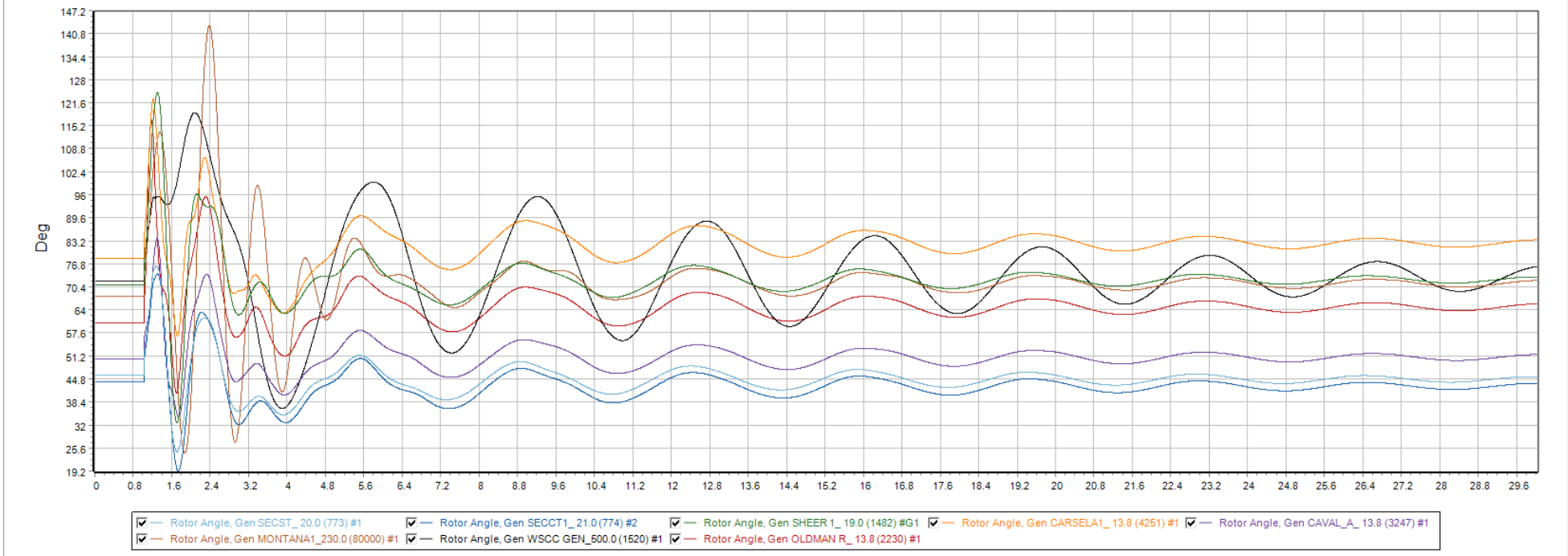
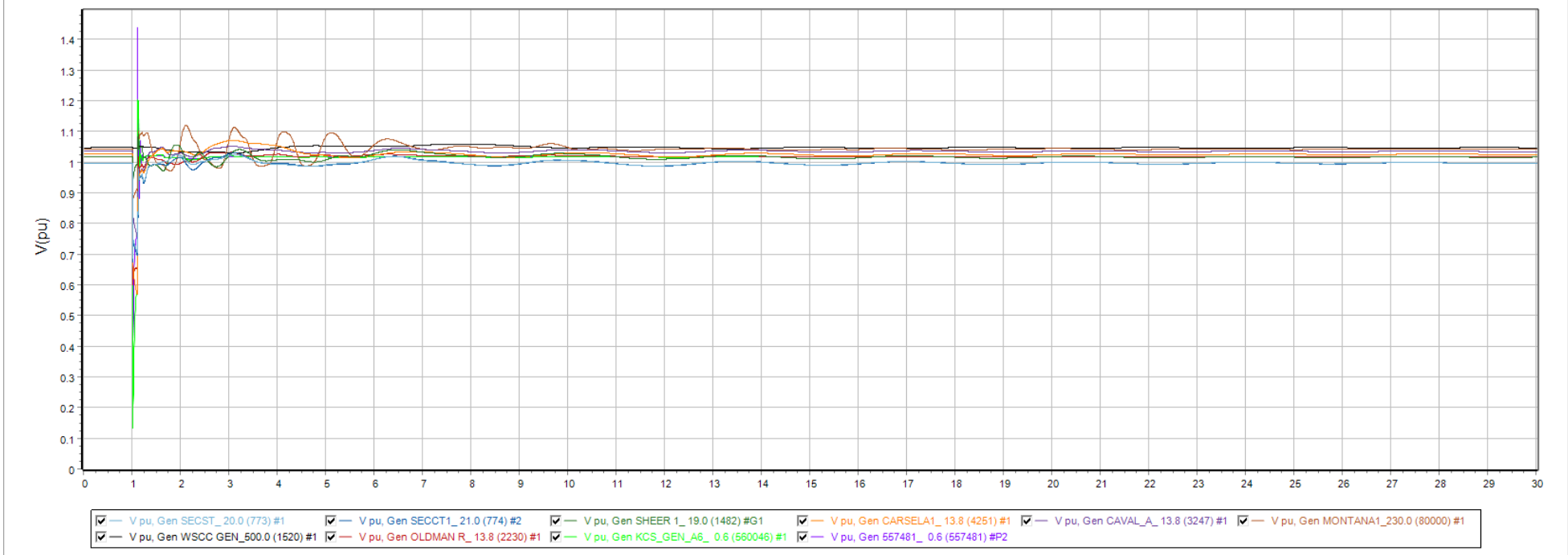
May 16, 2023 22:55:25

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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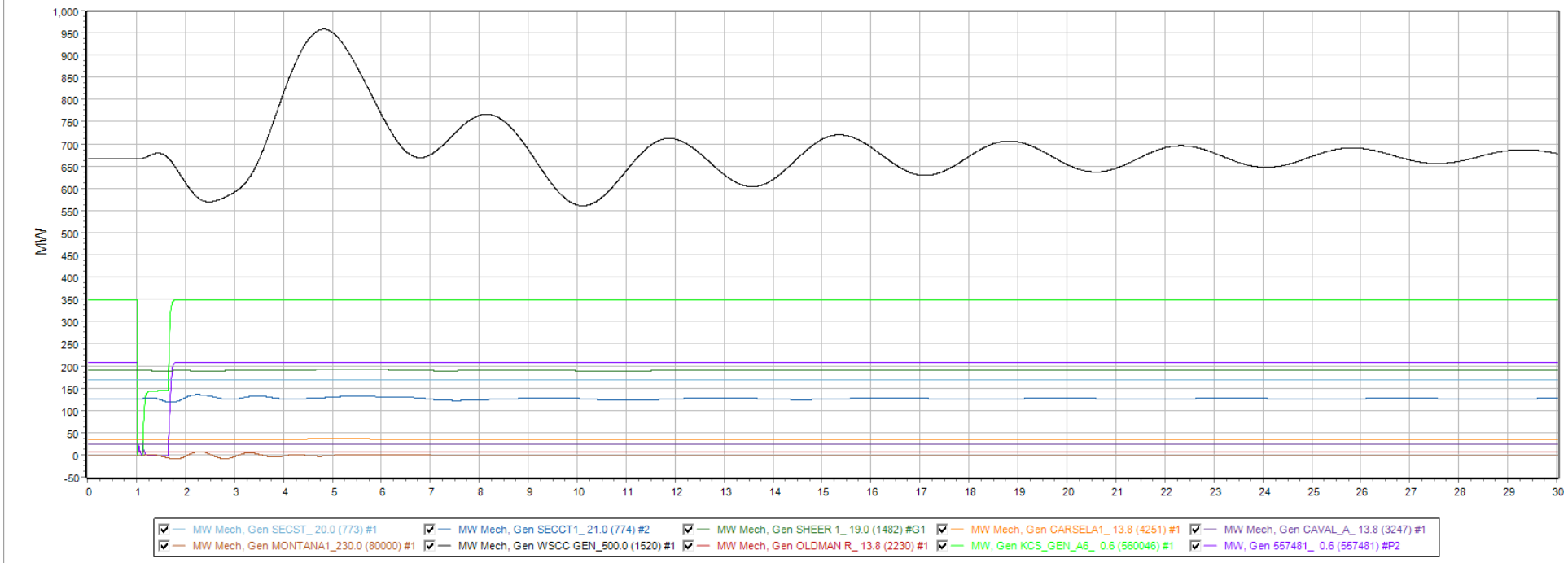
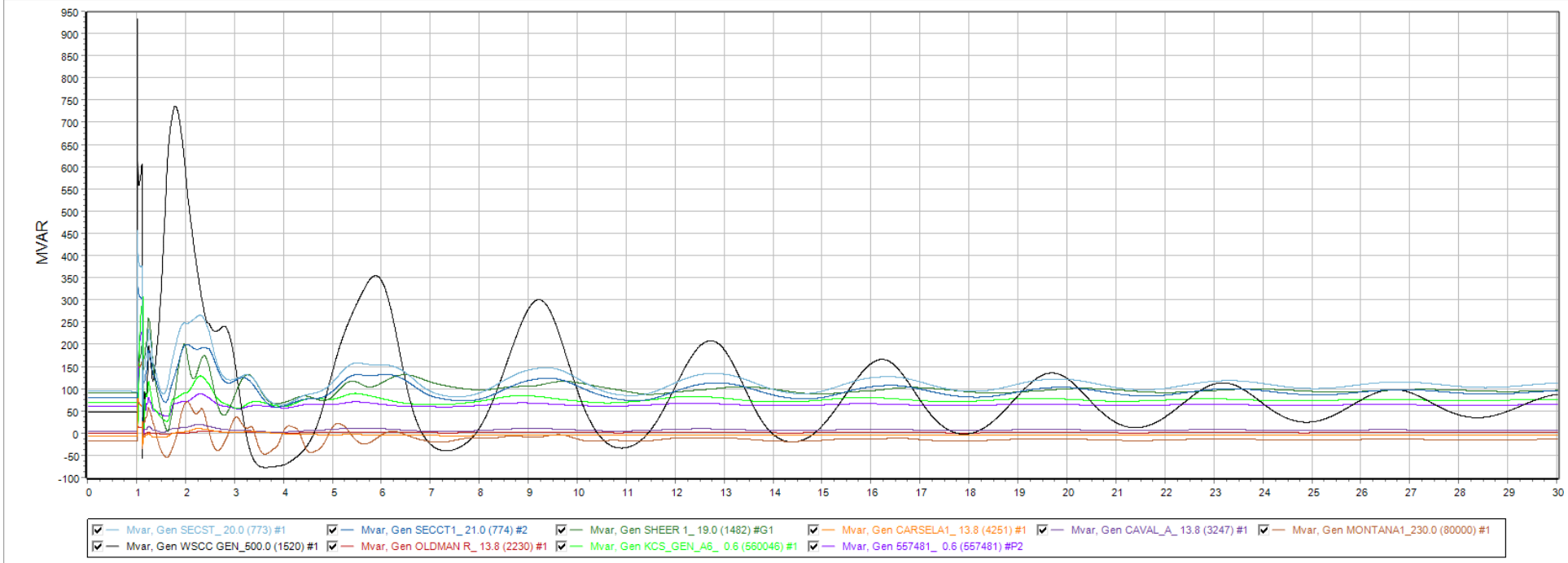
May 16, 2023 23:03:21

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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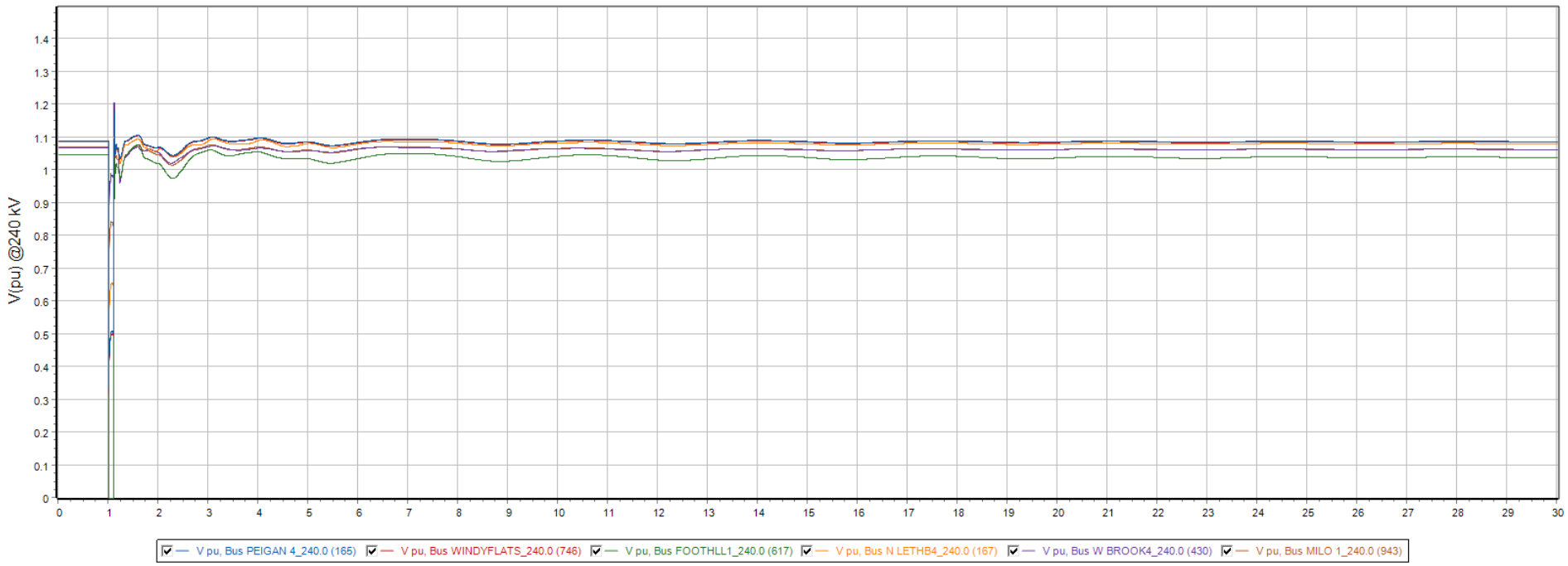
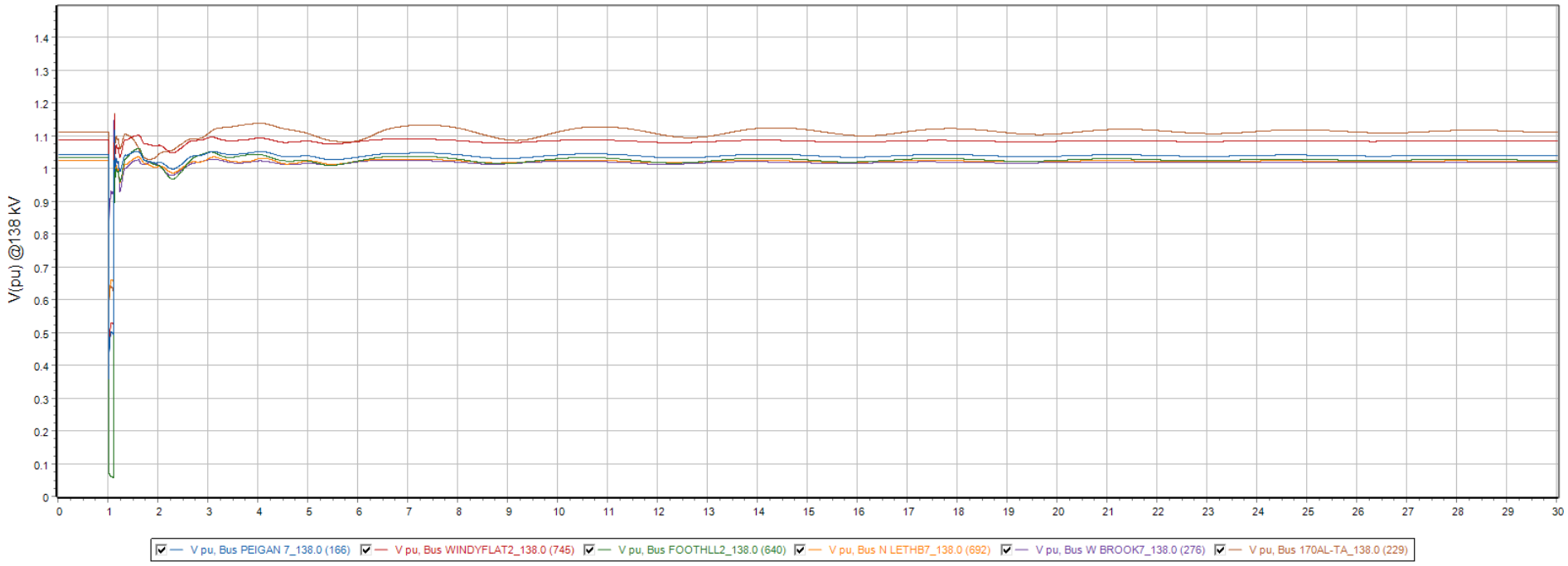
May 16, 2023 23:03:21

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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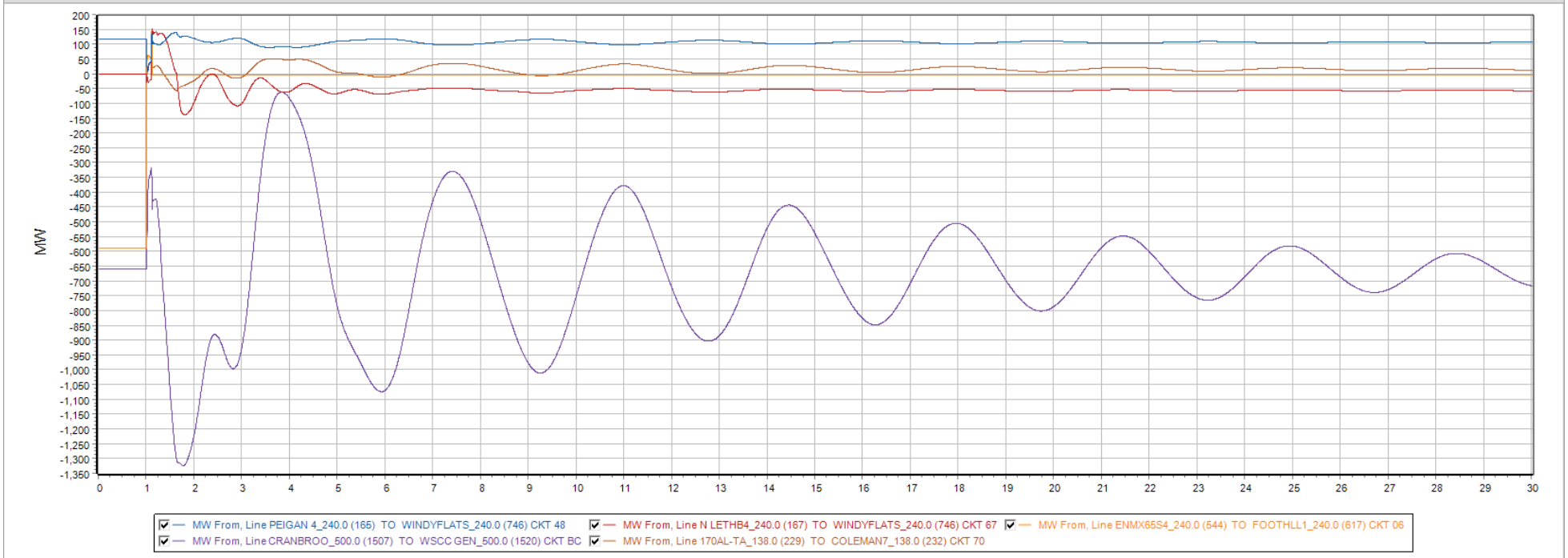
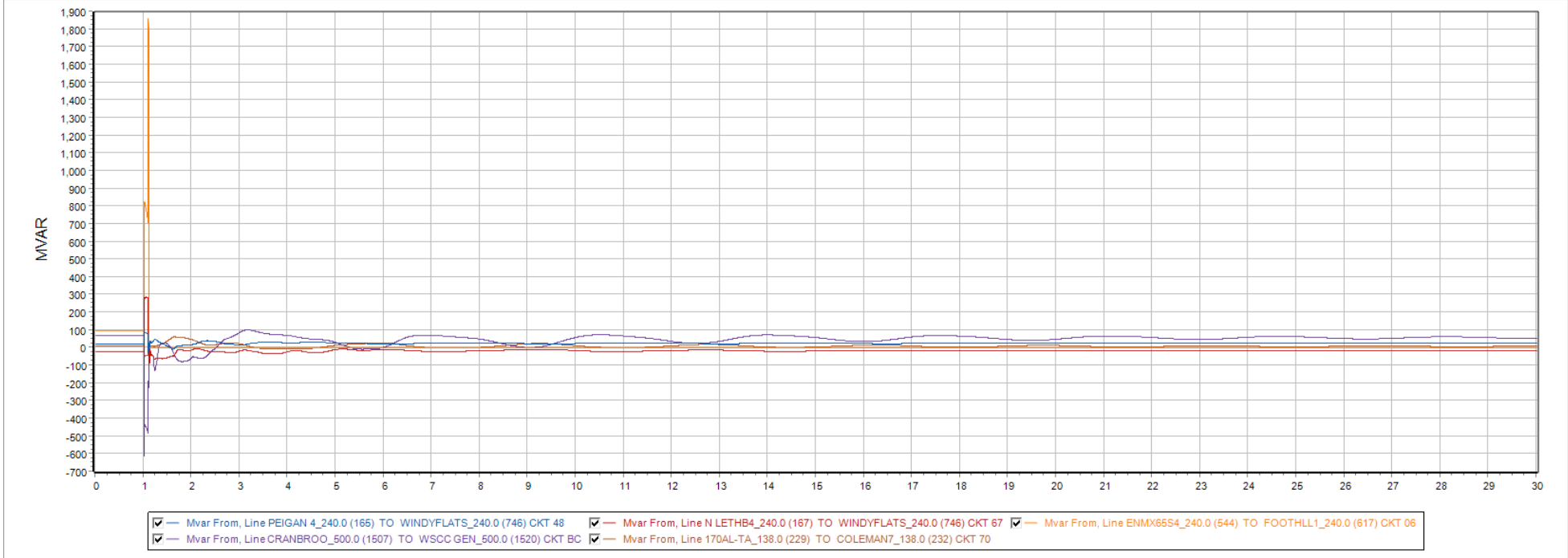
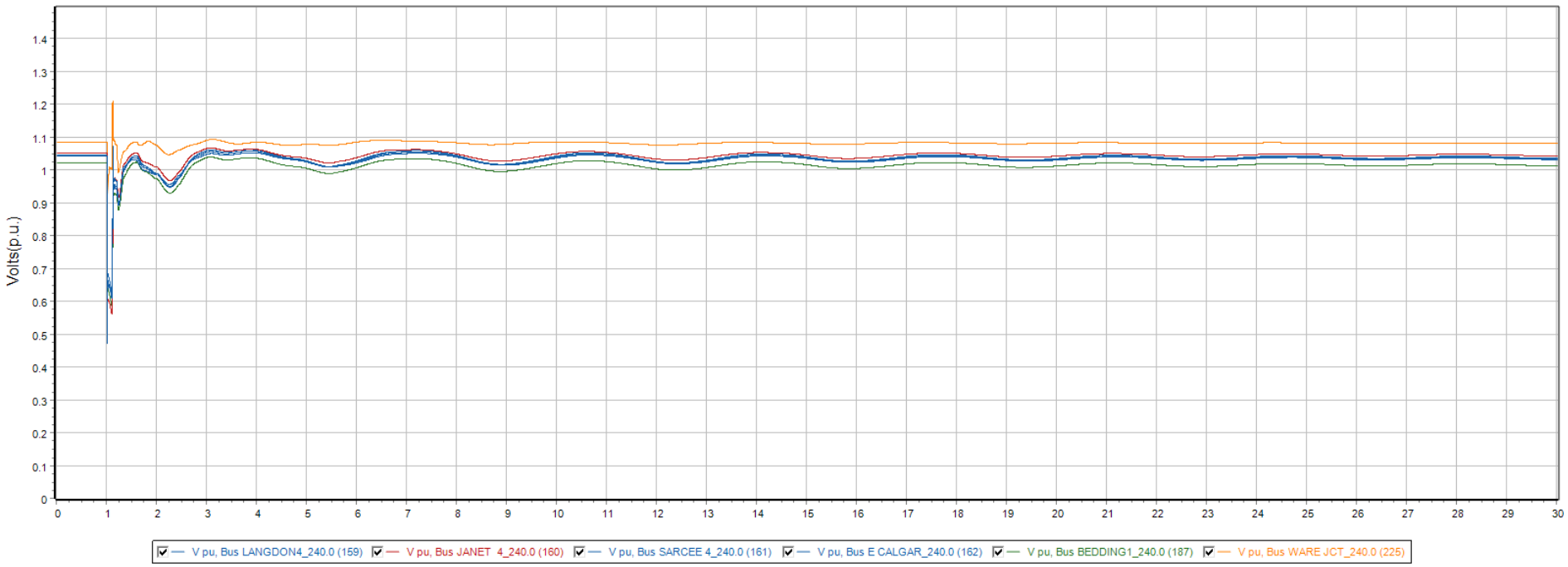
May 16, 2023 23:03:22

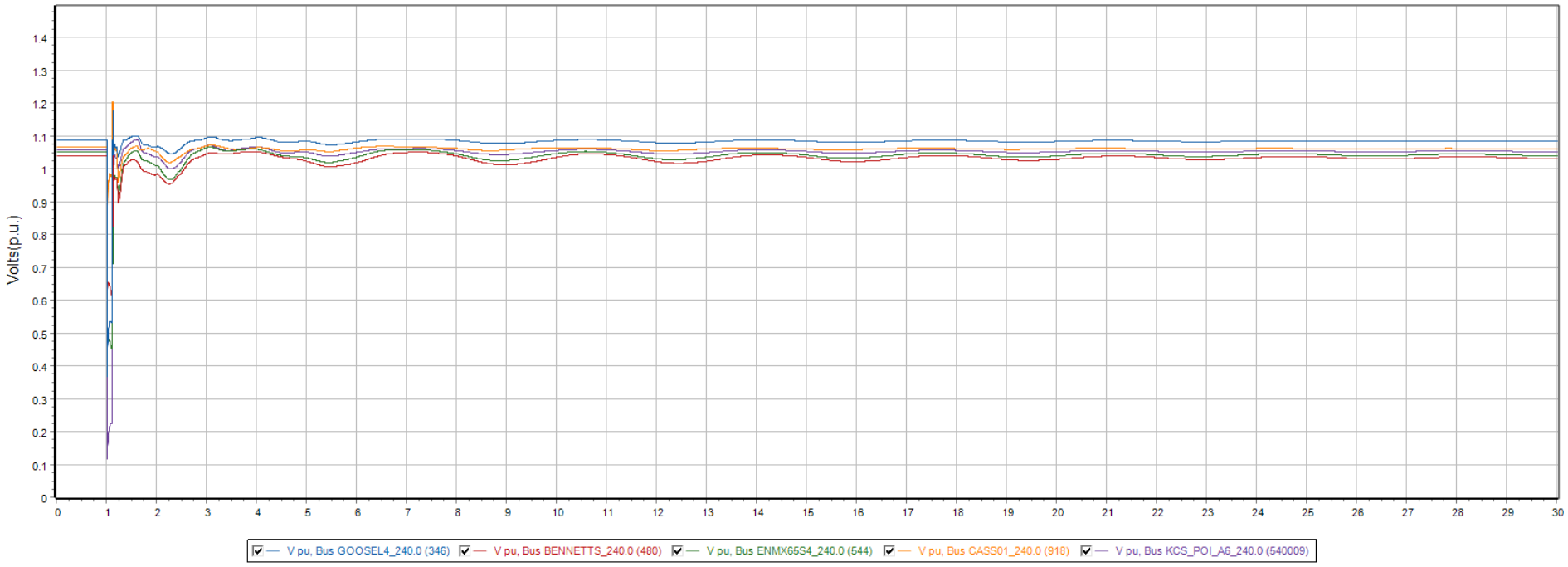
Monitor Line MW & MVAR. Q4



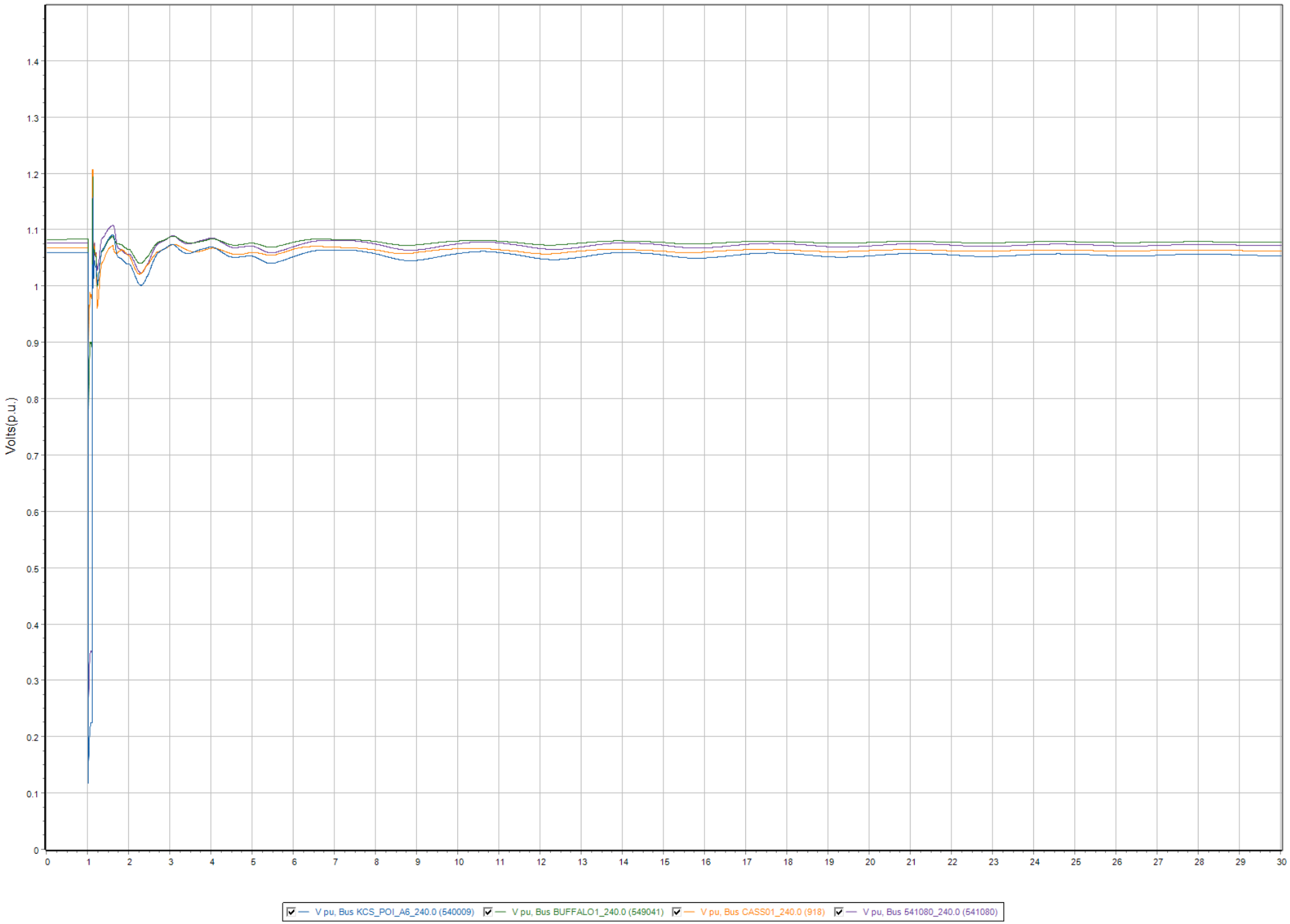


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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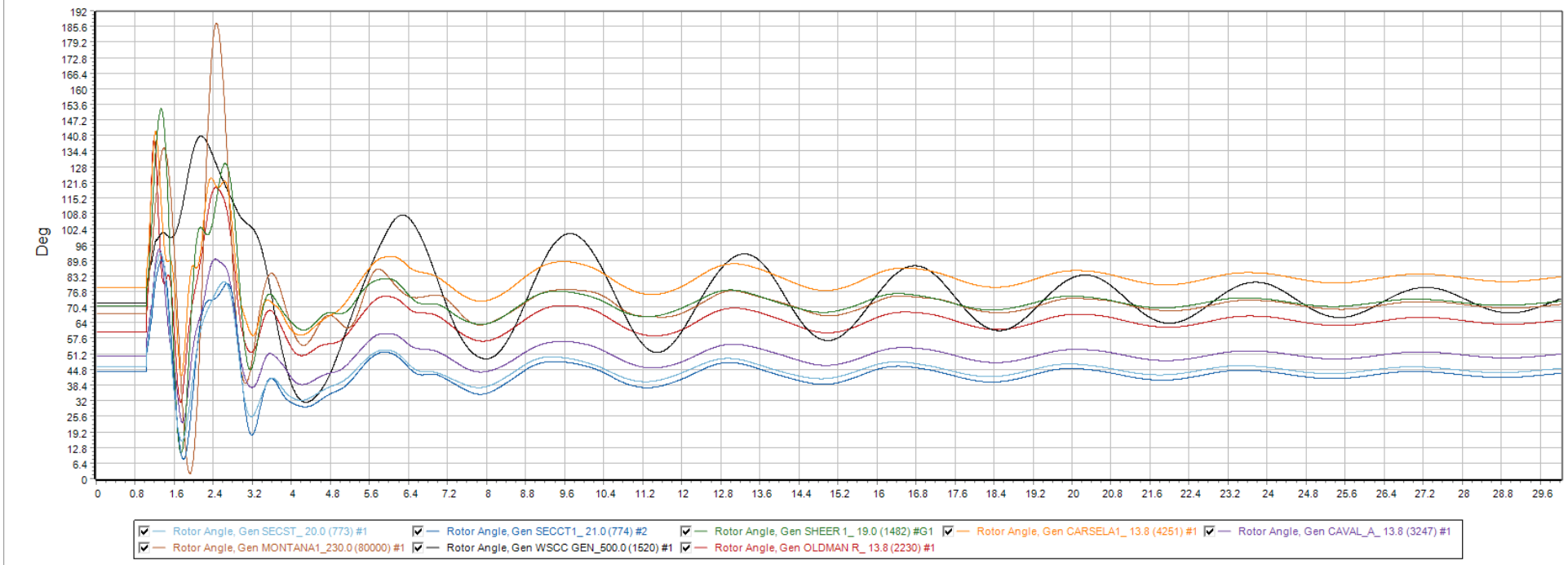
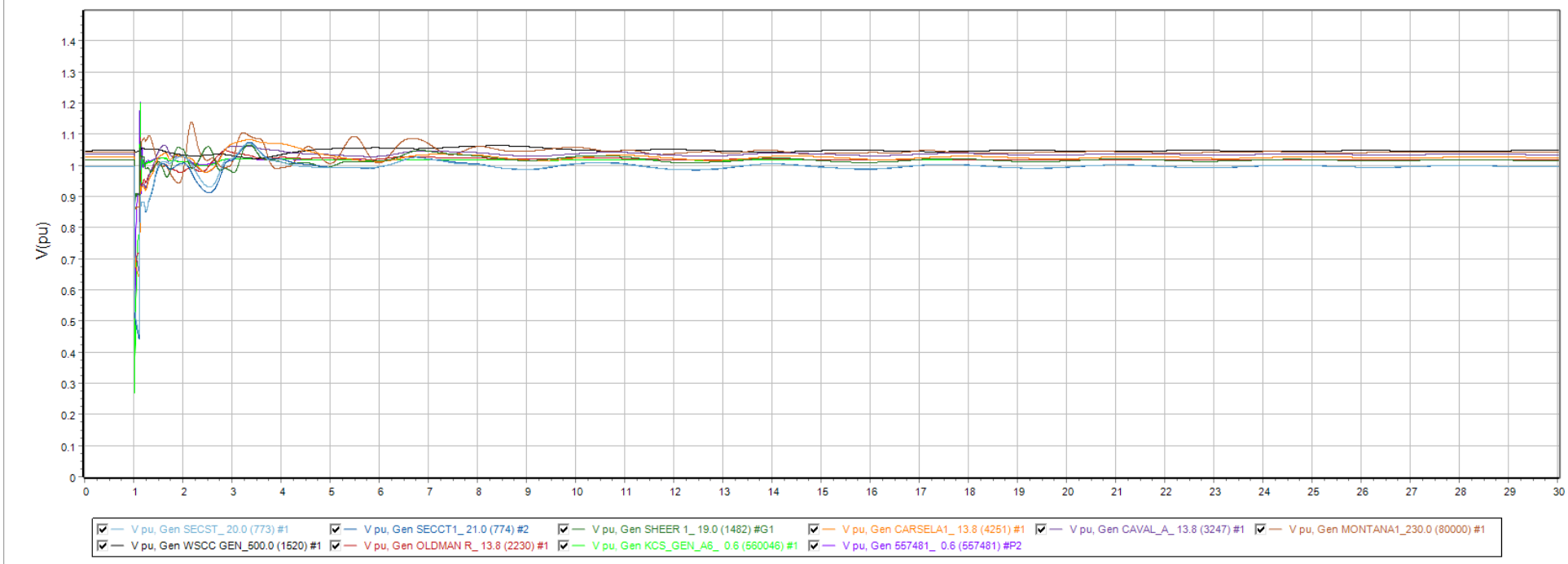
May 16, 2023 23:03:23

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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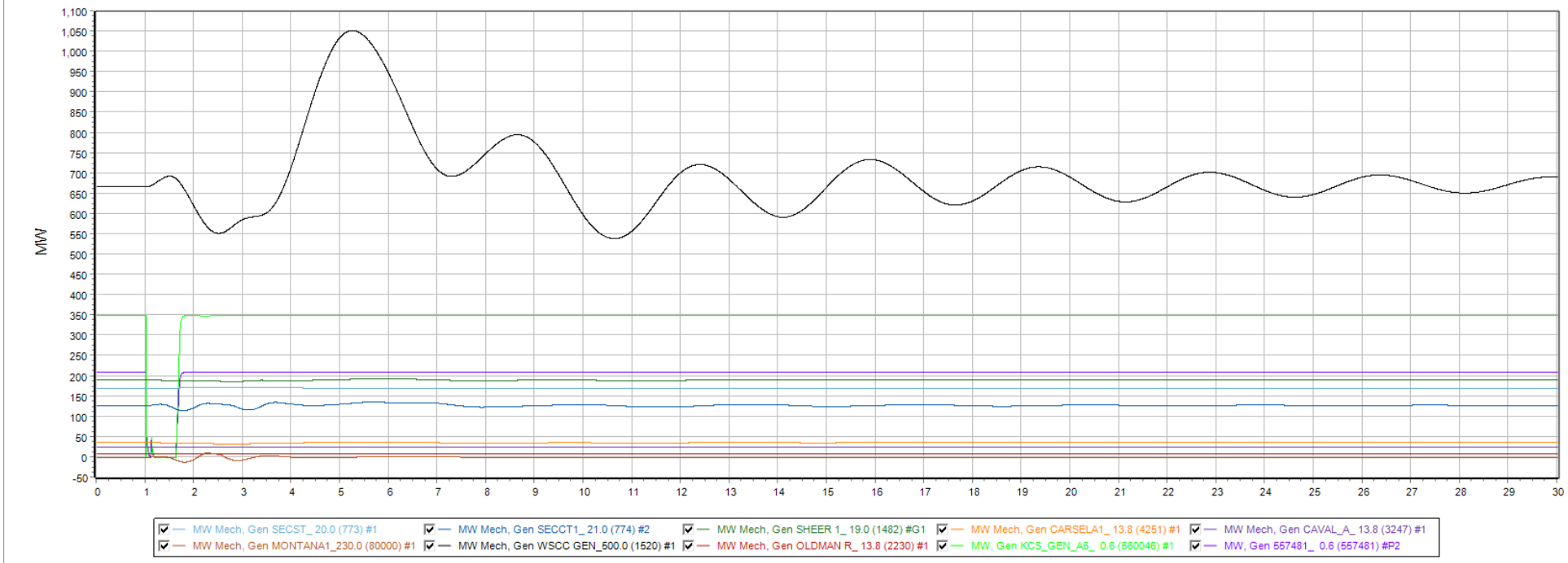
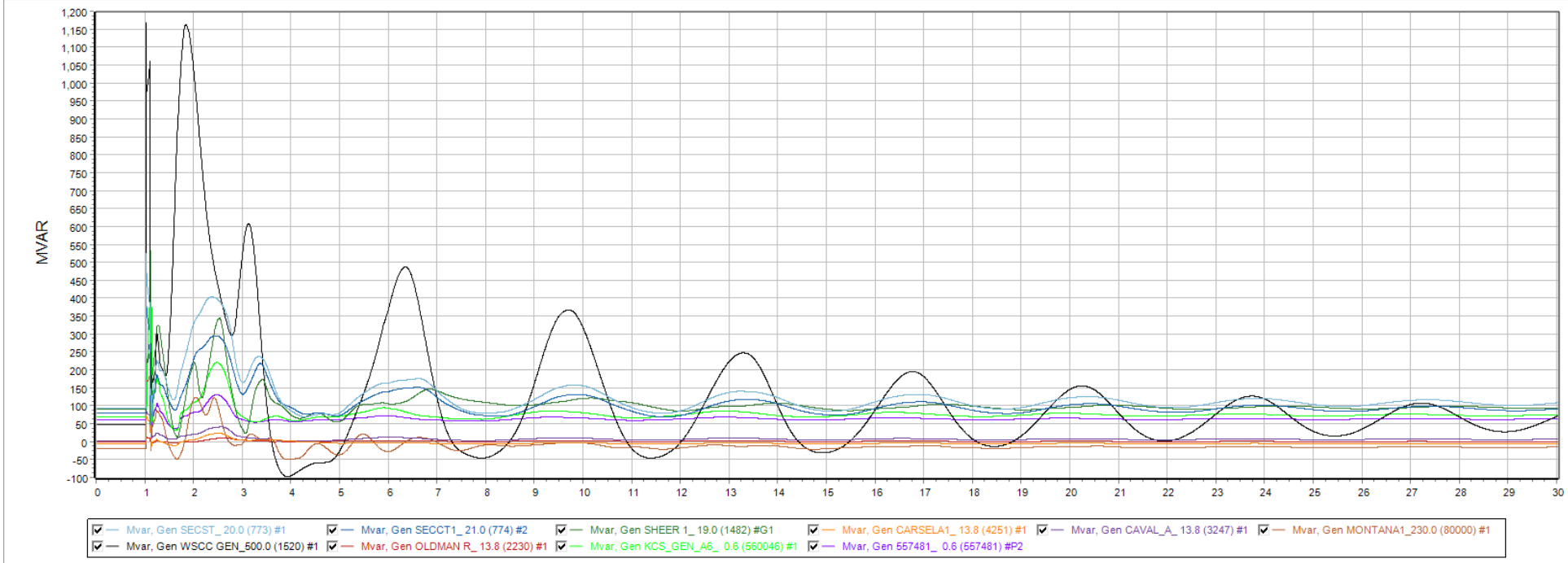
May 16, 2023 23:41:43

Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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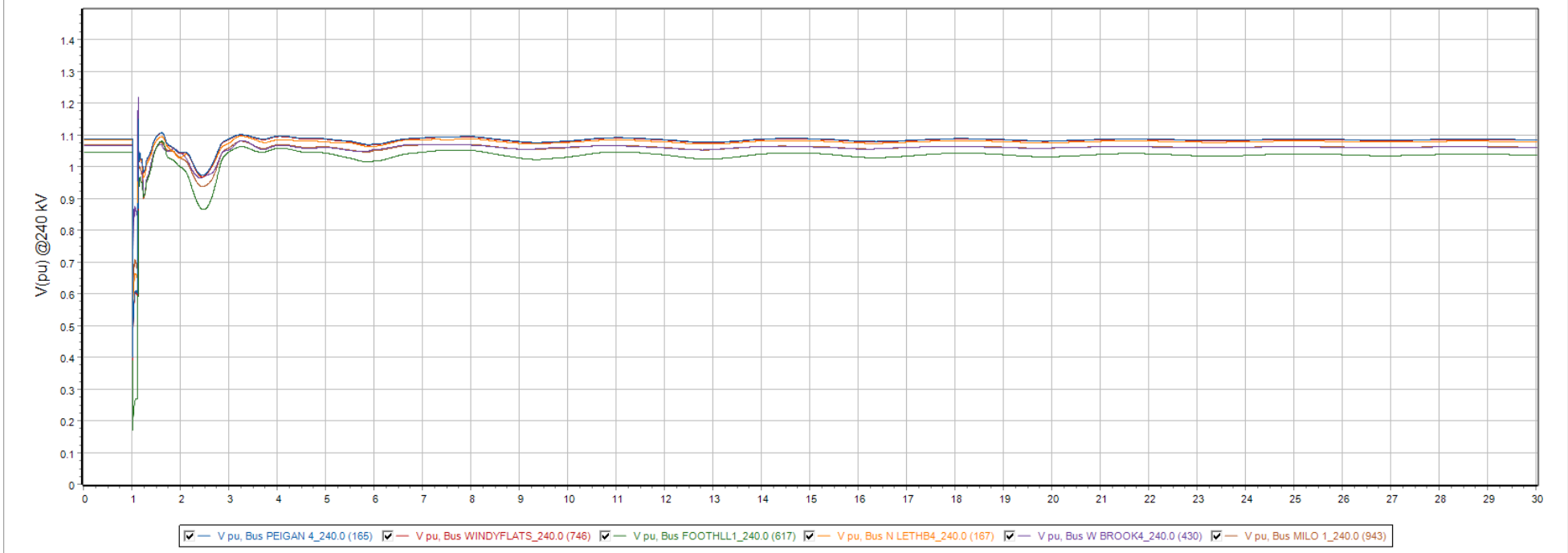
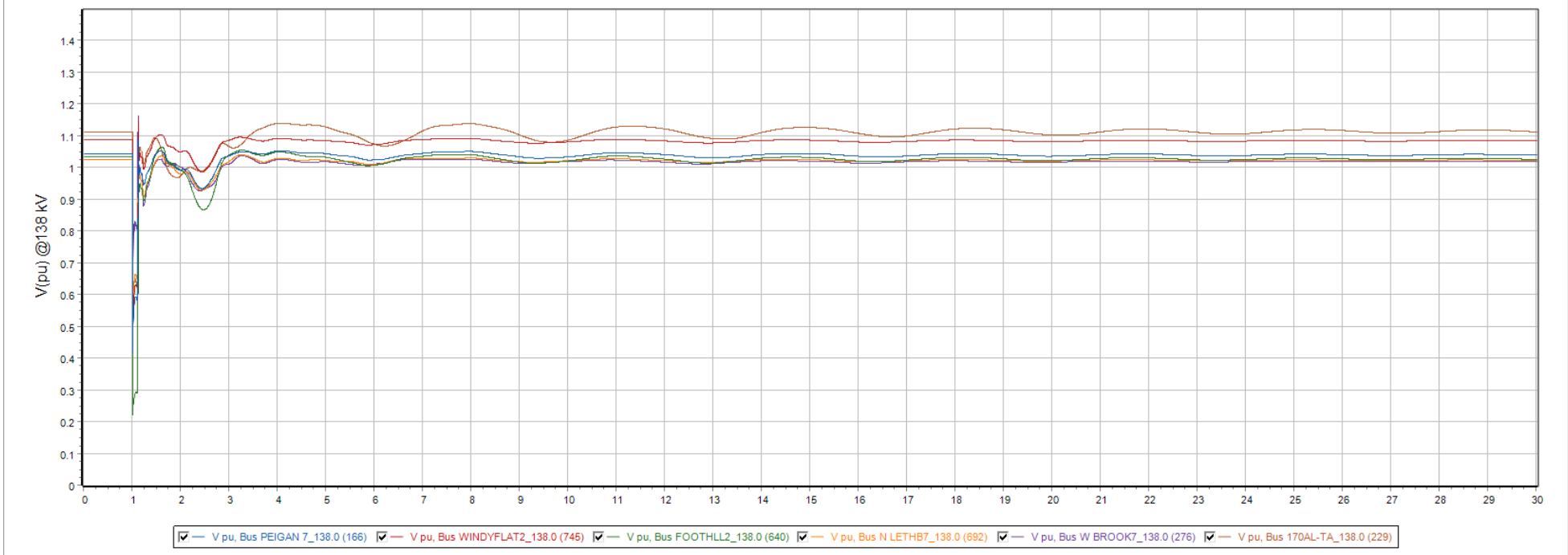
May 16, 2023 23:41:44

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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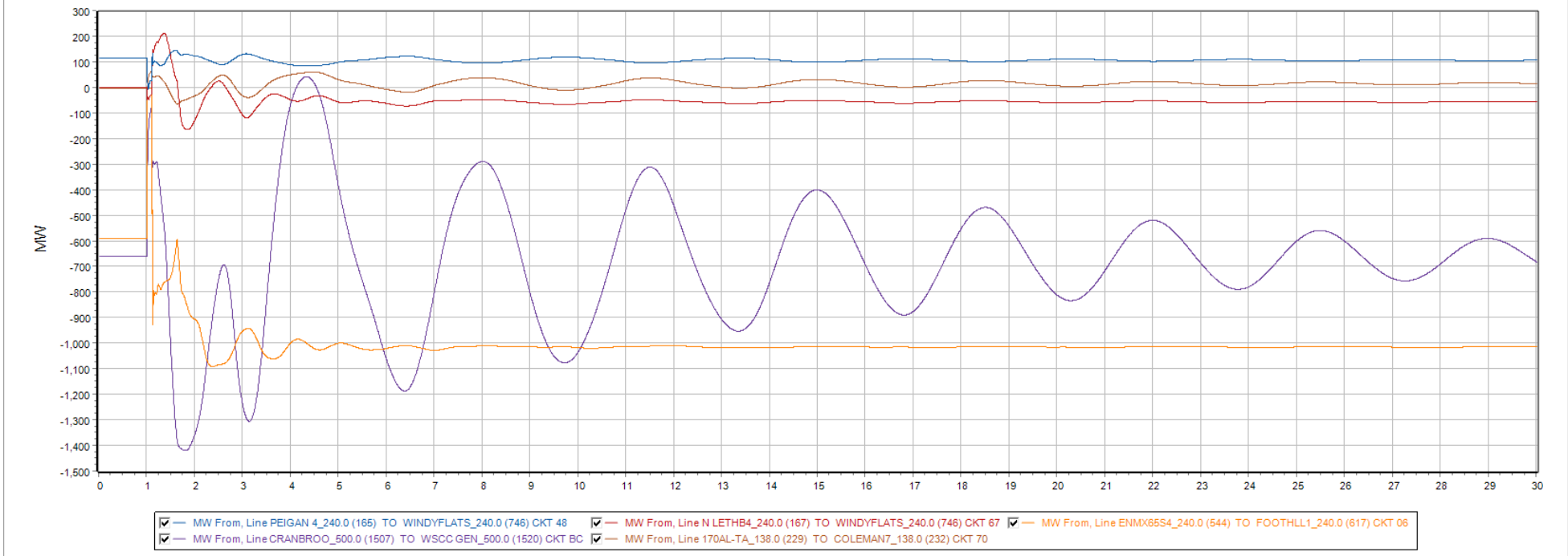
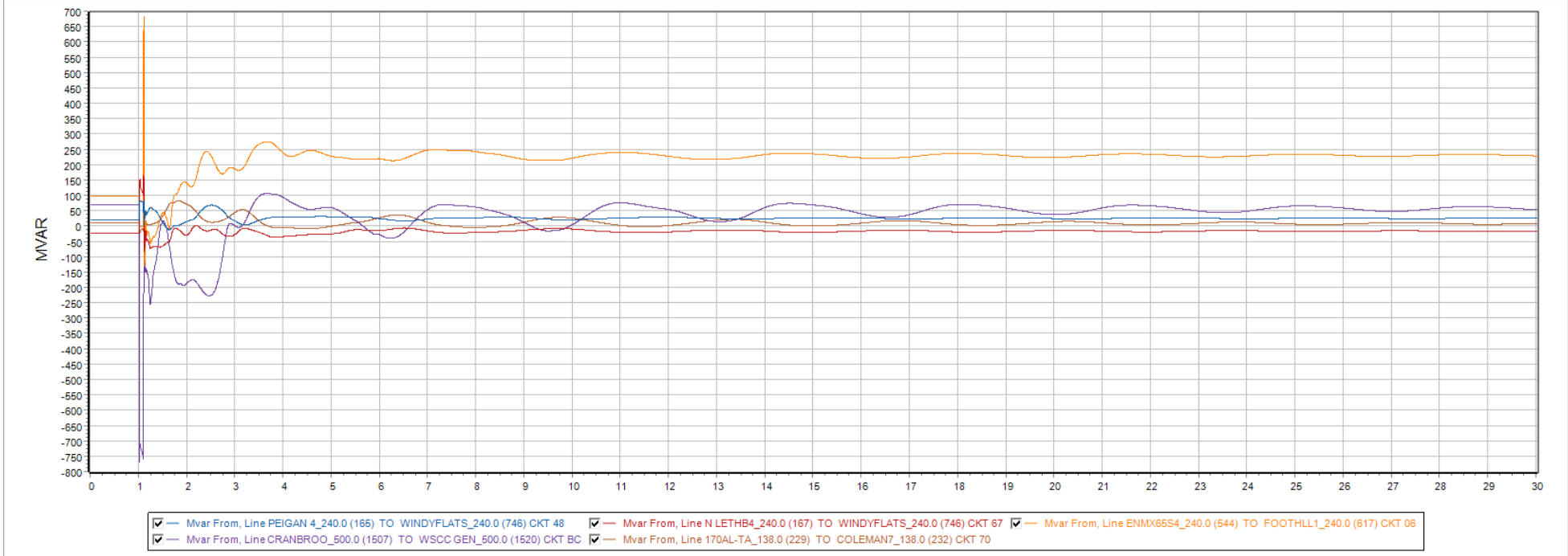
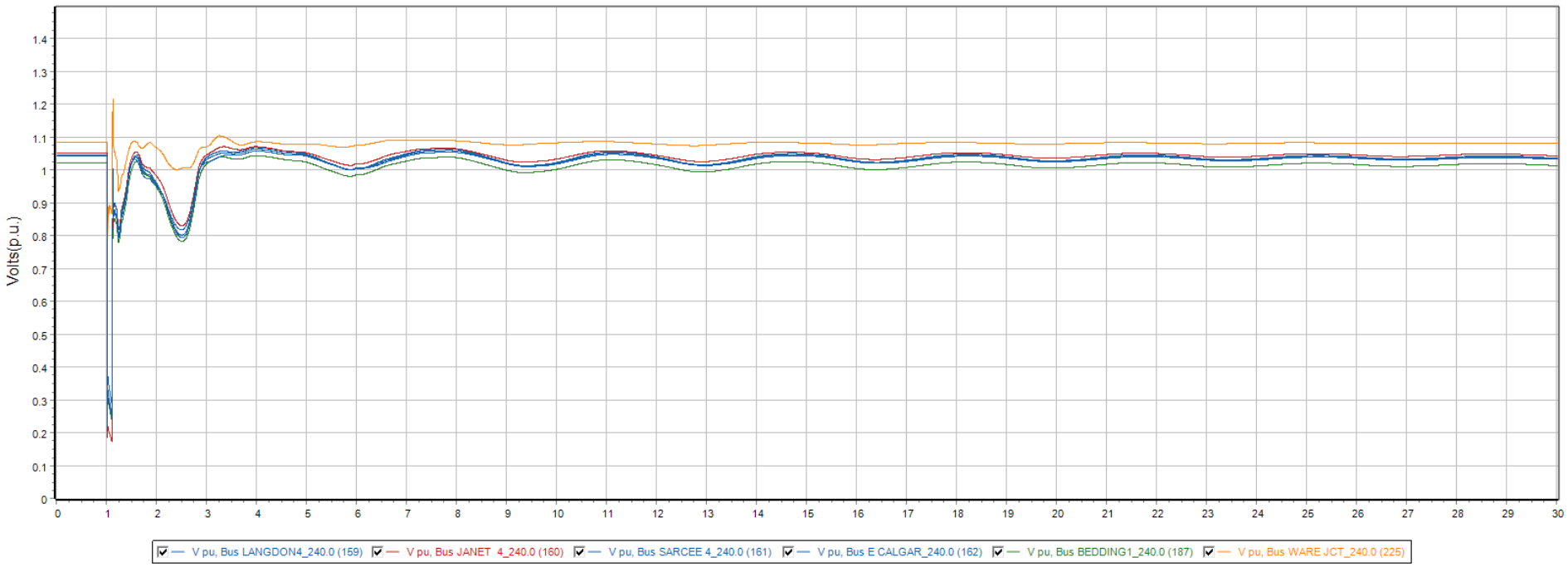
May 16, 2023 23:41:44

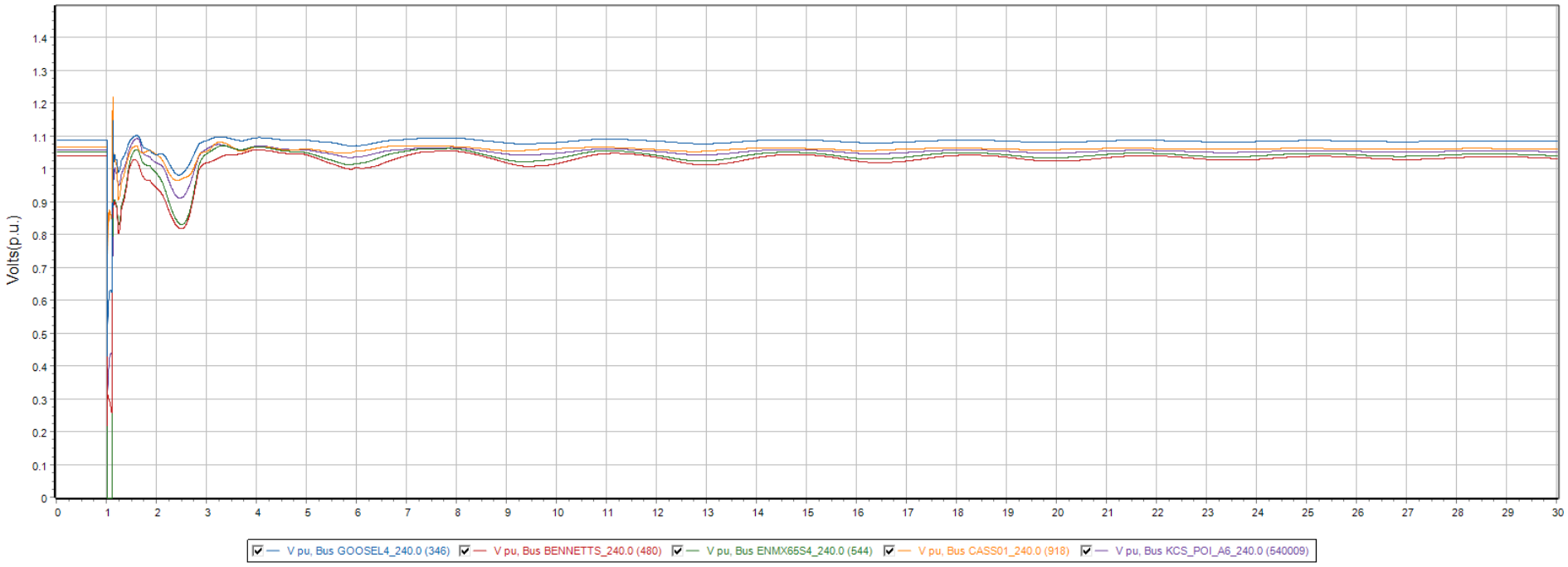
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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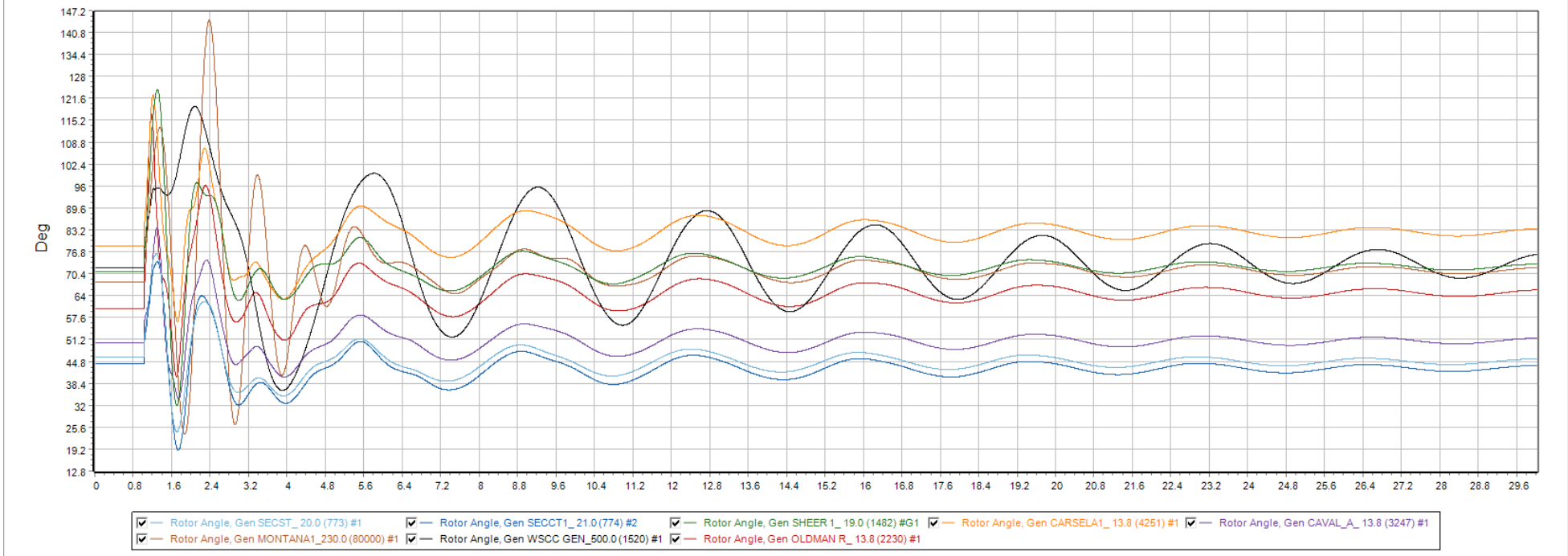
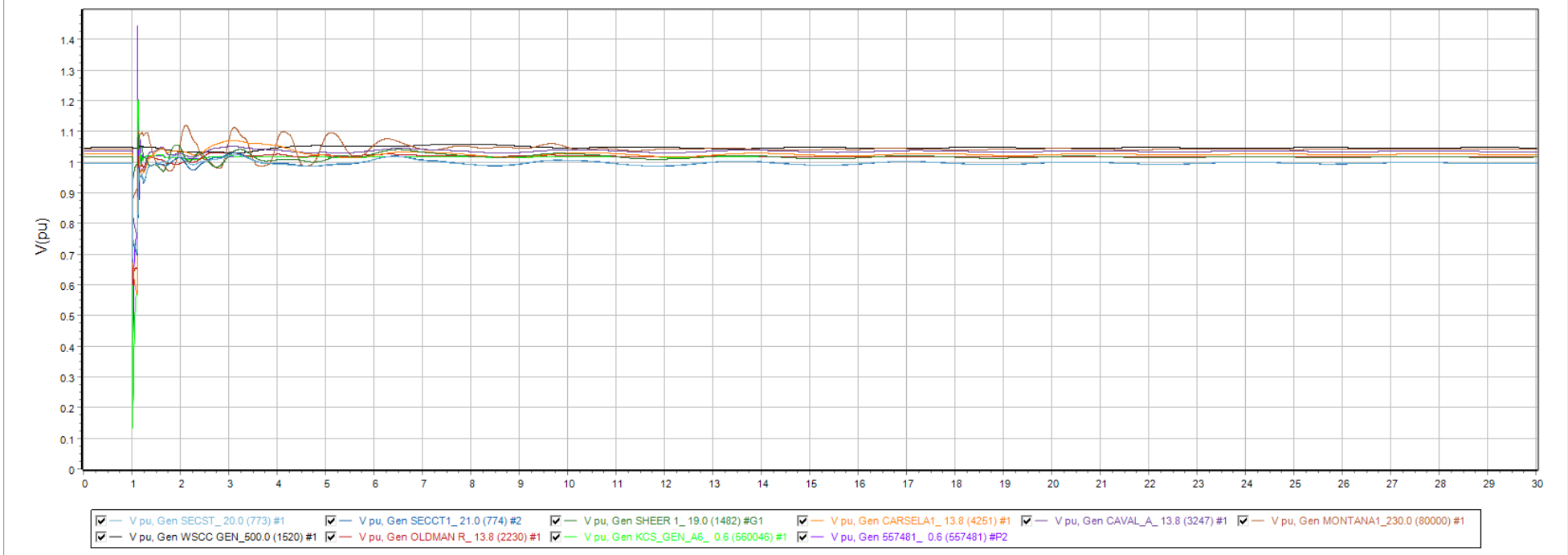
May 16, 2023 23:41:45

Monitor Gens. Q1





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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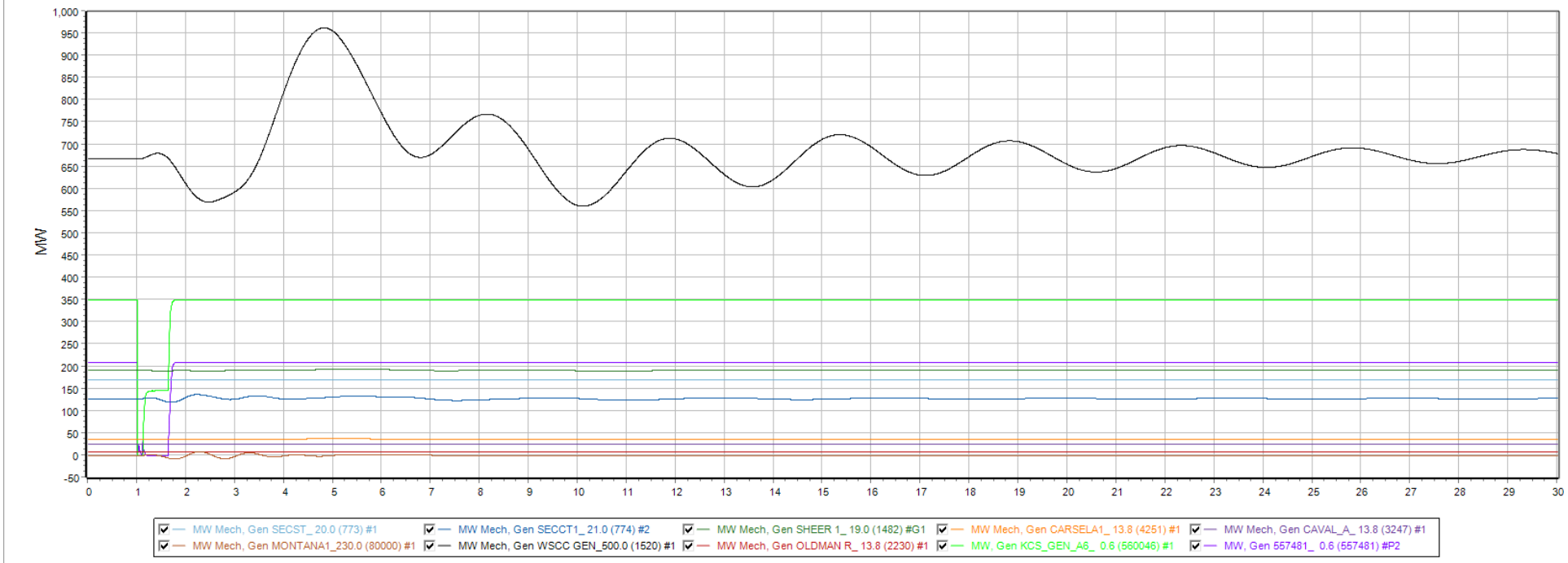
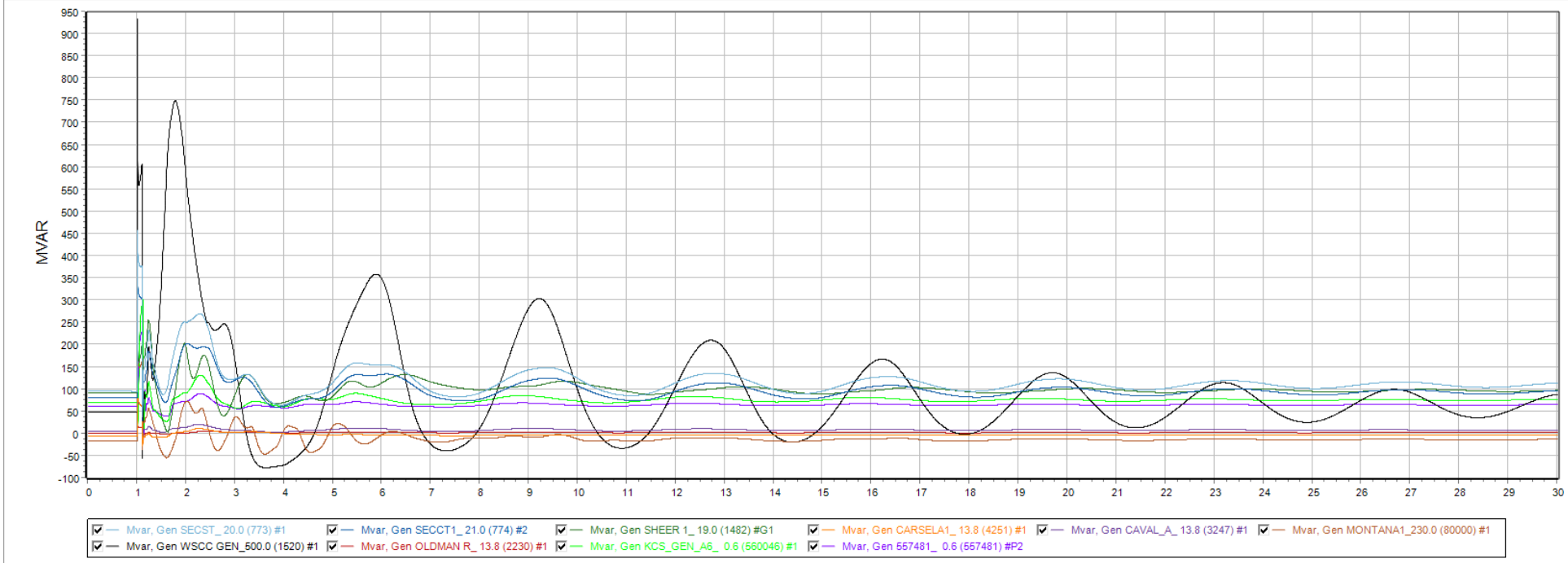
Monitor Gens. Q2





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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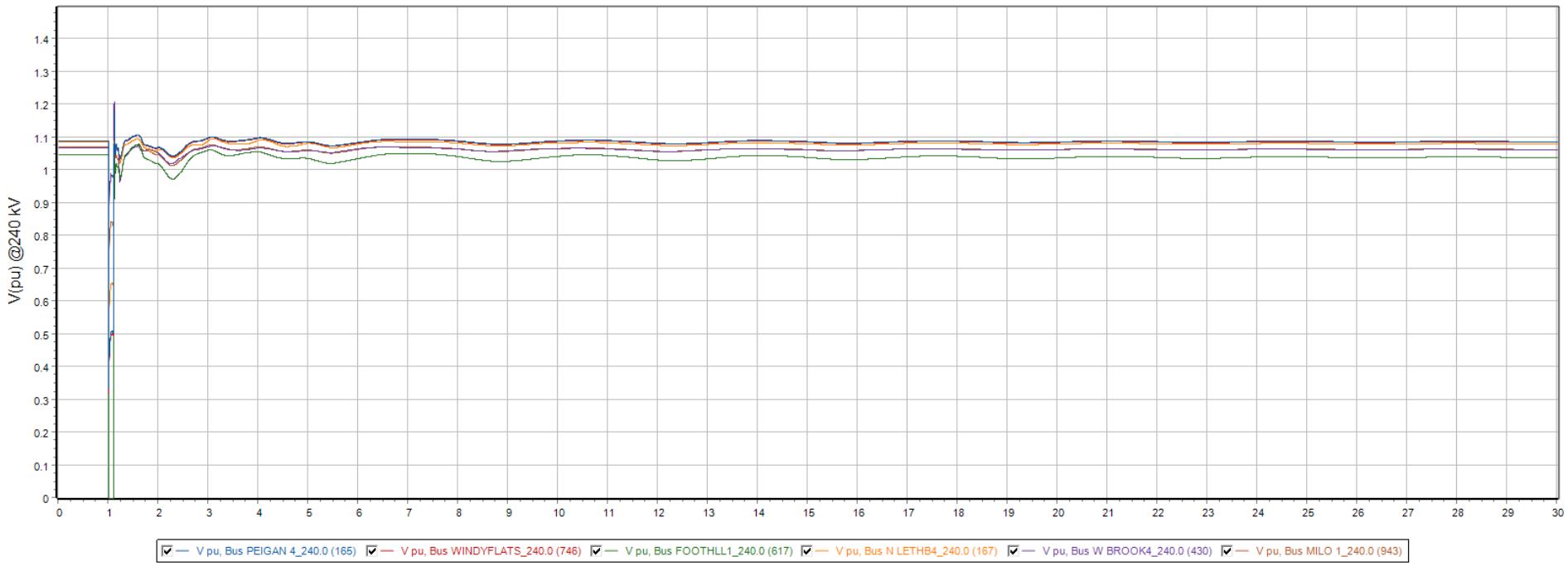
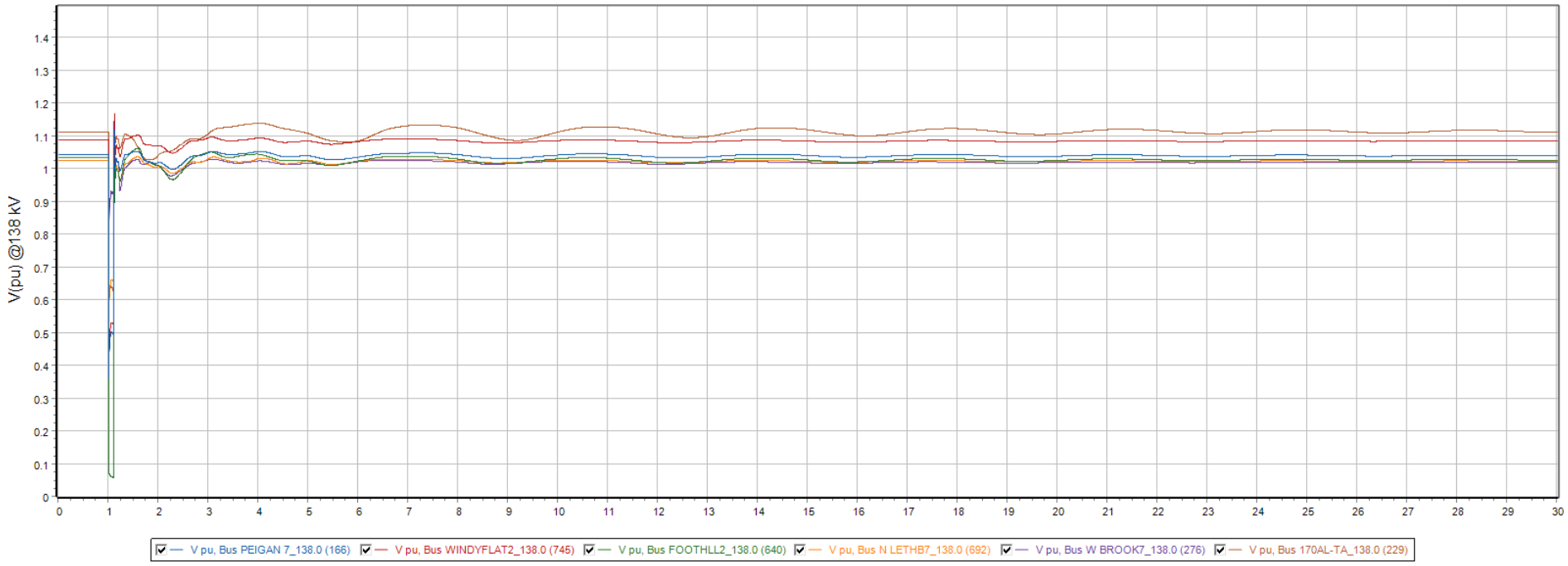
May 16, 2023 23:48:05

Monitor Bus Volts Q3





SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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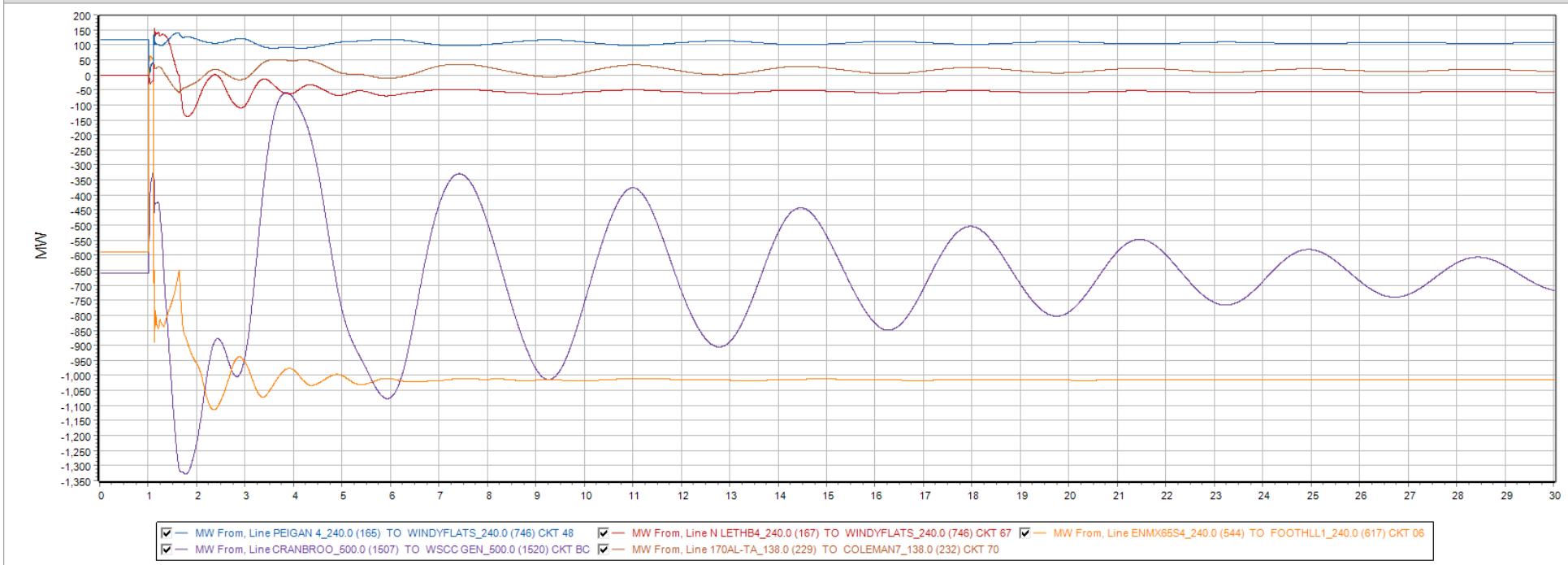
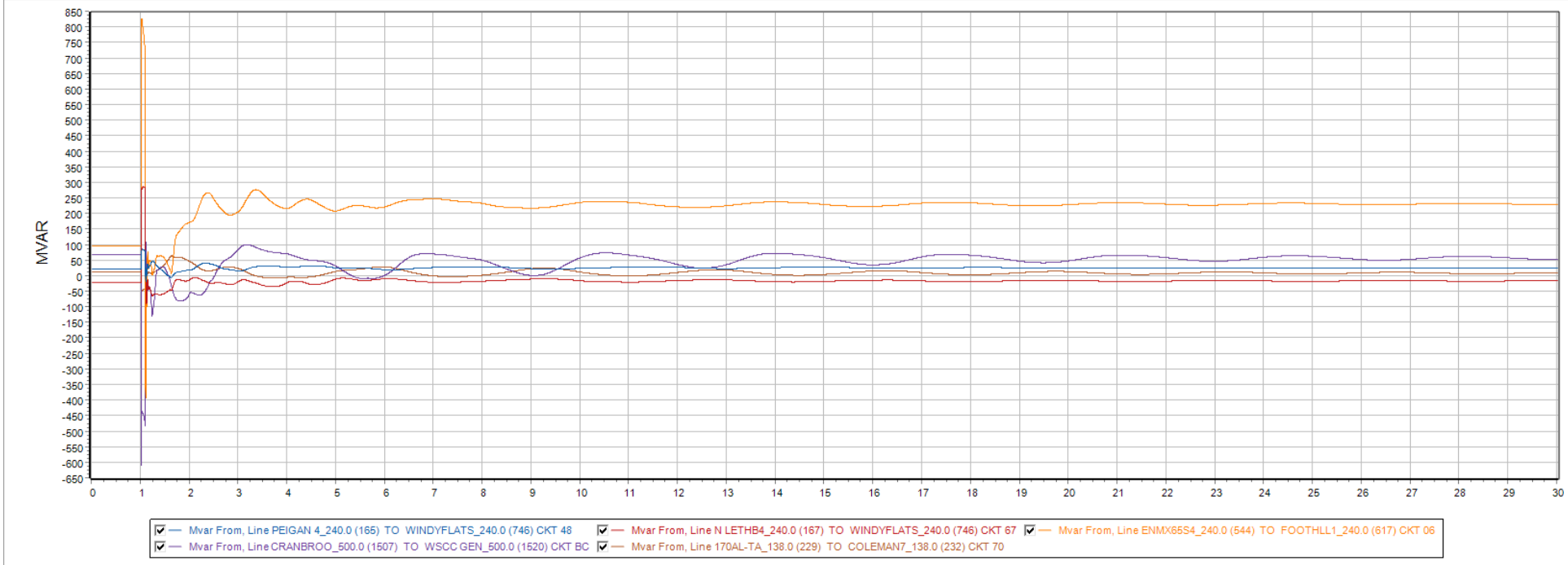
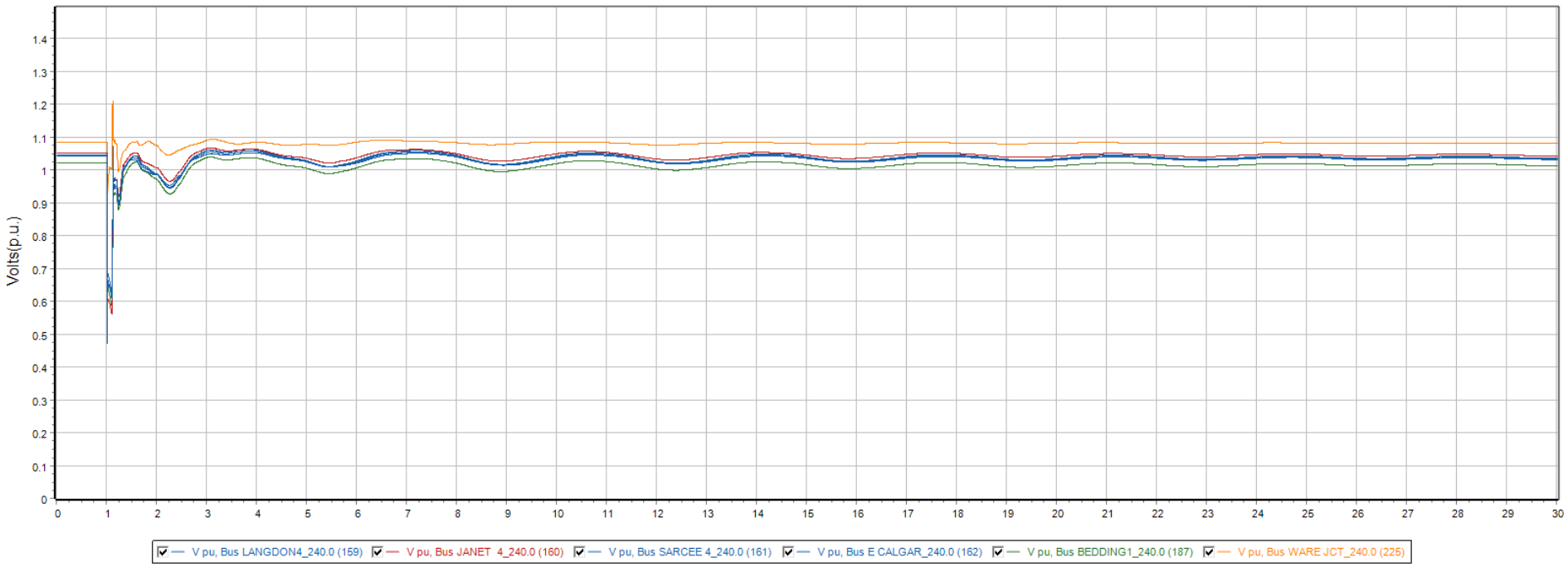
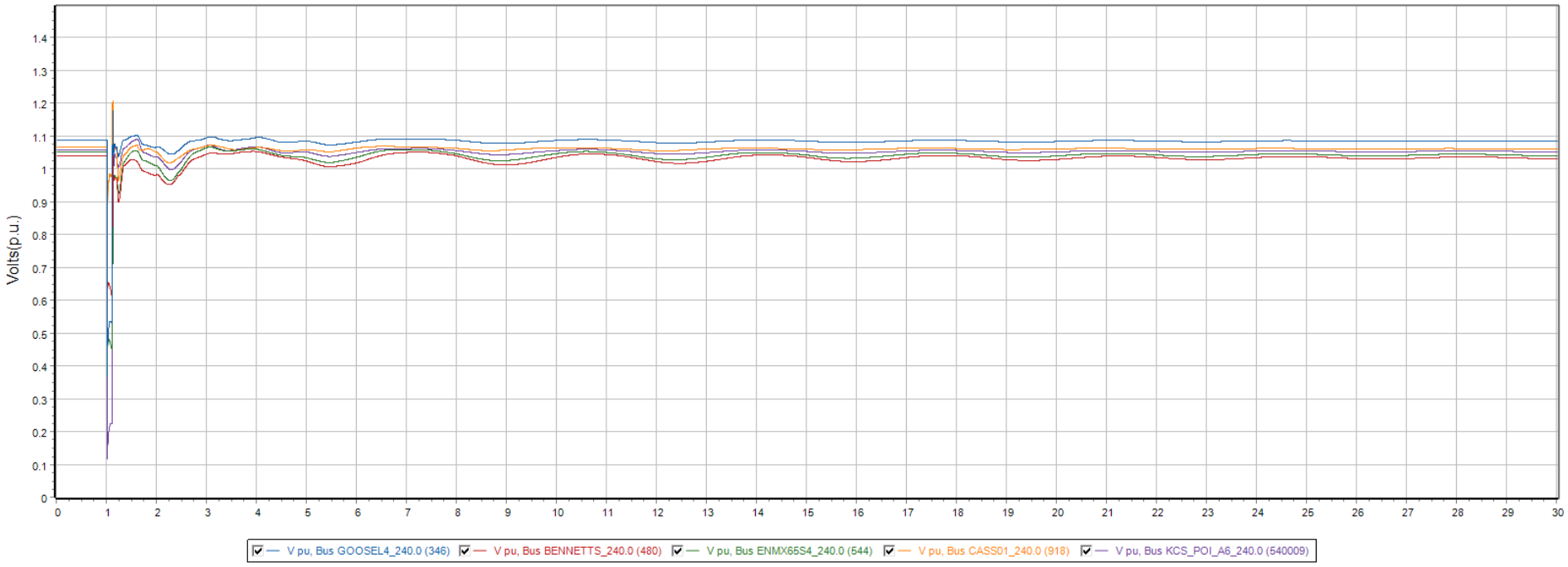
Monitor Line MW & MVAR. Q4



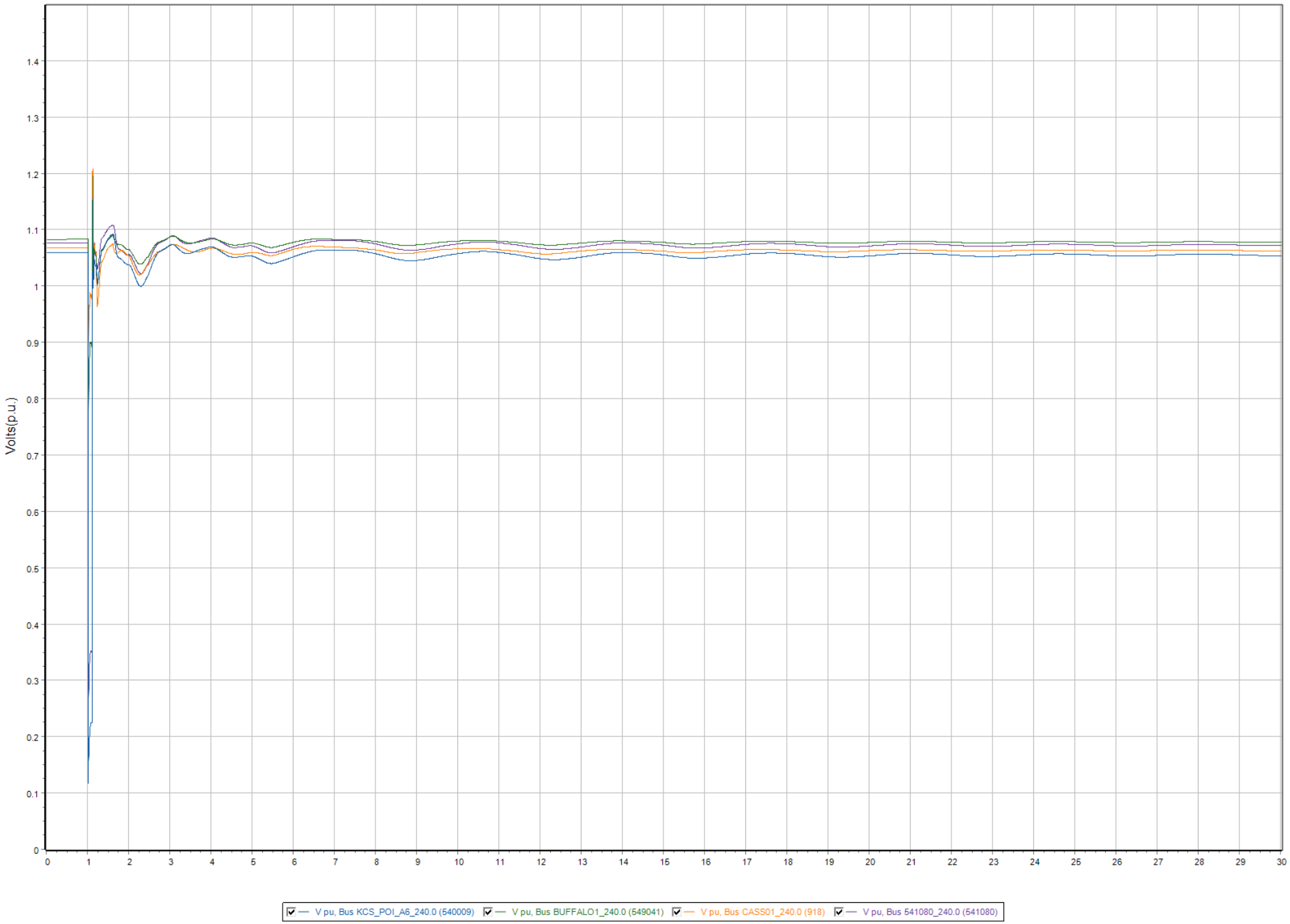


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC08_2025SL_POST-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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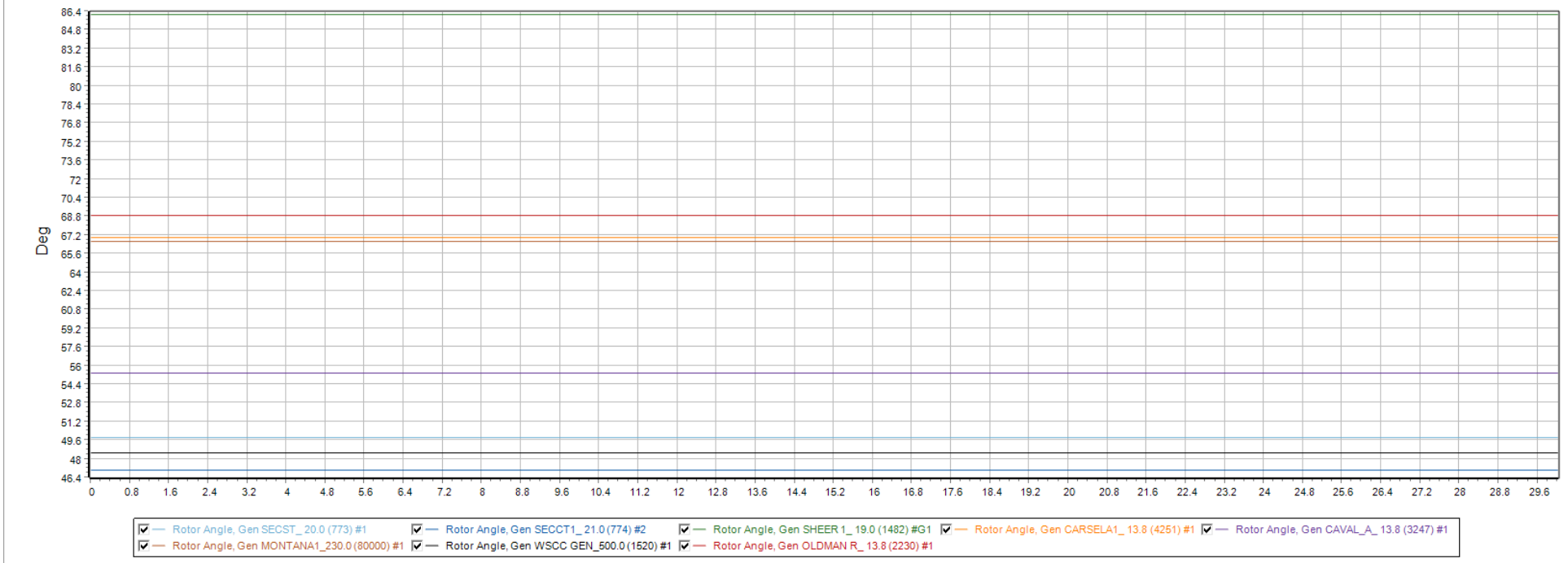
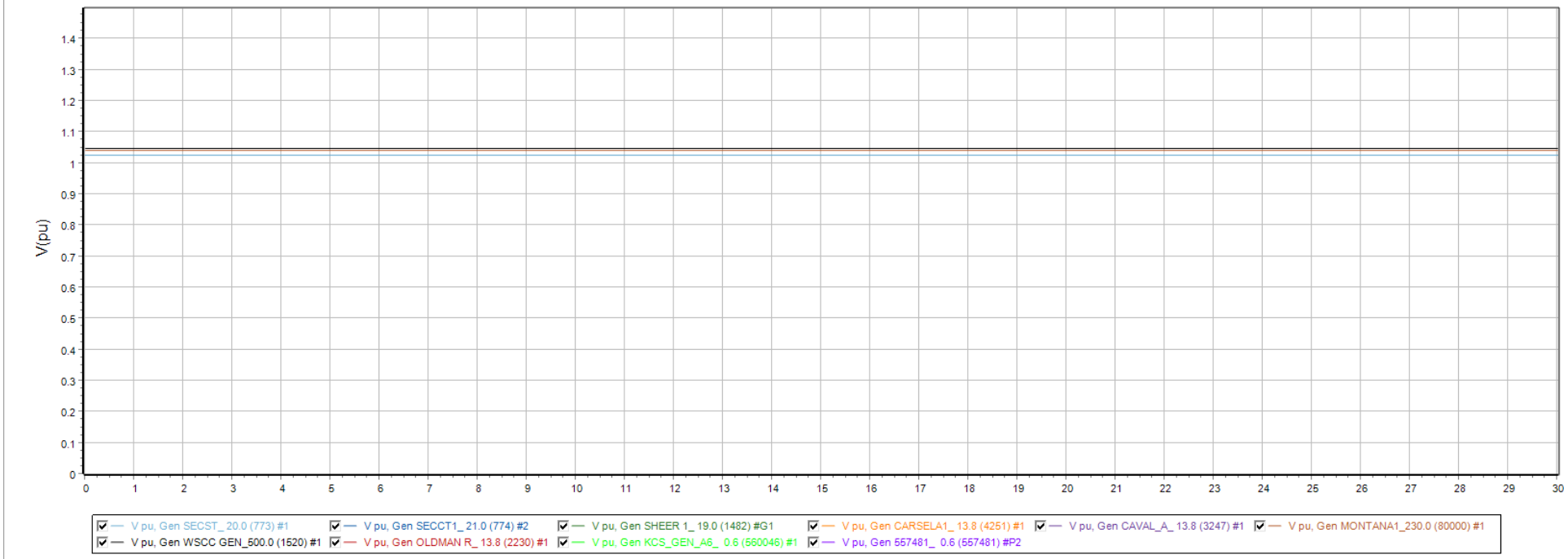
2025 SUMMER PEAK SENSITIVITY

Single Line Diagrams P2445
POST-PROJECT Transient
Stability Response SC09

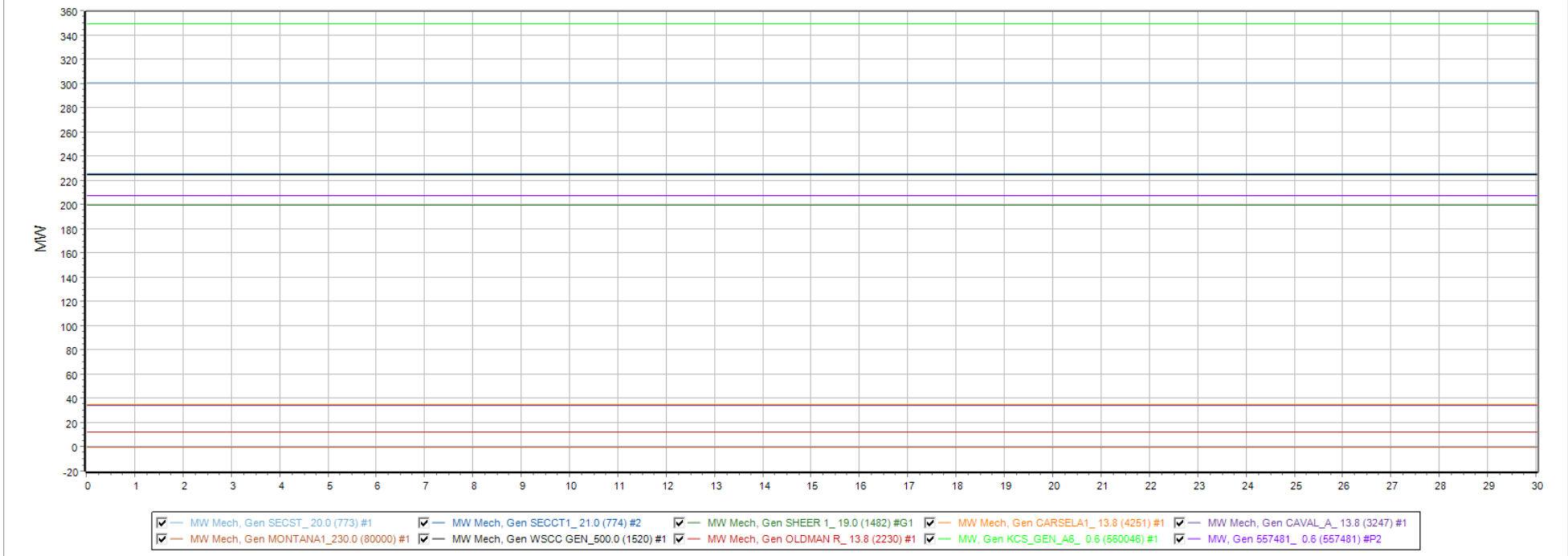
NICAN

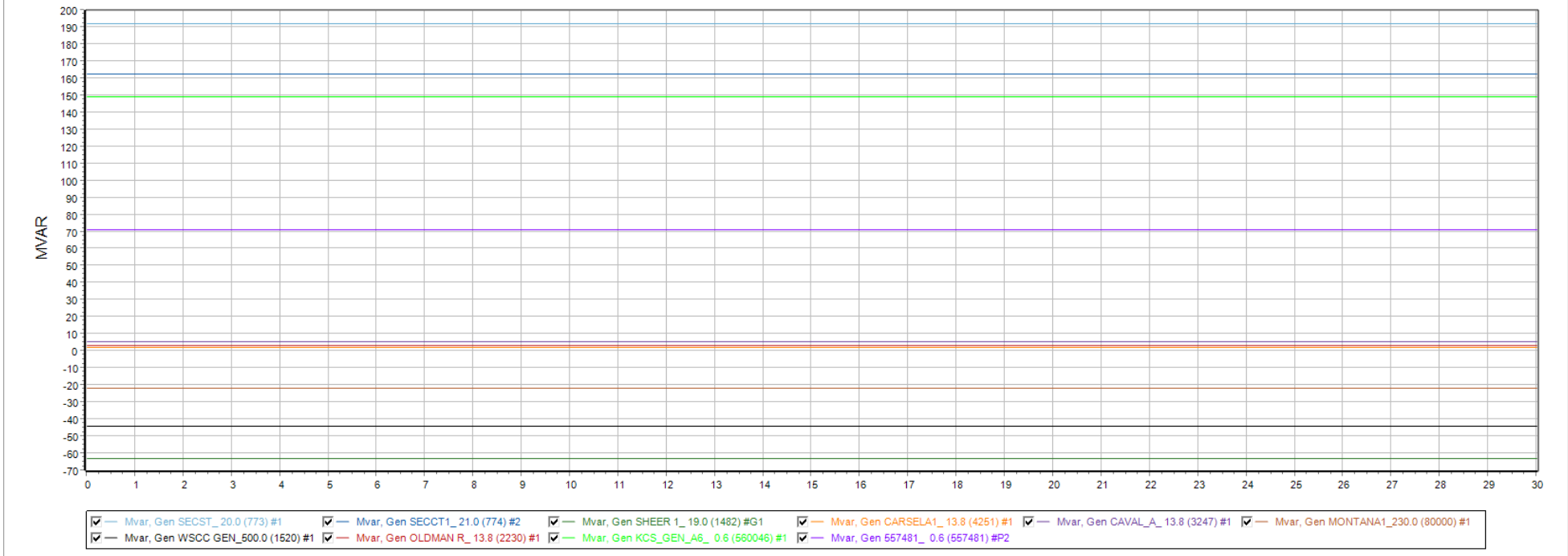
Monitor Gens. Q1



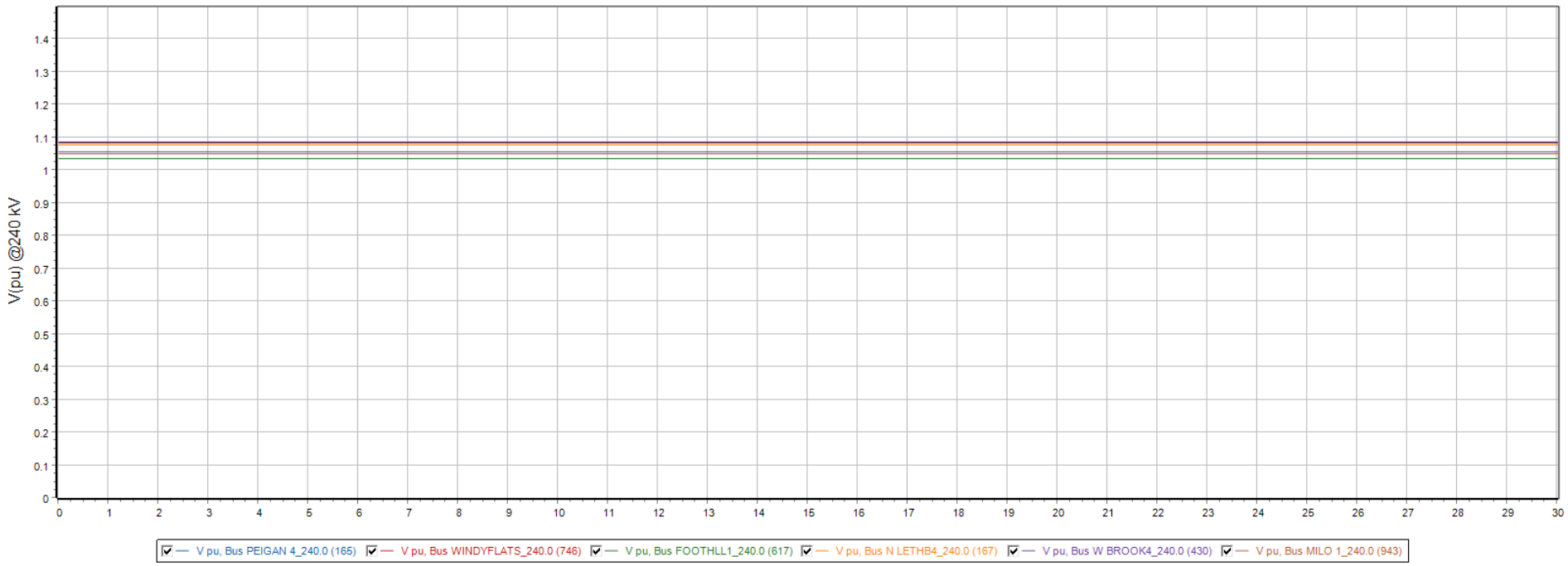


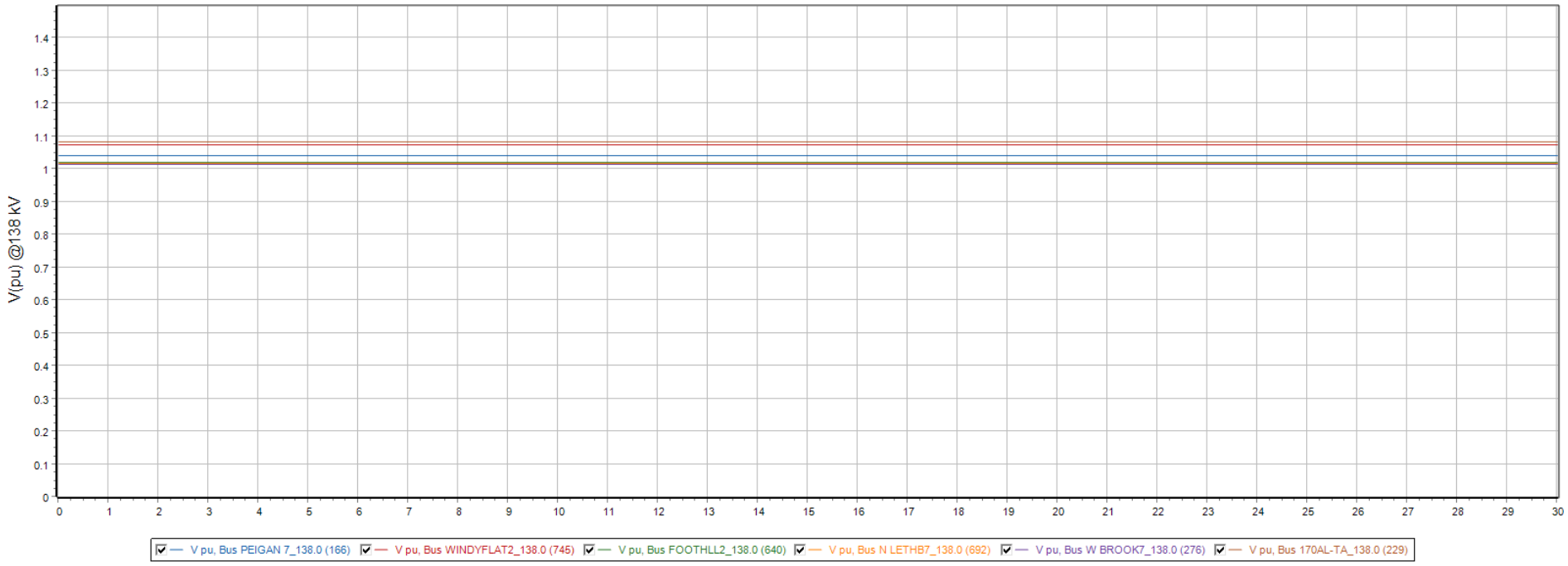
Monitor Gens. Q2



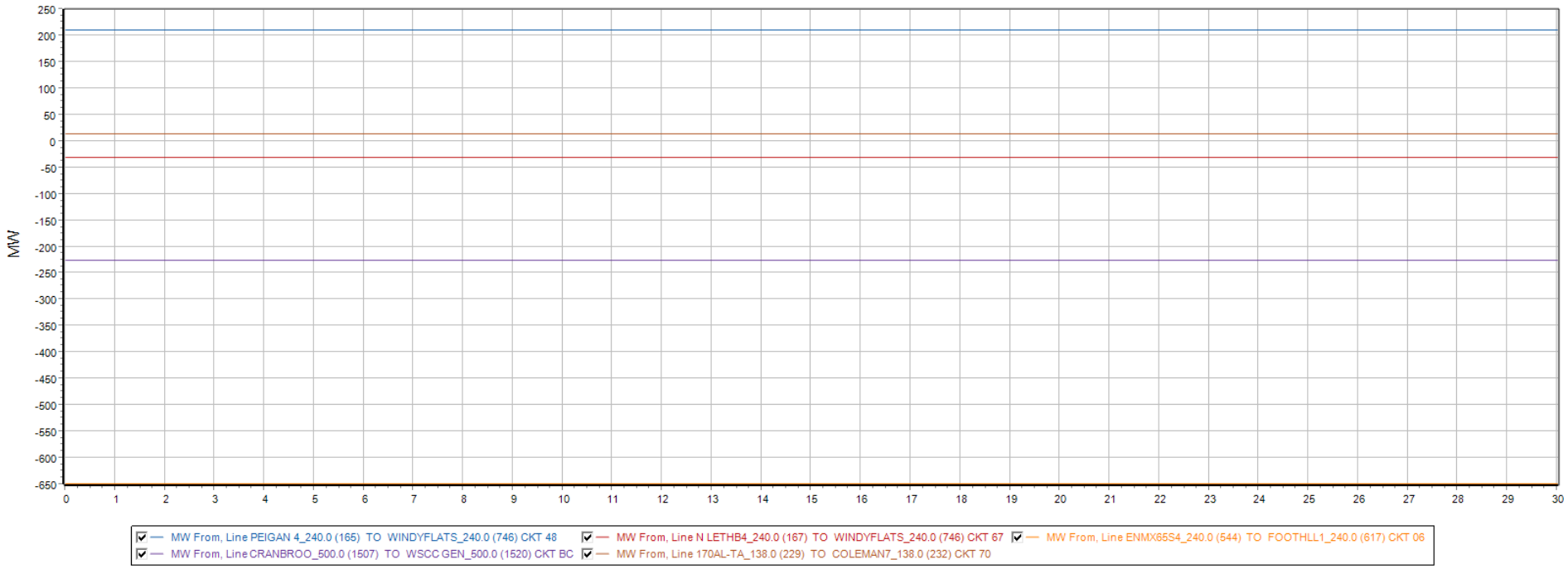


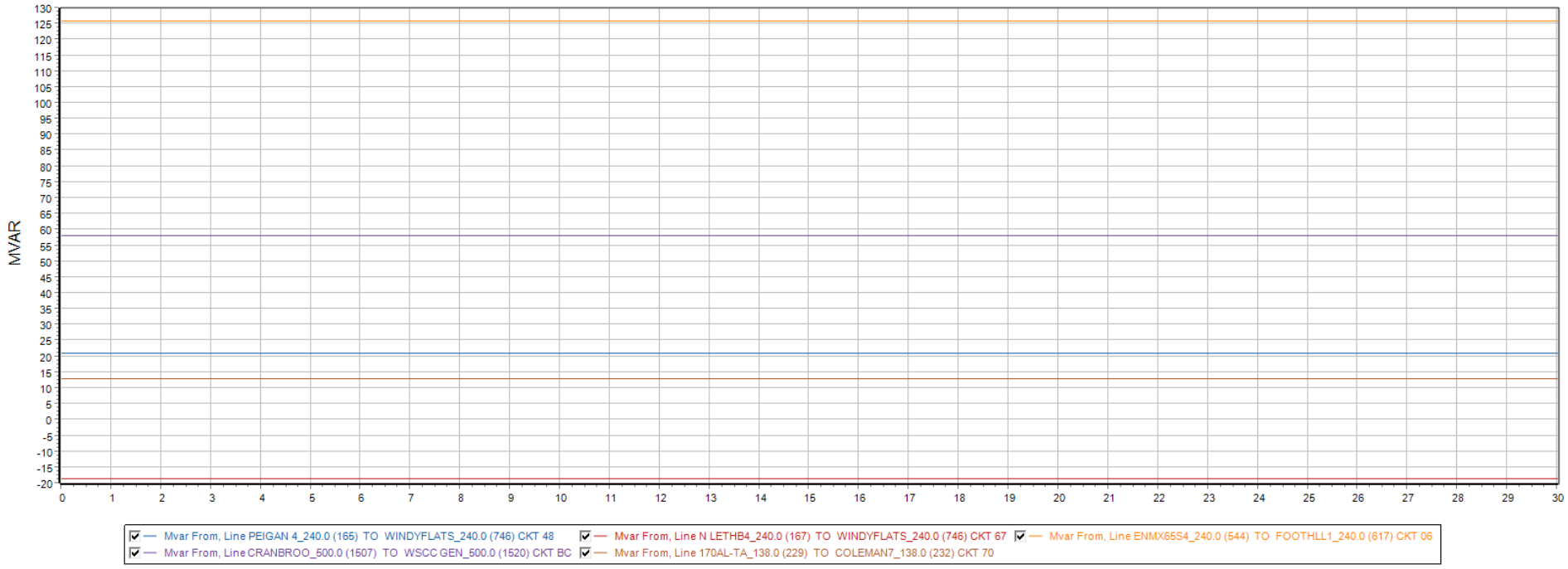
Monitor Bus Volts Q3



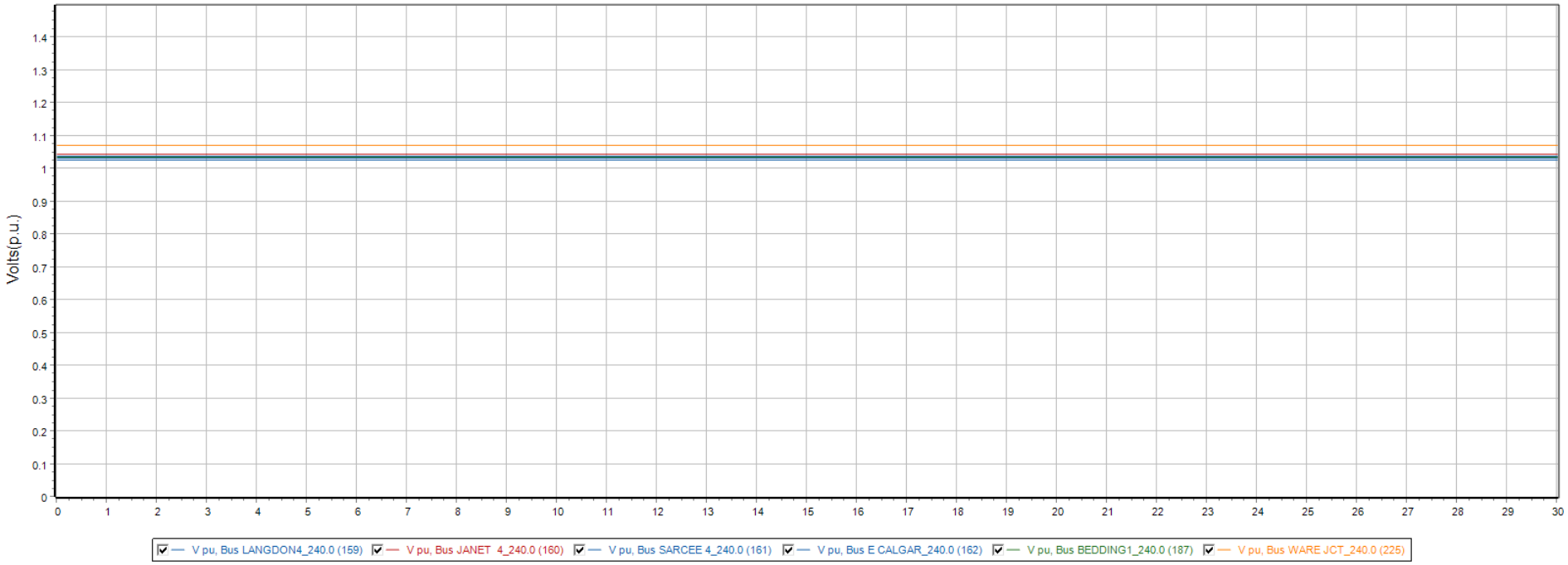


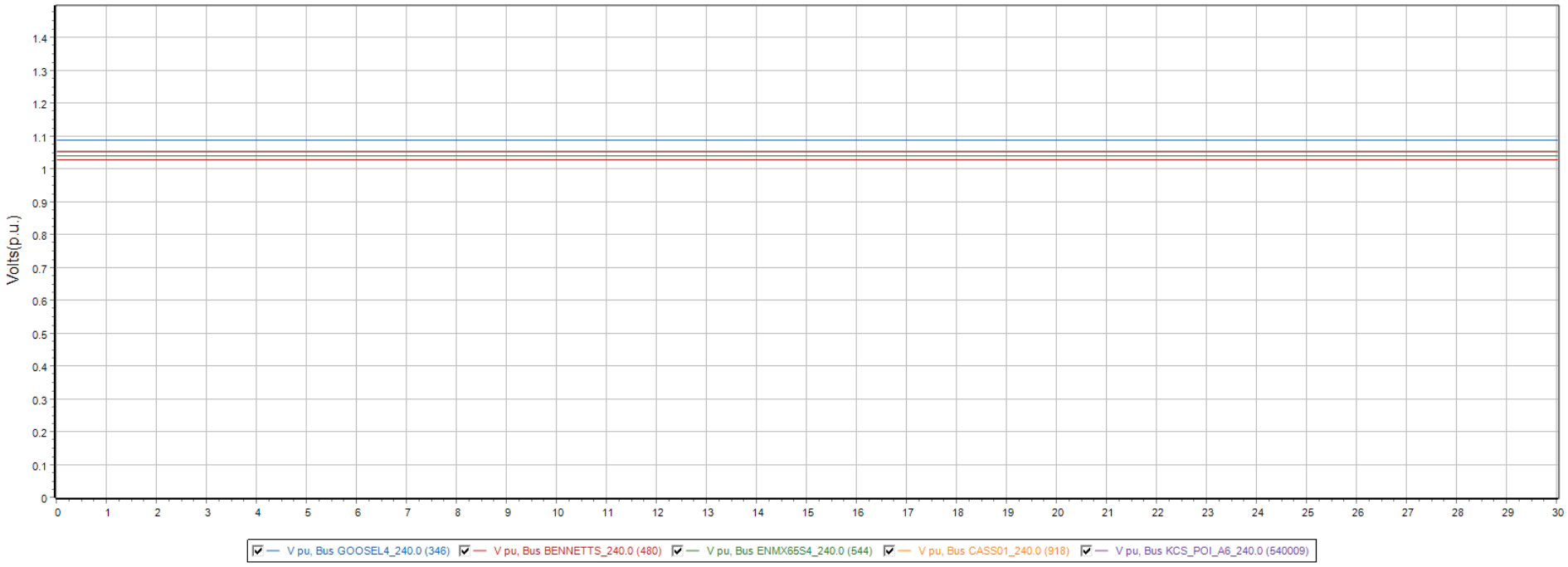
Monitor Line MW & MVAR. Q4



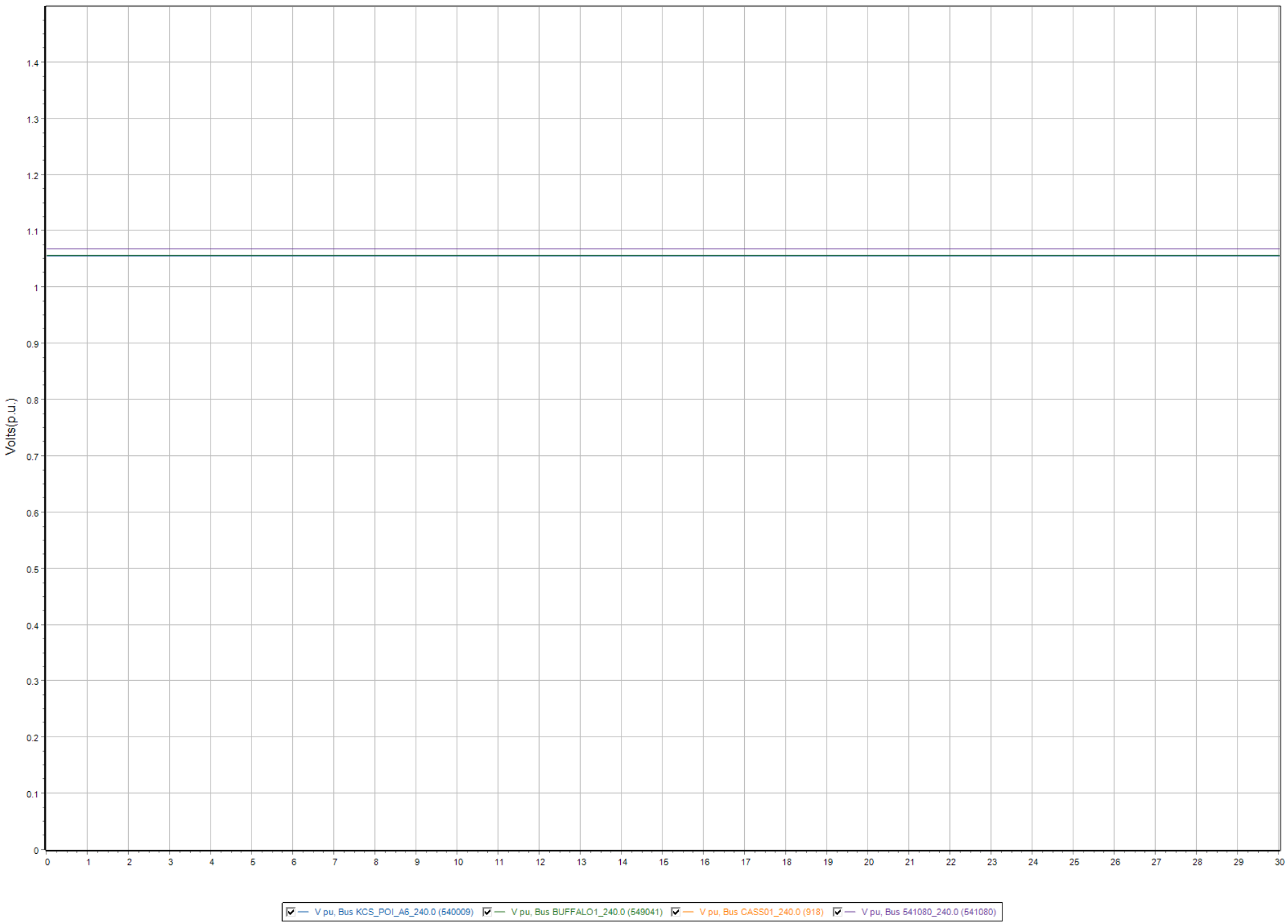


Additional 240 kV Bus Volts

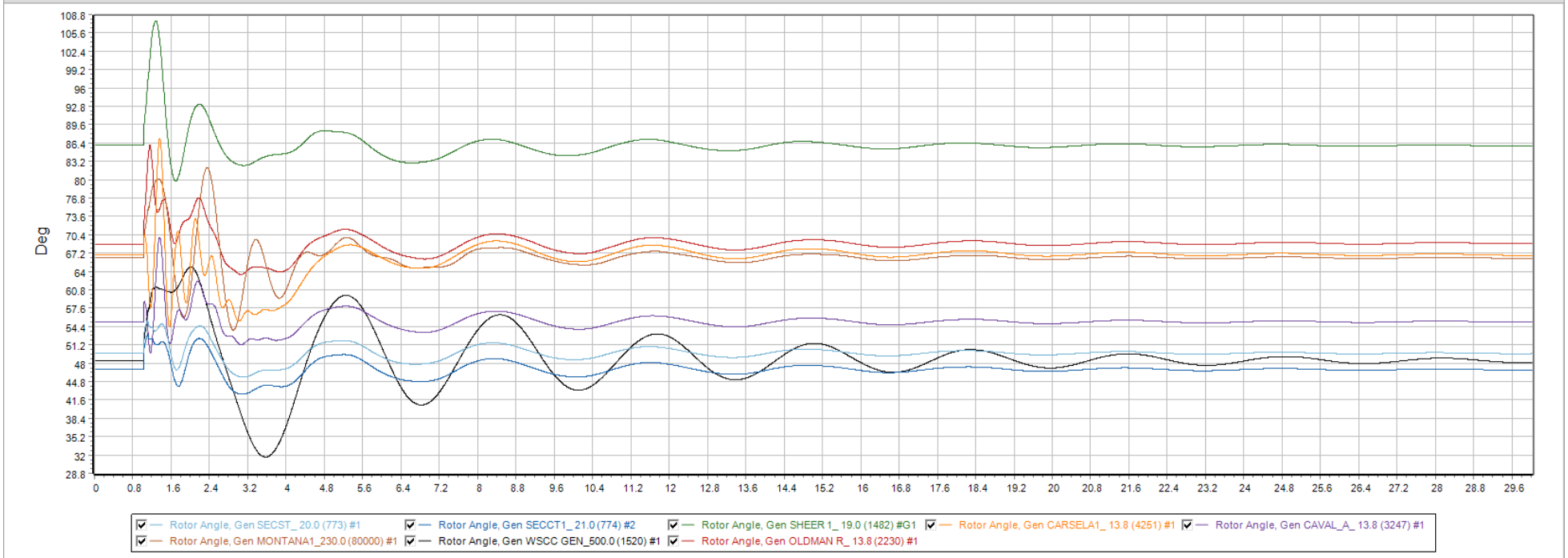


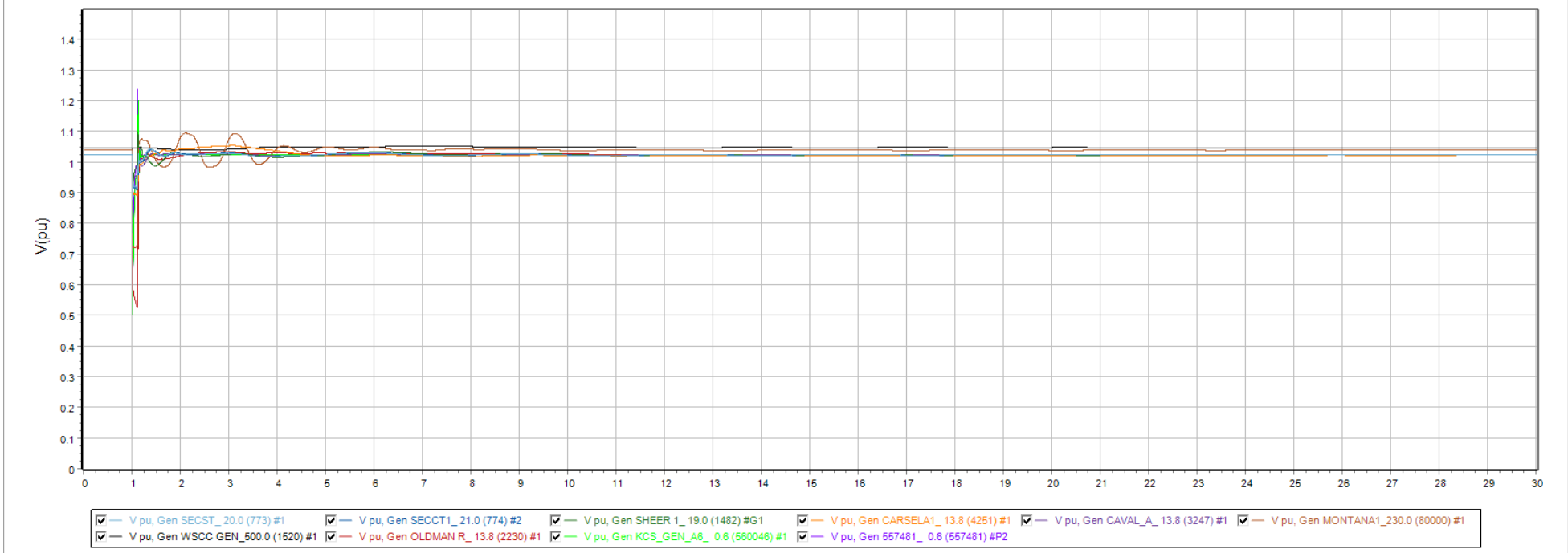


Large Project 240 kV Bus Volts



Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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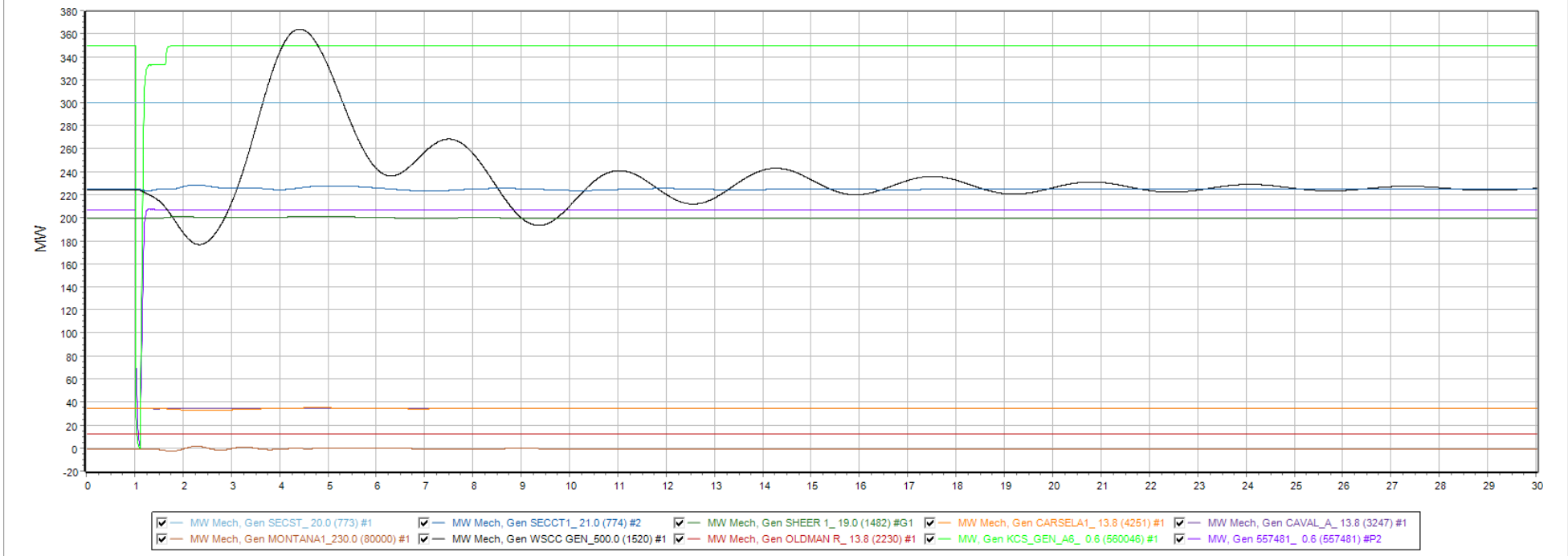
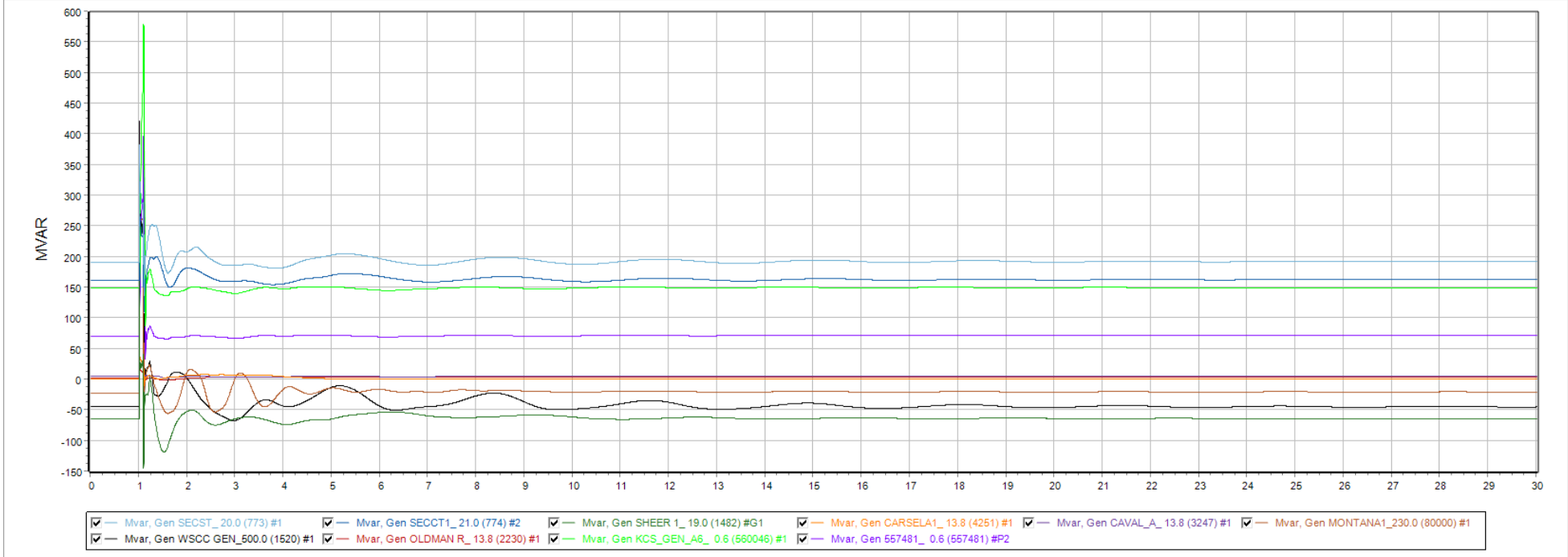
Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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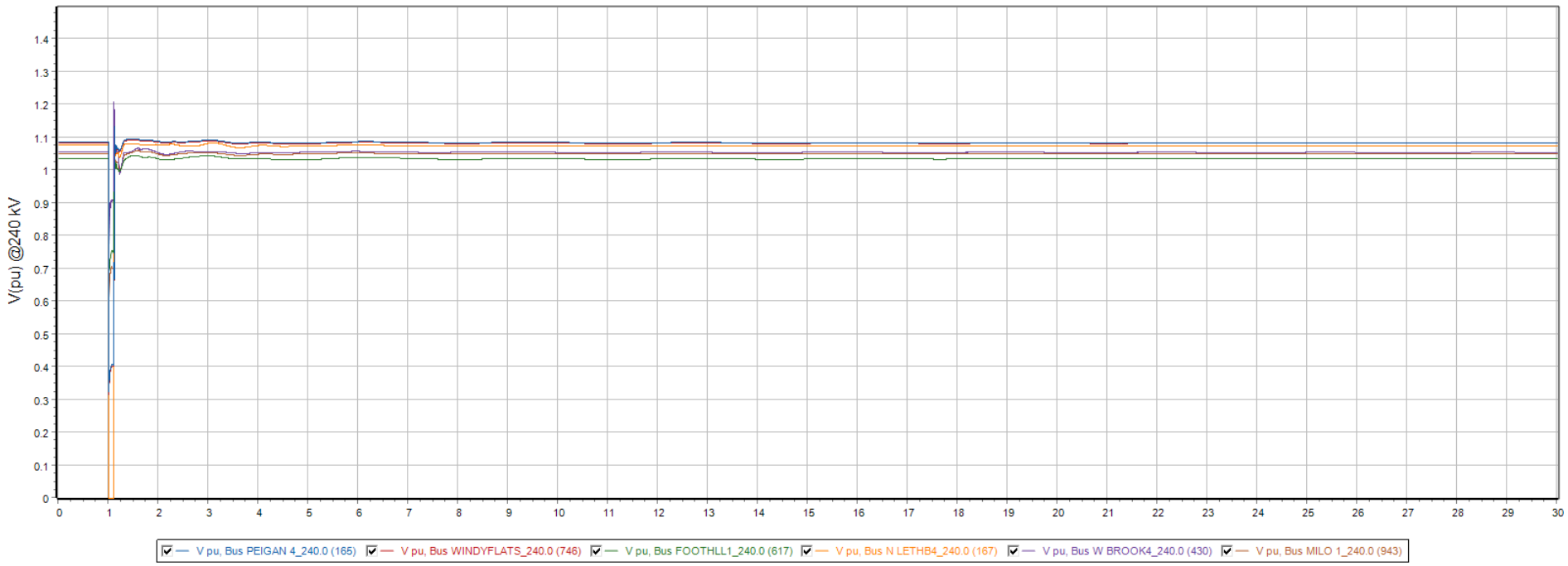
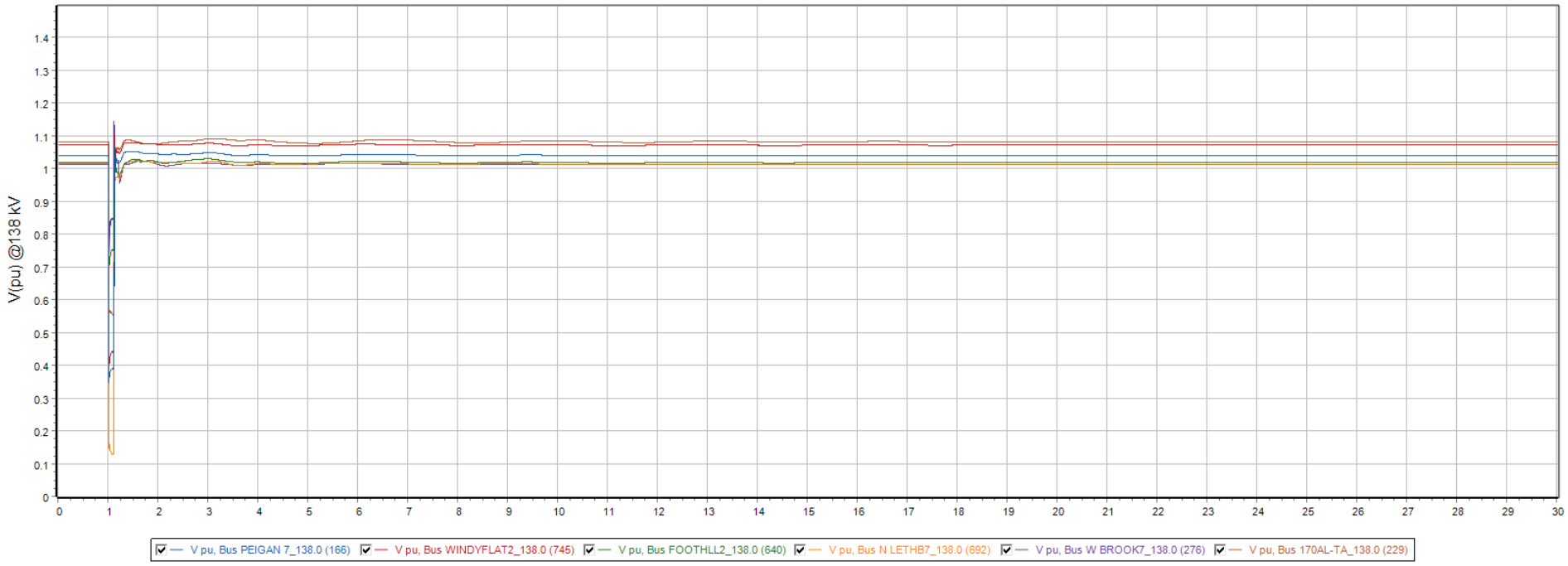
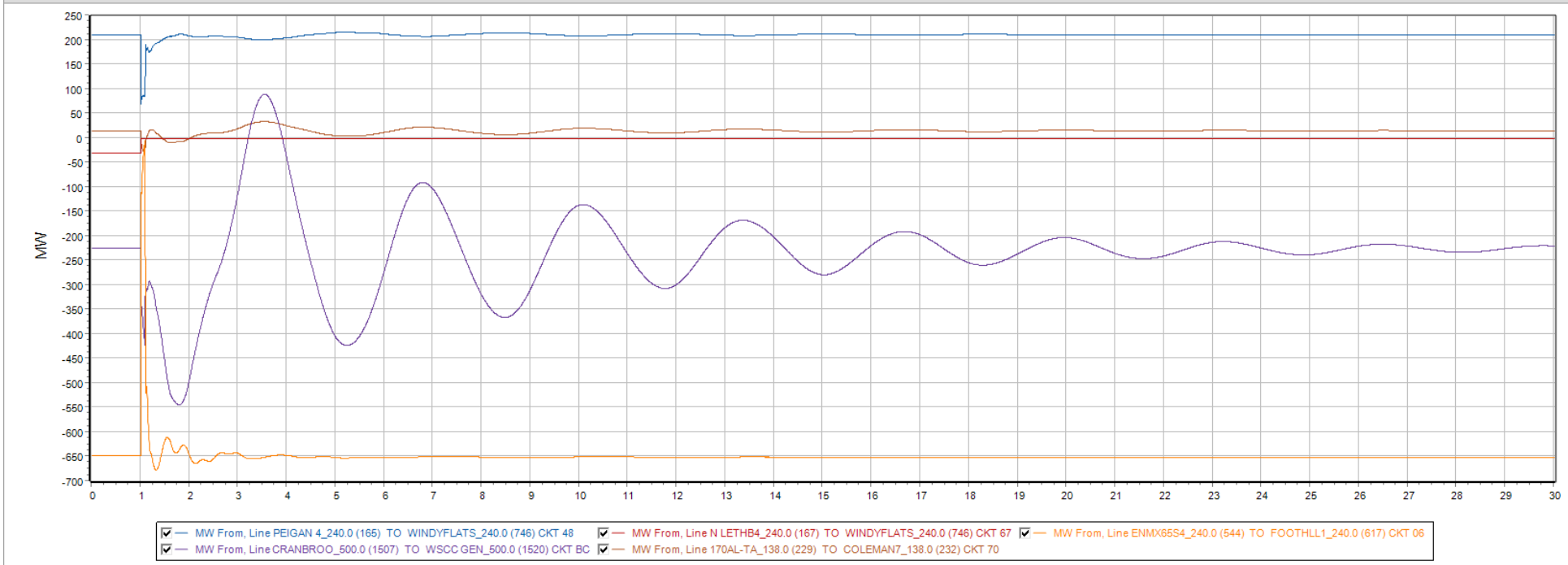
May 16, 2023 20:35:27

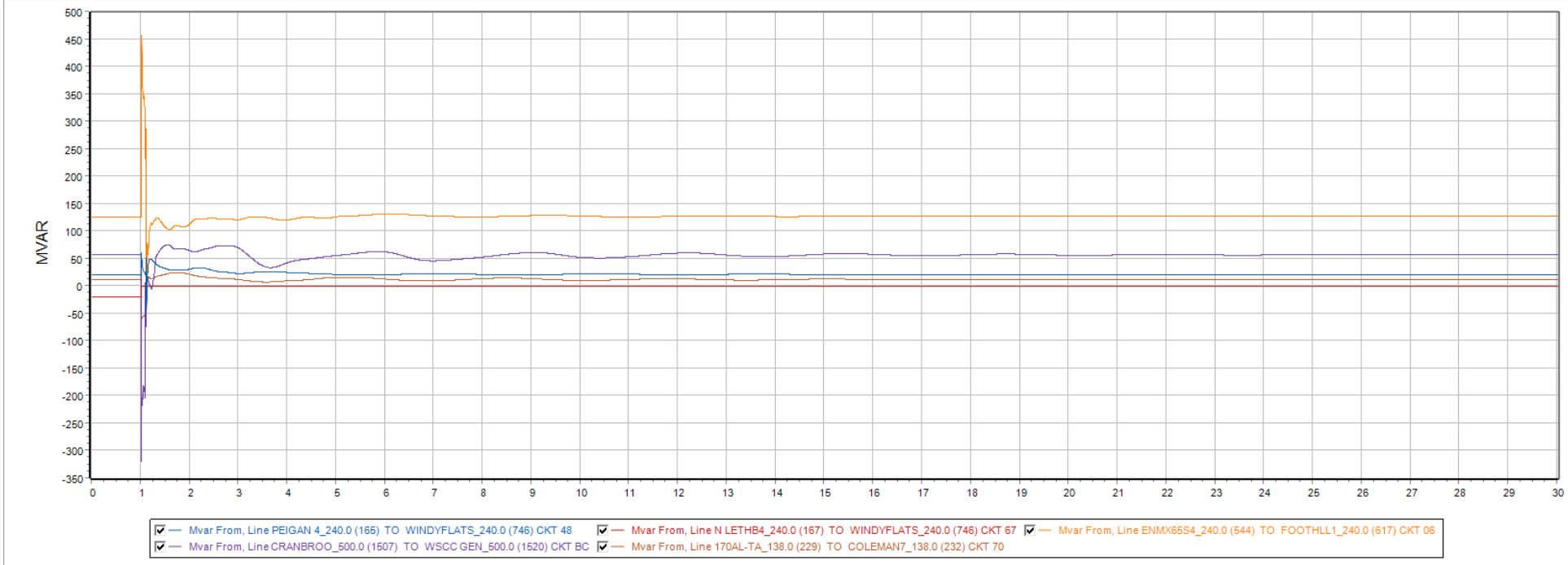
Monitor Bus Volts Q3



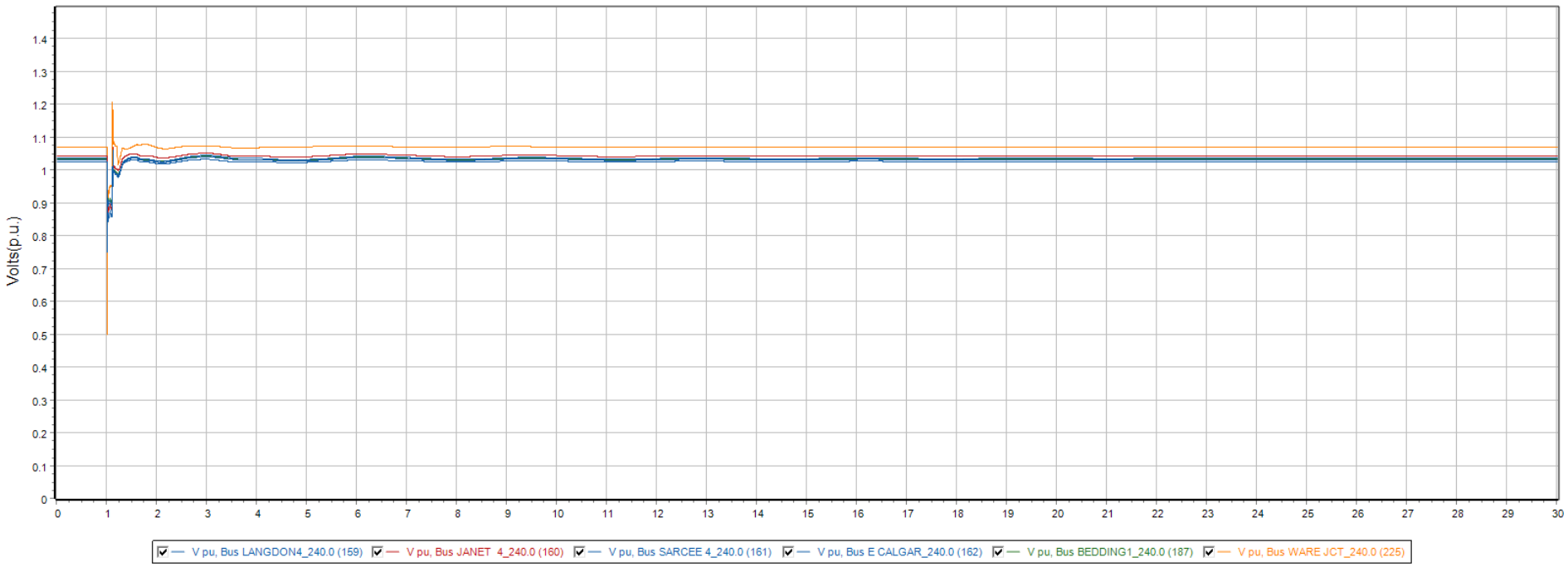


Monitor Line MW & MVAR. Q4

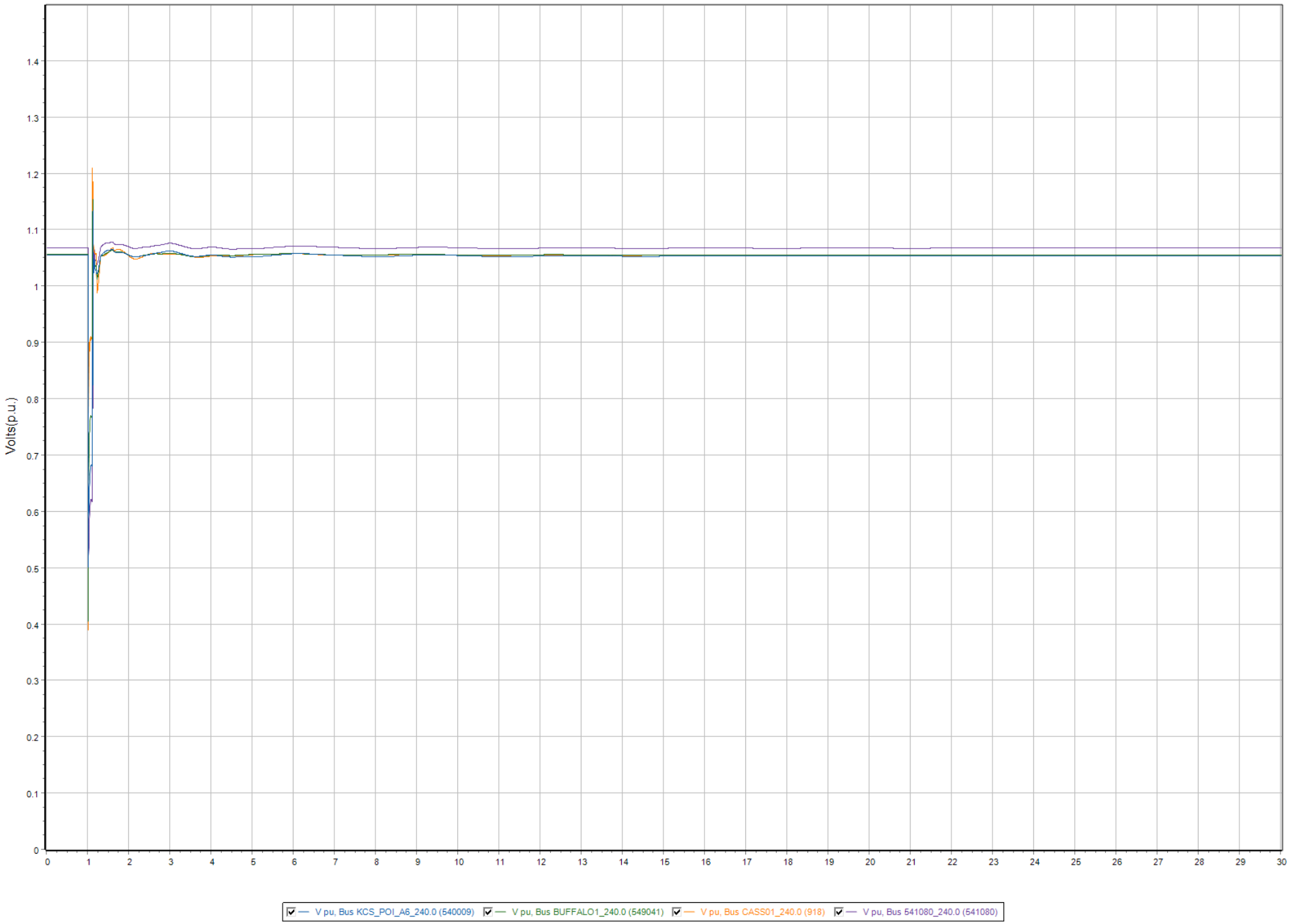




Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01A - 967L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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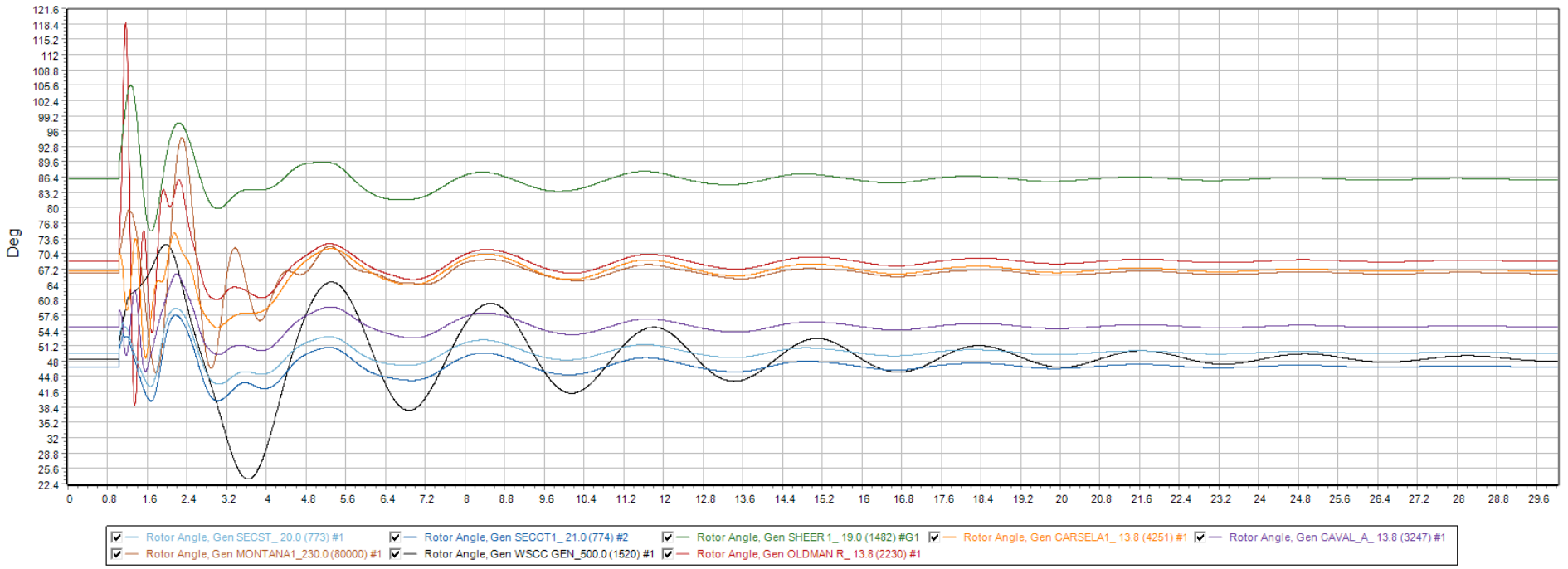
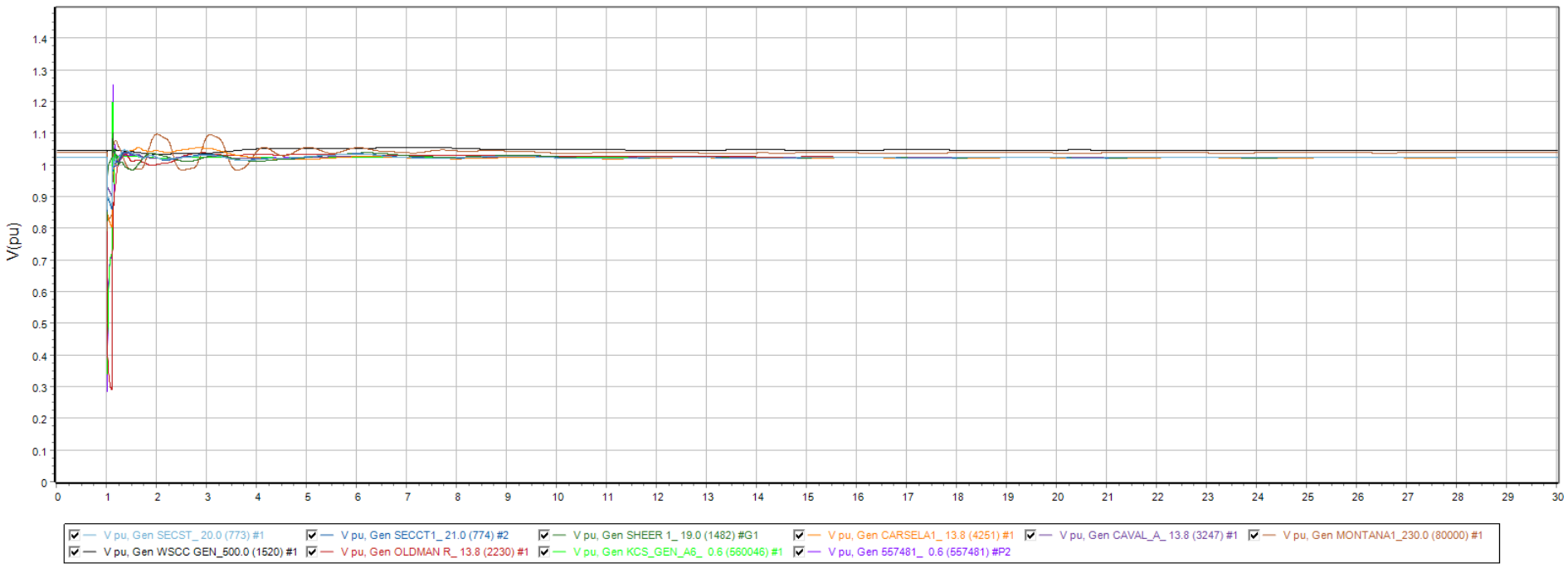
May 16, 2023 20:35:29

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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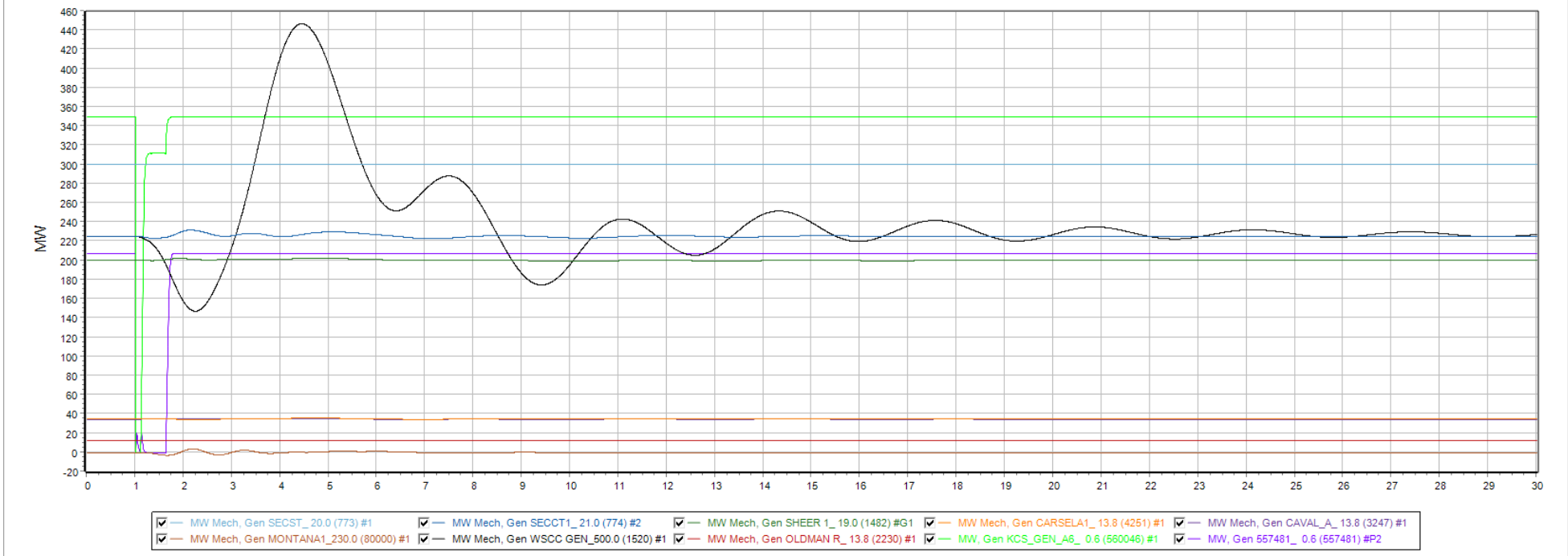
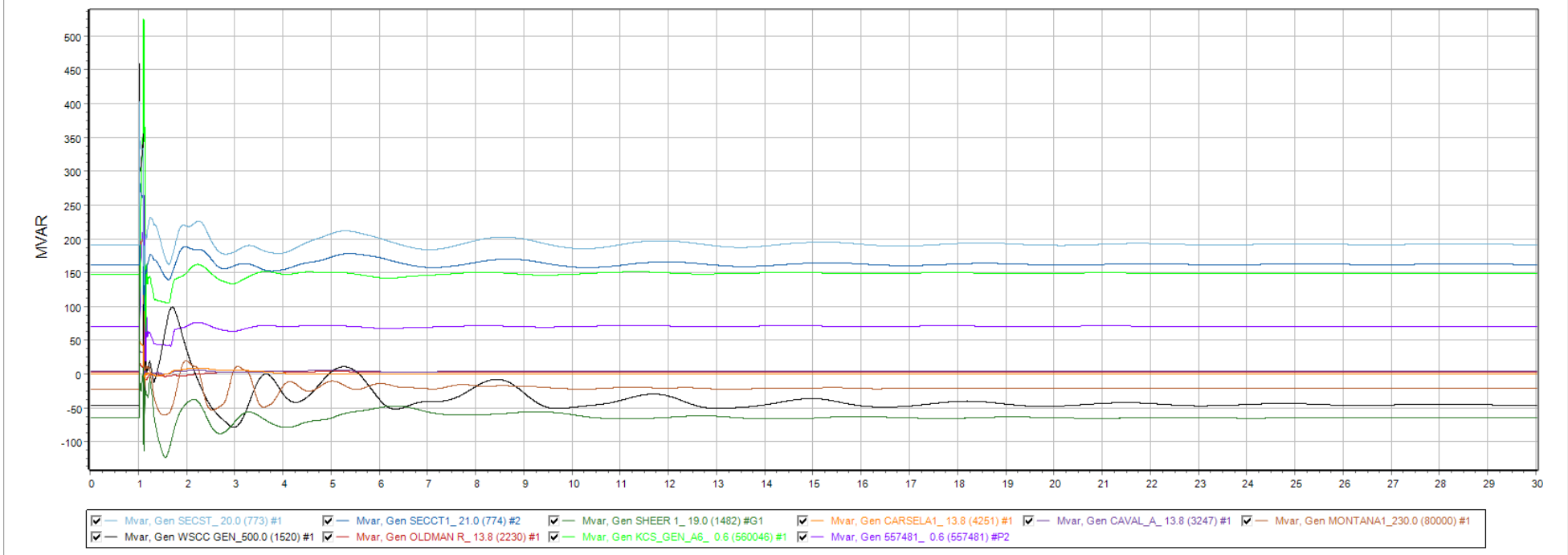
May 16, 2023 20:46:48

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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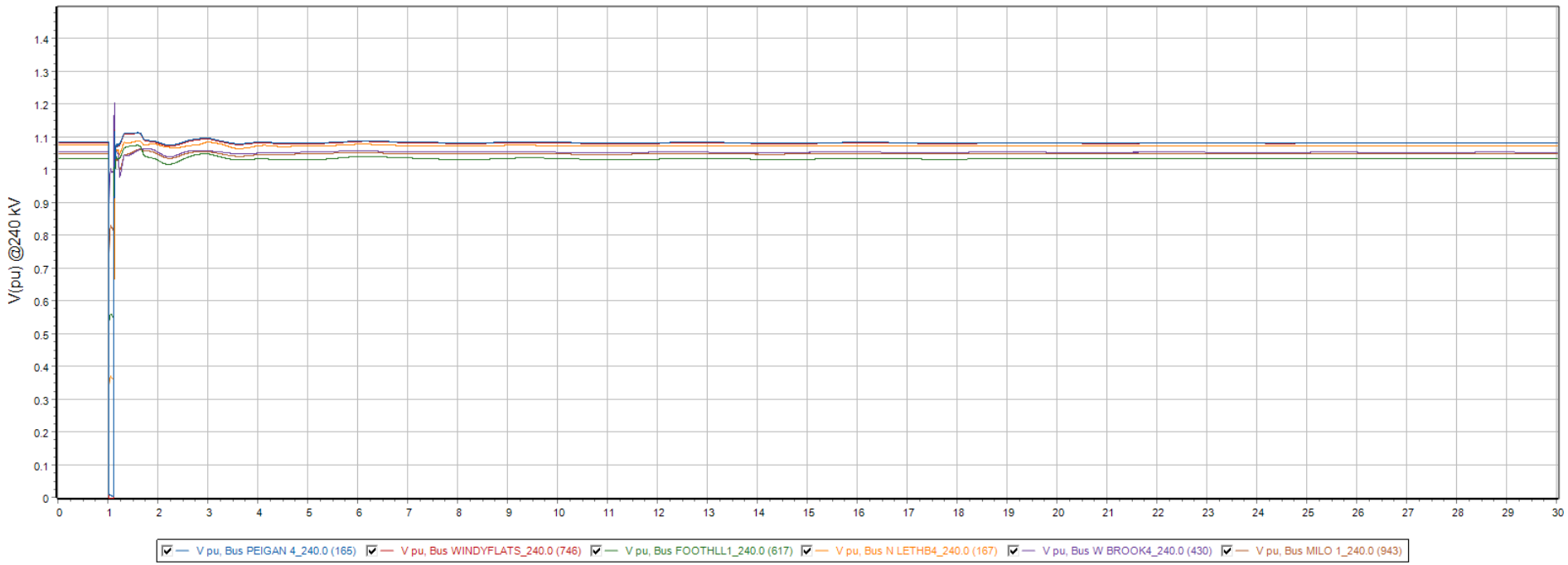
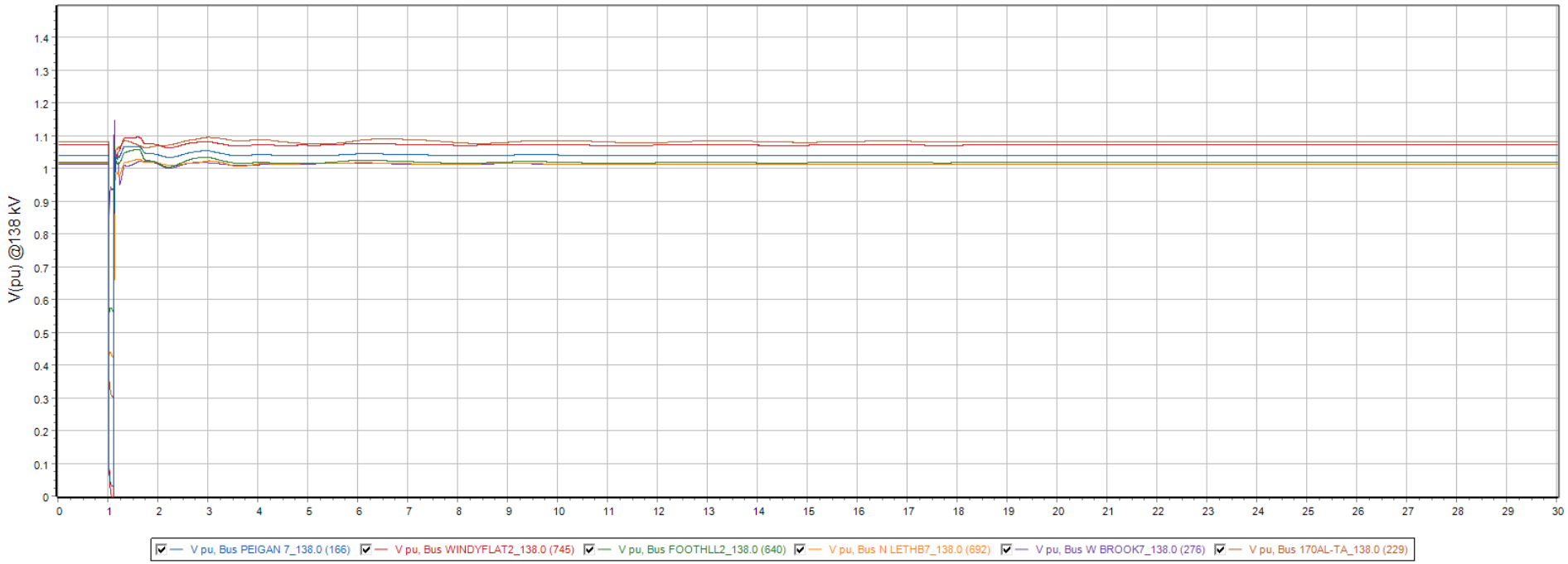
May 16, 2023 20:46:48

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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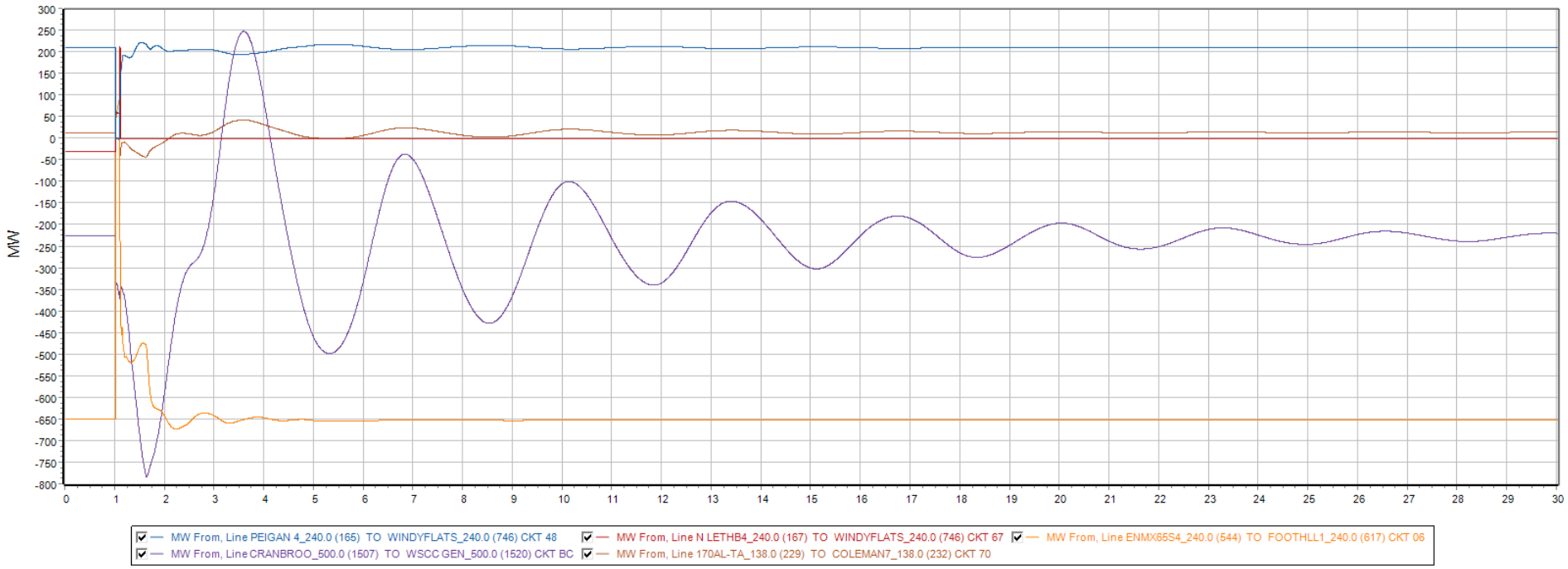
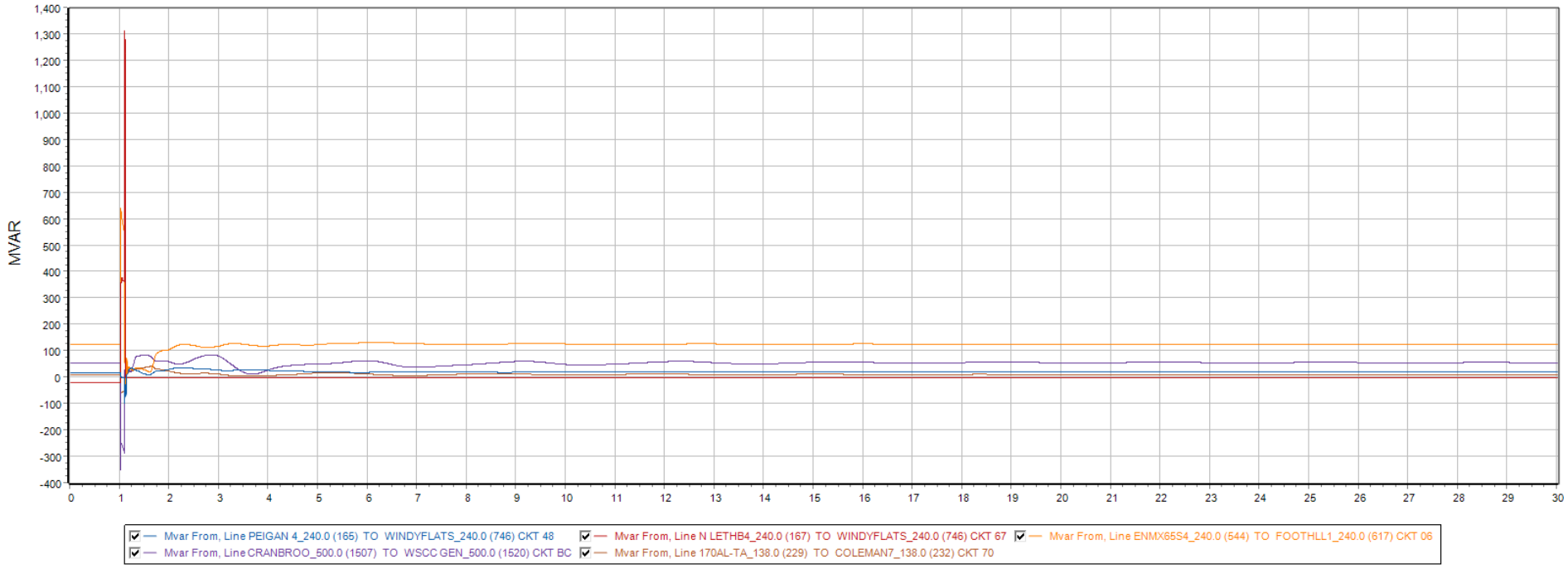
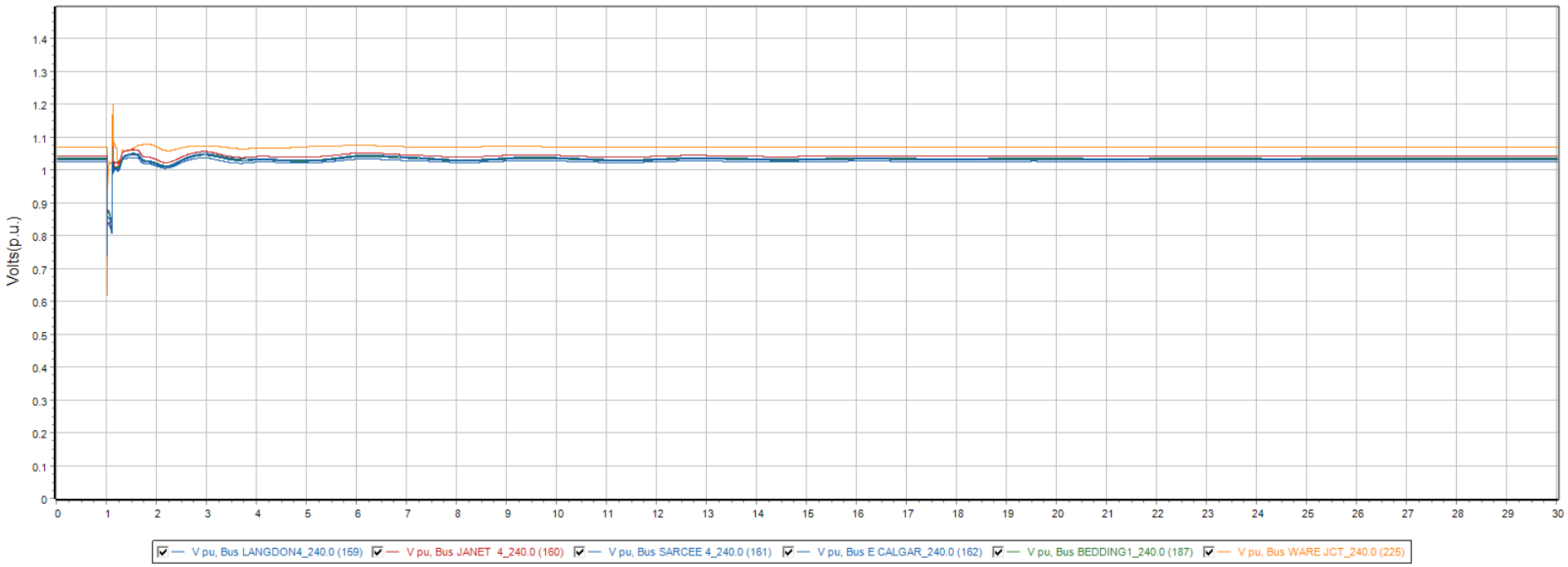
May 16, 2023 20:46:49

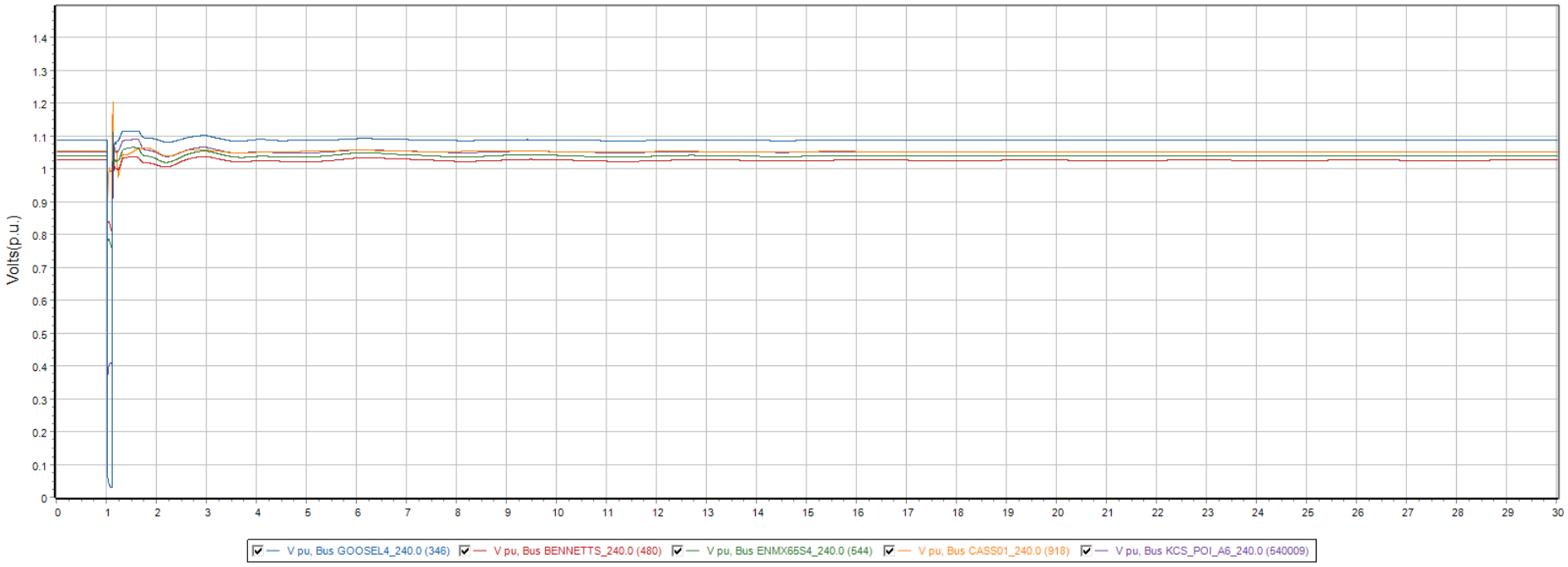
Monitor Line MW & MVAR. Q4



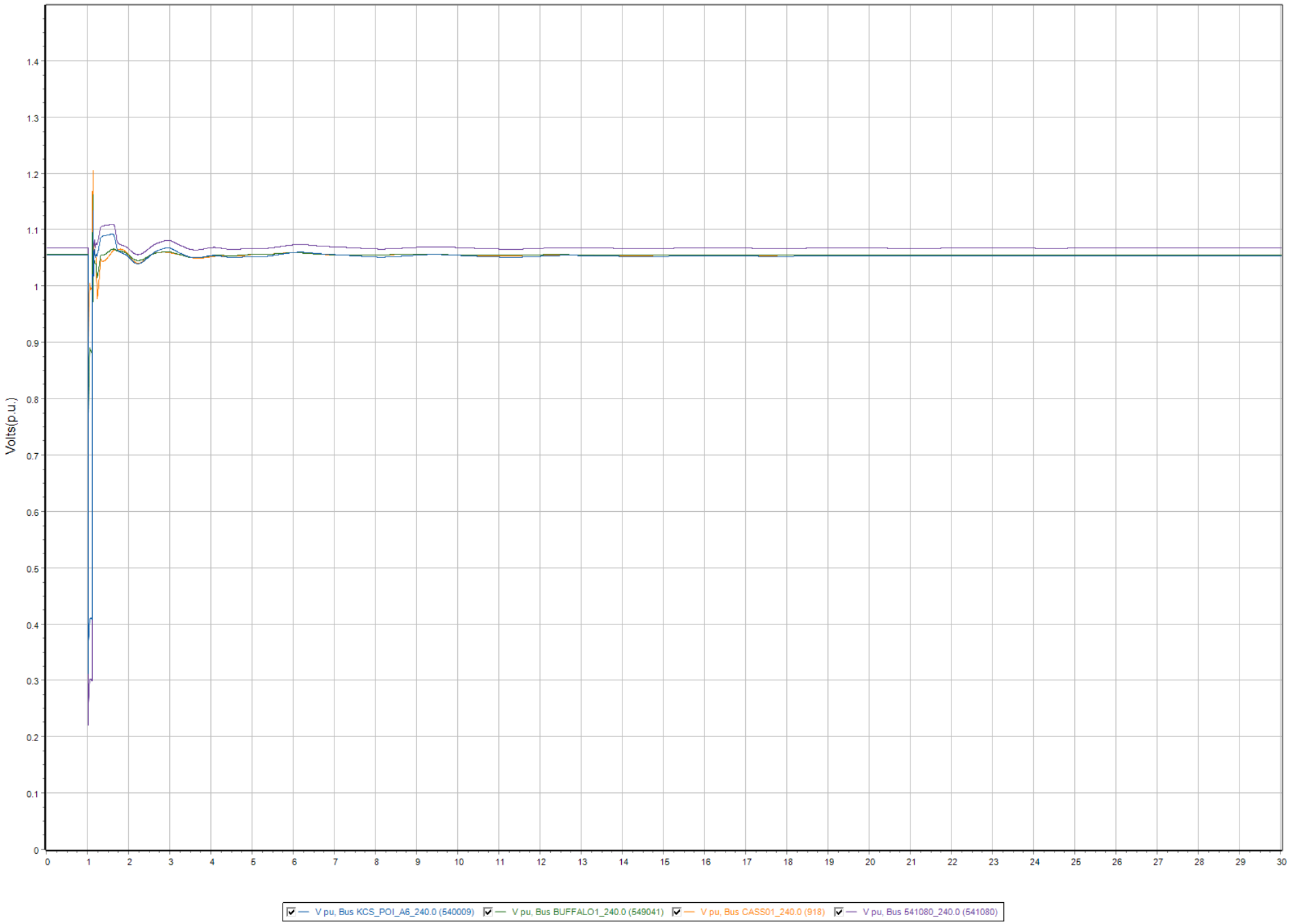


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 01B - 967L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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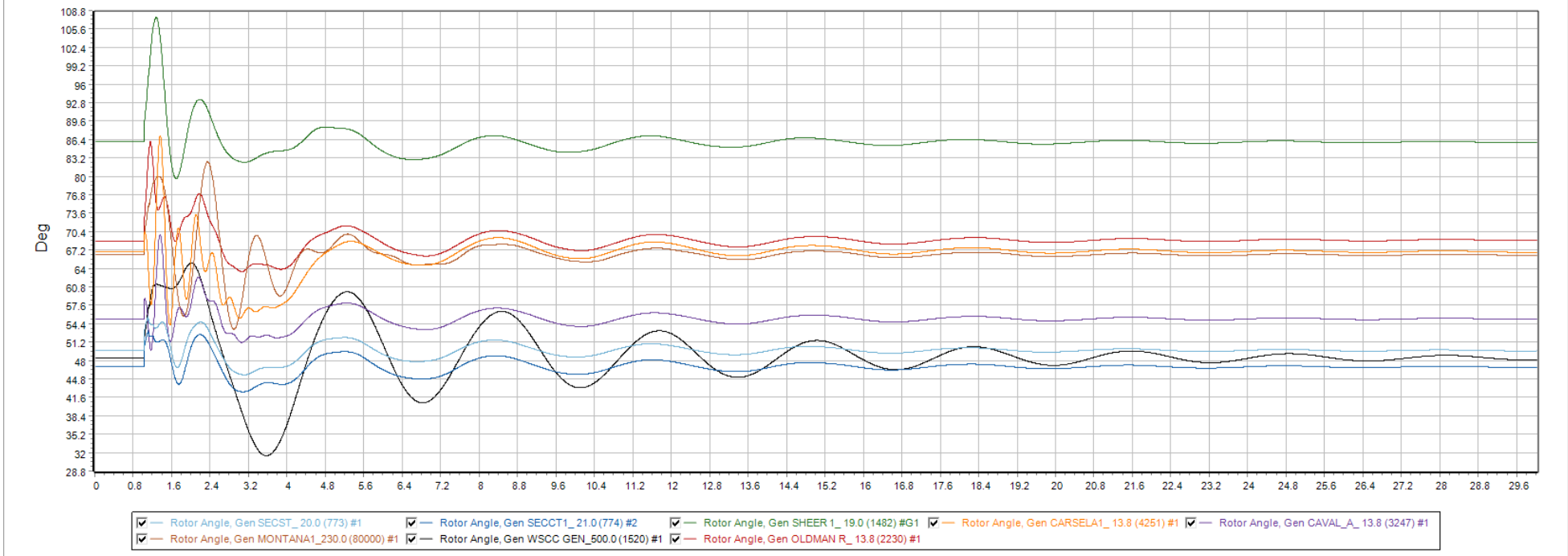
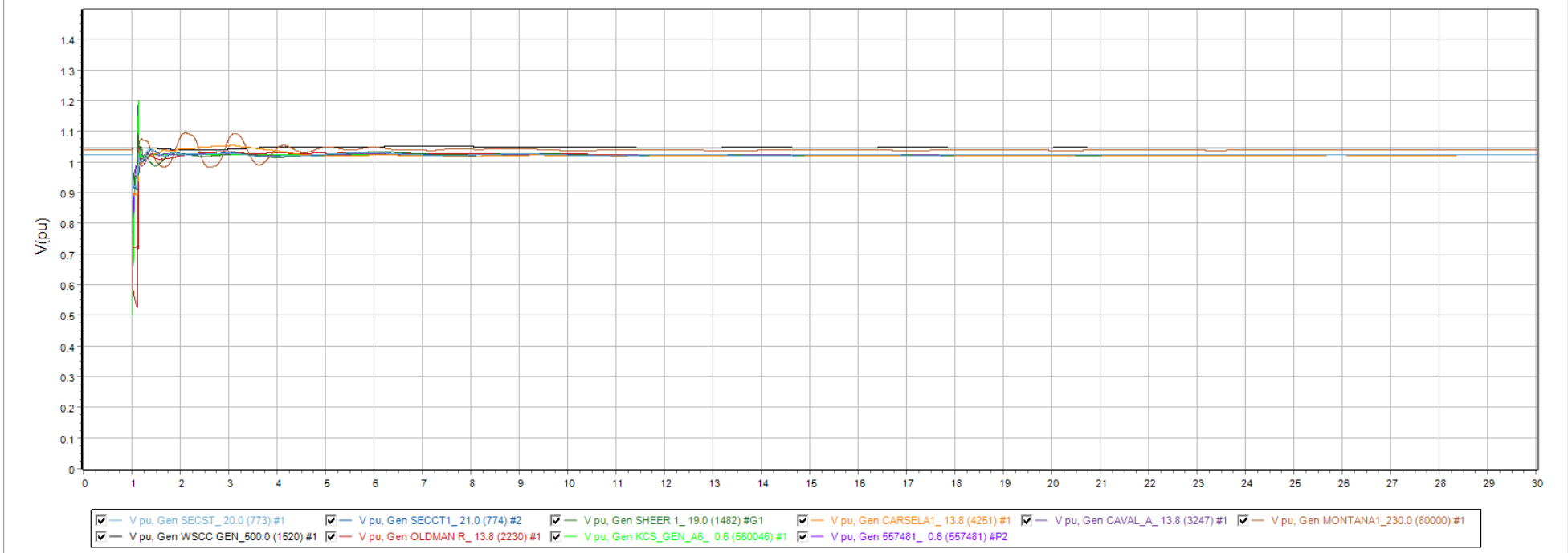
May 16, 2023 20:46:50

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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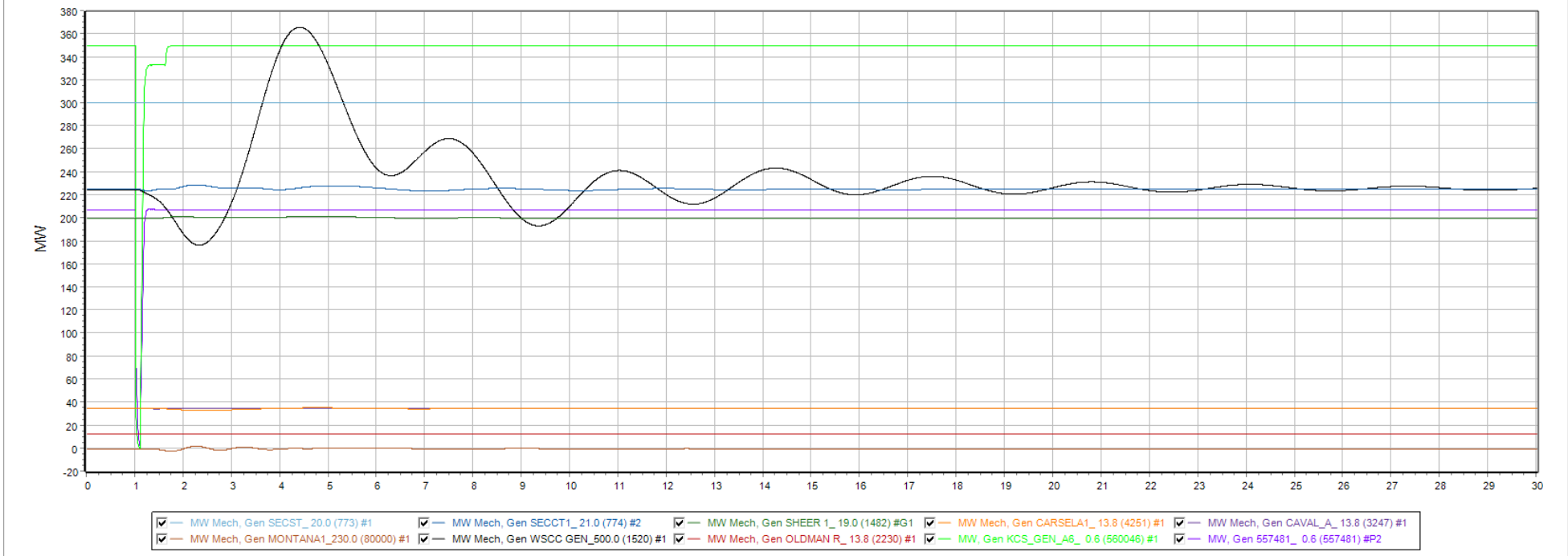
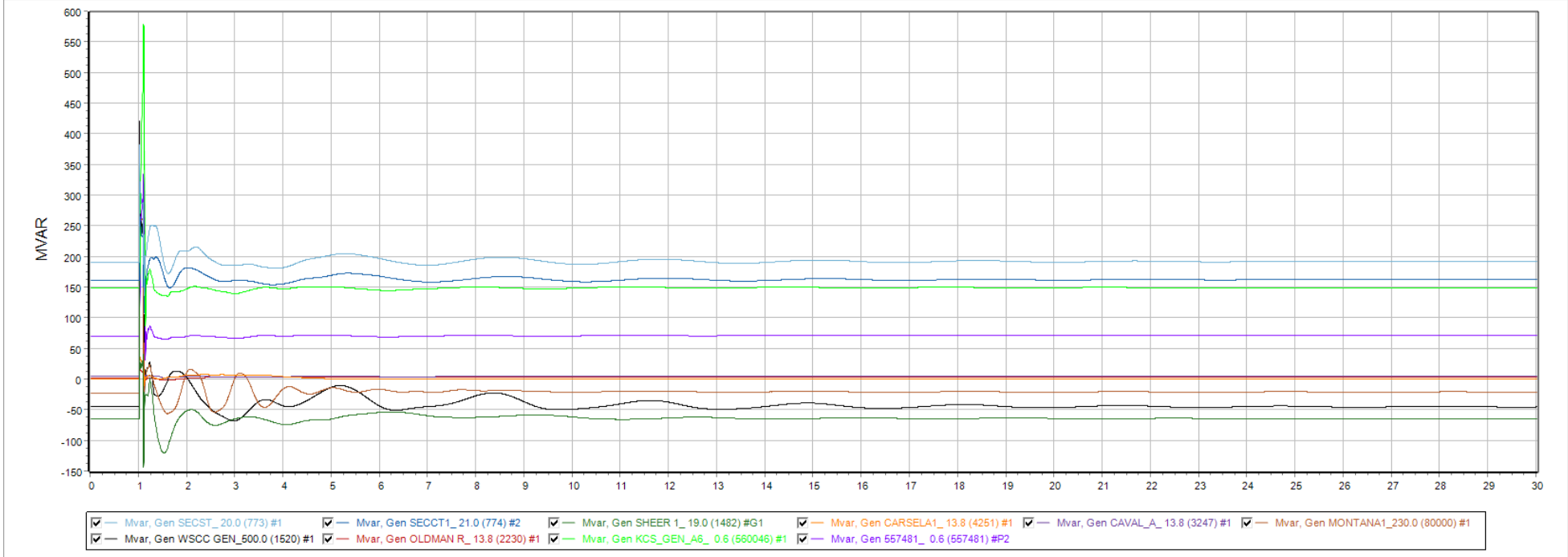
May 16, 2023 20:57:32

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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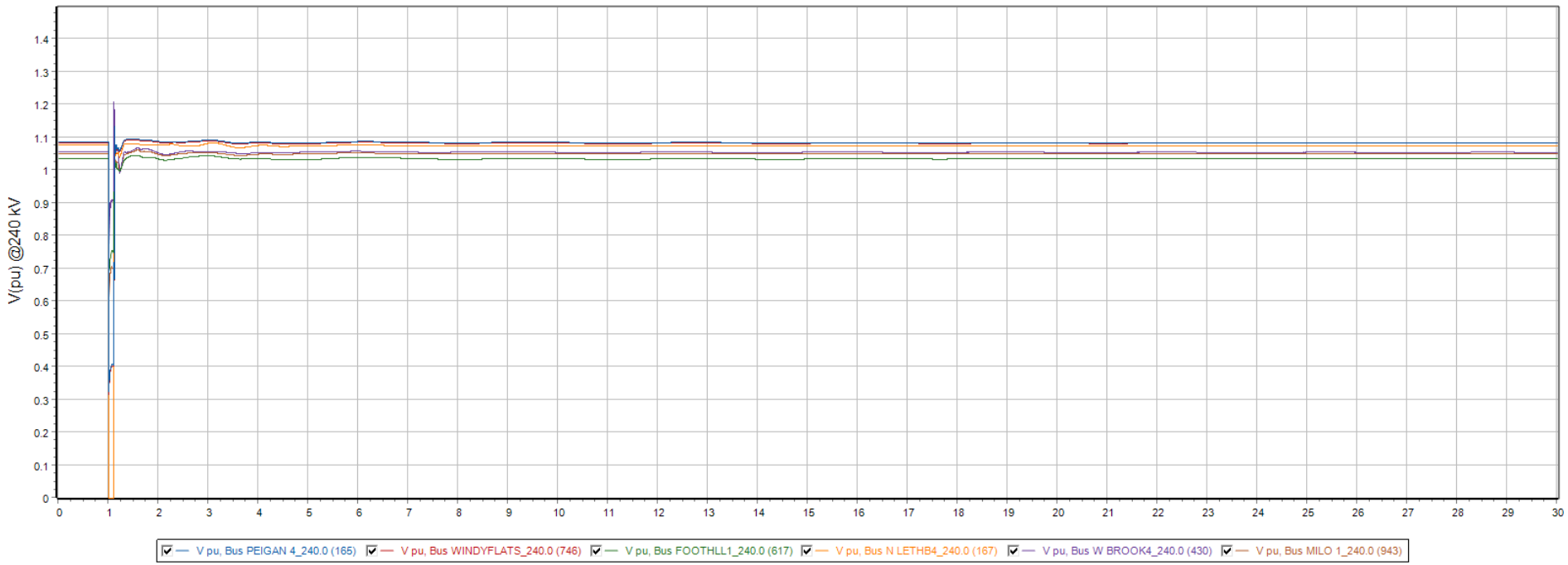
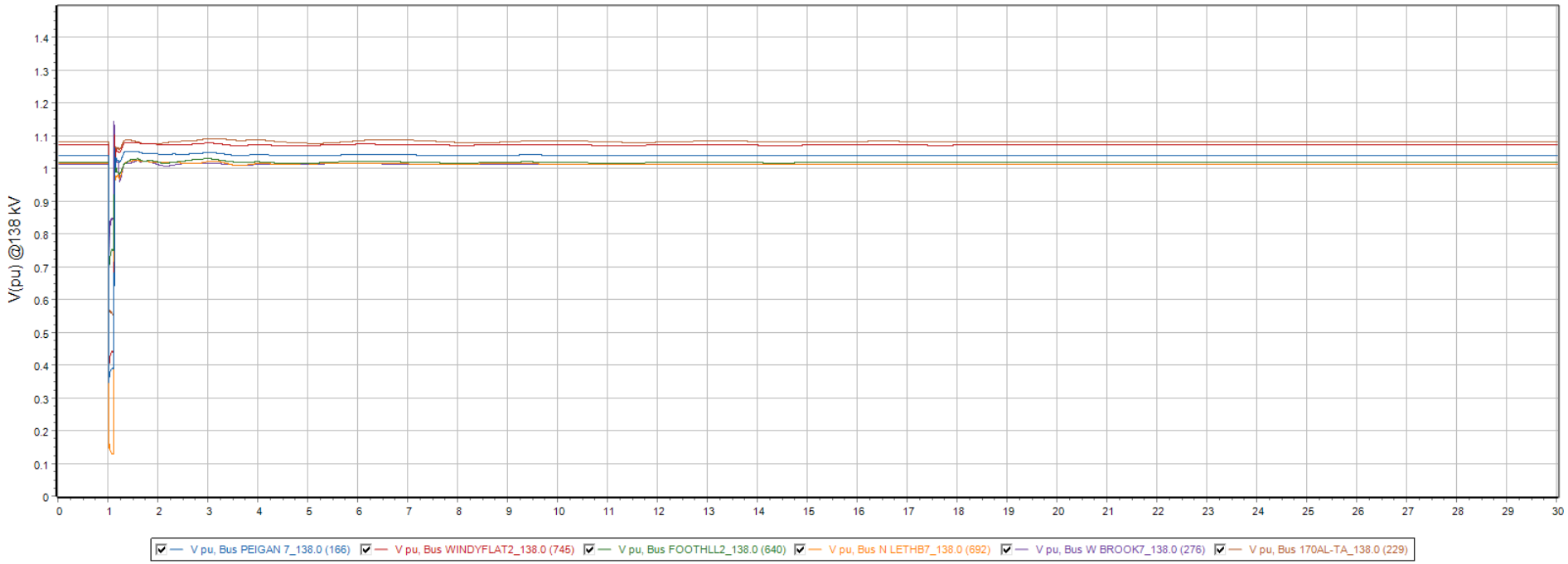
May 16, 2023 20:57:32

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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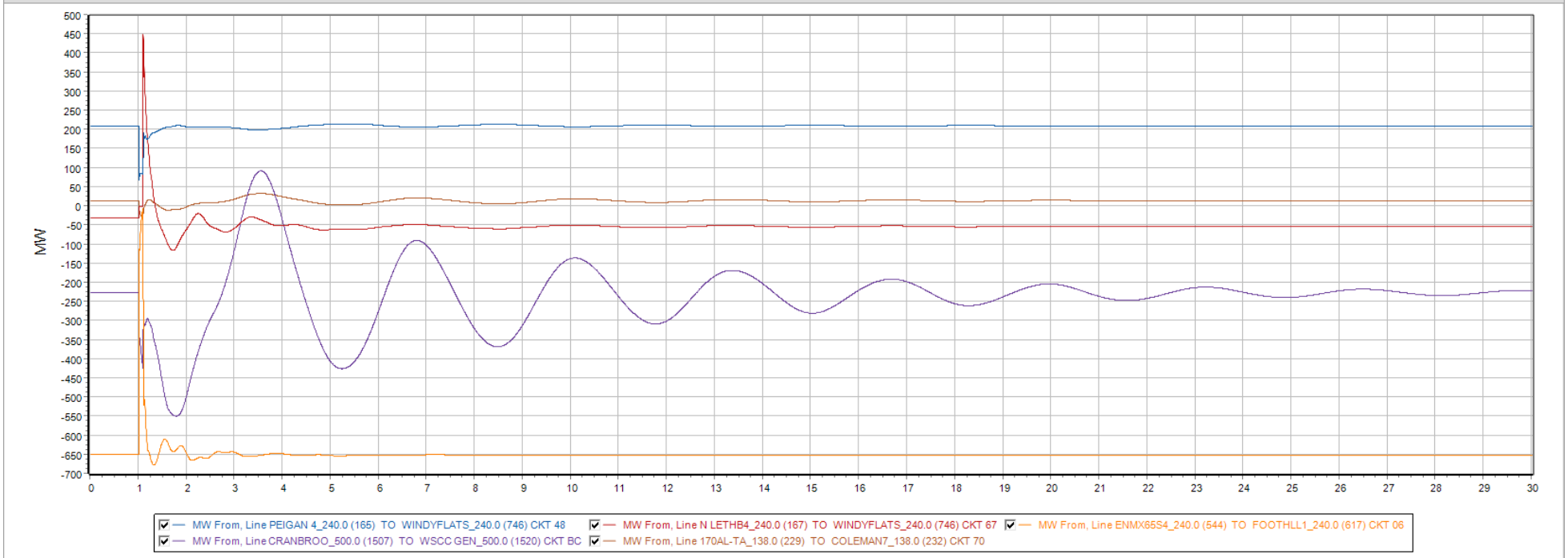
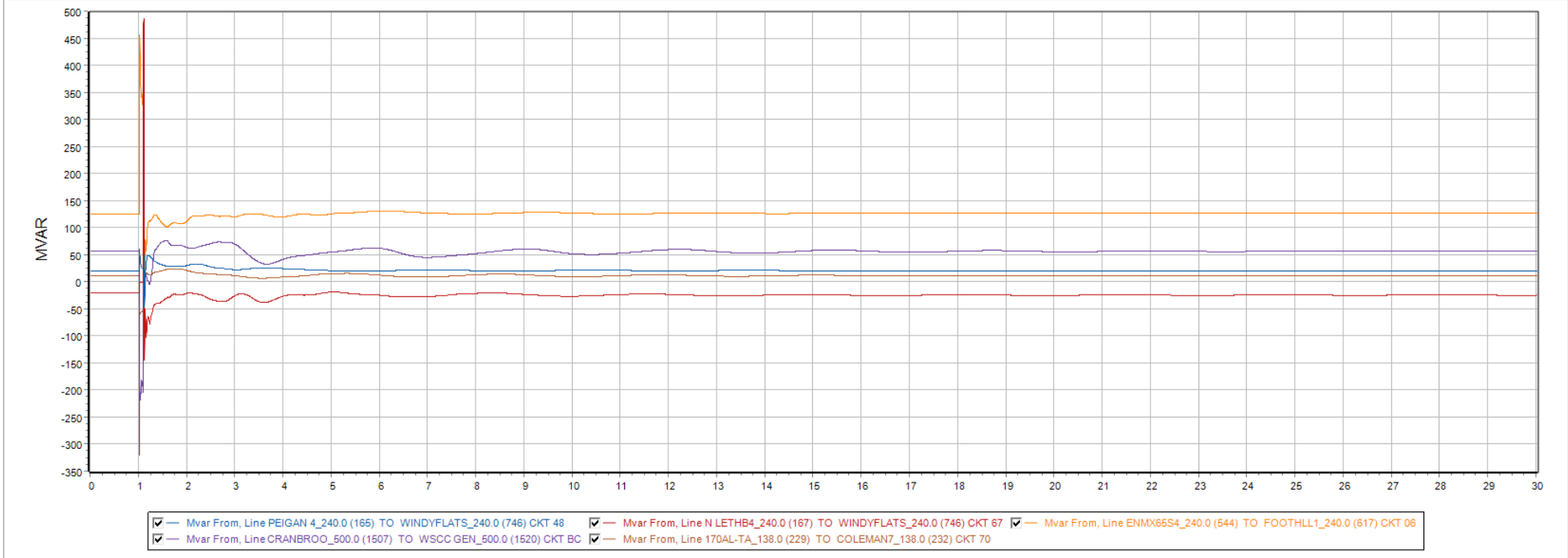
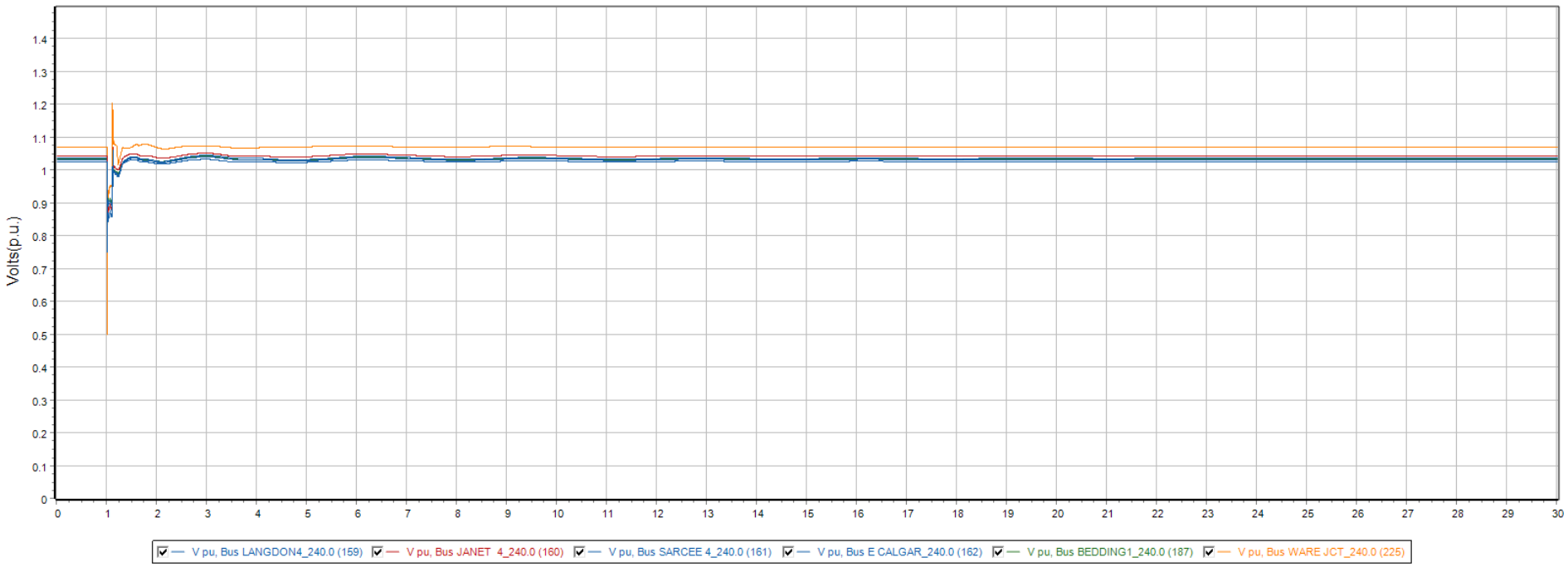
May 16, 2023 20:57:33

Monitor Line MW & MVAR. Q4

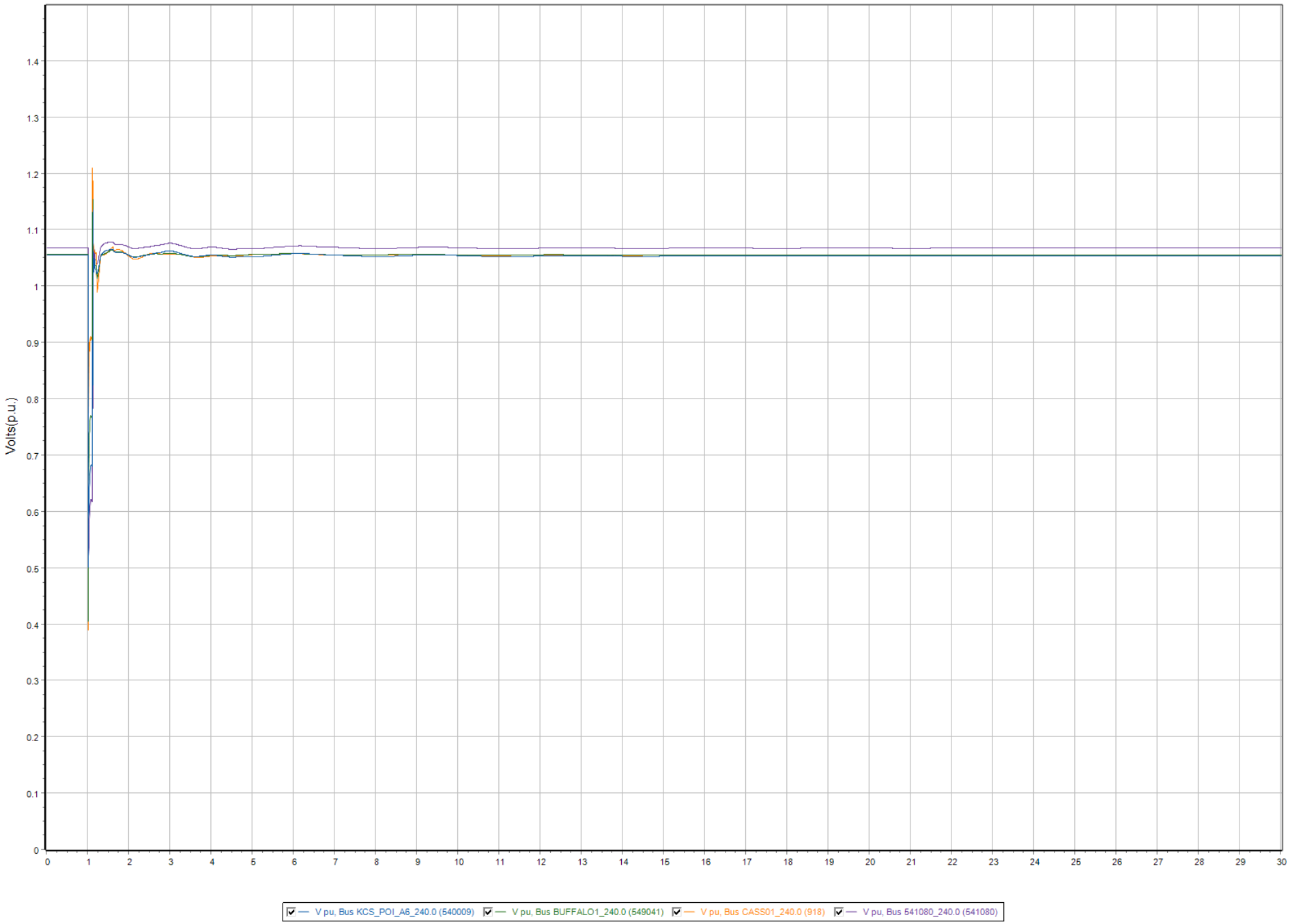




Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02A - 968L (North Lethbridge 370S - Windy Flats 138S) @ North Lethbridge 370S

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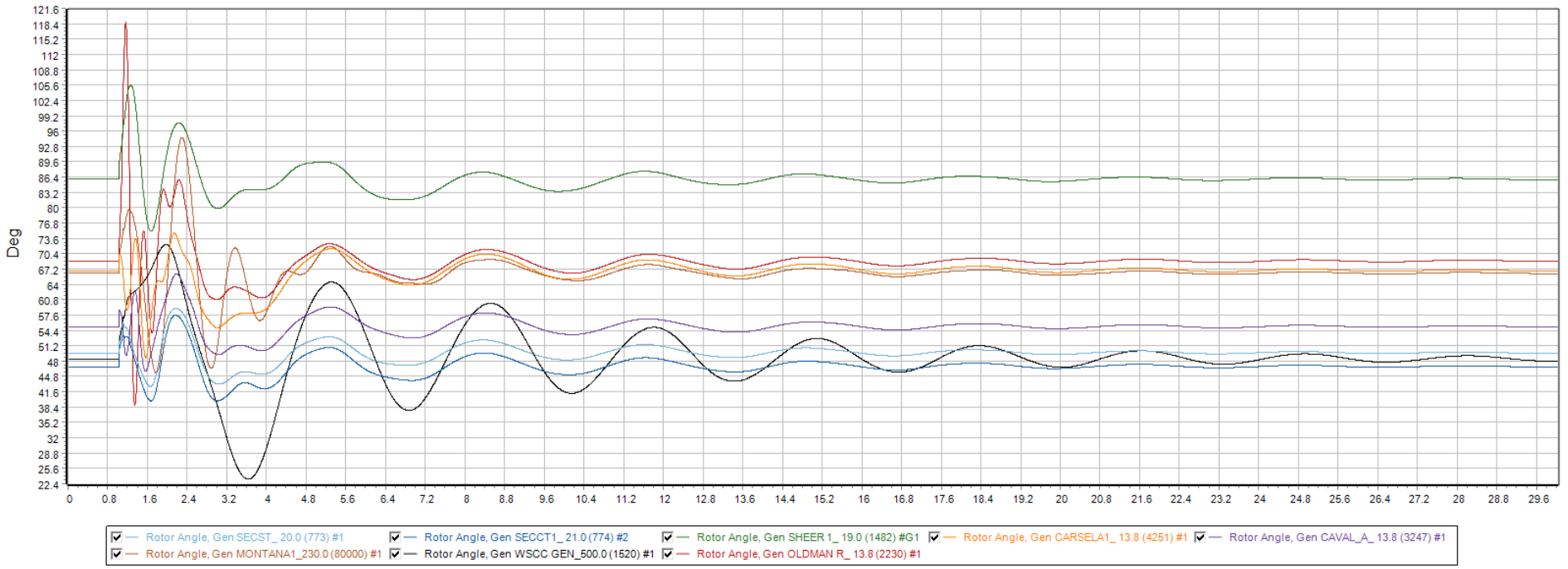
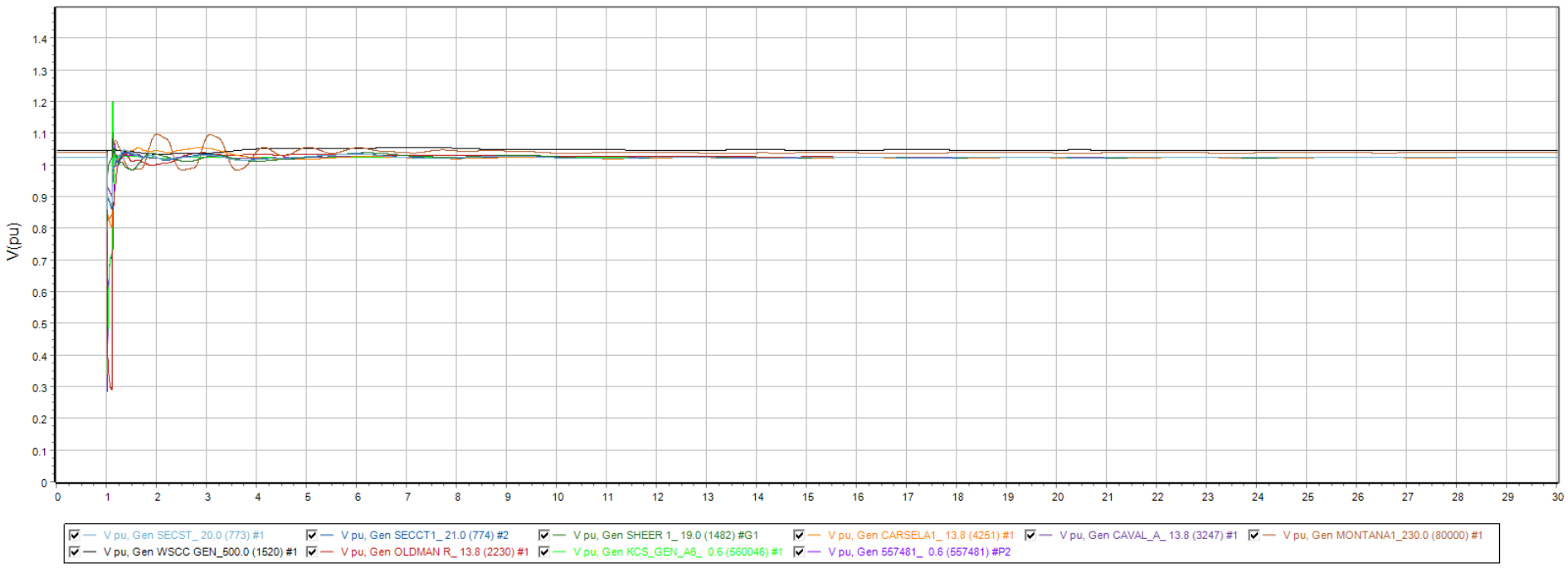
May 16, 2023 20:57:34

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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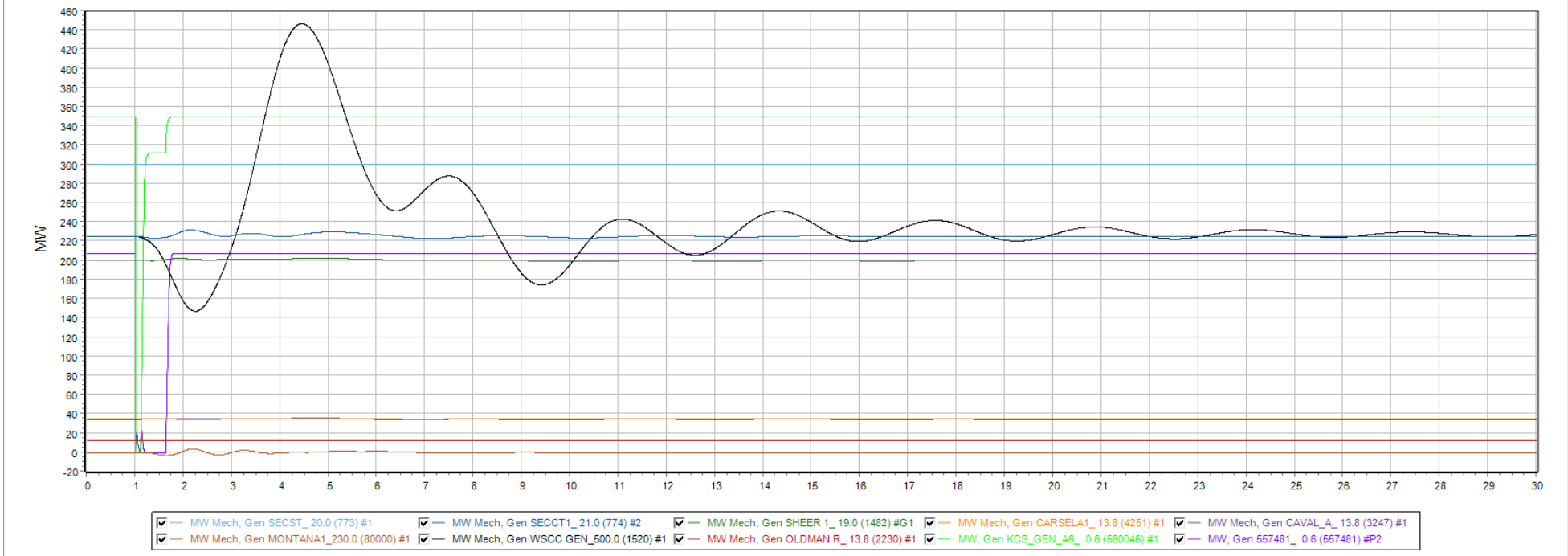
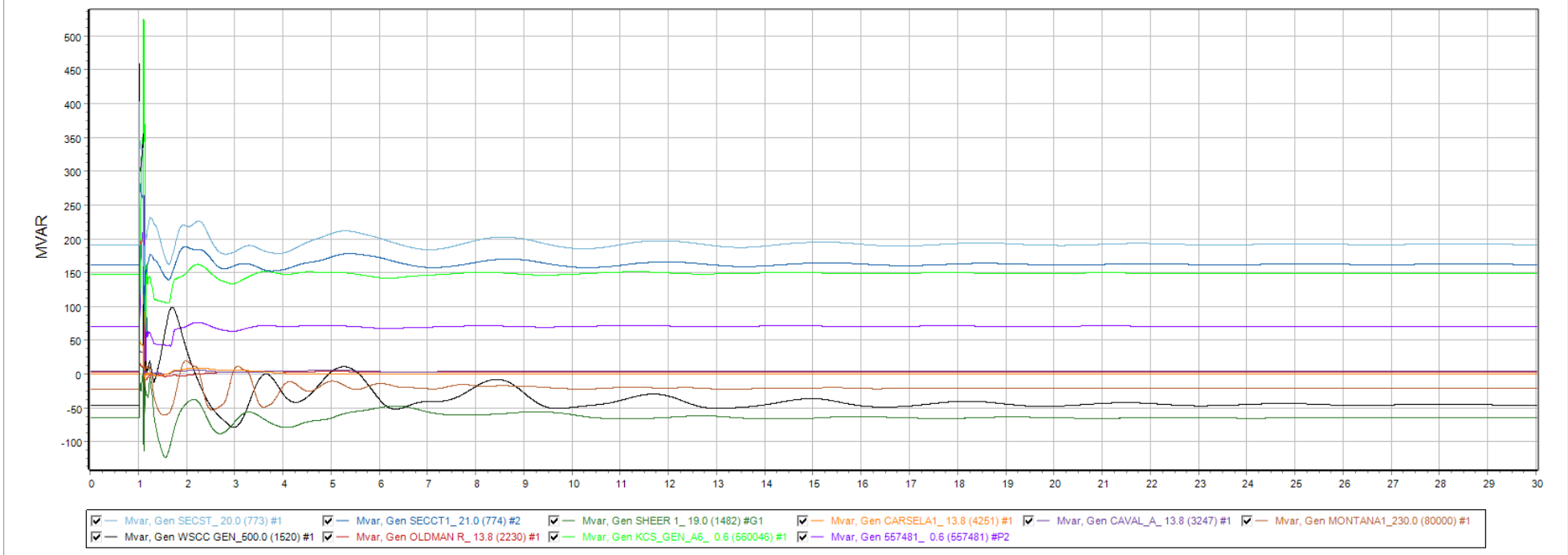
May 16, 2023 21:09:16

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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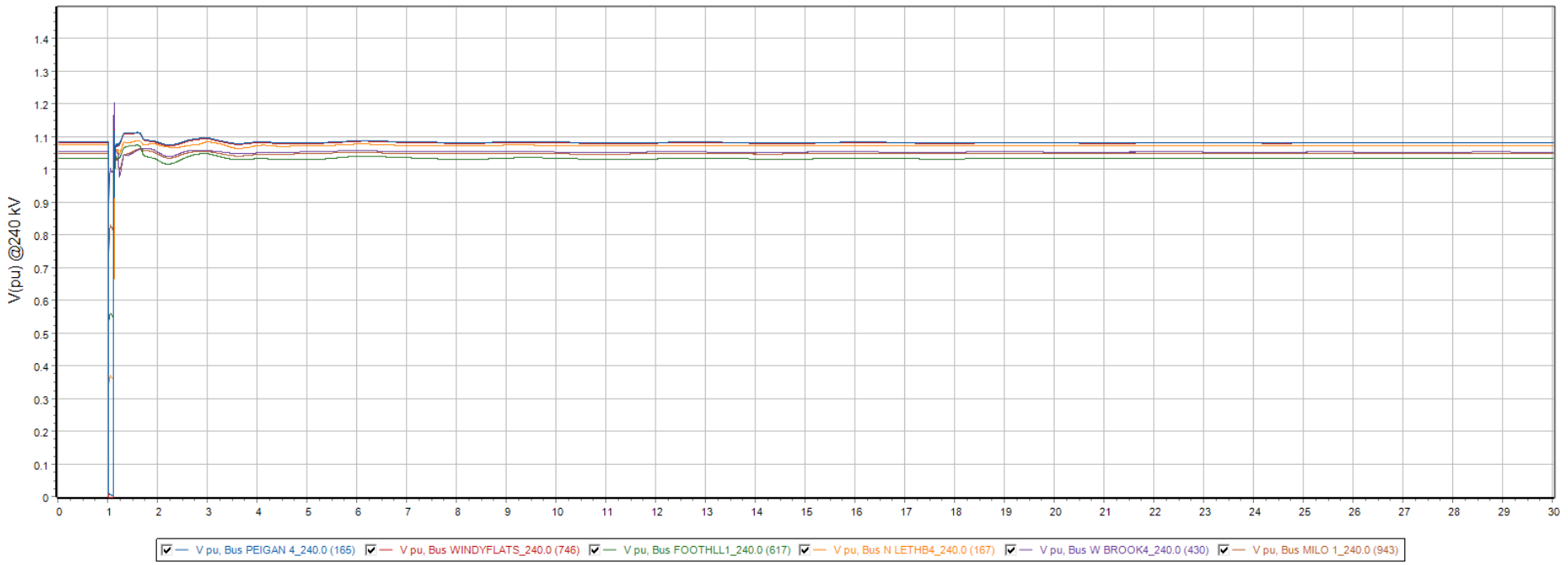
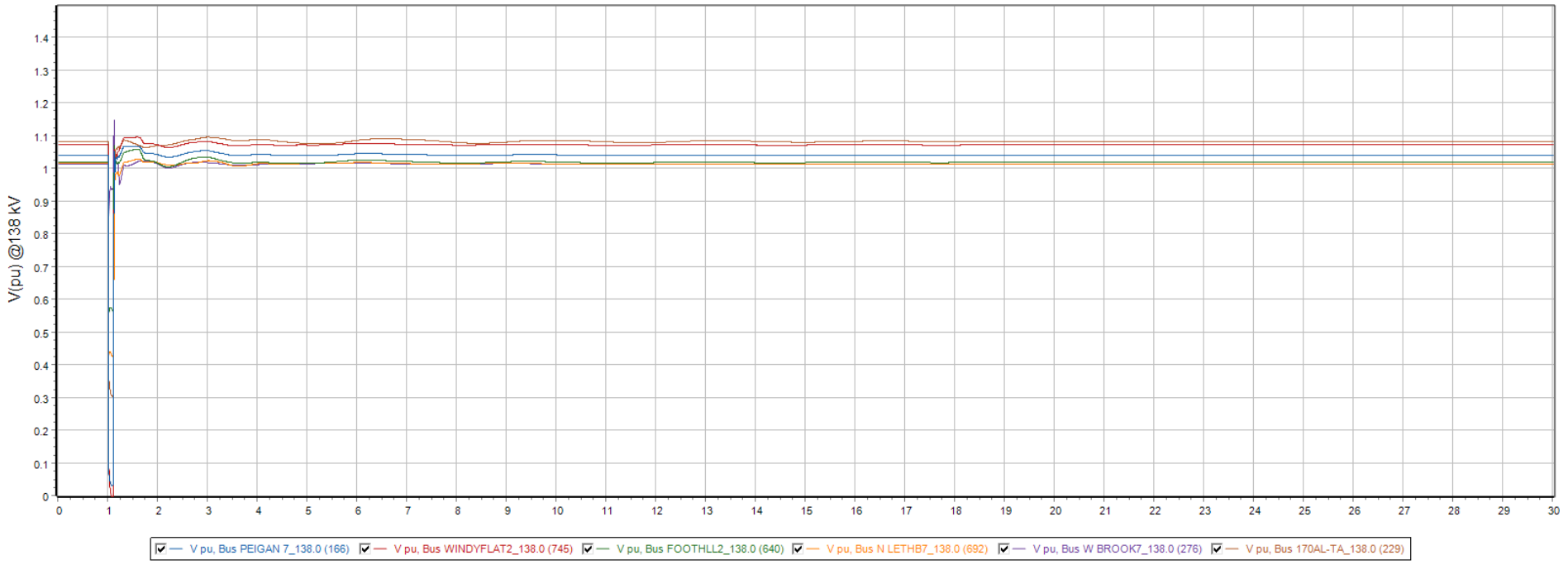
May 16, 2023 21:09:16

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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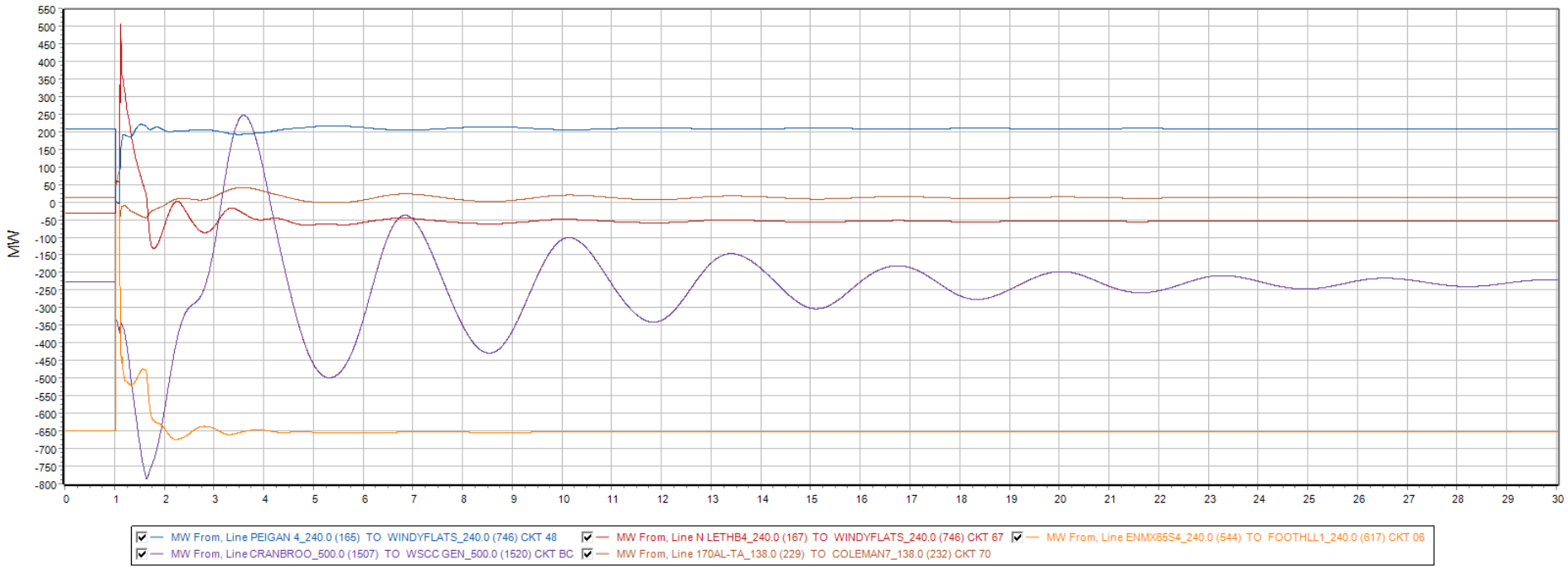
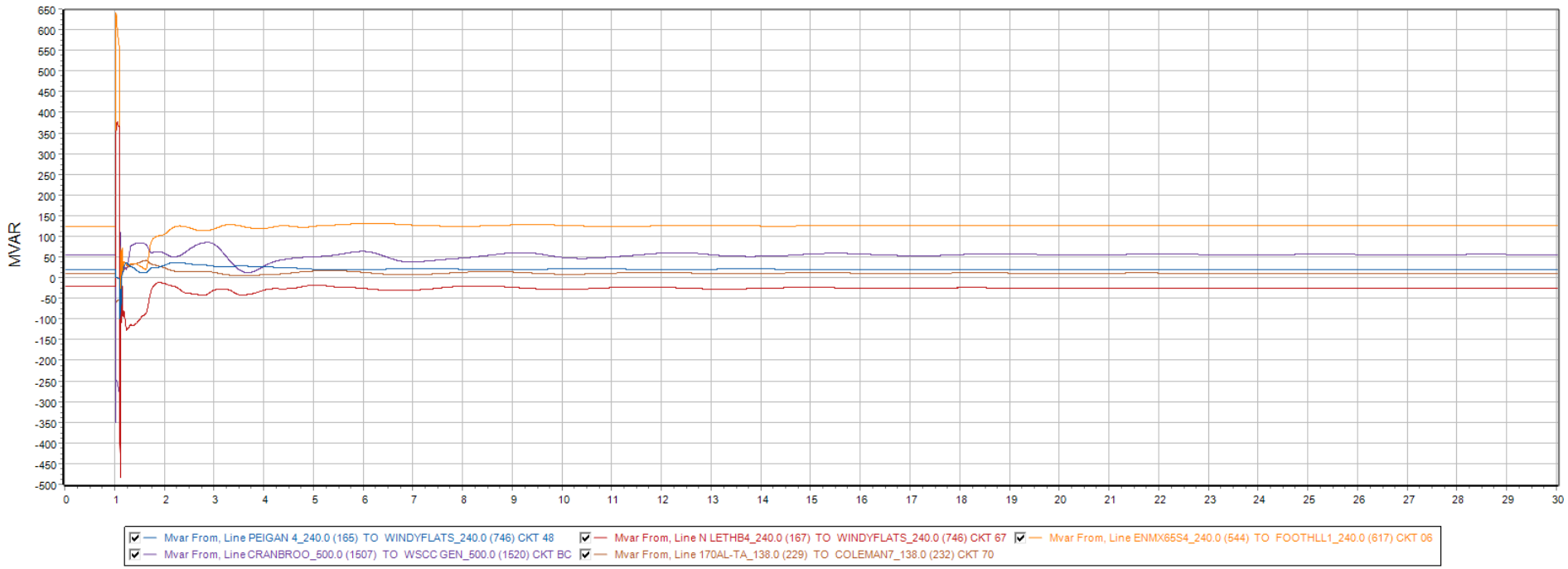
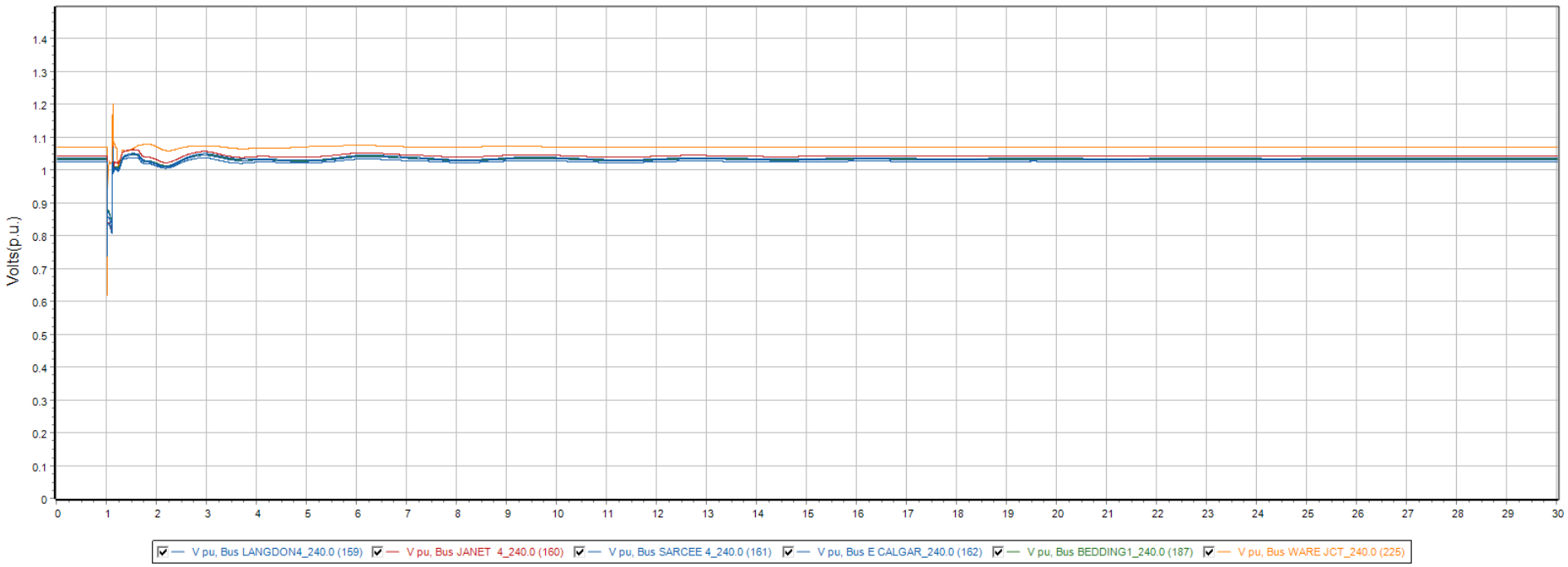
May 16, 2023 21:09:17

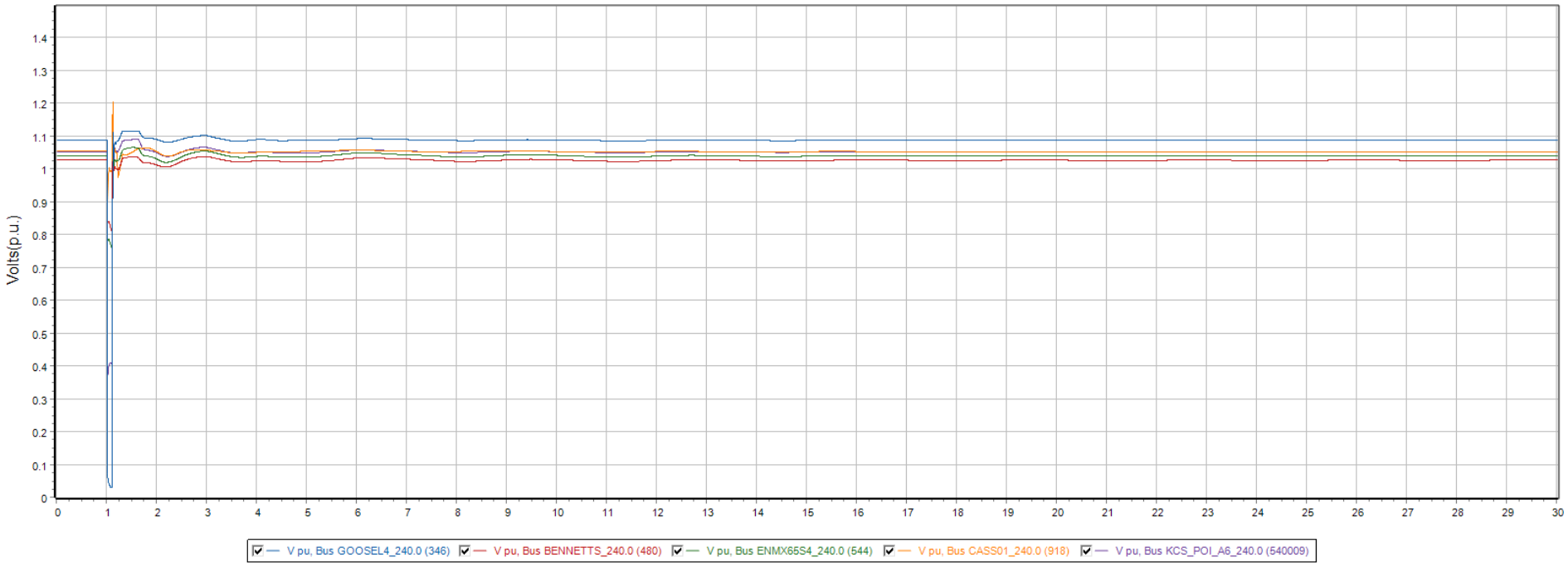
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 02B - 968L (North Lethbridge 370S - Windy Flats 138S) @ Windy Flats 138S

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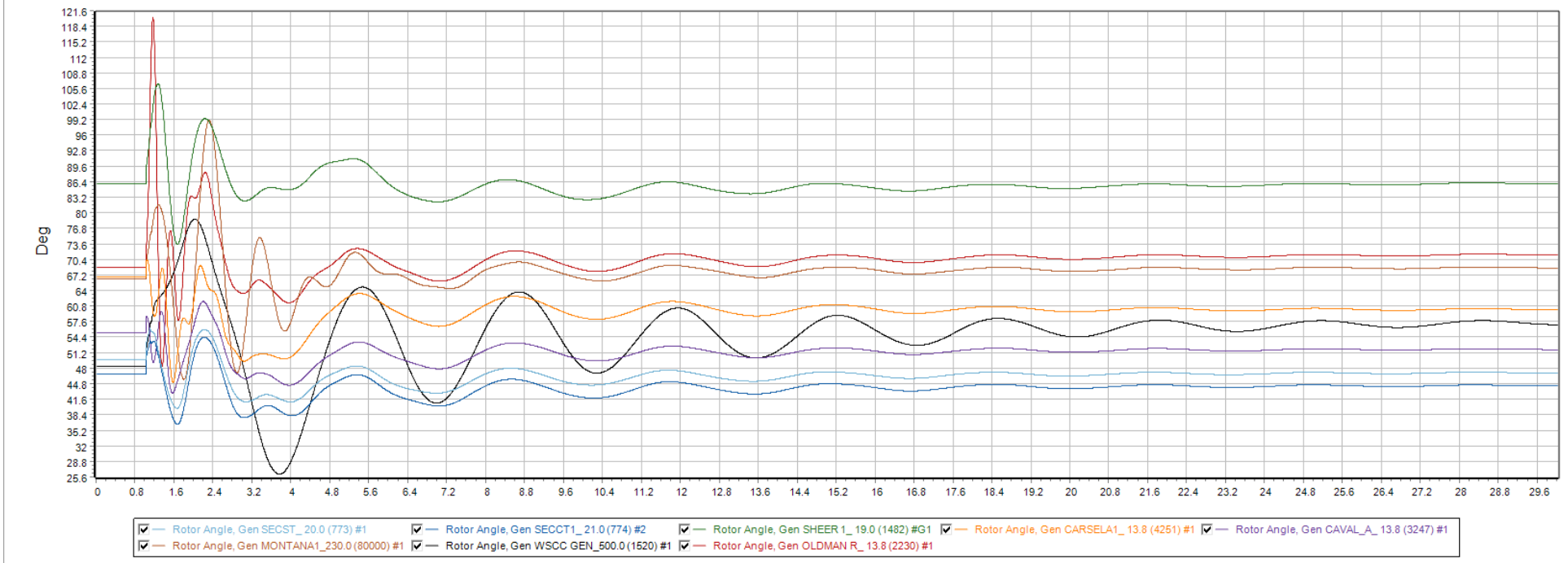
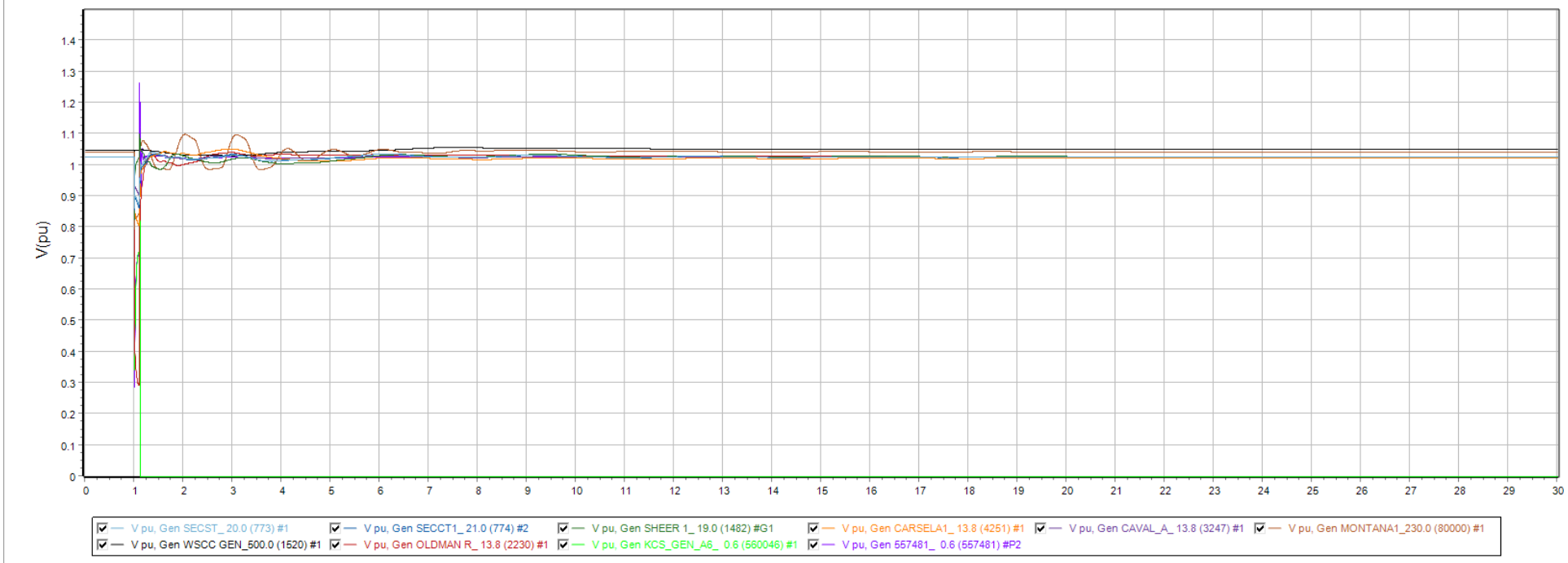
May 16, 2023 21:09:18

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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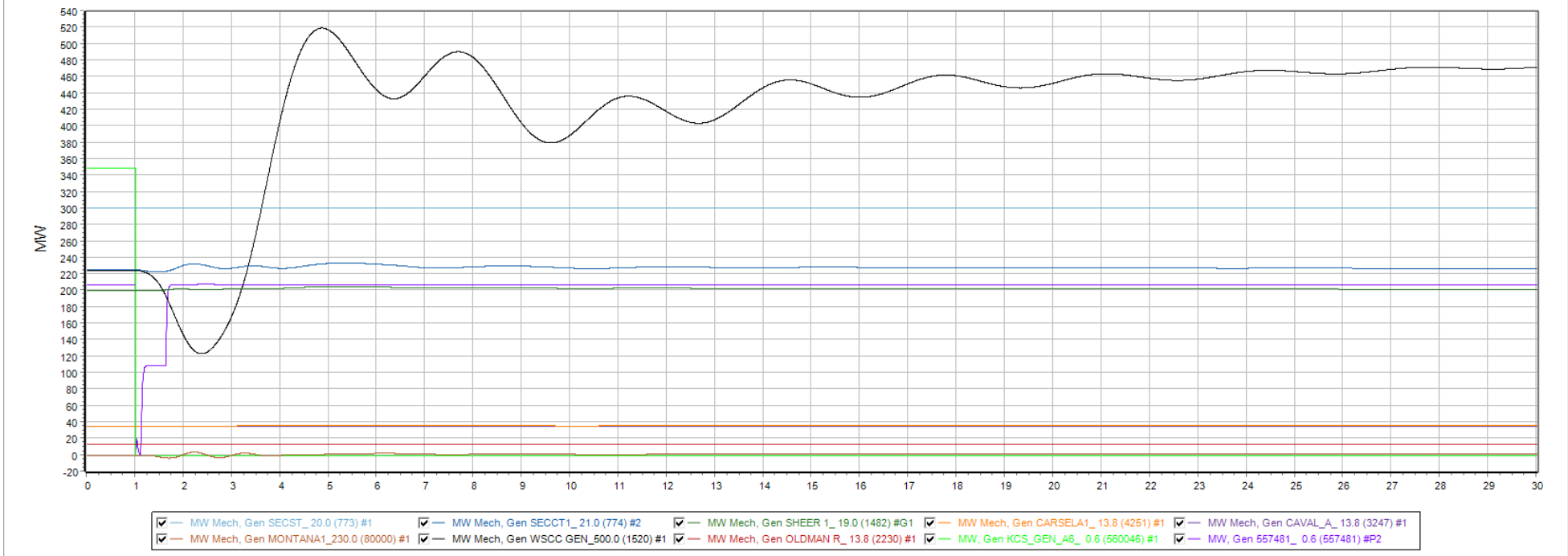
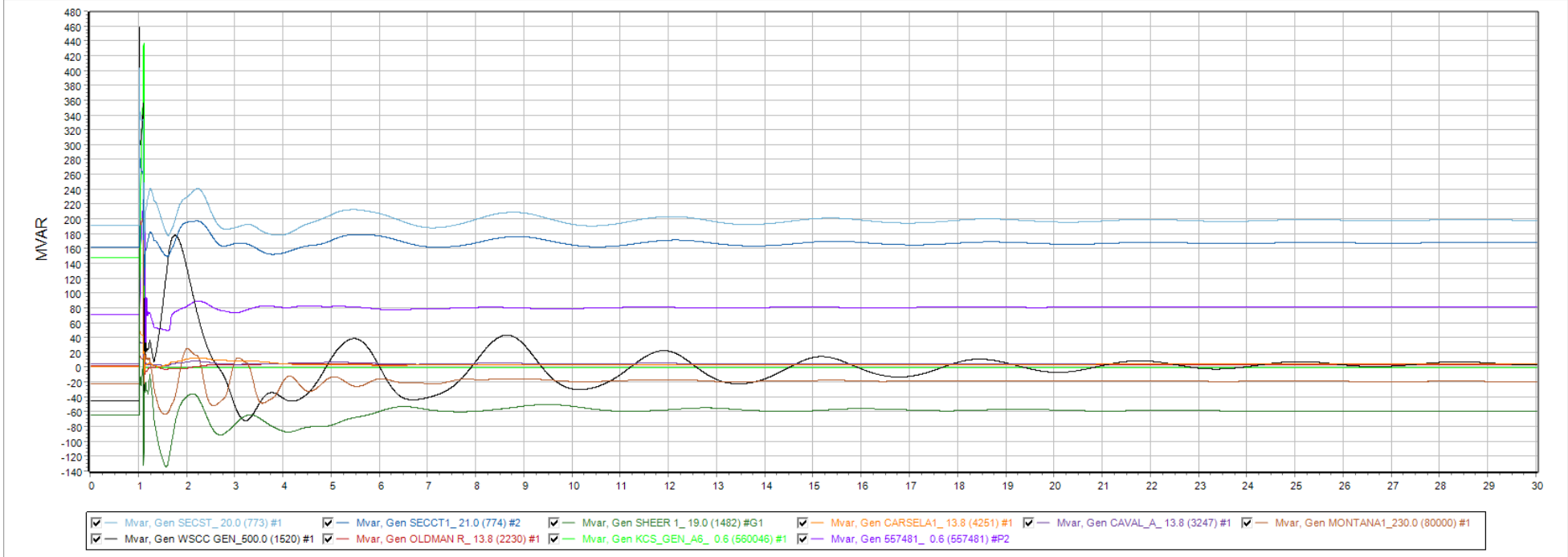
May 16, 2023 23:31:14

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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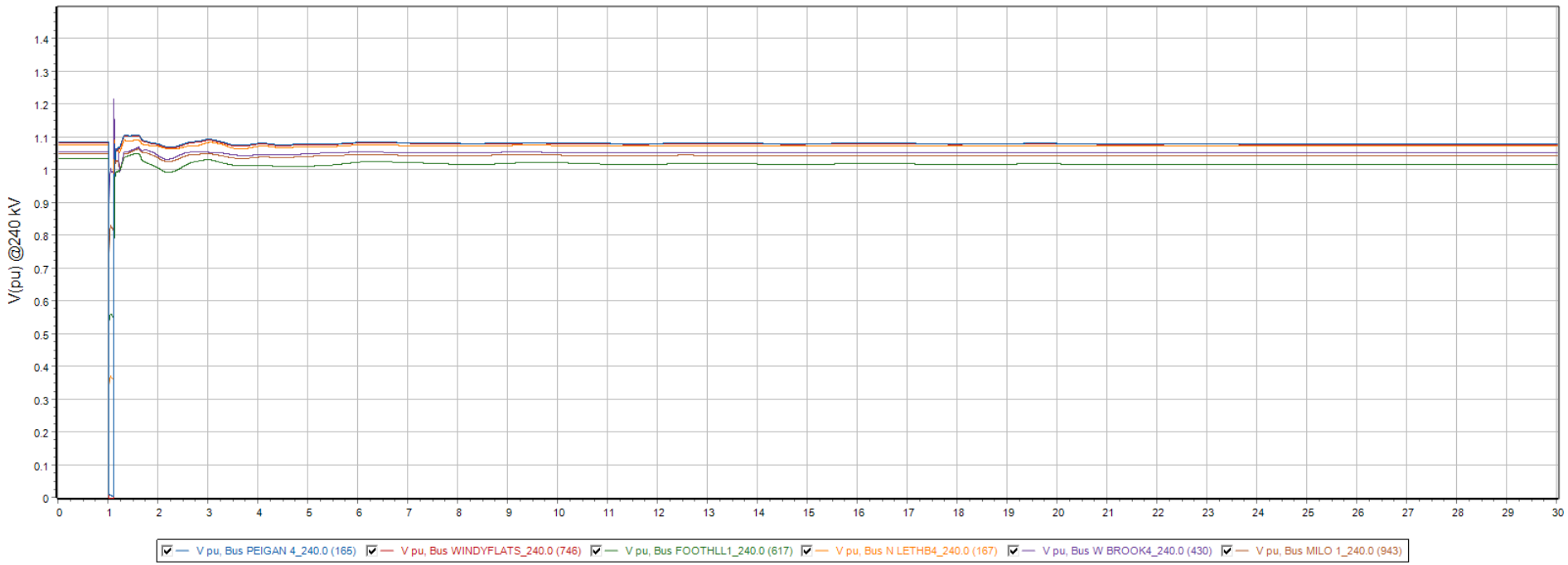
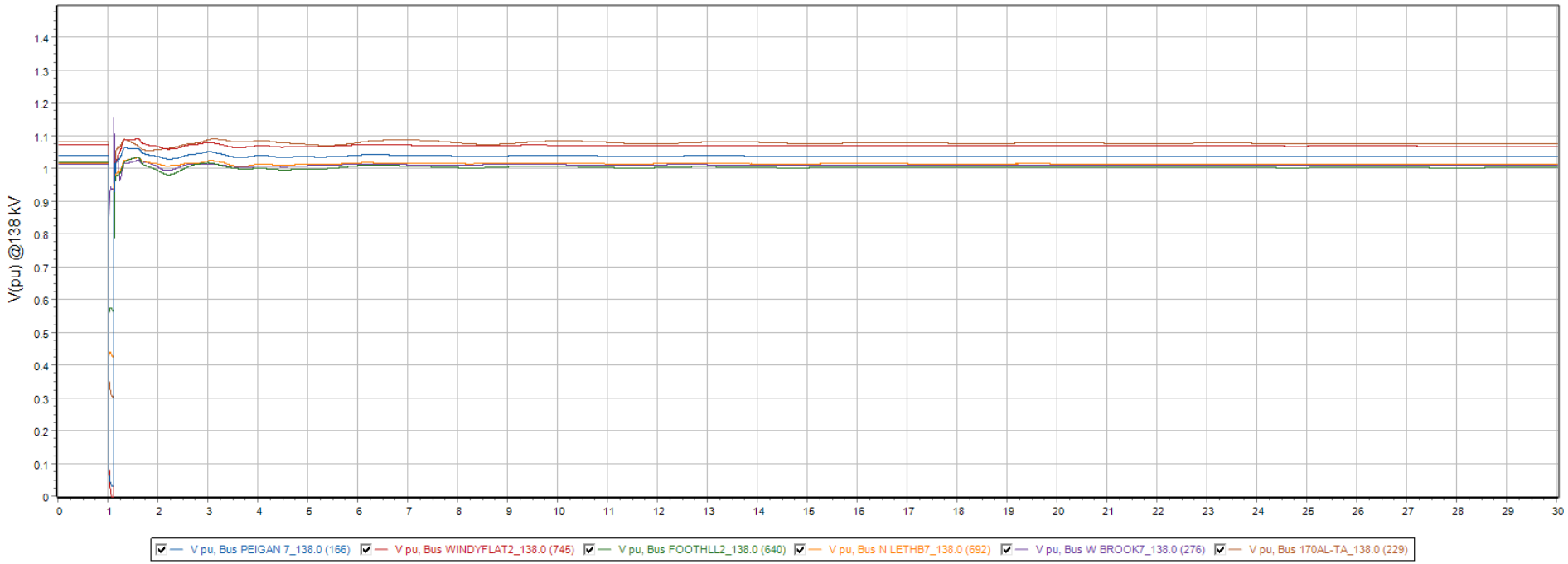
May 16, 2023 23:31:14

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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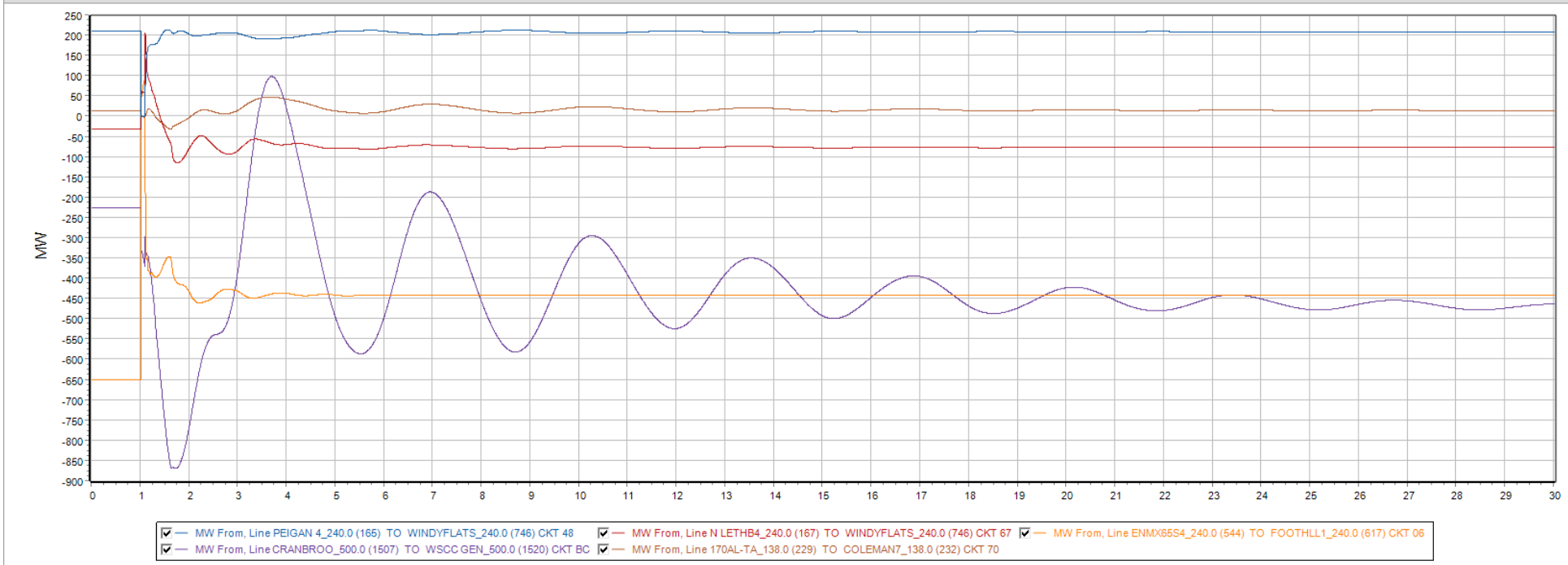
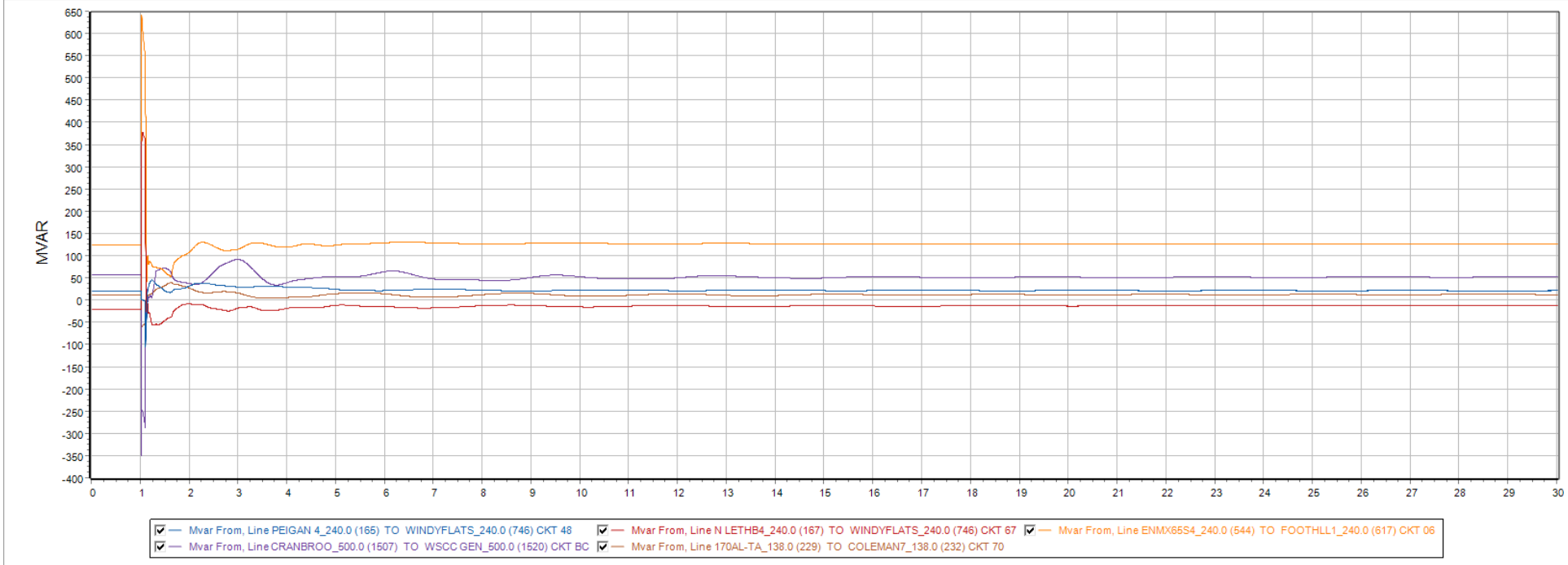
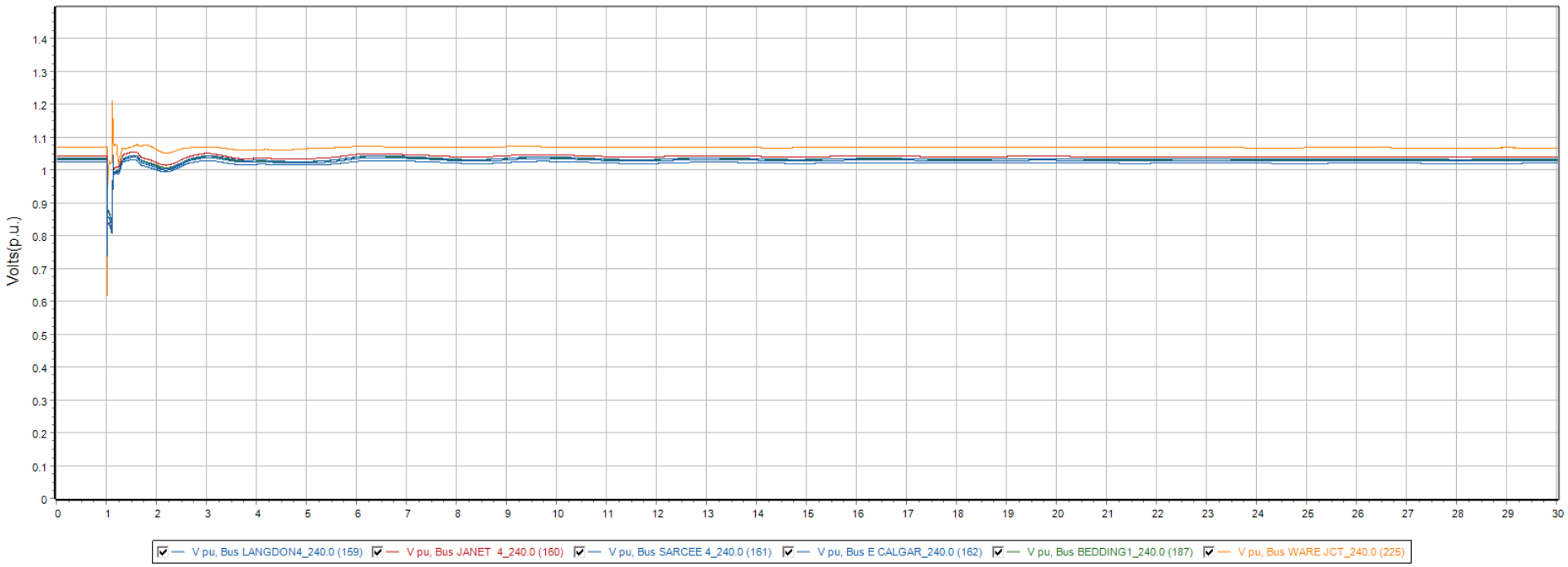
May 16, 2023 23:31:15

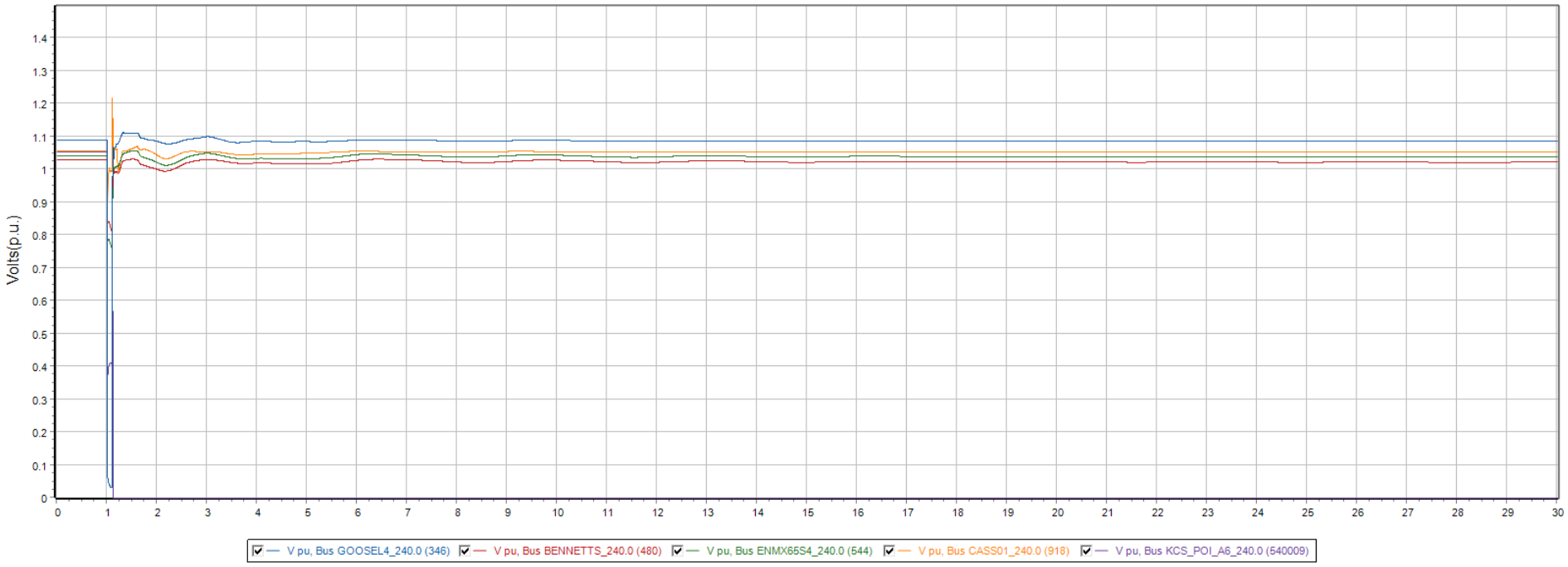
Monitor Line MW & MVAR. Q4



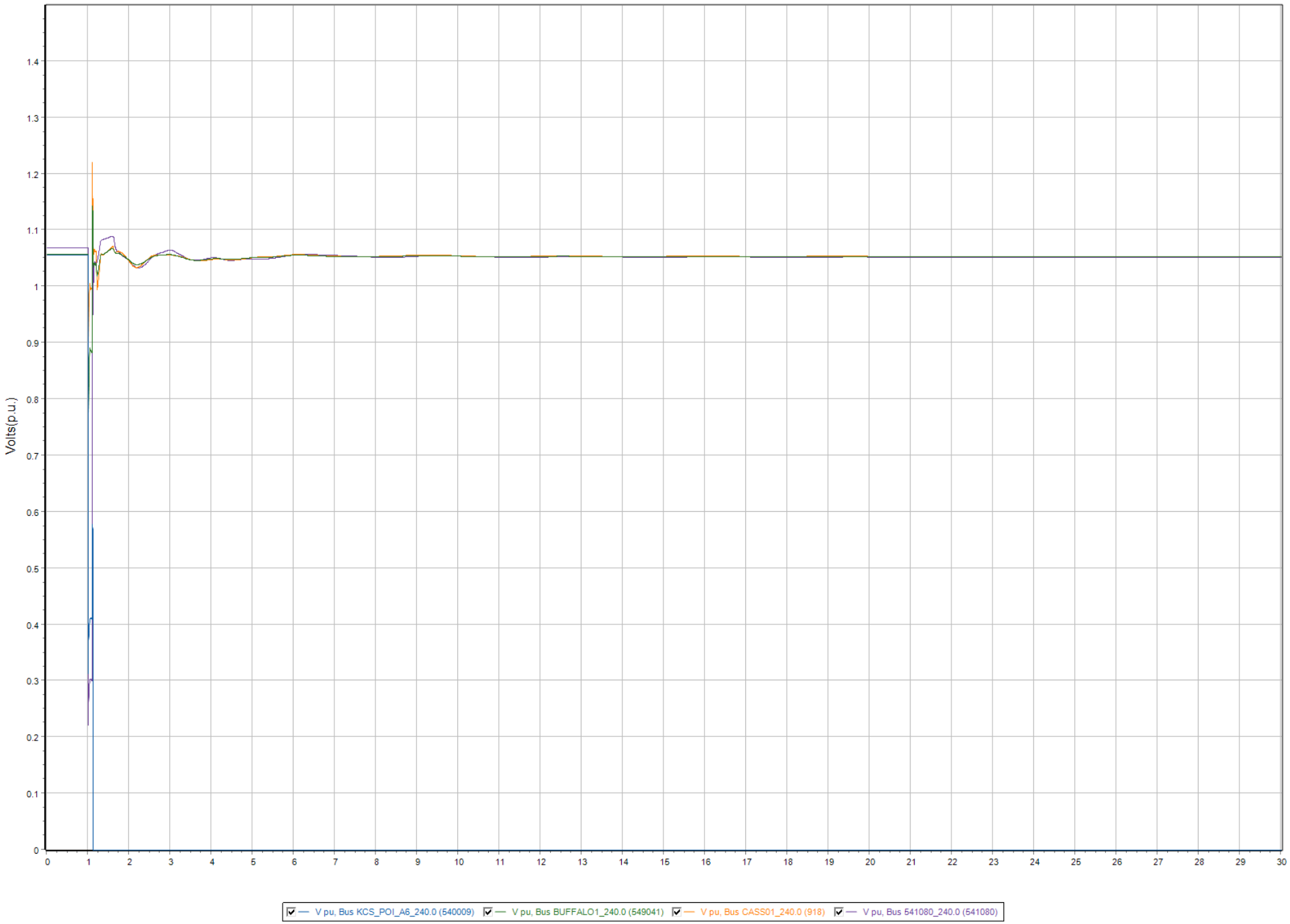


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1A - 1038L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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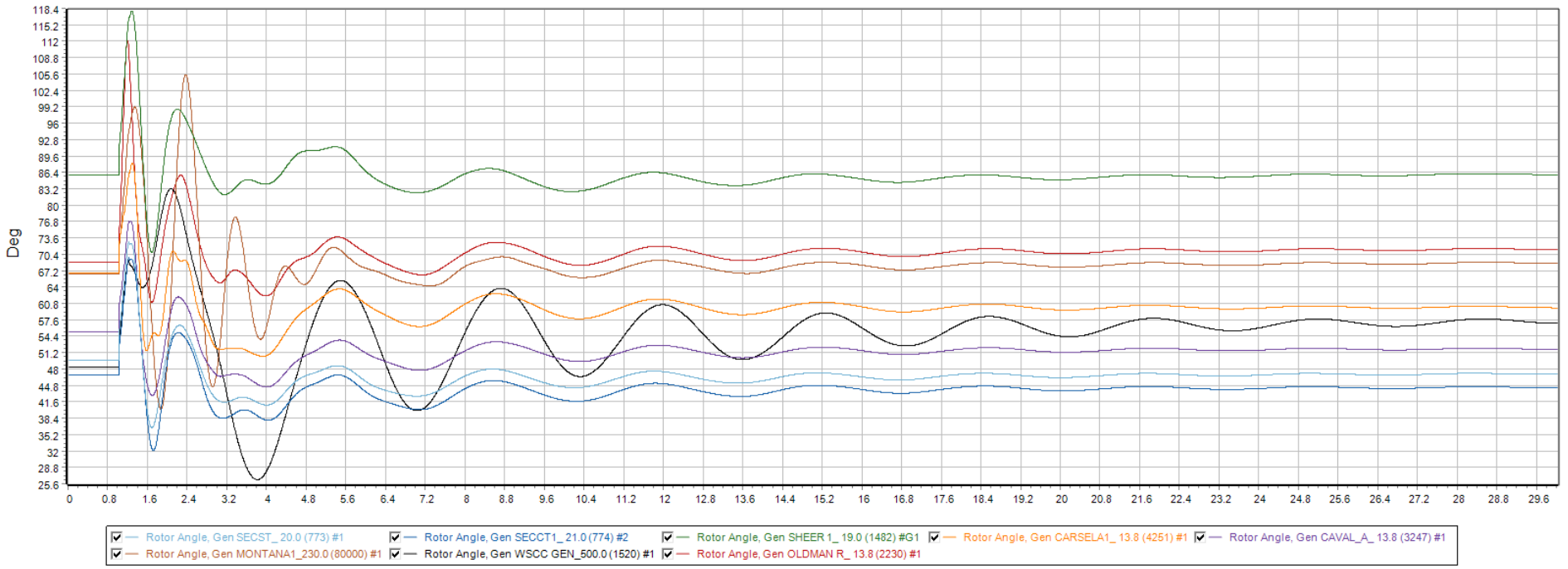
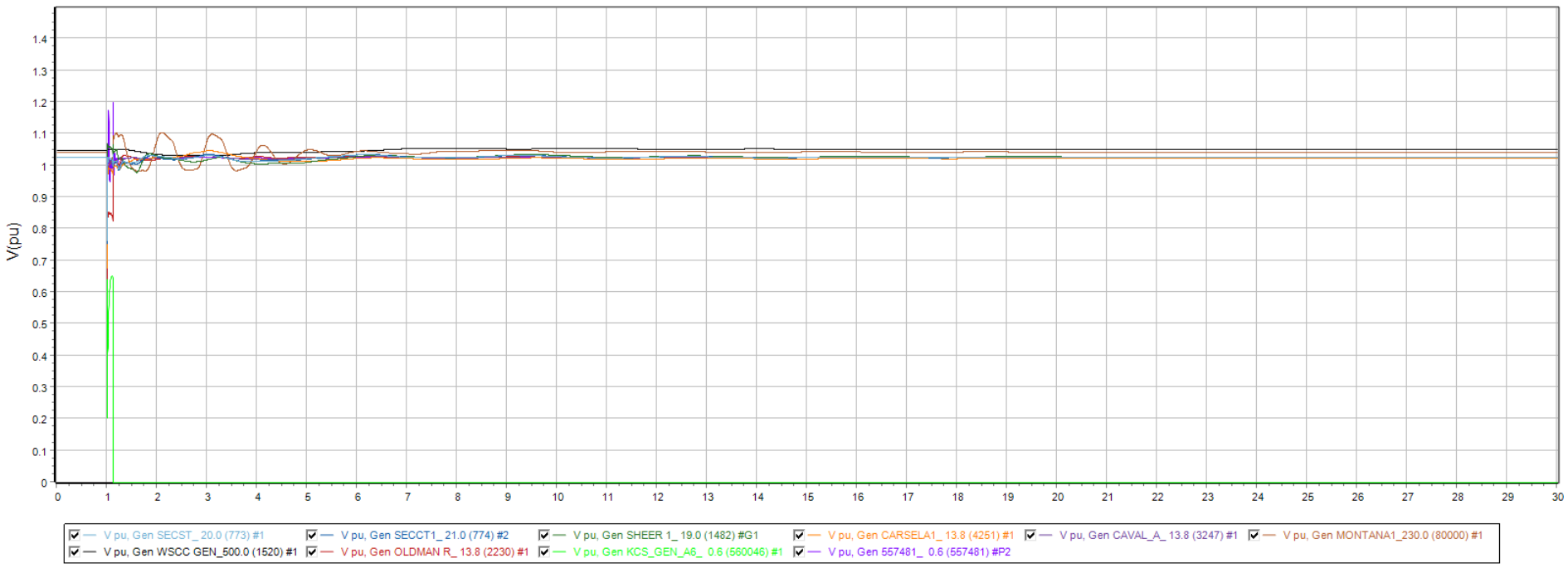
May 16, 2023 23:31:16

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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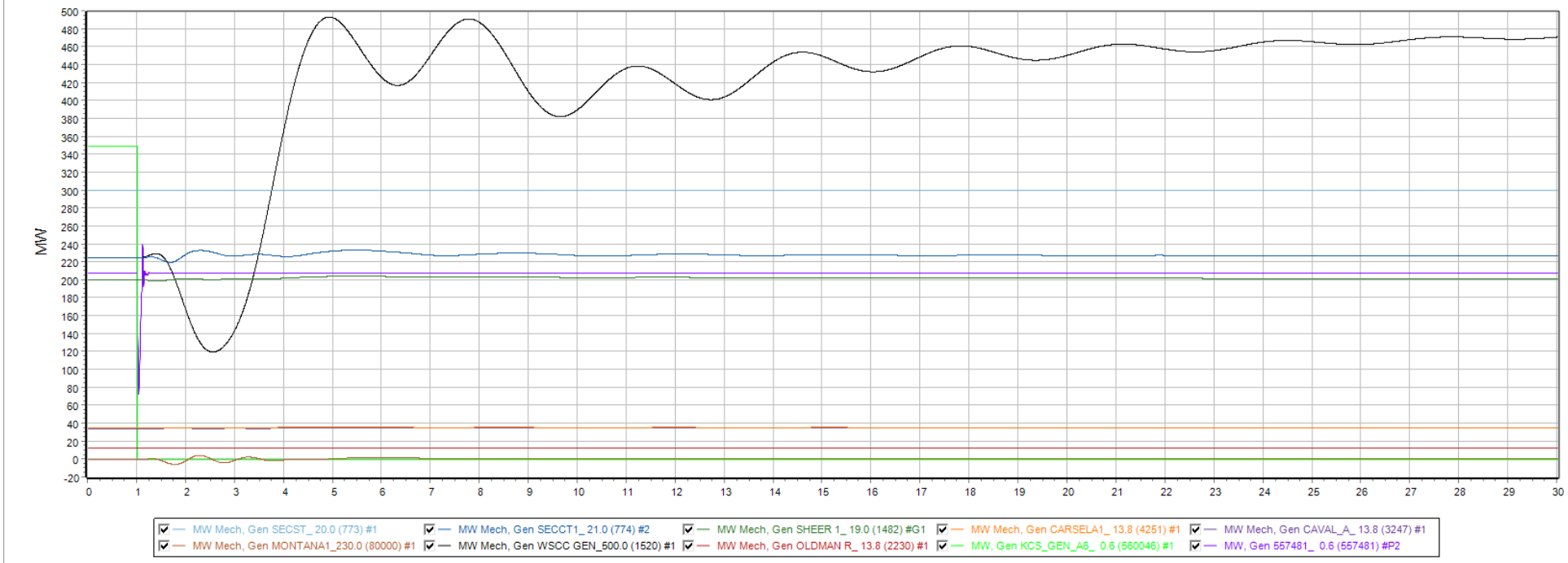
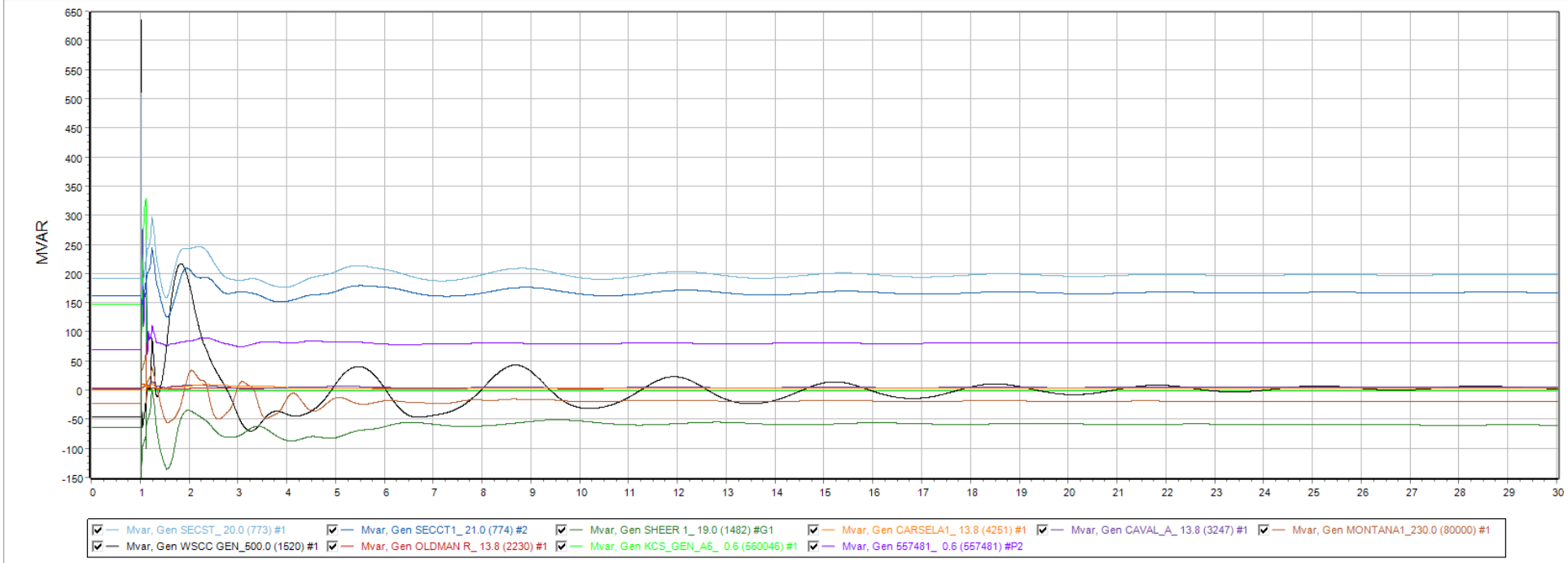
May 16, 2023 23:39:56

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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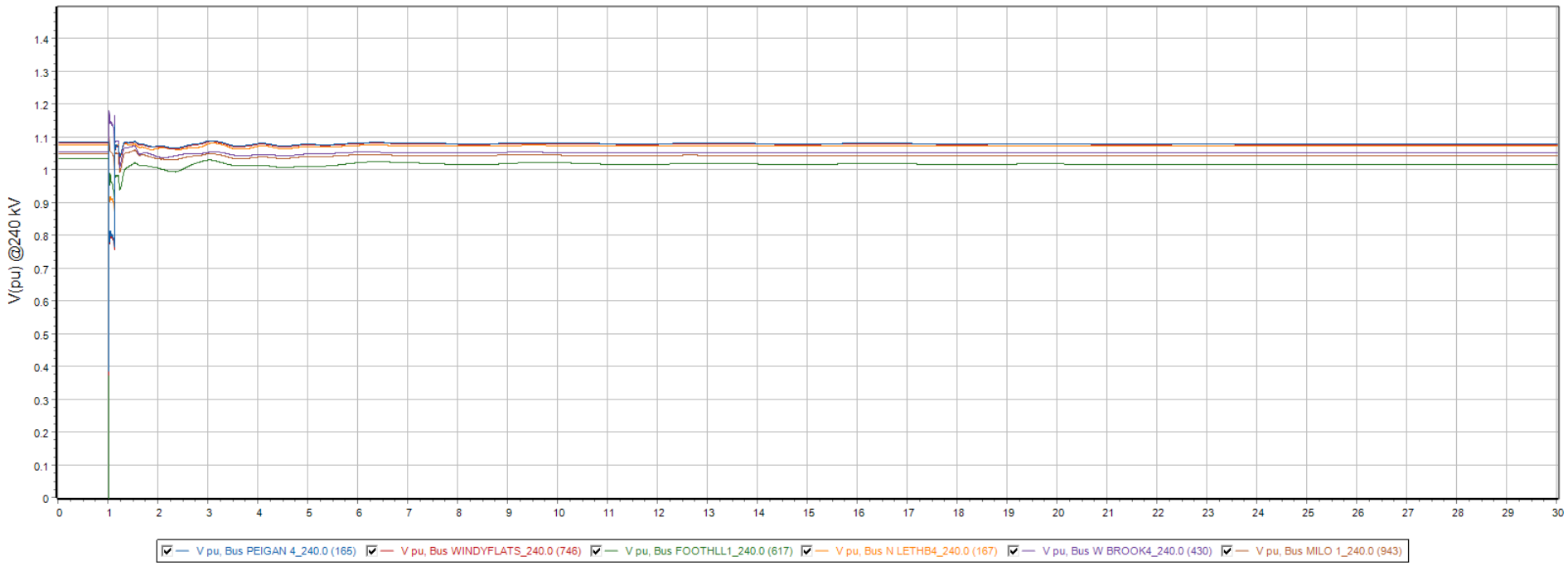
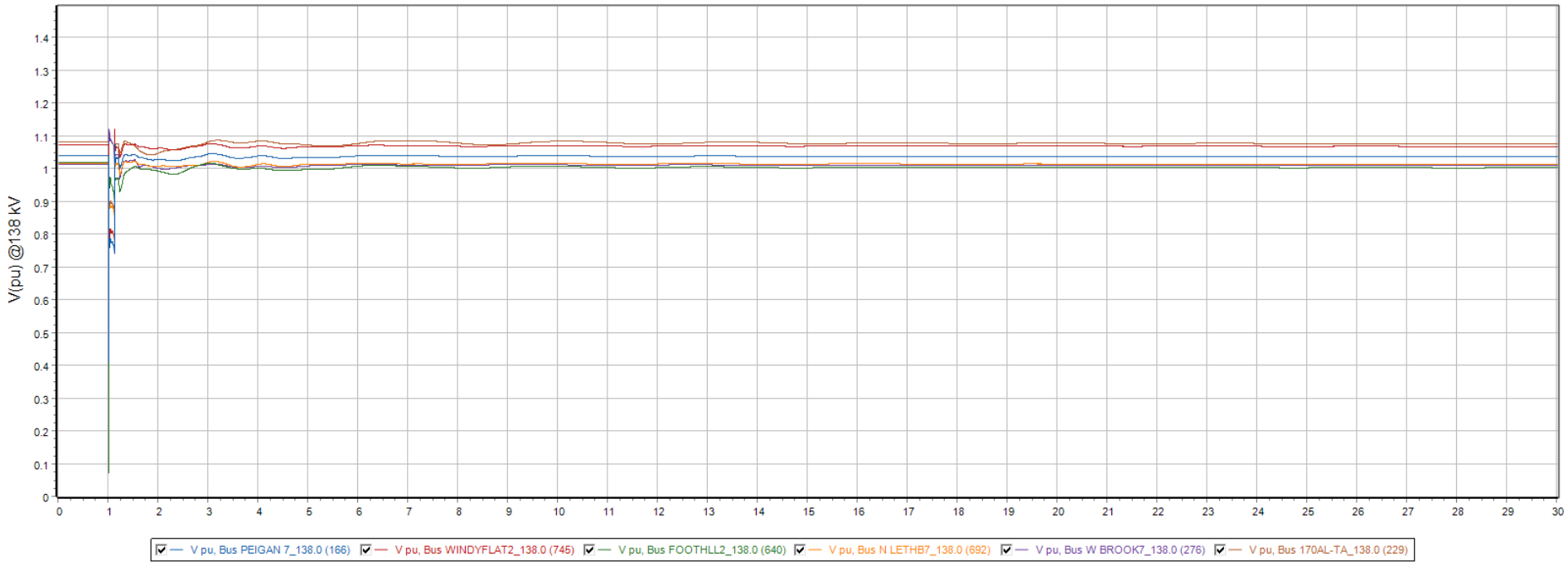
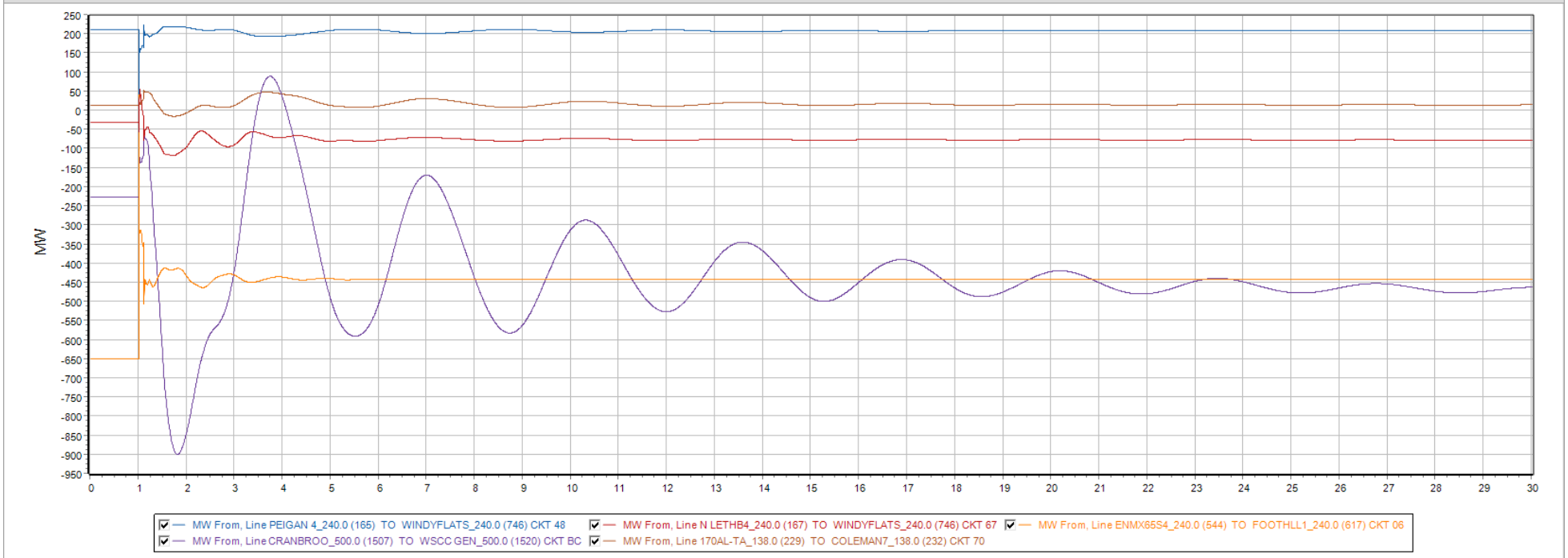
May 16, 2023 23:39:56

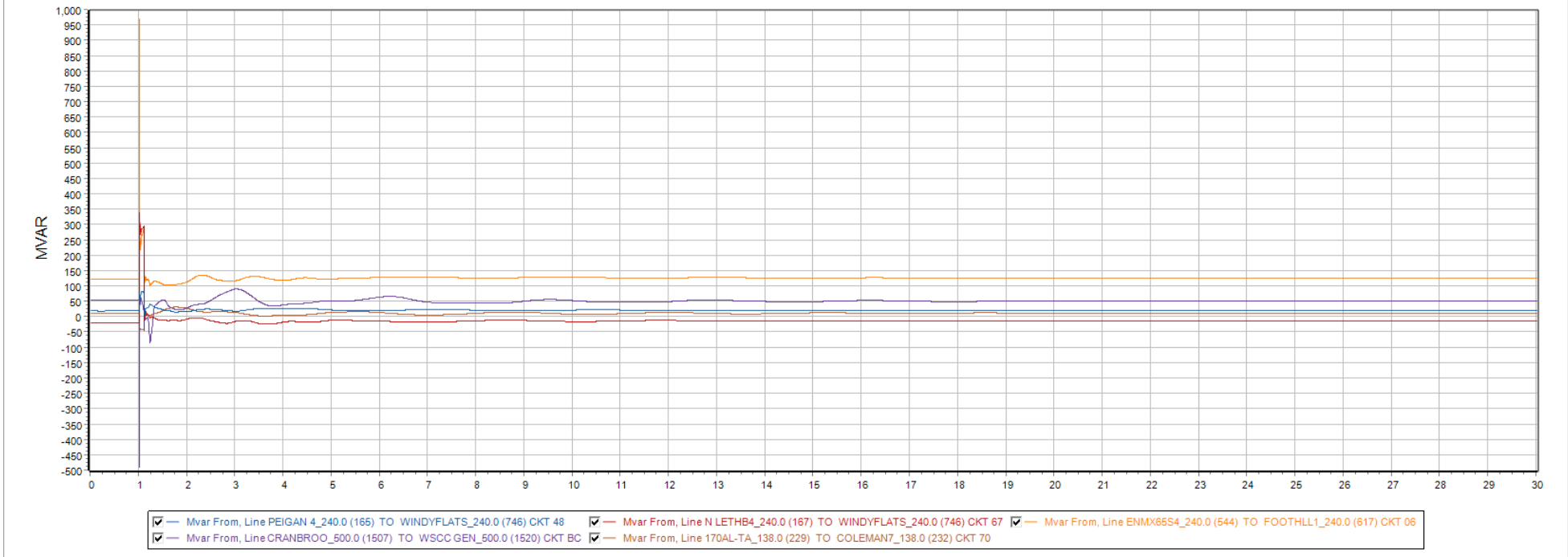
Monitor Bus Volts Q3



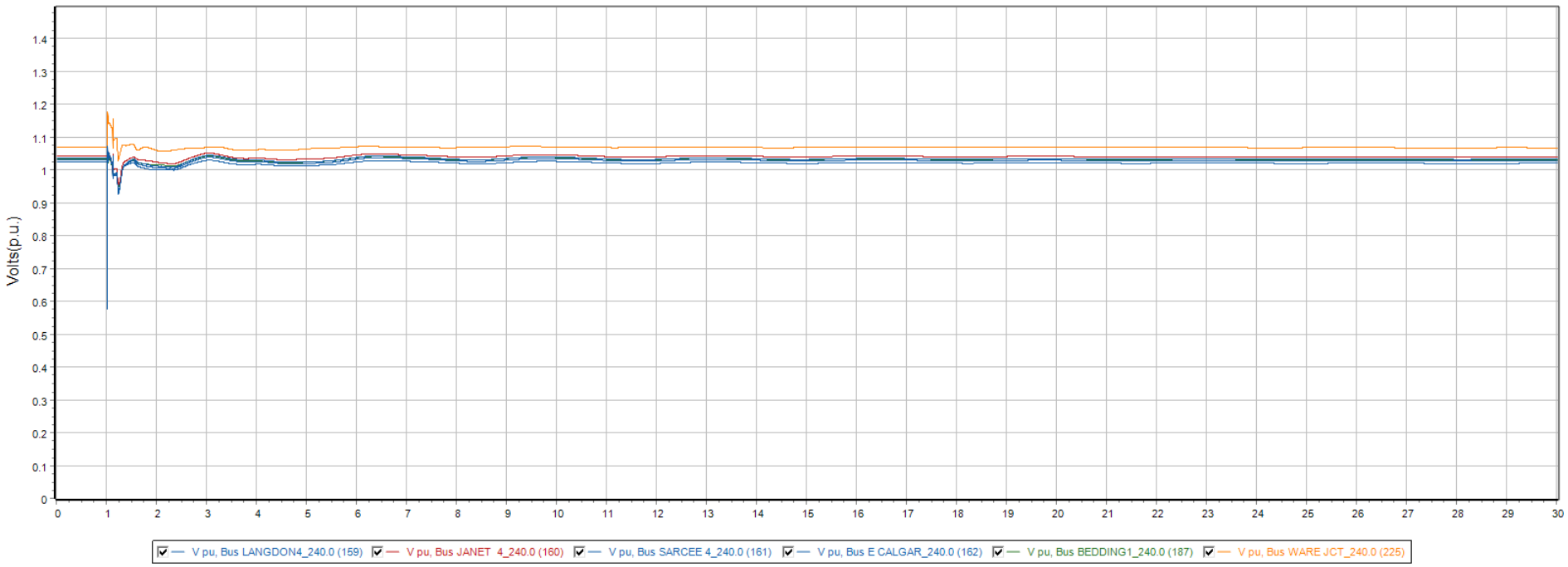


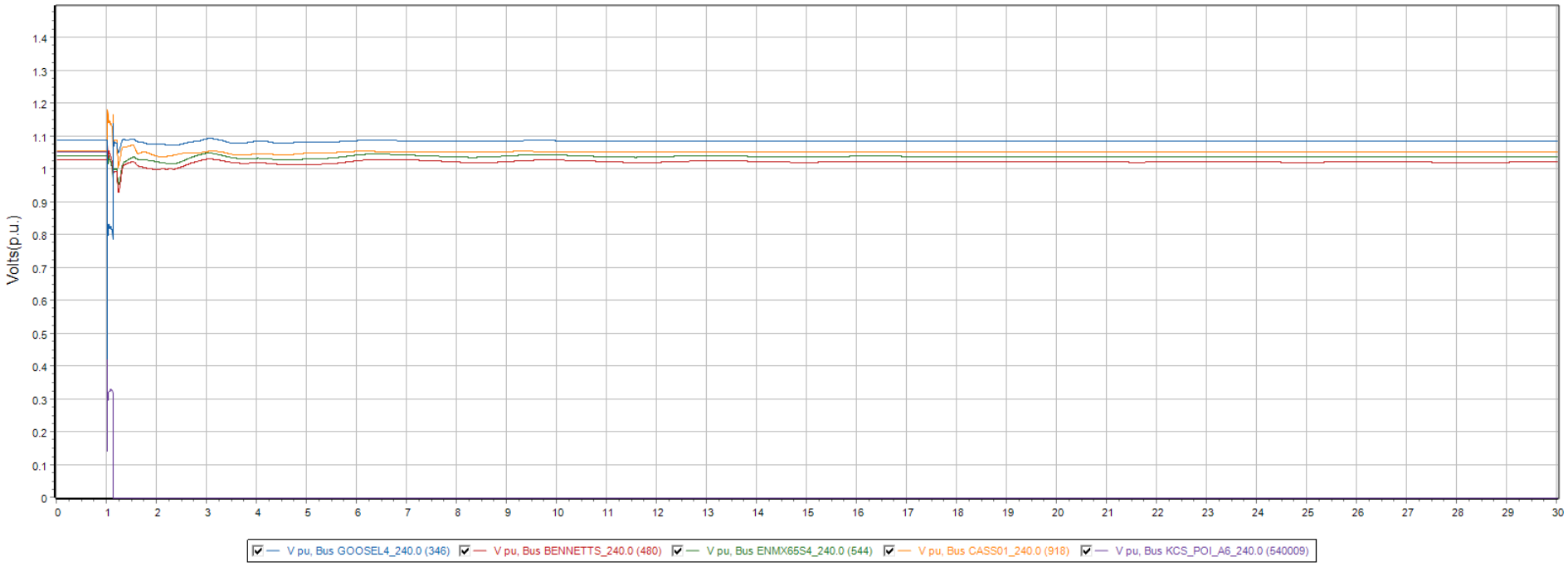
Monitor Line MW & MVAR. Q4



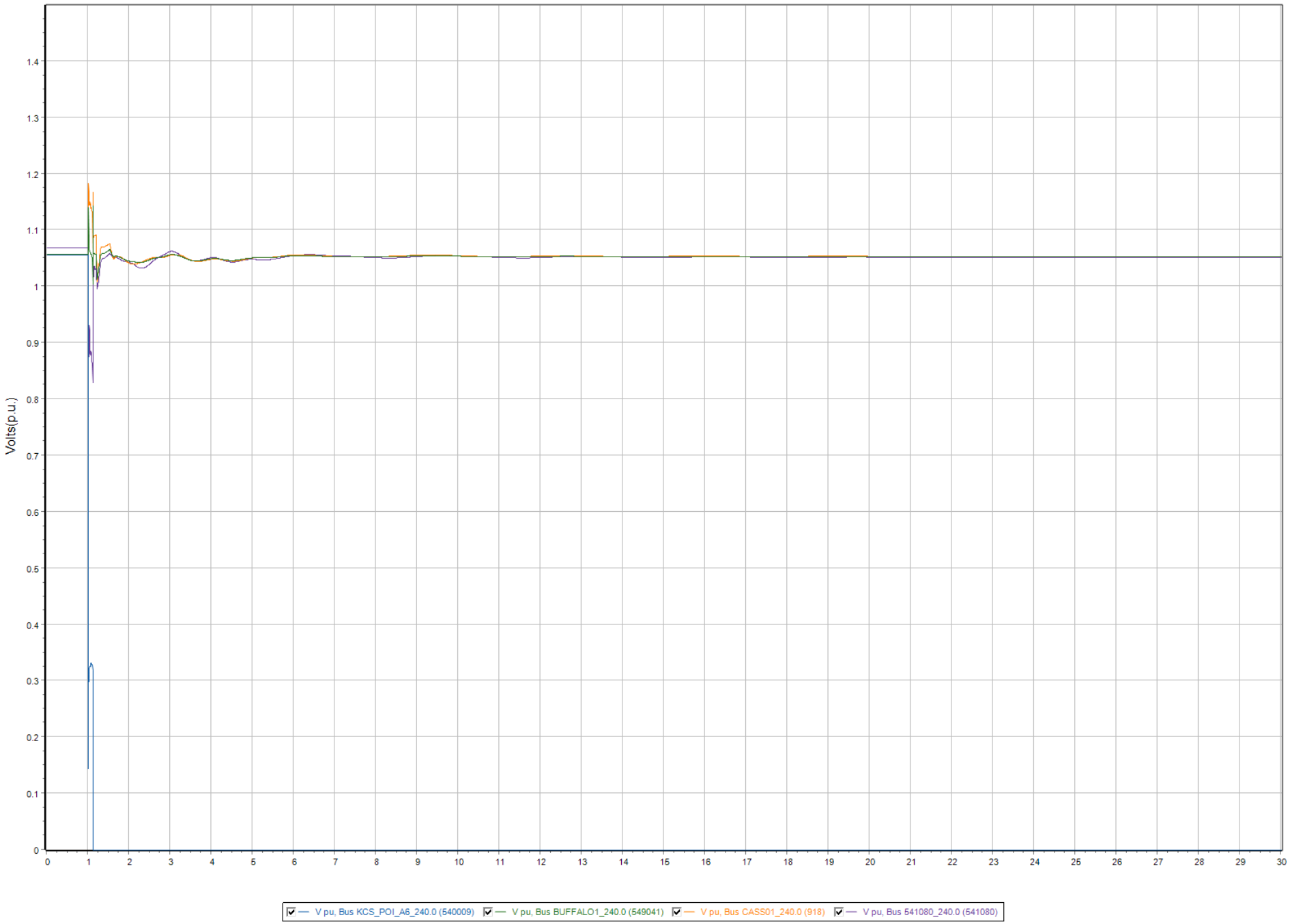


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03.1B - 1038L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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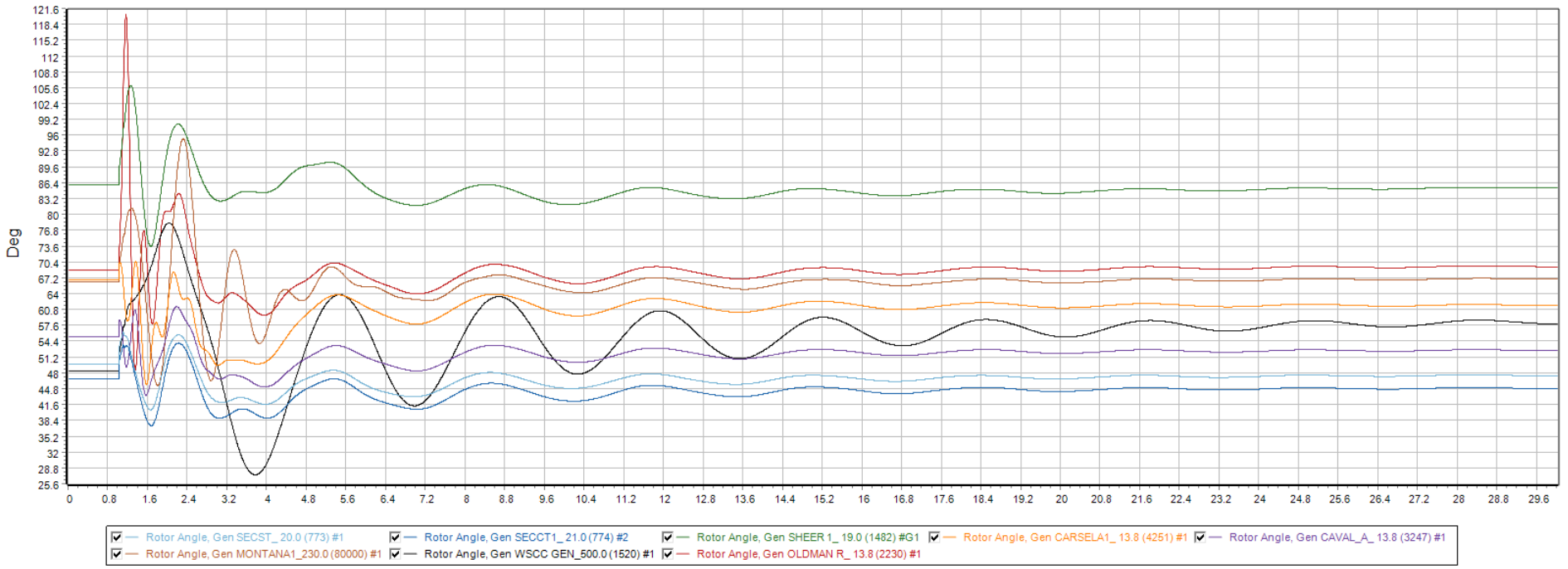
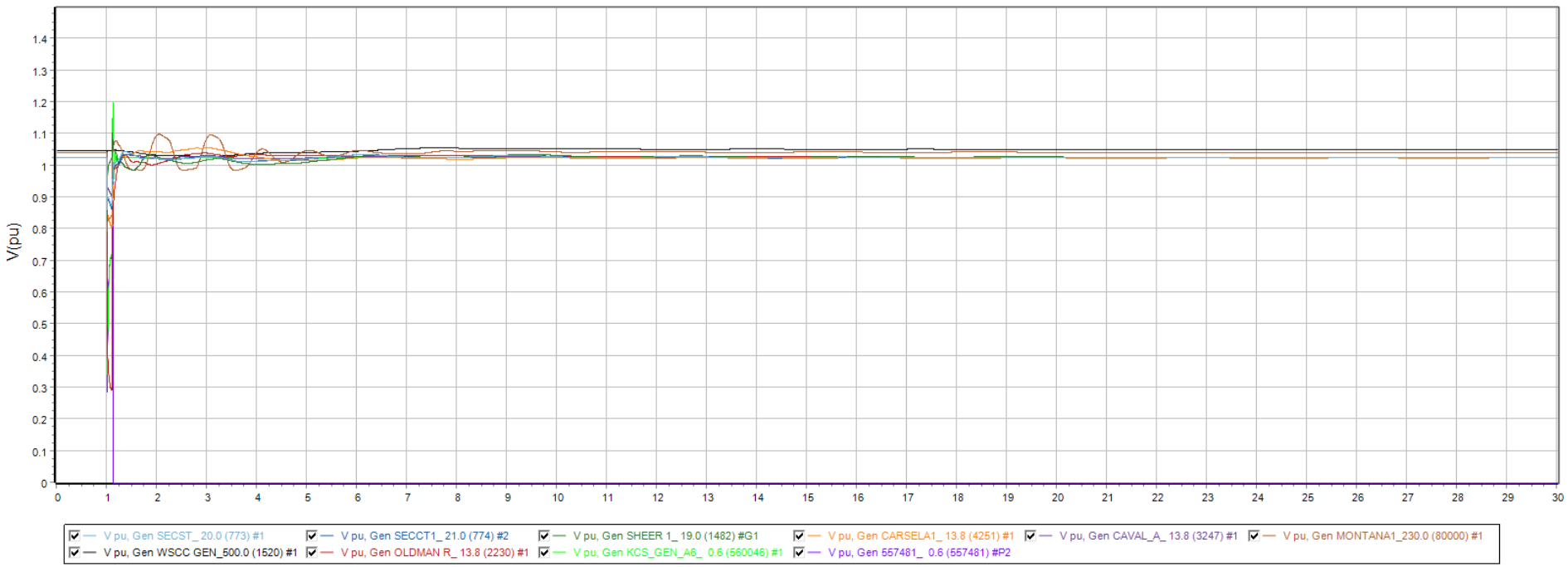
May 16, 2023 23:39:58

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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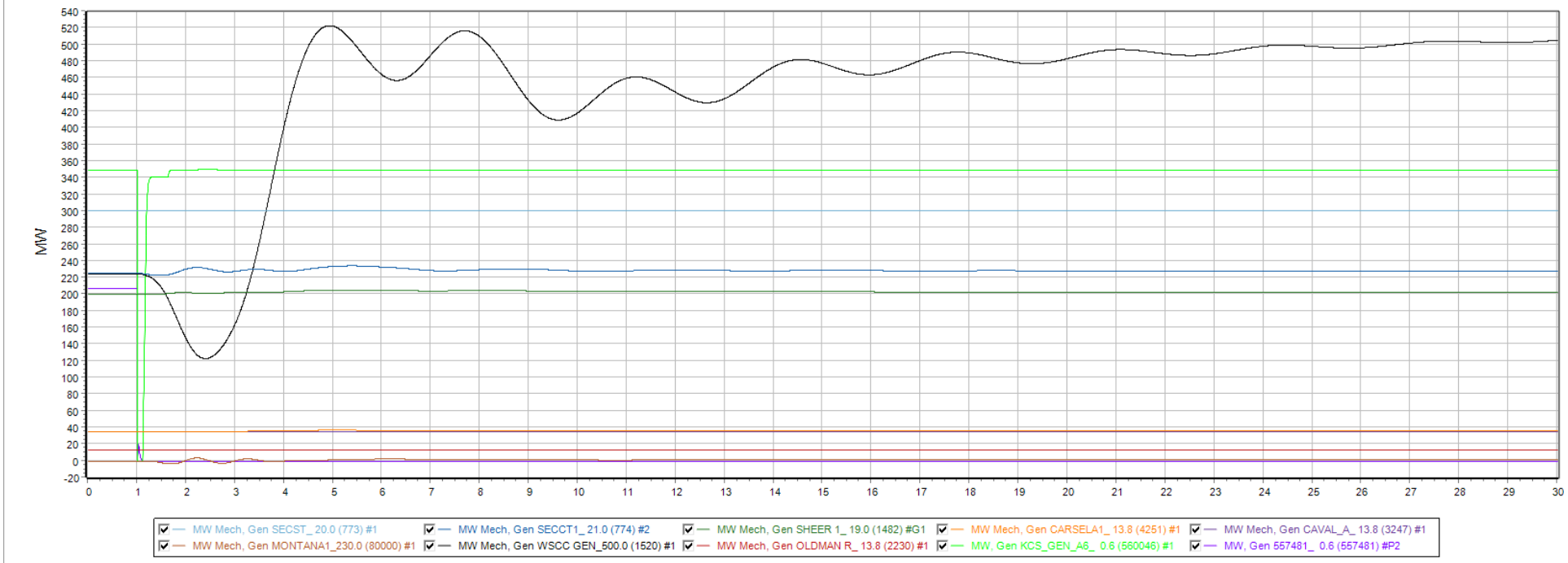
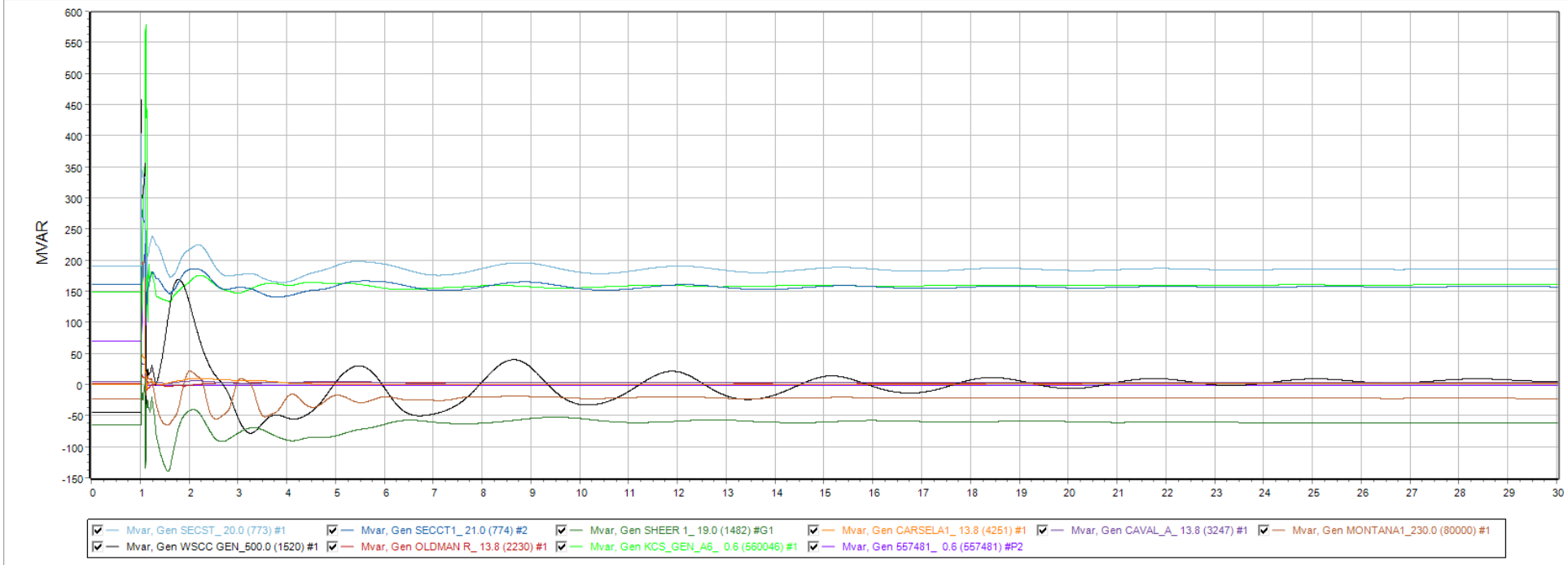
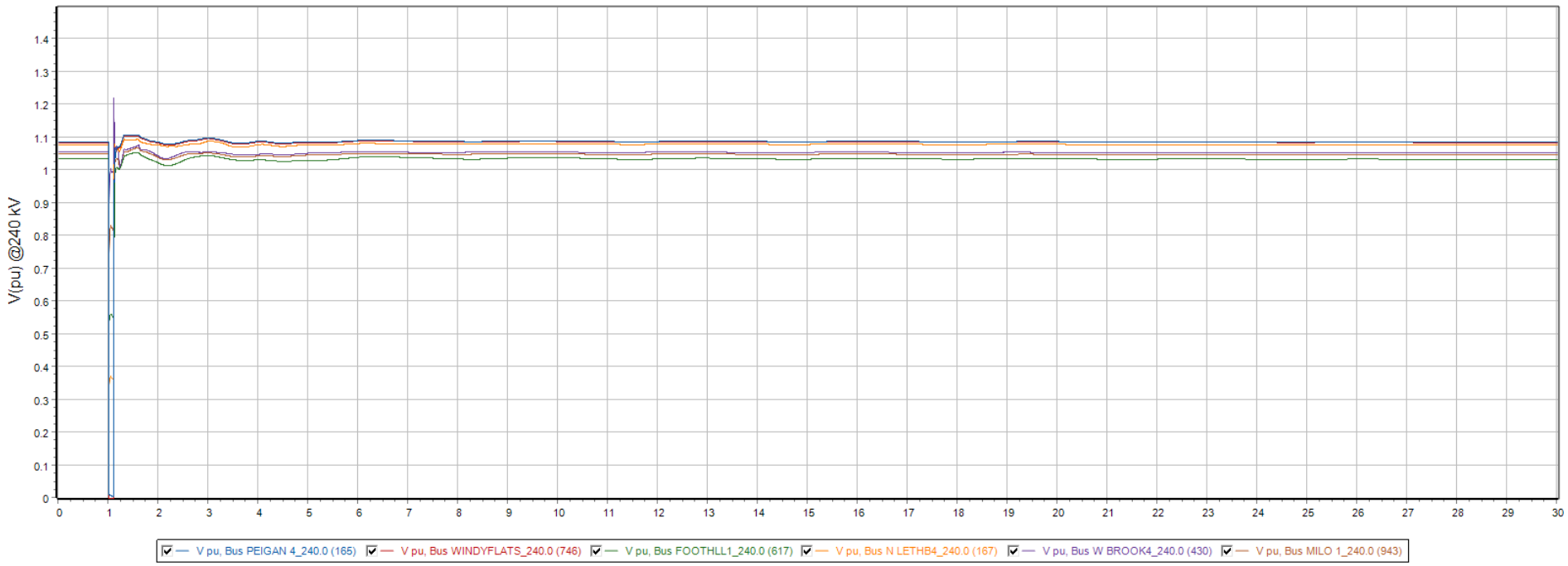
May 16, 2023 21:20:59

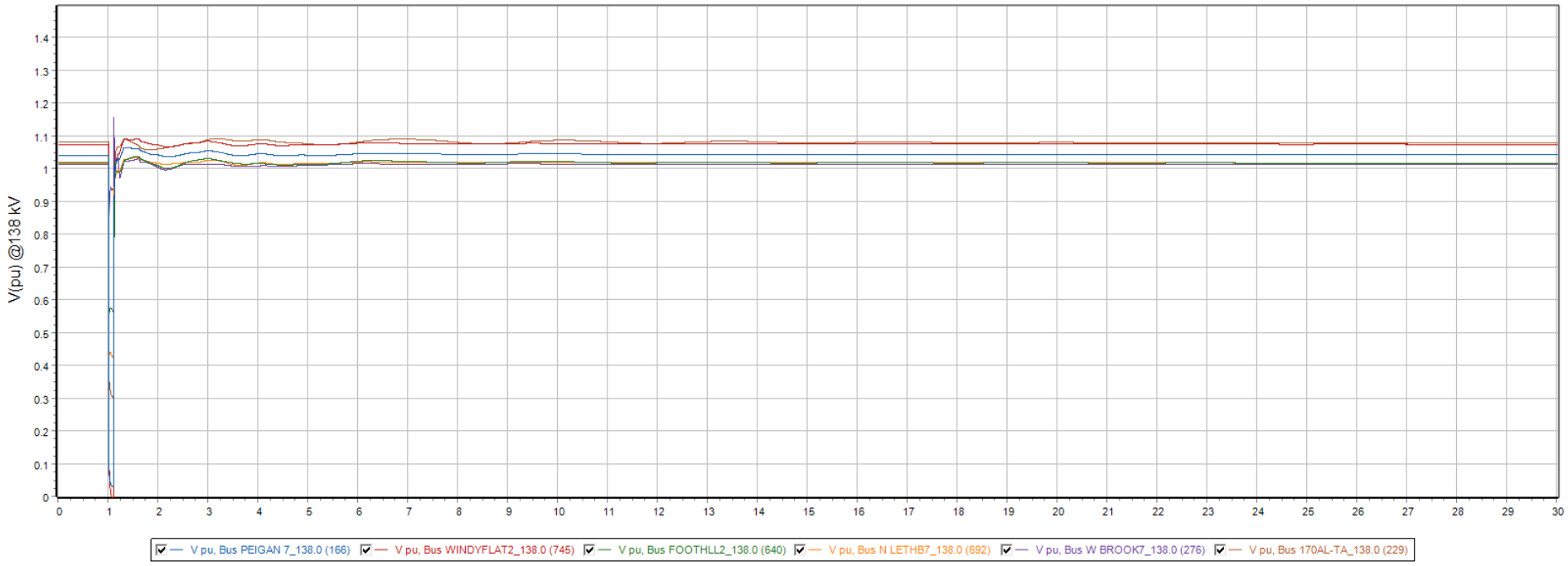
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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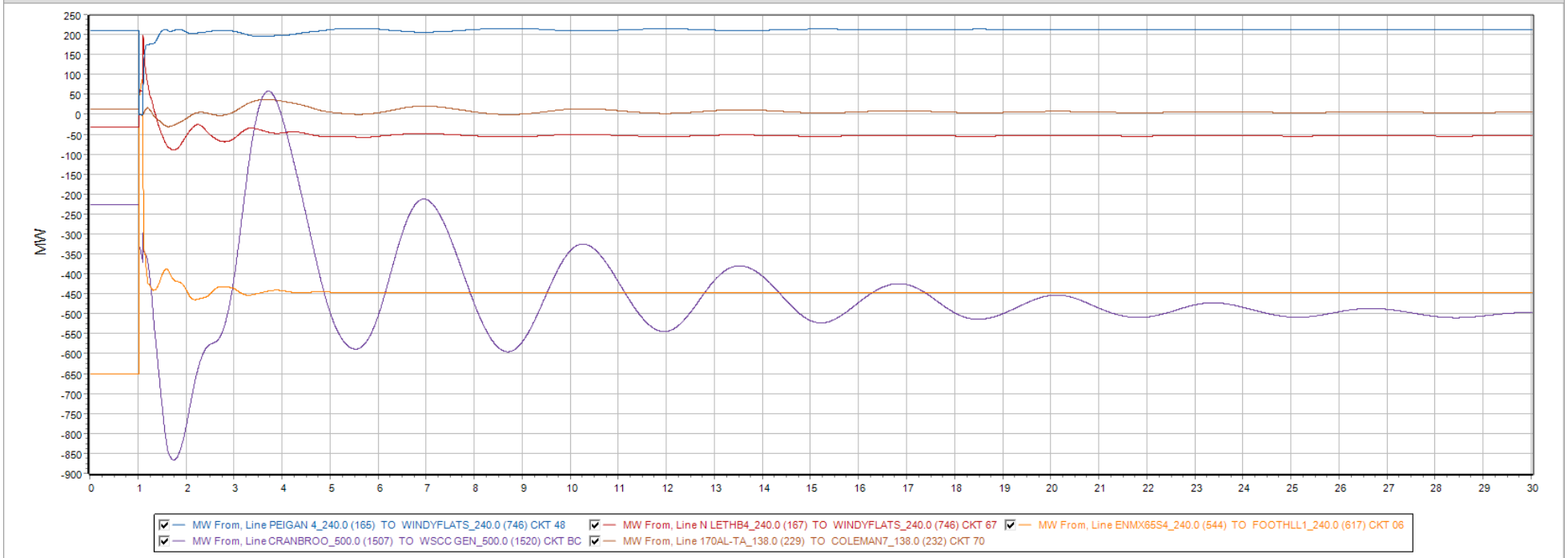
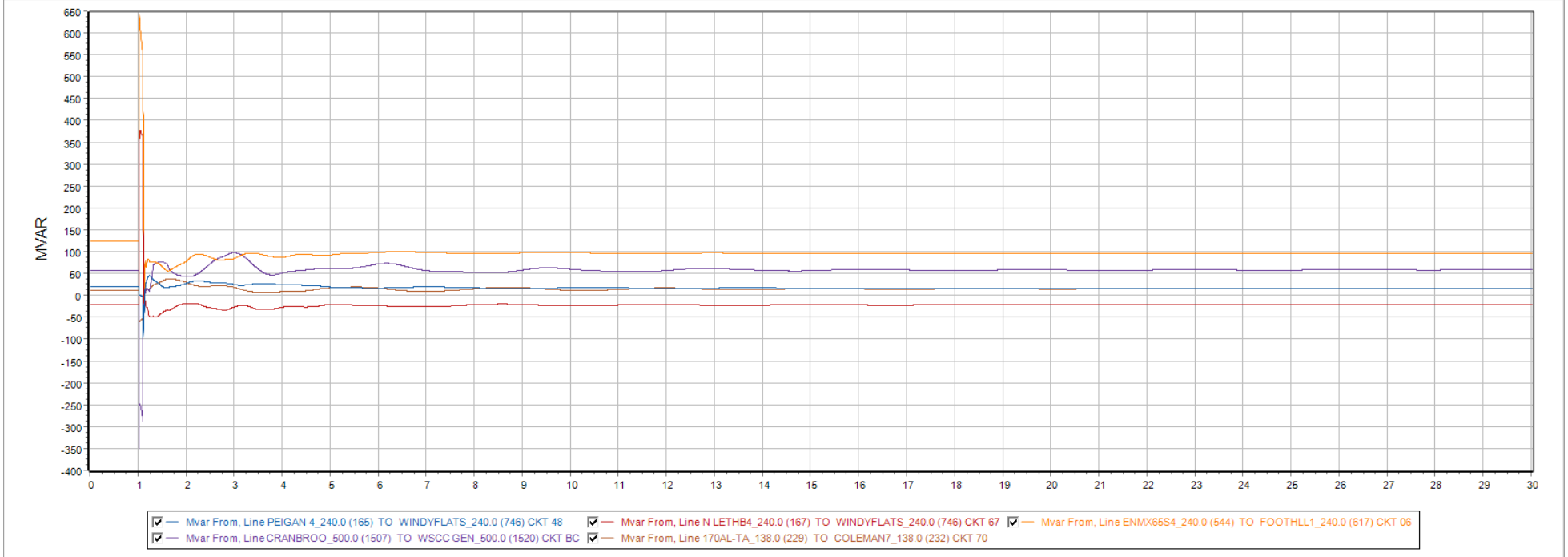
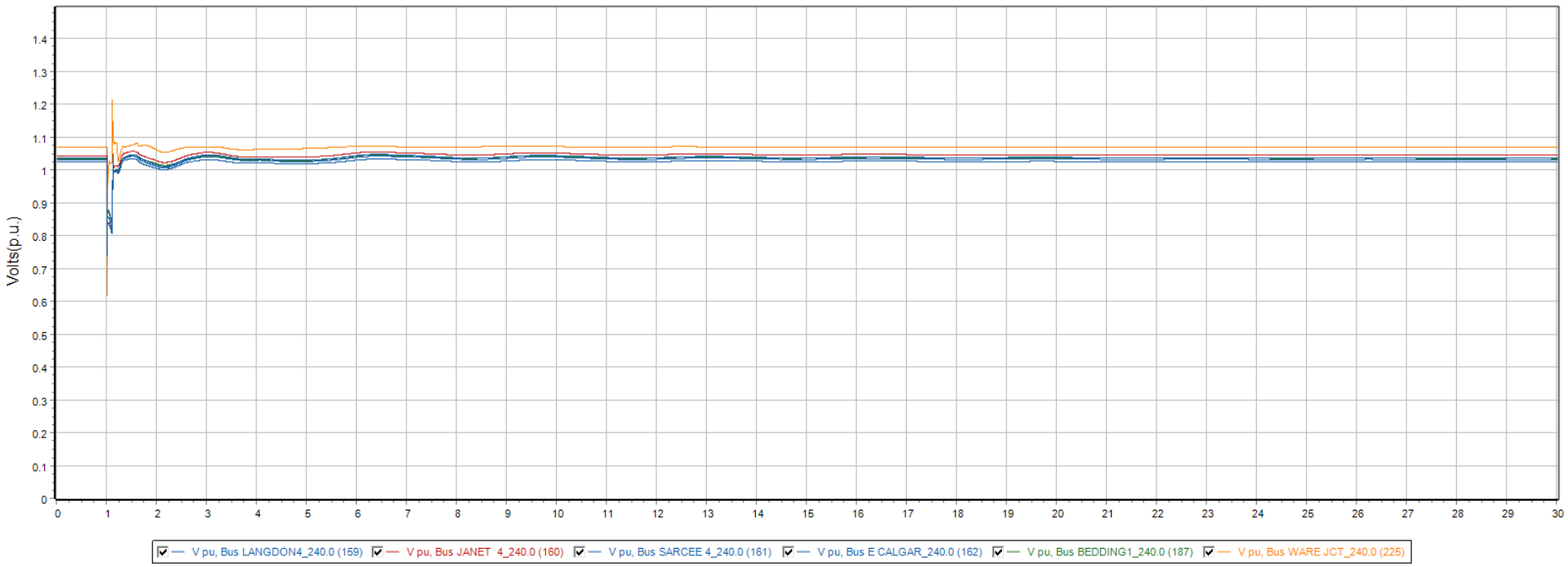
May 16, 2023 21:21:00

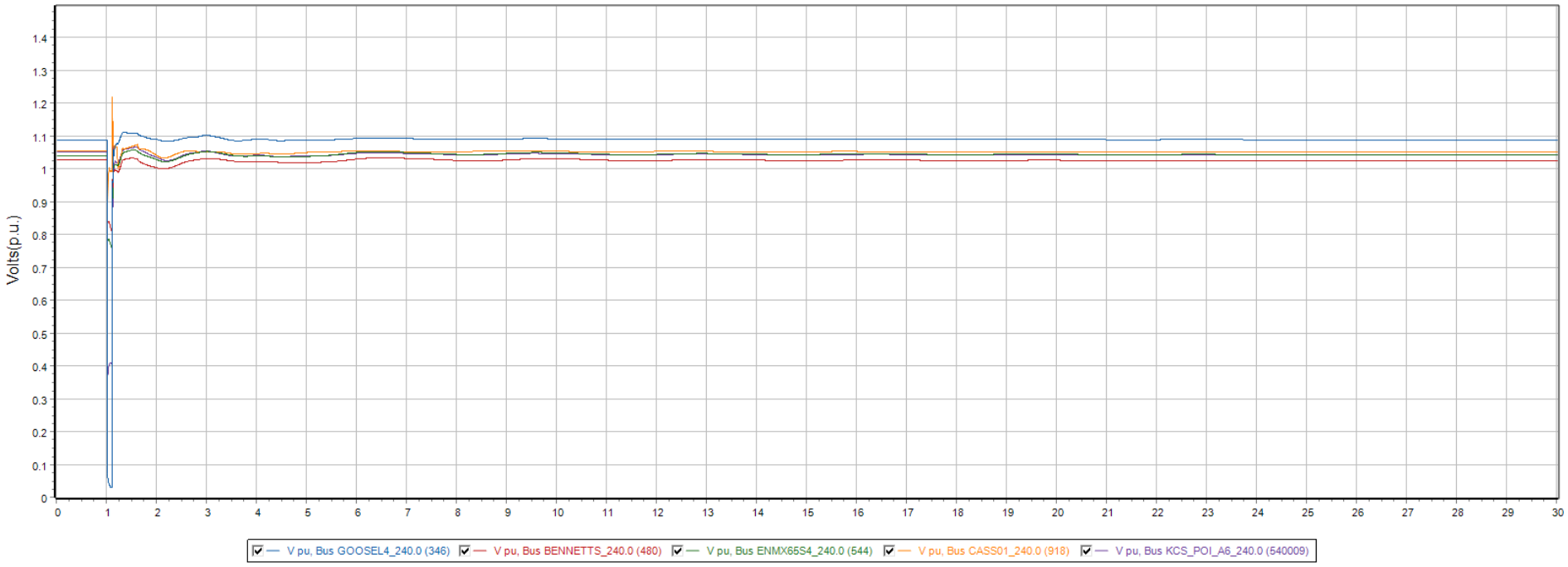
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03A - 1037L (Windy Flats 138S - Foothills 237S) @ Windy Flats 138S

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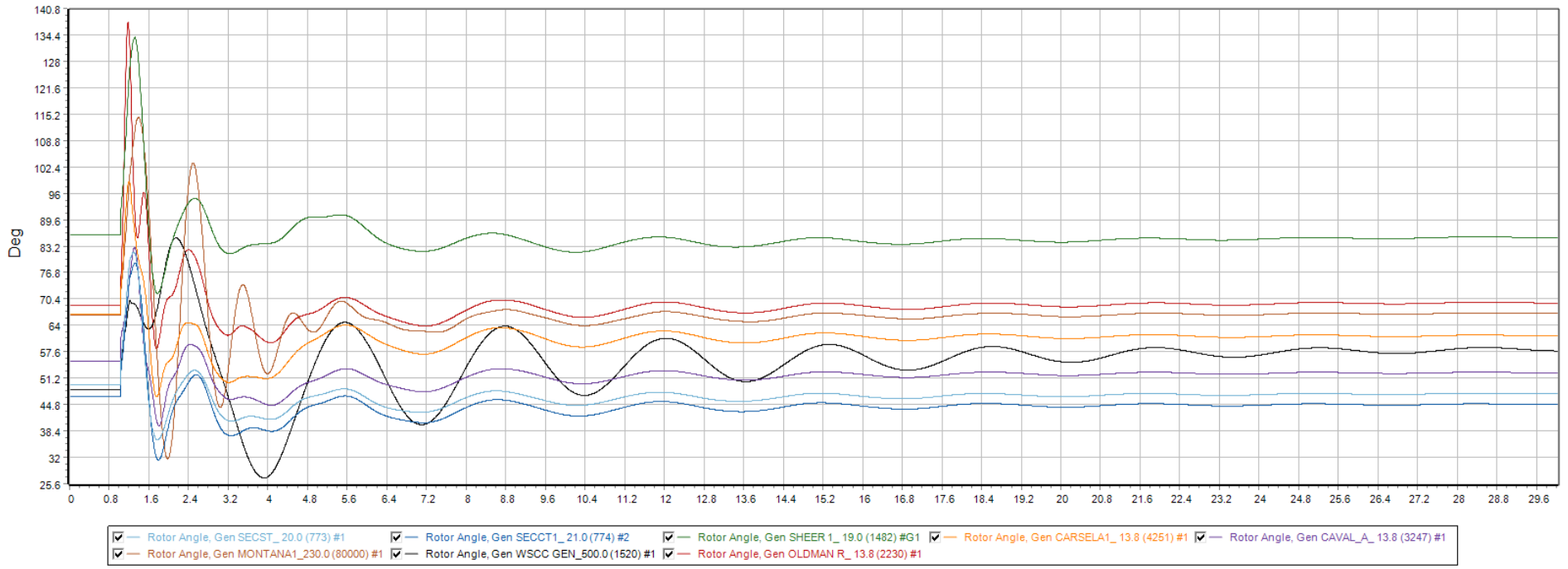
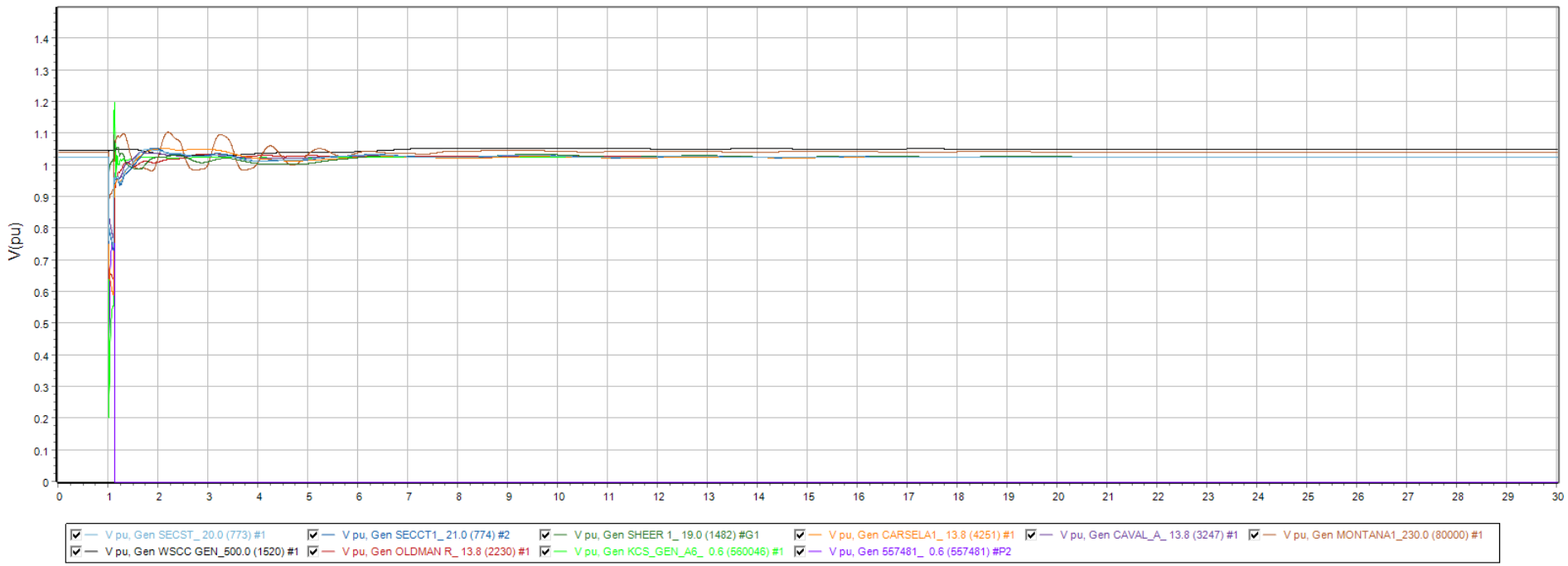
May 16, 2023 21:21:01

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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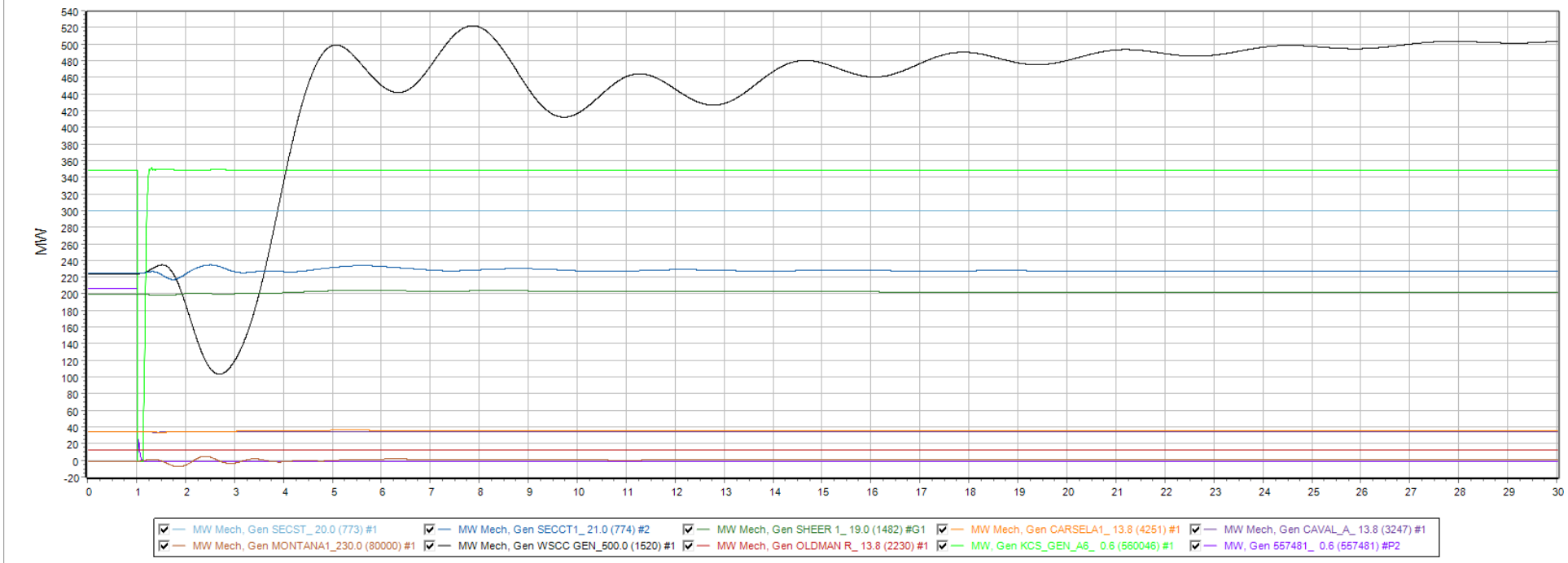
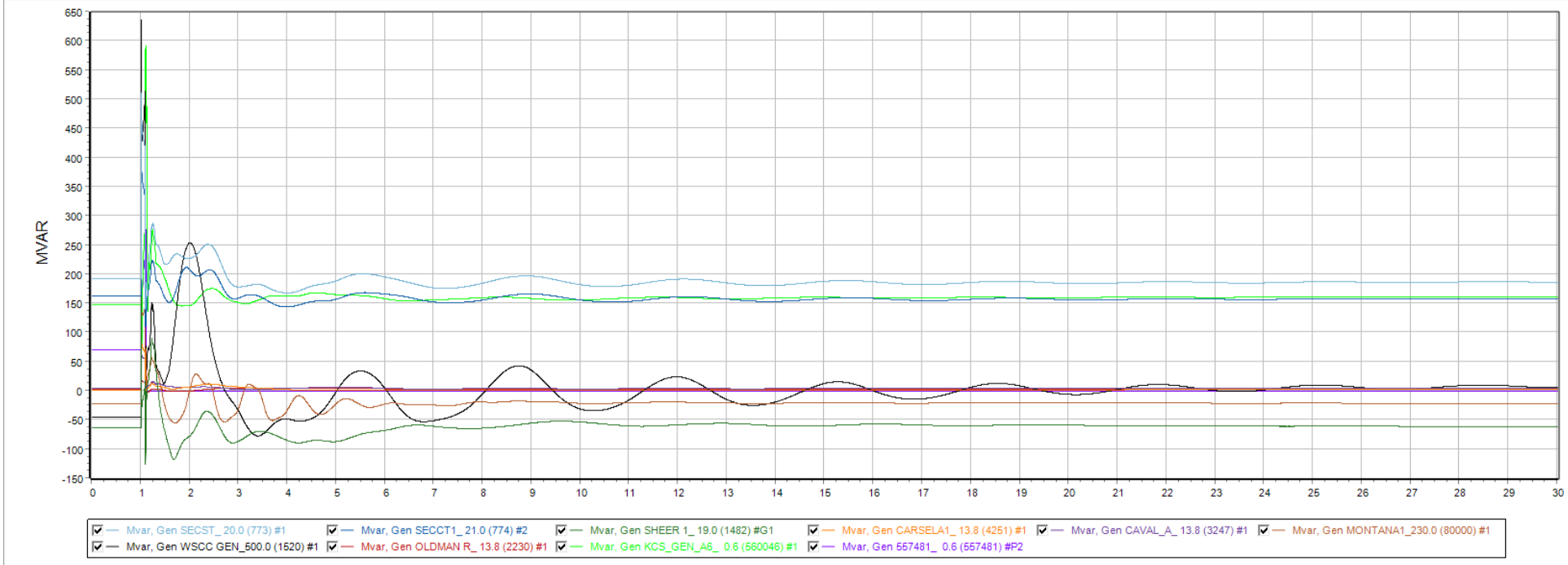
May 16, 2023 21:31:33

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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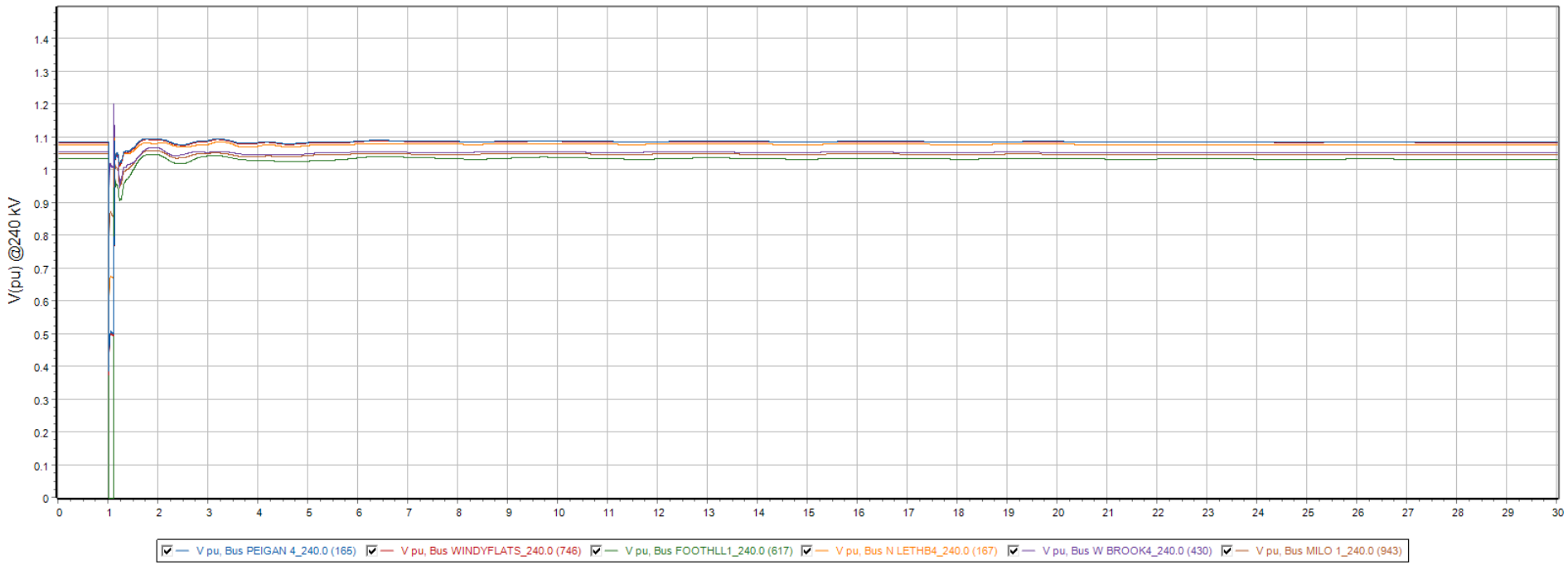
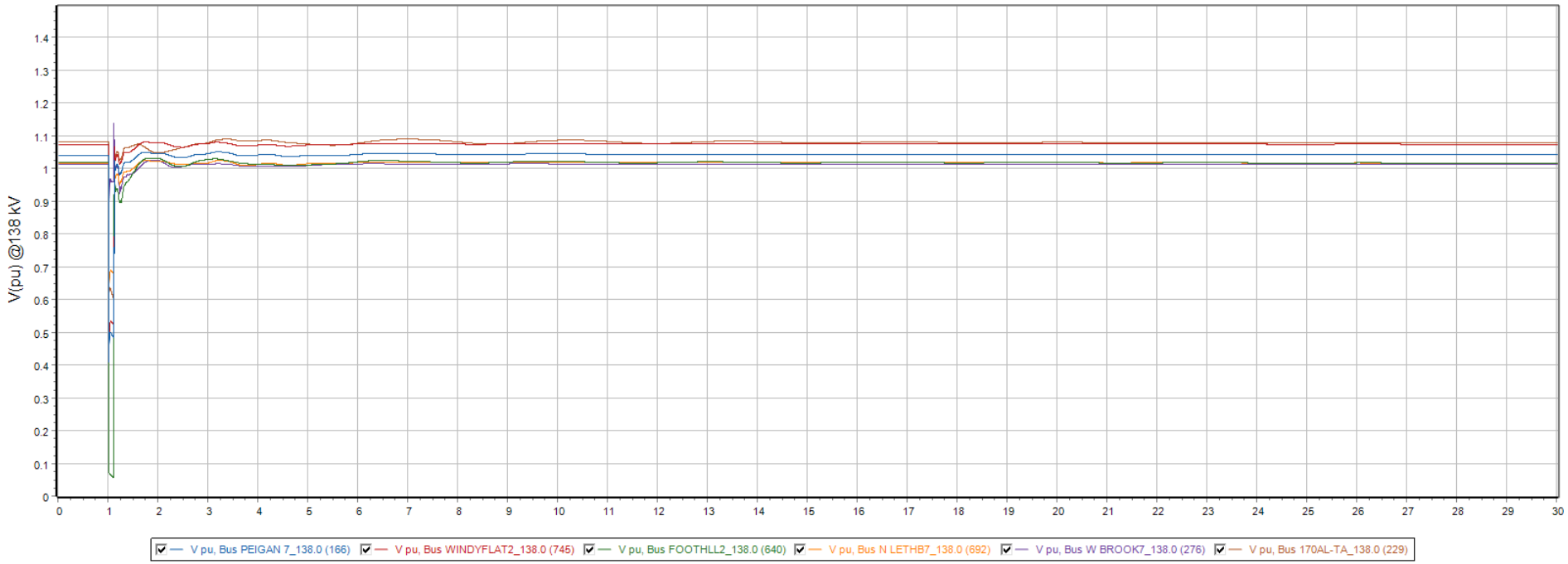
May 16, 2023 21:31:34

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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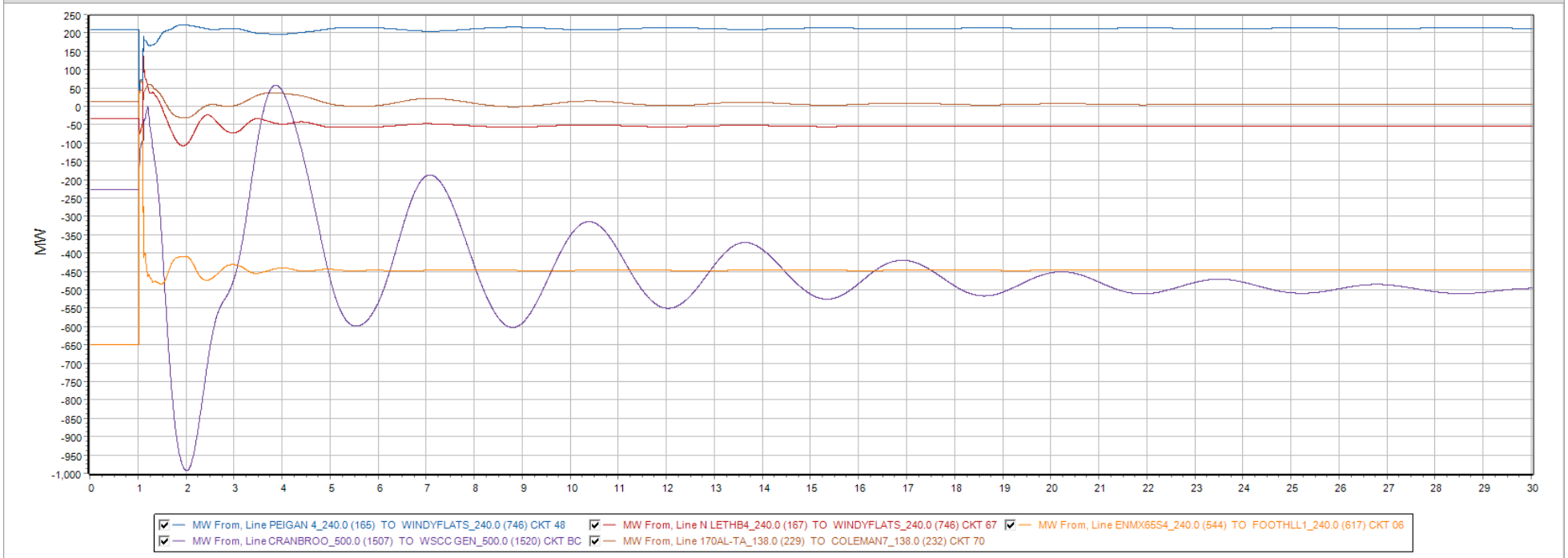
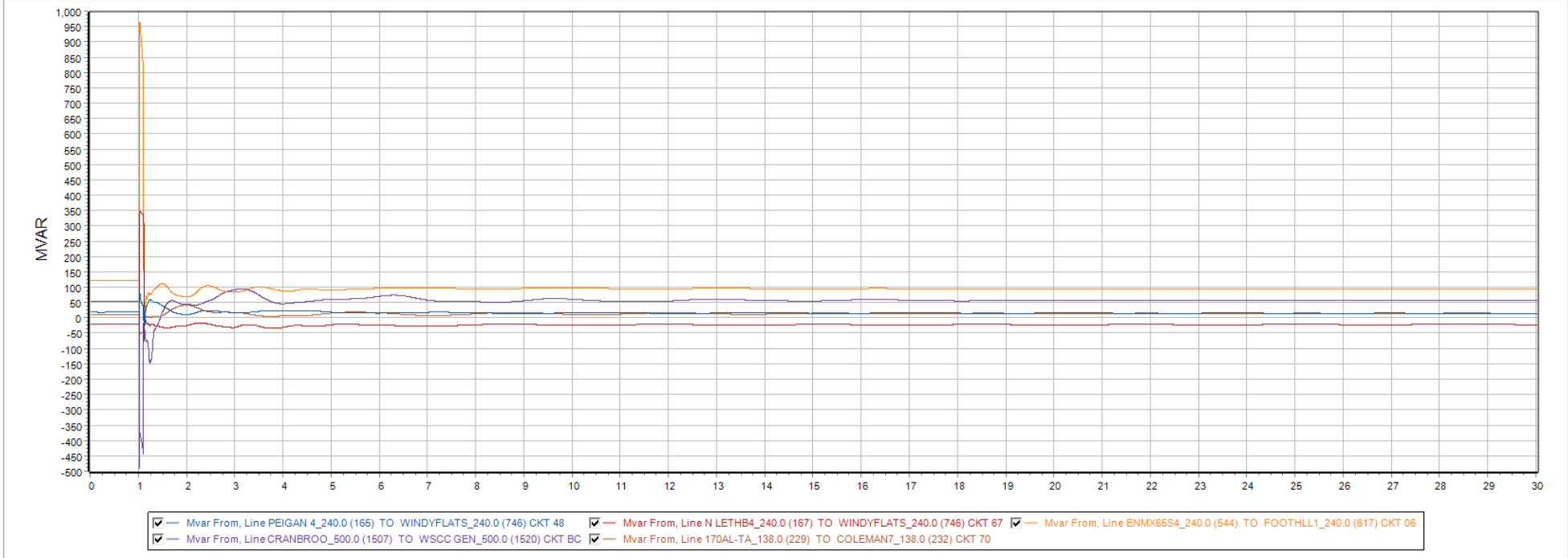
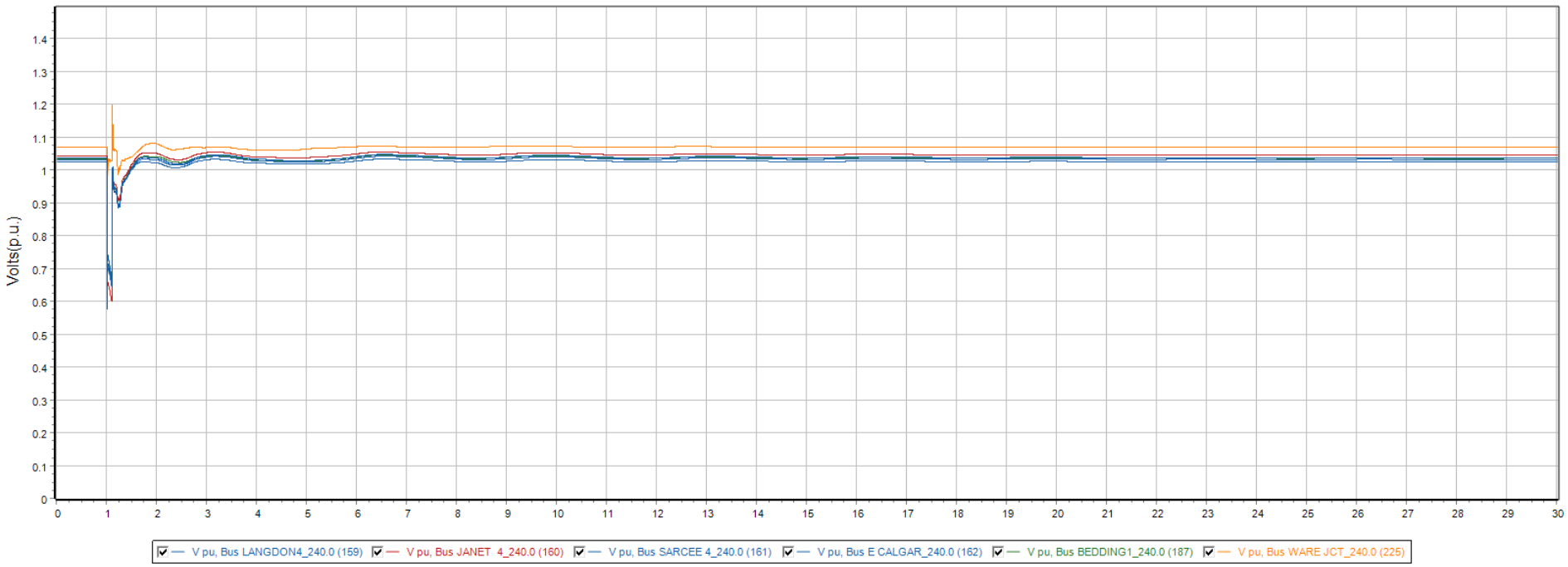
May 16, 2023 21:31:34

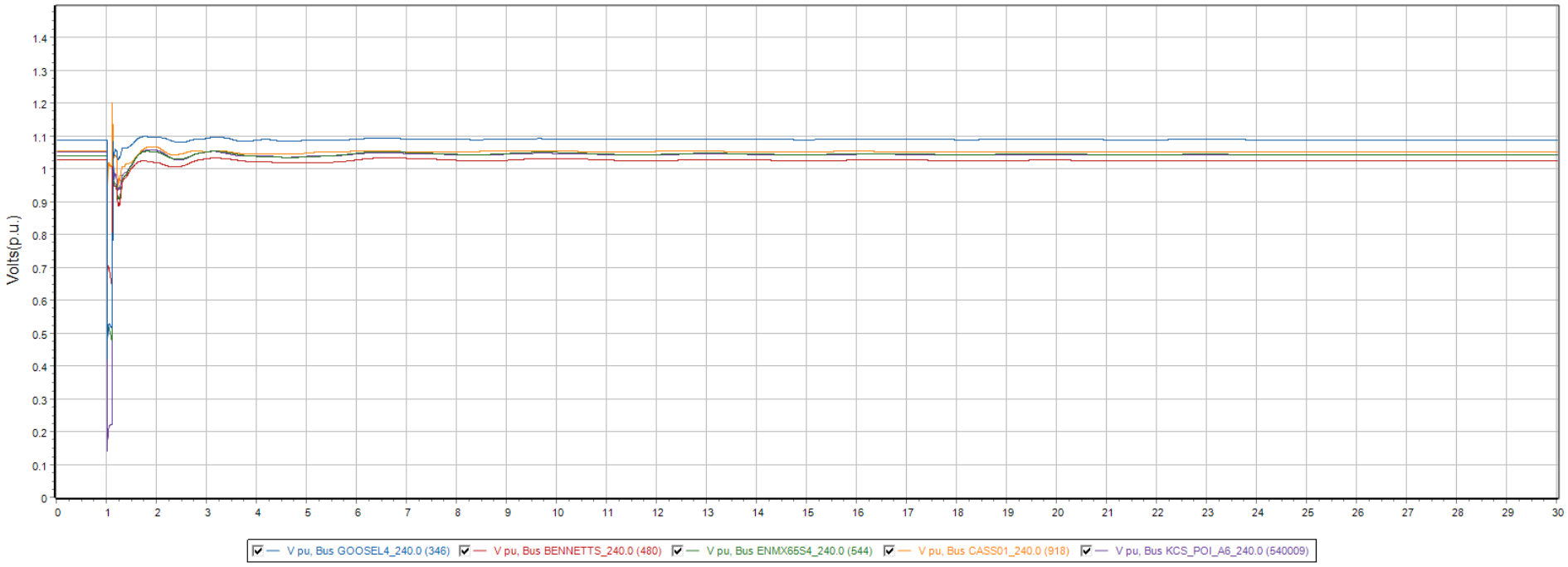
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 03B - 1037L (Windy Flats 138S - Foothills 237S) @ Foothills 237S

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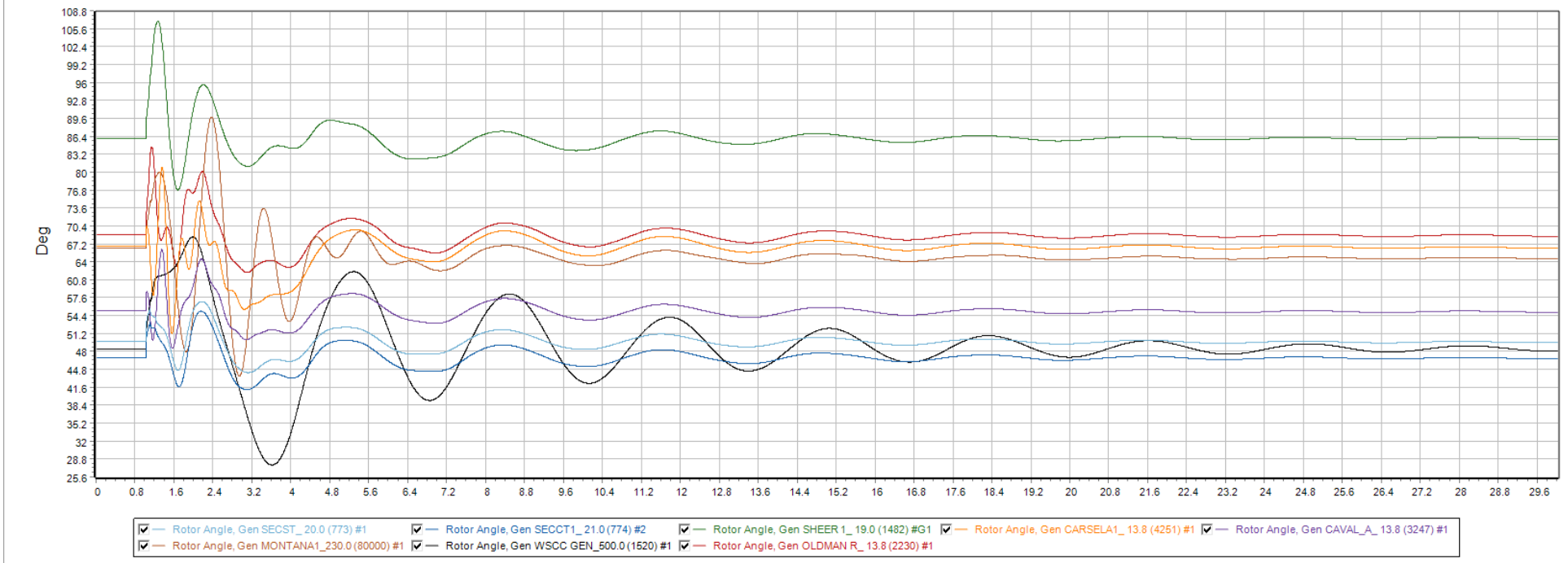
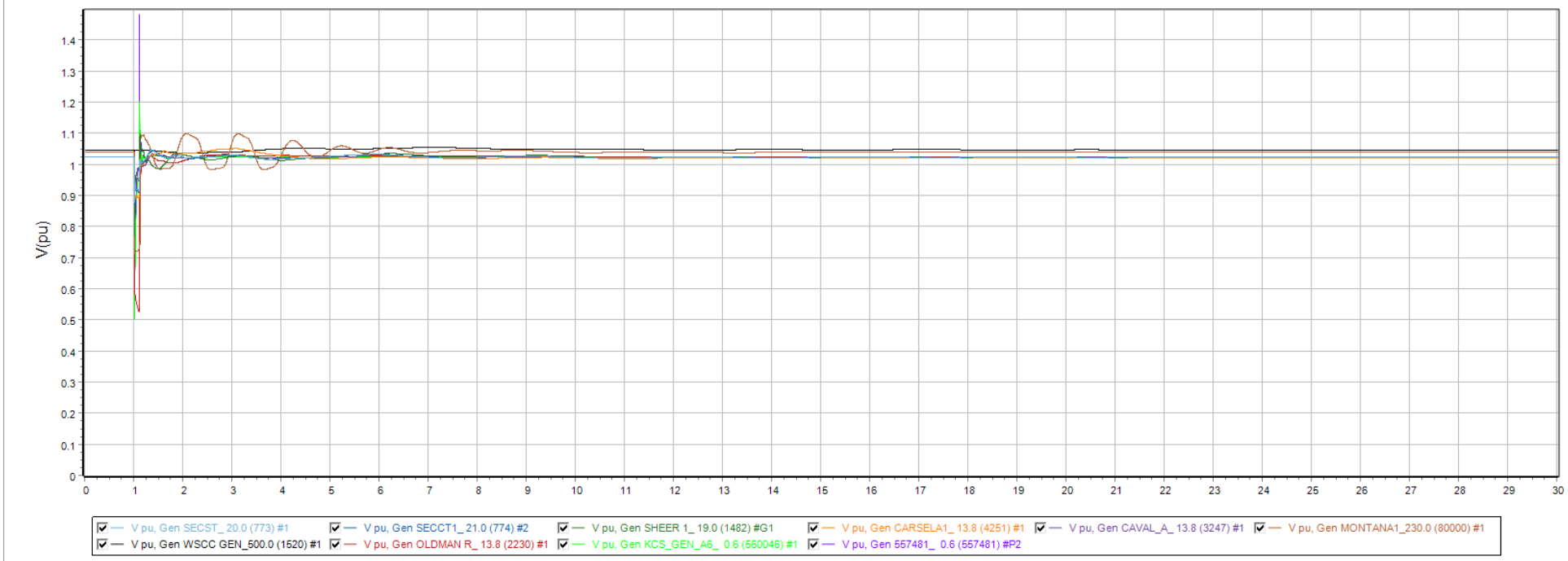
May 16, 2023 21:31:36

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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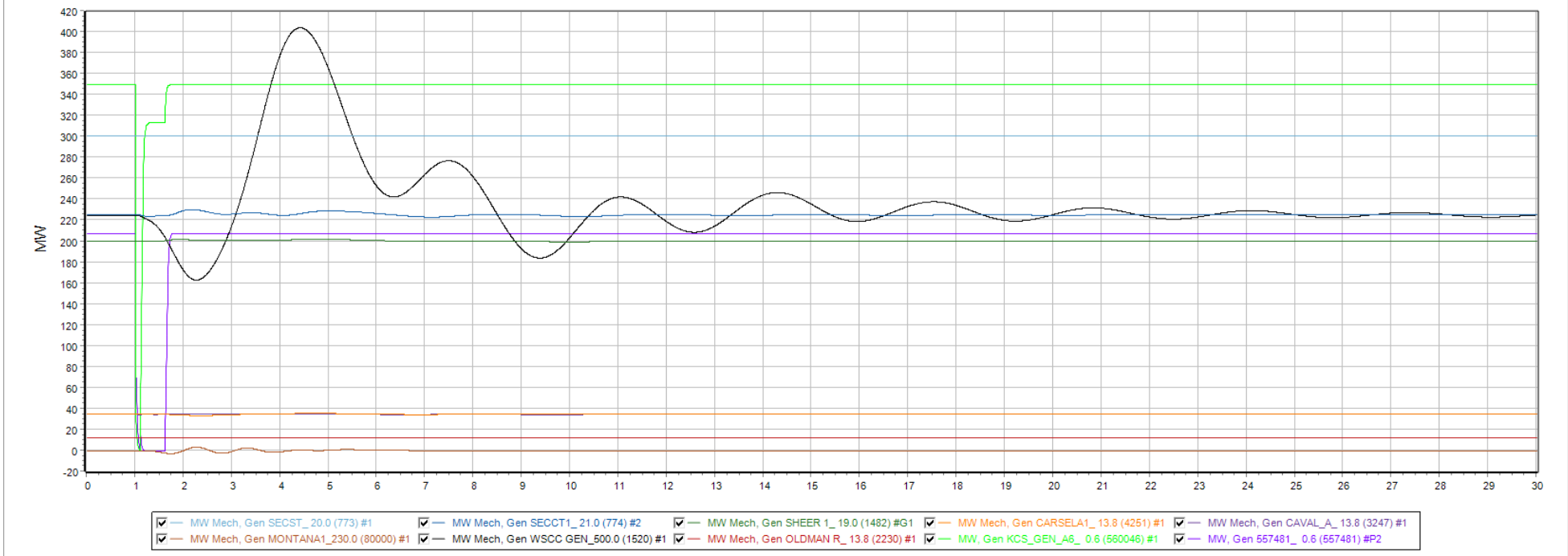
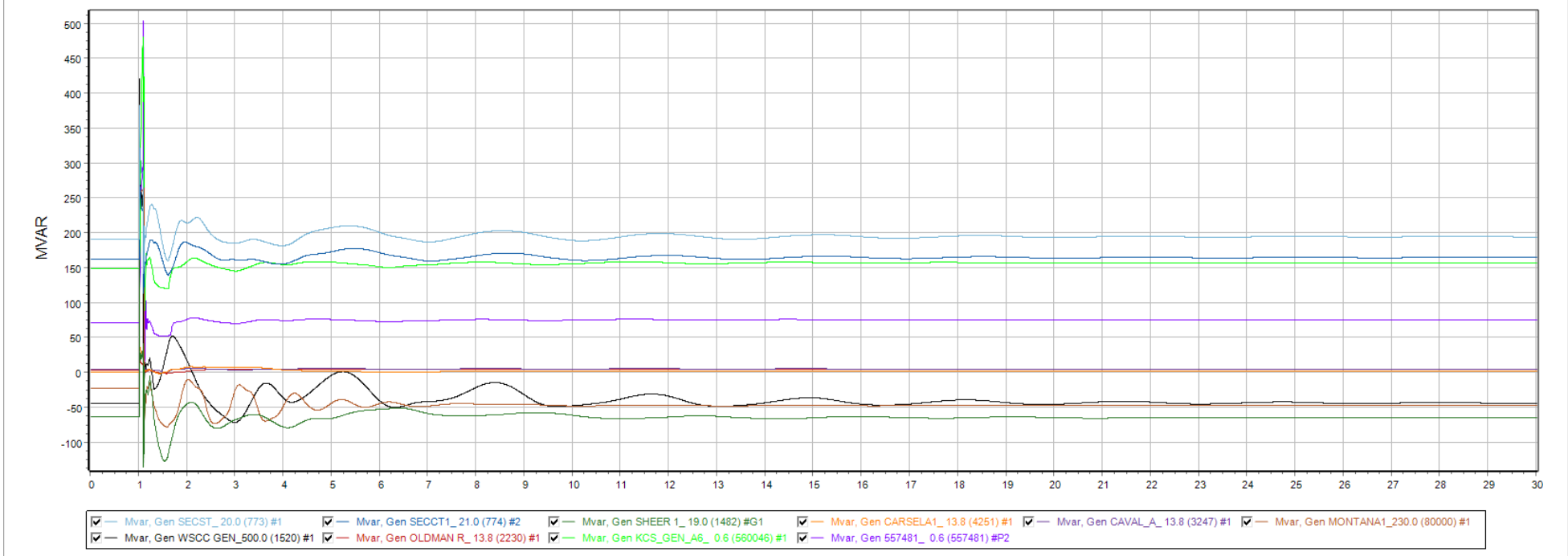
May 16, 2023 21:41:54

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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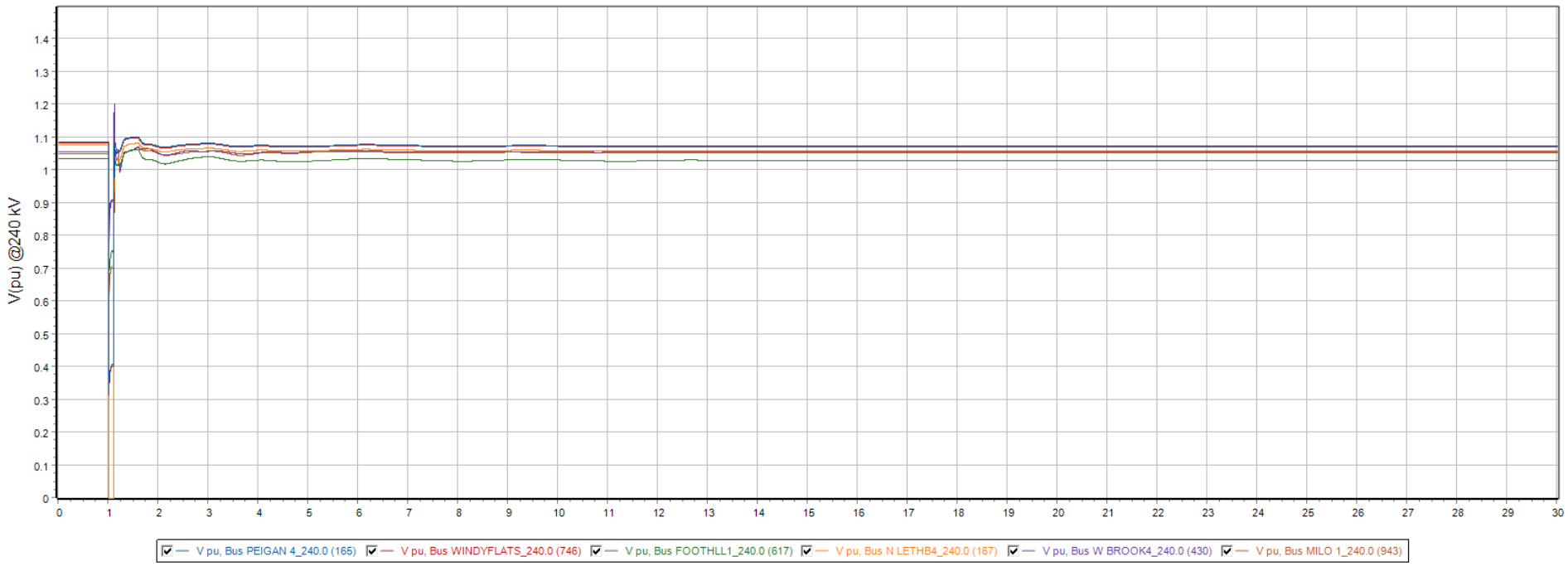
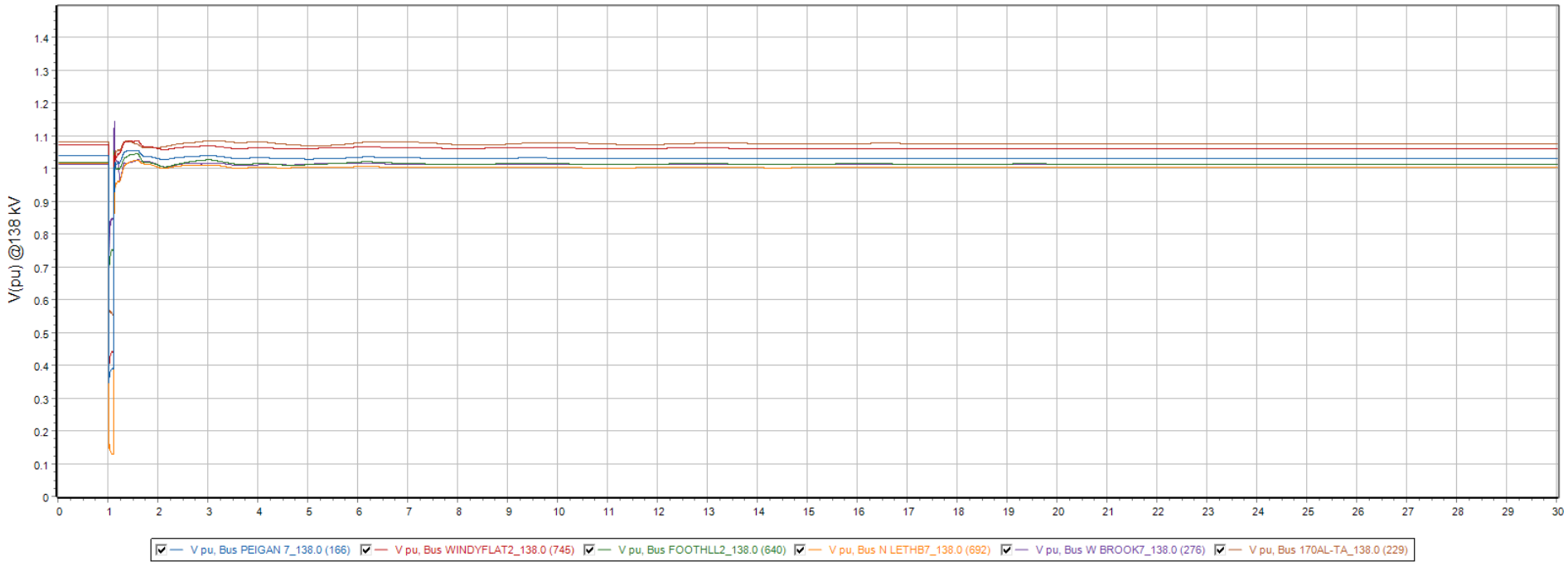
May 16, 2023 21:41:54

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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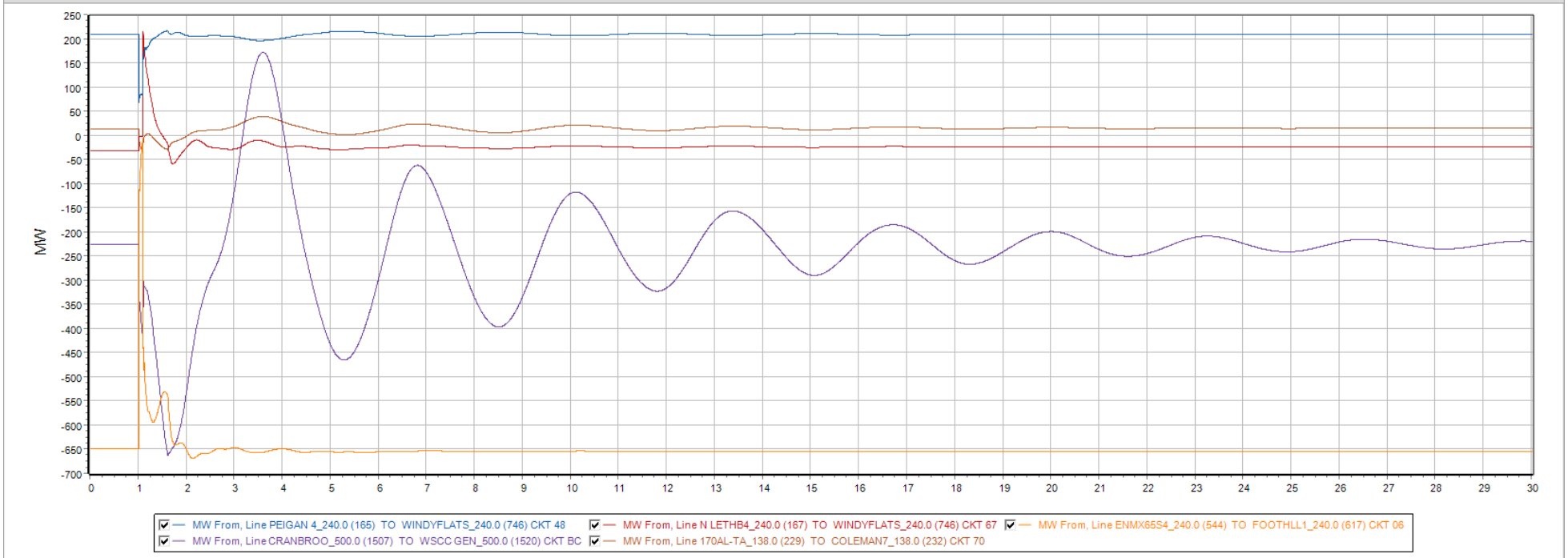
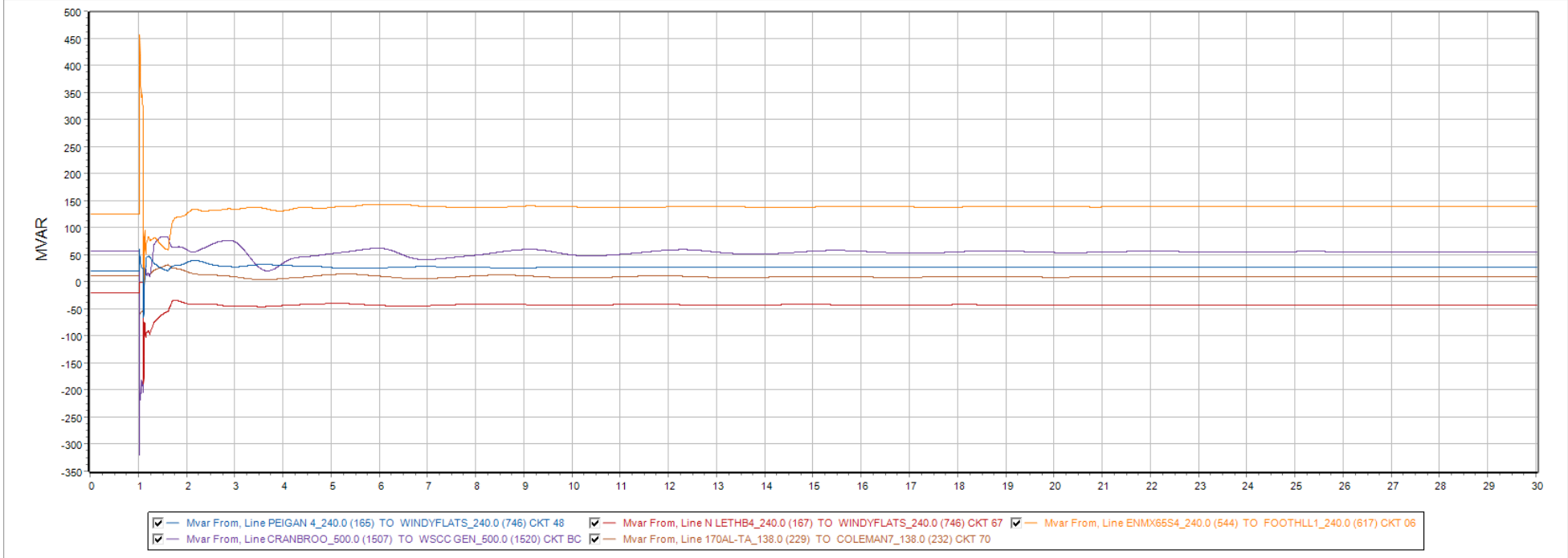
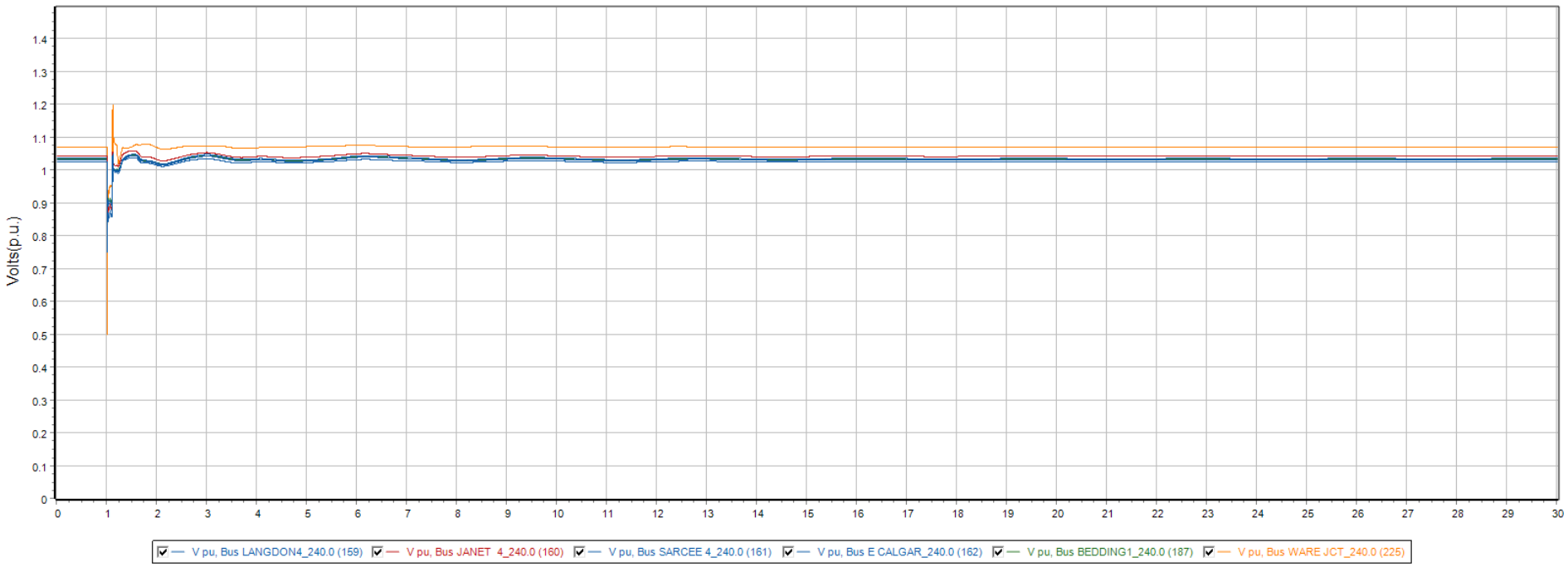
May 16, 2023 21:41:55

Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04A - 940L (North Lethbridge 370S - Picture Butte 120S) @ North Lethbridge 370S

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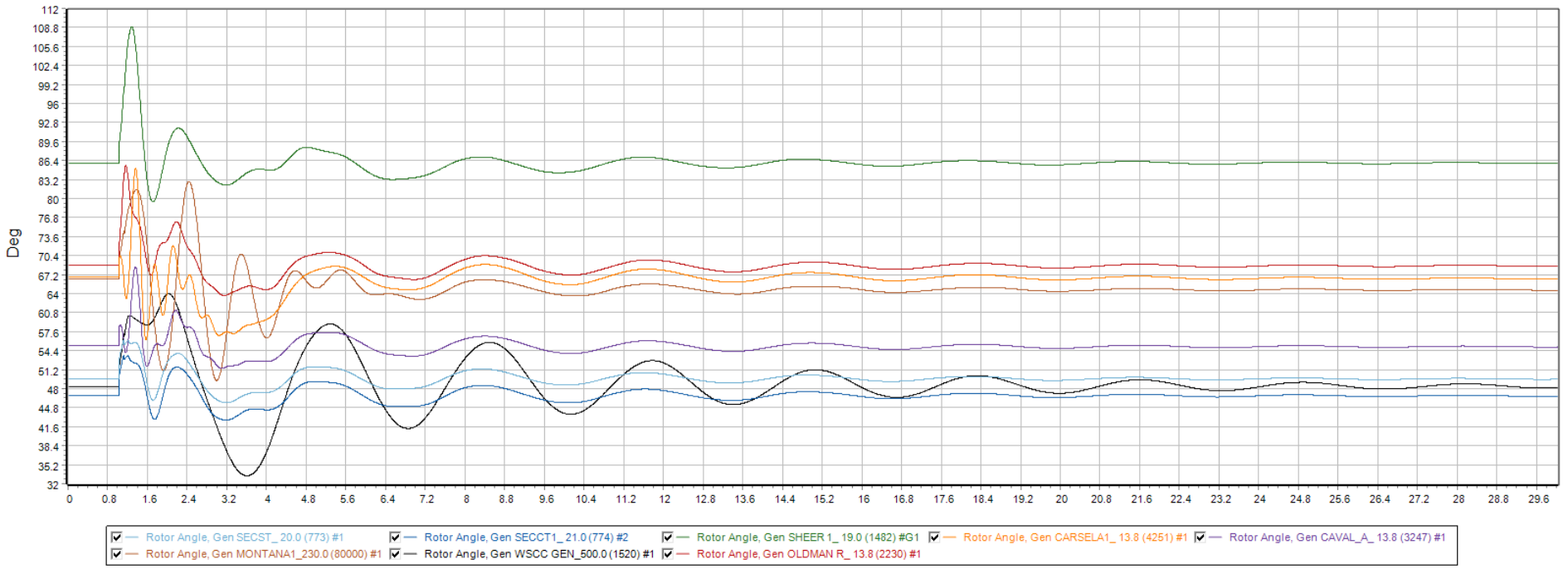
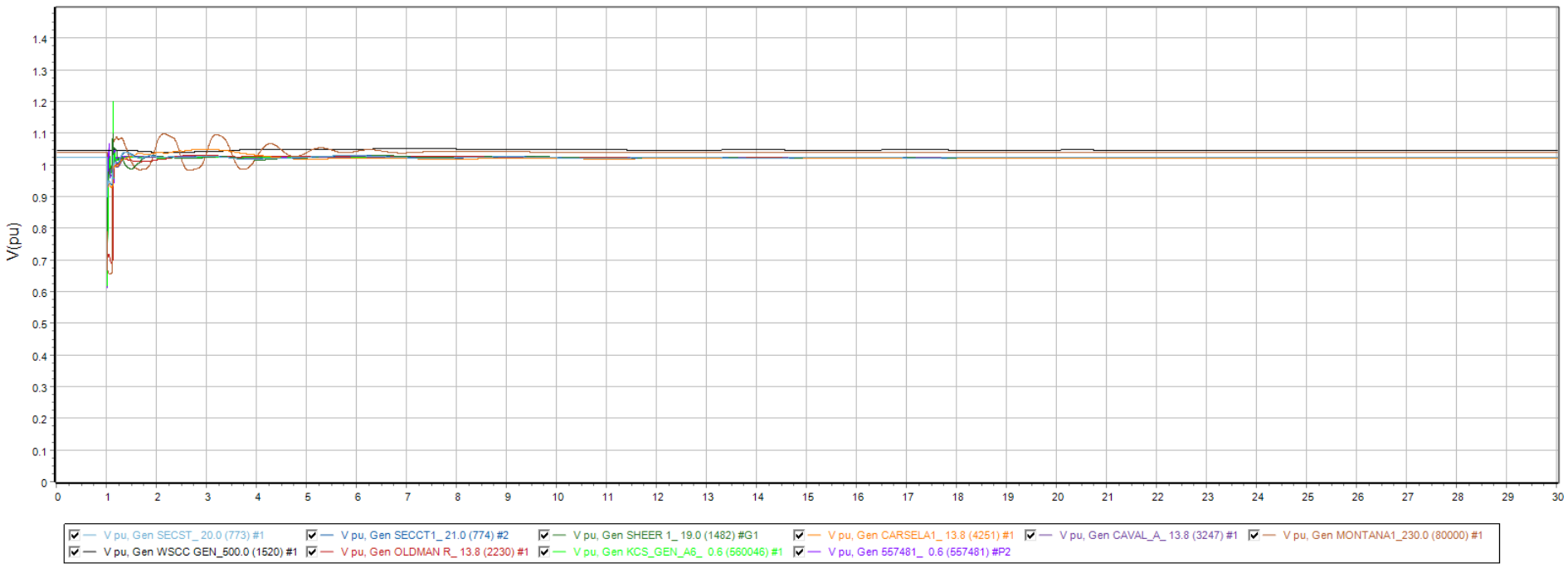
May 16, 2023 21:41:56

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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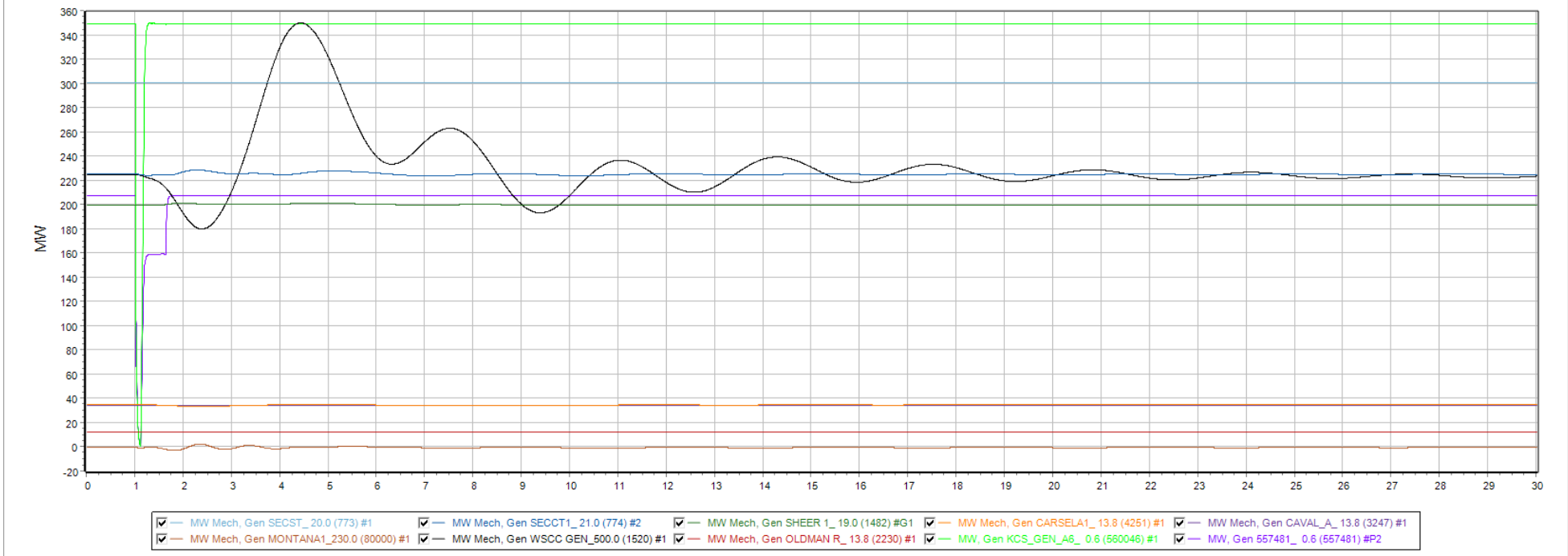
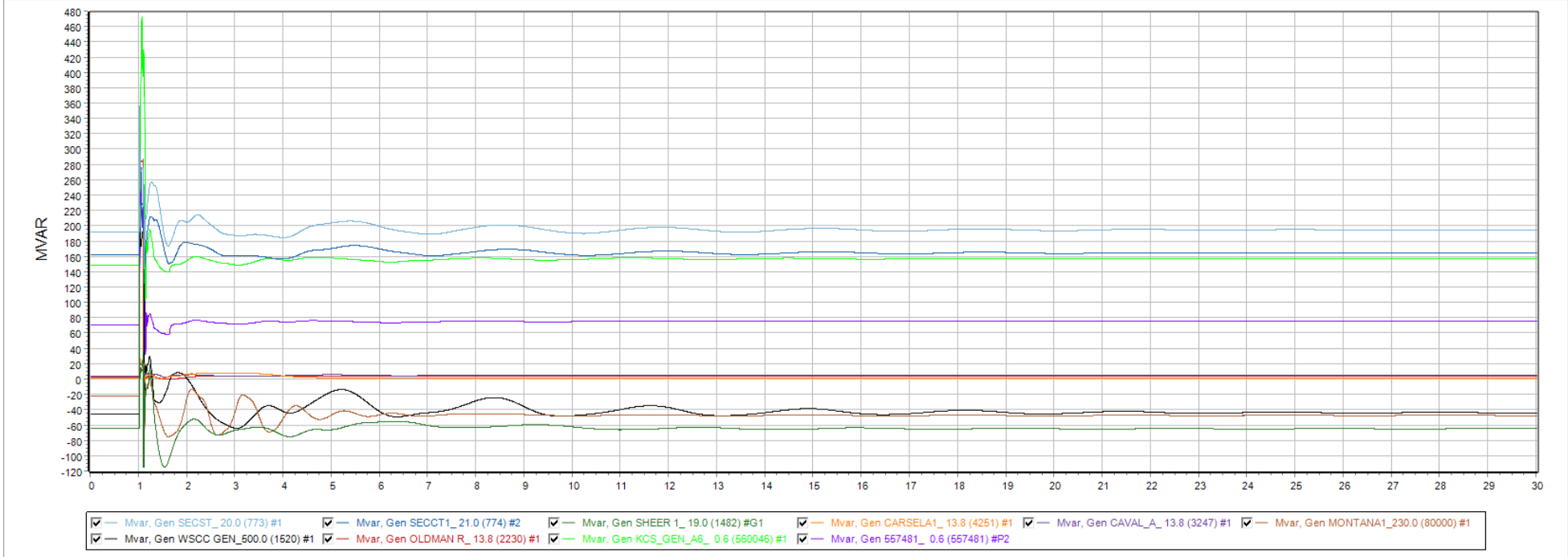
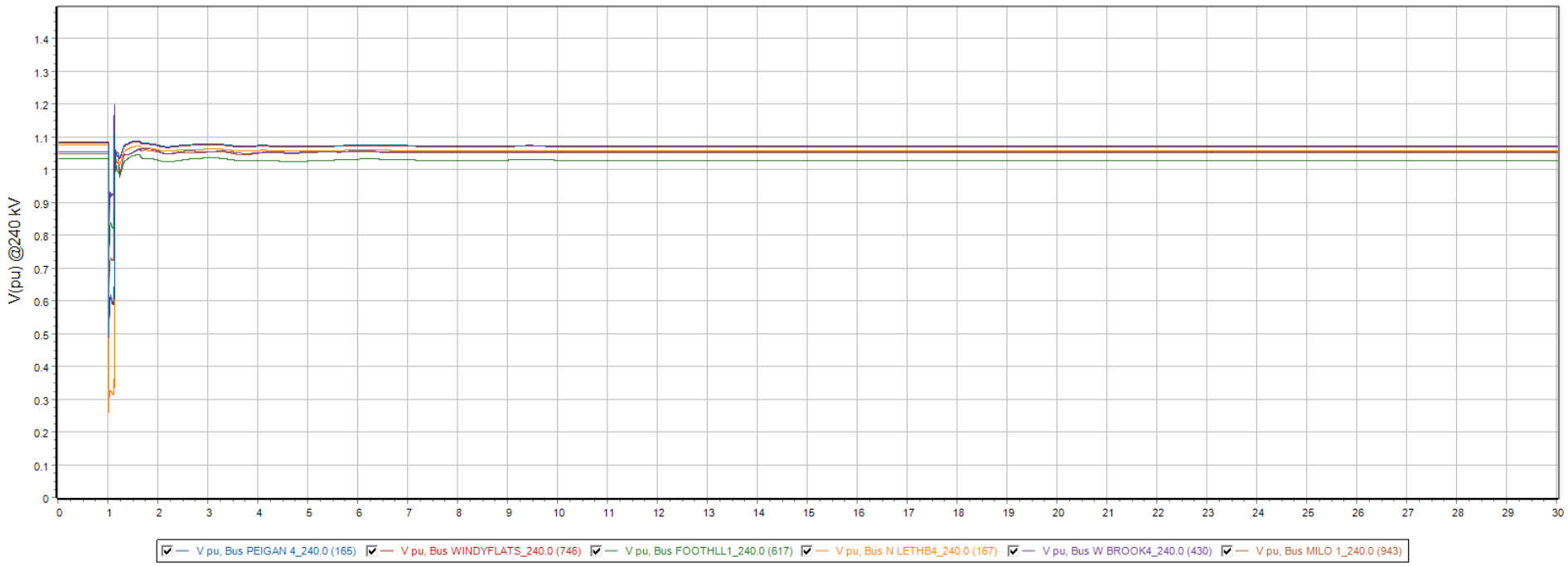
May 16, 2023 21:52:11

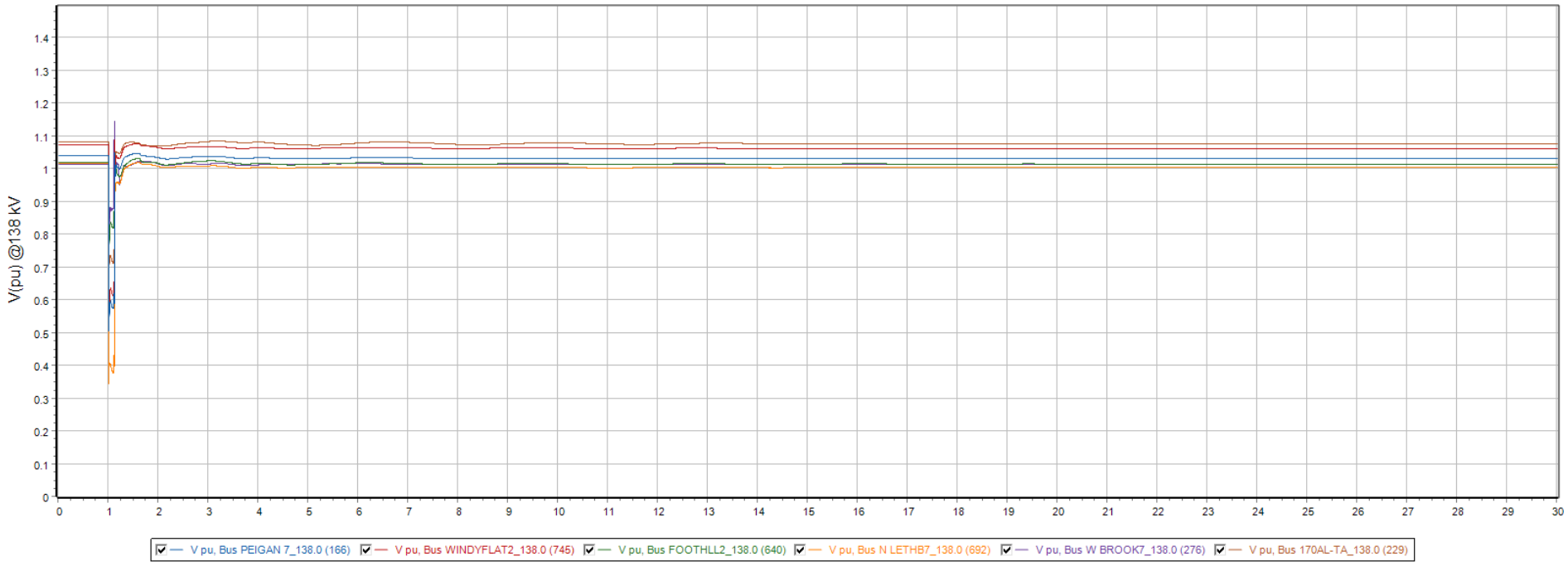
Monitor Gens. Q2



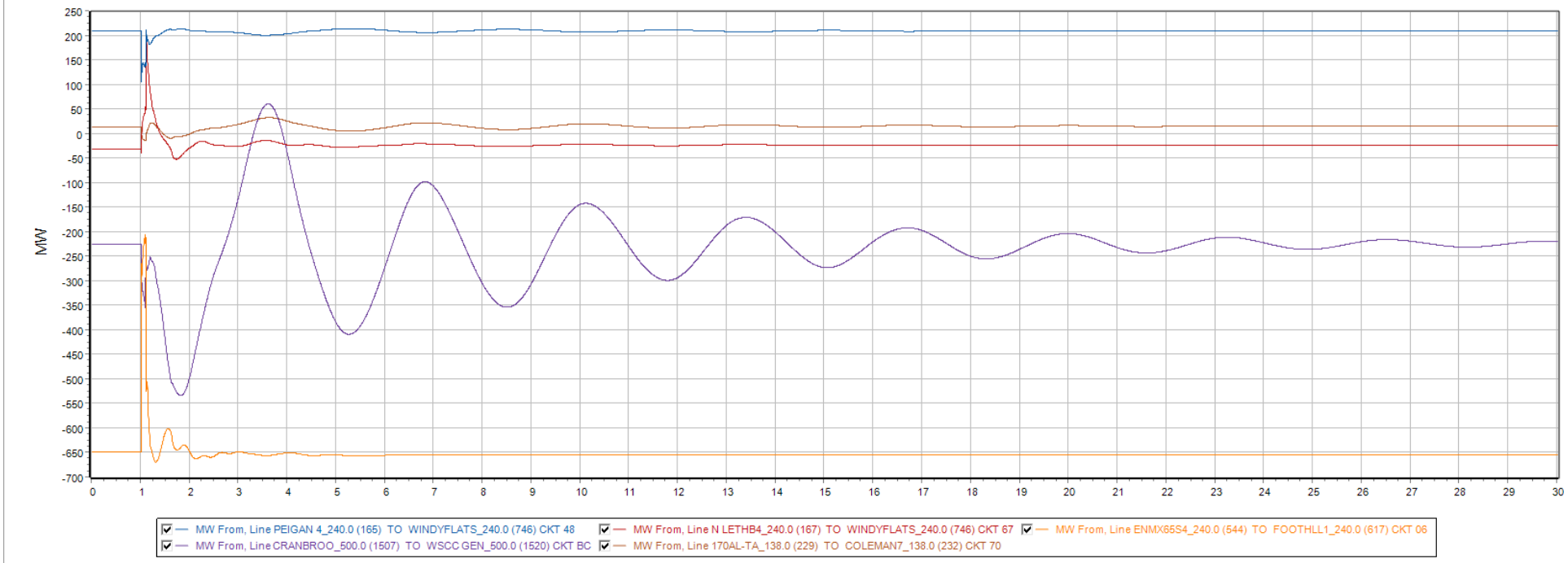


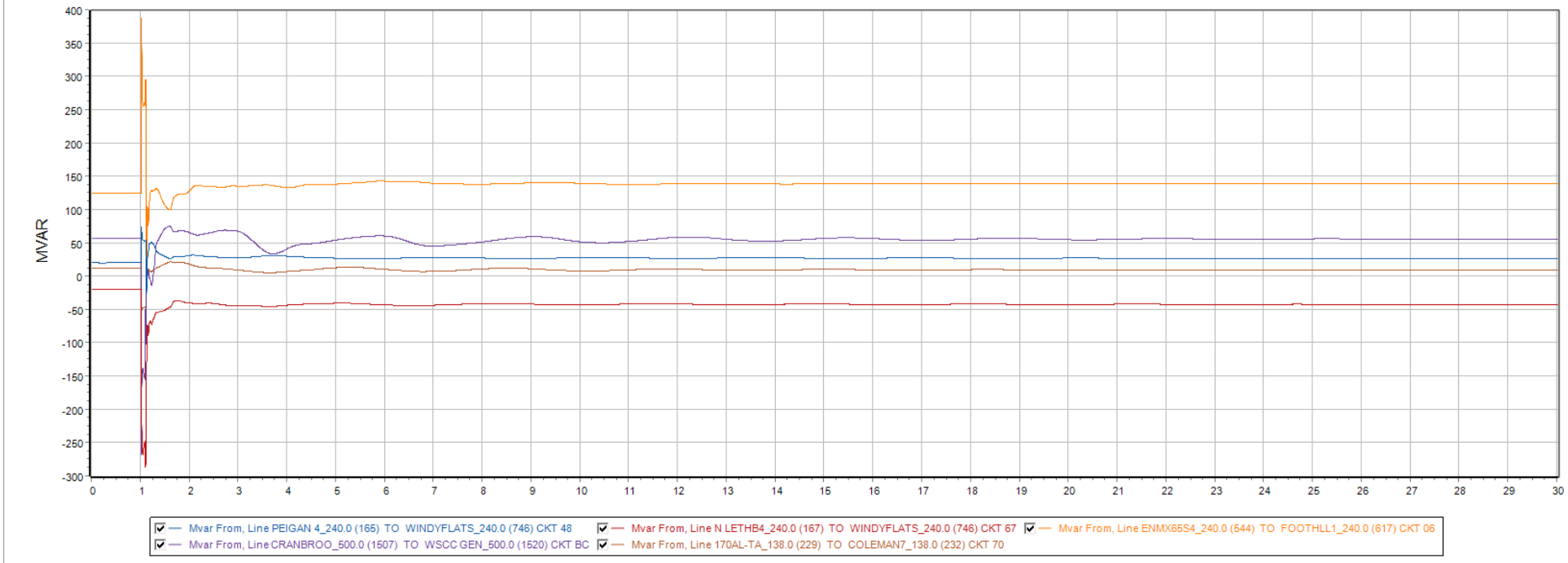
Monitor Bus Volts Q3



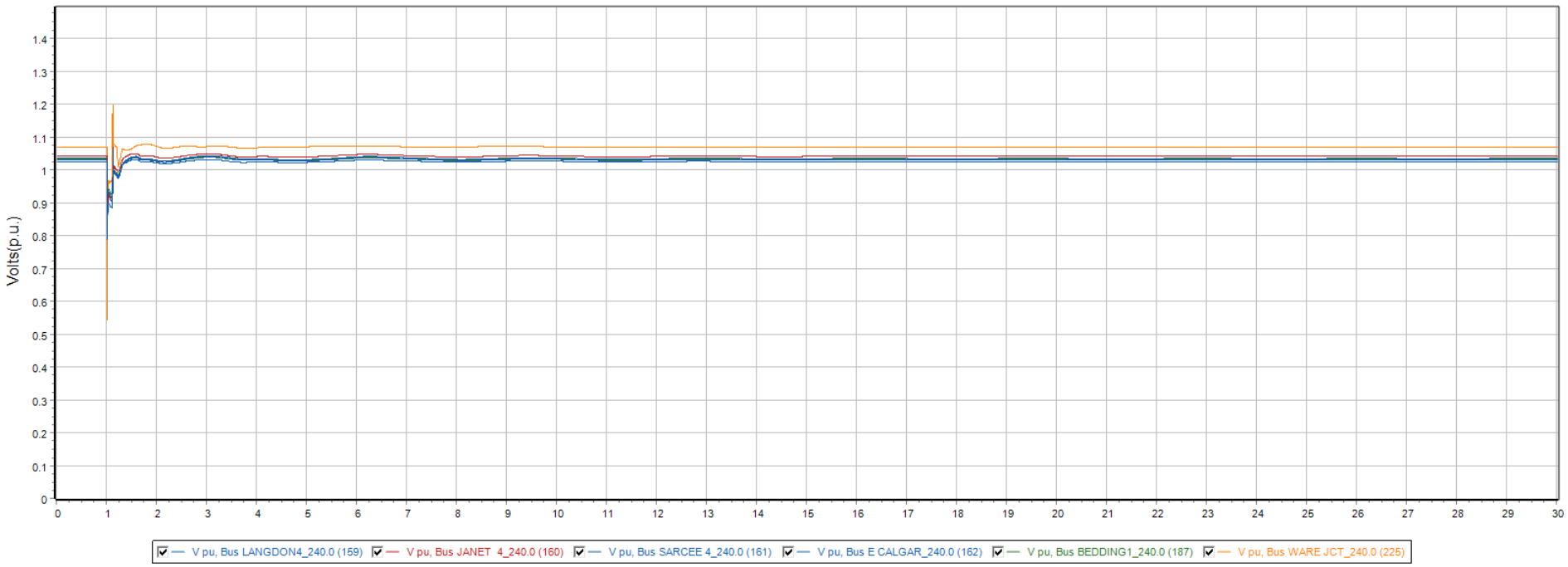


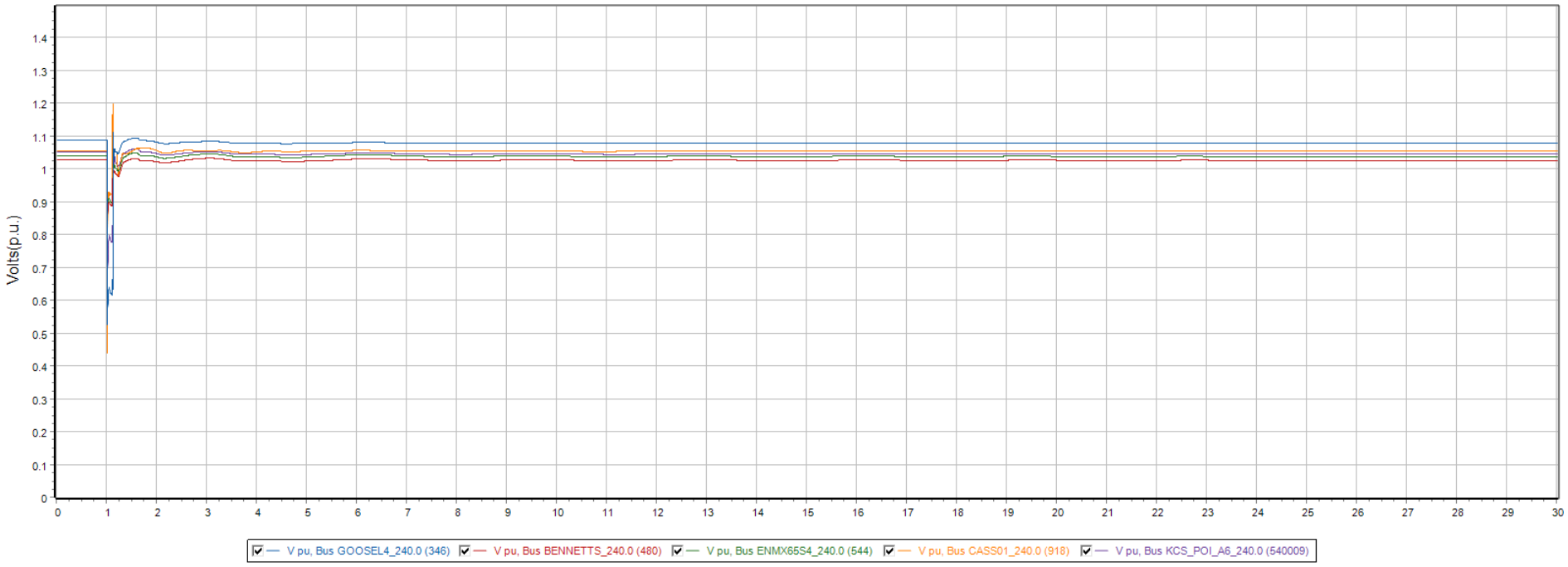
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 04B - 940L (North Lethbridge 370S - Picture Butte 120S) @ Picture Butte 120S

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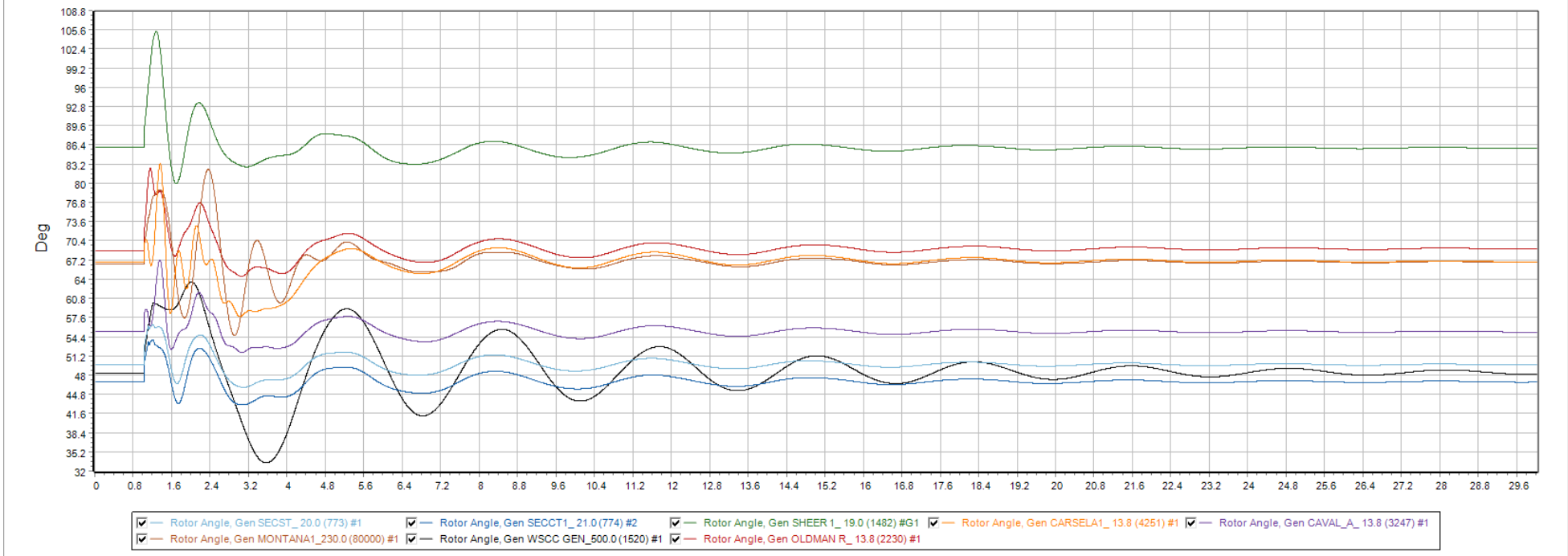
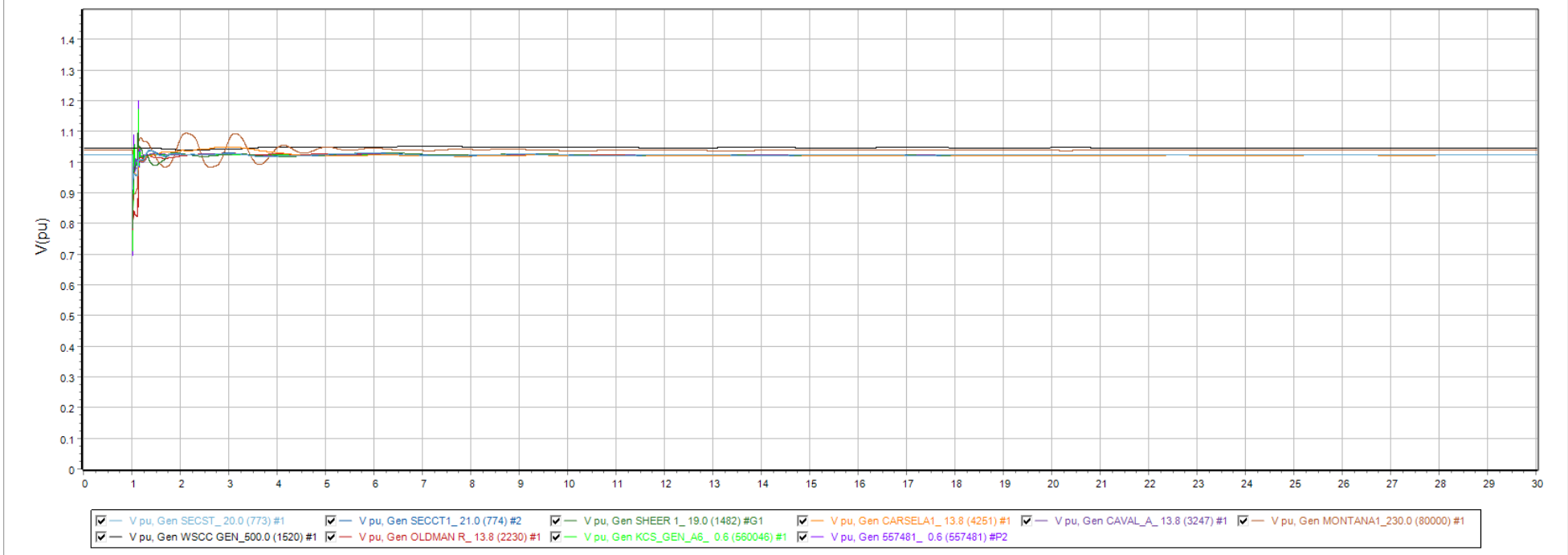
May 16, 2023 21:52:14

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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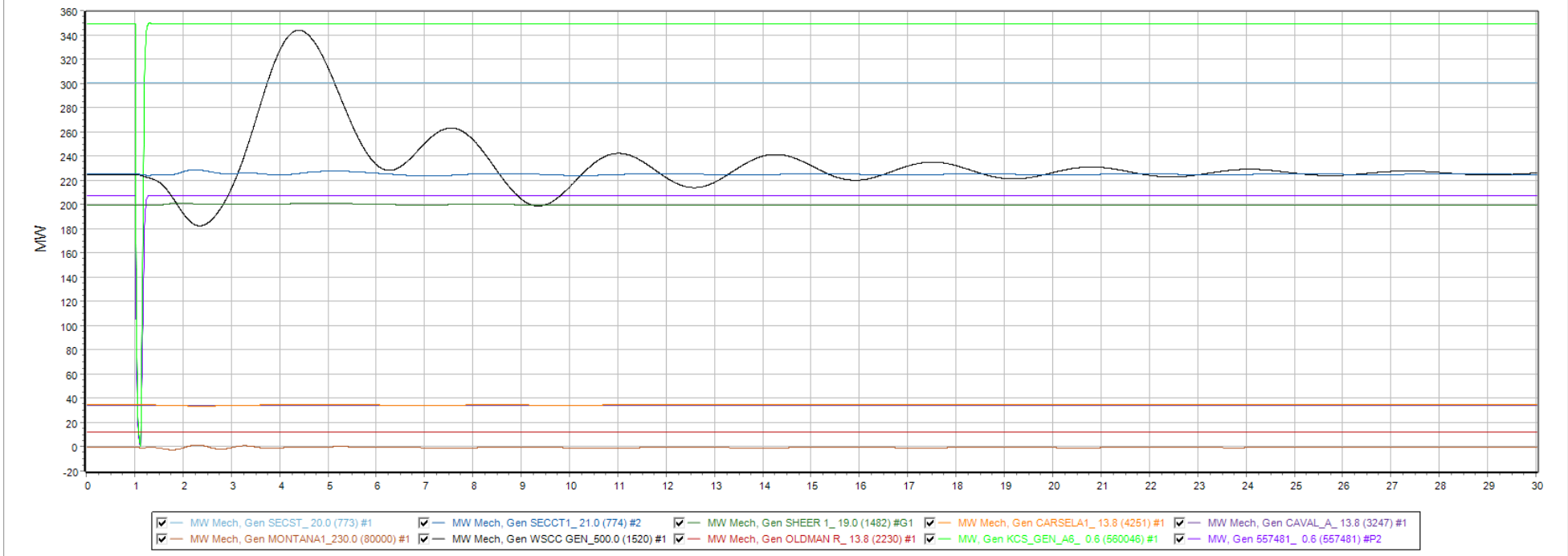
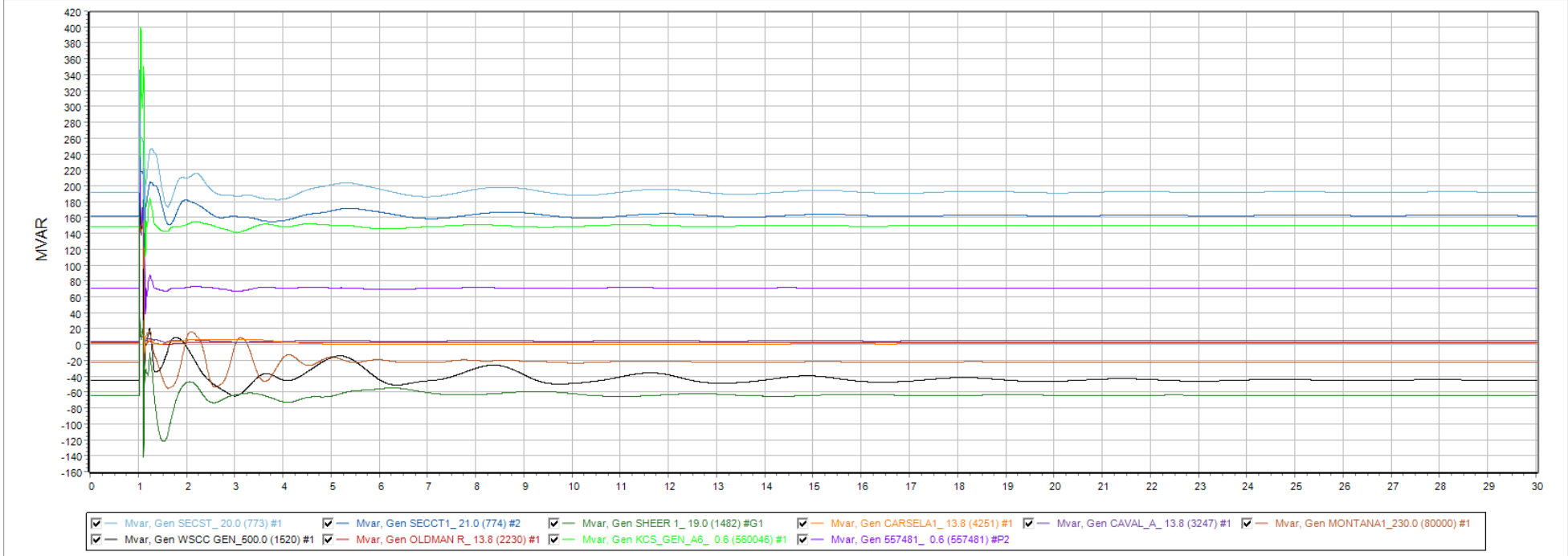
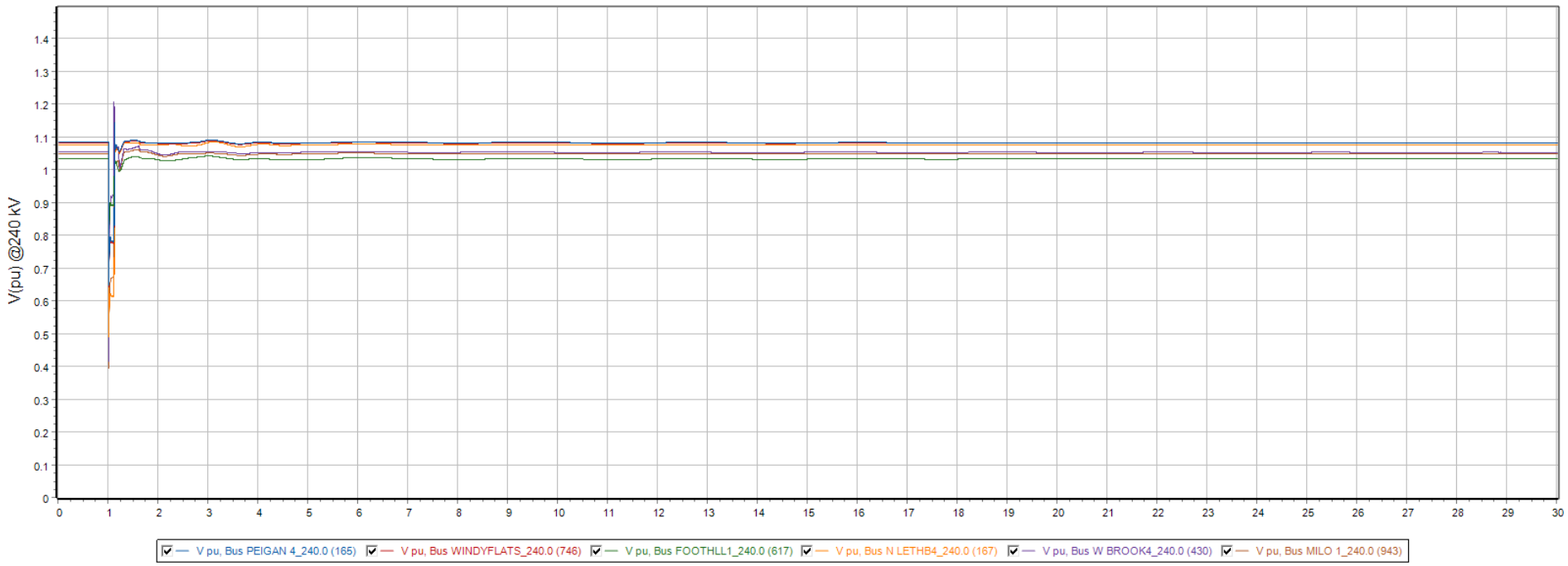
May 16, 2023 22:02:57

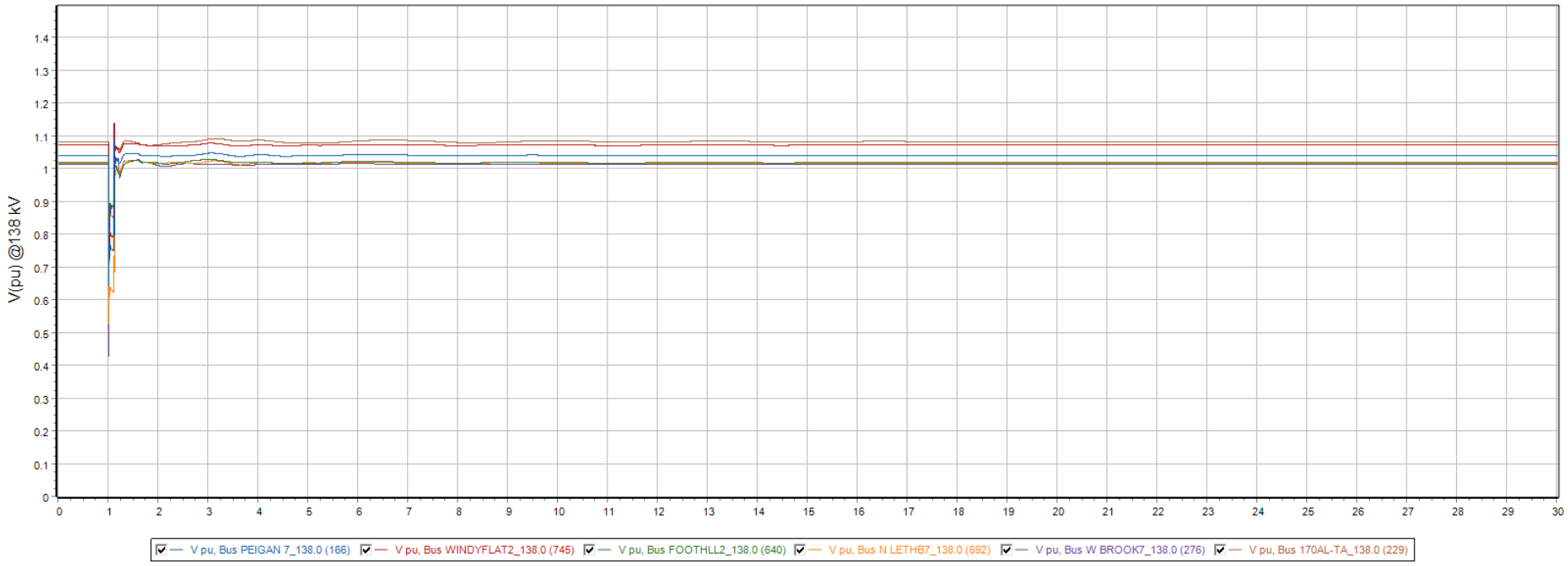
Monitor Gens. Q2



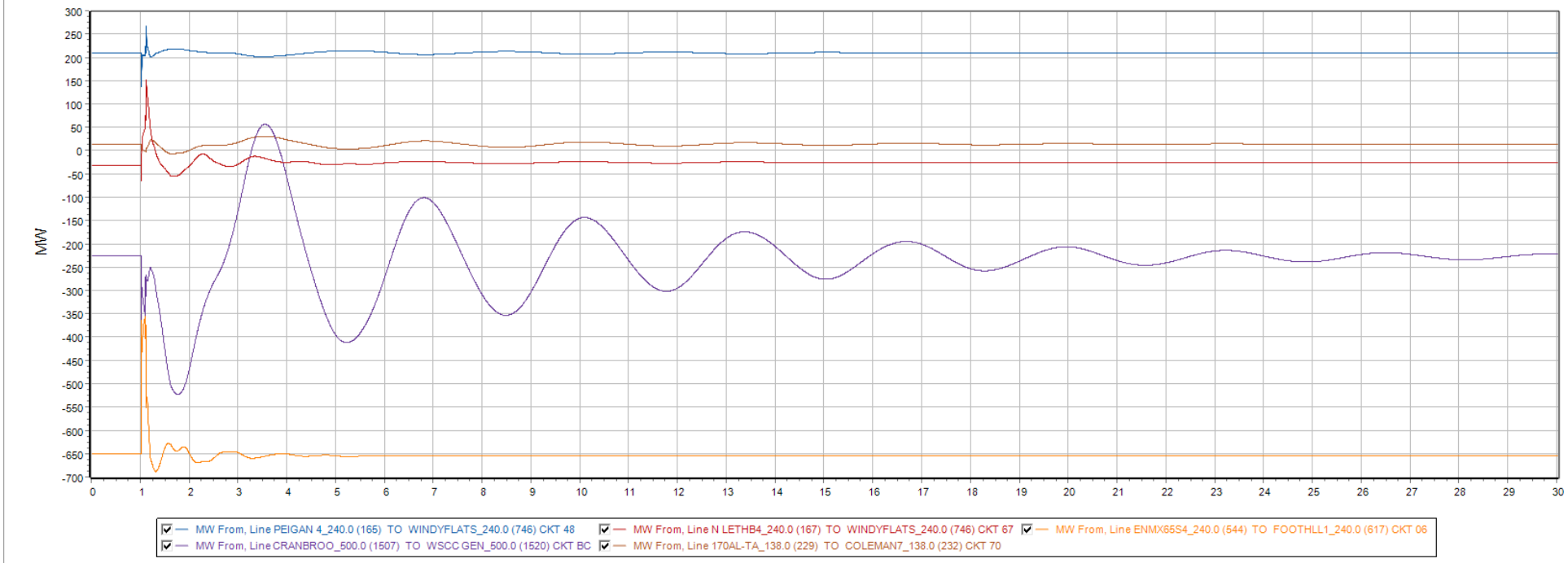


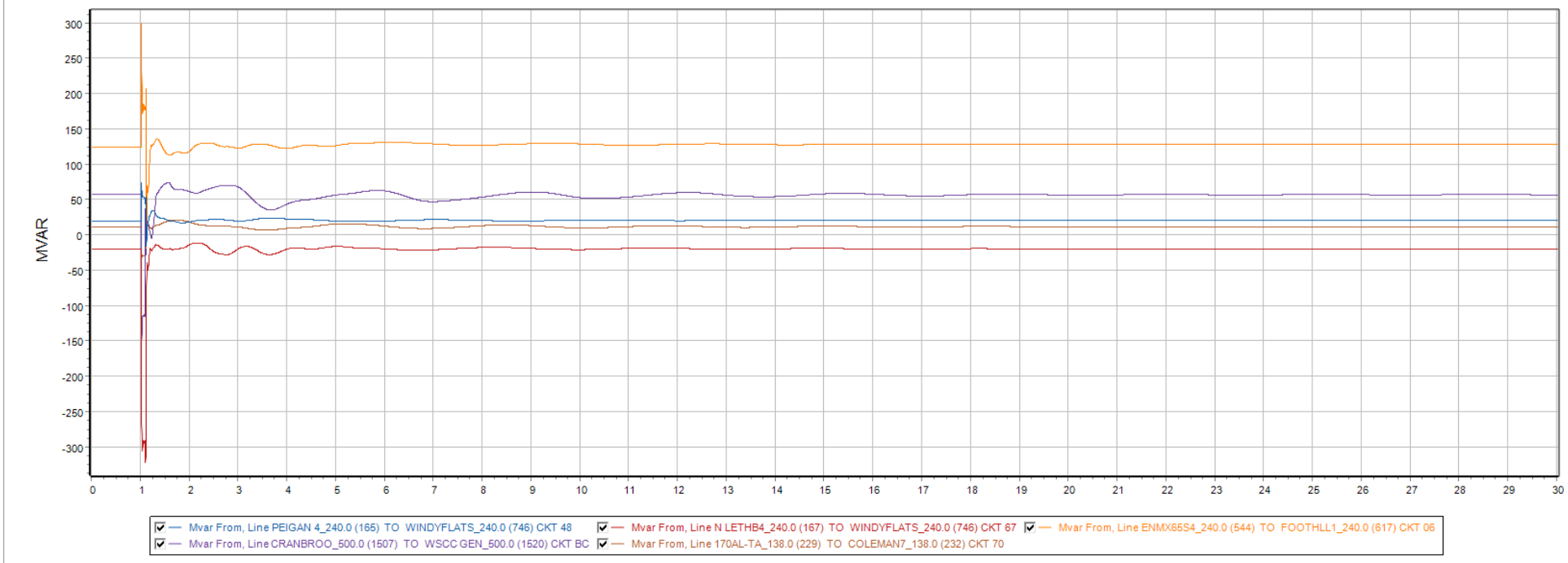
Monitor Bus Volts Q3



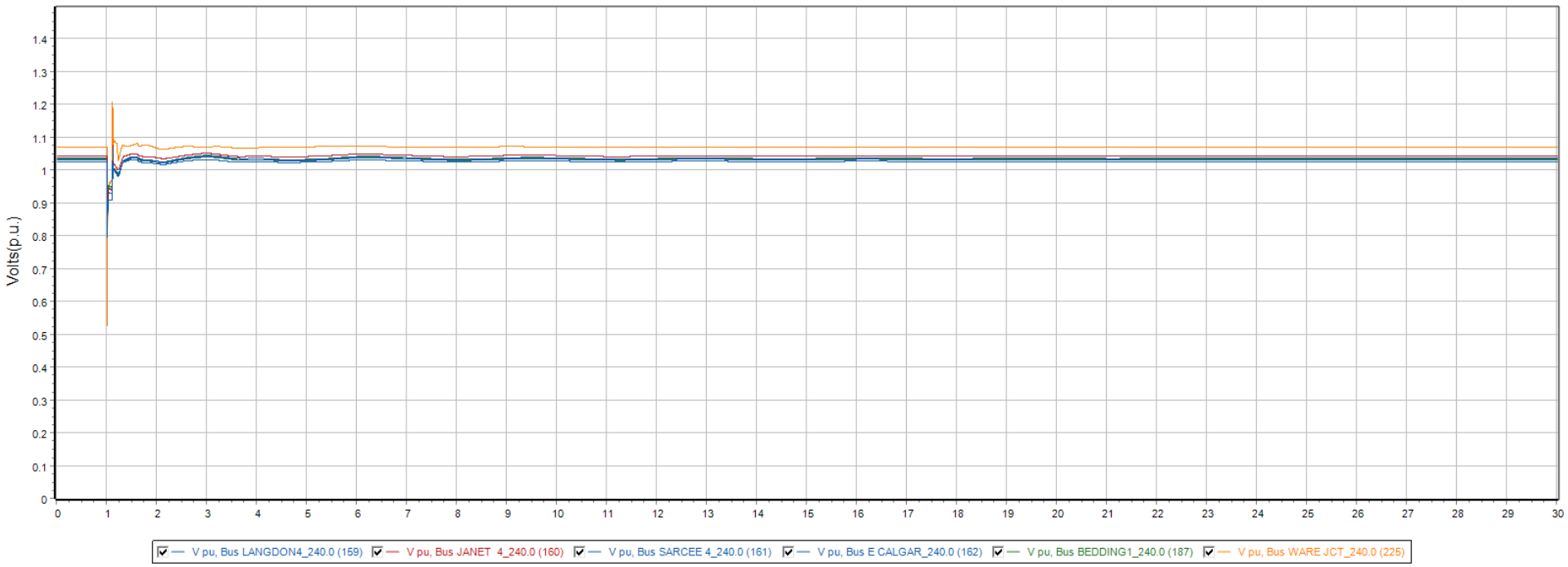


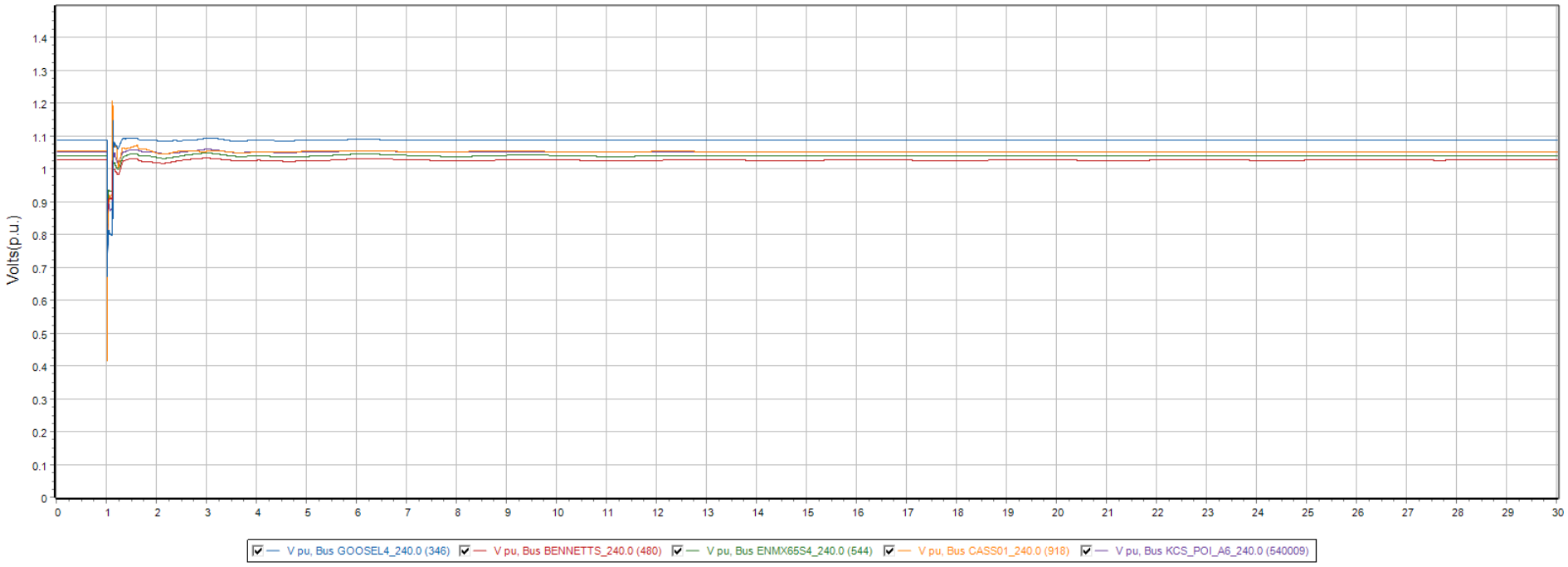
Monitor Line MW & MVAR. Q4



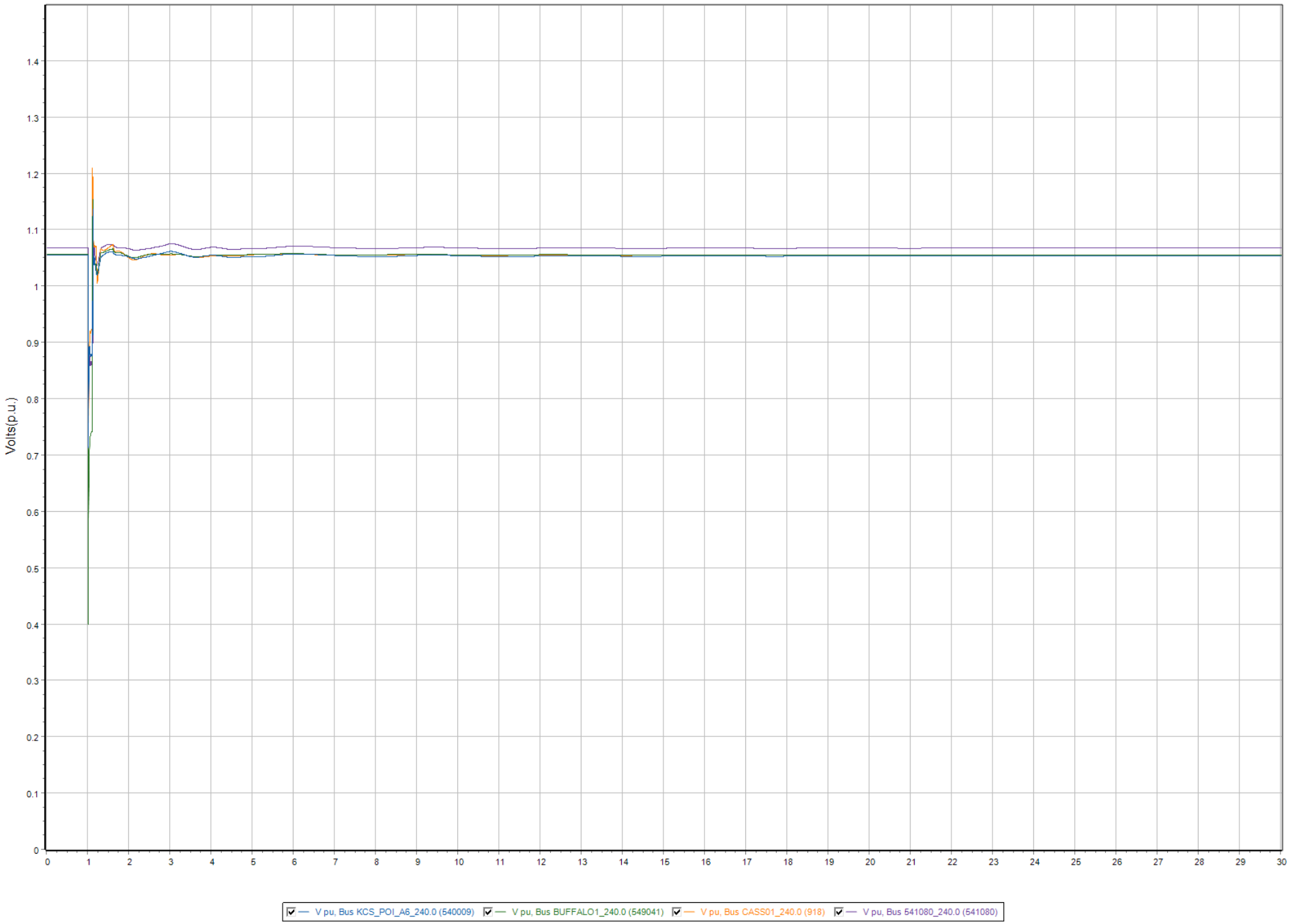


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05A - 1041L (Travers 554S - North Lethbridge 370S) @ Travers 554S

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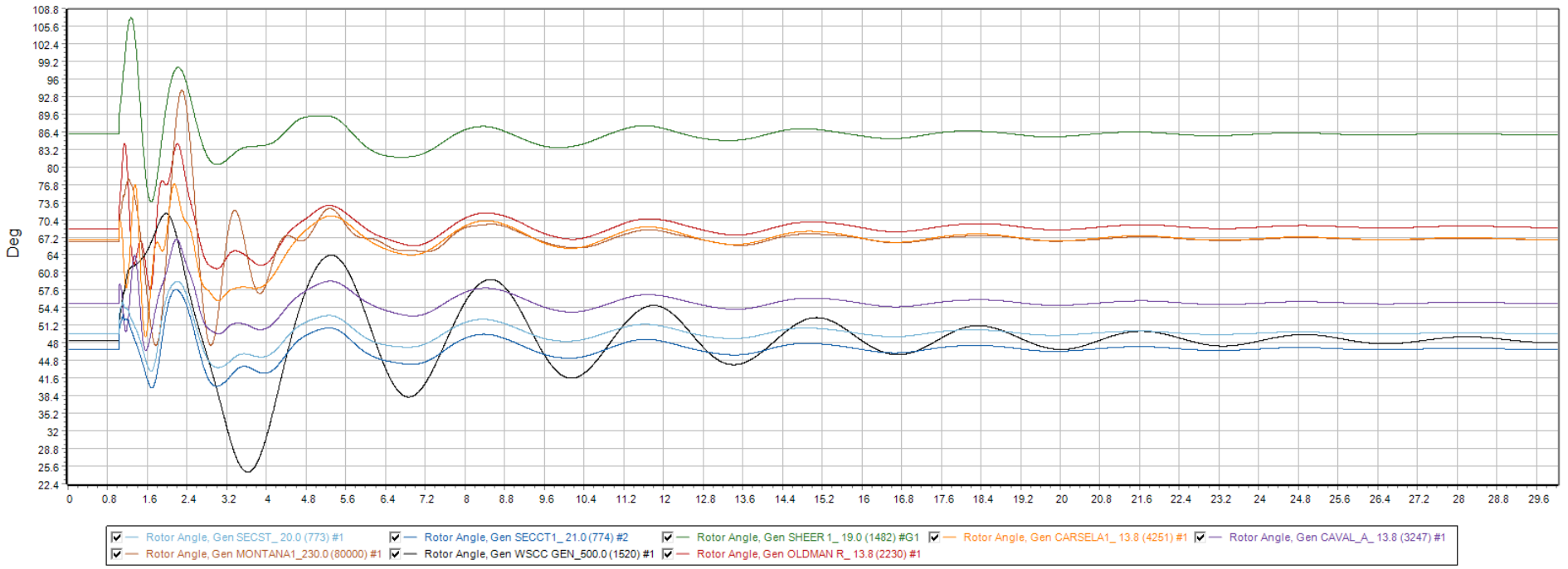
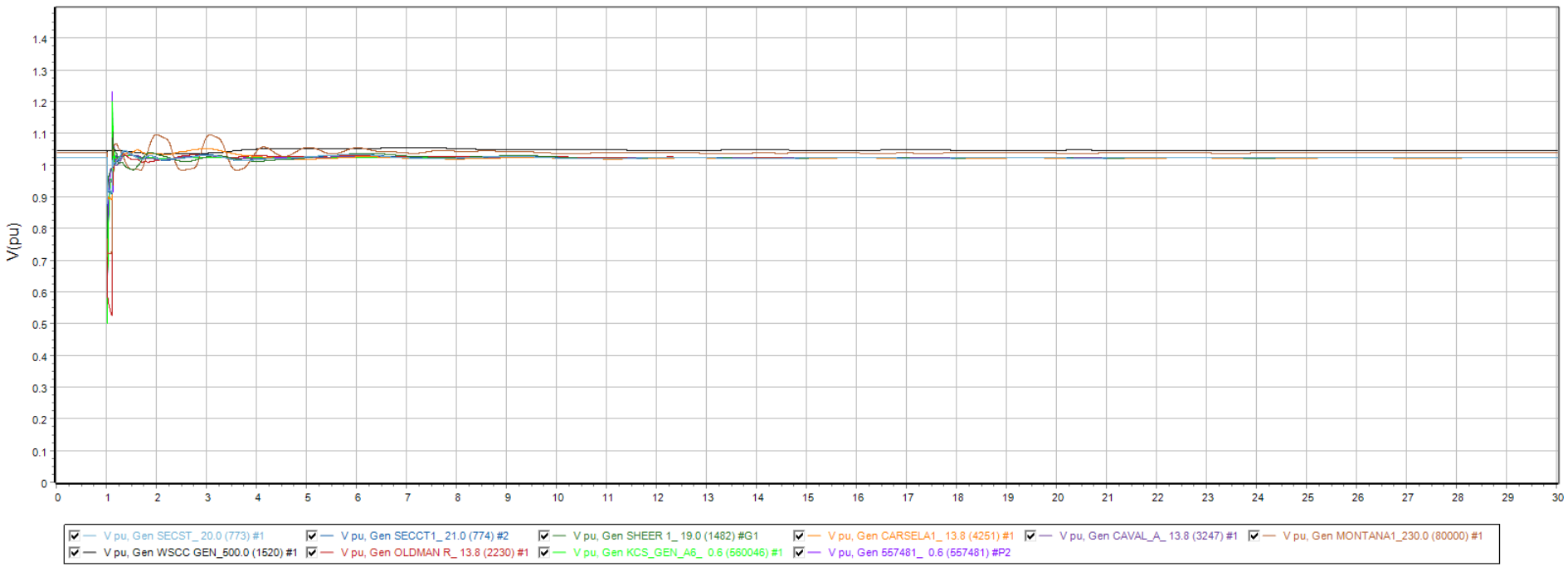
Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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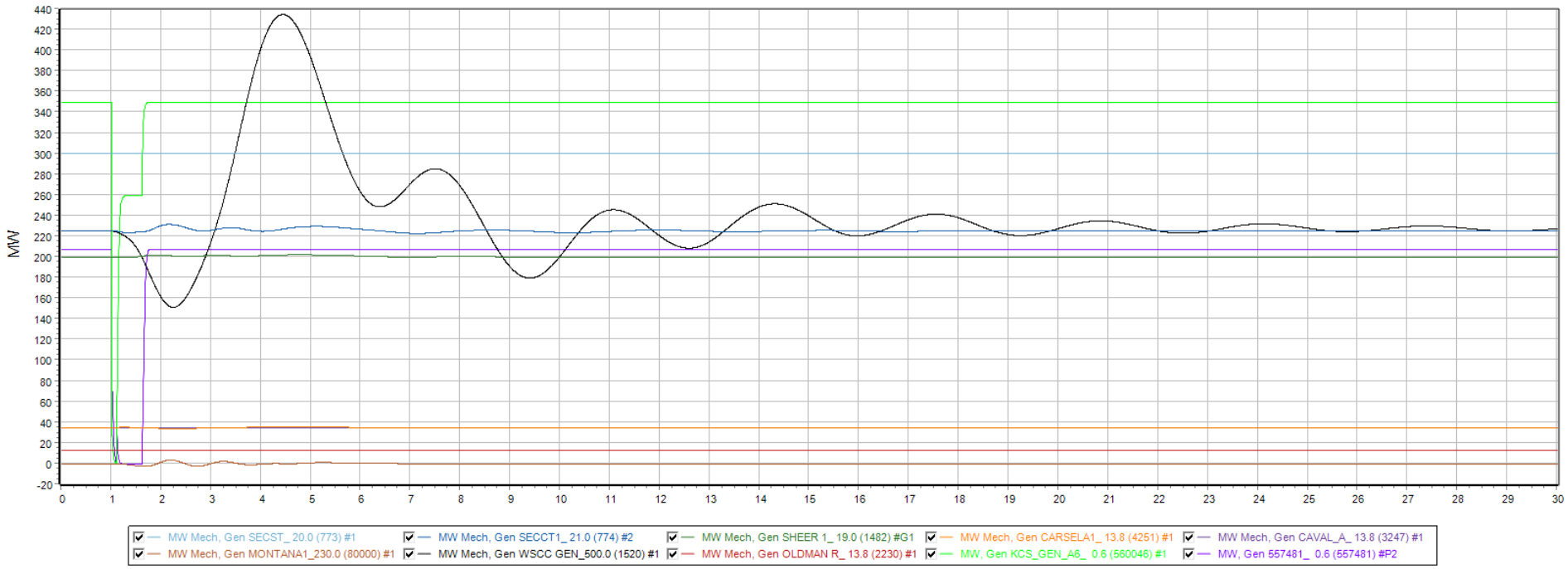
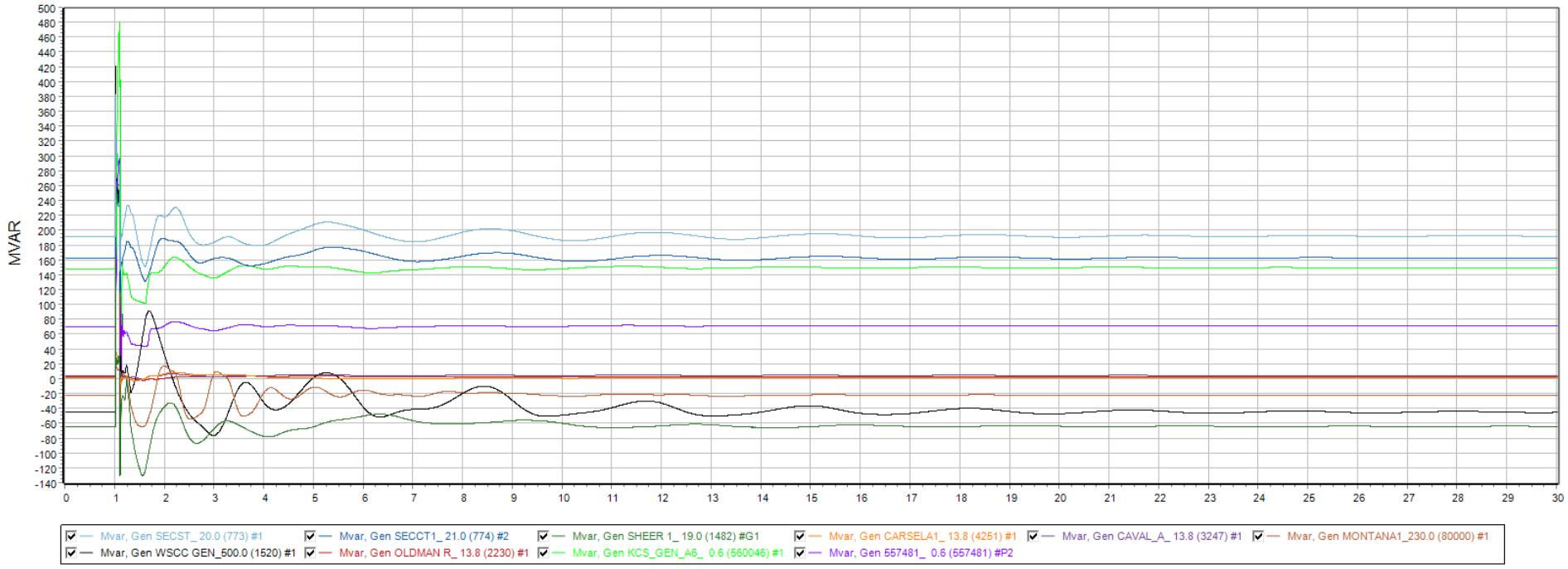
May 16, 2023 22:13:32

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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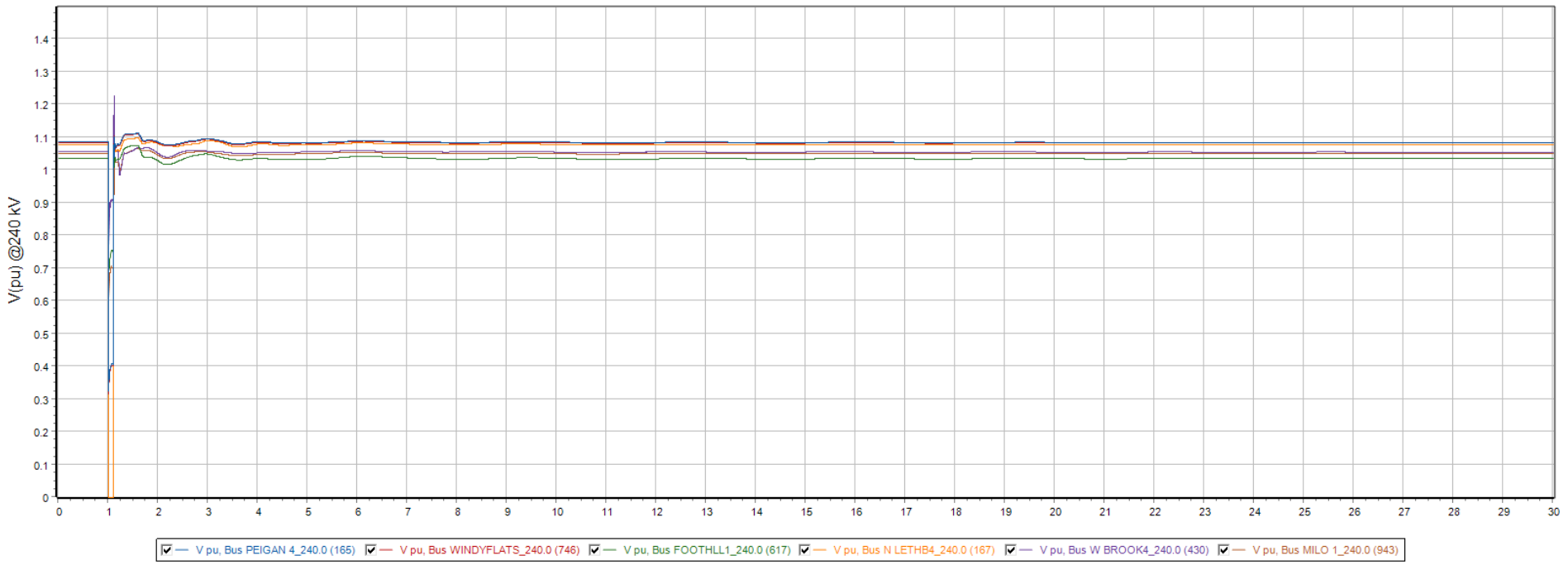
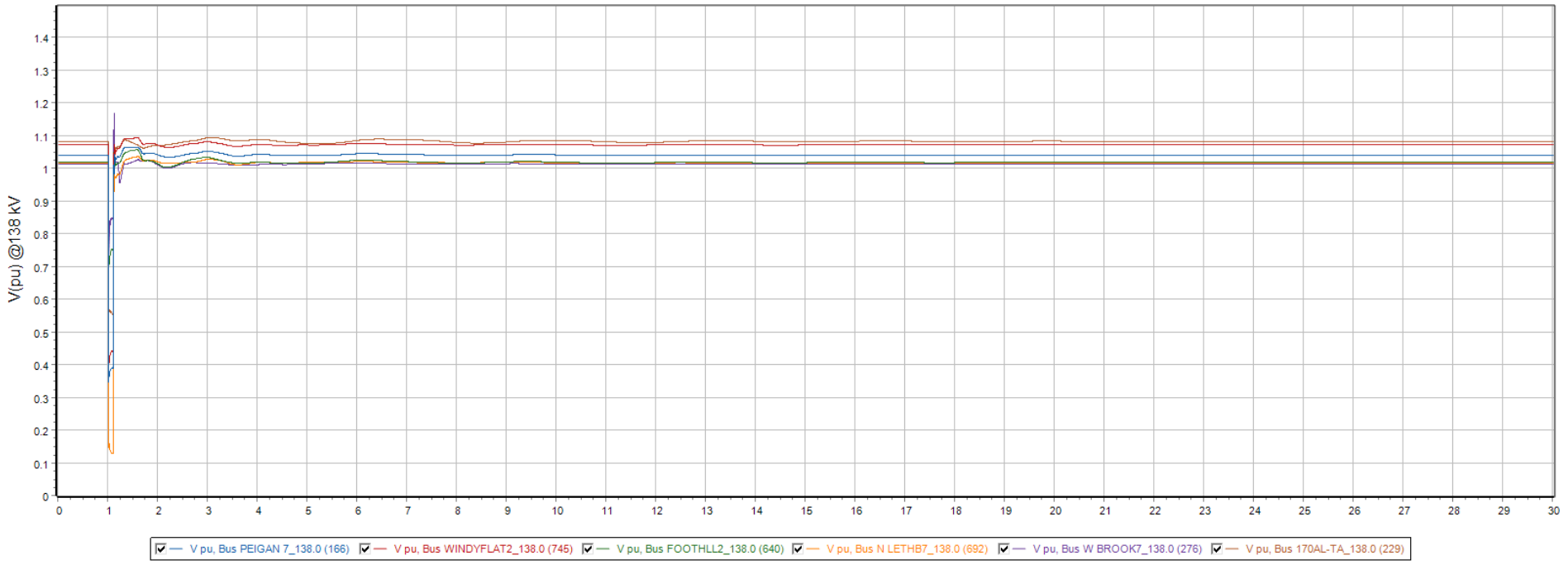
May 16, 2023 22:13:33

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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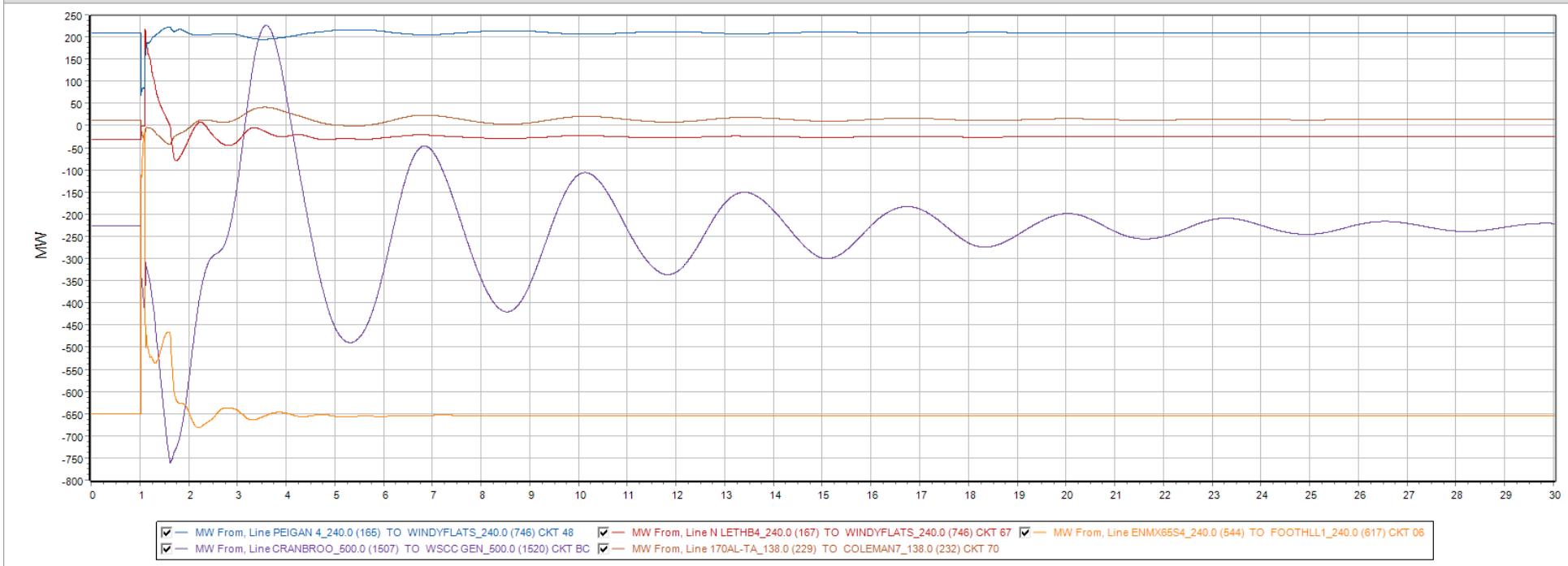
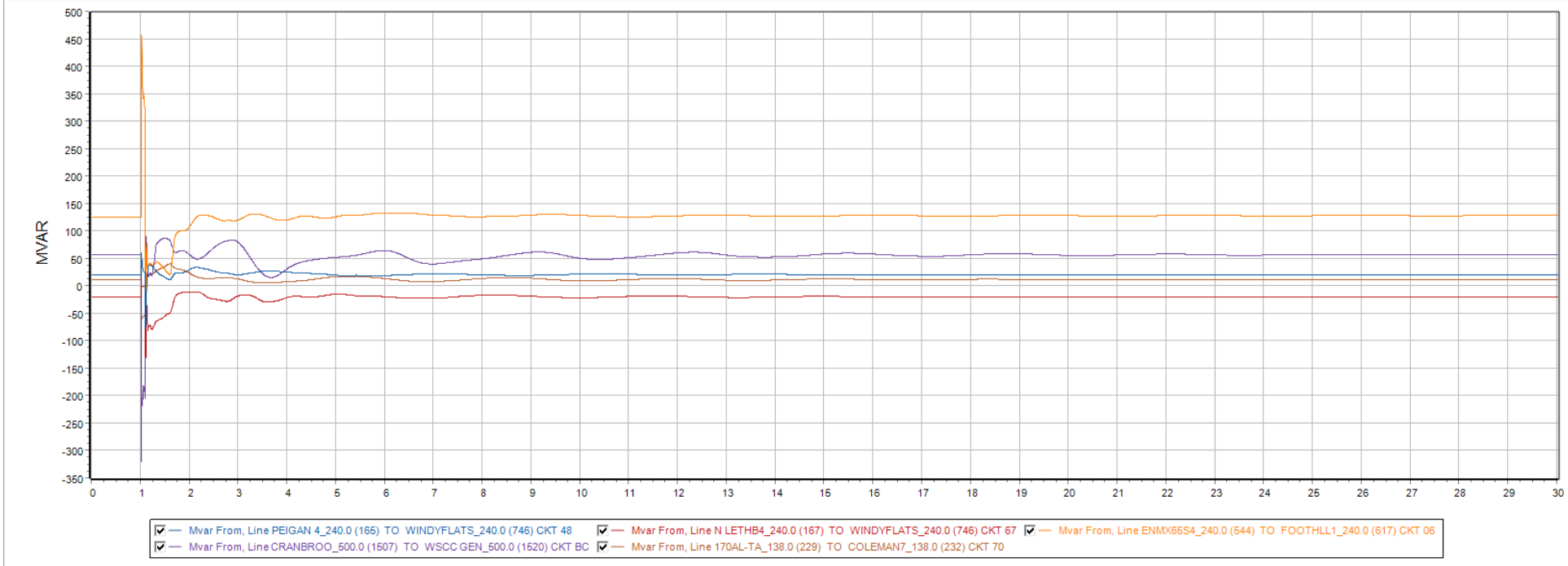
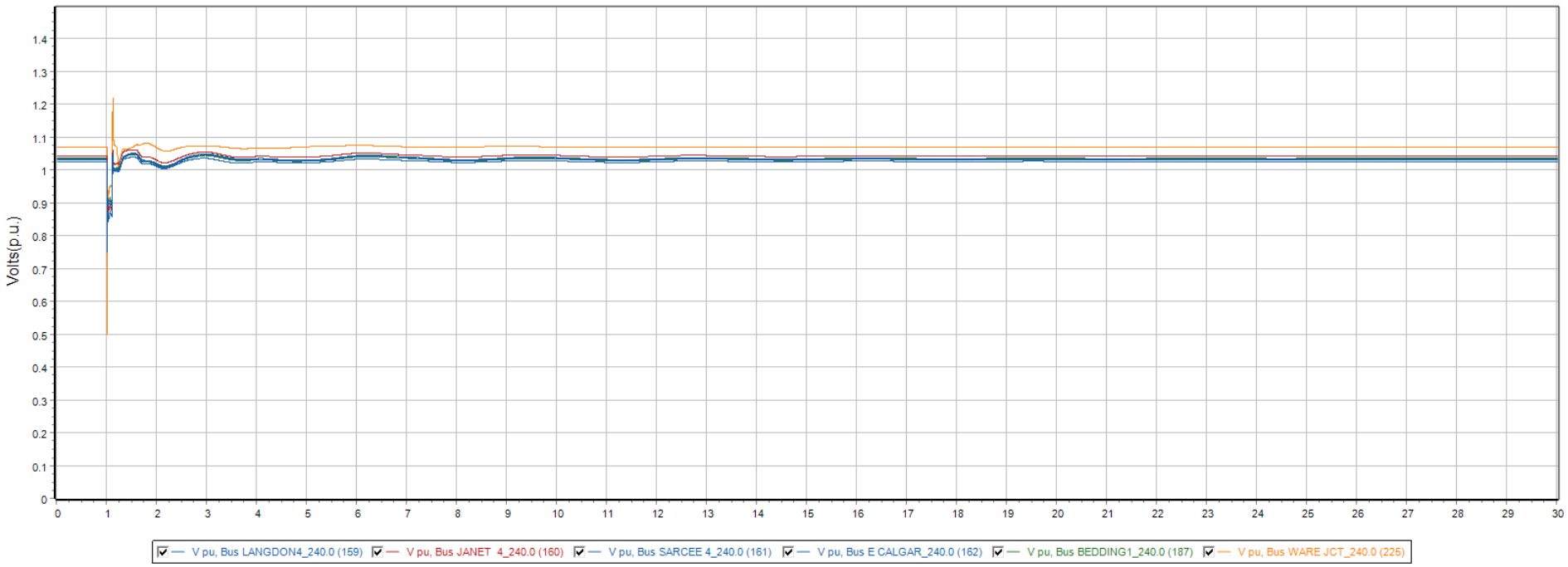
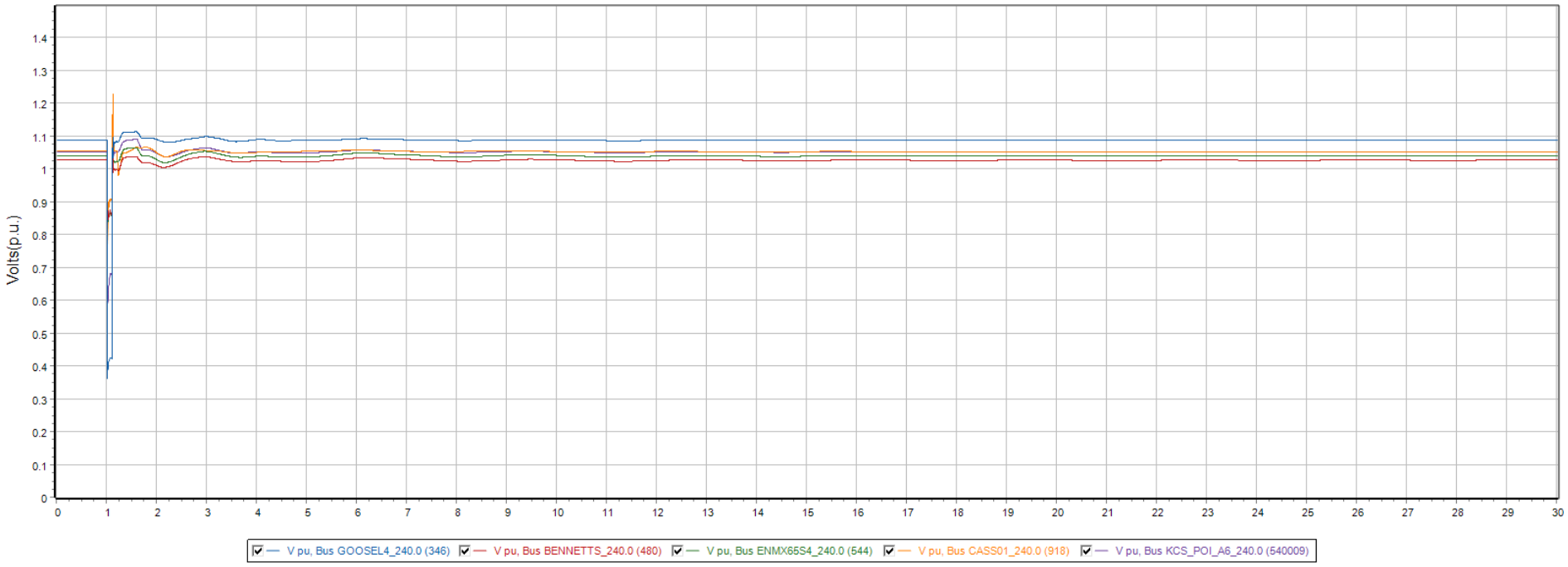
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 05B - 1041L (Travers 554S - North Lethbridge 370S) @ North Lethbridge 370S

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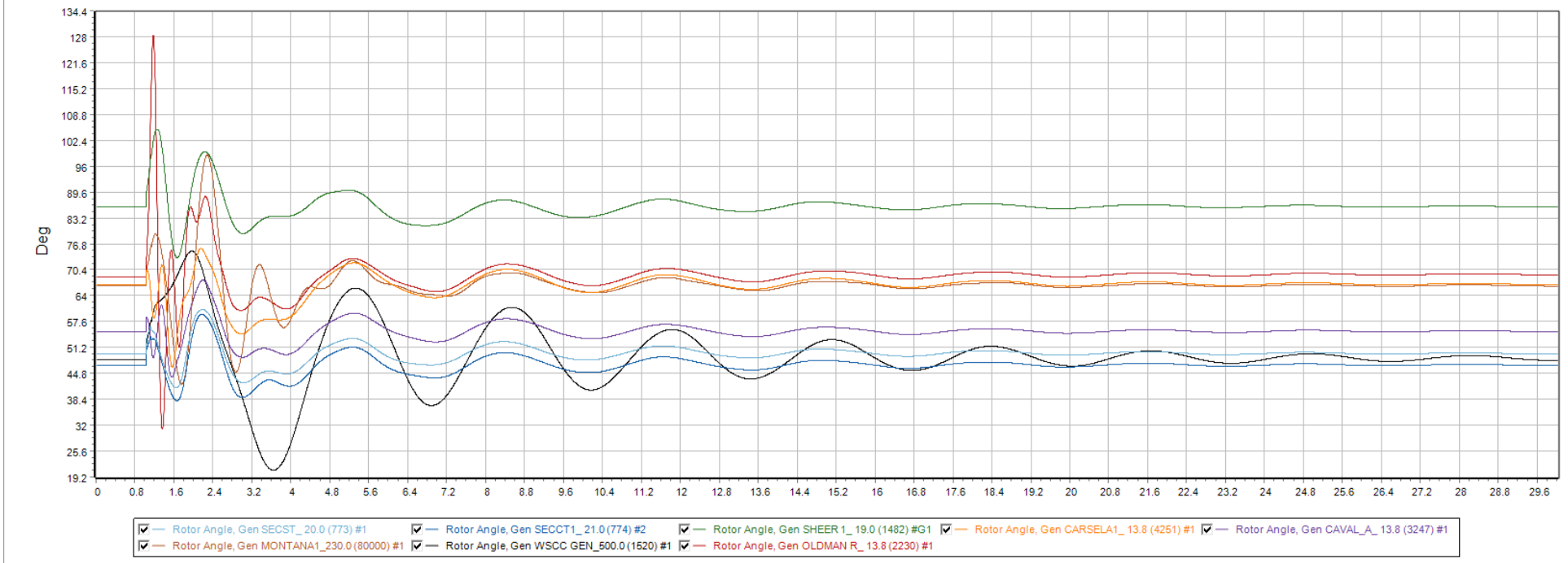
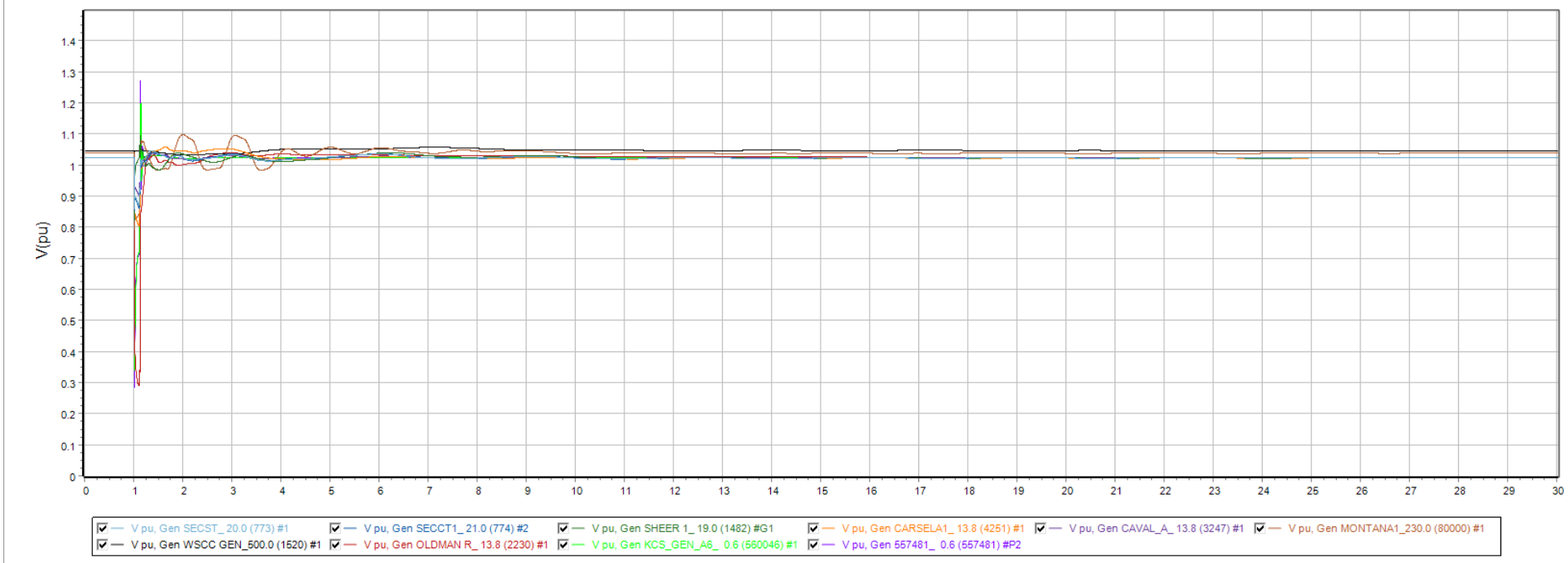
May 16, 2023 22:13:35

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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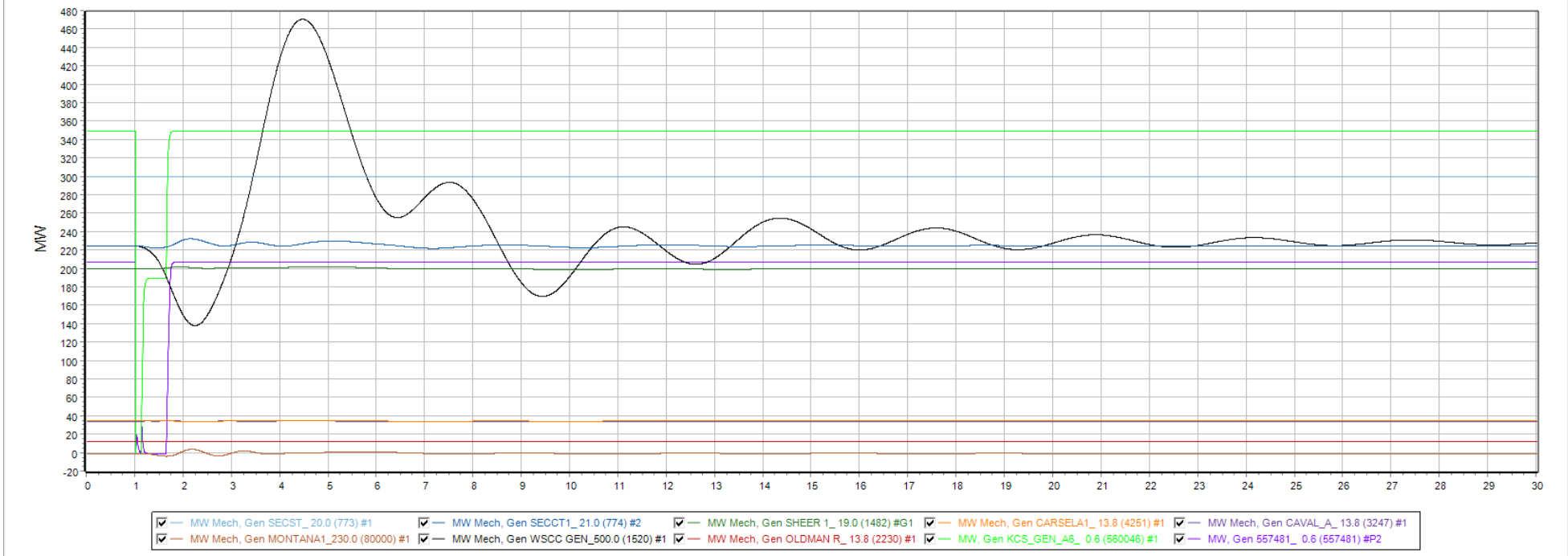
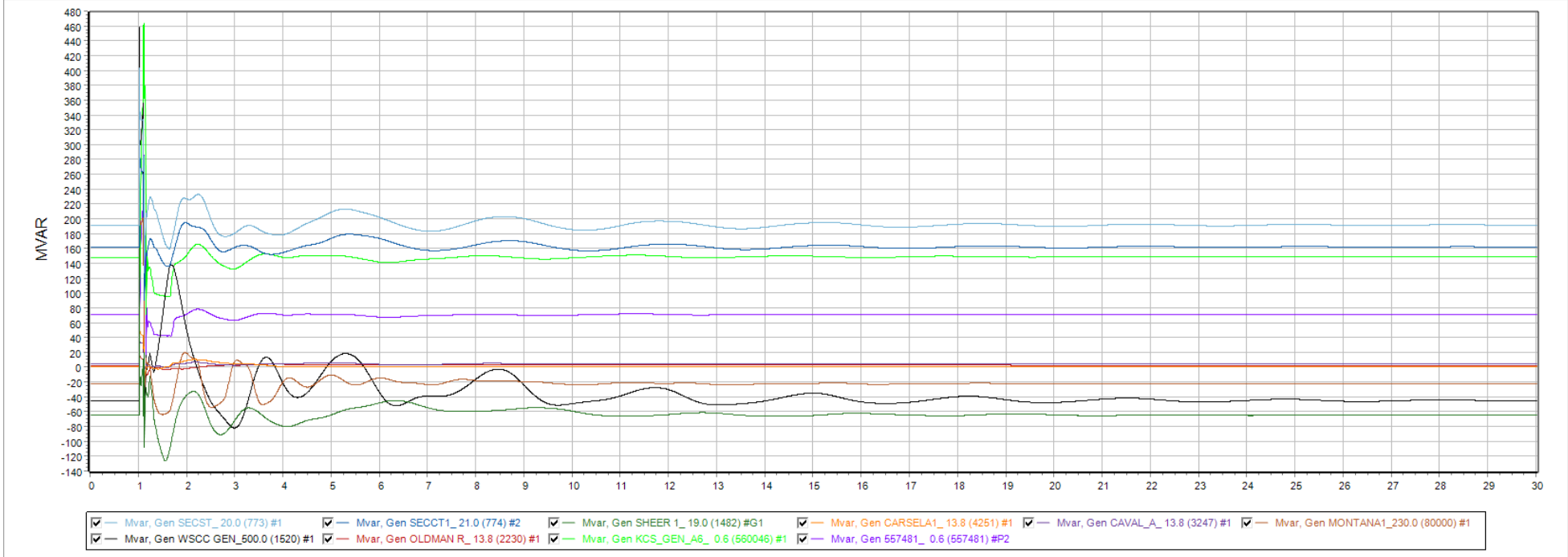
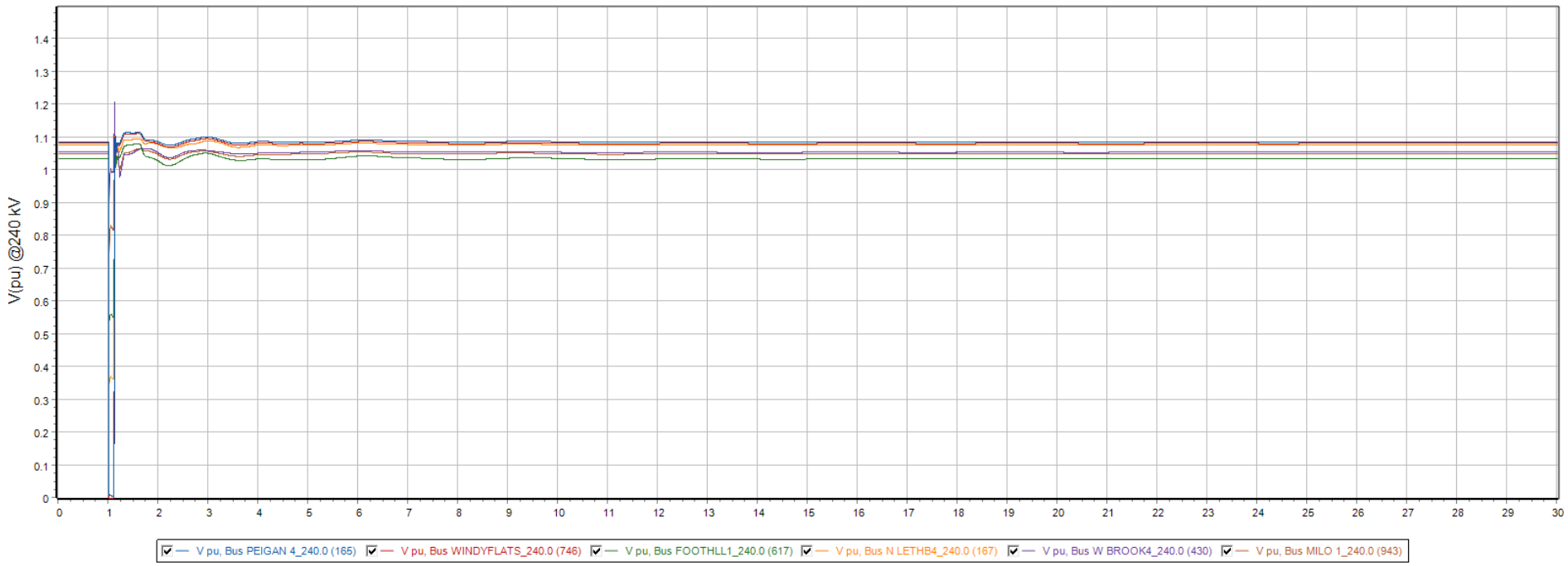
May 16, 2023 22:25:04

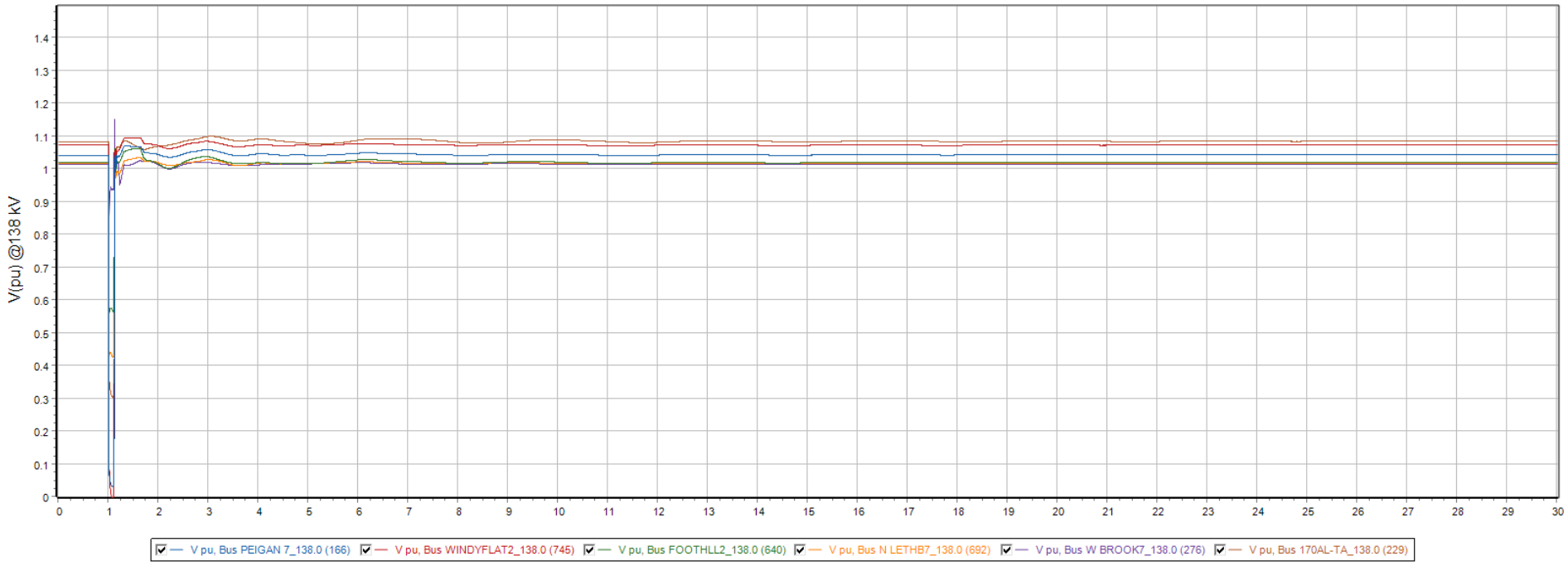
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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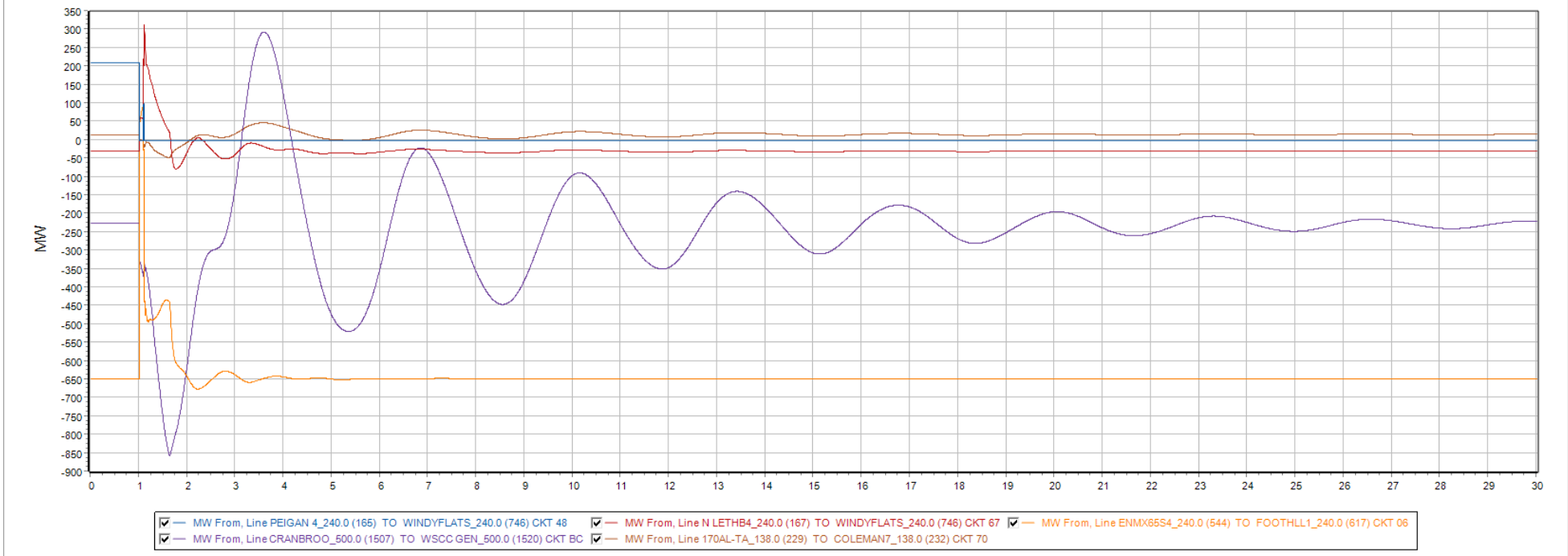
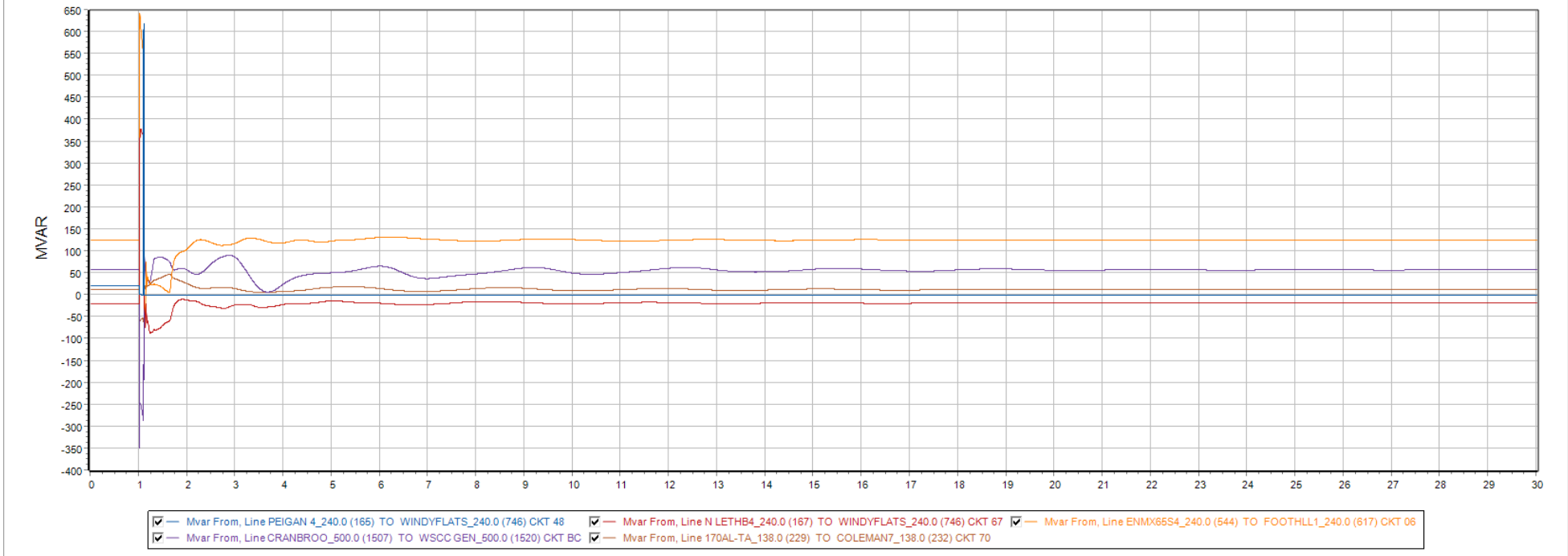
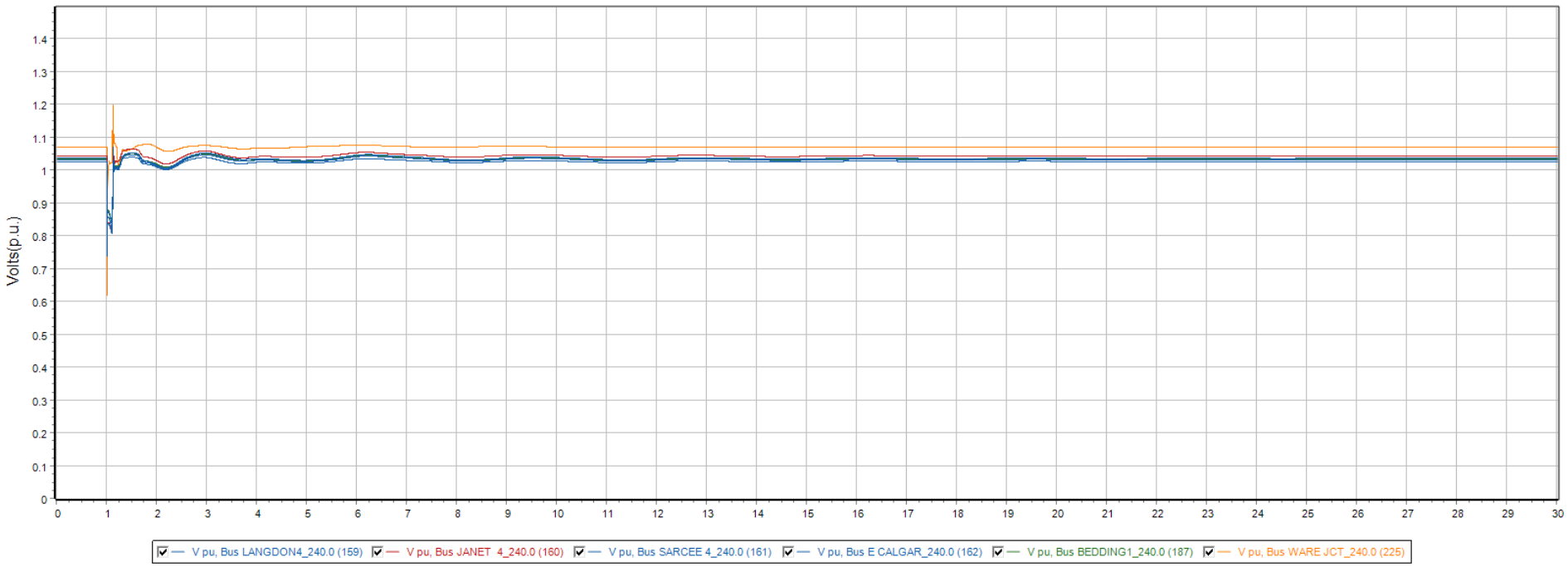
May 16, 2023 22:25:05

Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06A - 1048L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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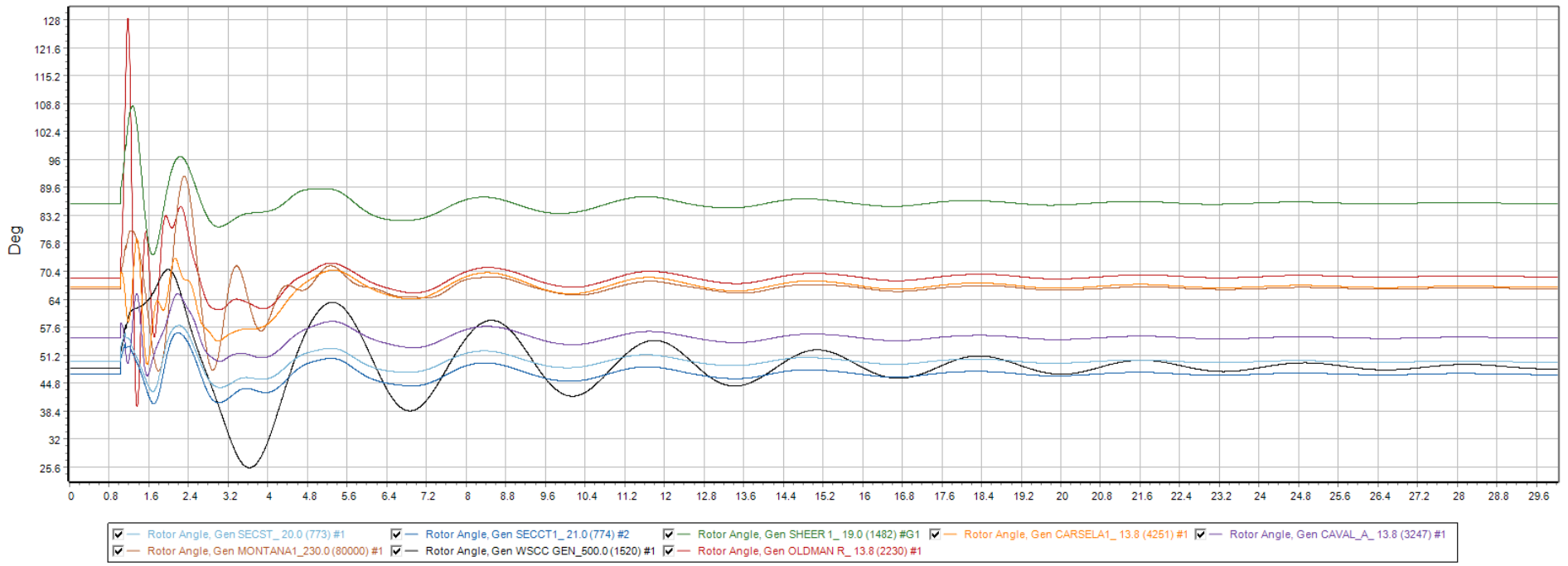
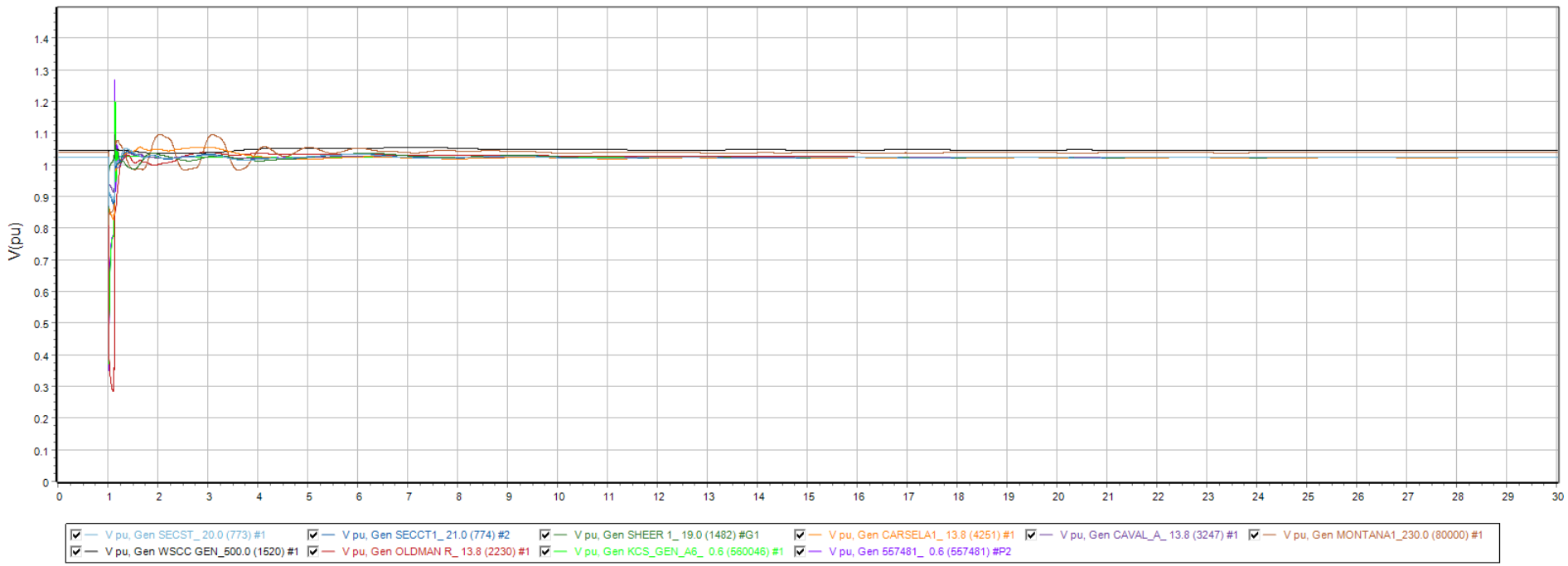
May 16, 2023 22:25:06

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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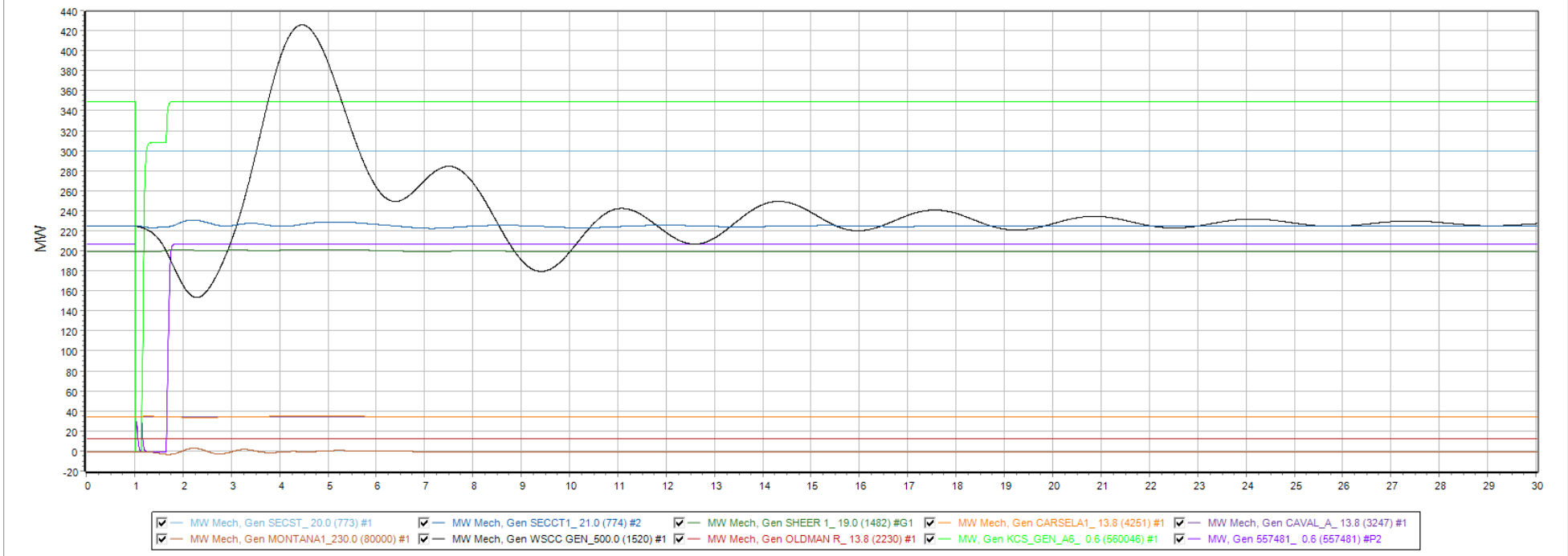
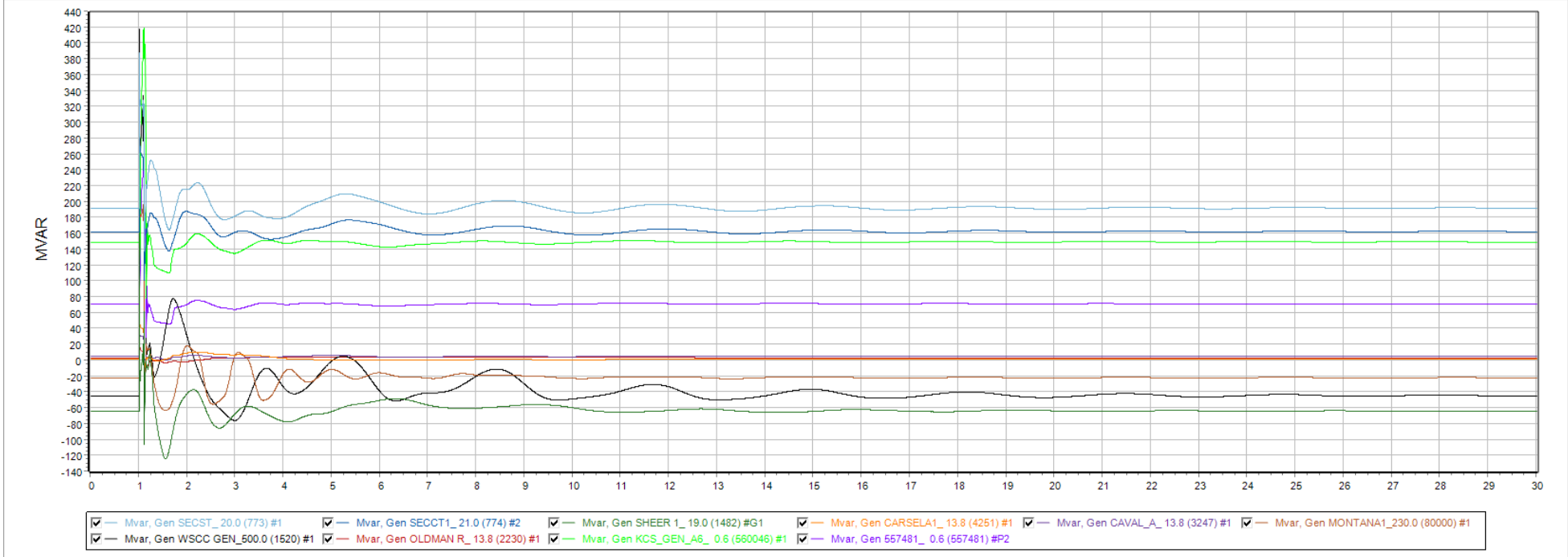
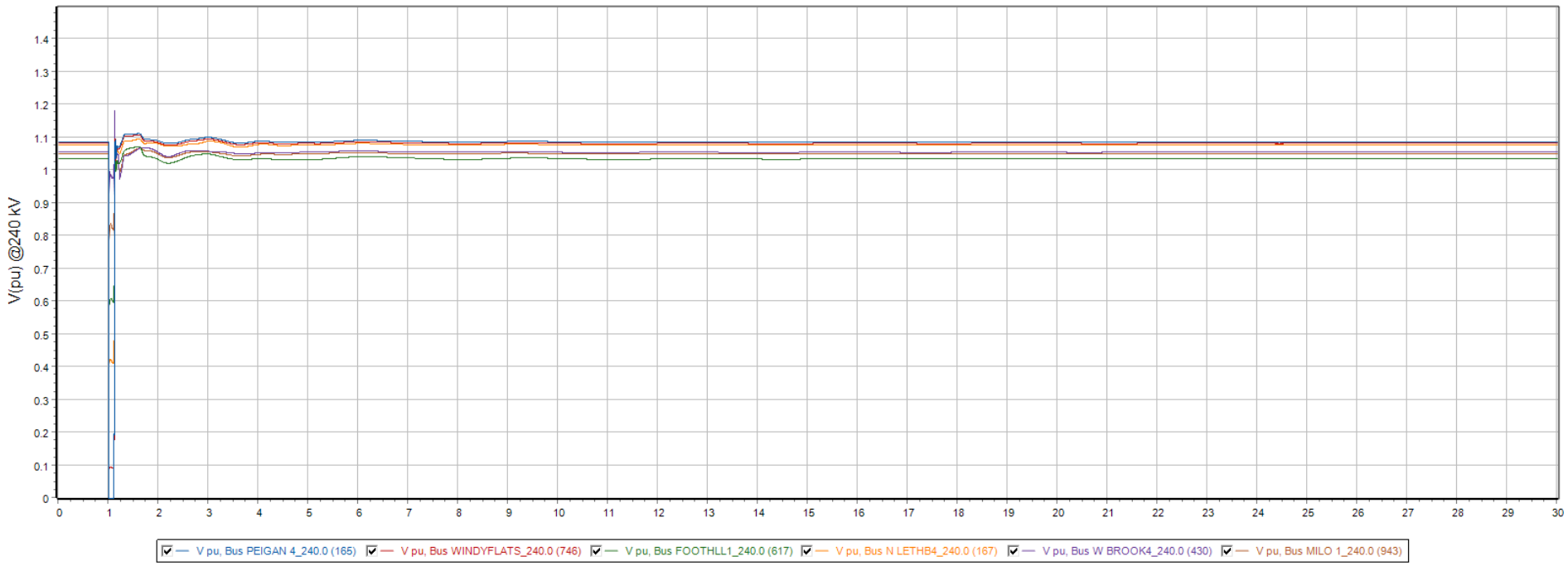
May 16, 2023 22:35:34

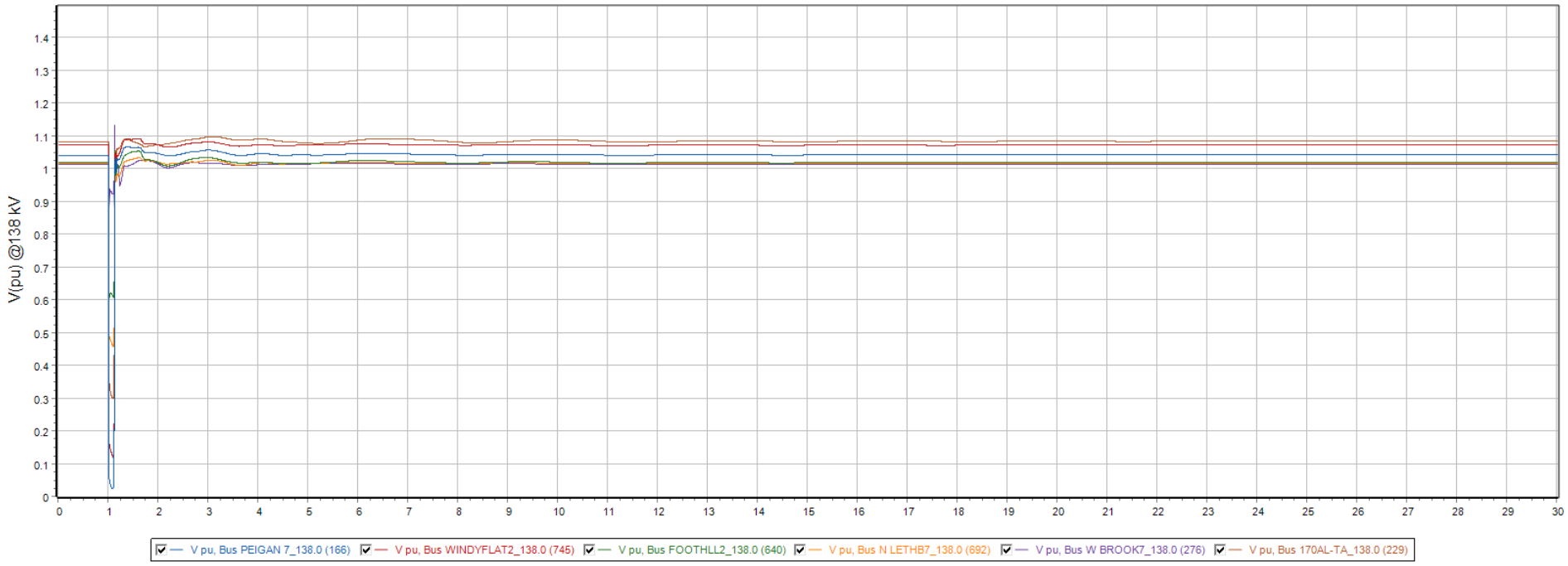
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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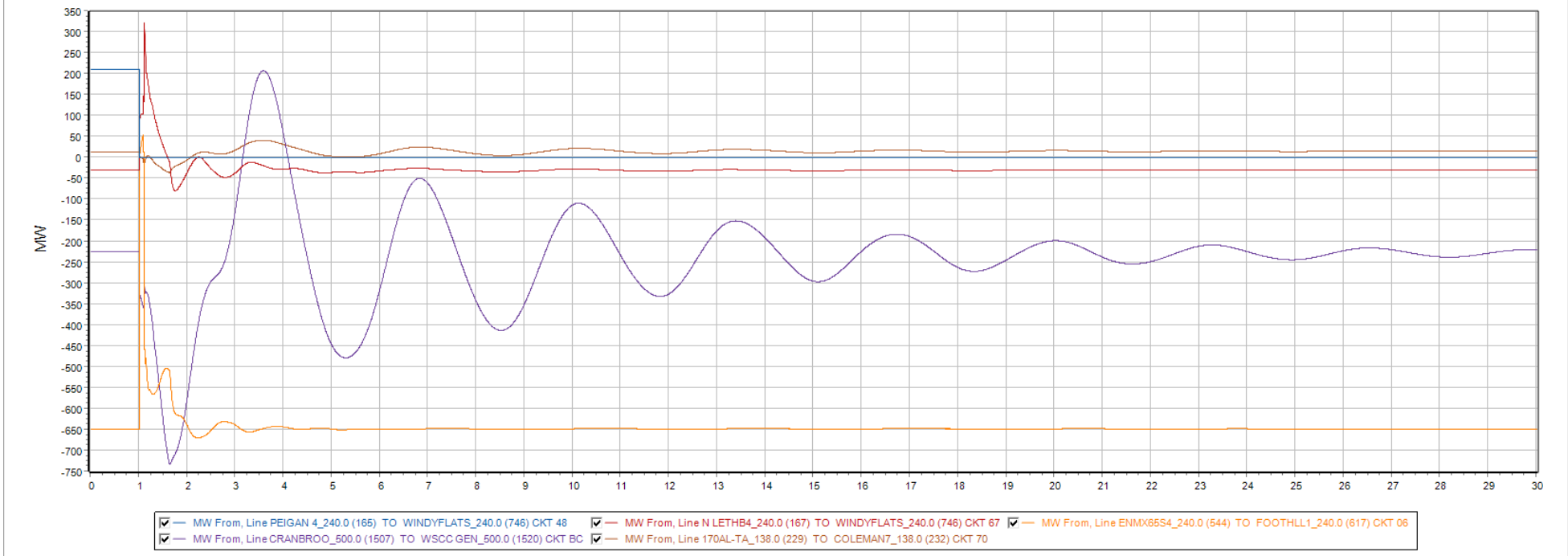
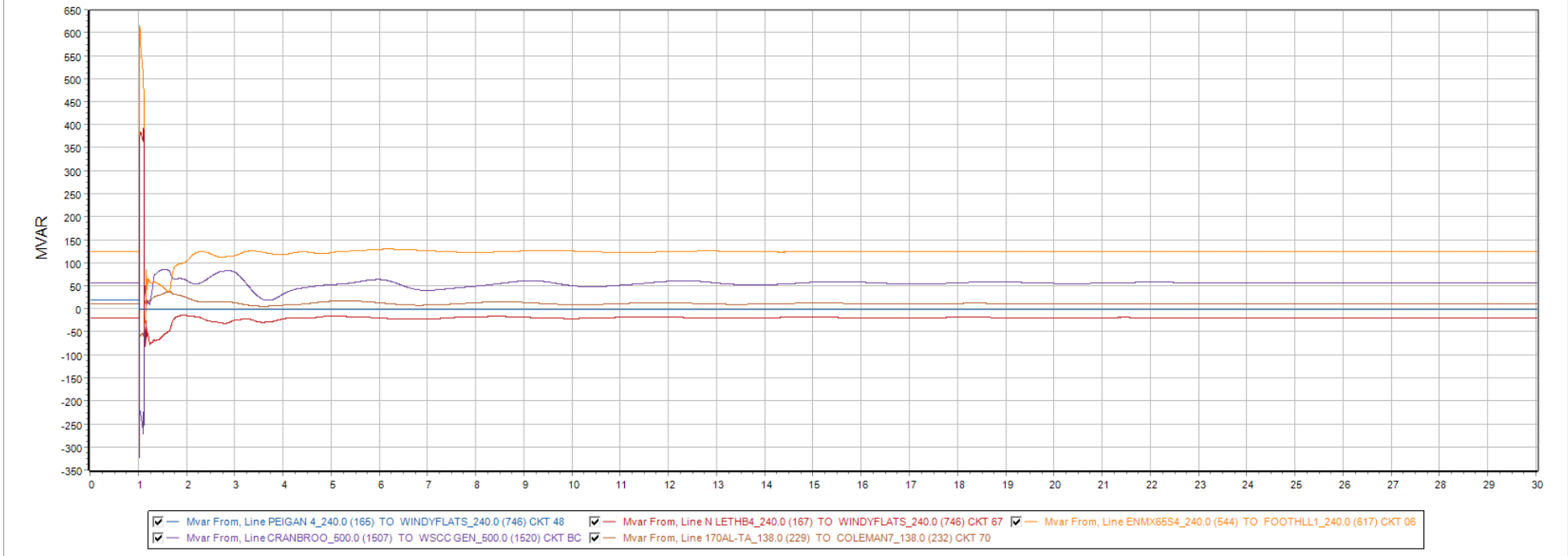
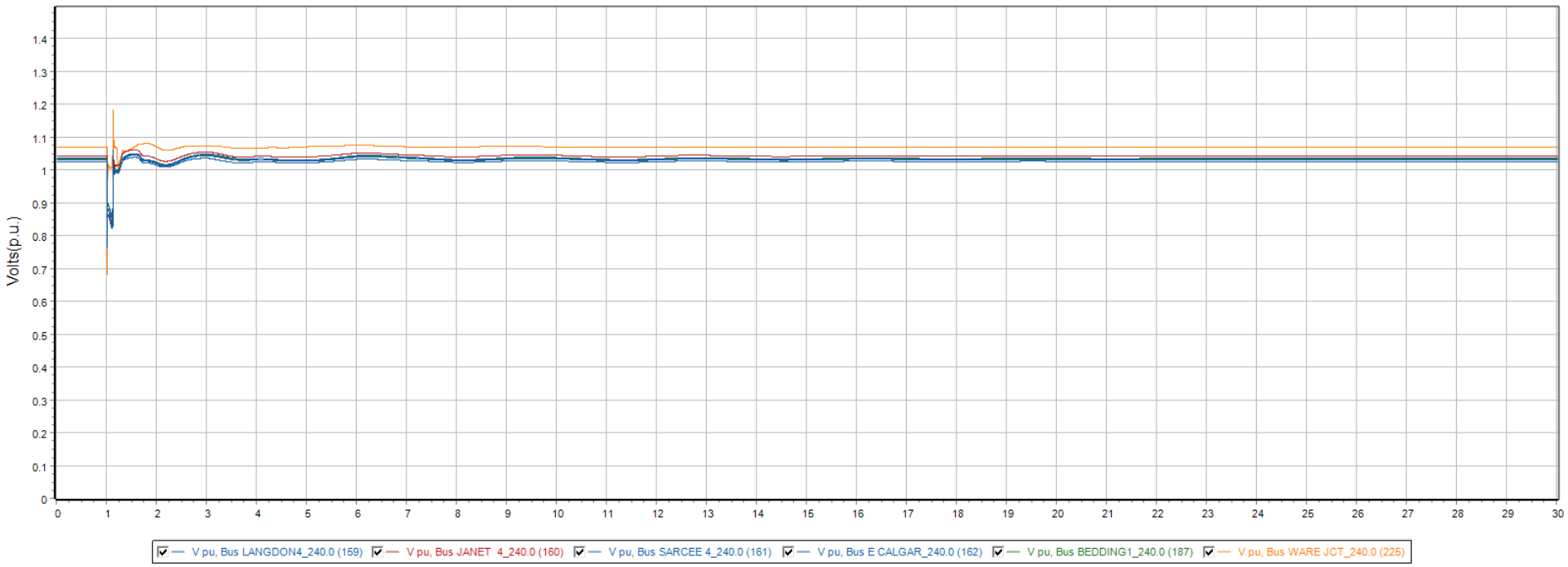
May 16, 2023 22:35:35

Monitor Line MW & MVAR. Q4

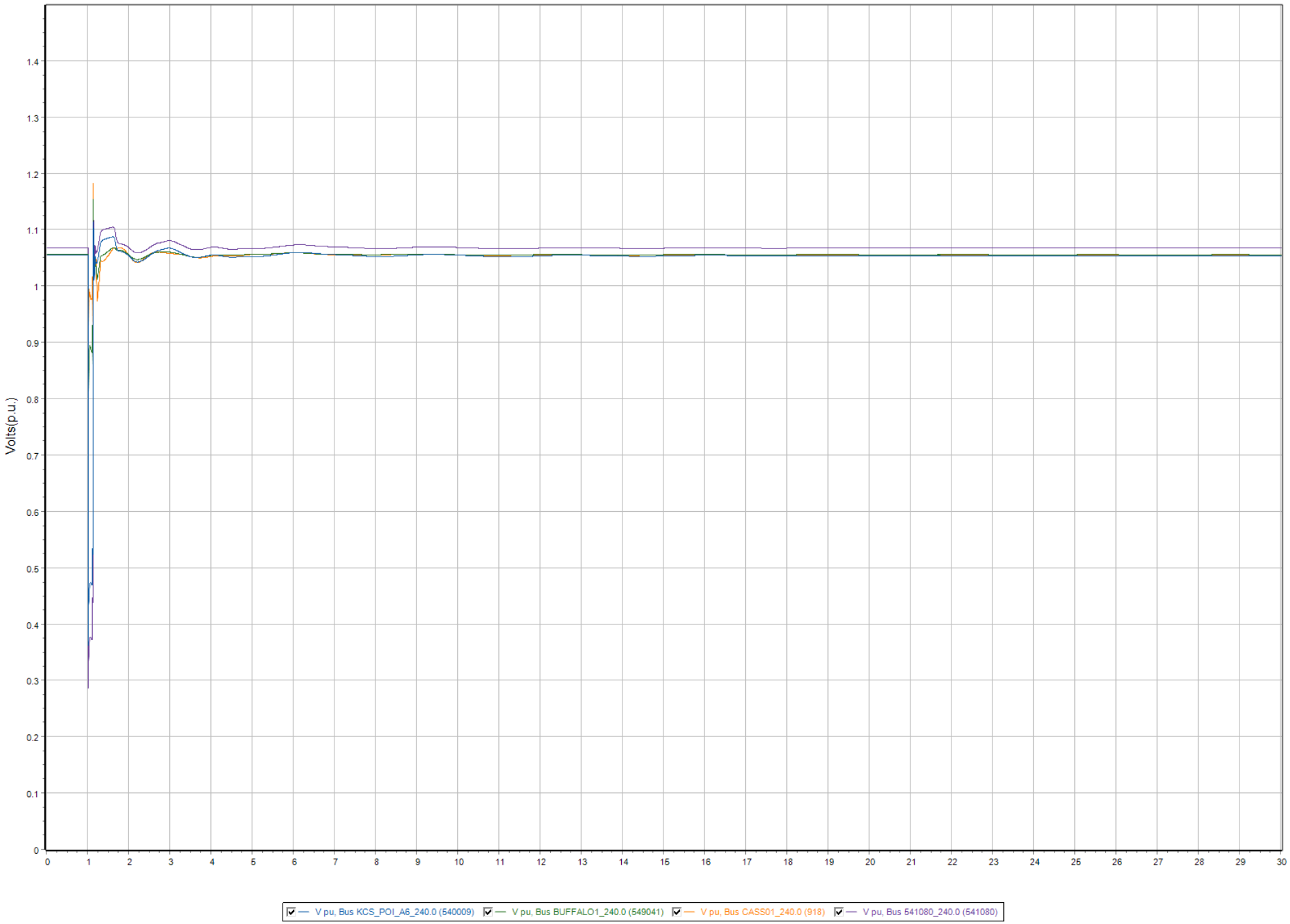




Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 06B - 1048L (Windy Flats 138S - Peigan 59S) @ Peigan 59S

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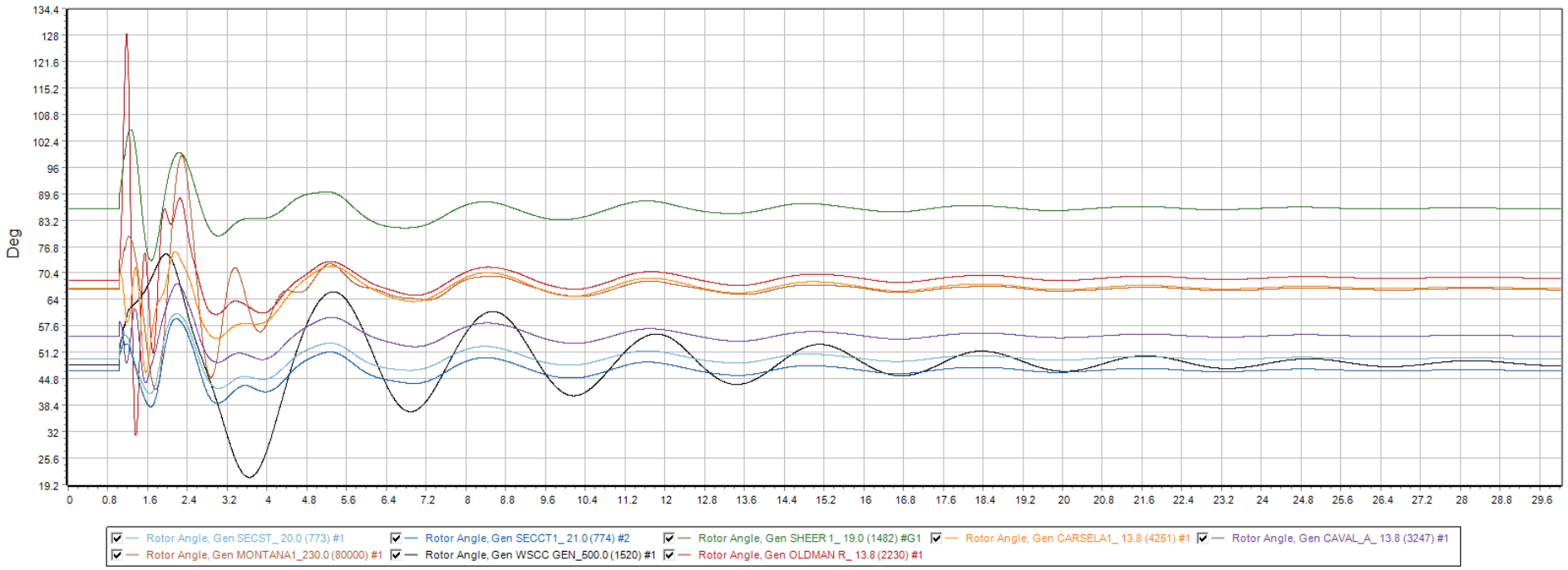
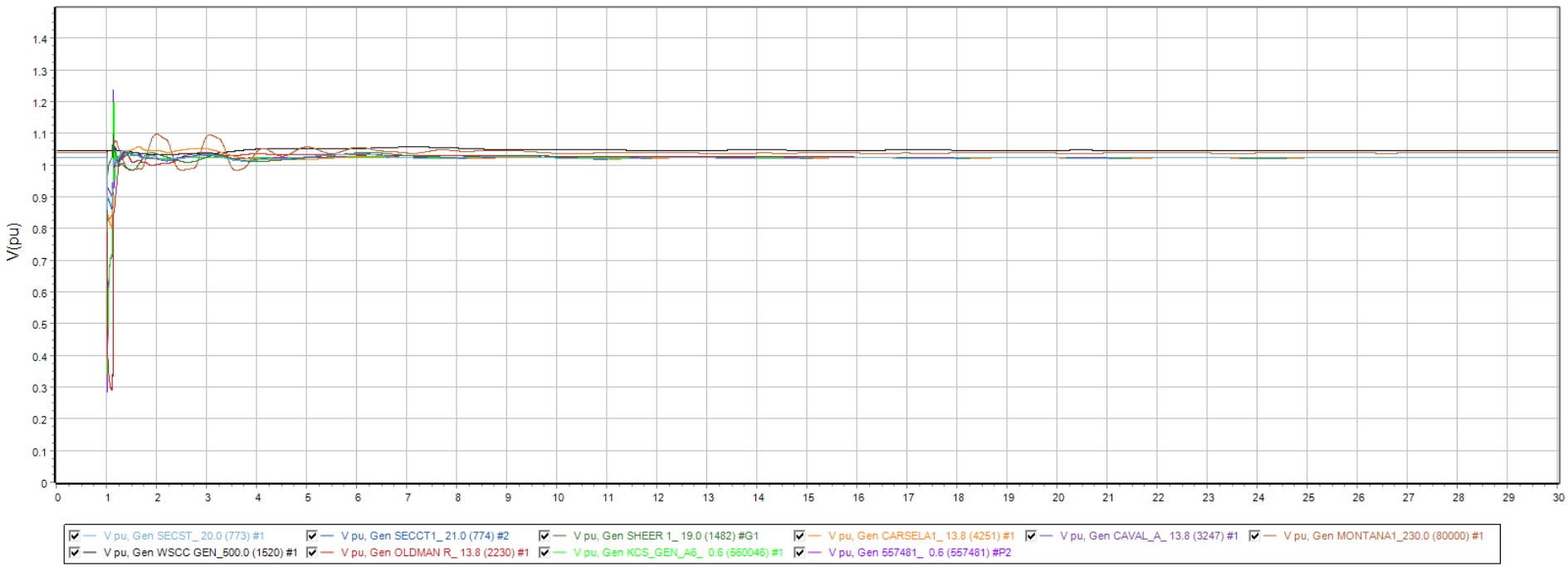
May 16, 2023 22:35:36

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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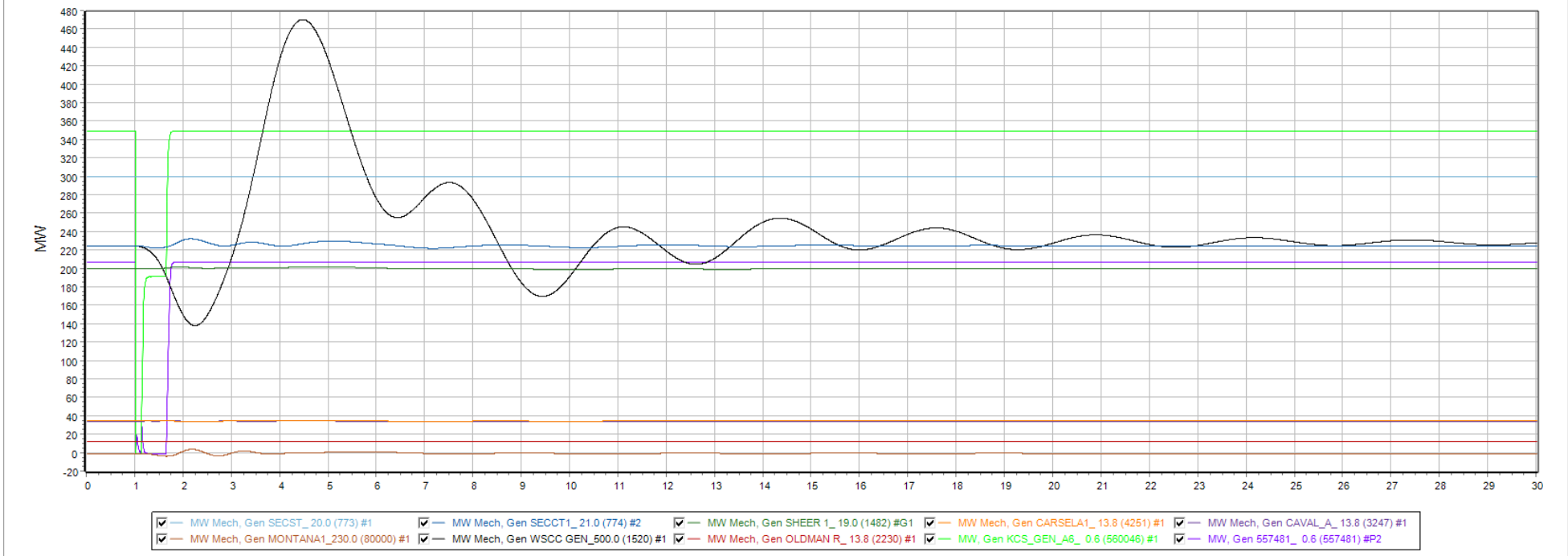
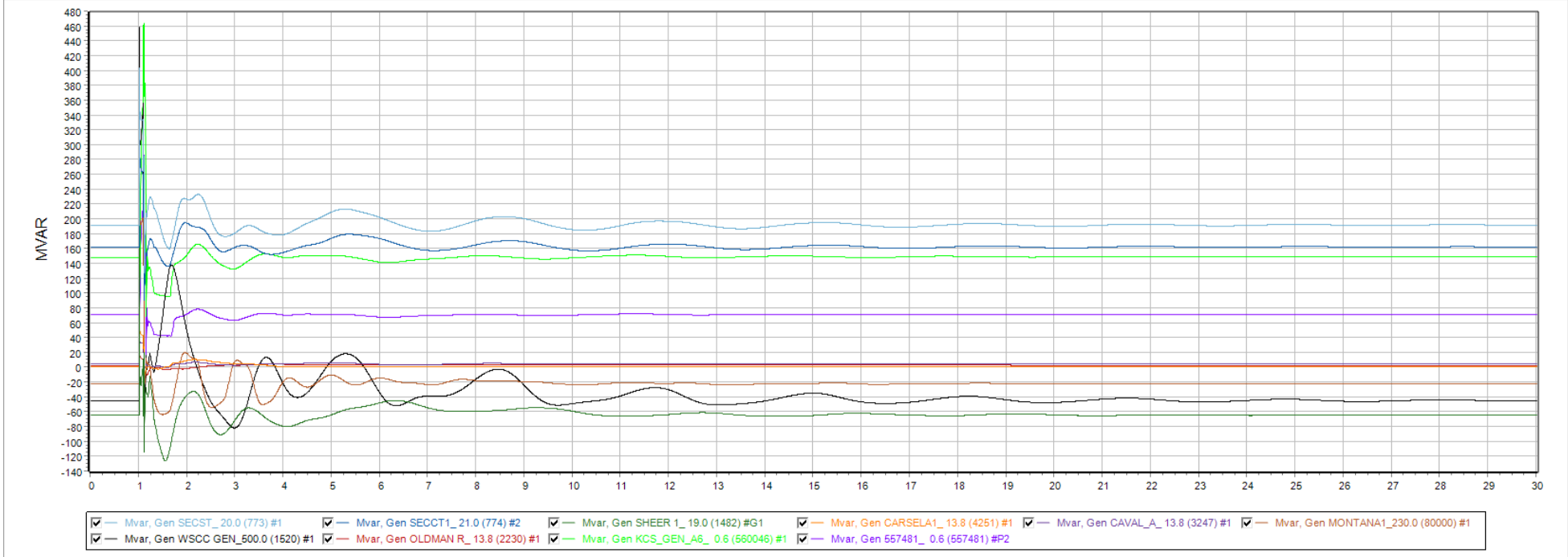
May 16, 2023 22:47:01

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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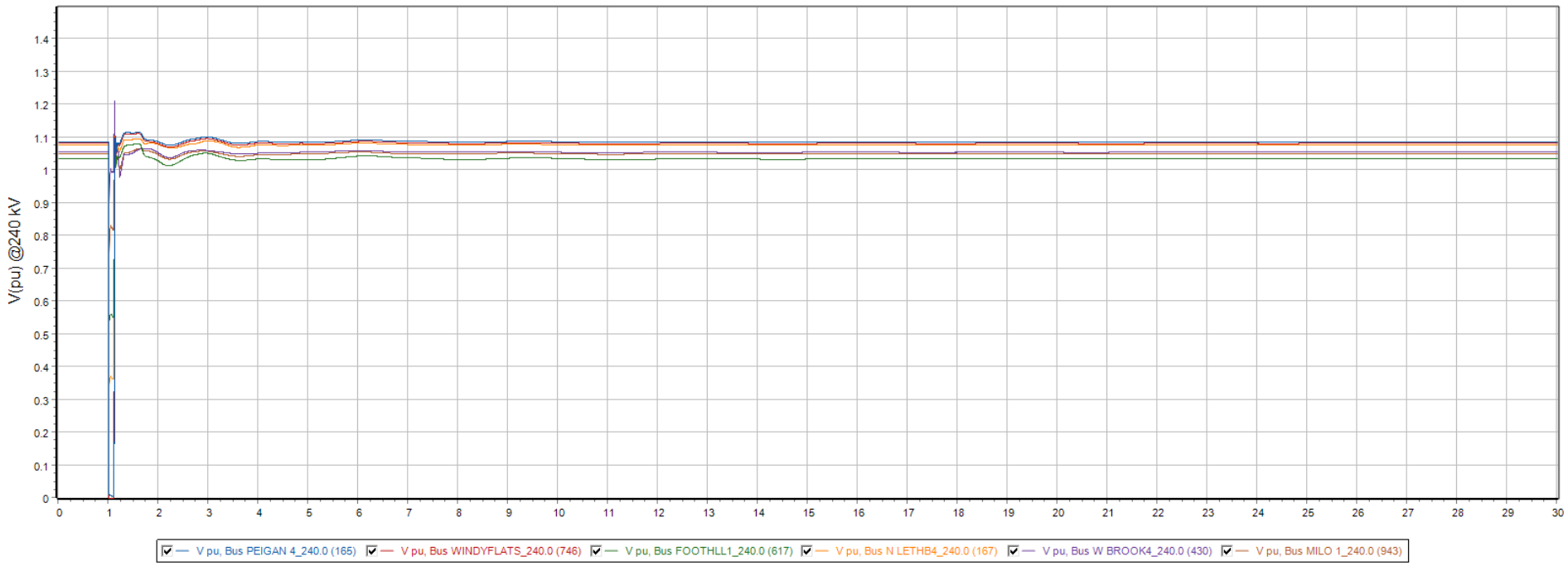
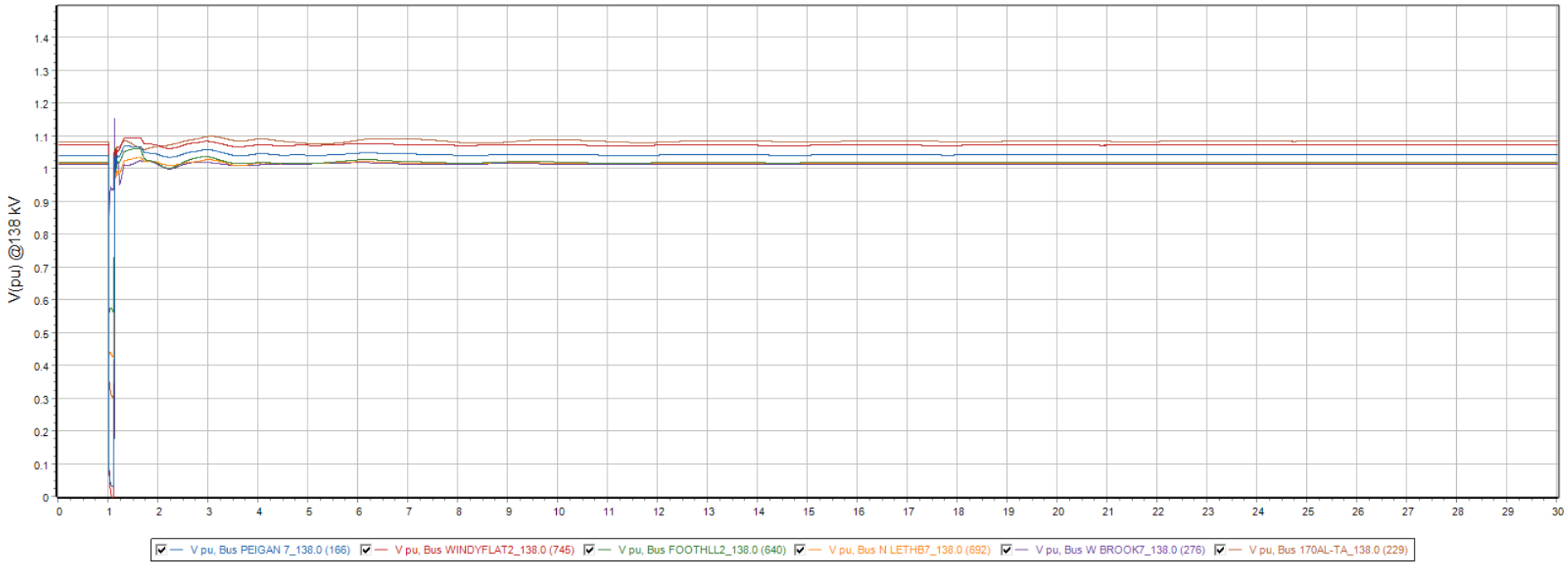
May 16, 2023 22:47:01

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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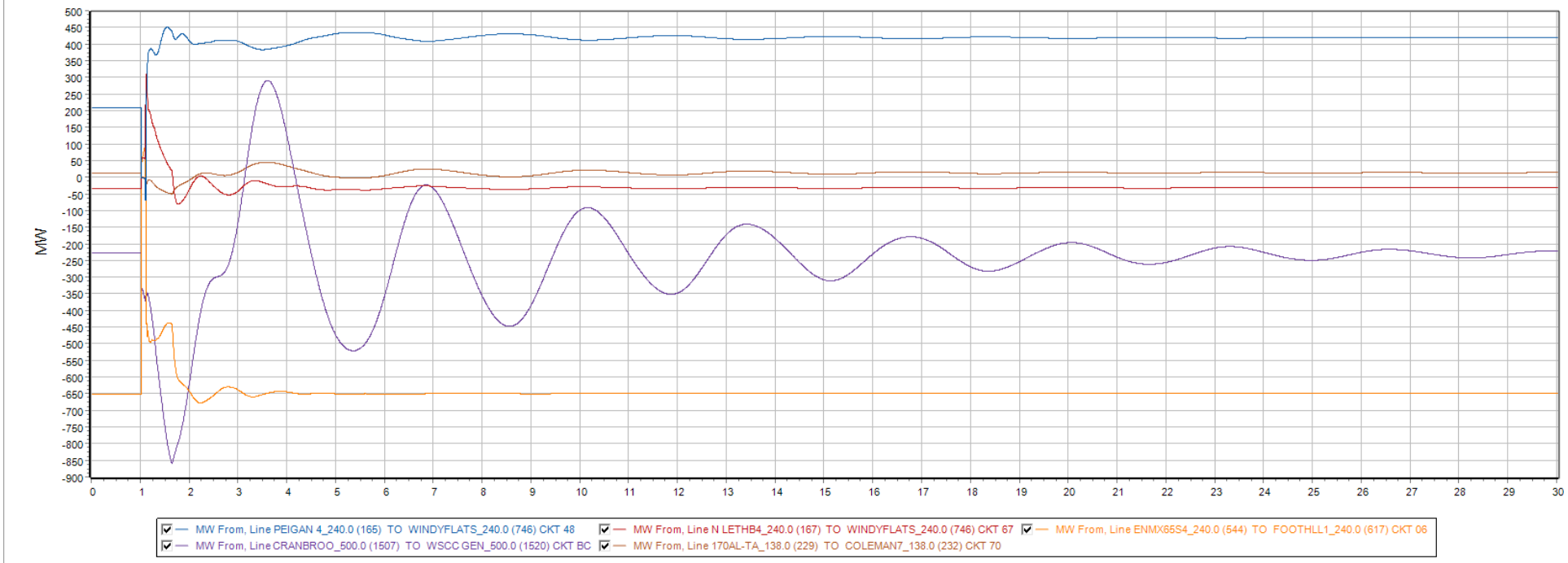
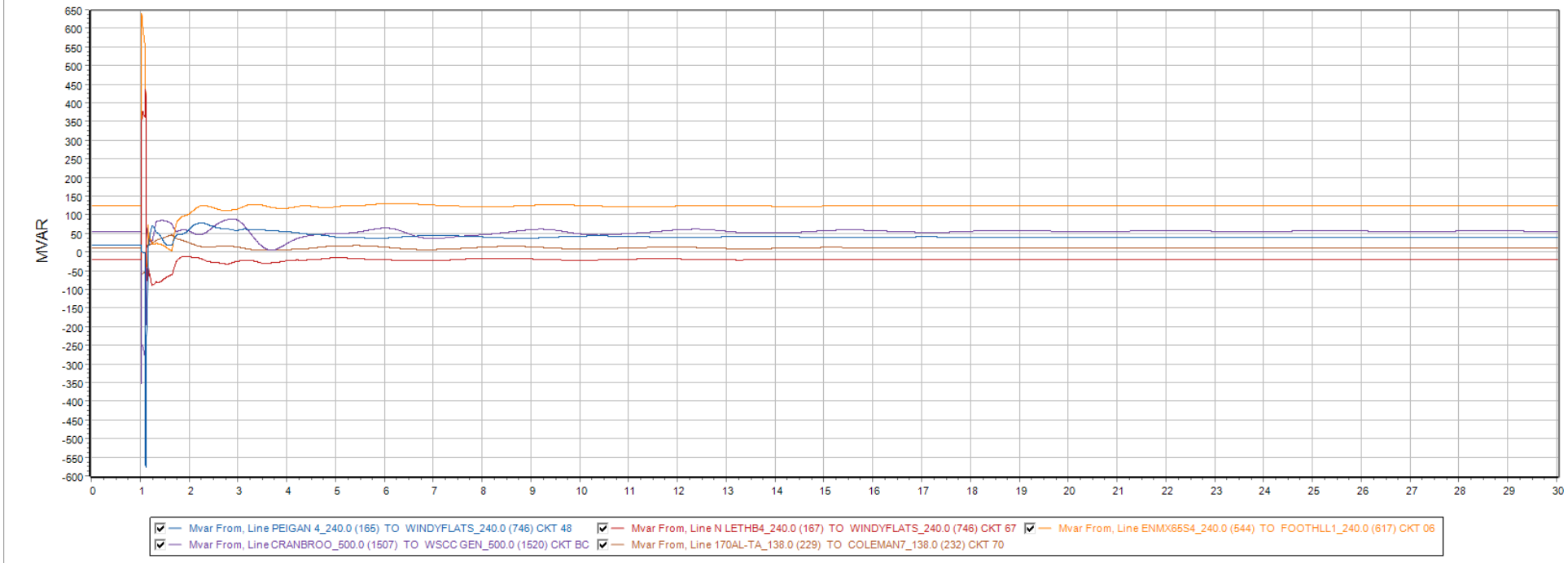
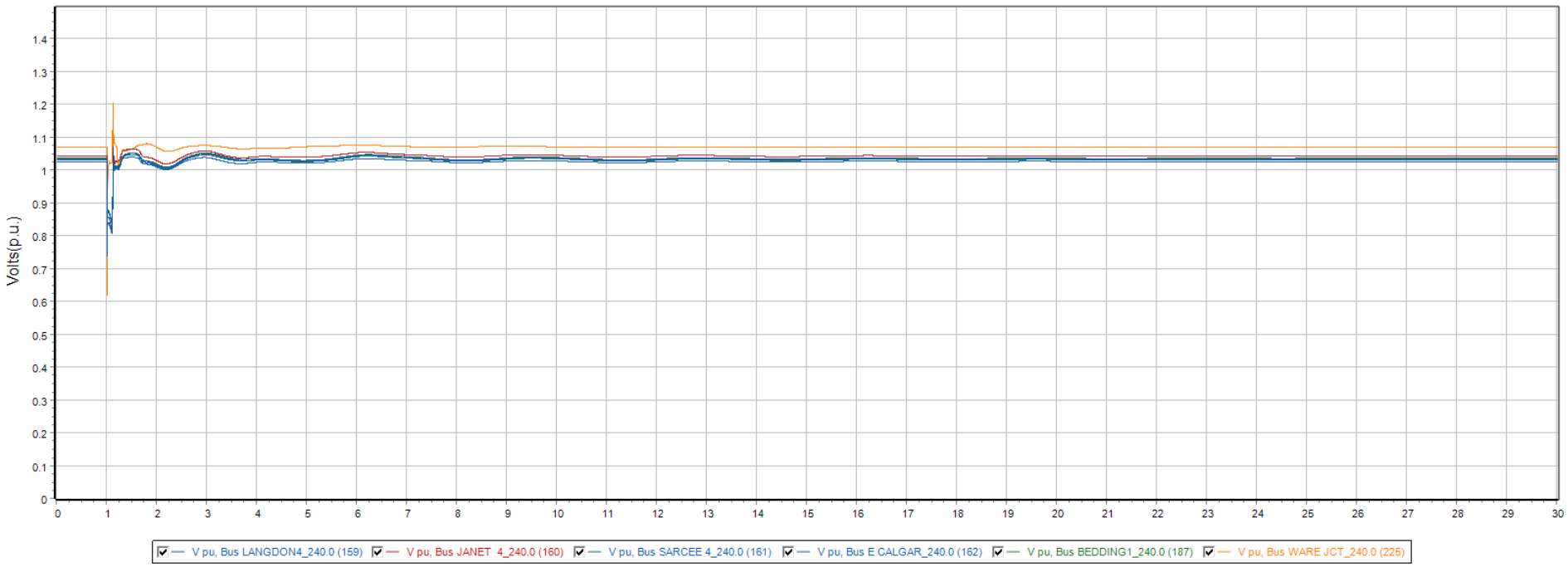
May 16, 2023 22:47:02

Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts



Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07A - 1049L (Windy Flats 138S – Peigan 59S) @ Windy Flats 138S

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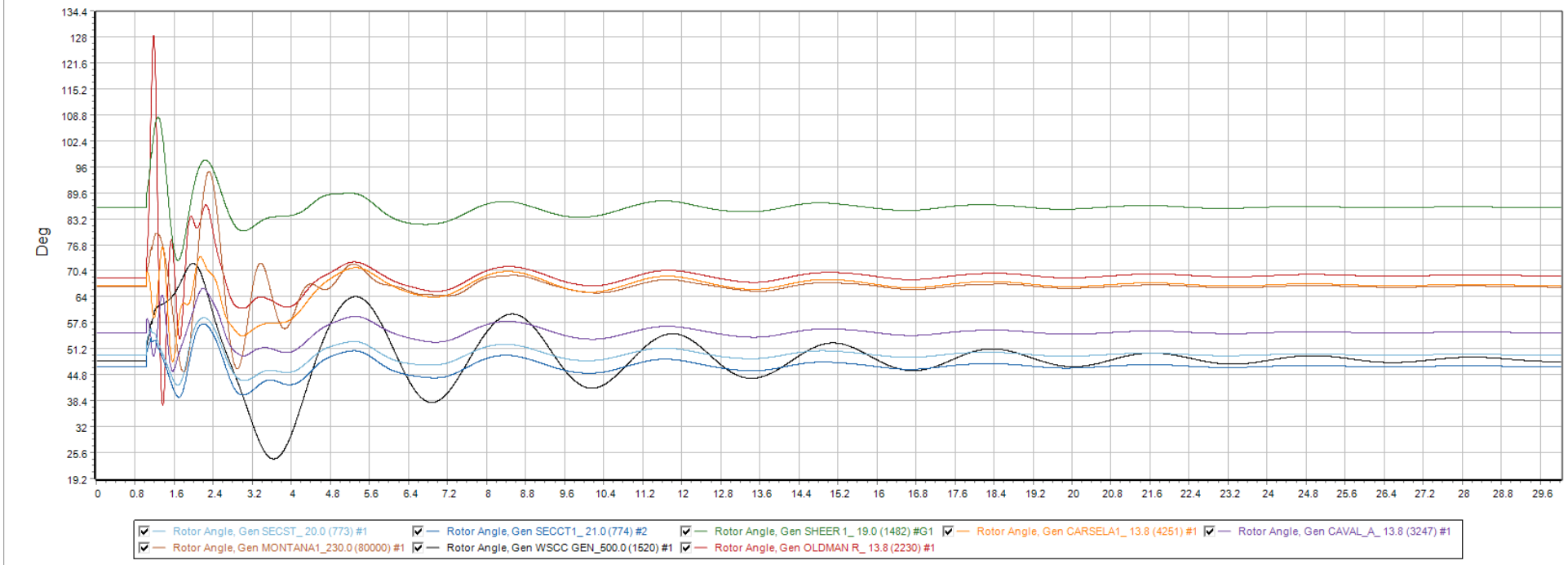
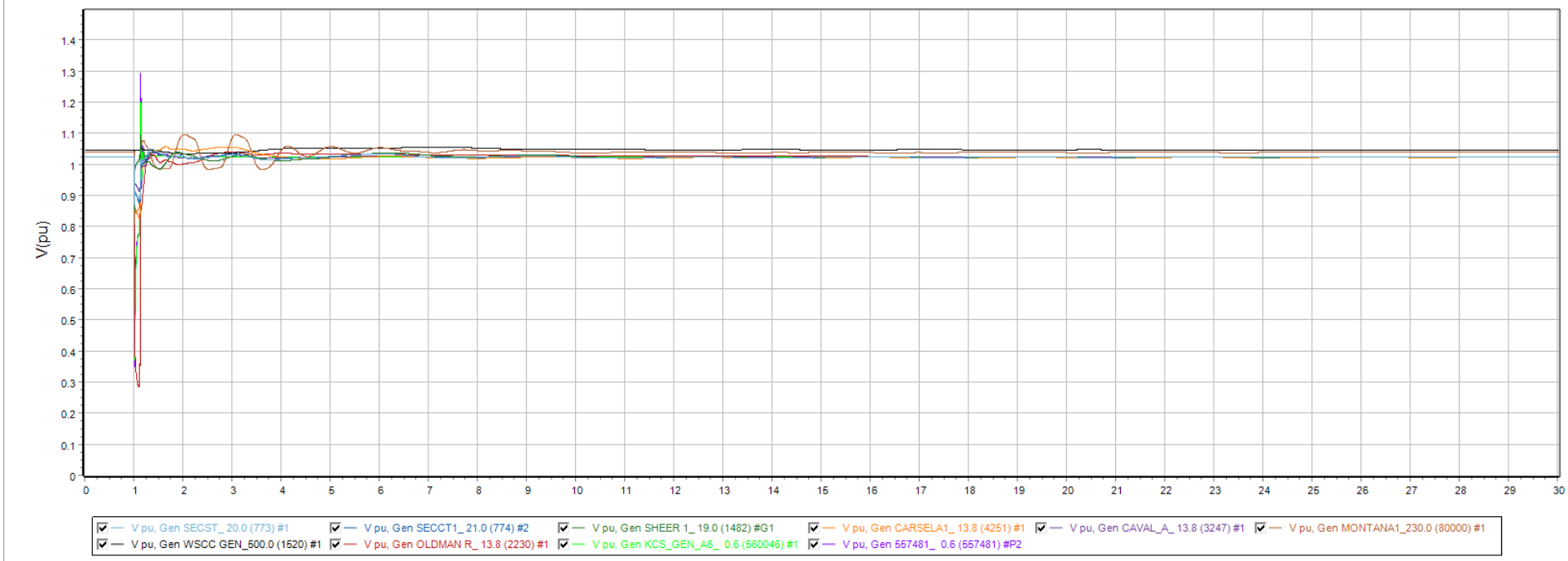
May 16, 2023 22:47:03

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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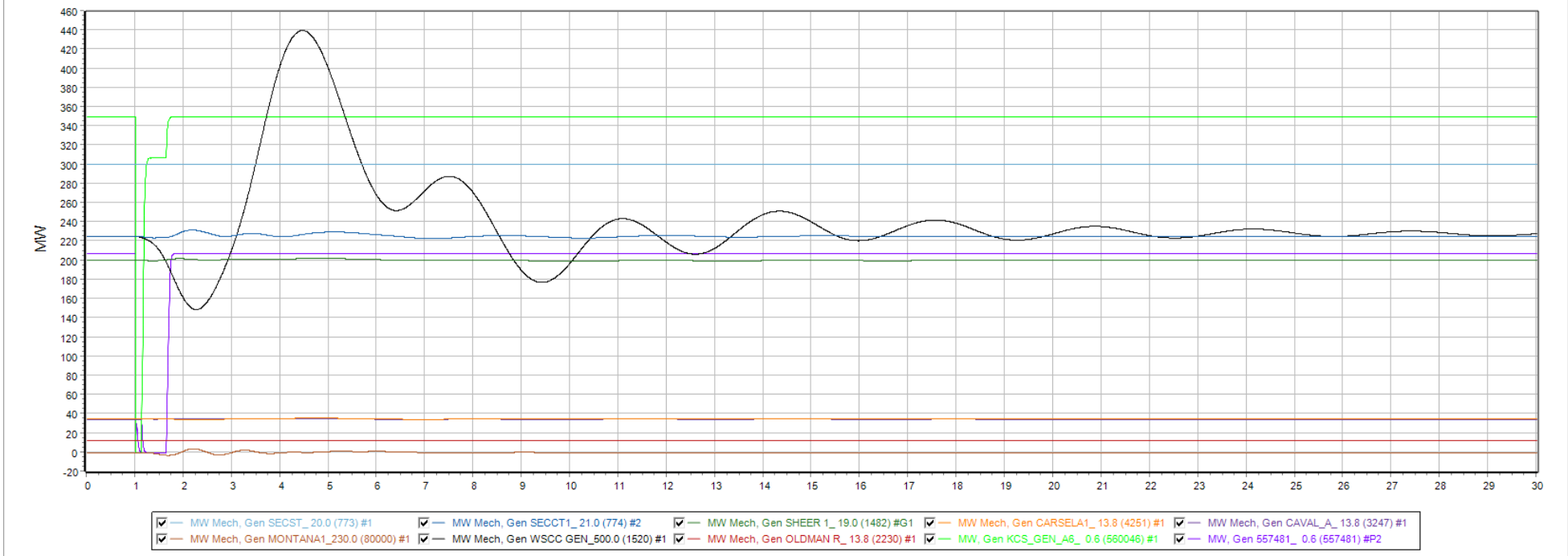
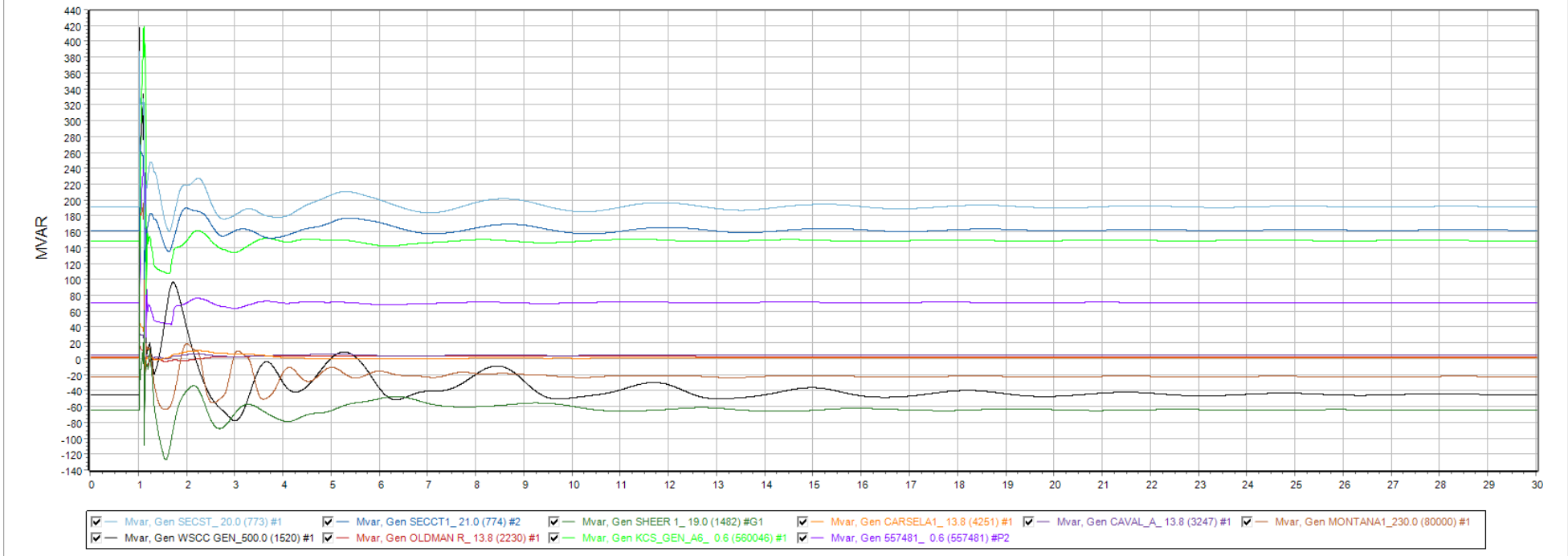
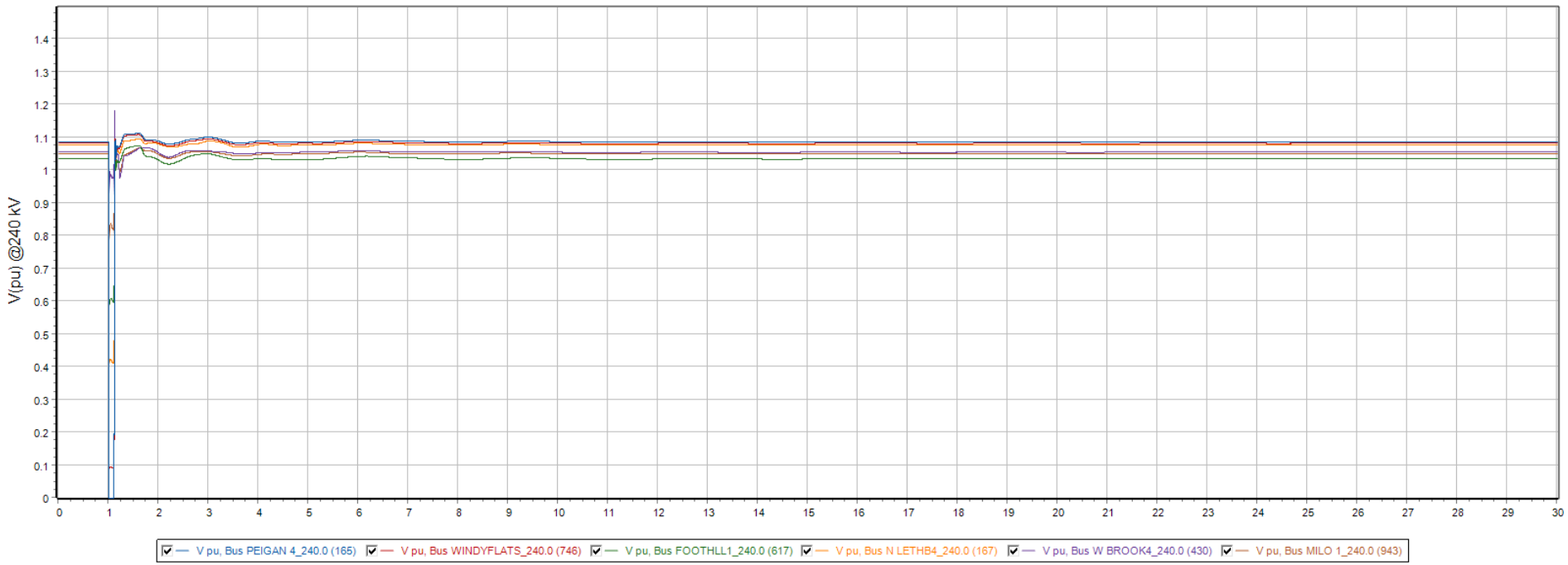
May 16, 2023 22:57:25

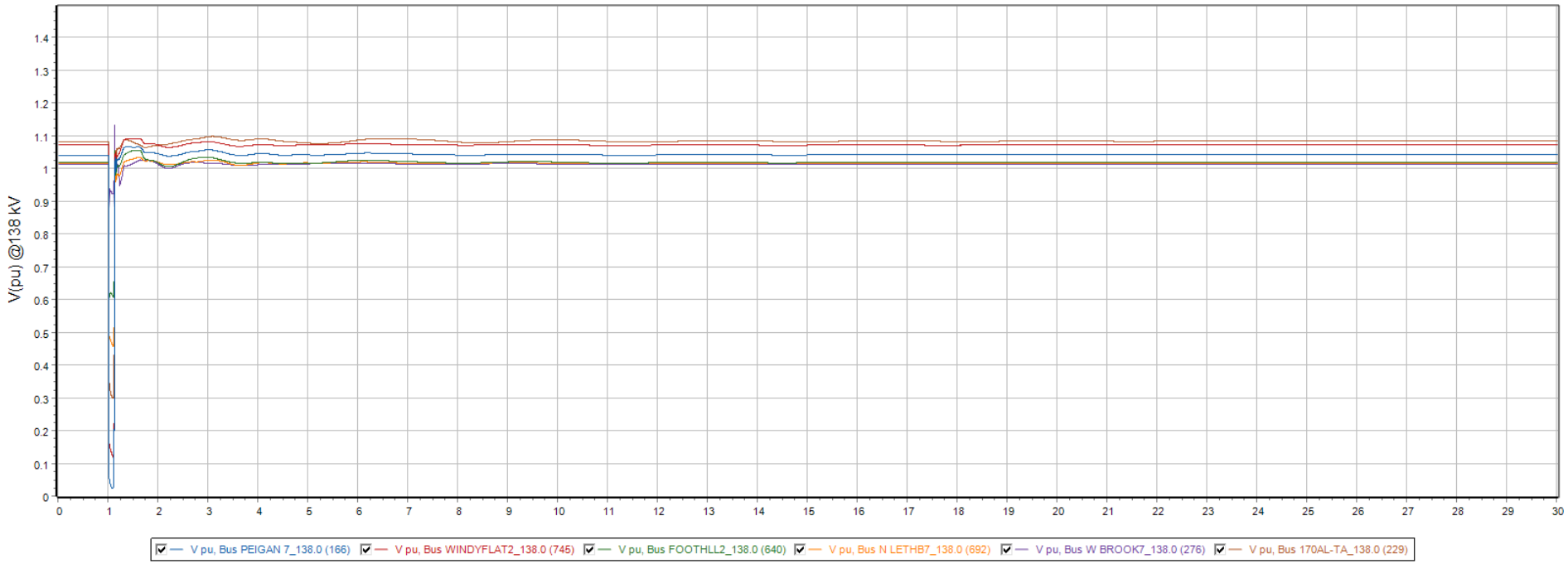
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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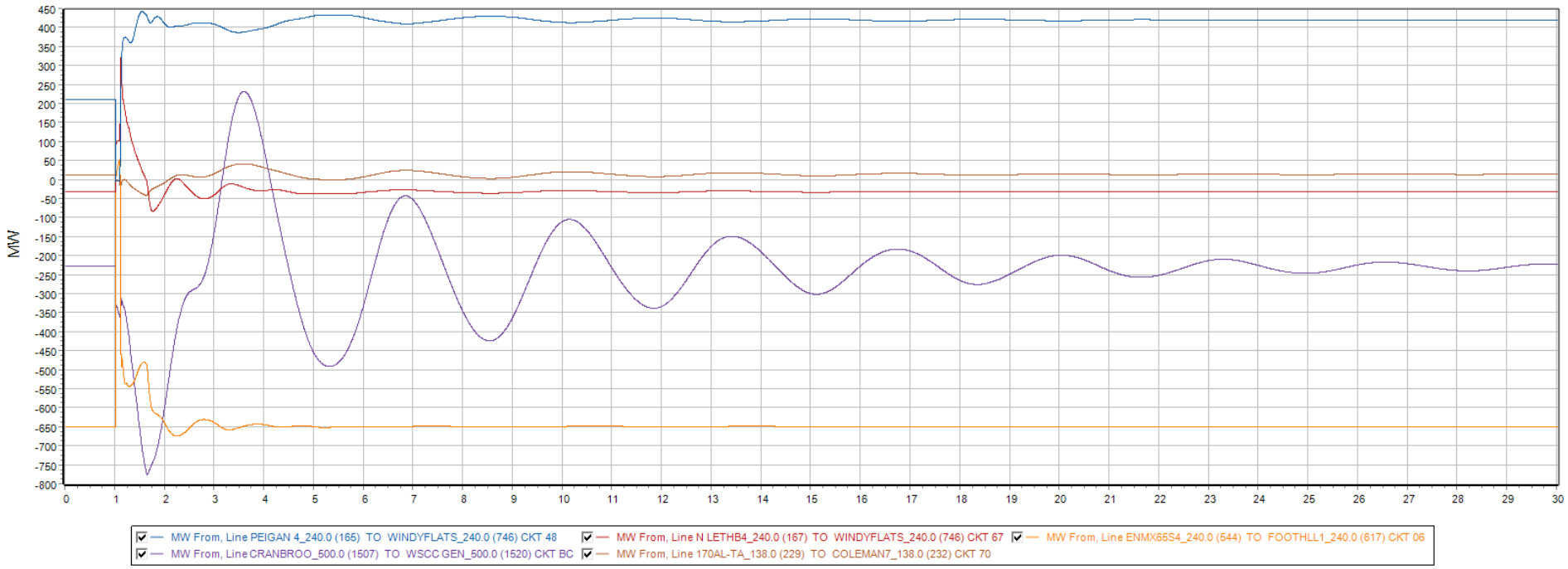
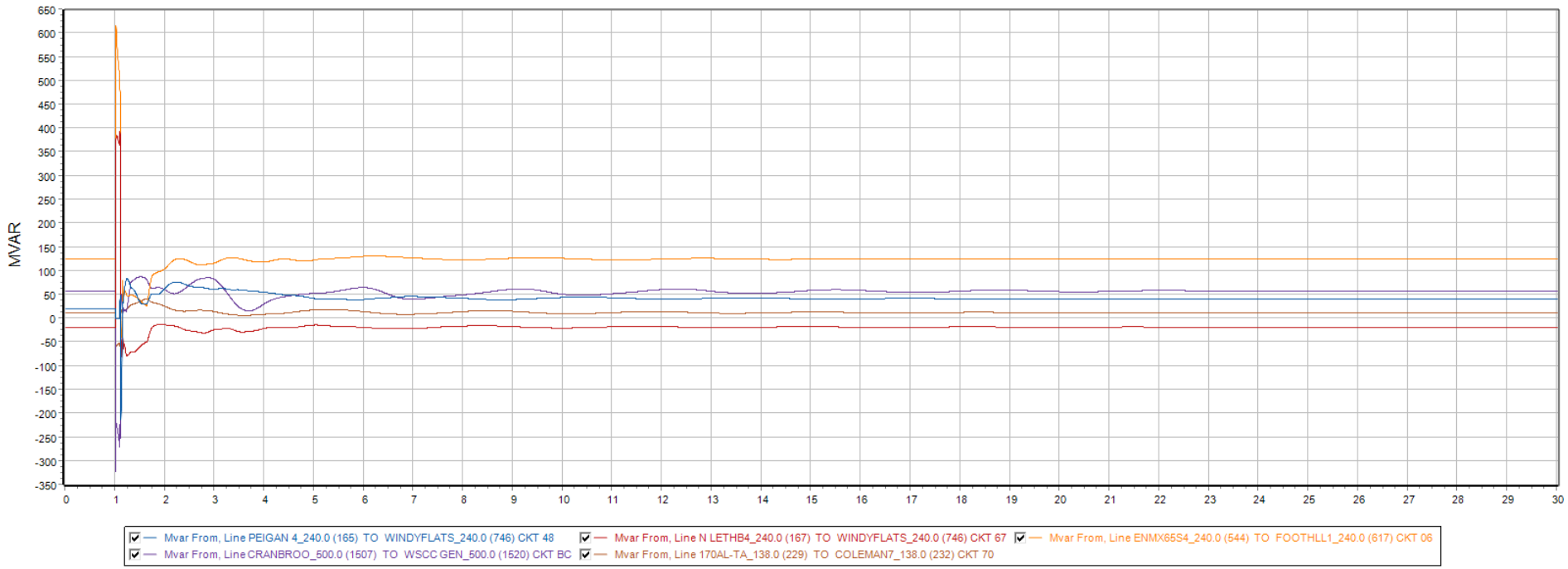
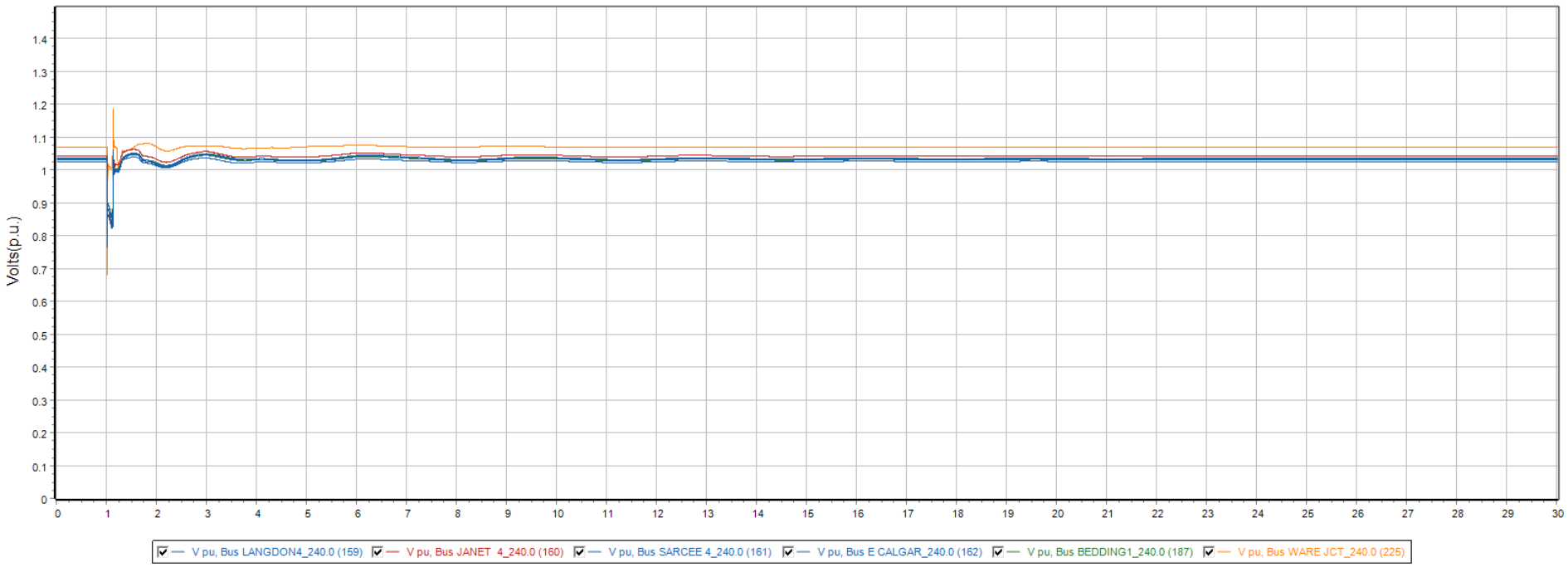
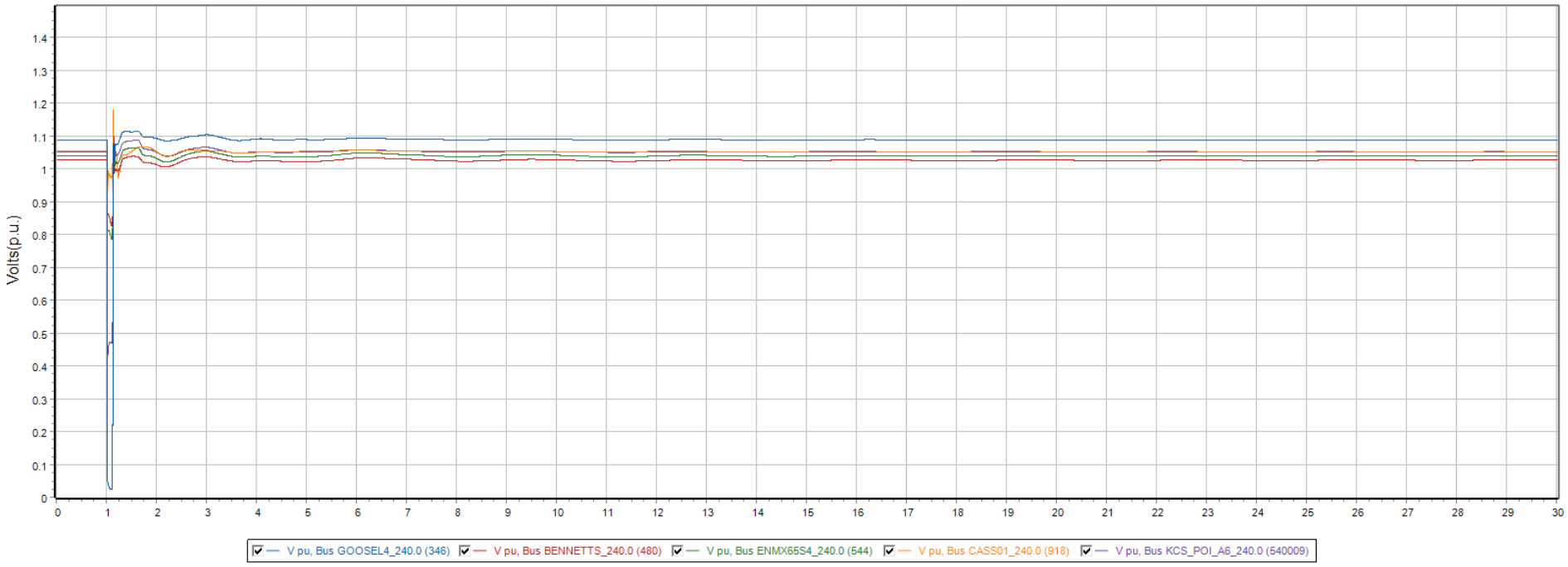
Monitor Line MW & MVAR. Q4





Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts

SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 07B - 1049L (Windy Flats 138S - Peigan 59S) @ Peigan 59

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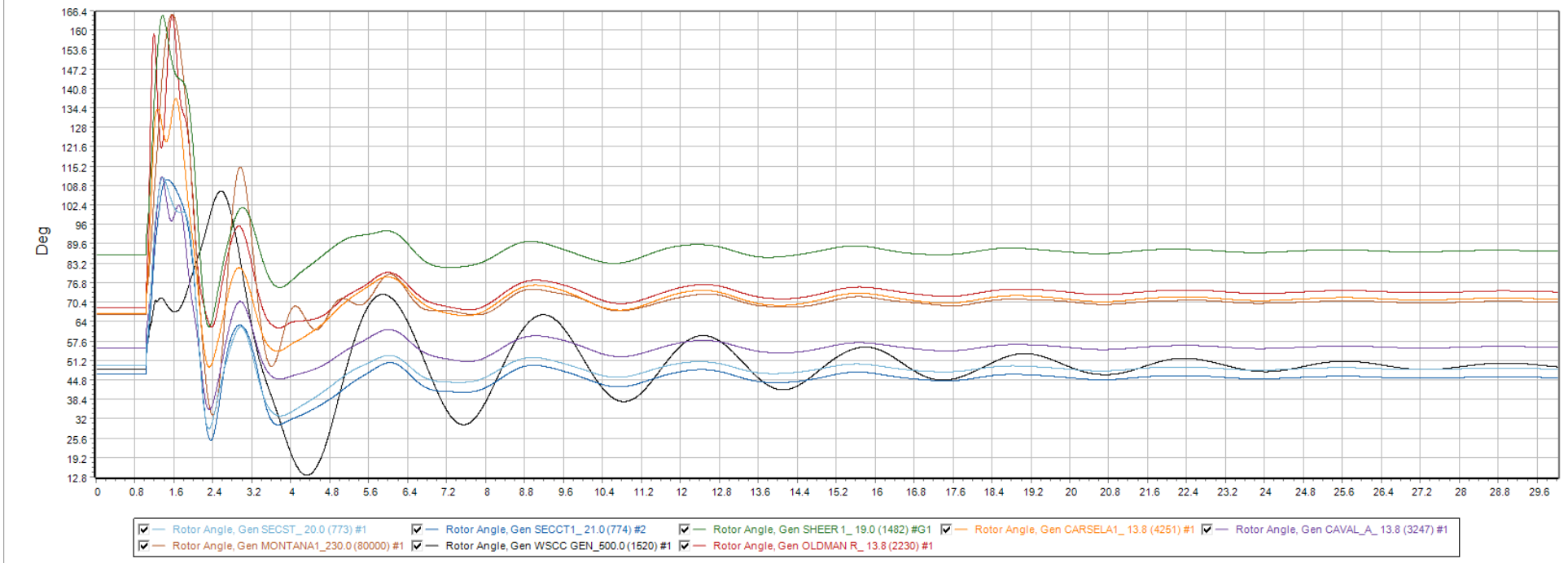
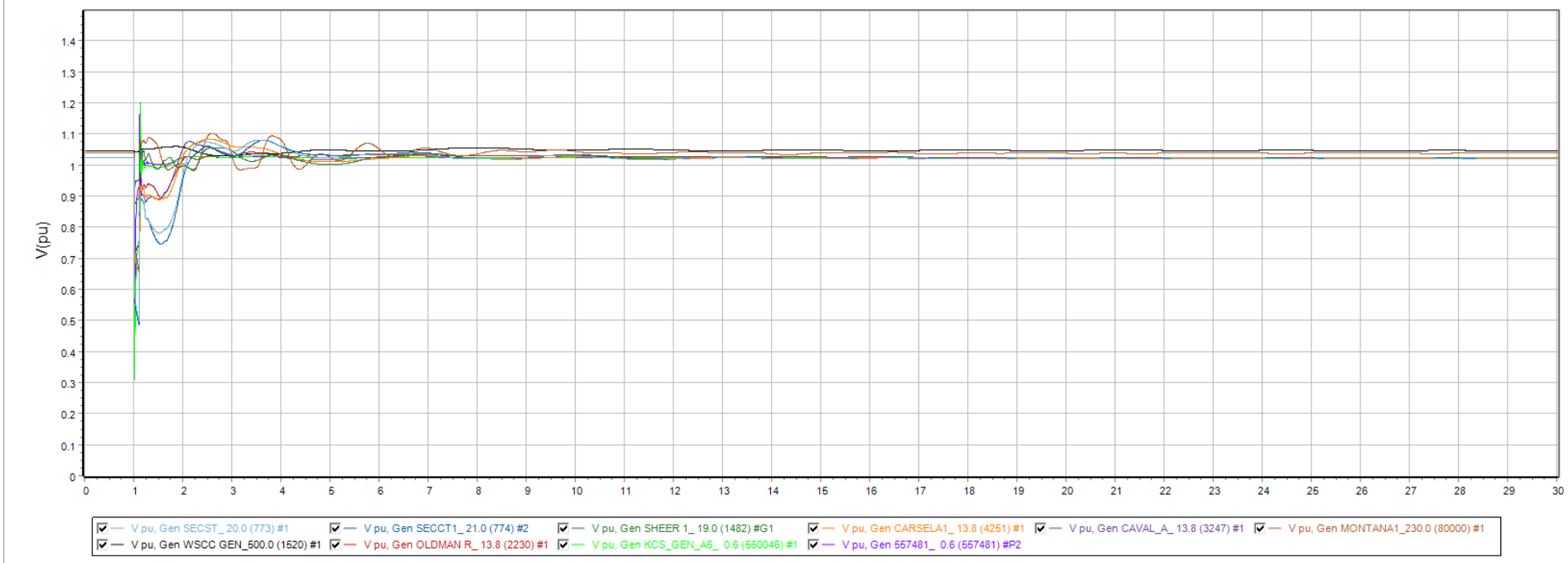
Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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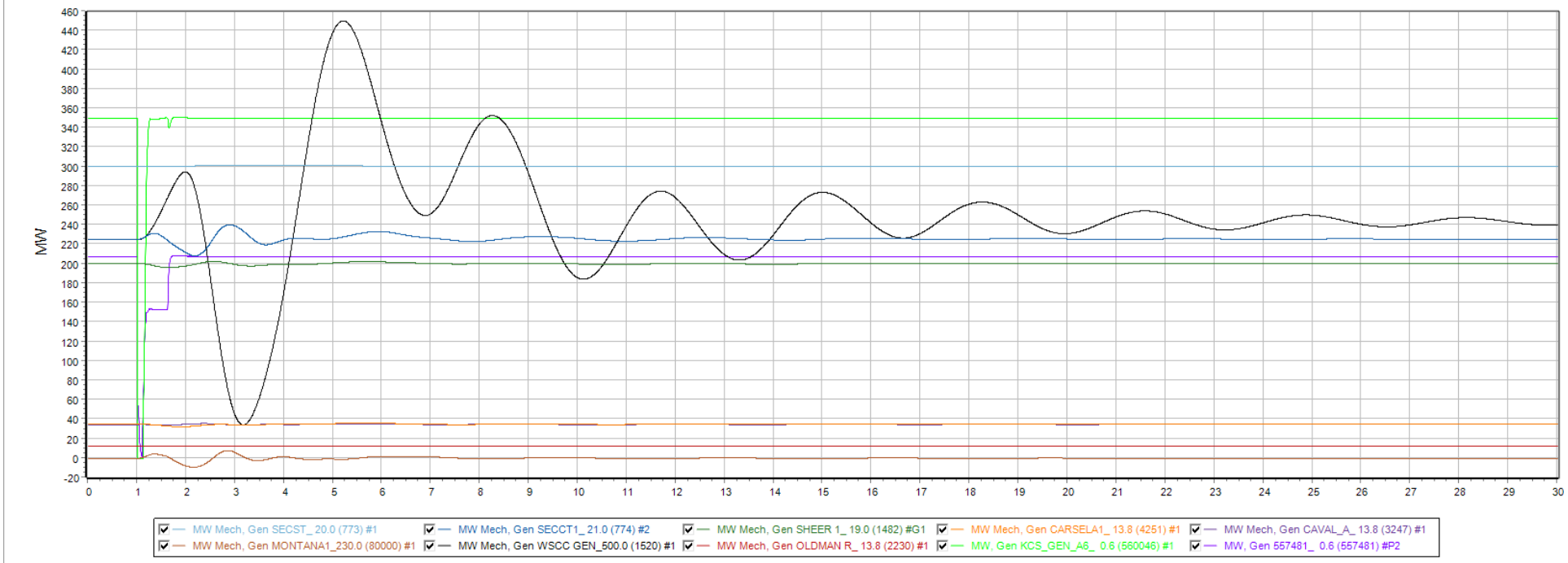
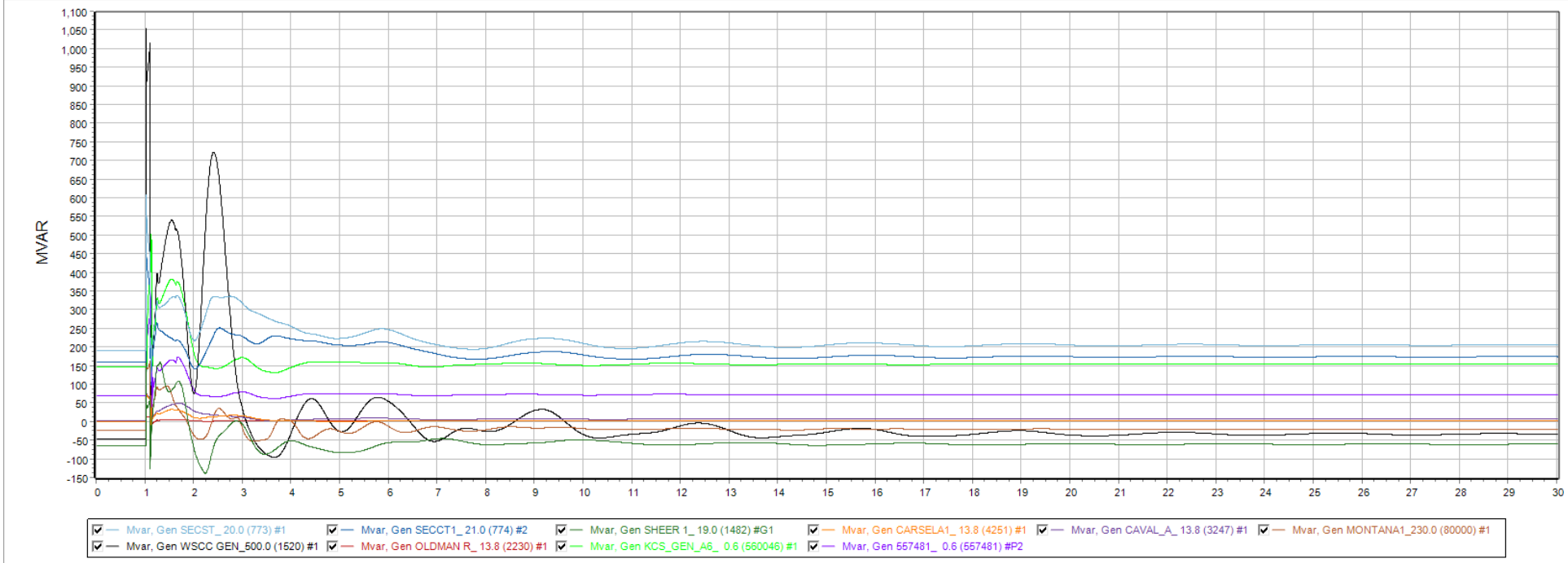
Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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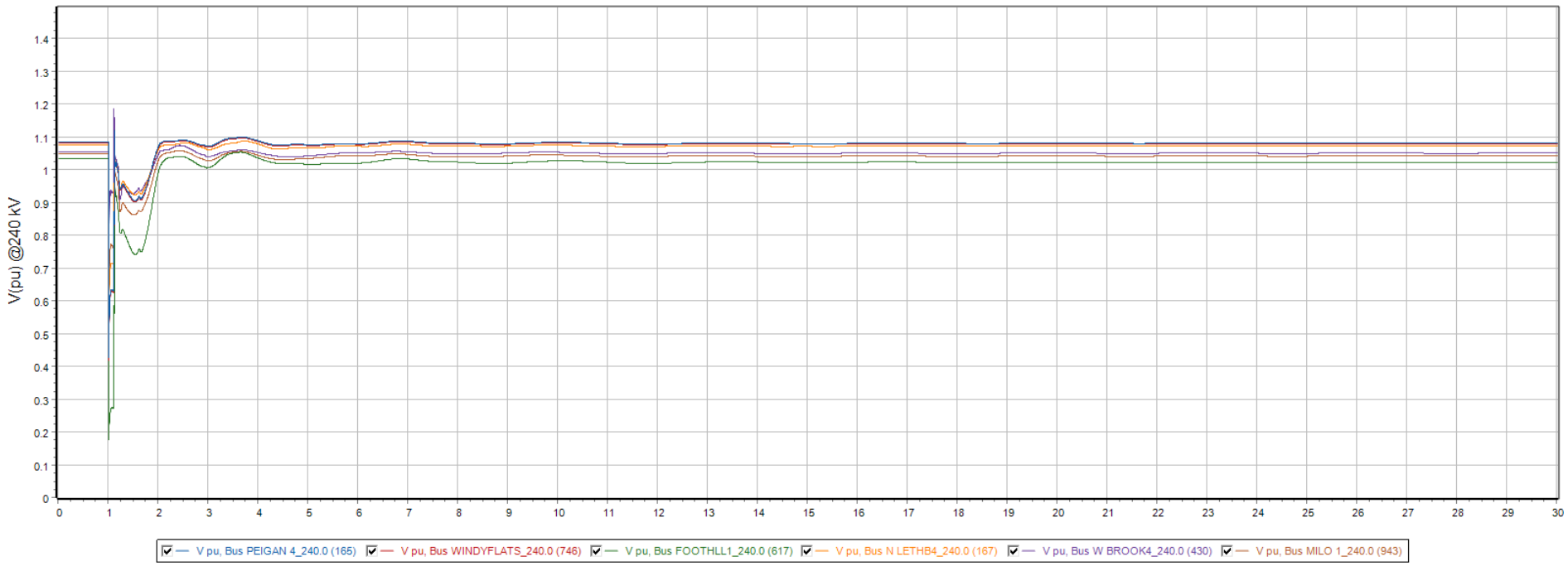
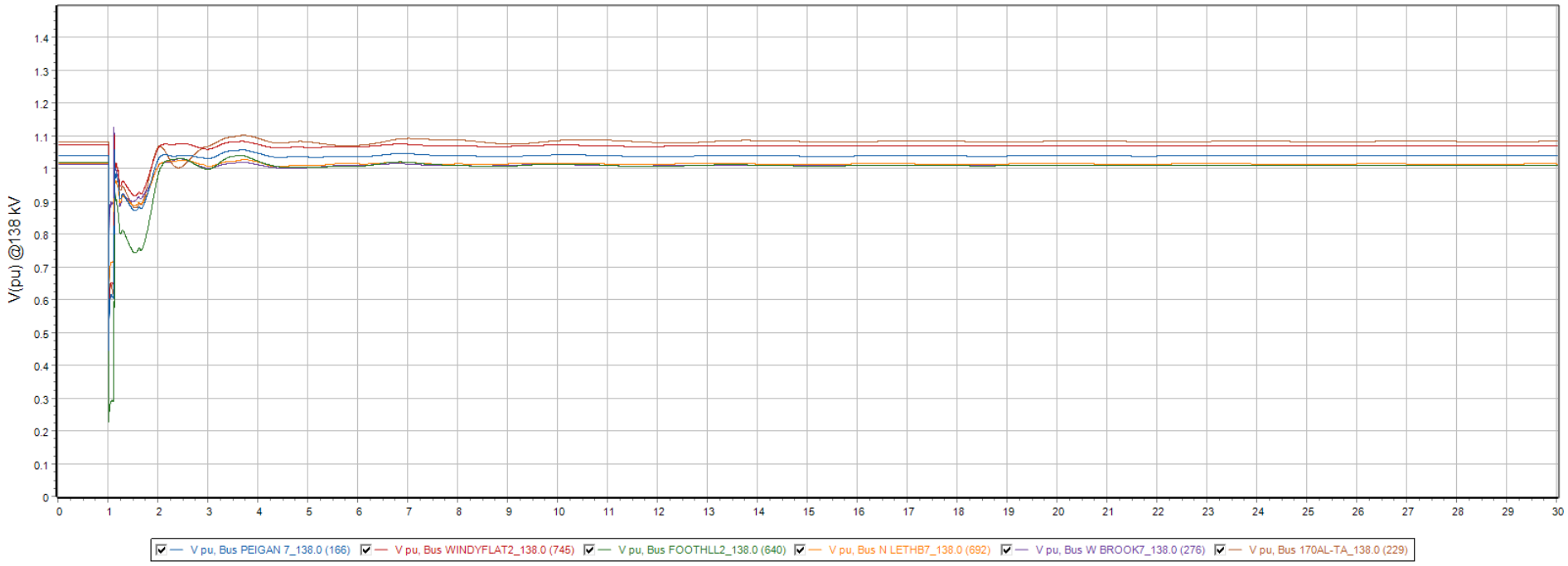
May 16, 2023 23:05:27

Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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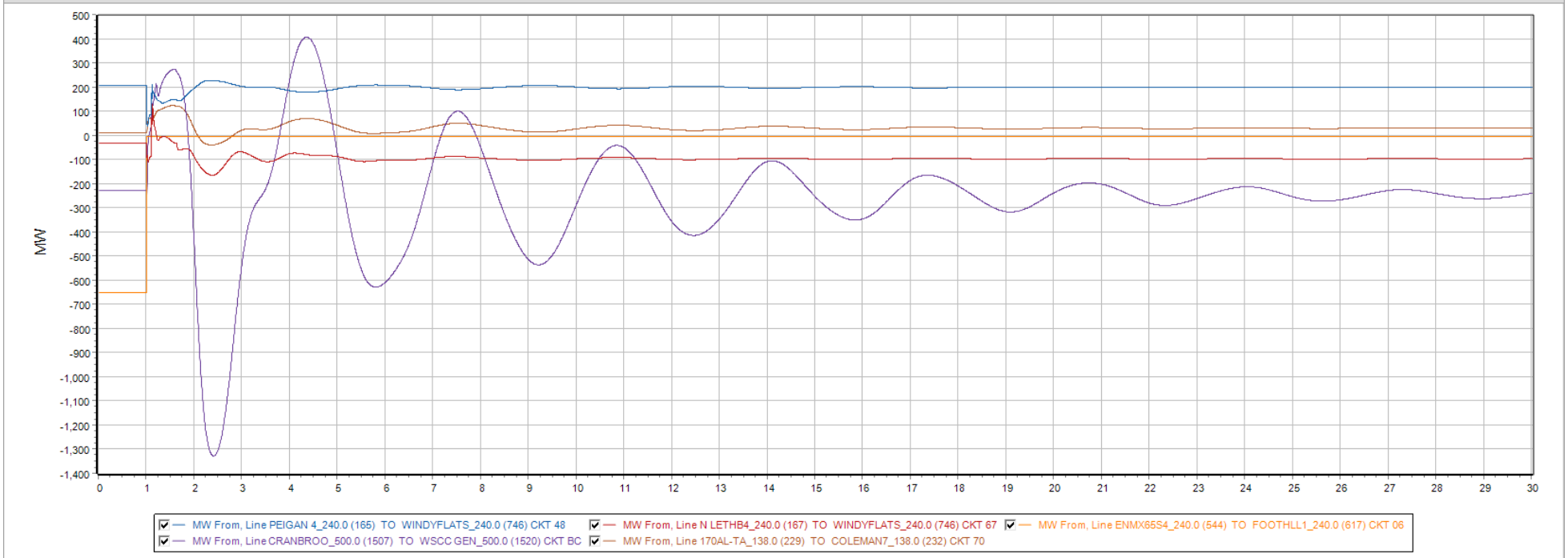
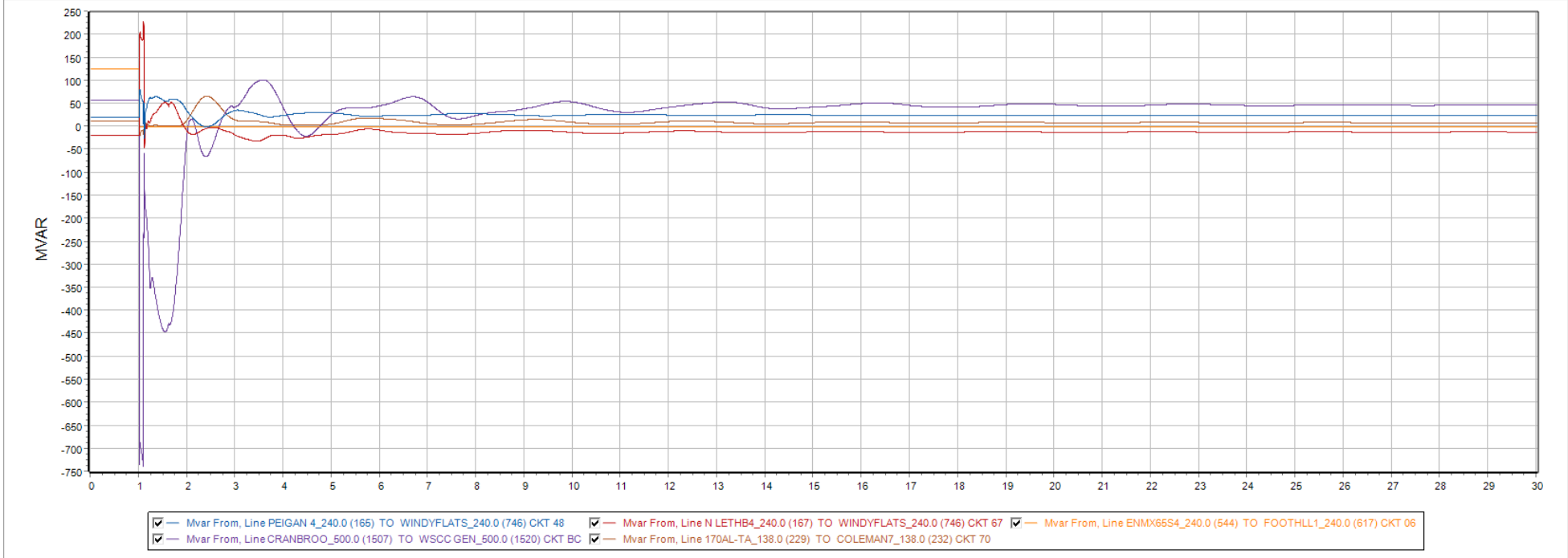
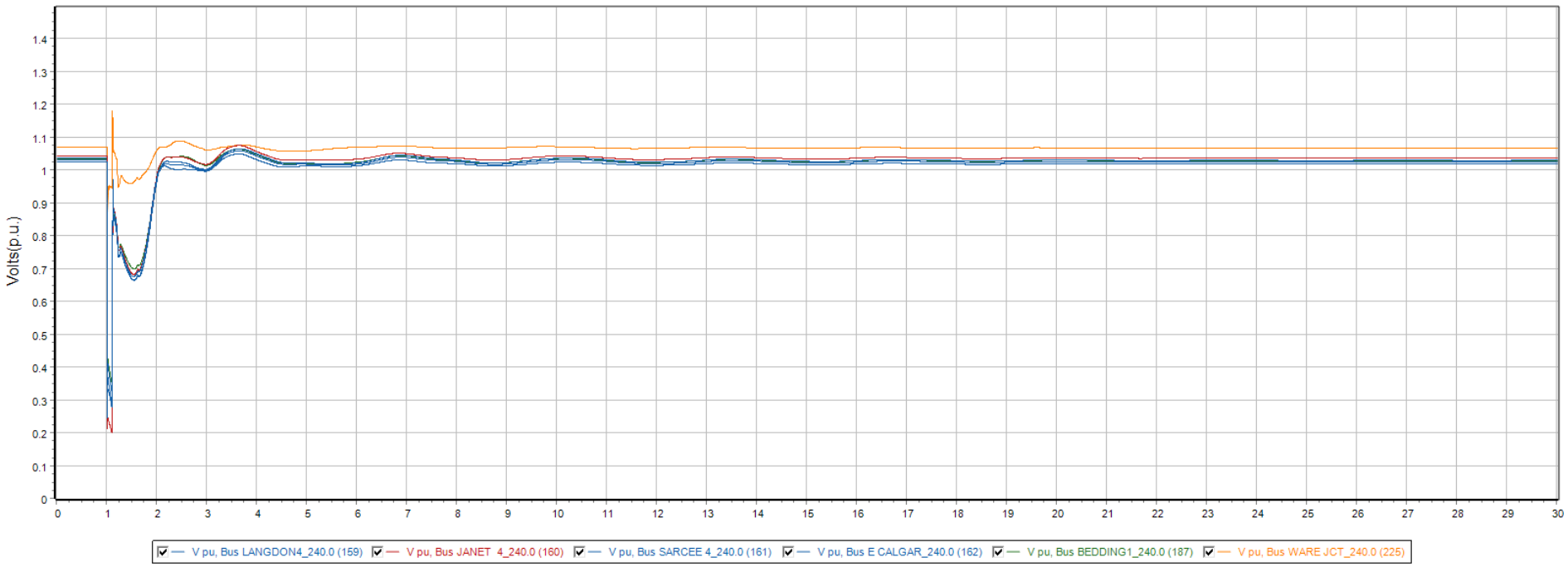
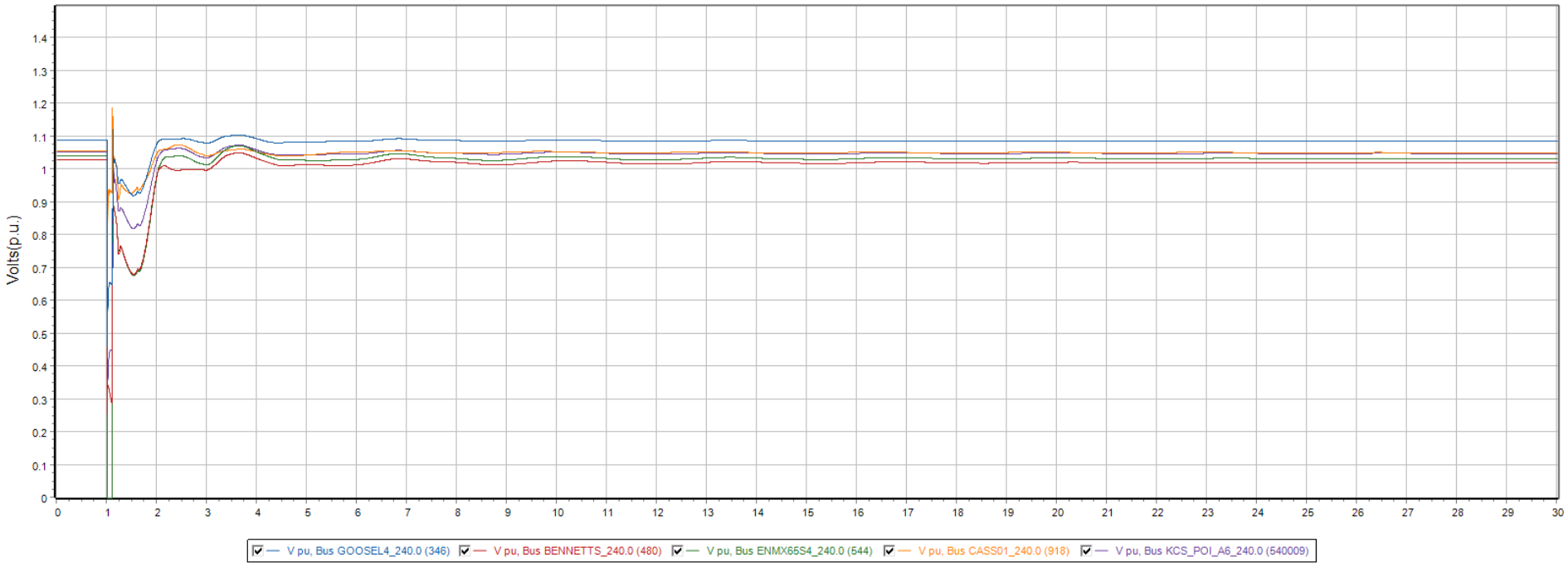
Monitor Line MW & MVAR. Q4



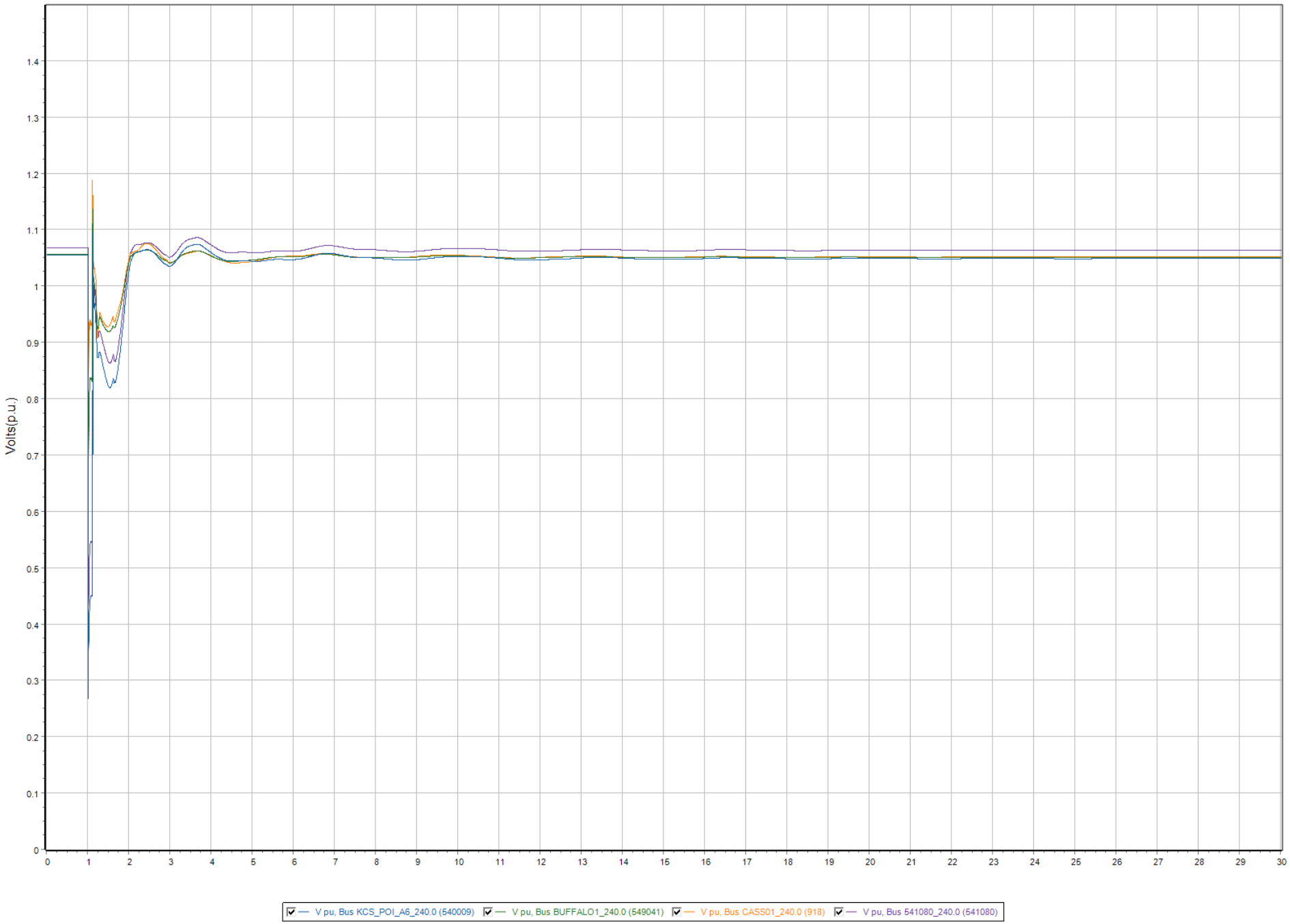


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08A - (1106L (Foothills 237S –SS 65) @ SS 65

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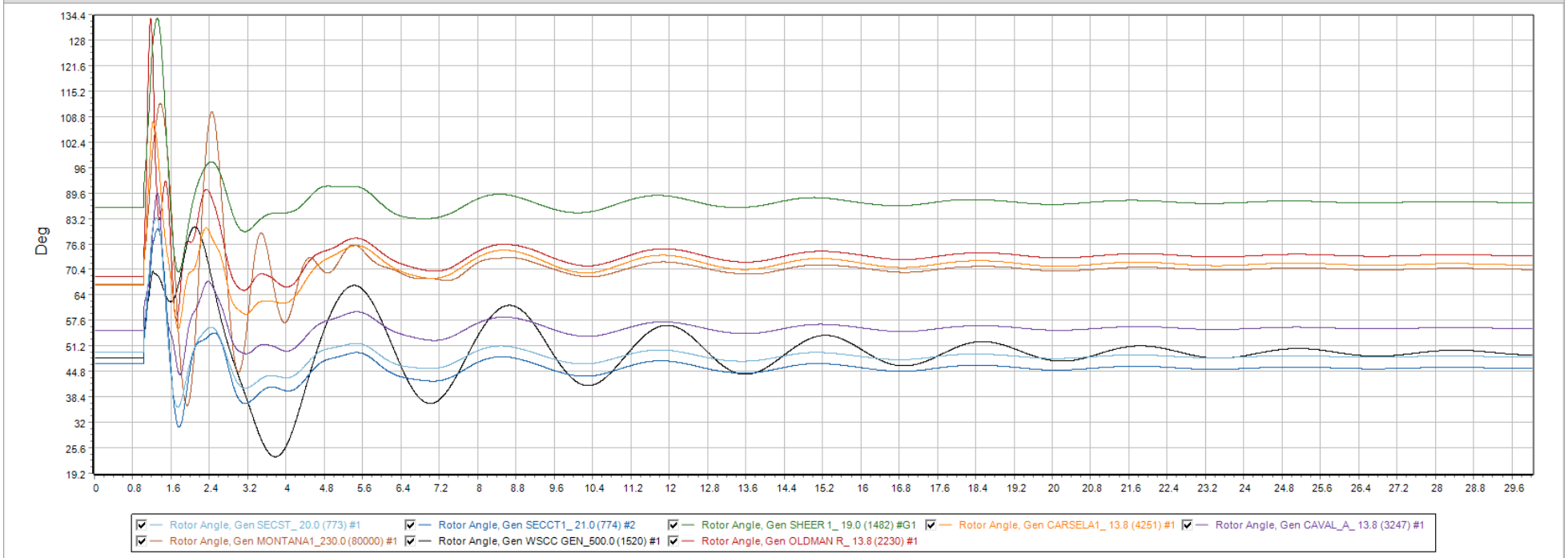
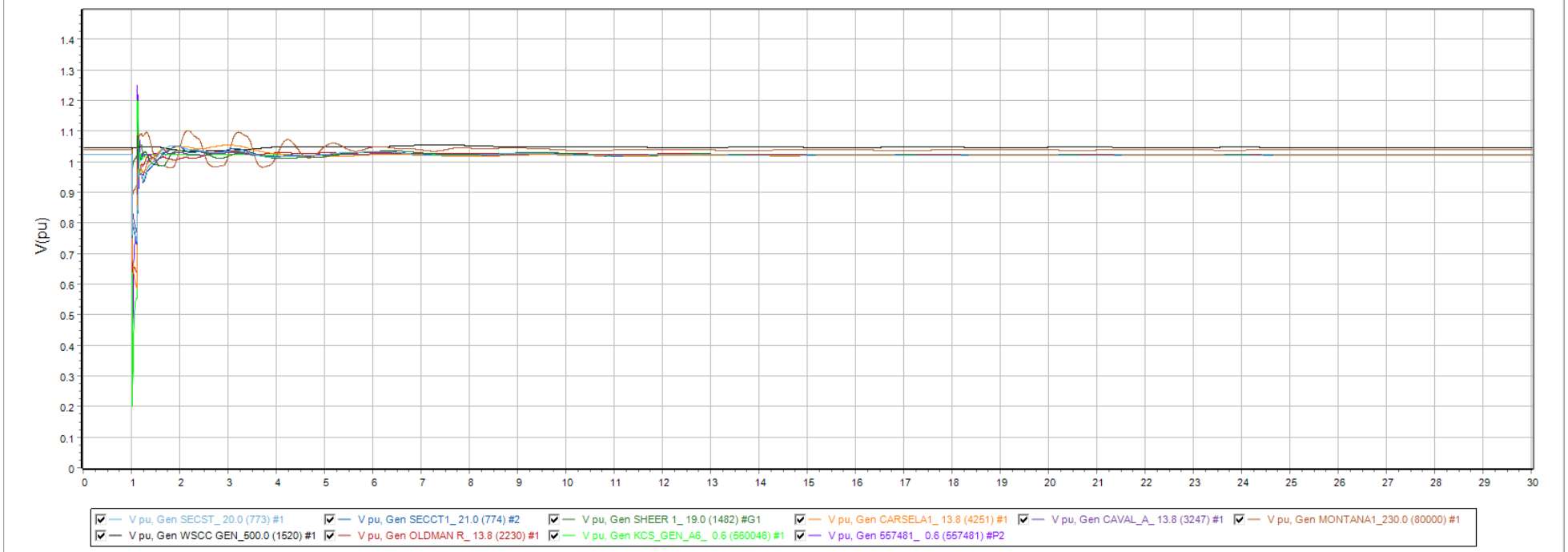
Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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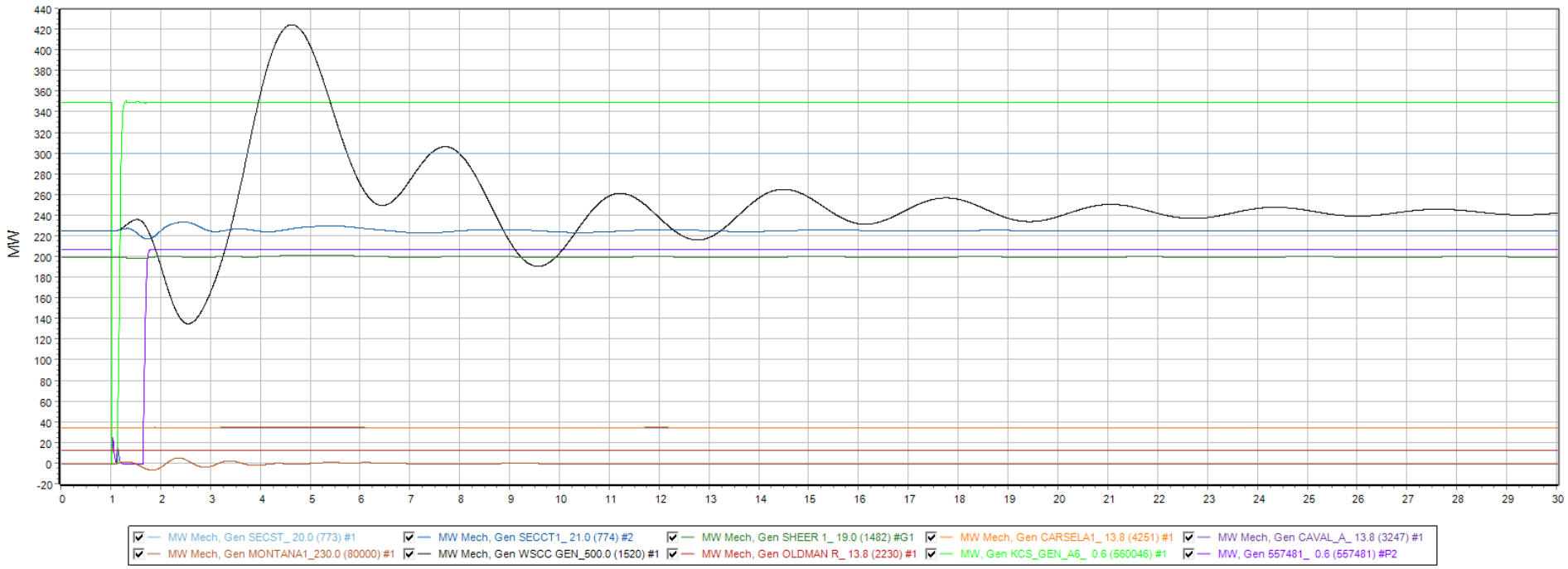
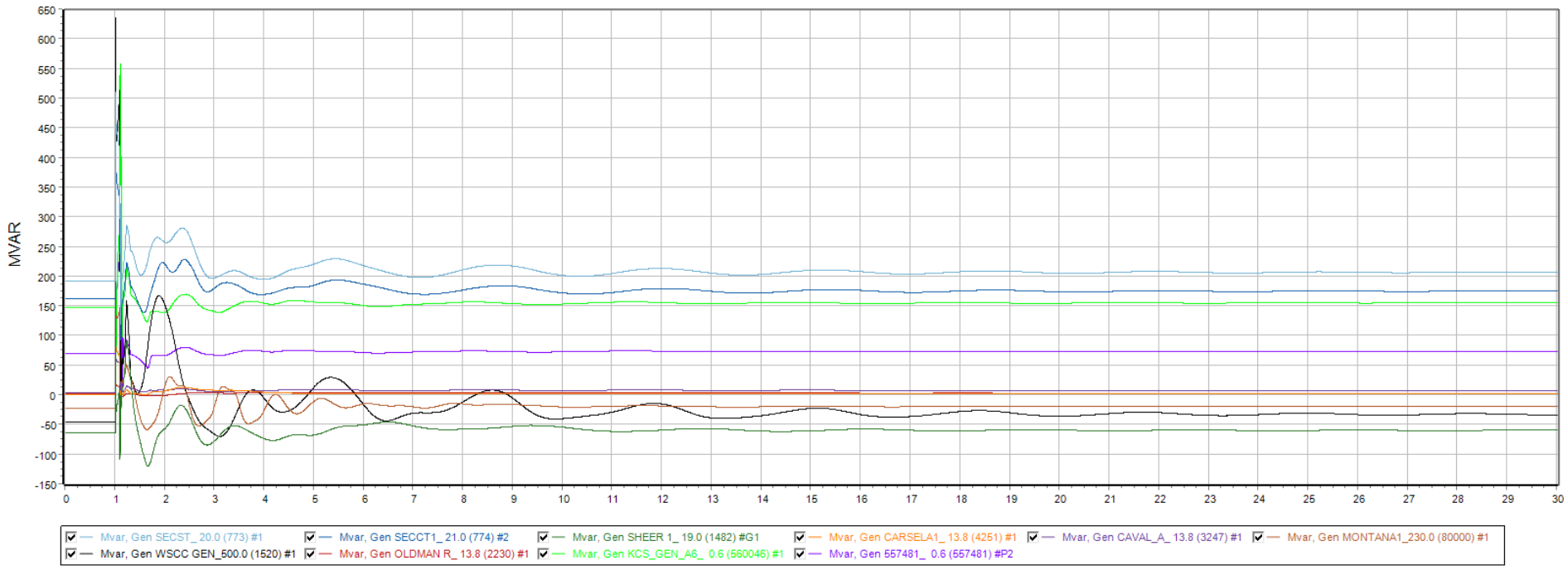
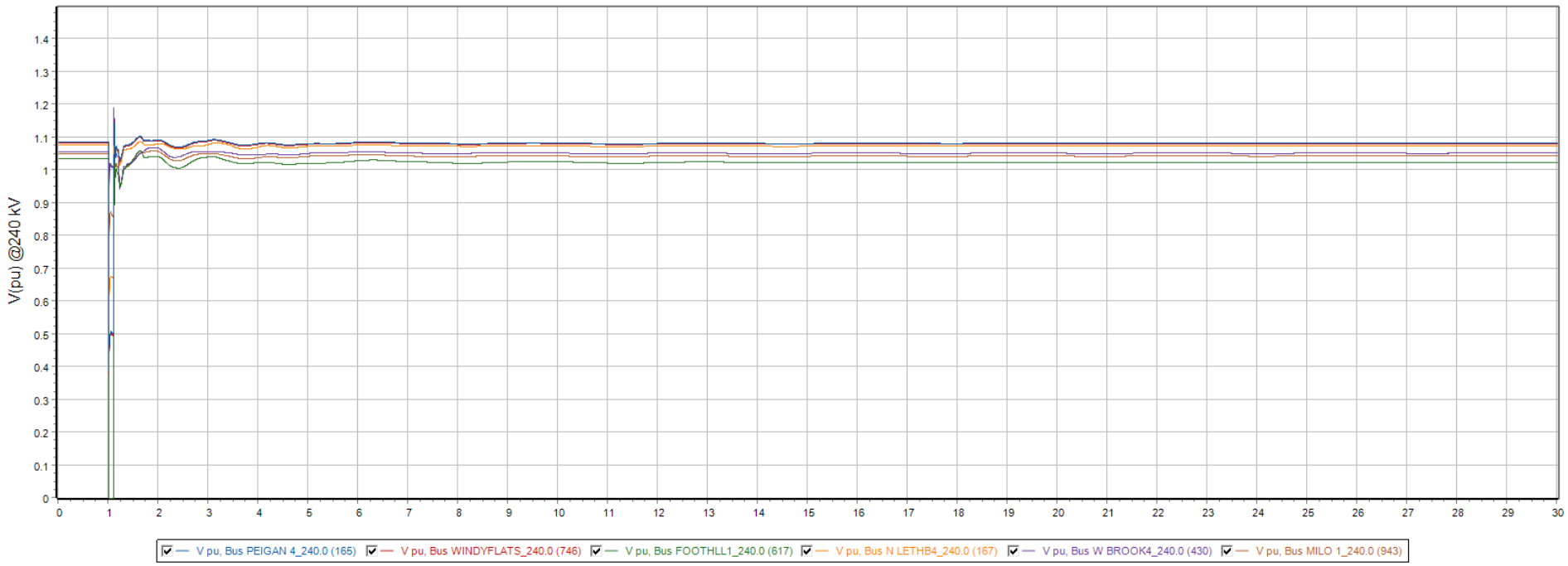
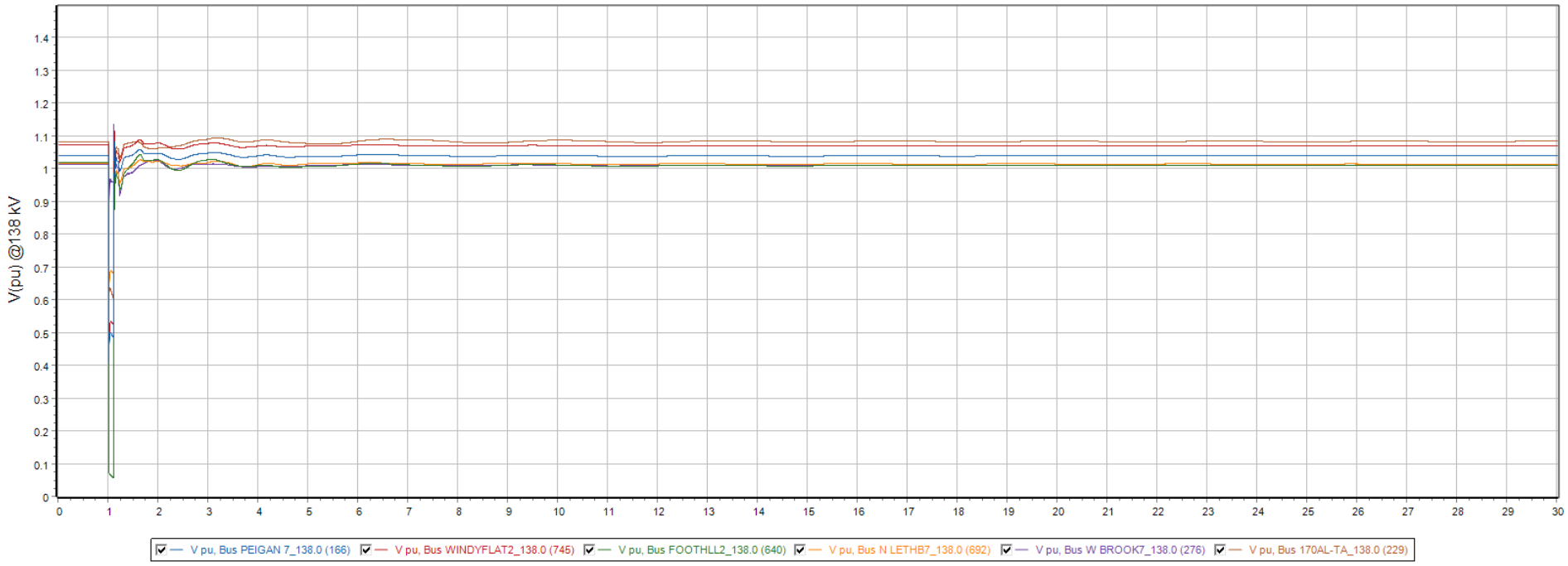
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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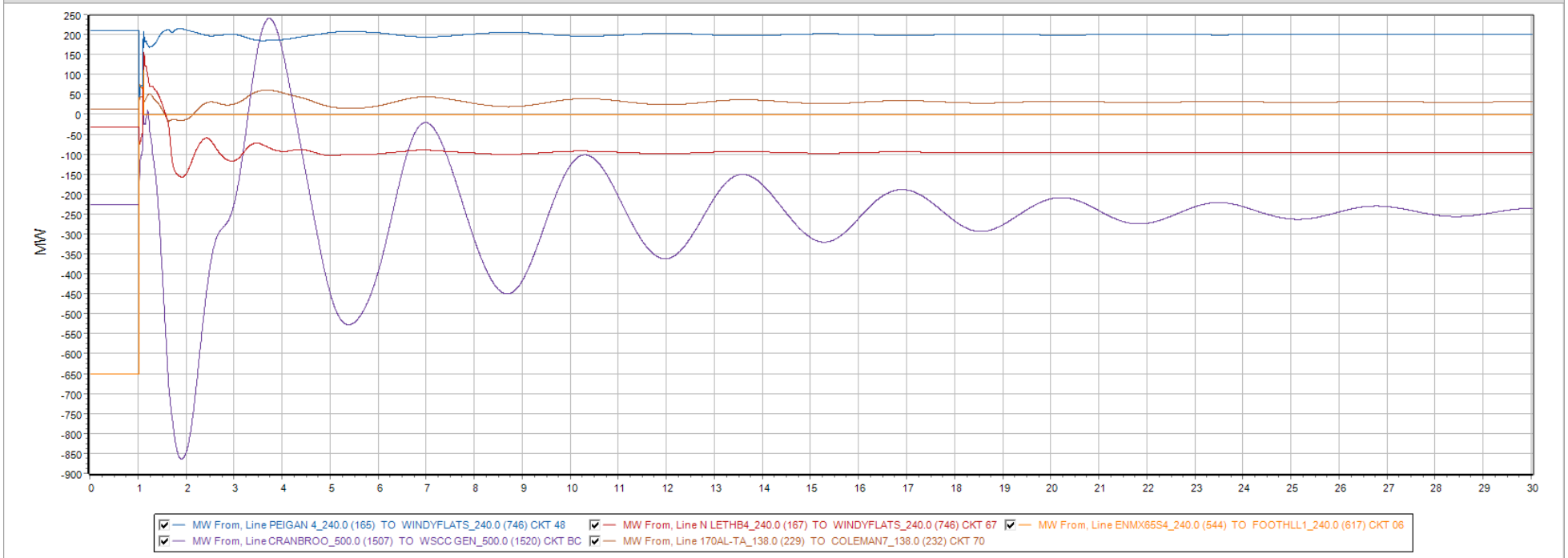
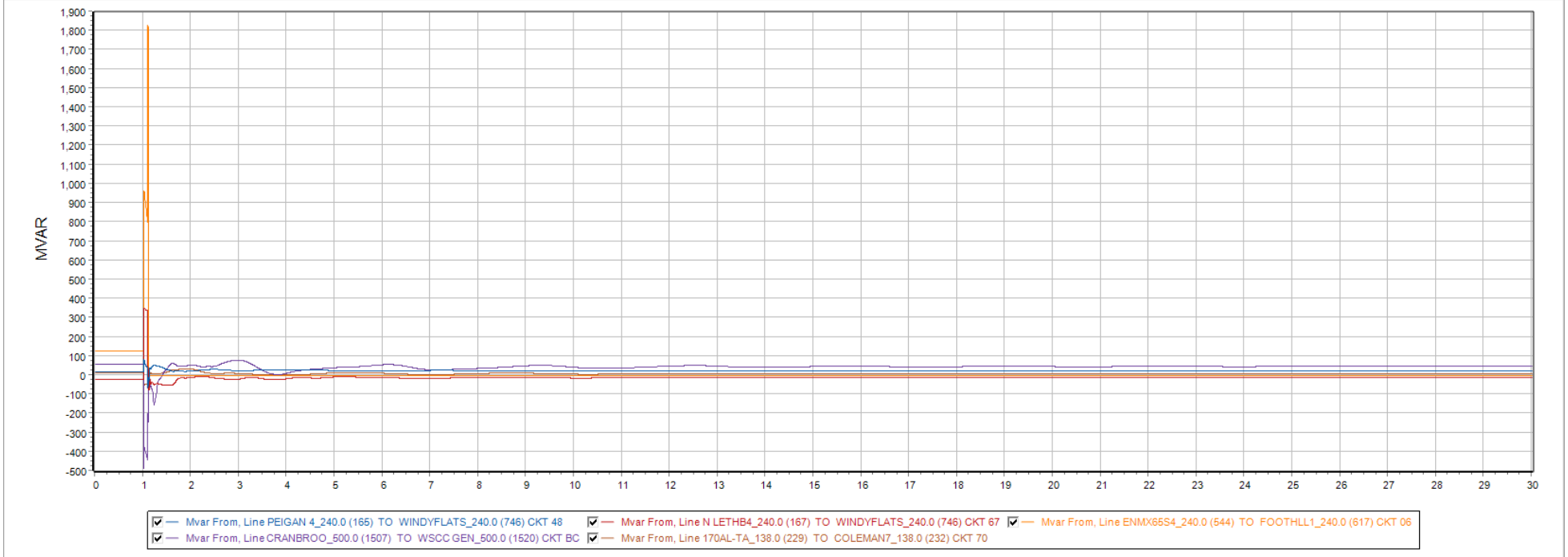
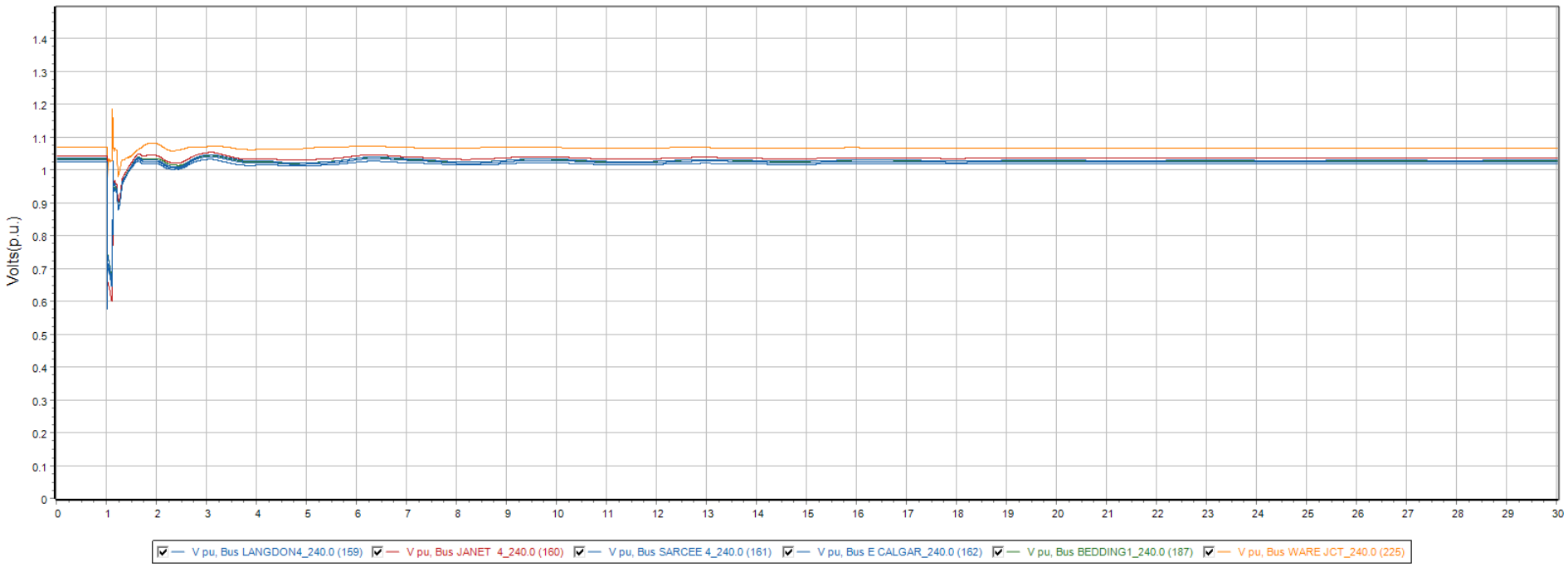
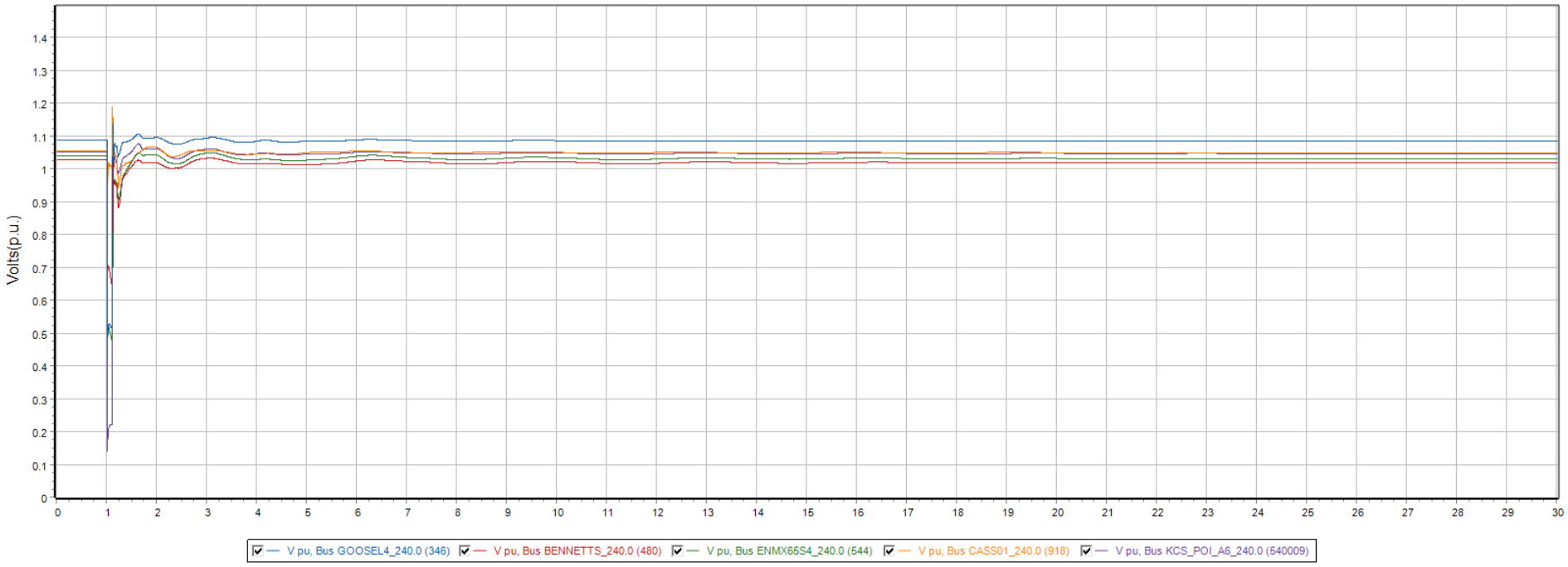
Monitor Line MW & MVAR. Q4



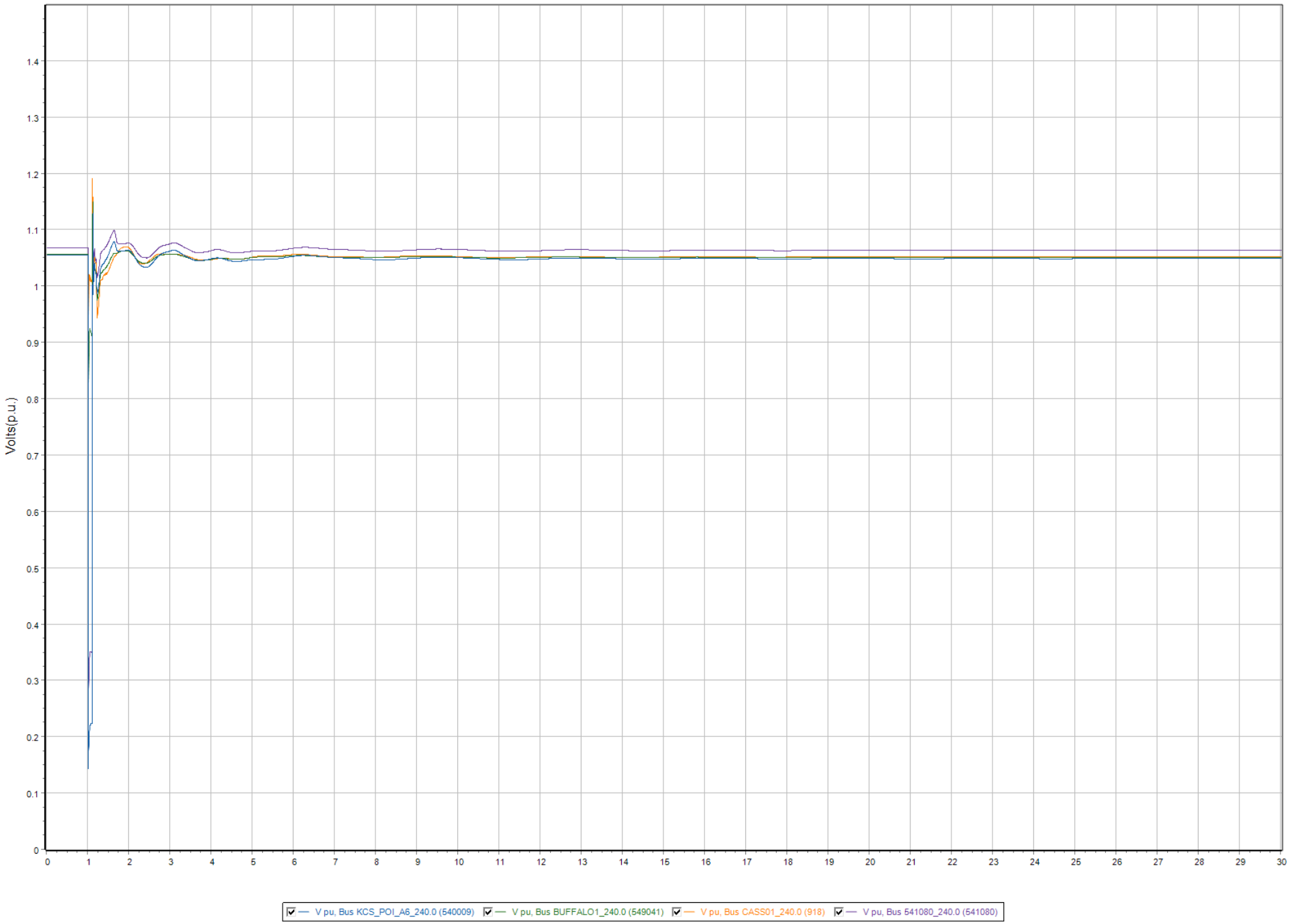


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 08B - (1106L (Foothills 237S –SS 65) @ Foothills 237S

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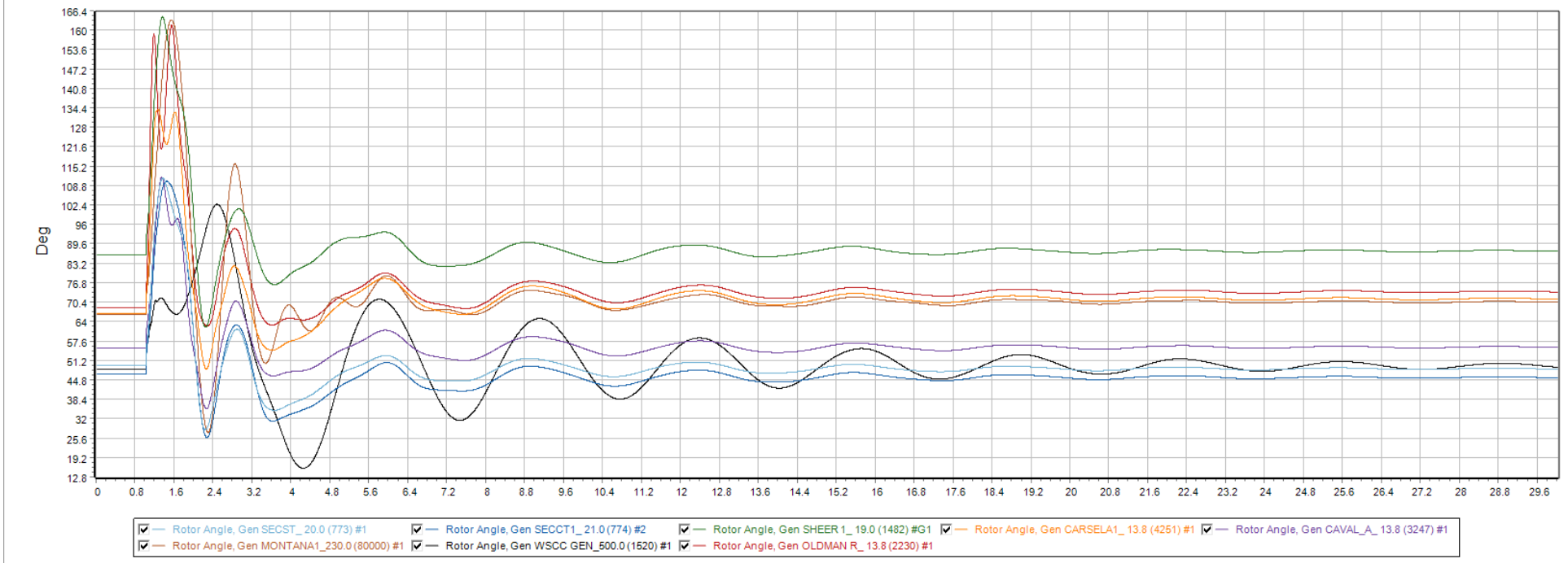
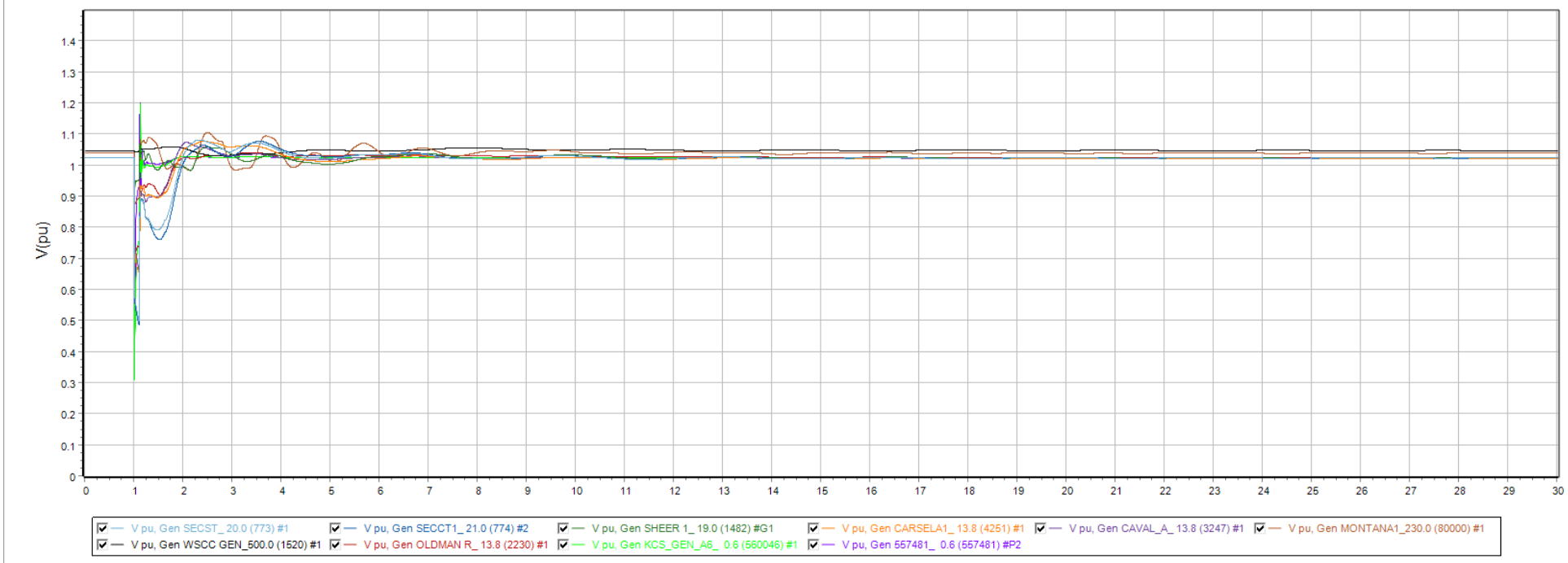
Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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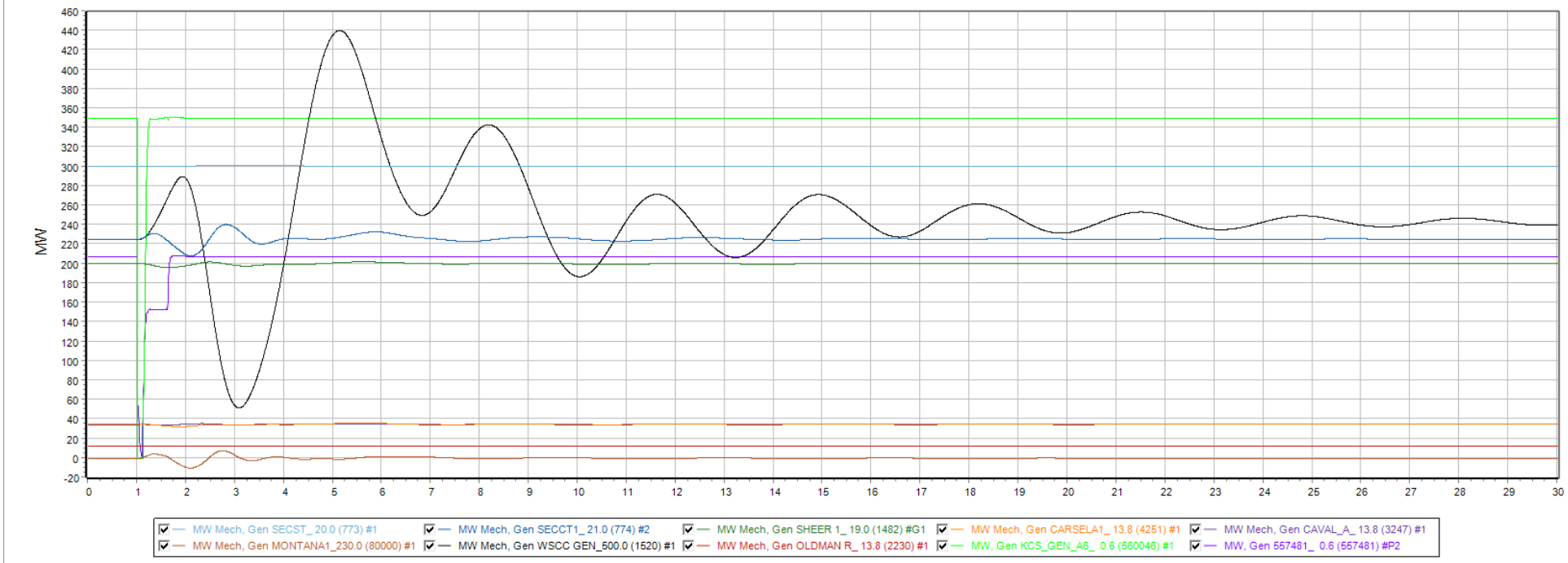
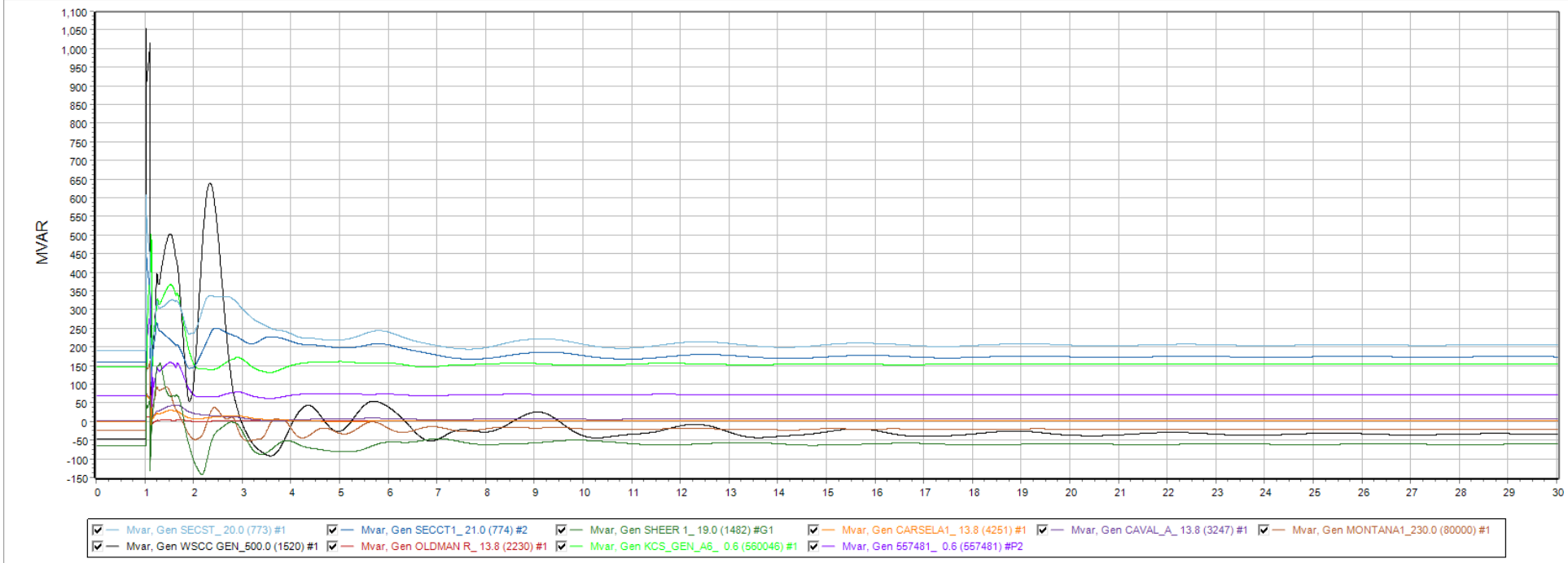
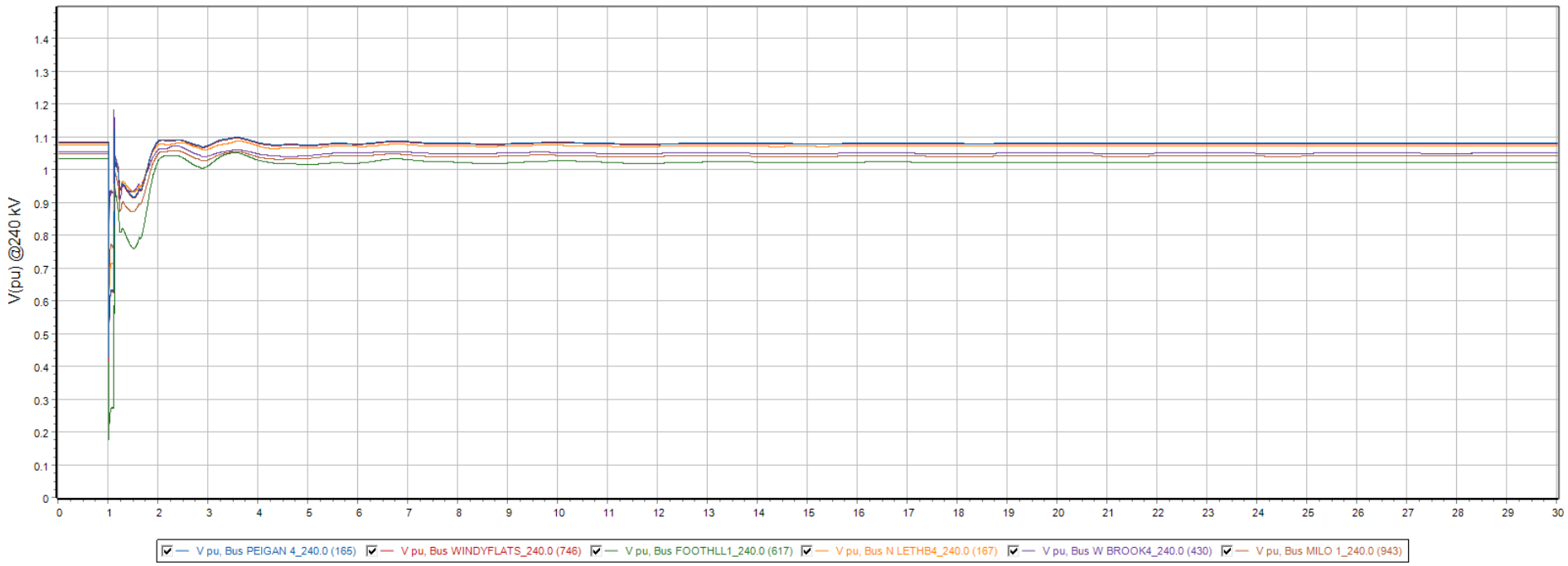
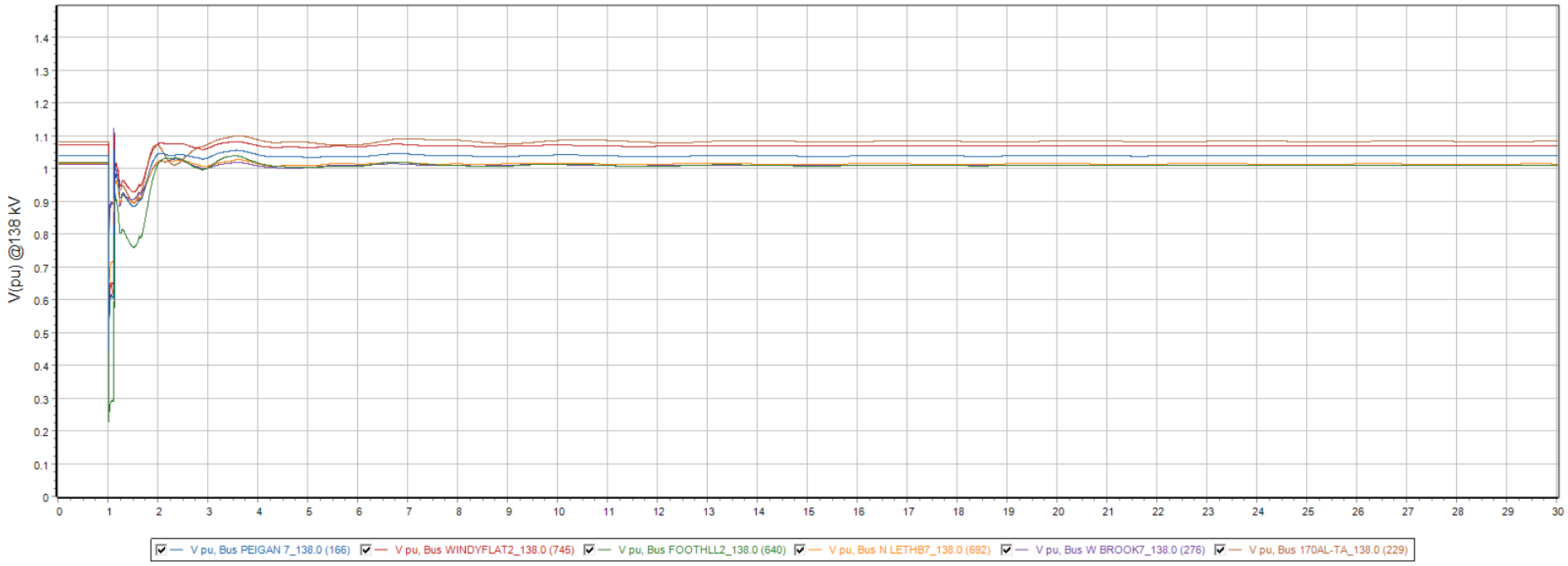
Monitor Gens. Q2





Monitor Bus Volts Q3





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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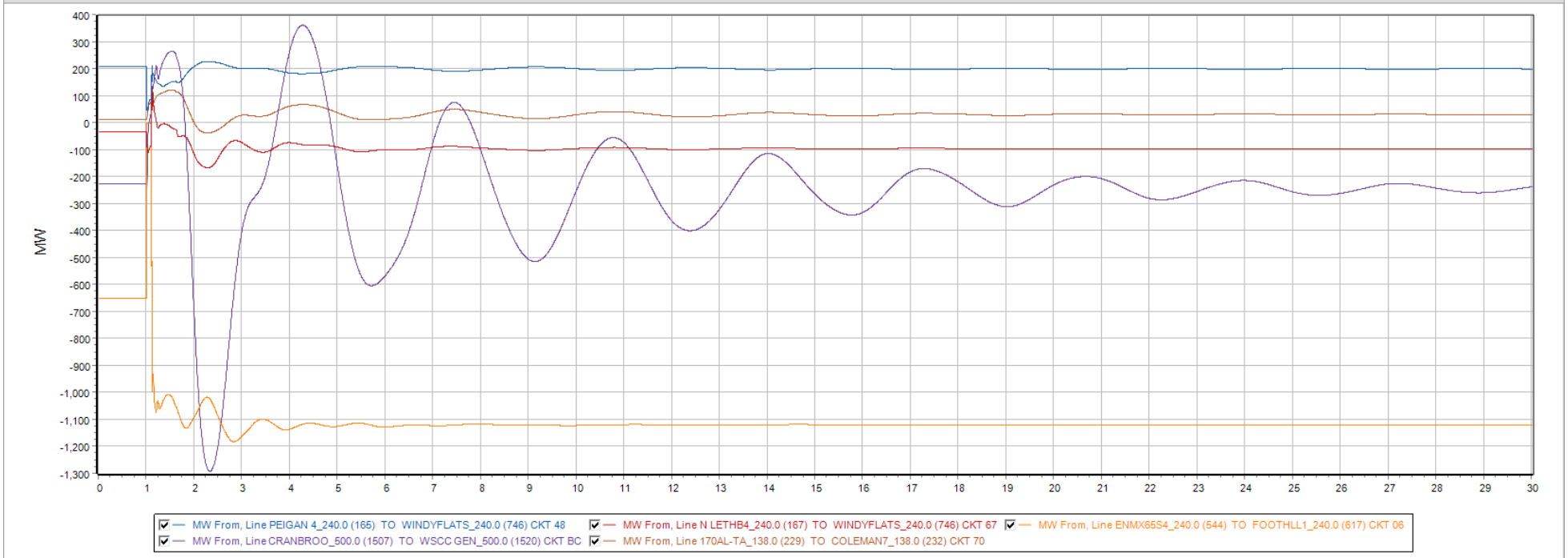
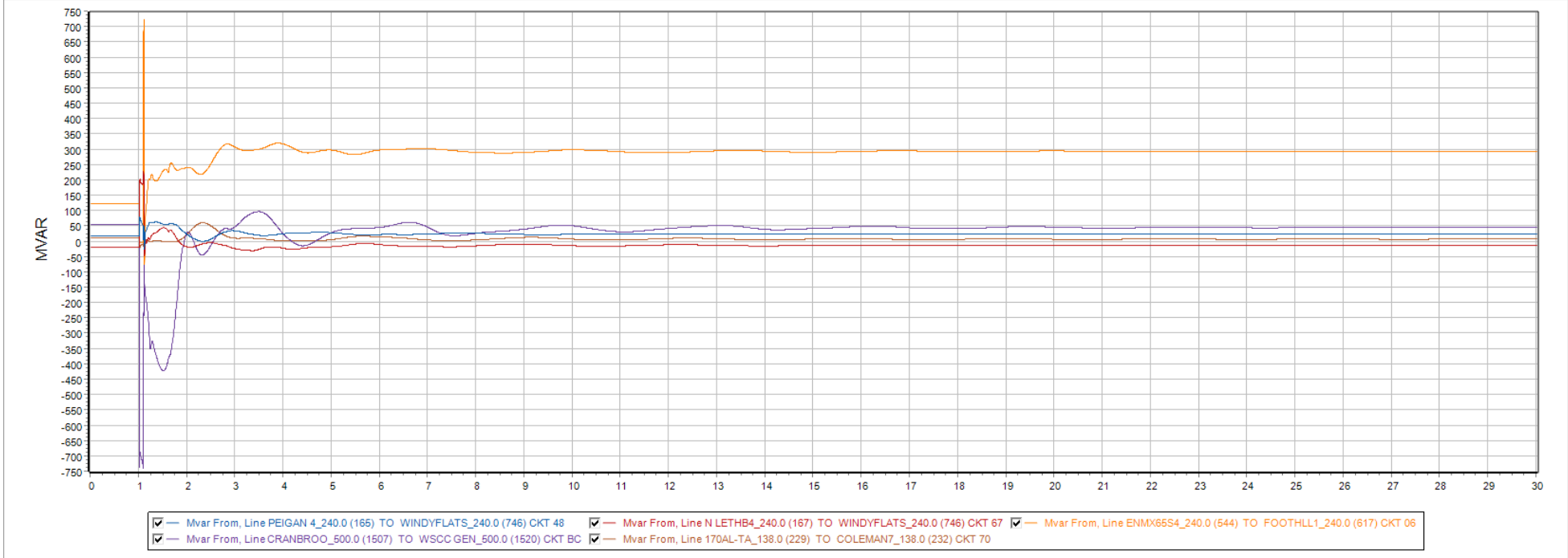
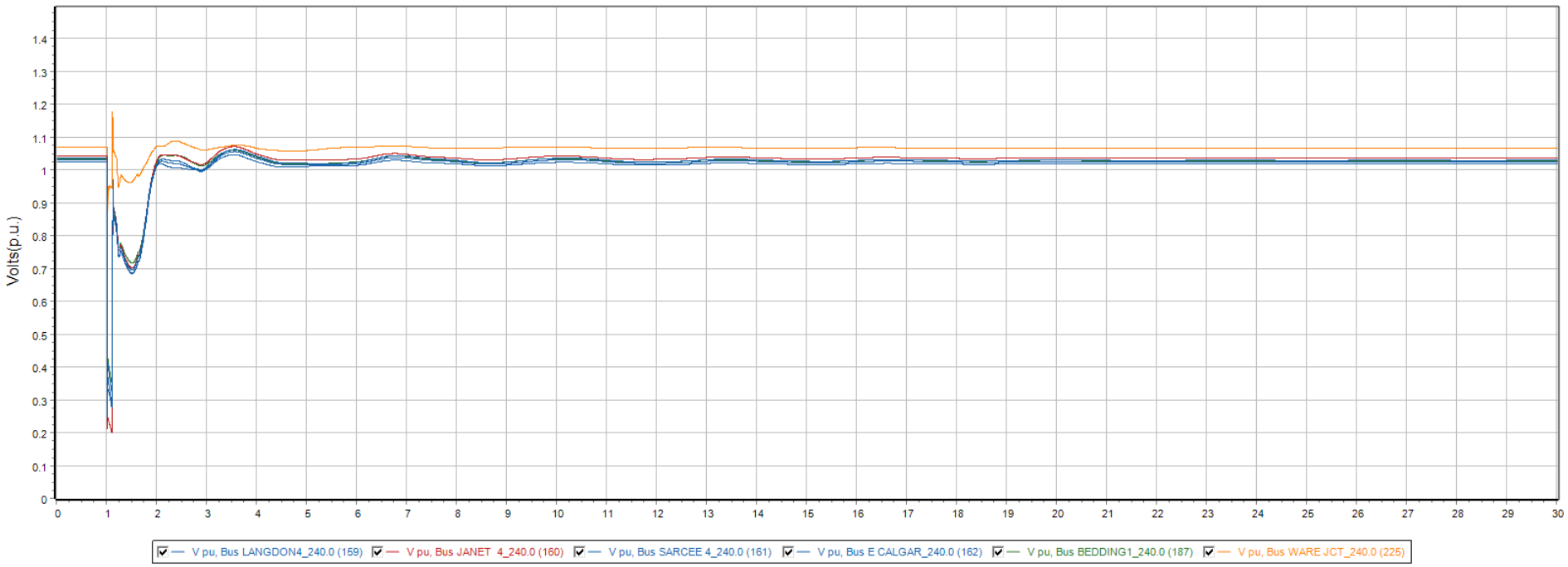
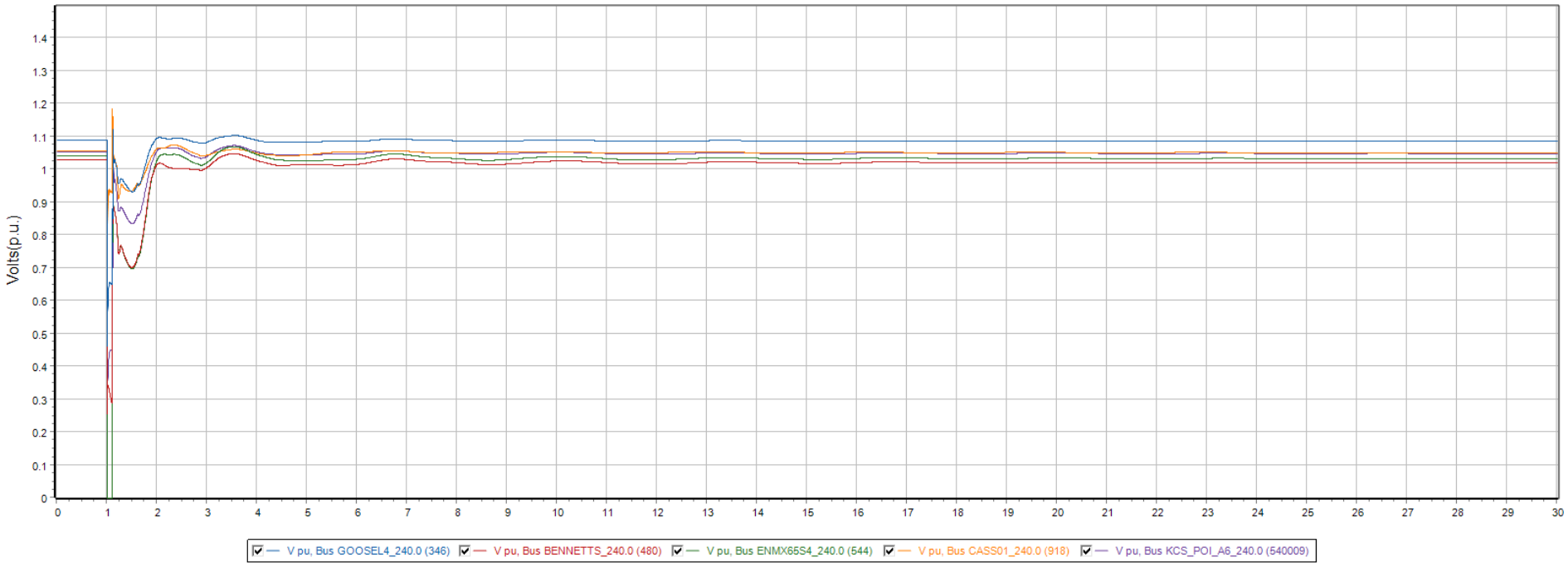
Monitor Line MW & MVAR. Q4



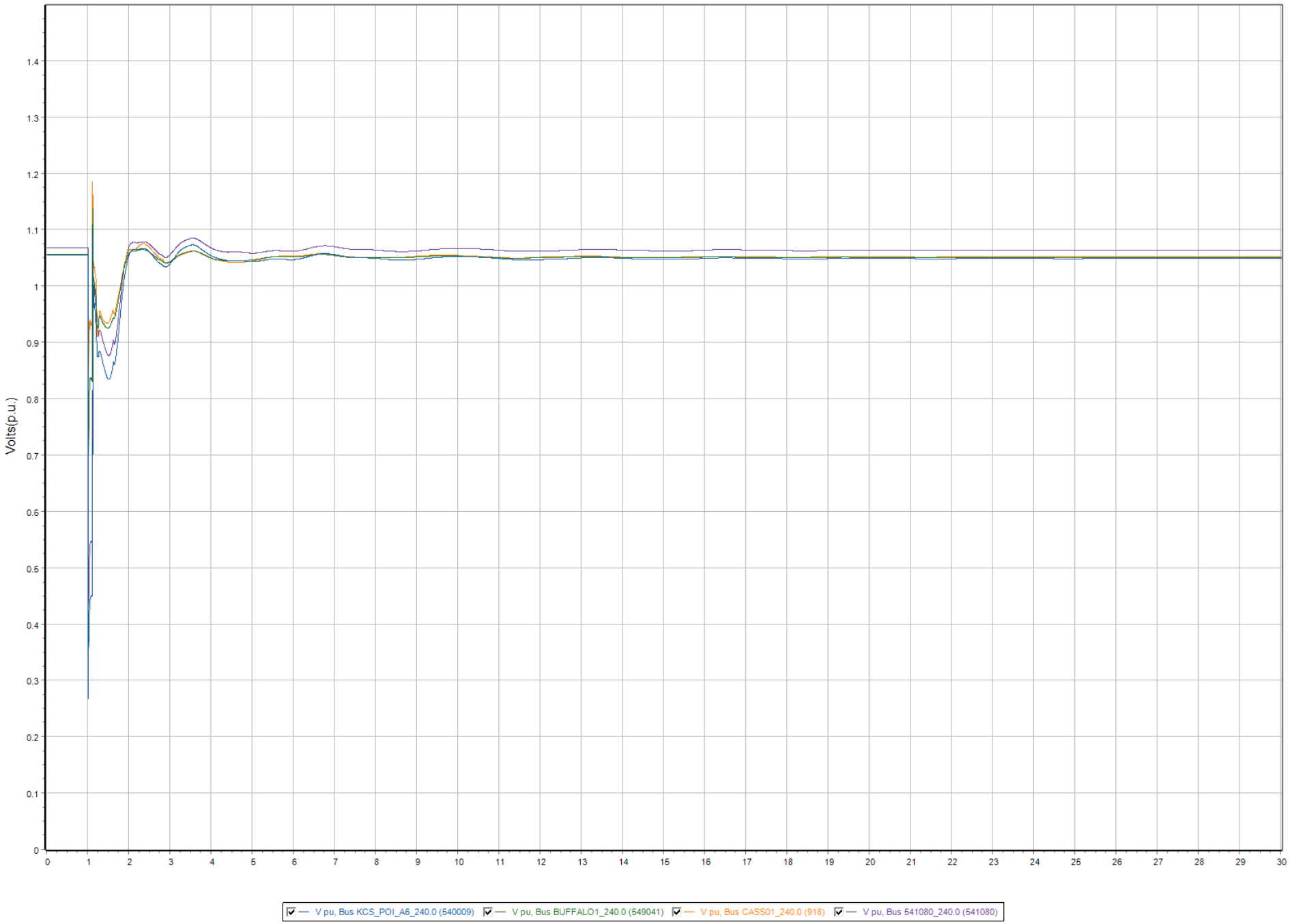


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09A - 1107L (Foothills 237S –SS 65) @ SS 65

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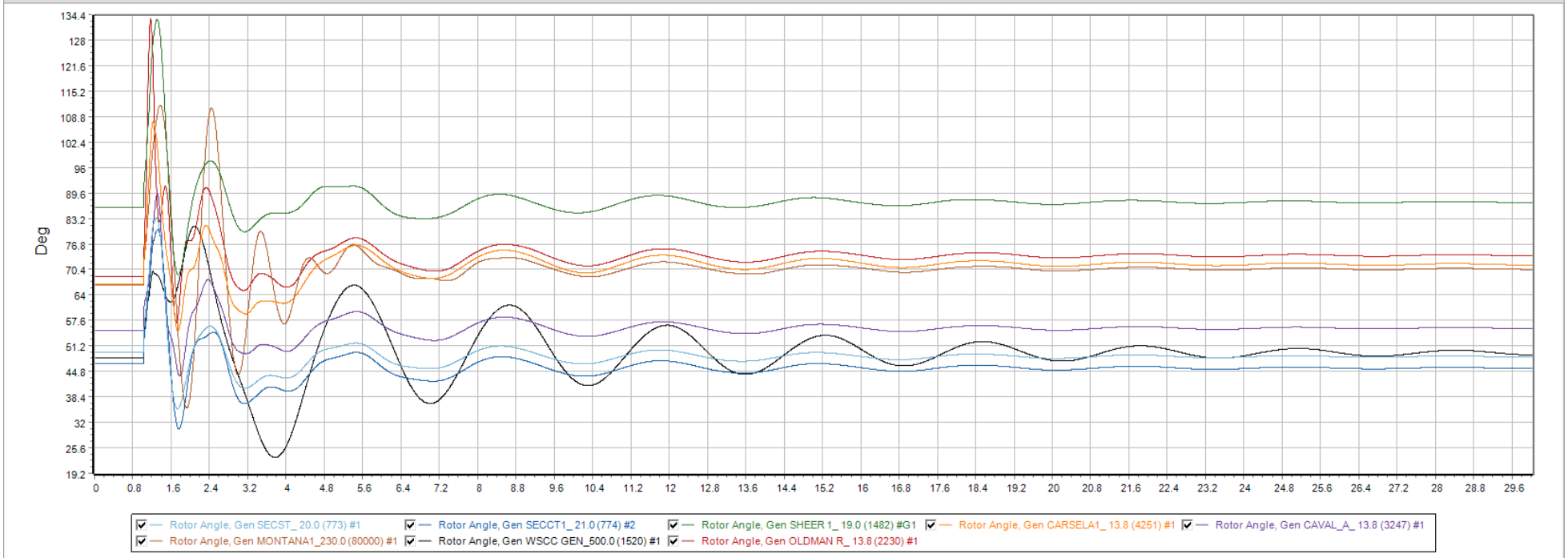
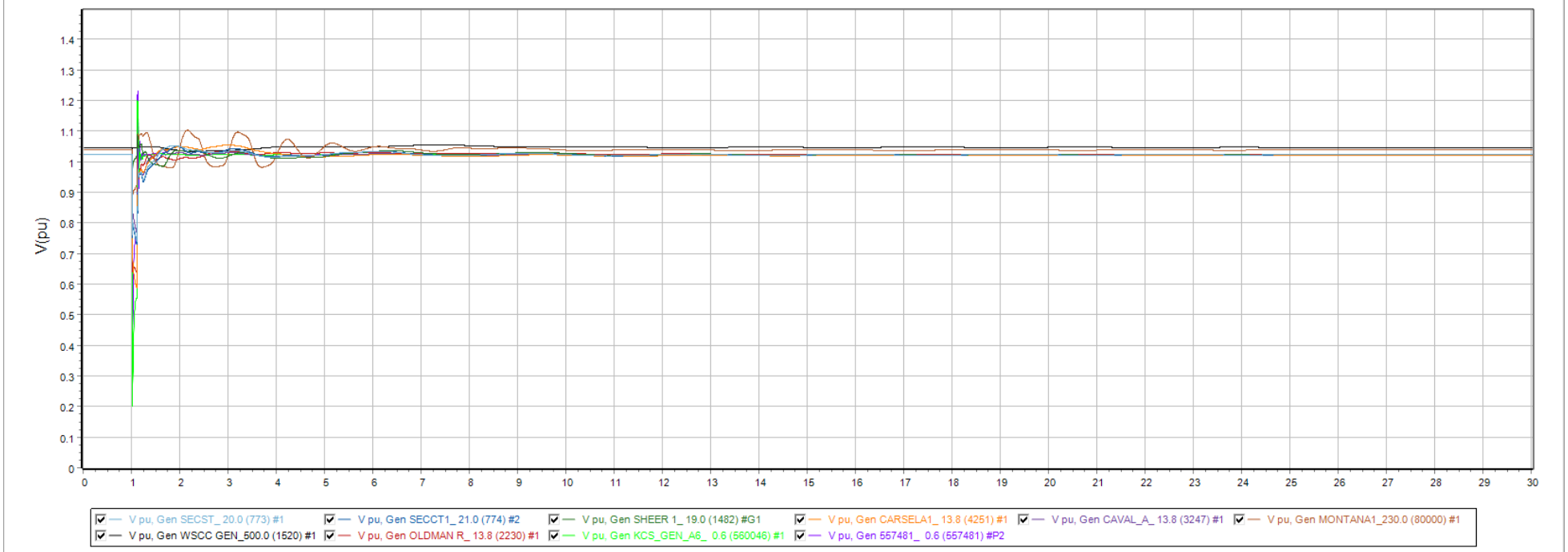
May 16, 2023 23:46:22

Monitor Gens. Q1





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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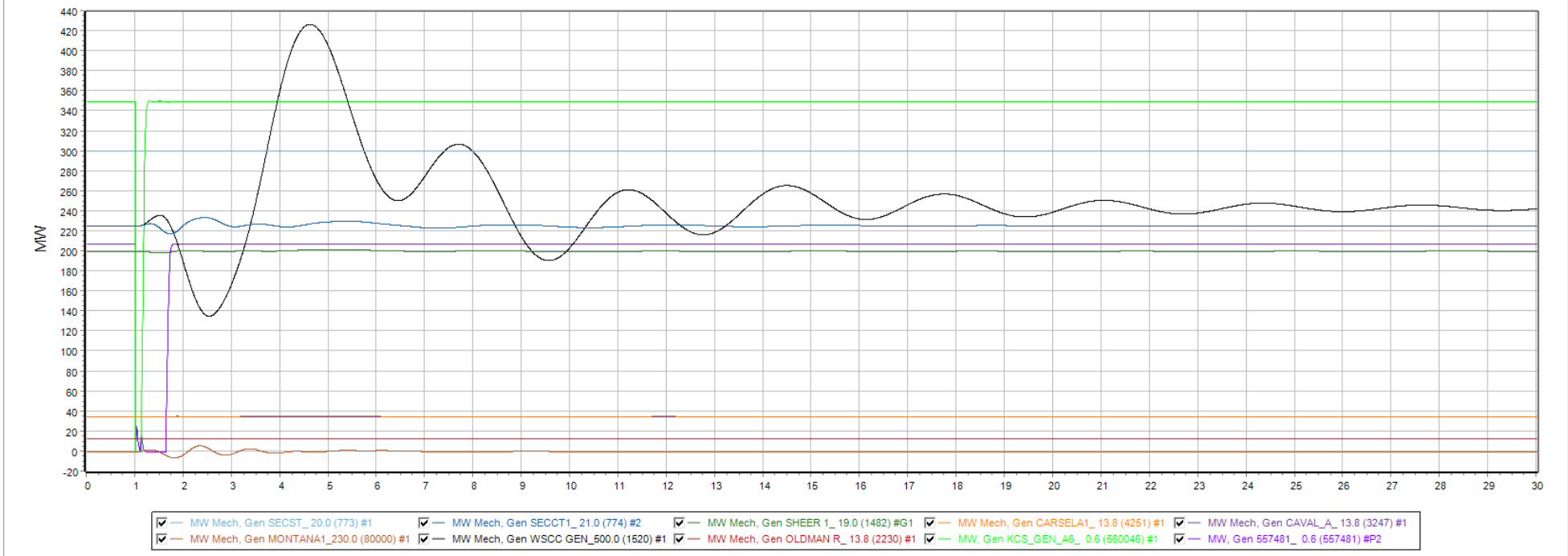
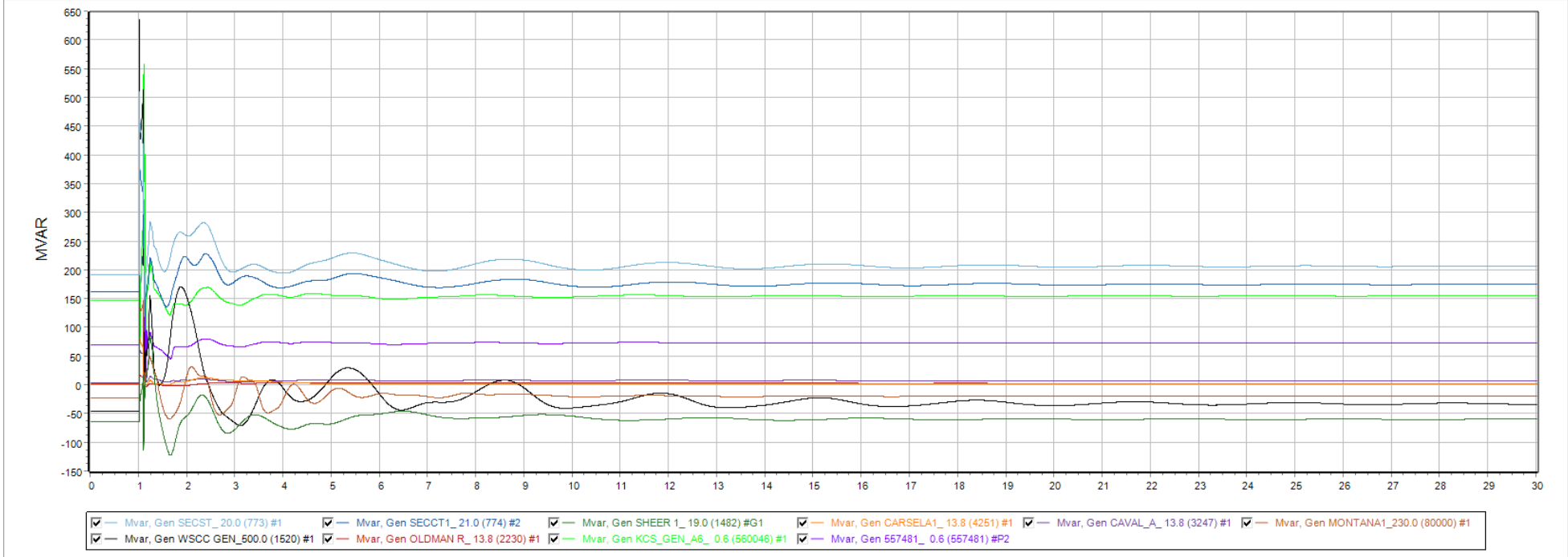
May 16, 2023 23:51:23

Monitor Gens. Q2





SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S -SS 65) @ Foothills 237S

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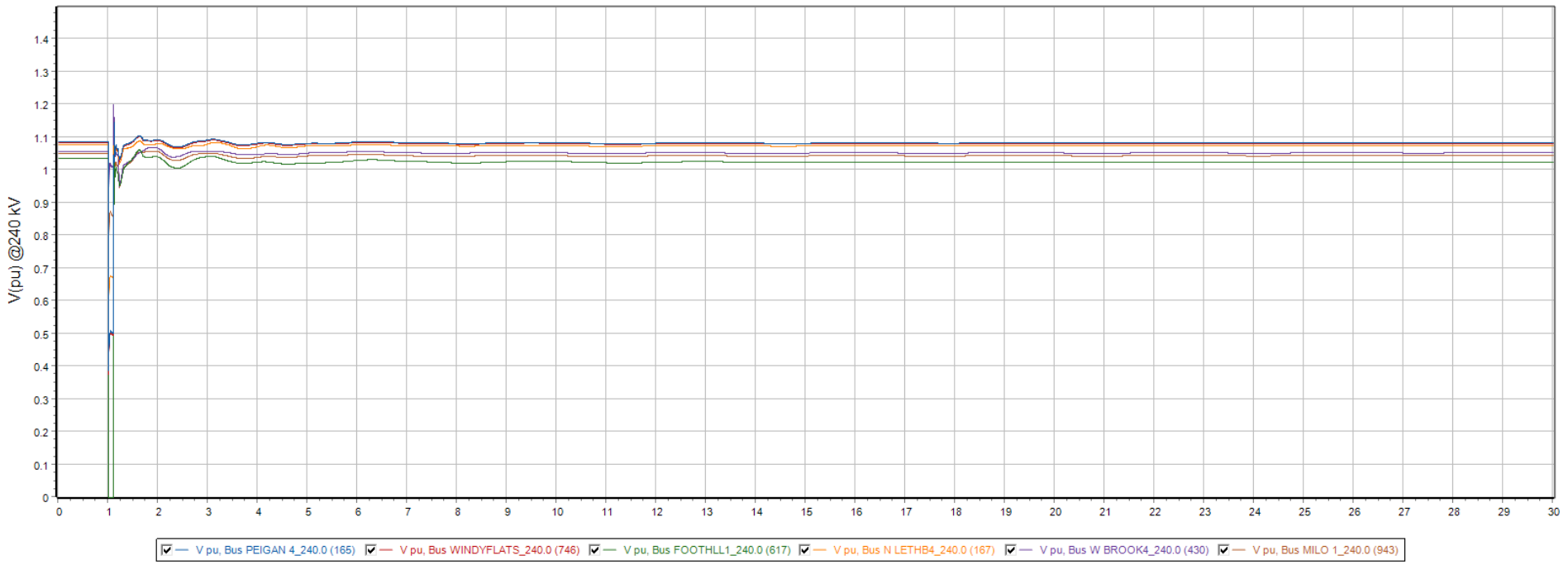
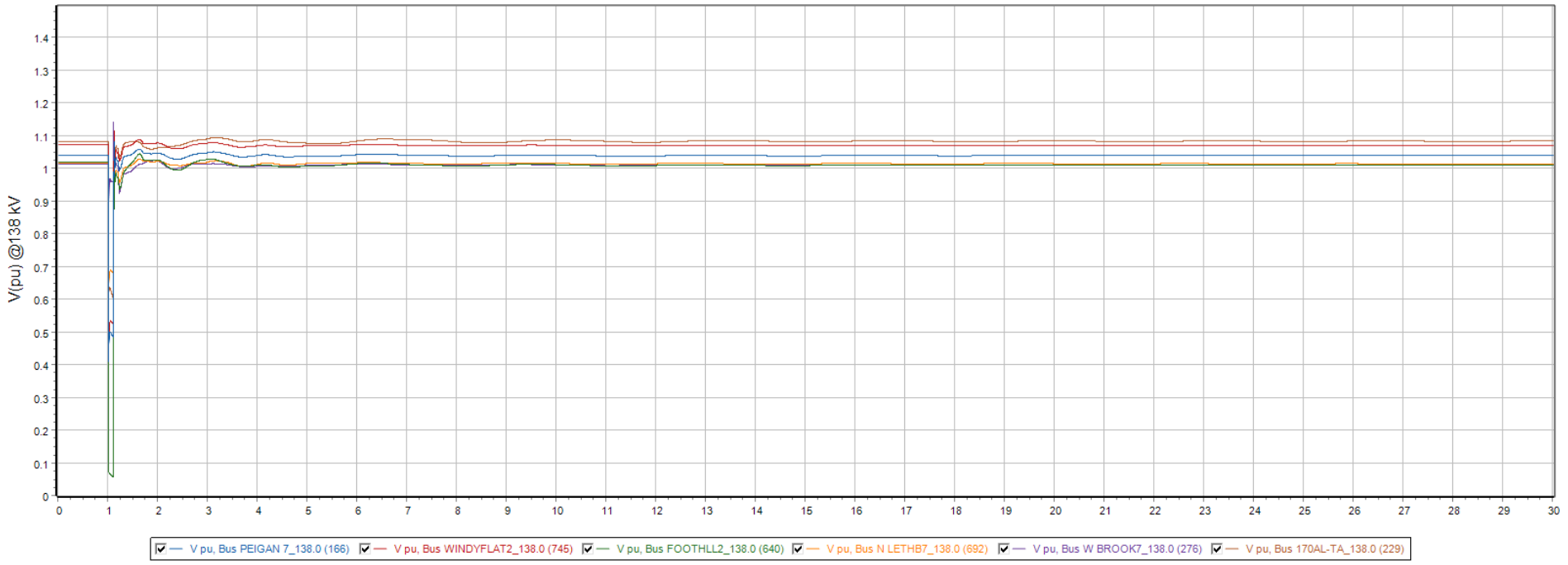
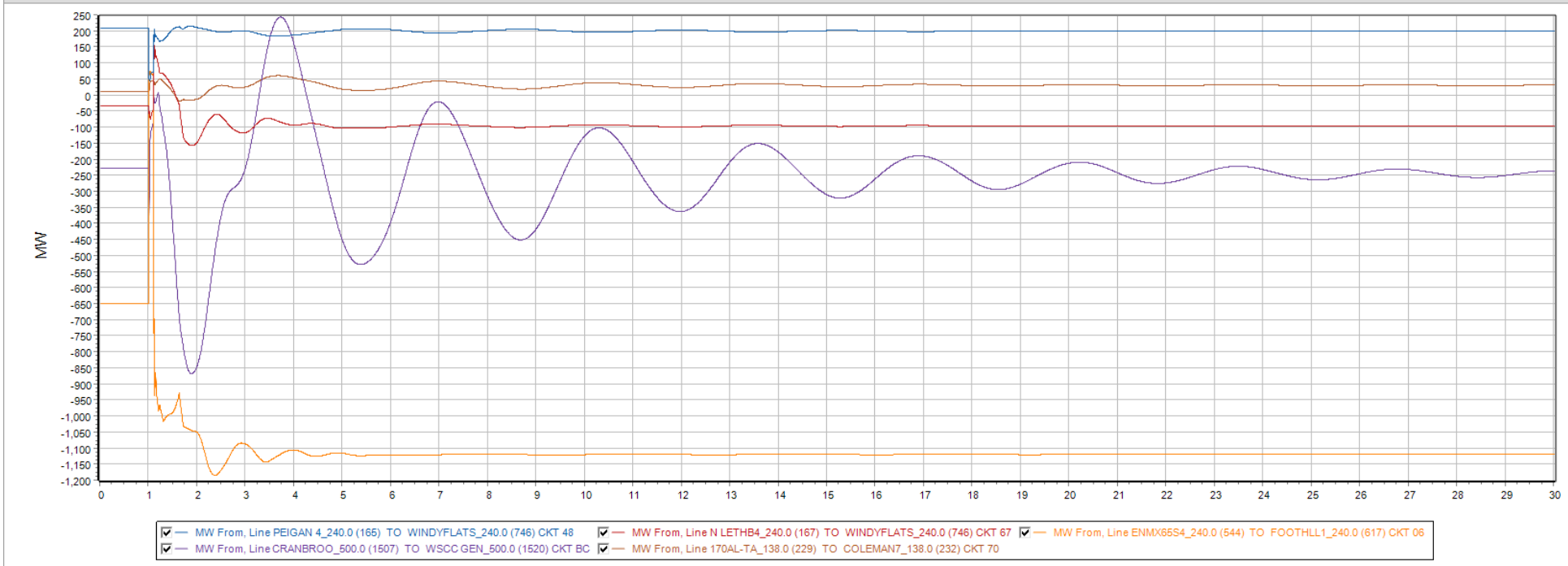
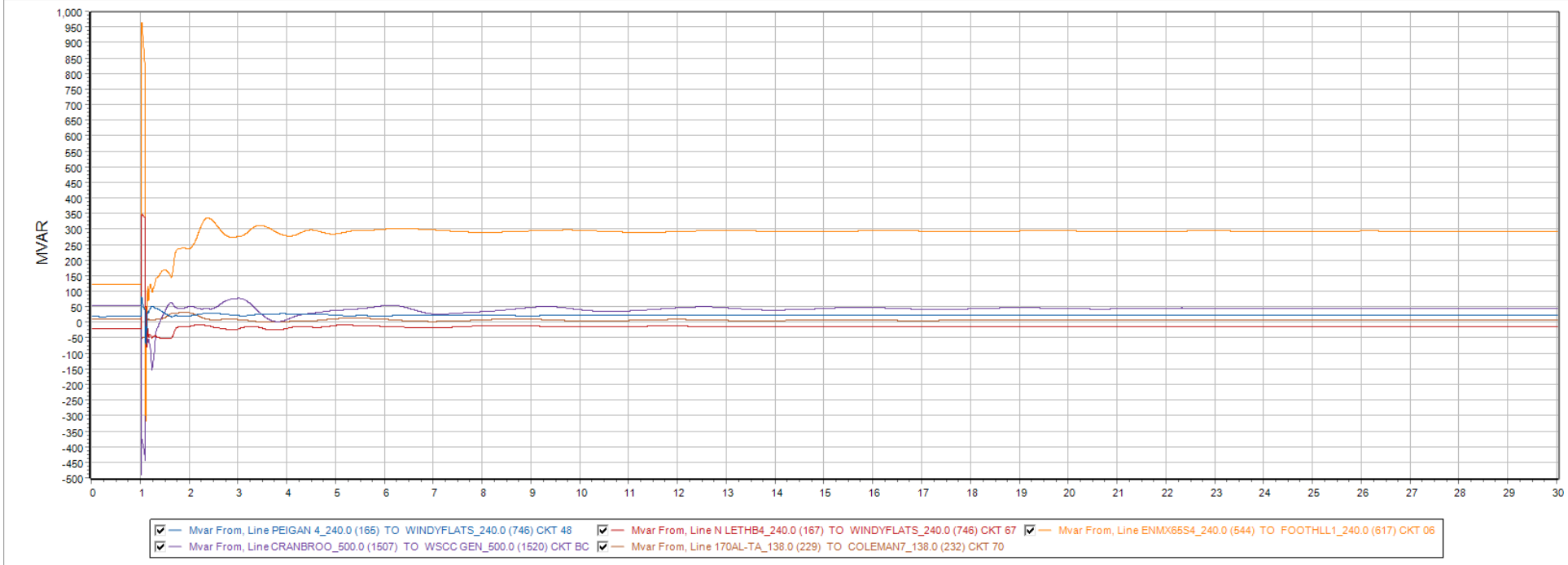
Monitor Bus Volts Q3



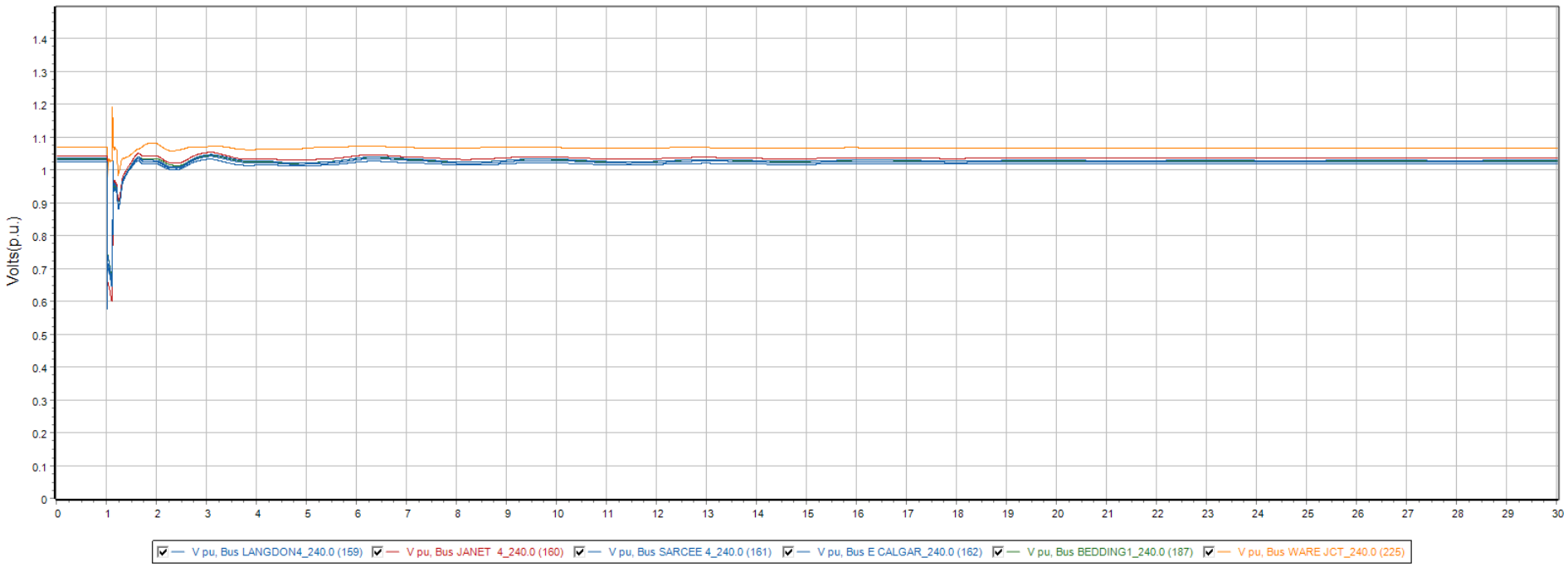


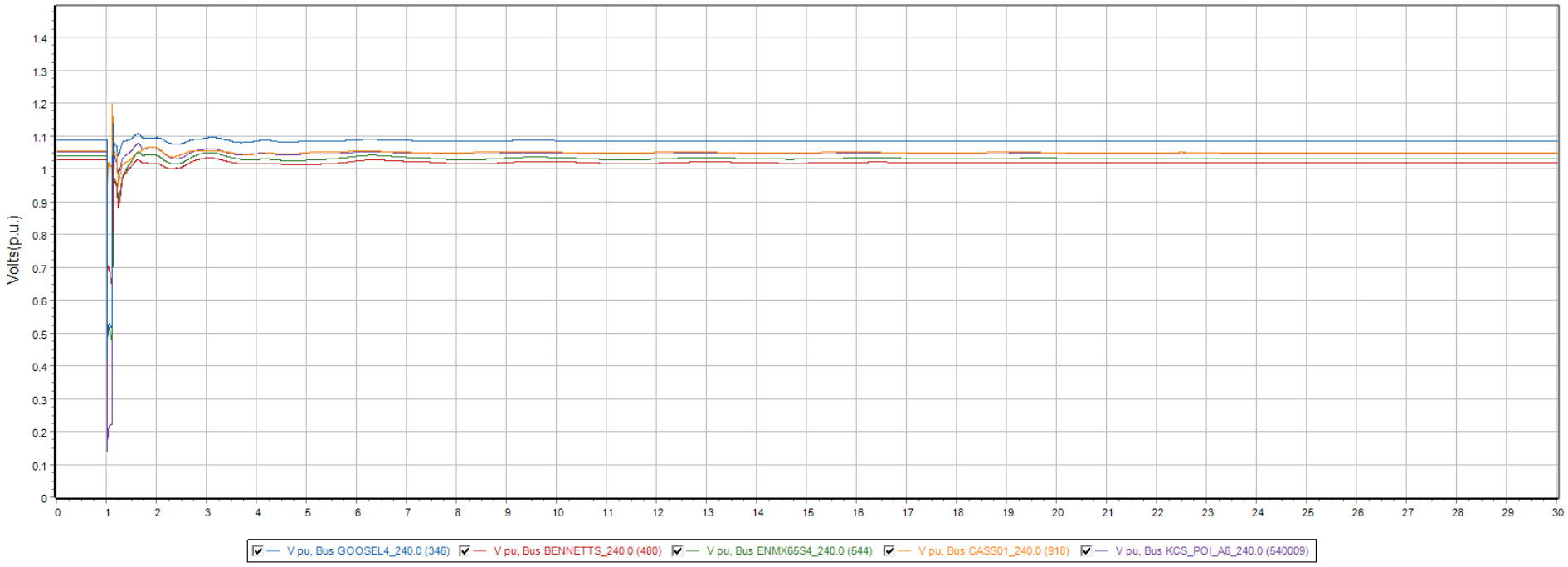
Monitor Line MW & MVAR. Q4



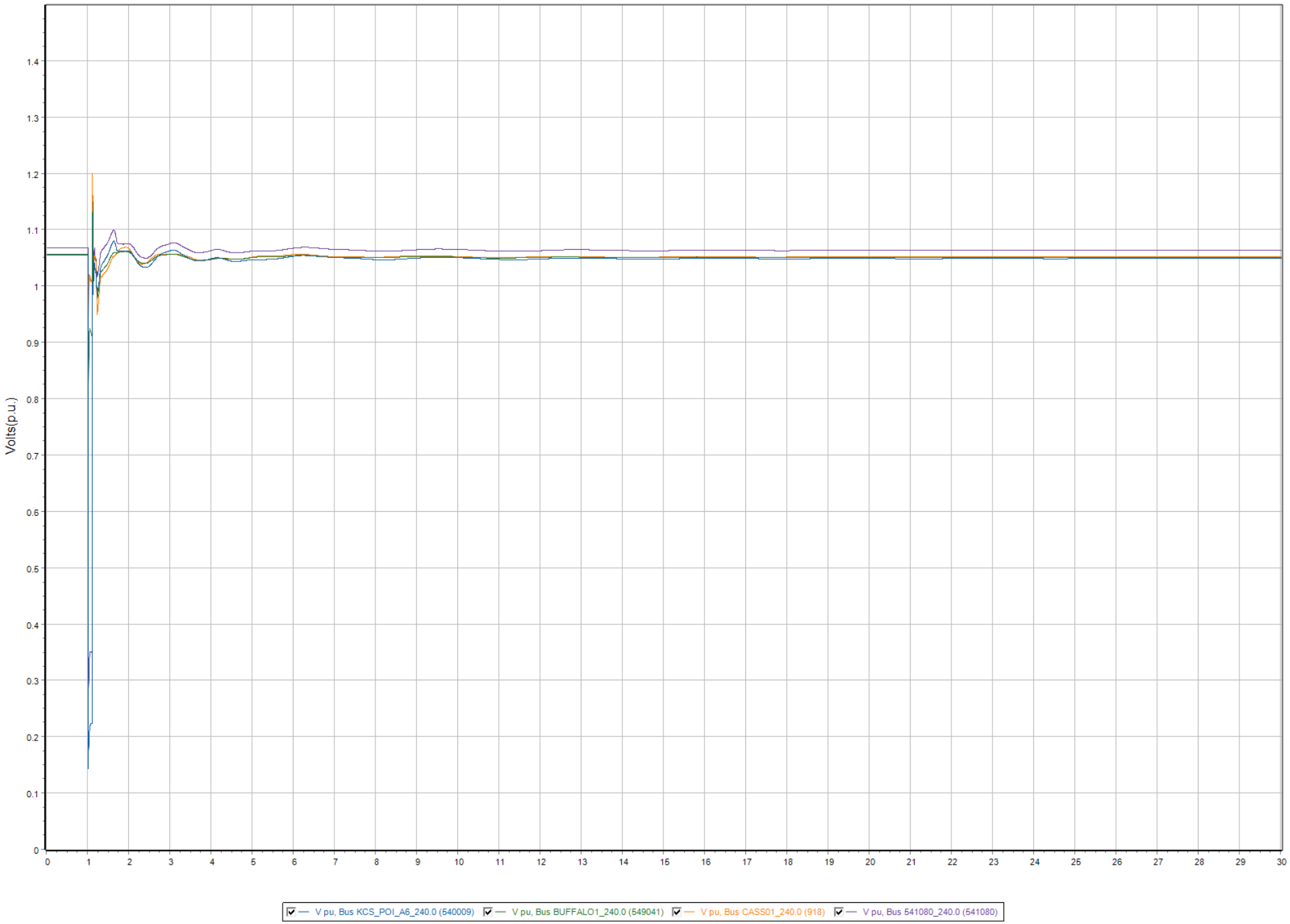


Additional 240 kV Bus Volts





Large Project 240 kV Bus Volts



SC09_2025SP_PRE-Project-Sense-Homstead ESR3-REV0.8.2

Contingency: 09B - 1107L (Foothills 237S –SS 65) @ Foothills 237S

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May 16, 2023 23:51:25

Attachment A5
Dynamic Data and Assumptions

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
RAINBOW - 17	40	30	100	100
HIGH LEV - 18	40	30	100	100
PEACE RI - 19	40	30	100	100
GRANDE P - 20	40	30	100	100
HIGH PRA - 21	40	30	100	100
GRANDE C - 22	40	30	100	100
VALLEYVI - 23	40	30	100	100
FOX CREE - 24	40	30	100	100
FORT MCM - 25	40	30	100	100
SWAN HIL - 26	40	30	100	100
ATHABASC - 27	40	30	100	100
FORT SAS - 33	40	30	100	100
Balance of System	10	10	100	100

Table A5-2: Generator Dynamic

Machine Model Dynamic Data (REGC_A model)											
LVPLSW	**rrpwr**	**brkpt**	**zerox**	**LVPL1**	**VLim**	**LVPnt1**	**LVPnt0**	**Tg**	**Tfltr**	**LVPLSW**	**rrpwr**
1	10	0.9	0.5	1.22	1.2	0.8	0.4	0.02	0.02	1	10
Iqrmax	**Iqrmin**	**Qmin**	**Khv**	**Xe**							
9999	-9999	-1.3	0.7	0							

Table A5-3: Exciter Dynamic Data

Exciter Dynamic Data (REECA1 model)											
PfFlag	**VFlag**	**QFlag**	**Pqflag**	**Pflag**	**Vdip**	**Vup**	**Trv**	**dbd1**	**dbd2**	**kqv**	**Iqh1**
0	0	1	0	0	0.5	1.1	0.016668	-0.1	0.1	2	1
Iql1	**Vref0**	**Iqfrz**	**Thld**	**Thld2**	**Tp**	**Qmax**	**Qmin**	**Vmax**	**Vmin**	**Kqp**	**Kqi**
-1	0	0	0	0	0.016668	0.6	-0.6	1.2	0.8	1	1
Kvp	**Kvi**	**Vref1**	**Tiq**	**dPmax**	**dPmin**	**Pmax**	**Pmin**	**Tpord**	**Imax**	**vq1**	**Iq1**
1	1	0	0.016668	1	-1	1	0	0.016668	1	-1	1
vq2	**Iq2**	**vq3**	**Iq3**	**vq4**	**Iq4**	**vp1**	**Ip1**	**vp2**	**Ip2**	**vp3**	**Ip3**
2	1	0	0	0	0	-1	1	2	1	0	0
vp4	**Ip4**	**MVABase**									
0	0	0									

Attachment A6
Post-Mitigation Power Flow Diagrams

2025 SUMMER LIGHT

Single Line Diagrams
P2445 - POST-PROJECT RAS
RESPONSE SC03

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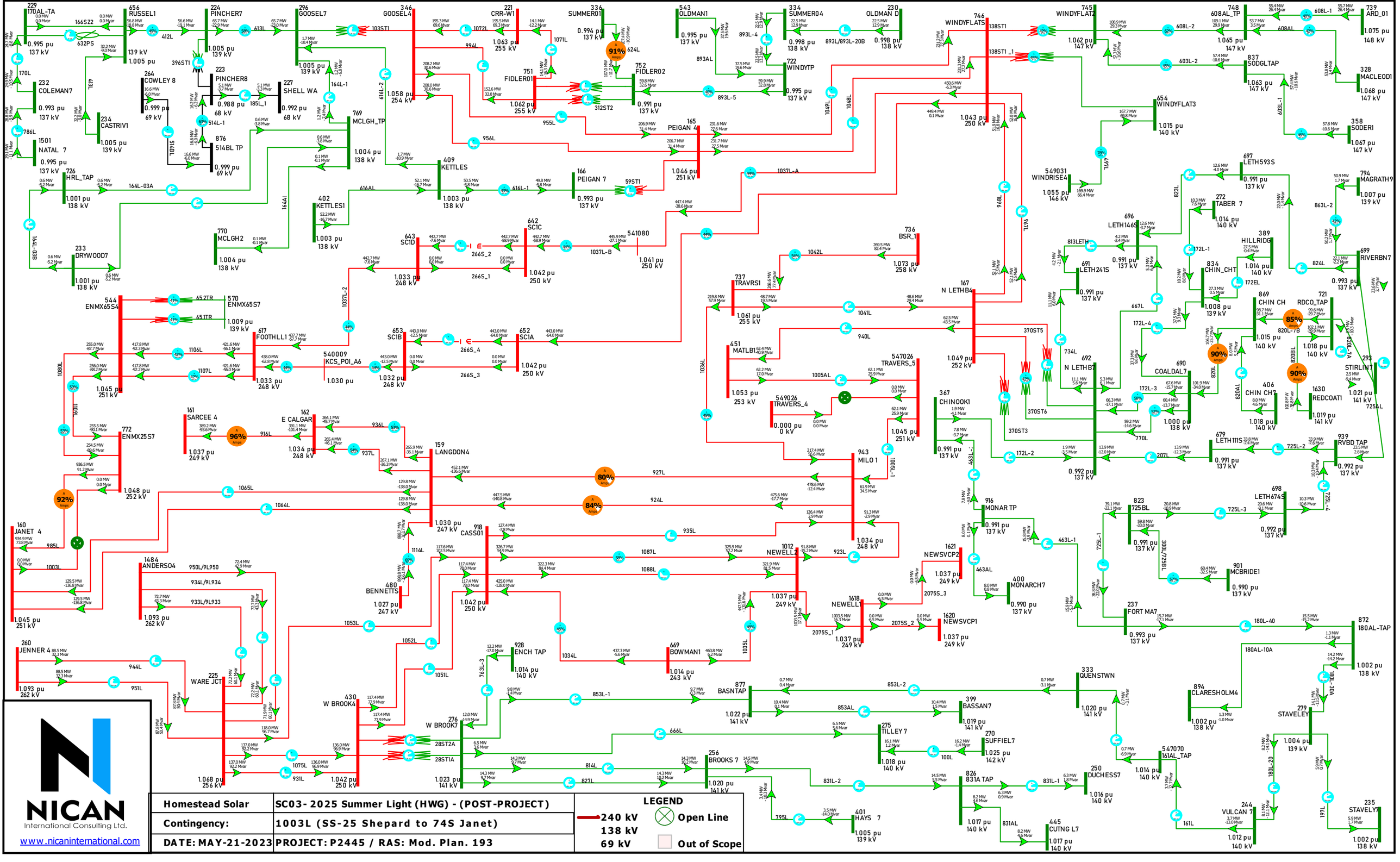
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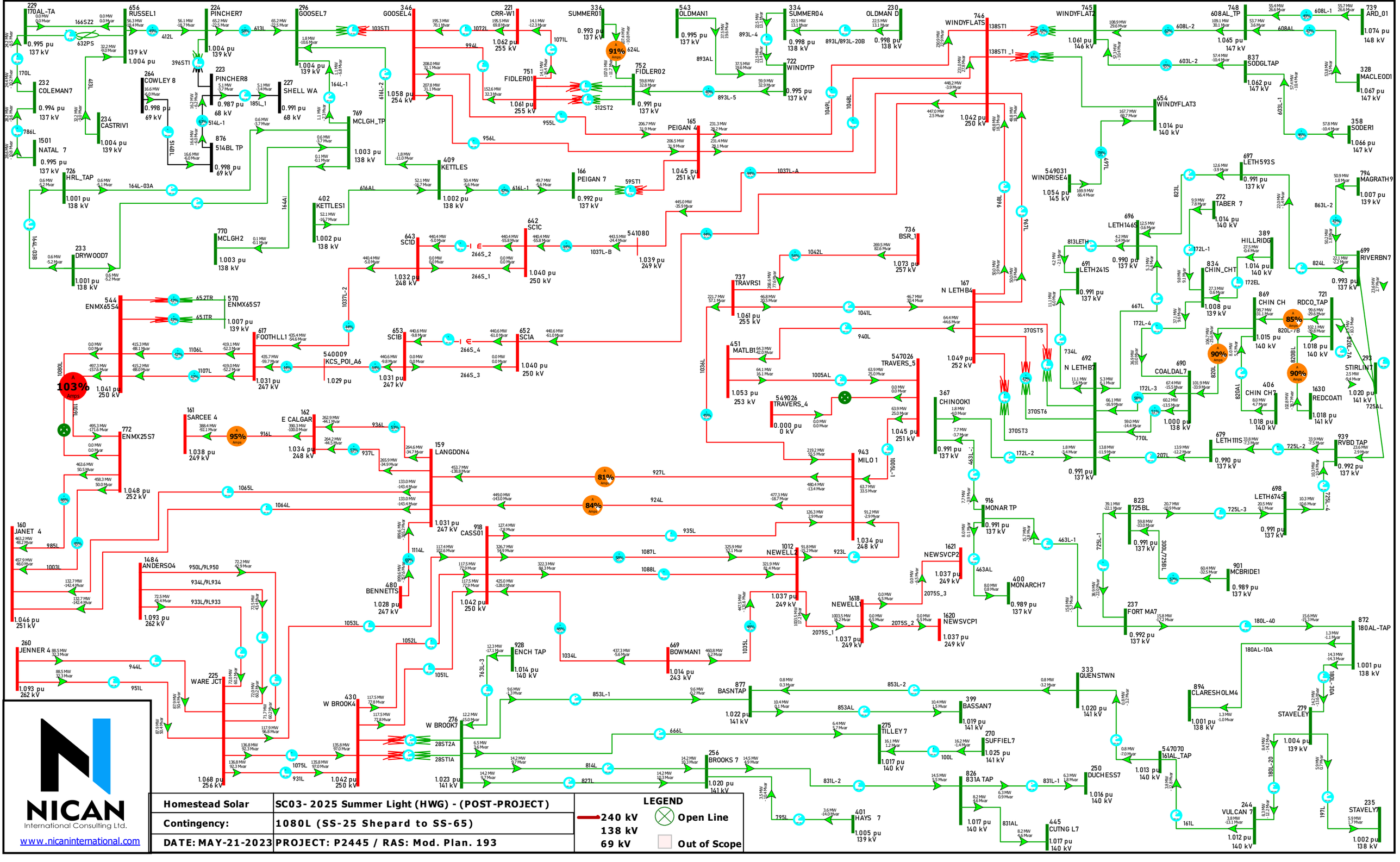
Homestead Solar
SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: Mod. Plan. 193
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
0.995 pu
137 kV
656
RUSSEL1
139 kV
1.004 pu
166SZ2
632PS
412L
224
PINCHER7
1.004 pu
139 kV
396ST1
223
PINCHER8
0.987 pu
68 kV
264
COWLEY 8
0.998 pu
69 kV
227
SHELL WA
0.991 pu
68 kV
185L_1
514L-1
876
514BL TP
0.998 pu
69 kV
514L
296
GOOSEL7
1.004 pu
139 kV
164L-1
769
MCLGH_TP
1.003 pu
138 kV
346
GOOSEL4
1.058 pu
254 kV
103ST1
616L-2
994L
208.0 MW
31.1 Mvar
207.8 MW
31.1 Mvar
221
CRR-W1
1.062 pu
255 kV
1071L
751
FIDLER01
1.061 pu
255 kV
312ST2
336
SUMMER01
0.993 pu
137 kV
91%
624L
752
FIDLER02
0.991 pu
137 kV
955L
956L
543
OLDMAN1
0.995 pu
137 kV
893L-4
893L-5
893AL
334
SUMMER04
0.998 pu
138 kV
893L/893L-20B
230
OLDMAN D
0.998 pu
138 kV
722
WINDYTP
0.995 pu
137 kV
165
PEIGAN 4
1.045 pu
251 kV
59ST1
166
PEIGAN 7
0.992 pu
137 kV
409
KETTLES
1.002 pu
138 kV
616L-1
402
KETTLES1
1.002 pu
138 kV
616AL
1501
NATAL 7
0.995 pu
137 kV
786L
232
COLEMAN7
0.994 pu
137 kV
170L
234
CASTRIV1
1.004 pu
139 kV
410L
726
HRL_TAP
1.001 pu
138 kV
164L-03A
164AL
164L-03B
233
DRYWOOD7
1.001 pu
138 kV
770
MCLGH2
1.003 pu
138 kV
642
SC1C
1.040 pu
250 kV
643
SC1D
1.032 pu
248 kV
266S_2
266S_1
541080
1.039 pu
249 kV
1037L-B
445.0 MW
-35.9 Mvar
1037L-A
1042L
736
BSR_1
1.073 pu
257 kV
737
TRAVRS1
1.061 pu
255 kV
1041L
940L
451
MATLBI
1.053 pu
253 kV
1005AL
547026
TRAVERS_5
549026
TRAVERS_4
0.000 pu
0 kV
1045 pu
251 kV
1005L-1
943
MILO 1
1037L-2
544
ENMX65S4
570
ENMX65S7
1.007 pu
139 kV
65.2TR
65.1TR
617
FOOTHLL1
1.031 pu
247 kV
1106L
1107L
540009
KCS_POI_A6
1.029 pu
653
SC1B
652
SC1A
1.040 pu
250 kV
266S_4
266S_3
1080L
103%
1.041 pu
250 kV
1091L
772
ENMX25S7
1.048 pu
252 kV
1065L
1064L
160
JANET 4
1.046 pu
251 kV
985L
1003L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.093 pu
262 kV
260
JENNER 4
1.093 pu
262 kV
944L
951L
225
WARE JCT
1.068 pu
256 kV
1075L
931L
430
W BROOK4
1.042 pu
250 kV
1053L
1052L
1051L
480
BENNETTS
1.028 pu
247 kV
1114L
161
SARCEE 4
1.038 pu
249 kV
95%
916L
162
E CALGAR
1.034 pu
248 kV
936L
937L
159
LANGDON4
1.031 pu
247 kV
81%
927L
84%
924L
918
CASS01
1.042 pu
250 kV
935L
1087L
1088L
1012
NEWELL2
1.037 pu
249 kV
923L
1618
NEWELL1
1.037 pu
249 kV
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1.037 pu
249 kV
1621
NEWSVCP2
1.037 pu
249 kV
463AL
400
MONARCH7
0.989 pu
137 kV
916
MONAR TP
0.991 pu
137 kV
463L-1
746
WINDYFLATS
1.042 pu
250 kV
138ST1
138ST1_1
1048L
1049L
1047L
1034L
1035L
1036L
549031
WINDRISE4
1.054 pu
145 kV
169.9 MW
66.4 Mvar
697L
745
WINDYFLAT2
1.061 pu
146 kV
654
WINDYFLAT3
1.014 pu
140 kV
748
608AL_TP
1.065 pu
147 kV
608L-2
608AL
608L-1
739
ARD_01
1.074 pu
148 kV
837
SODGLTAP
1.062 pu
147 kV
603L-2
603L-1
328
MACLEOD1
1.067 pu
147 kV
358
SODER1
1.066 pu
147 kV
697
LETH593S
0.991 pu
137 kV
794
MAGRATH9
1.007 pu
139 kV
863L-2
699
RIVERBN7
0.993 pu
137 kV
824L
823L
272
TABER 7
1.014 pu
140 kV
172L-1
696
LETH146S
0.990 pu
137 kV
813LETH
691
LETH241S
0.991 pu
137 kV
834
CHIN_CHT
1.008 pu
139 kV
172EL
389
HILLRIDG
1.014 pu
140 kV
667L
172L-4
869
CHIN CH
1.015 pu
140 kV
85%
820L-7B
820L-7A
721
RDCO_TAP
1.018 pu
140 kV
293
STIRLIN7
1.020 pu
141 kV
725AL
690
COALDAL7
1.000 pu
138 kV
172L-3
820L
90%
406
CHIN CH7
1.018 pu
140 kV
820AL
1630
REDCOAT1
1.018 pu
141 kV
820BL
692
N LETHB7
1.049 pu
252 kV
734L
370ST5
370ST6
370ST3
167
N LETHB4
1.049 pu
252 kV
172L-2
207L
679
LETH111S
0.990 pu
137 kV
725L-2
939
RVBD TAP
0.992 pu
137 kV
367
CHINOOK1
0.991 pu
137 kV
770L
698
LETH674S
0.991 pu
137 kV
725L-3
725L-4
823
725BL
0.991 pu
137 kV
3001/725BL
901
MCBRIDE1
0.989 pu
137 kV
725L-1
237
FORT MA7
0.992 pu
137 kV
180L-40
872
180AL-TAP
1.001 pu
138 kV
180AL-10A
894
CLARESHOLM4
1.001 pu
138 kV
180L-30A
279
STAVELEY
1.004 pu
139 kV
180L-20
197L
235
STAVELY7
1.002 pu
138 kV
333
QUENSTWN
1.020 pu
141 kV
399
BASSAN7
1.019 pu
141 kV
853L-2
853L-1
853AL
877
BASNTAP
1.022 pu
141 kV
928
ENCH TAP
1.014 pu
140 kV
763L-3
669
BOWMAN1
1.014 pu
243 kV
1034L
437.3 MW
-5.6 Mvar
666L
275
TILLEY 7
1.017 pu
140 kV
100L
270
SUFFIEL7
1.025 pu
141 kV
547070
161AL_TAP
1.013 pu
140 kV
161L
244
VULCAN 7
1.012 pu
140 kV
445
CUTNG L7
1.017 pu
140 kV
831AL
826
831A TAP
1.017 pu
140 kV
831L-2
831L-1
250
DUCHESS7
1.016 pu
140 kV
256
BROOKS 7
1.020 pu
141 kV
814L
827L
795L
401
HAYS 7
1.005 pu
139 kV
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
Homestead Solar
SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:
1080L (SS-25 Shepard to SS-65)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: Mod. Plan. 193
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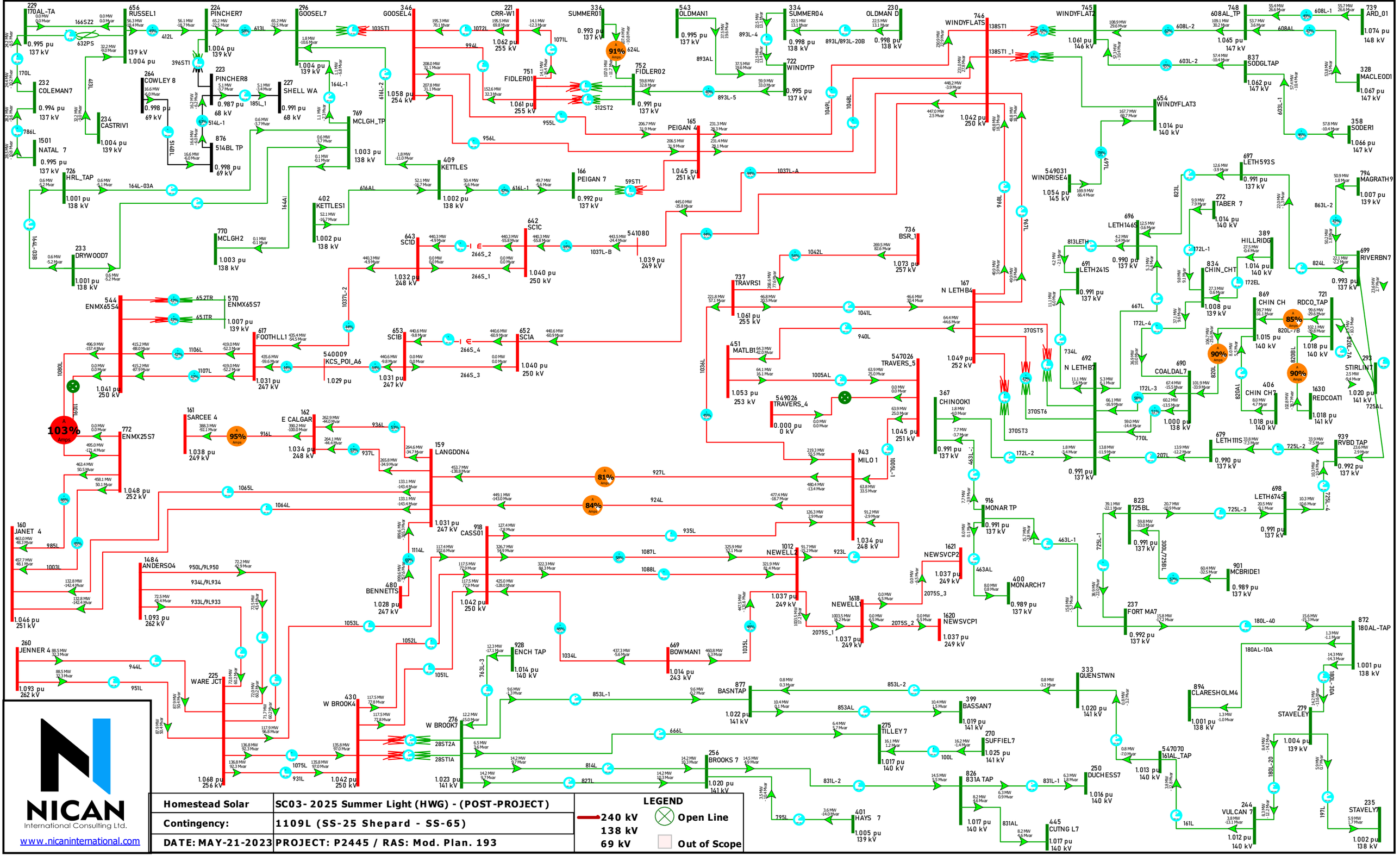

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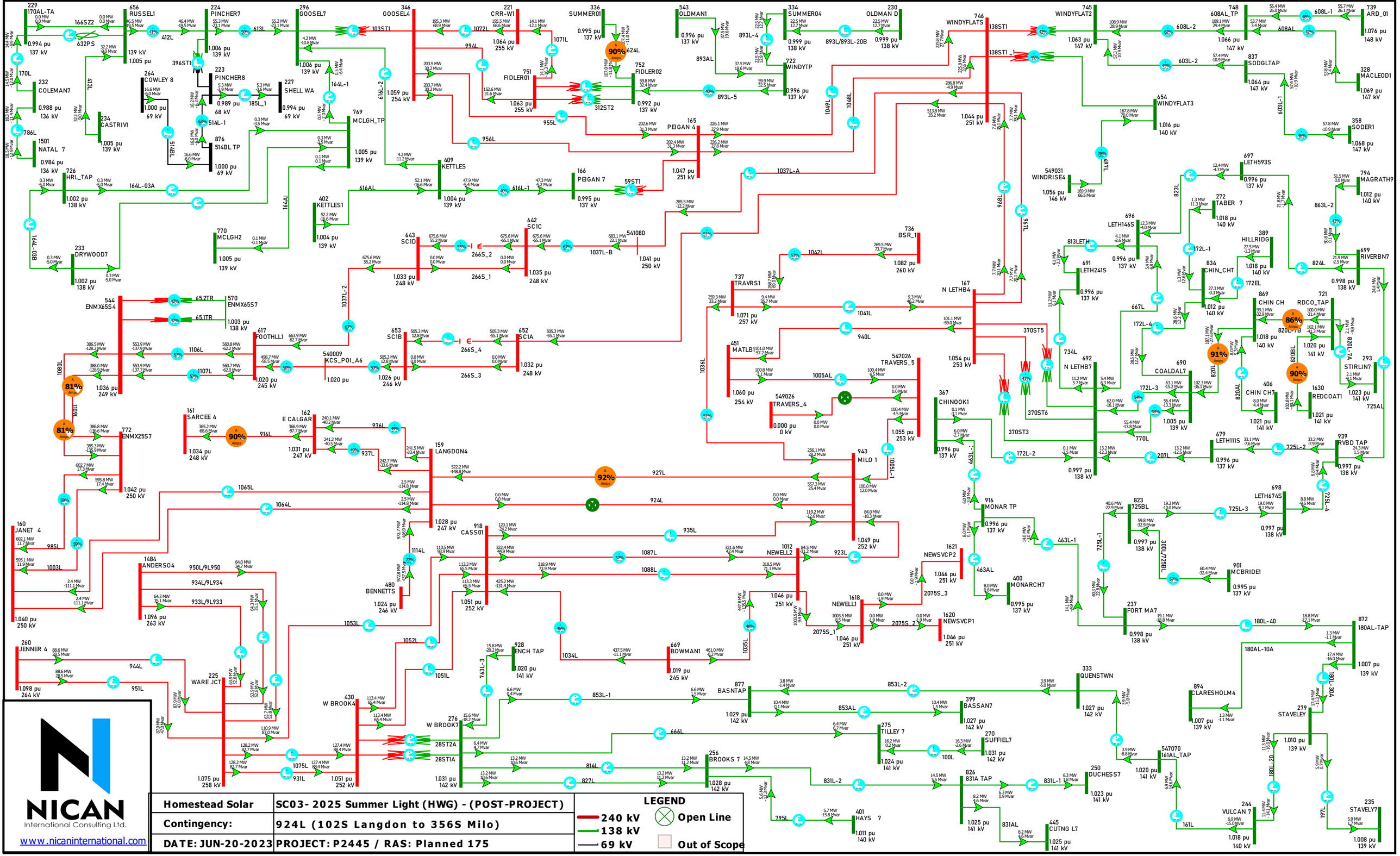
Homestead Solar	**SC03- 2025 Summer Light (HWG) - (POST-PROJECT)**
Contingency:	**1109L (SS-25 Shepard - SS-65)**
DATE: MAY-21-2023	**PROJECT: P2445 / RAS: Mod. Plan. 193**

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
0.994 pu
137 kV
656
RUSSEL1
139 kV
1.005 pu
632PS
166SZ2
412L
224
PINCHER7
1.006 pu
139 kV
396ST1
223
PINCHER8
0.989 pu
68 kV
264
COWLEY 8
1.000 pu
69 kV
227
SHELL WA
0.994 pu
69 kV
185L_1
514L-1
876
514BL TP
1.000 pu
69 kV
296
GOOSEL7
1.006 pu
139 kV
103ST1
346
GOOSEL4
1.059 pu
254 kV
616L-2
994L
221
CRR-W1
1.064 pu
255 kV
1071L
336
SUMMER01
0.995 pu
137 kV
90%
624L
751
FIDLER01
1.063 pu
255 kV
752
FIDLER02
0.992 pu
137 kV
312ST2
543
OLDMAN1
0.996 pu
137 kV
893L-4
893AL
893L-5
334
SUMMER04
0.999 pu
138 kV
893L/893L-20B
230
OLDMAN D
0.999 pu
138 kV
722
WINDYTP
0.996 pu
137 kV
746
WINDYFLATS
138ST1
138ST1_1
1.044 pu
251 kV
1049L
1048L
745
WINDYFLAT2
1.063 pu
147 kV
608AL_TP
1.066 pu
147 kV
608L-2
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
608L-1
608AL
739
ARD_01
1.076 pu
148 kV
328
MACLEOD1
1.069 pu
147 kV
358
SODER1
1.068 pu
147 kV
654
WINDYFLAT3
1.016 pu
140 kV
549031
WINDRISE4
1.056 pu
146 kV
169L
786L
1501
NATAL 7
0.984 pu
136 kV
232
COLEMAN7
0.988 pu
136 kV
234
CASTRIVI
1.005 pu
139 kV
514L
726
HRL_TAP
1.002 pu
138 kV
164L-03A
164L-1
233
DRYWOOD7
1.002 pu
138 kV
B03L
764L
770
MCLGH2
1.005 pu
139 kV
164AL
769
MCLGH_TP
1.005 pu
139 kV
409
KETTLES
1.004 pu
139 kV
616AL
616L-1
402
KETTLES1
1.004 pu
139 kV
166
PEIGAN 7
0.995 pu
137 kV
59ST1
165
PEIGAN 4
1.047 pu
251 kV
955L
956L
1037L-A
1037L-B
541080
1.041 pu
250 kV
643
SC1D
1.033 pu
248 kV
642
SC1C
1.035 pu
248 kV
266S_2
266S_1
653
SC1B
1.026 pu
246 kV
652
SC1A
1.032 pu
248 kV
266S_4
266S_3
1037L-2
544
ENMX65S4
570
ENMX65S7
1.003 pu
138 kV
65.2TR
65.1TR
617
FOOTHLL1
1.020 pu
245 kV
540009
KCS_POI_A6
1.020 pu
1106L
1107L
1080L
1.036 pu
249 kV
81%
1090L
772
ENMX25S7
1.042 pu
250 kV
161
SARCEE 4
1.034 pu
248 kV
90%
916L
162
E CALGAR
1.031 pu
247 kV
936L
937L
159
LANGDON4
1065L
1064L
1.028 pu
247 kV
927L
924L
1114L
480
BENNETTS
1.024 pu
246 kV
160
JANET 4
1.040 pu
250 kV
985L
1003L
1484
ANDERS04
1.096 pu
263 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.098 pu
264 kV
944L
951L
225
WARE JCT
1075L
931L
1.075 pu
258 kV
1.051 pu
252 kV
1053L
1052L
1051L
918
CASS01
1.051 pu
252 kV
935L
1087L
1088L
1012
NEWELL2
1.046 pu
251 kV
923L
1049L
1.049 pu
252 kV
1621
NEWSVCP2
1.046 pu
251 kV
2075S_3
463AL
400
MONARCH7
0.995 pu
137 kV
1618
NEWELL1
2075S_1
1620
NEWSVCP1
1.046 pu
251 kV
2075S_2
916
MONAR TP
0.996 pu
137 kV
463L-1
1035L
1034L
669
BOWMAN1
1.019 pu
245 kV
928
ENCH TAP
1.020 pu
141 kV
763L-3
430
W BROOK4
276
W BROOK7
28ST2A
28ST1A
1.031 pu
142 kV
666L
814L
827L
256
BROOKS 7
1.028 pu
142 kV
831L-2
795L
401
HAYS 7
1.011 pu
140 kV
877
BASNTAP
1.029 pu
142 kV
853L-1
853L-2
853AL
399
BASSAN7
1.027 pu
142 kV
333
QUENSTWN
1.027 pu
142 kV
275
TILLEY 7
1.024 pu
141 kV
100L
270
SUFFIEL7
1.031 pu
142 kV
826
831A TAP
1.025 pu
141 kV
831L-1
831AL
445
CUTNG L7
1.025 pu
141 kV
250
DUCHESS7
1.023 pu
141 kV
547070
161AL_TAP
1.020 pu
141 kV
161L
244
VULCAN 7
1.018 pu
140 kV
180L-20
180L-30A
180AL-10A
894
CLARESHOLM4
1.007 pu
139 kV
279
STAVELEY
1.010 pu
139 kV
197L
235
STAVELY7
1.008 pu
139 kV
180L-40
180AL-TAP
872
1.007 pu
139 kV
737
TRAVRS1
1.071 pu
257 kV
1042L
1041L
736
BSR_1
1.082 pu
260 kV
451
MATLB1
1.060 pu
254 kV
1005AL
549026
TRAVERS_4
0.000 pu
0 kV
547026
TRAVERS_5
1.055 pu
253 kV
1050L-1
943
MILO 1
1.049 pu
252 kV
1050L
167
N LETHB4
1.054 pu
253 kV
940L
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.005 pu
139 kV
172L-2
172L-3
172L-4
690
COALDAL7
1.005 pu
139 kV
770L
820L
820AL
820BL
820L-7A
820L-7B
86%
91%
90%
869
CHIN CH
1.018 pu
140 kV
406
CHIN CH7
1.021 pu
141 kV
1630
REDCOAT1
1.021 pu
141 kV
721
RDCO_TAP
1.020 pu
141 kV
293
STIRLIN7
1.023 pu
141 kV
725AL
725L-2
725L-3
725L-4
939
RVBD TAP
0.997 pu
138 kV
698
LETH674S
0.997 pu
138 kV
823
725BL
0.997 pu
138 kV
3001/725BL
901
MCBRIDE1
0.995 pu
137 kV
237
FORT MA7
0.998 pu
138 kV
824L
699
RIVERBN7
0.998 pu
138 kV
863L-2
794
MAGRATH9
1.012 pu
140 kV
697
LETH593S
0.996 pu
137 kV
272
TABER 7
1.018 pu
140 kV
823L
172L-1
834
CHIN_CHT
1.012 pu
140 kV
172EL
389
HILLRIDG
1.018 pu
140 kV
696
LETH146S
0.996 pu
137 kV
691
LETH241S
0.996 pu
137 kV
813LETH
667L
739L
697L
698L
699L
367
CHINOOK1
0.996 pu
137 kV
916L-1
679
LETH111S
0.996 pu
137 kV
207L
172L-2
0.997 pu
138 kV
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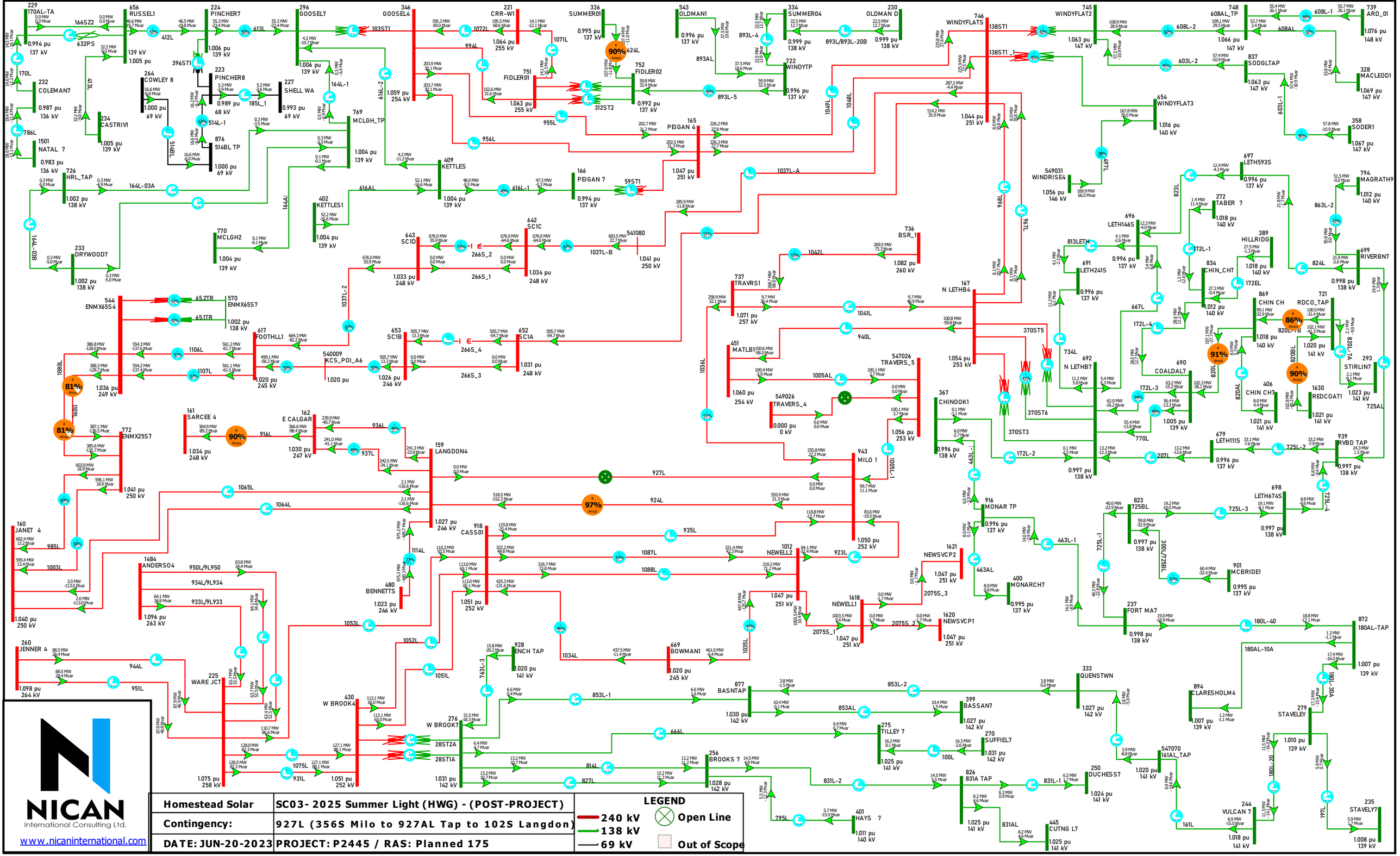
Homestead Solar
SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:
924L (102S Langdon to 356S Milo)
DATE: JUN-20-2023
PROJECT: P2445 / RAS: Planned 175
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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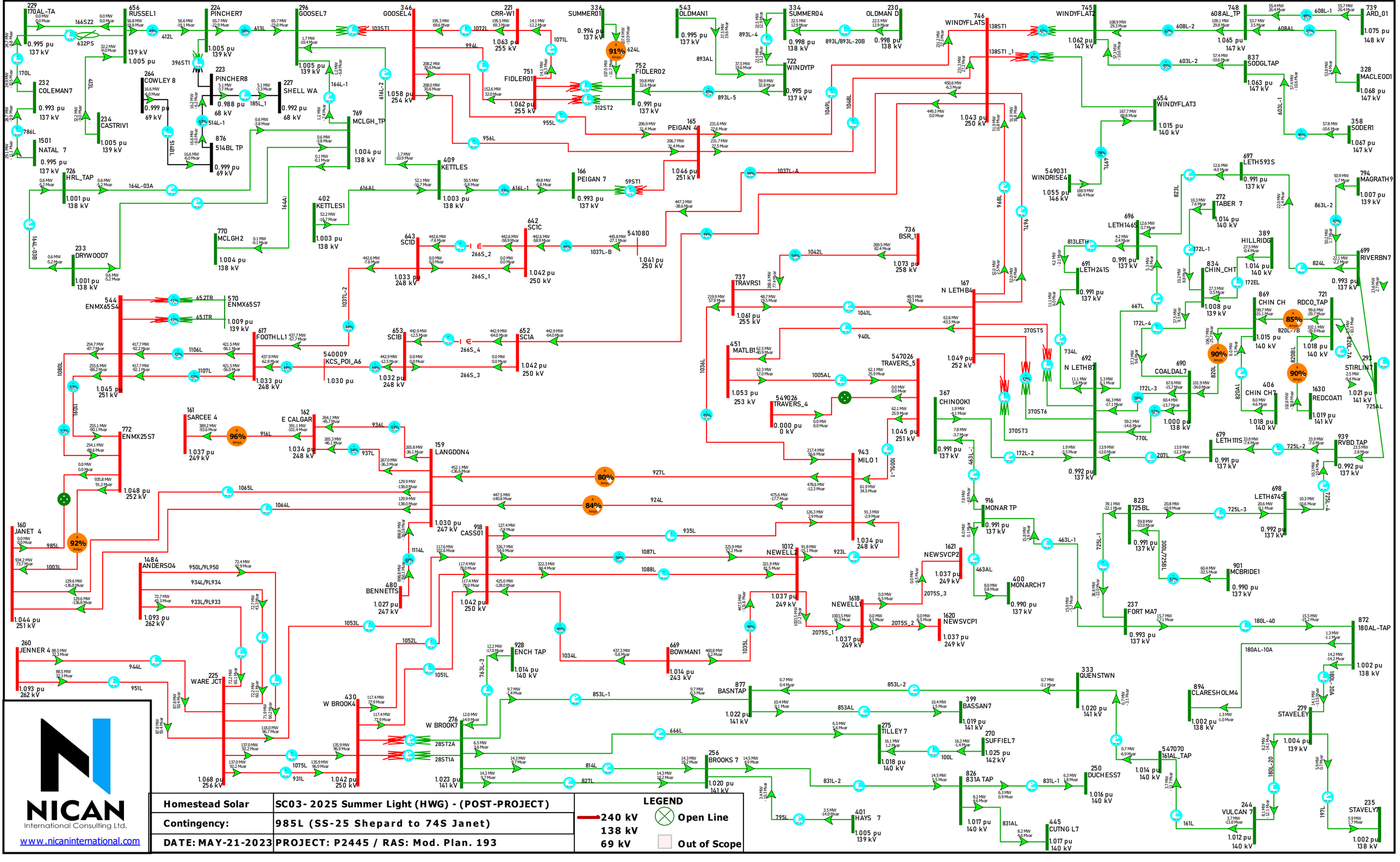
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: JUN-20-2023	PROJECT: P2445 / RAS: Planned 175

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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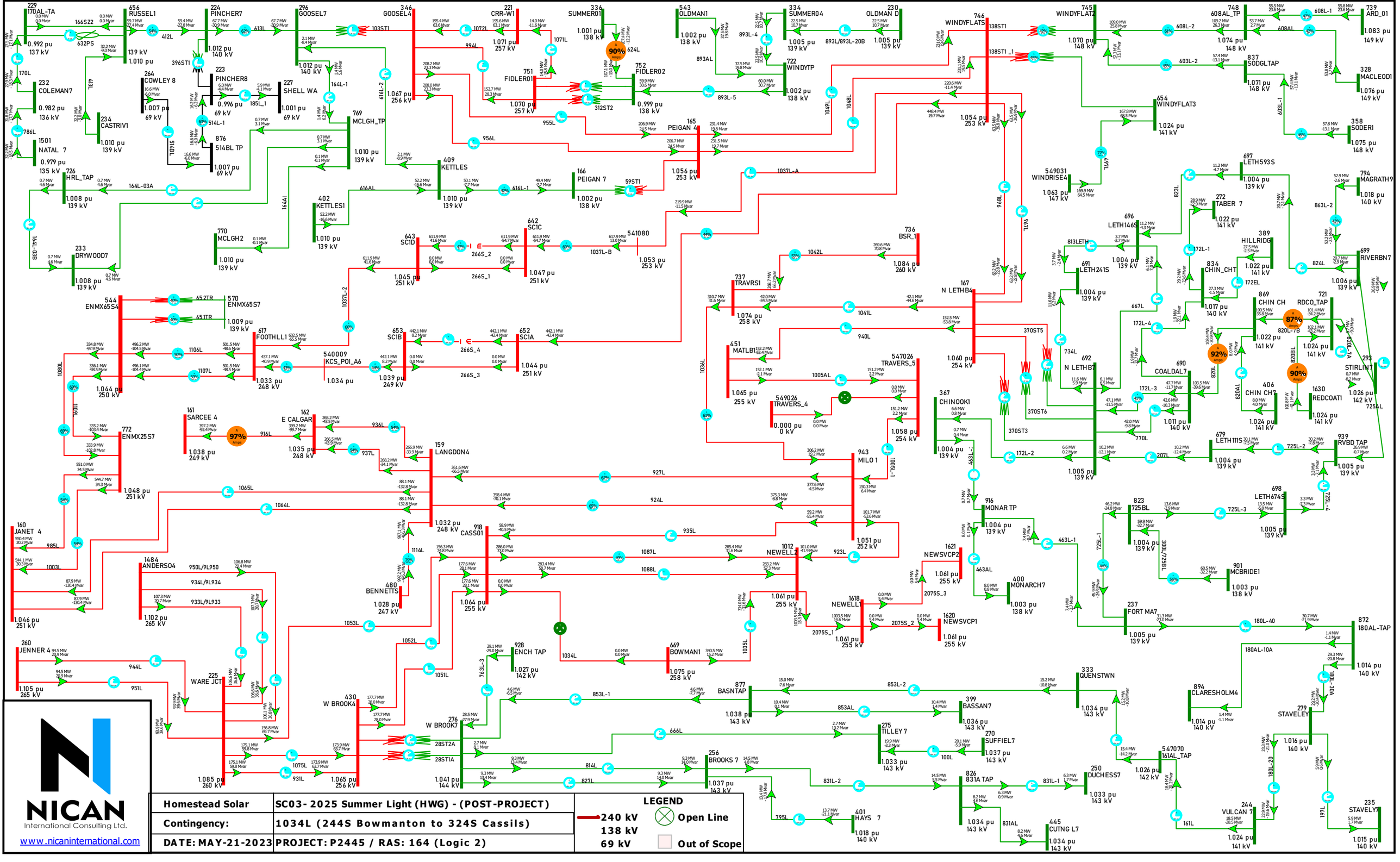
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	985L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023	PROJECT: P2445 / RAS: Mod. Plan. 193

LEGEND

240 kV
138 kV
69 kV
Open Line
Out of Scope



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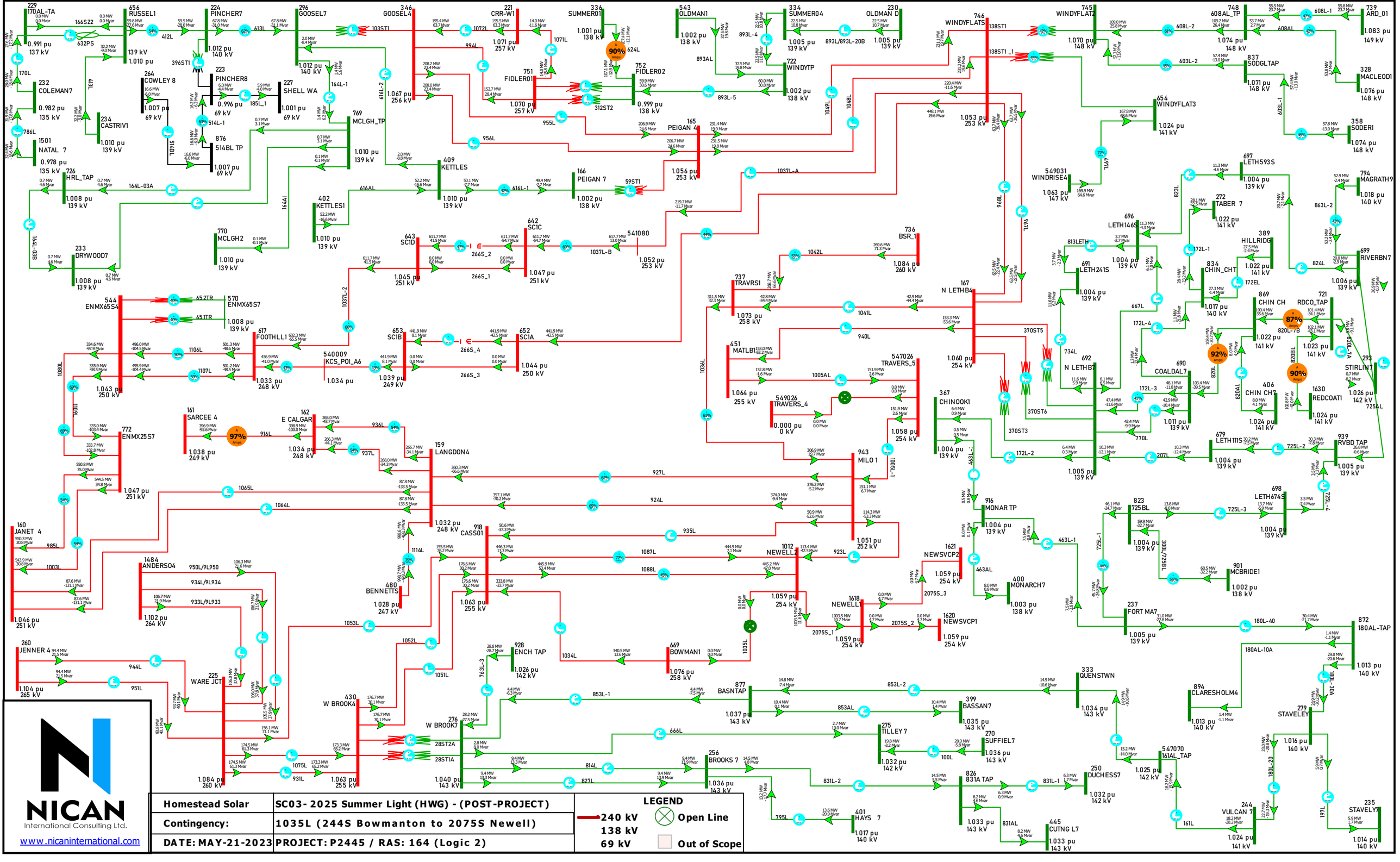
Homestead Solar	SC03- 2025 Summer Light (HWG) - (POST-PROJECT)
Contingency:	1034L (244S Bowmanton to 324S Cassils)
DATE: MAY-21-2023	PROJECT: P2445 / RAS: 164 (Logic 2)

LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229 170AL-TA 0.991 pu 137 kV
656 RUSSEL1 139 kV 1.010 pu
224 PINCHER7 1.012 pu 140 kV
223 PINCHER8 0.996 pu 69 kV
264 COWLEY 8 1.007 pu 69 kV
227 SHELL WA 1.001 pu 69 kV
876 514BL TP 1.007 pu 69 kV
296 GOOSEL7 1.012 pu 140 kV
346 GOOSEL4 1.067 pu 256 kV
221 CRR-W1 1.071 pu 257 kV
751 FIDLER01 1.070 pu 257 kV
336 SUMMER01 1.001 pu 138 kV
752 FIDLER02 0.999 pu 138 kV
543 OLDMAN1 1.002 pu 138 kV
334 SUMMER04 1.005 pu 139 kV
230 OLDMAN D 1.005 pu 139 kV
722 WINDYTP 1.002 pu 138 kV
746 WINDYFLATS 1.053 pu 253 kV
745 WINDYFLAT2 1.070 pu 148 kV
748 608AL_TP 1.074 pu 148 kV
739 ARD_01 1.083 pu 149 kV
837 SODGLTAP 1.071 pu 148 kV
328 MACLEOD01 1.076 pu 148 kV
654 WINDYFLAT3 1.024 pu 141 kV
358 SODER1 1.074 pu 148 kV
549031 WINDRISE4 1.063 pu 147 kV
697 LETH593S 1.004 pu 139 kV
794 MAGRATH9 1.018 pu 140 kV
272 TABER 7 1.022 pu 141 kV
696 LETH146S 1.004 pu 139 kV
691 LETH241S 1.004 pu 139 kV
834 CHIN_CHT 1.017 pu 140 kV
389 HILLRIDG 1.022 pu 141 kV
699 RIVERBN7 1.006 pu 139 kV
869 CHIN CH 1.022 pu 141 kV
721 RDCO_TAP 1.023 pu 141 kV
293 STIRLIN7 1.026 pu 142 kV
692 N LETHB7 1.024 pu 141 kV
690 COALDAL7 1.011 pu 139 kV
406 CHIN CH7 1.024 pu 141 kV
1630 REDCOAT1 1.024 pu 141 kV
679 LETH111S 1.004 pu 139 kV
939 RVBD TAP 1.005 pu 139 kV
698 LETH674S 1.004 pu 139 kV
823 725BL 1.004 pu 139 kV
901 MCBRIDE1 1.002 pu 138 kV
237 FORT MA7 1.005 pu 139 kV
872 180AL-TAP 1.013 pu 140 kV
894 CLARESHOLM4 1.013 pu 140 kV
279 STAVELEY 1.016 pu 140 kV
235 STAVELY7 1.014 pu 140 kV
244 VULCAN 7 1.024 pu 141 kV
547070 161AL_TAP 1.025 pu 142 kV
250 DUCHESS7 1.032 pu 142 kV
826 831A TAP 1.033 pu 143 kV
445 CUTNG L7 1.033 pu 143 kV
916 MONAR TP 1.004 pu 139 kV
400 MONARCH7 1.003 pu 138 kV
1621 NEWSVCP2 1.059 pu 254 kV
1620 NEWSVCP1 1.059 pu 254 kV
1618 NEWELL1 1.059 pu 254 kV
1012 NEWELL2 1.059 pu 254 kV
333 QUENSTWN 1.034 pu 143 kV
399 BASSAN7 1.035 pu 143 kV
275 TILLEY 7 1.032 pu 142 kV
270 SUFFIEL7 1.036 pu 143 kV
877 BASNTAP 1.037 pu 143 kV
669 BOWMAN1 1.076 pu 258 kV
928 ENCH TAP 1.026 pu 142 kV
430 W BROOK4 1.063 pu 255 kV
276 W BROOK7 1.040 pu 143 kV
256 BROOKS 7 1.036 pu 143 kV
401 HAYS 7 1.017 pu 140 kV
943 MILO 1 1.051 pu 252 kV
165 PEIGAN 4 1.056 pu 253 kV
166 PEIGAN 7 1.002 pu 138 kV
59ST1 541080 1.052 pu 253 kV
409 KETTLES 1.010 pu 139 kV
402 KETTLES1 1.010 pu 139 kV
770 MCLGH2 1.010 pu 139 kV
769 MCLGH_TP 1.010 pu 139 kV
1501 NATAL 7 0.978 pu 135 kV
726 HRL_TAP 1.008 pu 139 kV
233 DRYWOOD7 1.008 pu 139 kV
232 COLEMAN7 0.982 pu 135 kV
234 CASTRIV1 1.010 pu 139 kV
786L 170L 410L 396ST1 514L-1 514BL 164L-1 164L-2 164L-03A 164L-03B 164AL 185L_1 616L-2 616AL 616L-1 103ST1 994L 956L 955L 1072L 1071L 624L 312ST2 893L-4 893L/893L-20B 893AL 893L-5 1040L 1048L 1037L-A 1037L-B 1042L 1041L 940L 1005AL 1005L-1 1004L 1003L 985L 1080L 1109L 1106L 1107L 1037L-2 1044L 1045L 1046L 1047L 1048L 1049L 1050L 1051L 1052L 1053L 1034L 1035L 1064L 1065L 1066L 1067L 1068L 1069L 1070L 1071L 1072L 1073L 1074L 1075L 1076L 1077L 1078L 1079L 1080L 1081L 1082L 1083L 1084L 1085L 1086L 1087L 1088L 1089L 1090L 1091L 1092L 1093L 1094L 1095L 1096L 1097L 1098L 1099L 1100L 1101L 1102L 1103L

2025 SUMMER PEAK

Single Line Diagrams
P2445 - POST-PROJECT
RAS RESPONSE SC04

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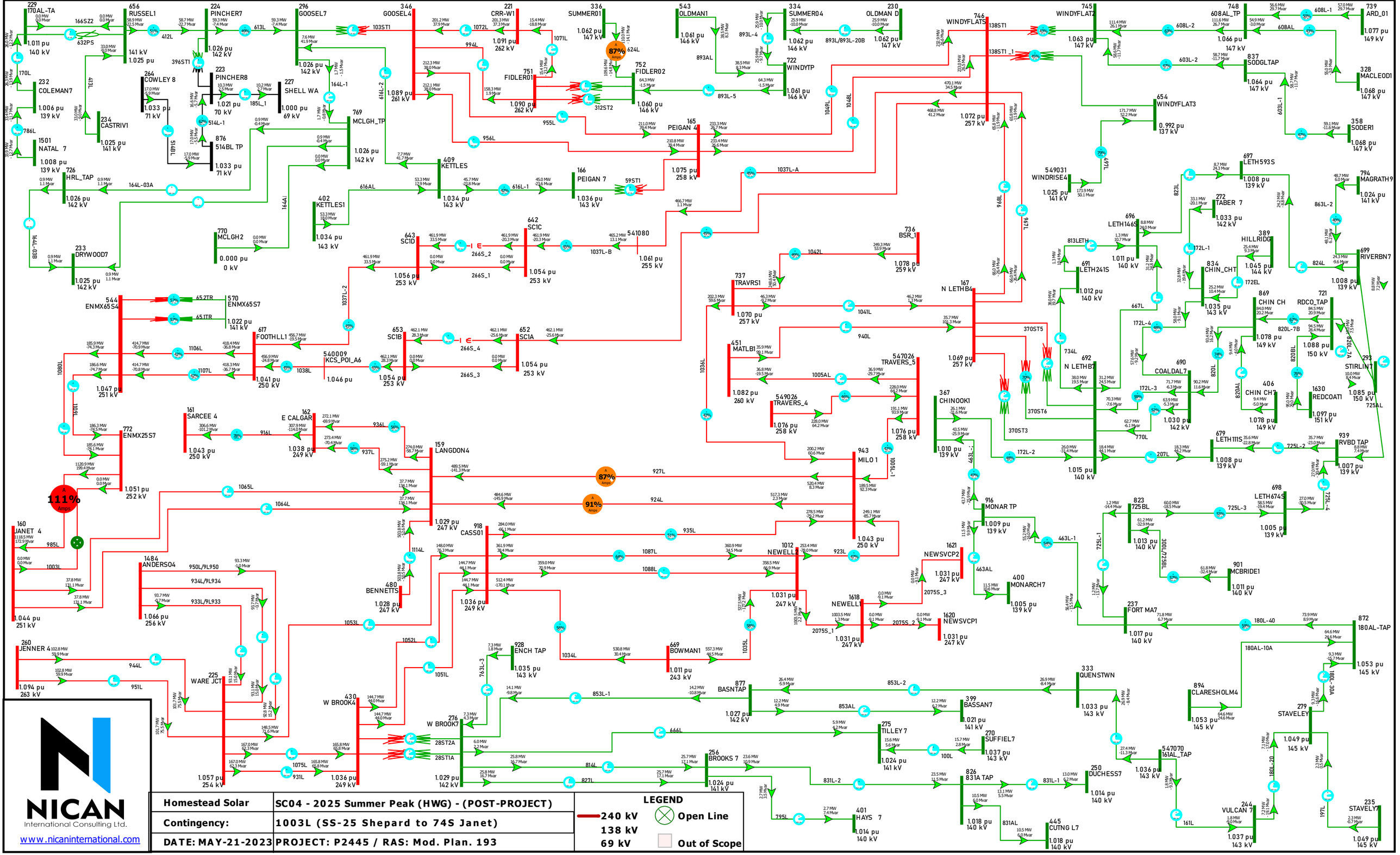
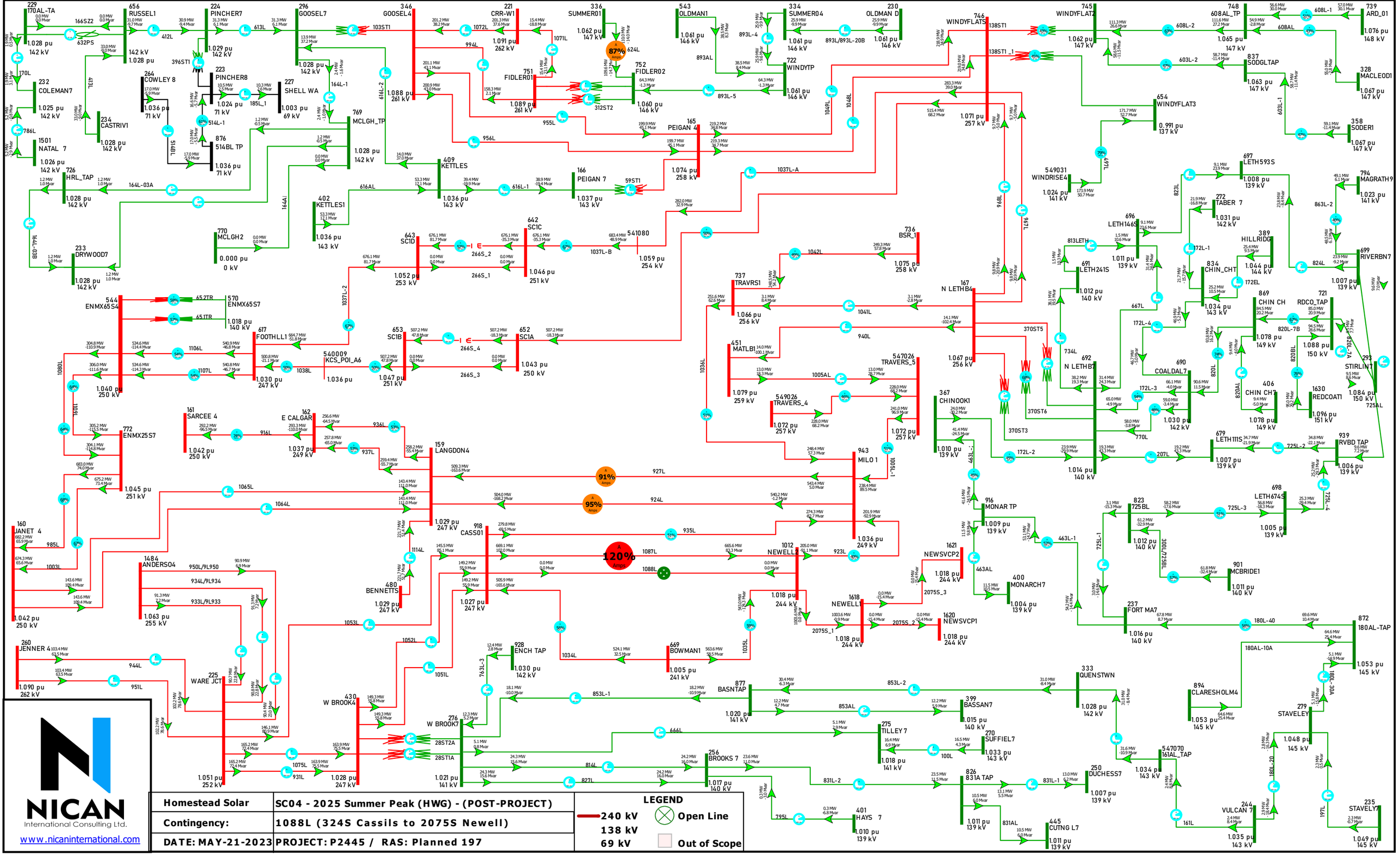

170AL-TA
166SZ2
632PS
RUSSEL1
PINCHER7
GOOSEL7
GOOSEL4
CRR-W1
SUMMER01
OLDMAN1
SUMMER04
OLDMAN D
893L-4
893L/893L-20B
WINDYFLAT2
WINDYFLAT3
608AL_TP
608L-1
608L-2
608AL
603L-2
603L-1
SODGLTAP
ARD_01
MACLEOD1
SODER1
COWLEY 8
PINCHER8
SHELL WA
185L_1
396ST1
514L-1
514BL TP
514BL
COLEMAN7
CASTRIV1
NATAL 7
786L
HRL_TAP
164L-03A
DRYWOOD7
MCLGH_TP
MCLGH2
KETTLES
KETTLES1
616AL
616L-1
616L-2
PEIGAN 4
PEIGAN 7
59ST1
FIDLER01
FIDLER02
312ST2
955L
956L
994L
1071L
624L
893L-5
1040L
1048L
1037L-A
1037L-B
1042L
1041L
940L
1005AL
1005L-1
1004L
1003L
1044L
1045L
1046L
1047L
1048L
1049L
1050L
1051L
1052L
1053L
1054L
1055L
1056L
1057L
1058L
1059L
1060L
1061L
1062L
1063L
1064L
1065L
1066L
1067L
1068L
1069L
1070L
1071L
1072L
1073L
1074L
1075L
1076L
1077L
1078L
1079L
1080L
1081L
1082L
1083L


229 170AL-TA
1.028 pu 142 kV
166SZ2
632PS
656 RUSSEL1
142 kV 1.028 pu
412L
224 PINCHER7
1.029 pu 142 kV
396ST1
613L
223 PINCHER8
1.024 pu 71 kV
264 COWLEY 8
1.036 pu 71 kV
227 SHELL WA
1.003 pu 69 kV
185L_1
514L_1
876 514BL TP
1.036 pu 71 kV
514AL
296 GOOSEL7
1.028 pu 142 kV
164L-1
164L-2
346 GOOSEL4
1.088 pu 261 kV
103ST1
201.2 MW 38.2 Mvar
1072L
221 CRR-W1
1.091 pu 262 kV
1071L
994L
751 FIDLER01
1.089 pu 261 kV
158.3 MW 2.1 Mvar
336 SUMMER01
1.062 pu 147 kV
87% Amps
624L
312ST2
752 FIDLER02
1.060 pu 146 kV
543 OLDMAN1
1.061 pu 146 kV
893L-4
893AL
893L-5
334 SUMMER04
1.061 pu 146 kV
893L/893L-20B
230 OLDMAN D
1.061 pu 146 kV
722 WINDYTP
1.061 pu 146 kV
746 WINDYFLATS
138ST1
138ST1_1
1.071 pu 257 kV
745 WINDYFLAT2
1.062 pu 147 kV
608L-2
603L-2
748 608AL_TP
1.065 pu 147 kV
608AL
608L-1
739 ARD_01
1.076 pu 148 kV
837 SODGLTAP
1.063 pu 147 kV
328 MACLEOD1
1.067 pu 147 kV
603L-1
358 SODER1
1.067 pu 147 kV
654 WINDYFLAT3
0.991 pu 137 kV
1048L
1047L
955L
956L
165 PEIGAN 4
1.074 pu 258 kV
199.9 MW 45.1 Mvar
199.7 MW 45.1 Mvar
219.2 MW 34.8 Mvar
219.3 MW 34.7 Mvar
1037L-A
1041L
940L
1005AL
1042L
1035L
1034L
1036L
1037L-2
1037L-B
1038L
1080L
1109L
1106L
1107L
1064L
1065L
1053L
1052L
1051L
1114L
1087L
1088L
1003L
985L
1001L
1002L
1010L
1011L
1012L
1013L
1014L
1015L
1016L
1017L
1018L
1019L
1020L
1021L
1022L
1023L
1024L
1025L
1026L
1027L
1028L
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1030L
1031L
1032L
1033L
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1035L
1036L
1037L
1038L
1039L
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1041L
1042L
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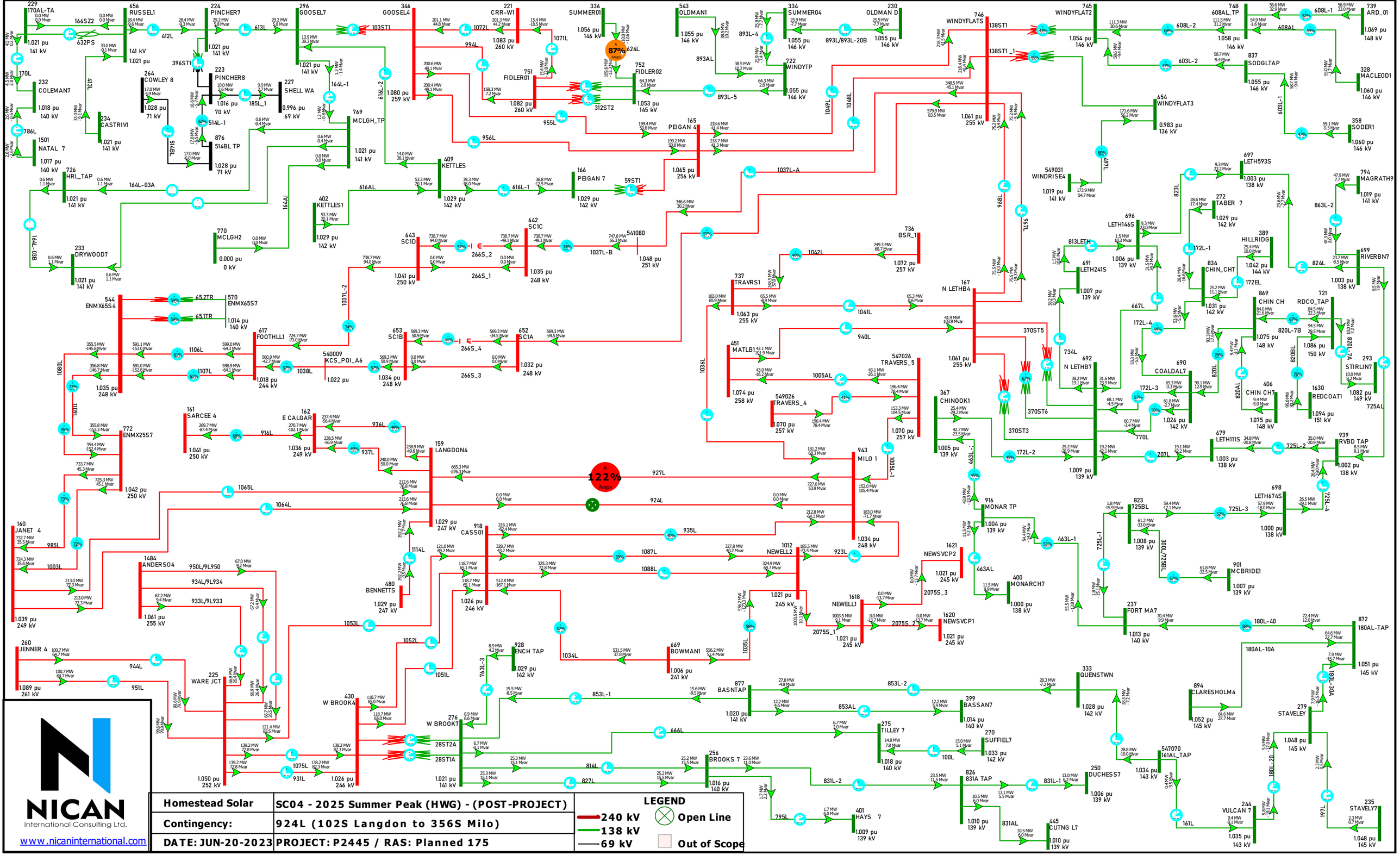
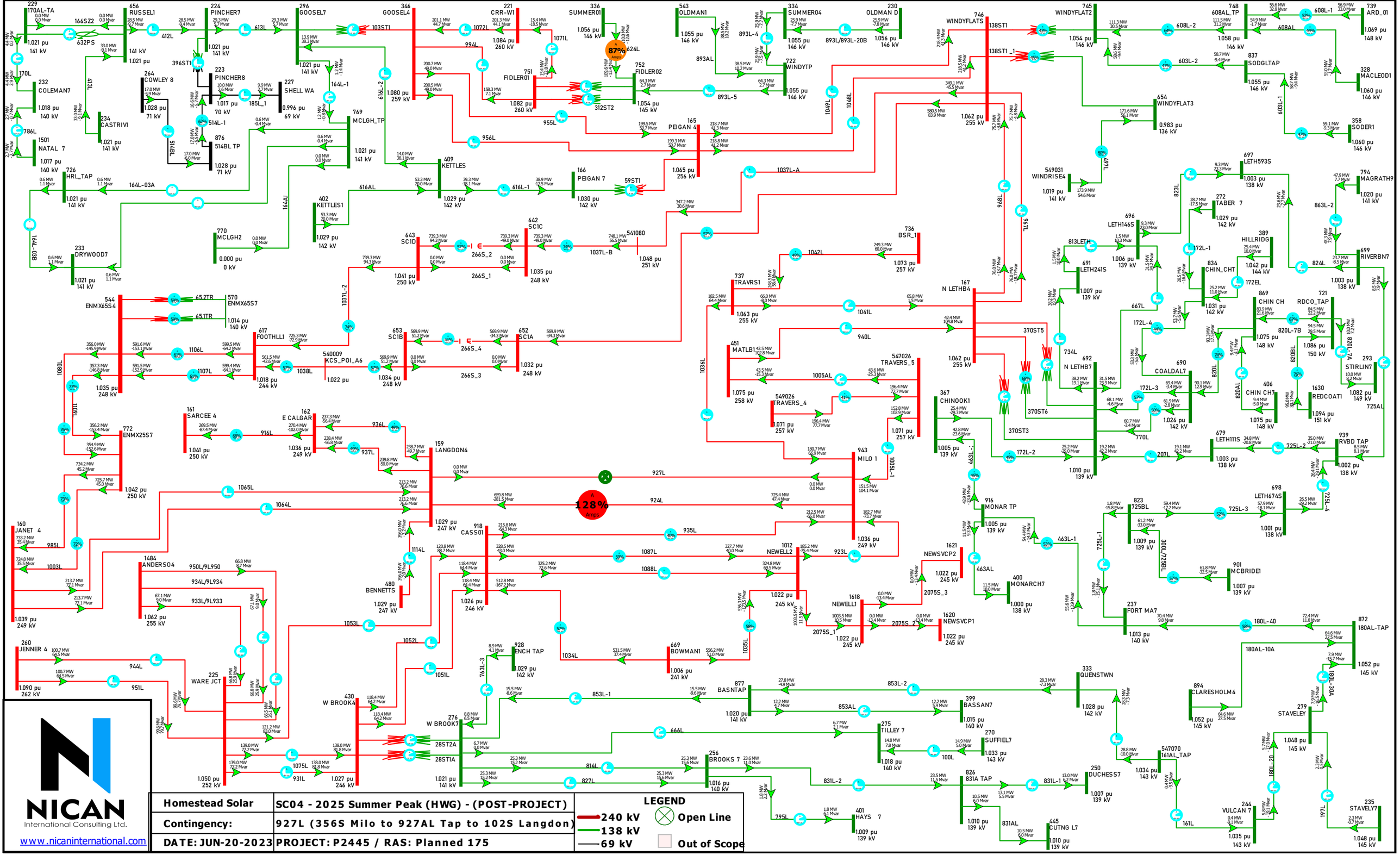
1047L
1048L
1049L


229
170AL-TA
1.021 pu
141 kV
166SZ2
632PS
656
RUSSEL1
141 kV
1.021 pu
412L
224
PINCHER7
1.021 pu
141 kV
613L
396ST1
223
PINCHER8
1.016 pu
70 kV
185L_1
227
SHELL WA
0.996 pu
69 kV
264
COWLEY 8
1.028 pu
71 kV
414L
170L
232
COLEMAN7
1.018 pu
140 kV
234
CASTRIVI
1.021 pu
141 kV
786L
1501
NATAL 7
1.017 pu
140 kV
514L-1
876
514BL TP
1.028 pu
71 kV
514BL
726
HRL_TAP
1.021 pu
141 kV
164L-03A
164AL
233
DRYWOOD7
1.021 pu
141 kV
B03L-7
770
MCLGH2
0.000 pu
0 kV
296
GOOSEL7
1.021 pu
141 kV
103ST1
164L-1
769
MCLGH_TP
1.021 pu
141 kV
346
GOOSEL4
1.080 pu
259 kV
616L-2
994L
956L
955L
409
KETTLES
1.029 pu
142 kV
402
KETTLES1
1.029 pu
142 kV
616AL
616L-1
166
PEIGAN 7
1.029 pu
142 kV
59ST1
221
CRR-W1
1.083 pu
260 kV
1072L
1071L
751
FIDLER01
1.082 pu
260 kV
336
SUMMER01
1.056 pu
146 kV
624L
87%
Amps
752
FIDLER02
1.053 pu
145 kV
312ST2
543
OLDMAN1
1.055 pu
146 kV
893AL
893L-4
893L-5
334
SUMMER04
1.055 pu
146 kV
893L/893L-20B
230
OLDMAN D
1.055 pu
146 kV
722
WINDYTP
1.055 pu
146 kV
165
PEIGAN 4
1.065 pu
256 kV
1049L
1048L
1037L-A
746
WINDYFLATS
138ST1
138ST1_1
1.061 pu
255 kV
745
WINDYFLAT2
1.054 pu
146 kV
608L-2
748
608AL_TP
1.058 pu
146 kV
608L-1
608AL
739
ARD_01
1.069 pu
148 kV
603L-2
837
SODGLTAP
1.055 pu
146 kV
328
MACLEOD1
1.060 pu
146 kV
603L-1
358
SODER1
1.060 pu
146 kV
654
WINDYFLAT3
0.983 pu
136 kV
549031
WINDRISE4
1.019 pu
141 kV
169L
697
LETH593S
1.003 pu
138 kV
794
MAGRATH9
1.019 pu
141 kV
863L-2
823L
272
TABER 7
1.029 pu
142 kV
696
LETH146S
1.006 pu
139 kV
813LETH
691
LETH241S
1.007 pu
139 kV
172L-1
834
CHIN_CHT
1.031 pu
142 kV
172EL
389
HILLRIDG
1.042 pu
144 kV
824L
699
RIVERBN7
1.003 pu
138 kV
172L-4
667L
869
CHIN CH
1.075 pu
148 kV
721
RDCO_TAP
1.086 pu
150 kV
820L-7B
820L-7A
293
STIRLIN7
1.082 pu
149 kV
725AL
820BL
820AL
406
CHIN CH7
1.075 pu
148 kV
1630
REDCOAT1
1.094 pu
151 kV
690
COALDAL7
1.026 pu
142 kV
172L-3
820L
736
BSR_1
1.072 pu
257 kV
1042L
737
TRAVRS1
1.063 pu
255 kV
1041L
940L
451
MATLB1
1.074 pu
258 kV
1005AL
549026
TRAVERS_4
1.070 pu
257 kV
547026
TRAVERS_5
1.070 pu
257 kV
1005L-1
943
MILO 1
1.034 pu
248 kV
1034L
167
N LETHB4
1.061 pu
255 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.009 pu
139 kV
367
CHINOOK1
1.005 pu
139 kV
172L-2
207L
679
LETH111S
1.003 pu
138 kV
939
RVBD TAP
1.002 pu
138 kV
725L-2
698
LETH674S
1.000 pu
138 kV
725L-4
725L-3
823
725BL
1.008 pu
139 kV
725L-1
3001/725BL
901
MCBRIDE1
1.007 pu
139 kV
916
MONAR TP
1.004 pu
139 kV
463L-1
463AL
400
MONARCH7
1.000 pu
138 kV
1621
NEWSVCP2
1.021 pu
245 kV
2075S_3
1618
NEWELL1
1.021 pu
245 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.021 pu
245 kV
1012
NEWELL2
1.021 pu
245 kV
923L
1087L
1088L
669
BOWMANI
1.006 pu
241 kV
1035L
763L-3
928
ENCH TAP
1.029 pu
142 kV
928L
918
CASS01
1.026 pu
246 kV
1114L
480
BENNETTS
1.029 pu
247 kV
1053L
1052L
1051L
935L
927L
924L
159
LANGDON4
1.029 pu
247 kV
1065L
1064L
985L
1003L
160
JANET 4
1.039 pu
249 kV
1484
ANDERSO4
1.061 pu
255 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1.089 pu
261 kV
944L
951L
225
WARE JCT
430
W BROOK4
276
W BROOK7
1.021 pu
141 kV
28ST2A
28ST1A
666L
814L
827L
795L
1.050 pu
252 kV
1075L
931L
1.026 pu
246 kV
877
BASNTAP
1.020 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.014 pu
140 kV
275
TILLEY 7
1.018 pu
140 kV
100L
270
SUFFIEL7
1.033 pu
142 kV
256
BROOKS 7
1.016 pu
140 kV
831L-2
831L-1
826
831A TAP
1.010 pu
139 kV
831AL
445
CUTNG L7
1.010 pu
139 kV
250
DUCHESS7
1.006 pu
139 kV
333
QUENSTWN
1.028 pu
142 kV
894
CLARESHOLM4
1.052 pu
145 kV
180L-10A
180L-40
872
180AL-TAP
1.051 pu
145 kV
180L-30A
279
STAVELEY
1.048 pu
145 kV
547070
161AL_TAP
1.034 pu
143 kV
161L
244
VULCAN 7
1.035 pu
143 kV
235
STAVELY7
1.048 pu
145 kV
180L-20
1691L
544
ENMX65S4
570
ENMX65S7
1.014 pu
140 kV
65.2TR
65.1TR
1106L
1107L
1080L
1109L
1035 pu
248 kV
617
FOOTHLL1
1038L
1018 pu
244 kV
540009
KCS_POI_A6
1.022 pu
653
SC1B
1041 pu
250 kV
266S_4
266S_3
652
SC1A
1032 pu
248 kV
643
SC1D
266S_2
266S_1
1035 pu
248 kV
642
SC1C
541080
1037L-B
1048 pu
251 kV
1037L-2
772
ENMX25S7
1042 pu
250 kV
161
SARCEE 4
1041 pu
250 kV
916L
162
E CALGAR
1036 pu
249 kV
936L
937L
1065L
1064L
1039 pu
249 kV
985L
1003L
1484
ANDERSO4
1061 pu
255 kV
950L/9L950
934L/9L934
933L/9L933
260
JENNER 4
1089 pu
261 kV
944L
951L
225
WARE JCT
430
W BROOK4
276
W BROOK7
1.021 pu
141 kV
28ST2A
28ST1A
1050 pu
252 kV
1075L
931L
1.026 pu
246 kV
877
BASNTAP
1.020 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.014 pu
140 kV
275
TILLEY 7
1.018 pu
140 kV
100L
270
SUFFIEL7
1.033 pu
142 kV
256
BROOKS 7
1.016 pu
140 kV
831L-2
831L-1
826
831A TAP
1.010 pu
139 kV
831AL
445
CUTNG L7
1.010 pu
139 kV
250
DUCHESS7
1.006 pu
139 kV
333
QUENSTWN
1.028 pu
142 kV
894
CLARESHOLM4
1.052 pu
145 kV
180L-10A
180L-40
872
180AL-TAP
1.051 pu
145 kV
180L-30A
279
STAVELEY
1.048 pu
145 kV
547070
161AL_TAP
1.034 pu
143 kV
161L
244
VULCAN 7
1.035 pu
143 kV
235
STAVELY7
1.048 pu
145 kV
180L-20
1691L
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
924L (102S Langdon to 356S Milo)
DATE: JUN-20-2023
PROJECT: P2445 / RAS: Planned 175



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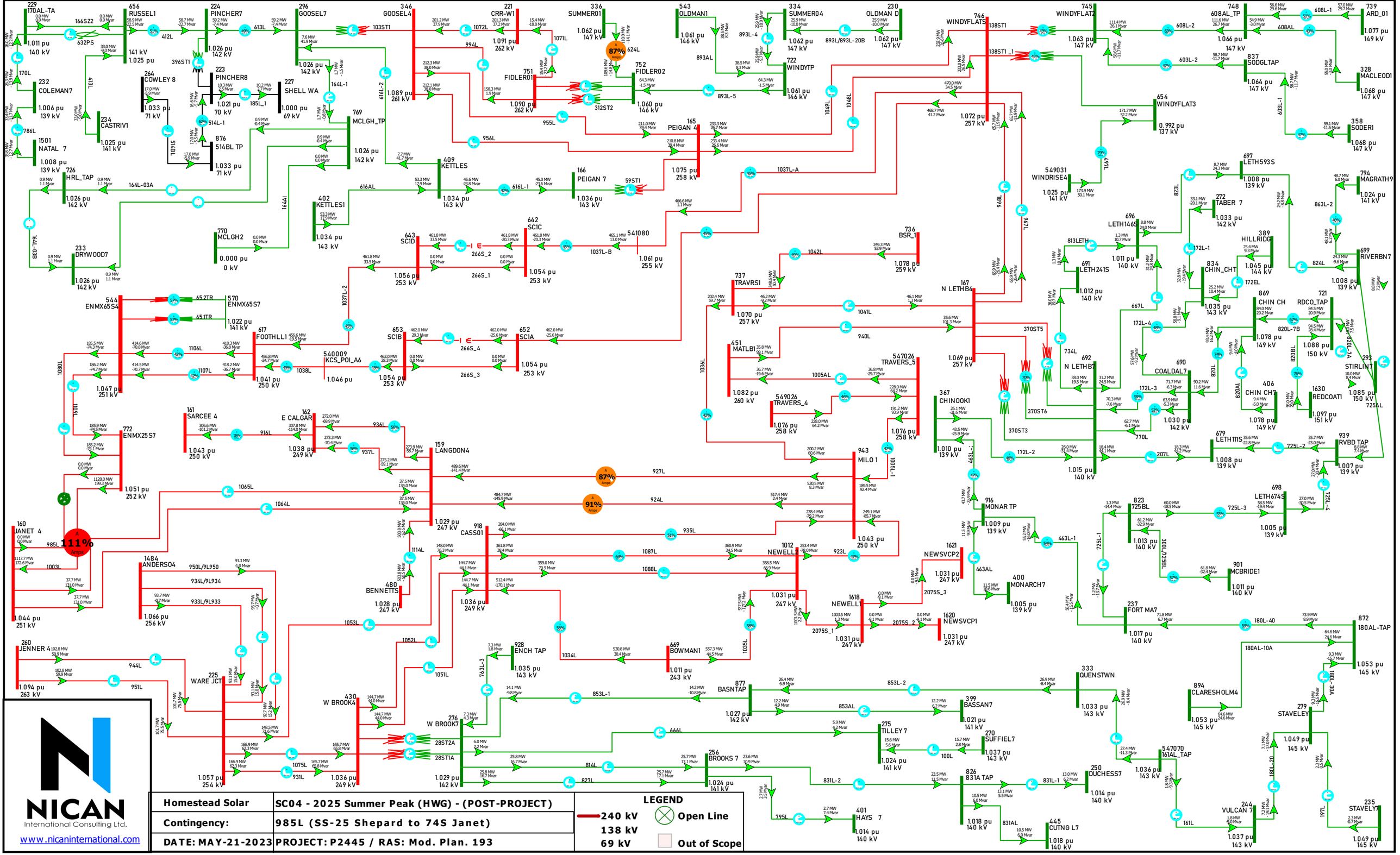
Homestead Solar	SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:	927L (356S Milo to 927AL Tap to 102S Langdon)
DATE: JUN-20-2023	PROJECT: P2445 / RAS: Planned 175

LEGEND
- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope


229
170AL-TA
1.011 pu
140 kV
656
RUSSEL1
141 kV
1.025 pu
166SZ2
632PS
224
PINCHER7
1.026 pu
142 kV
613L
296
GOOSEL7
1.026 pu
142 kV
346
GOOSEL4
1.089 pu
261 kV
221
CRR-W1
1.091 pu
262 kV
1072L
1071L
336
SUMMER01
1.062 pu
147 kV
87%
624L
543
OLDMAN1
1.061 pu
146 kV
893L-4
334
SUMMER04
1.062 pu
147 kV
893L/893L-20B
230
OLDMAN D
1.062 pu
147 kV
745
WINDYFLAT2
1.063 pu
147 kV
748
608AL_TP
1.066 pu
147 kV
608L-1
608L-2
608AL
739
ARD_01
1.077 pu
149 kV
328
MACLEOD1
1.068 pu
147 kV
603L-2
837
SODGLTAP
1.064 pu
147 kV
603L-1
358
SODER1
1.068 pu
147 kV
746
WINDYFLAT3
0.992 pu
137 kV
654
WINDYFLAT3
0.992 pu
137 kV
549031
WINDRISE4
1.025 pu
141 kV
697
LETH593S
1.008 pu
139 kV
794
MAGRATH9
1.024 pu
141 kV
863L-2
699
RIVERBN7
1.008 pu
139 kV
824L
272
TABER 7
1.033 pu
142 kV
823L
696
LETH146S
1.011 pu
140 kV
813LETH
691
LETH241S
1.012 pu
140 kV
834
CHIN_CHT
1.045 pu
144 kV
389
HILLRIDG
1.045 pu
144 kV
172L-1
172EL
869
CHIN CH
1.078 pu
149 kV
721
RDCO_TAP
1.088 pu
150 kV
820L-7B
820L-7A
293
STIRLIN7
1.085 pu
150 kV
725AL
820BL
820AL
406
CHIN CH7
1.078 pu
149 kV
1630
REDCOAT1
1.097 pu
151 kV
690
COALDAL7
1.030 pu
142 kV
172L-4
172L-3
667L
734L
692
N LETHB7
1.015 pu
140 kV
370ST5
370ST6
370ST3
172L-2
207L
679
LETH111S
1.008 pu
139 kV
939
RVBD TAP
1.007 pu
139 kV
725L-2
698
LETH674S
1.005 pu
139 kV
725L-4
725L-3
725L-1
823
725BL
1.013 pu
140 kV
3001/7298L
901
MCBRIDE1
1.011 pu
140 kV
237
FORT MA7
1.017 pu
140 kV
180L-40
872
180AL-TAP
1.053 pu
145 kV
180AL-10A
894
CLARESHOLM4
1.053 pu
145 kV
180L-30A
279
STAVELEY
1.049 pu
145 kV
180L-20
235
STAVELY7
1.049 pu
145 kV
197L
244
VULCAN 7
1.037 pu
143 kV
161L
547070
161AL_TAP
1.036 pu
143 kV
250
DUCHESS7
1.014 pu
140 kV
831L-1
831L-2
826
831A TAP
1.018 pu
140 kV
831AL
445
CUTNG L7
1.018 pu
140 kV
401
HAYS 7
1.014 pu
140 kV
795L
927L
924L
943
MILO 1
1.015 pu
140 kV
1005L-1
463L-1
916
MONAR TP
1.009 pu
139 kV
463AL
1621
NEWSVCP2
1.031 pu
247 kV
2075S_3
400
MONARCH7
1.005 pu
139 kV
1618
NEWELL1
1.031 pu
247 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.031 pu
247 kV
1012
NEWELL2
1.031 pu
247 kV
923L
935L
1087L
1088L
918
CASS01
1.036 pu
249 kV
1.029 pu
247 kV
1034L
669
BOWMAN1
1.011 pu
243 kV
1035L
763L-3
928
ENCH TAP
1.035 pu
143 kV
1053L
1052L
1051L
1114L
480
BENNETTS
1.028 pu
247 kV
1484
ANDERSO4
1.066 pu
256 kV
950L/9L950
934L/9L934
933L/9L933
1003L
985L
111%
160
JANET 4
1.044 pu
251 kV
260
JENNER 4
1.094 pu
263 kV
944L
951L
225
WARE JCT
1.057 pu
254 kV
1075L
931L
430
W BROOK4
1.036 pu
249 kV
276
W BROOK7
1.029 pu
142 kV
28ST2A
28ST1A
1065L
1064L
1080L
1109L
772
ENMX25S7
1.051 pu
252 kV
161
SARCEE 4
1.043 pu
250 kV
162
E CALGAR
1.038 pu
249 kV
916L
936L
937L
159
LANGDON4
927L
924L
1029L
544
ENMX65S4
570
ENMX65S7
1.022 pu
141 kV
65.2TR
65.1TR
1106L
1107L
617
FOOTHLL1
1.041 pu
250 kV
1038L
540009
KCS_POI_A6
1.046 pu
1037L-2
643
SC1D
1.056 pu
253 kV
266S_2
266S_1
642
SC1C
1.054 pu
253 kV
541080
1.061 pu
255 kV
1037L-B
653
SC1B
1.054 pu
253 kV
266S_4
266S_3
652
SC1A
1.054 pu
253 kV
1037L-A
1037L
1042L
1041L
940L
1005AL
1036L
451
MATLBI
1.082 pu
260 kV
737
TRAVRS1
1.070 pu
257 kV
736
BSR_1
1.078 pu
259 kV
547026
TRAVERS_5
1.076 pu
258 kV
549026
TRAVERS_4
1.076 pu
258 kV
167
N LETHB4
1.069 pu
257 kV
367
CHINOOK1
1.010 pu
139 kV
631L
877
BASNTAP
1.027 pu
142 kV
853L-2
853L-1
853AL
399
BASSAN7
1.021 pu
141 kV
333
QUENSTWN
1.033 pu
143 kV
275
TILLEY 7
1.024 pu
141 kV
100L
270
SUFFIEL7
1.037 pu
143 kV
256
BROOKS 7
1.024 pu
141 kV
814L
827L
666L
1.7TR
1.8TR
1.9TR
1.10TR
1.11TR
1.12TR
1.13TR
1.14TR
1.15TR
1.16TR
1.17TR
1.18TR
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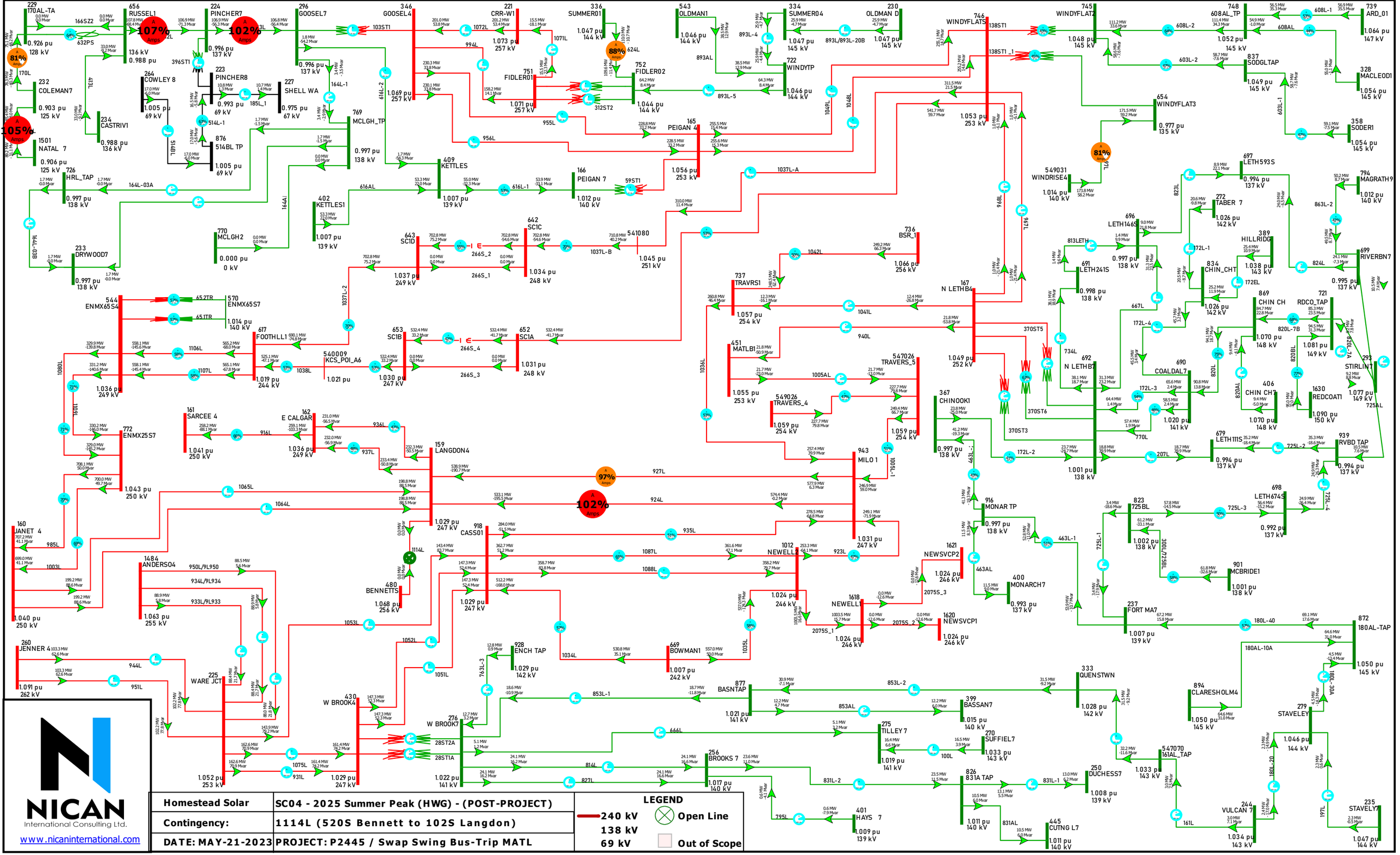
1.49TR


229
170AL-TA
0.926 pu
128 kV
656
RUSSEL1
107%
136 kV
0.988 pu
166SZ2
632PS
224
PINCHER7
102%
0.996 pu
137 kV
106.9 MW
-71.3 Mvar
106.8 MW
-55.4 Mvar
396ST1
223
PINCHER8
0.993 pu
69 kV
185L_1
227
SHELL WA
0.975 pu
67 kV
296
GOOSEL7
0.996 pu
137 kV
1.8 MW
-54.2 Mvar
164L-1
346
GOOSEL4
103ST1
1.069 pu
257 kV
201.0 MW
53.8 Mvar
1072L
221
CRR-W1
1.073 pu
257 kV
15.5 MW
-18.1 Mvar
1071L
336
SUMMER01
1.047 pu
144 kV
624L
88%
543
OLDMAN1
1.046 pu
144 kV
893L-4
334
SUMMER04
1.047 pu
145 kV
893L/893L-20B
230
OLDMAN D
1.047 pu
145 kV
893AL
752
FIDLER02
1.044 pu
144 kV
893L-5
751
FIDLER01
1.071 pu
257 kV
312ST2
994L
955L
956L
769
MCLGH_TP
0.997 pu
138 kV
409
KETTLES
1.007 pu
139 kV
616L-1
166
PEIGAN 7
1.012 pu
140 kV
59ST1
165
PEIGAN 4
1.056 pu
253 kV
1037L-A
1037L-B
541080
1.045 pu
251 kV
310.0 MW
11.4 Mvar
402
KETTLES1
1.007 pu
139 kV
616AL
770
MCLGH2
0.000 pu
0 kV
642
SC1C
643
SC1D
1.037 pu
249 kV
266S_2
266S_1
1.034 pu
248 kV
702.8 MW
75.2 Mvar
702.8 MW
-54.6 Mvar
1501
NATAL 7
0.906 pu
125 kV
232
COLEMAN7
0.903 pu
125 kV
234
CASTRIV1
0.988 pu
136 kV
264
COWLEY 8
1.005 pu
69 kV
514L-1
876
514BL TP
1.005 pu
69 kV
514AL
4191
170L
726
HRL_TAP
0.997 pu
138 kV
164L-03A
1941
03AL
233
DRYWOOD7
0.997 pu
138 kV
1641
164AL
544
ENMX65S4
570
ENMX65S7
1.014 pu
140 kV
65.2TR
65.1TR
617
FOOTHLL1
1.019 pu
244 kV
1038L
540009
KCS_POI_A6
1.021 pu
1037L-2
653
SC1B
652
SC1A
1.030 pu
247 kV
266S_4
266S_3
1.031 pu
248 kV
1106L
1107L
1080L
1036 pu
249 kV
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772
ENMX25S7
1.043 pu
250 kV
161
SARCEE 4
1.041 pu
250 kV
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E CALGAR
1.036 pu
249 kV
936L
937L
159
LANGDON4
1065L
1064L
1.029 pu
247 kV
927L
924L
97%
102%
1114L
480
BENNETTS
1.068 pu
256 kV
160
JANET 4
1.040 pu
250 kV
985L
1003L
1484
ANDERSO4
1.063 pu
255 kV
950L/9L950
934L/9L934
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1053L
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JENNER 4
1.091 pu
262 kV
944L
951L
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WARE JCT
430
W BROOK4
1.052 pu
253 kV
1075L
931L
1.029 pu
247 kV
276
W BROOK7
28ST2A
28ST1A
1.022 pu
141 kV
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ENCH TAP
1.029 pu
142 kV
763L-3
669
BOWMAN1
1.007 pu
242 kV
1034L
1035L
530.8 MW
35.1 Mvar
557.0 MW
52.0 Mvar
877
BASNTAP
1.021 pu
141 kV
853L-1
853L-2
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BROOKS 7
1.017 pu
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TRAVRS1
1.057 pu
254 kV
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MATLBT
1.055 pu
253 kV
547026
TRAVERS_5
1.059 pu
254 kV
549026
TRAVERS_4
1.059 pu
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BSR_1
1.066 pu
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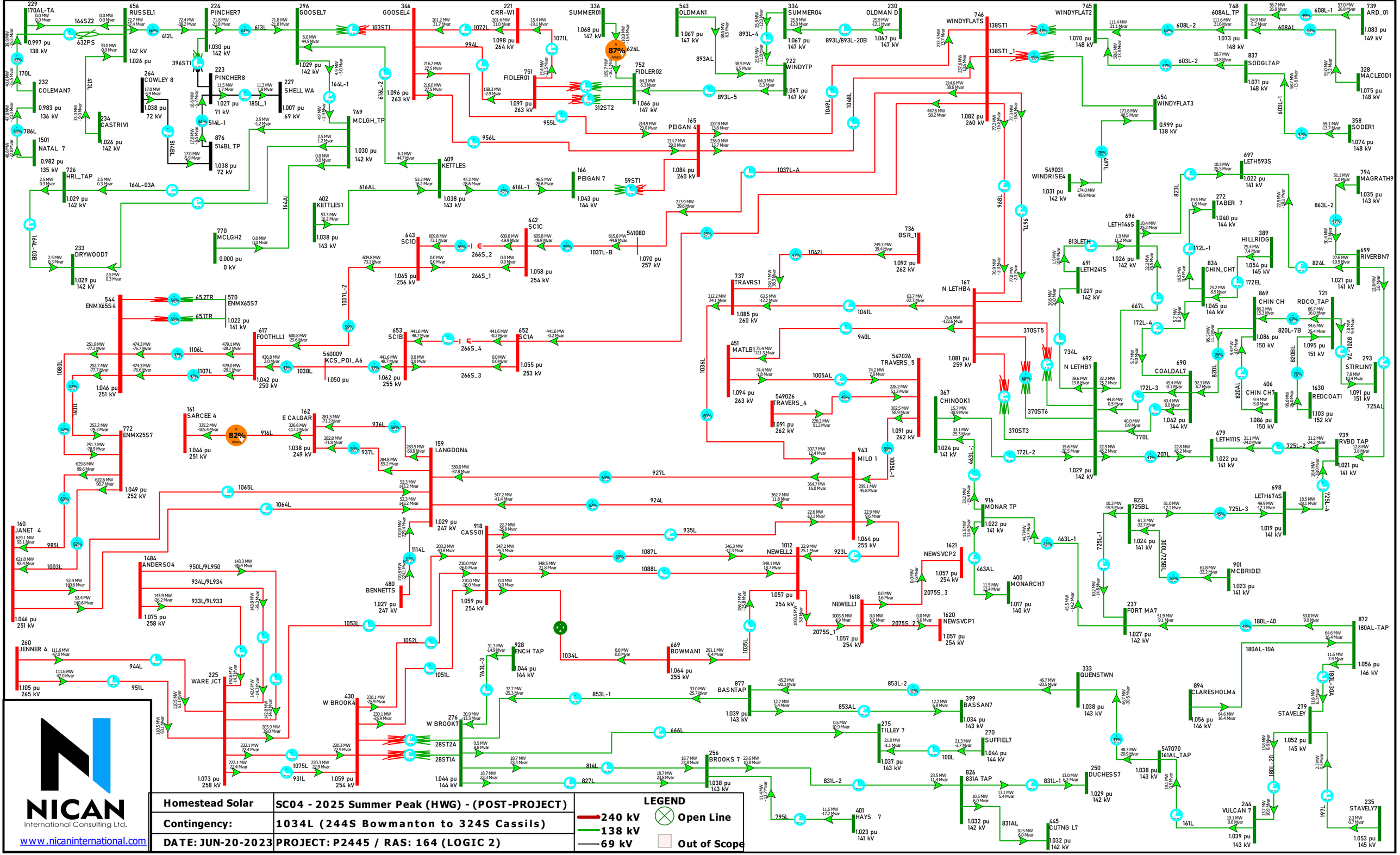
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
1114L (520S Bennett to 102S Langdon)
DATE: MAY-21-2023
PROJECT: P2445 / Swap Swing Bus-Trip MATL
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



Homestead Solar	**SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)**
Contingency:	**1034L (244S Bowmanton to 324S Cassils)**
DATE: JUN-20-2023	**PROJECT: P2445 / RAS: 164 (LOGIC 2)**

LEGEND

- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope

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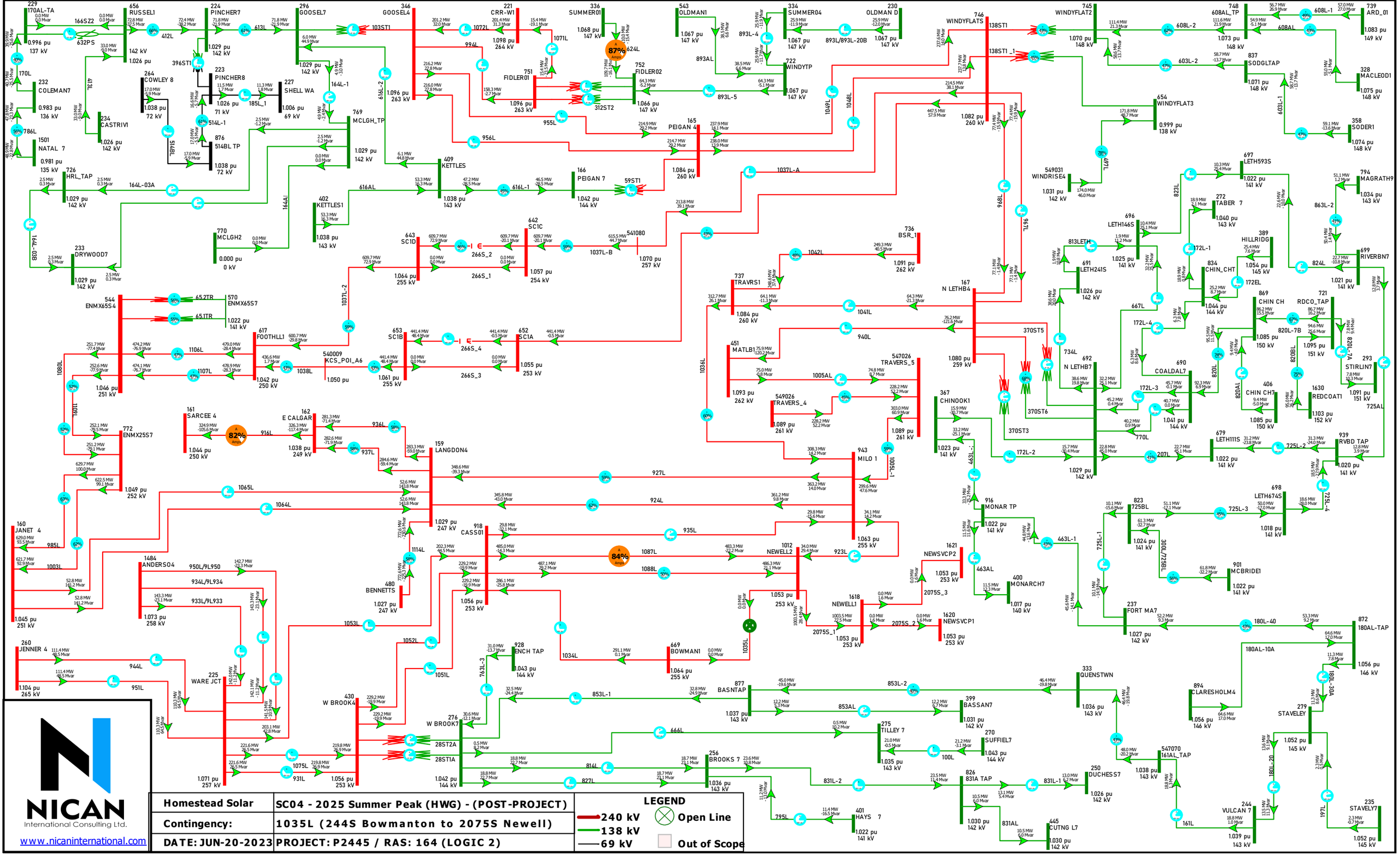
229
170AL-TA
166SZ2
656
RUSSEL1
632PS
412L
224
PINCHER7
613L
396ST1
223
PINCHER8
185L_1
227
SHELL WA
264
COWLEY 8
414L
232
COLEMAN7
234
CASTRIVI
170L
786L
1501
NATAL 7
514L-1
514BL TP
876
514BL
769
MCLGH_TP
726
HRL_TAP
164L-03A
164L-1
164L-2
233
DRYWOOD7
B03L
770
MCLGH2
0.000 pu
0 kV
296
GOOSEL7
103ST1
346
GOOSEL4
994L
956L
955L
1096 pu
263 kV
409
KETTLES
616AL
616L-1
402
KETTLES1
1038 pu
143 kV
166
PEIGAN 7
59ST1
1042 pu
144 kV
165
PEIGAN 4
1084 pu
260 kV
221
CRR-W1
1098 pu
264 kV
1072L
1071L
751
FIDLER01
312ST2
752
FIDLER02
1066 pu
147 kV
336
SUMMER01
1068 pu
147 kV
624L
543
OLDMAN1
1067 pu
147 kV
893L-4
893AL
893L-5
334
SUMMER04
893L/893L-20B
230
OLDMAN D
722
WINDYTP
746
WINDYFLATS
138ST1
138ST1_1
1082 pu
260 kV
1049L
1048L
1037L-A
1037L-B
541080
1070 pu
257 kV
642
SC1C
643
SC1D
266S_2
266S_1
1064 pu
255 kV
1057 pu
254 kV
653
SC1B
652
SC1A
266S_4
266S_3
1061 pu
255 kV
1055 pu
253 kV
540009
KCS_POI_A6
1050 pu
617
FOOTHLL1
1038L
1042 pu
250 kV
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1022 pu
141 kV
1046 pu
251 kV
1080L
1106L
1107L
1109L
772
ENMX25S7
1049 pu
252 kV
161
SARCEE 4
1044 pu
250 kV
82%
916L
162
E CALGAR
1038 pu
249 kV
936L
937L
159
LANGDON4
927L
924L
935L
1065L
1064L
1029 pu
247 kV
1114L
480
BENNETTS
1027 pu
247 kV
1087L
1088L
84%
918
CASS01
1056 pu
253 kV
1012
NEWELL2
1053 pu
253 kV
1053L
1052L
1051L
1034L
669
BOWMAN1
1064 pu
255 kV
1035L
1618
NEWELL1
2075S_1
2075S_2
1620
NEWSVCP1
1053 pu
253 kV
1621
NEWSVCP2
2075S_3
463AL
400
MONARCH7
1017 pu
140 kV
916
MONAR TP
1022 pu
141 kV
463L-1
1160
JANET 4
1045 pu
251 kV
985L
1003L
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1073 pu
258 kV
260
JENNER 4
1104 pu
265 kV
944L
951L
225
WARE JCT
1071 pu
257 kV
1075L
931L
430
W BROOK4
1056 pu
253 kV
928
BENCH TAP
1043 pu
144 kV
763L-3
853L-1
877
BASNTAP
1037 pu
143 kV
853L-2
853AL
399
BASSAN7
1031 pu
142 kV
333
QUENSTWN
1036 pu
143 kV
276
W BROOK7
28ST2A
28ST1A
1042 pu
144 kV
666L
814L
827L
275
TILLEY 7
1035 pu
143 kV
100L
270
SUFFIEL7
1043 pu
144 kV
256
BROOKS 7
1036 pu
143 kV
831L-2
826
831A TAP
1030 pu
142 kV
831L-1
250
DUCHESS7
1026 pu
142 kV
831AL
445
CUTNG L7
1030 pu
142 kV
795L
401
HAYS 7
1022 pu
141 kV
1005L-1
943
MILO 1
1063 pu
255 kV
1005AL
451
MATLB1
1093 pu
262 kV
1042L
737
TRAVRS1
1084 pu
260 kV
1041L
940L
547026
TRAVERS_5
1089 pu
261 kV
549026
TRAVERS_4
1089 pu
261 kV
736
BSR_1
1091 pu
262 kV
167
N LETHB4
1080 pu
259 kV
370ST5
370ST6
370ST3
692
N LETHB7
734L
367
CHINOOK1
1023 pu
141 kV
163L
172L-2
1029 pu
142 kV
207L
679
LETH111S
1022 pu
141 kV
939
RVBD TAP
1020 pu
141 kV
725L-2
725L-4
698
LETH674S
1018 pu
141 kV
725L-3
823
725BL
1024 pu
141 kV
300L/725BL
901
MCBRIDE1
1022 pu
141 kV
725L-1
237
FORT MA7
1027 pu
142 kV
180L-40
872
180AL-TAP
1056 pu
146 kV
180AL-10A
894
CLARESHOLM4
1056 pu
146 kV
180L-30A
279
STAVELEY
1052 pu
145 kV
180L-20
244
VULCAN 7
1039 pu
143 kV
197L
235
STAVELY7
1052 pu
145 kV
547070
161AL_TAP
1038 pu
143 kV
161L
1630
REDCOAT1
1103 pu
152 kV
725AL
293
STIRLIN7
1091 pu
151 kV
820L-7A
820L-7B
820BL
820AL
406
CHIN CH7
1085 pu
150 kV
869
CHIN CH
1085 pu
150 kV
721
RDCO_TAP
1095 pu
151 kV
690
COALDAL7
1041 pu
144 kV
172L-3
172L-4
667L
834
CHIN_CHT
1044 pu
144 kV
172L-1
172EL
272
TABER 7
1040 pu
143 kV
696
LETH146S
1025 pu
141 kV
691
LETH241S
1026 pu
142 kV
813LETH
828L
697
LETH593S
1022 pu
141 kV
549031
WINDRISE4
1031 pu
142 kV
174L
654
WINDYFLAT3
0.999 pu
138 kV
609L-1
358
SODER1
1074 pu
148 kV
837
SODGLTAP
1071 pu
148 kV
603L-2
608L-2
748
608AL_TP
1073 pu
148 kV
608AL
745
WINDYFLAT2
1070 pu
148 kV
608L-1
739
ARD_01
1083 pu
149 kV
328
MACLEOD1
1075 pu
148 kV
794
MAGRATH9
1034 pu
143 kV
863L-2
699
RIVERBN7
1021 pu
141 kV
824L
1609L
1986
1987L
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
Homestead Solar
SC04 - 2025 Summer Peak (HWG) - (POST-PROJECT)
Contingency:
1035L (244S Bowmanton to 2075S Newell)
DATE: JUN-20-2023
PROJECT: P2445 / RAS: 164 (LOGIC 2)
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2025 SUMMER LIGHT (Sensitivity)

Single Line Diagrams
P2445 - POST-PROJECT
RAS RESPONSE SC08

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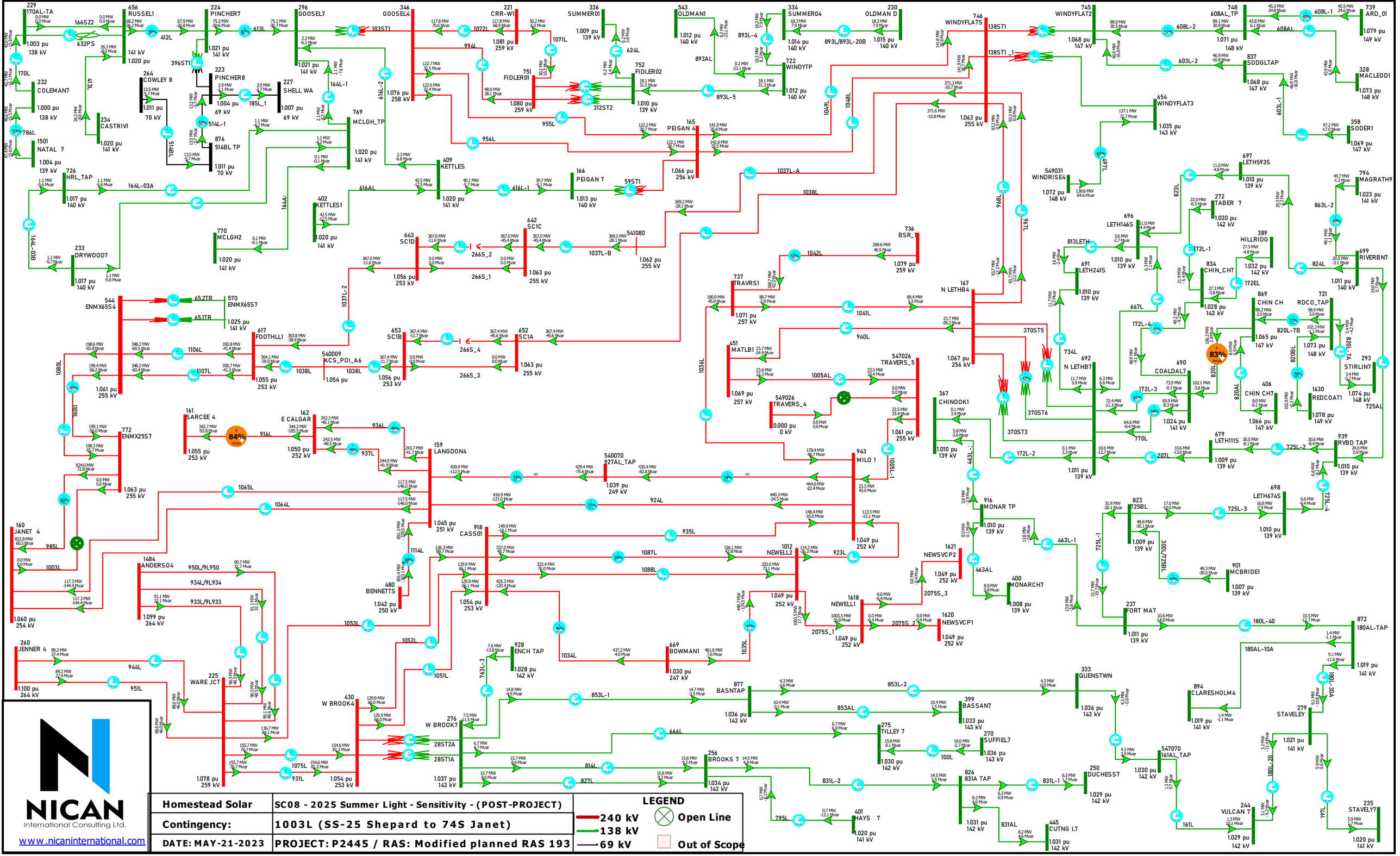
229 170AL-TA 1.003 pu 138 kV
166SZ2
632PS
656 RUSSEL1 141 kV 1.020 pu
412L
224 PINCHER7 1.021 pu 141 kV
613L
296 GOOSEL7 1.021 pu 141 kV
396ST1
223 PINCHER8 1.004 pu 69 kV
264 COWLEY 8 1.011 pu 70 kV
185L_1
227 SHELL WA 1.007 pu 69 kV
164L-1
769 MCLGH_TP 1.020 pu 141 kV
514L-1
876 514BL TP 1.011 pu 70 kV
514L
170L
232 COLEMAN7 1.000 pu 138 kV
234 CASTRIVI 1.020 pu 141 kV
786L
1501 NATAL 7 1.004 pu 139 kV
726 HRL_TAP 1.017 pu 140 kV
164L-03A
1644L
1638L
233 DRYWOOD7 1.017 pu 140 kV
346 GOOSEL4 1.076 pu 258 kV
103ST1
616L-2
994L
956L
955L
221 CRR-W1 1.081 pu 259 kV
1072L
1071L
751 FIDLER01 1.080 pu 259 kV
312ST2
336 SUMMER01 1.009 pu 139 kV
624L
752 FIDLER02 1.010 pu 139 kV
543 OLDMAN1 1.012 pu 140 kV
893AL
893L-5
334 SUMMER04 1.014 pu 140 kV
893L-4
893L/893L-20
230 OLDMAN D 1.015 pu 140 kV
722 WINDYTP 1.012 pu 140 kV
165 PEIGAN 4 1.066 pu 256 kV
1040L
1048L
59ST1
166 PEIGAN 7 1.013 pu 140 kV
409 KETTLES 1.020 pu 141 kV
616L-1
616AL
402 KETTLES1 1.020 pu 141 kV
1644L
770 MCLGH2 1.020 pu 141 kV
1037L-A
1038L
1037L-B
541080 1.062 pu 255 kV
642 SC1C 1.063 pu 255 kV
643 SC1D 1.056 pu 253 kV
266S_2
266S_1
1037L-2
653 SC1B 1.056 pu 253 kV
652 SC1A 1.063 pu 255 kV
266S_4
266S_3
736 BSR_1 1.079 pu 259 kV
1042L
737 TRAVRS1 1.071 pu 257 kV
1041L
940L
451 MATLB1 1.069 pu 257 kV
1005AL
549026 TRAVERS_4 0.000 pu 0 kV
547026 TRAVERS_5 1.061 pu 255 kV
1036L
1035L
544 ENMX65S4 1.061 pu 255 kV
65.2TR
65.1TR
570 ENMX65S7 1.025 pu 141 kV
1106L
1107L
617 FOOTHLL1 1.055 pu 253 kV
540009 KCS_POI_A6 1.054 pu
1080L
1090L
772 ENMX25S7 1.063 pu 255 kV
1065L
1064L
161 SARCEE 4 1.055 pu 253 kV
84% Amps
916L
162 E CALGAR 1.050 pu 252 kV
936L
937L
159 LANGDON4 1.045 pu 251 kV
540070 927AL_TAP 1.039 pu 249 kV
924L
943 MILO 1 1.049 pu 252 kV
1005L-1
160 JANET 4 1.060 pu 254 kV
985L
1003L
1484 ANDERSO4 1.099 pu 264 kV
950L/9L950
934L/9L934
933L/9L933
1114L
480 BENNETTS 1.042 pu 250 kV
1053L
1052L
1051L
918 CASS01 1.054 pu 253 kV
935L
1087L
1088L
1012 NEWELL2 1.049 pu 252 kV
923L
1618 NEWELL1 1.049 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1 1.049 pu 252 kV
1621 NEWSVCP2 1.049 pu 252 kV
2075S_3
463AL
463L-1
400 MONARCH7 1.008 pu 139 kV
916 MONAR TP 1.010 pu 139 kV
260 JENNER 4 1.100 pu 264 kV
944L
951L
225 WARE JCT
430 W BROOK4 1.078 pu 259 kV
1075L
931L
1054 pu 253 kV
276 W BROOK7 1.037 pu 143 kV
28ST2A
28ST1A
763L-3
928 ENCH TAP 1.028 pu 142 kV
669 BOWMAN1 1.030 pu 247 kV
437.2 MW -4.0 Mvar
461.6 MW 7.6 Mvar
853L-1
877 BASNTAP 1.036 pu 143 kV
853L-2
853AL
399 BASSAN7 1.033 pu 143 kV
333 QUENSTWN 1.036 pu 143 kV
666L
275 TILLEY 7 1.030 pu 142 kV
100L
270 SUFFIEL7 1.036 pu 143 kV
814L
827L
256 BROOKS 7 1.034 pu 143 kV
831L-2
826 831A TAP 1.031 pu 142 kV
831L-1
250 DUCHESS7 1.029 pu 142 kV
831AL
445 CUTNG L7 1.031 pu 142 kV
795L
401 HAYS 7 1.020 pu 141 kV
746 WINDYFLATS 138ST1 138ST1_1 1.063 pu 255 kV
1049L
1048L
1047L
549031 WINDRISE4 1.072 pu 148 kV
654 WINDYFLAT3 1.035 pu 143 kV
745 WINDYFLAT2 1.068 pu 147 kV
608AL_TP 608AL 608L-1 608L-2 1.071 pu 148 kV
603L-2
837 SODGLTAP 1.068 pu 147 kV
603L-1
739 ARD_01 1.079 pu 149 kV
328 MACLEOD1 1.073 pu 148 kV
358 SODER1 1.069 pu 147 kV
697 LETH593S 1.010 pu 139 kV
794 MAGRATH9 1.023 pu 141 kV
863L-2
824L
699 RIVERBN7 1.011 pu 140 kV
272 TABER 7 1.030 pu 142 kV
822L
172L-1
696 LETH146S 1.010 pu 139 kV
813LETH
691 LETH241S 1.010 pu 139 kV
389 HILLRIDG 1.032 pu 142 kV
834 CHIN_CHT 1.028 pu 142 kV
172EL
699 RIVERBN7
869 CHIN CH 1.065 pu 147 kV
820L-7B
820L-7A
721 RDCO_TAP 1.073 pu 148 kV
293 STIRLIN7 1.074 pu 148 kV
725AL
1630 REDCOAT1 1.078 pu 149 kV
406 CHIN CH7 1.066 pu 147 kV
820BL
820AL
690 COALDAL7 1.024 pu 141 kV
172L-3
172L-4
667L
734L
692 N LETHB7 1.067 pu 256 kV
370ST5
370ST6
370ST3
167 N LETHB4
367 CHINOOK1 1.010 pu 139 kV
172L-2
207L
679 LETH111S 1.009 pu 139 kV
725L-2
939 RVBD TAP 1.010 pu 139 kV
698 LETH674S 1.010 pu 139 kV
725L-3
725L-4
823 725BL 1.009 pu 139 kV
725L-1
300L/725BL
901 MCBRIDE1 1.007 pu 139 kV
237 FORT MA7 1.011 pu 139 kV
180L-40
872 180AL-TAP 1.019 pu 141 kV
180AL-10A
894 CLARESHOLM4 1.019 pu 141 kV
180L-30A
279 STAVELEY 1.021 pu 141 kV
180L-20
197L
244 VULCAN 7 1.029 pu 142 kV
161L
547070 161AL_TAP 1.030 pu 142 kV
235 STAVELY7 1.020 pu 141 kV
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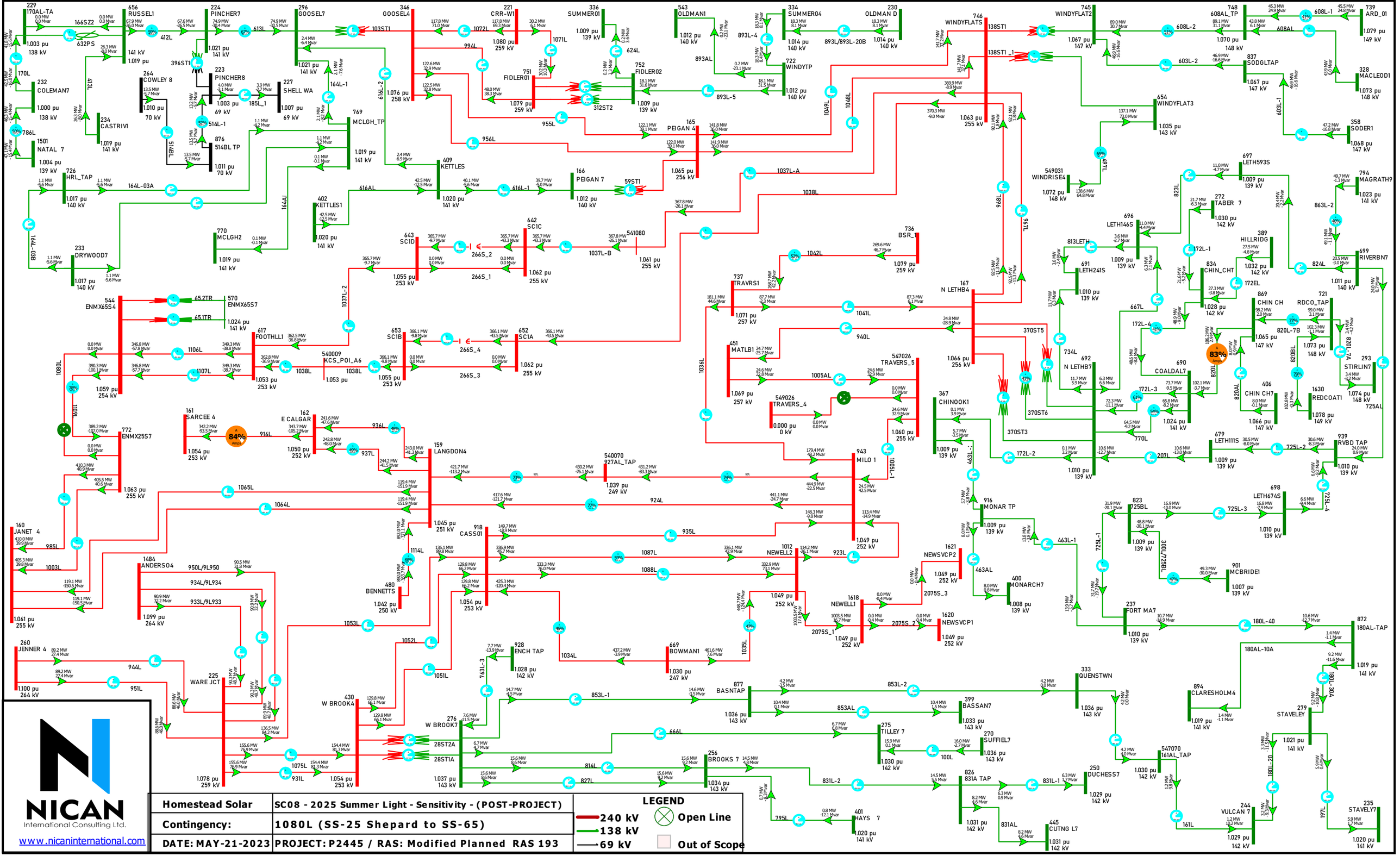
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: Modified planned RAS 193
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229 170AL-TA 1.003 pu 138 kV
656 RUSSEL1 141 kV 1.019 pu
166SZ2
632PS
224 PINCHER7 1.021 pu 141 kV
223 PINCHER8 1.003 pu 69 kV
264 COWLEY 8 1.010 pu 70 kV
227 SHELL WA 1.007 pu 69 kV
185L_1
514L-1
876 514BL TP 1.011 pu 70 kV
296 GOOSEL7 1.021 pu 141 kV
164L-1
769 MCLGH_TP 1.019 pu 141 kV
346 GOOSEL4 1.076 pu 258 kV
103ST1
396ST1
616L-2
409 KETTLES 1.020 pu 141 kV
616AL
402 KETTLES1 1.020 pu 141 kV
770 MCLGH2 1.019 pu 141 kV
164L-03A
164AL
170L 232 COLEMAN7 1.000 pu 138 kV
234 CASTRIVI 1.019 pu 141 kV
786L 1501 NATAL 7 1.004 pu 139 kV
726 HRL_TAP 1.017 pu 140 kV
164L-03B
233 DRYWOOD7 1.017 pu 140 kV
221 CRR-W1 1.080 pu 259 kV
1072L
1071L
994L
751 FIDLER01 1.079 pu 259 kV
955L
956L
336 SUMMER01 1.009 pu 139 kV
624L
752 FIDLER02 1.009 pu 139 kV
312ST2
543 OLDMAN1 1.012 pu 140 kV
893AL
893L-4
893L-5
334 SUMMER04 1.014 pu 140 kV
893L/893L-20B
230 OLDMAN D 1.014 pu 140 kV
722 WINDYTP 1.012 pu 140 kV
165 PEIGAN 4 1.065 pu 256 kV
166 PEIGAN 7 1.012 pu 140 kV
59ST1
1037L-A
1038L
1037L-B
541080 1.061 pu 255 kV
642 SC1C
643 SC1D
266S_2
266S_1
1.055 pu 253 kV
1.062 pu 255 kV
652 SC1A
653 SC1B
266S_4
266S_3
1.062 pu 255 kV
1.055 pu 253 kV
1037L-2
544 ENMX65S4
65.2TR
65.1TR
570 ENMX65S7 1.024 pu 141 kV
617 FOOTHLL1
1106L
1107L
1080L
1109L
1.059 pu 254 kV
1.053 pu 253 kV
540009 KCS_POI_A6
1038L
1.053 pu
772 ENMX25S7 1.063 pu 255 kV
1065L
1064L
160 JANET 4 1.061 pu 255 kV
985L
1003L
1484 ANDERSO4 1.099 pu 264 kV
950L/9L950
934L/9L934
933L/9L933
260 JENNER 4 1.100 pu 264 kV
944L
951L
225 WARE JCT
480 BENNETTS 1.042 pu 250 kV
1114L
1053L
1052L
1051L
430 W BROOK4 1.054 pu 253 kV
129.8 MW 66.1 Mvar
276 W BROOK7 1.037 pu 143 kV
28ST2A
28ST1A
1.078 pu 259 kV
1075L
931L
763L-3
928 ENCH TAP 1.028 pu 142 kV
669 BOWMAN1 1.030 pu 247 kV
1035L
1034L
877 BASNTAP 1.036 pu 143 kV
853L-1
853L-2
853AL
399 BASSAN7 1.033 pu 143 kV
333 QUENSTWN 1.036 pu 143 kV
161 SARCEE 4 1.054 pu 253 kV
84% Amps
162 E CALGAR 1.050 pu 252 kV
916L
936L
937L
159 LANGDON4
1.045 pu 251 kV
540070 927AL_TAP 1.039 pu 249 kV
943 MILO 1 1.049 pu 252 kV
1005L-1
1005AL
451 MATLB1 1.069 pu 257 kV
737 TRAVRS1 1.071 pu 257 kV
1042L
1041L
940L
736 BSR_1 1.079 pu 259 kV
547026 TRAVERS_5 1.060 pu 255 kV
549026 TRAVERS_4 0.000 pu 0 kV
1036L
666L
814L
827L
795L
401 HAYS 7 1.020 pu 141 kV
831L-2
831L-1
826 831A TAP 1.031 pu 142 kV
831AL
445 CUTNG L7 1.031 pu 142 kV
250 DUCHESS7 1.029 pu 142 kV
275 TILLEY 7 1.030 pu 142 kV
100L
270 SUFFIEL7 1.036 pu 143 kV
167 N LETHB4 1.066 pu 256 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7 1.009 pu 139 kV
367 CHINOOK1 1.009 pu 139 kV
769L
916 MONAR TP 1.009 pu 139 kV
463L-1
463AL
400 MONARCH7 1.008 pu 139 kV
1621 NEWSVCP2 1.049 pu 252 kV
2075S_3
1618 NEWELL1 1.049 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1 1.049 pu 252 kV
1012 NEWELL2 1.049 pu 252 kV
923L
1087L
1088L
1040L
1048L
746 WINDYFLATS 1.063 pu 255 kV
138ST1
138ST1_1
549031 WINDRISE4 1.072 pu 148 kV
1487L
654 WINDYFLAT3 1.035 pu 143 kV
745 WINDYFLAT2 1.067 pu 147 kV
608L-2
603L-2
608L-1
608AL
608AL_TP
748 1.070 pu 148 kV
837 SODGLTAP 1.067 pu 147 kV
603L-1
739 ARD_01 1.079 pu 149 kV
328 MACLEOD1 1.073 pu 148 kV
358 SODER1 1.068 pu 147 kV
697 LETH593S 1.009 pu 139 kV
794 MAGRATH9 1.023 pu 141 kV
863L-2
824L
699 RIVERBN7 1.011 pu 140 kV
272 TABER 7 1.030 pu 142 kV
823L
172L-1
834 CHIN_CHT 1.032 pu 142 kV
172EL
389 HILLRIDG 1.032 pu 142 kV
696 LETH146S 1.009 pu 139 kV
813LETH
691 LETH241S 1.010 pu 139 kV
667L
172L-4
172L-3
690 COALDAL7 1.024 pu 141 kV
207L
679 LETH111S 1.009 pu 139 kV
725L-2
939 RVBD TAP 1.010 pu 139 kV
725L-4
698 LETH674S 1.010 pu 139 kV
725L-3
823 725BL 1.009 pu 139 kV
725L-1
3001/725BL
901 MCBRIDEI 1.007 pu 139 kV
237 FORT MA7 1.010 pu 139 kV
180L-40
872 180AL-TAP 1.019 pu 141 kV
180AL-10A
894 CLARESHOLM4 1.019 pu 141 kV
180L-30A
279 STAVELEY 1.021 pu 141 kV
180L-20
244 VULCAN 7 1.029 pu 142 kV
161L
547070 161AL_TAP 1.030 pu 142 kV
1630 REDCOAT1 1.078 pu 149 kV
197L
235 STAVELY7 1.020 pu 141 kV
869 CHIN CH 1.065 pu 147 kV
820L-7B
820L-7A
820BL
820AL
406 CHIN CH7 1.066 pu 147 kV
721 RDCO_TAP 1.074 pu 148 kV
725AL
293 STIRLIN7 1.074 pu 148 kV
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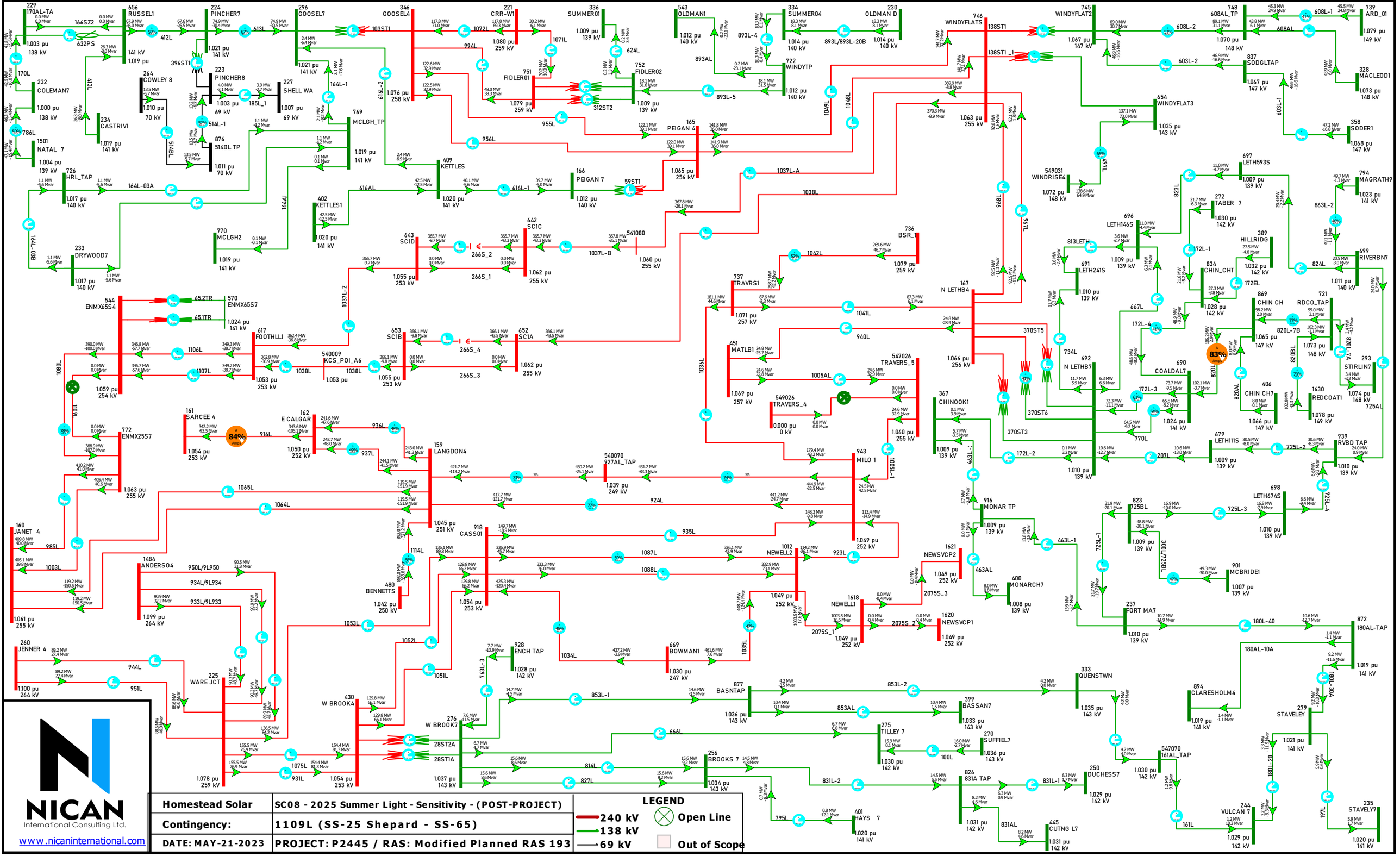
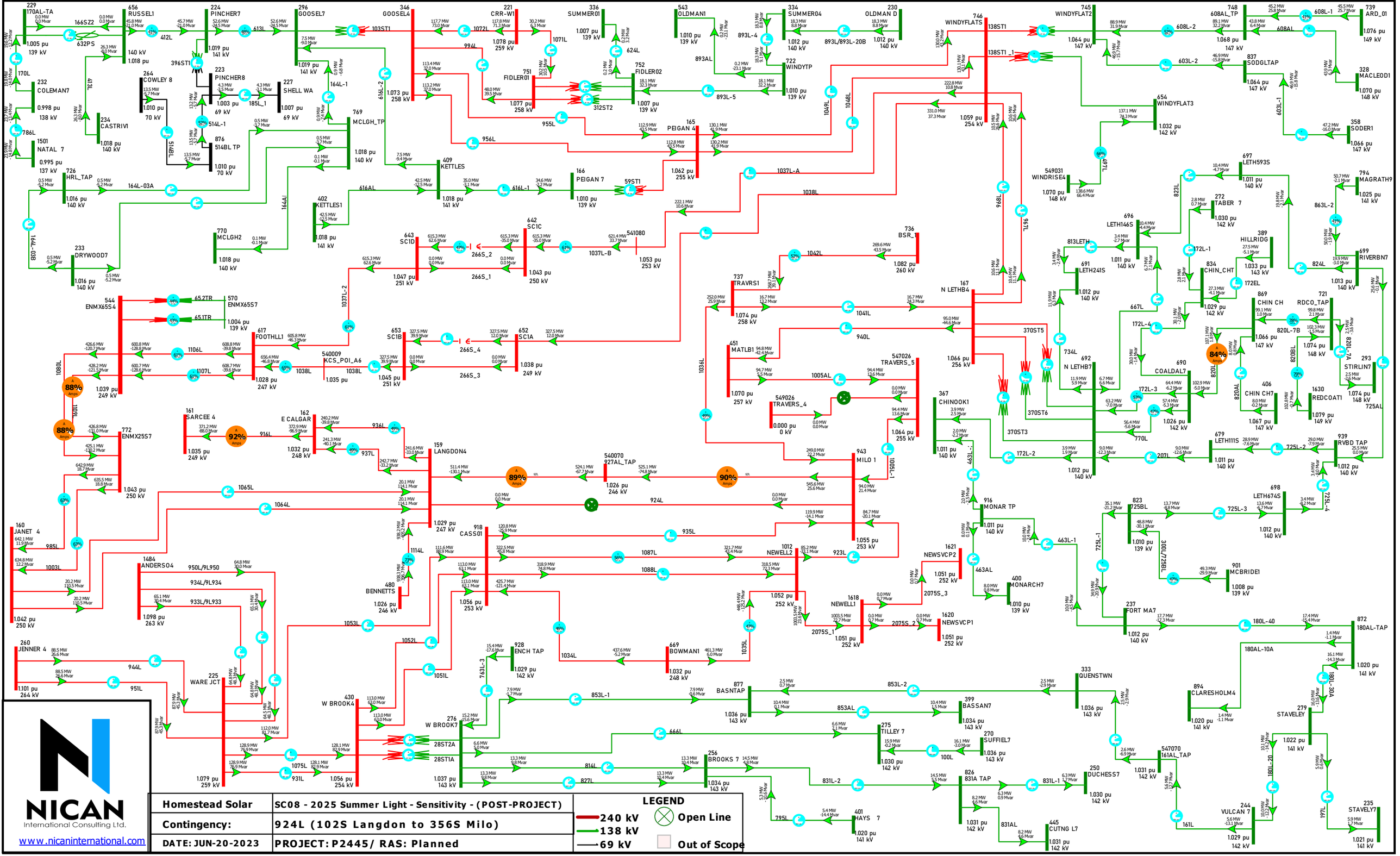
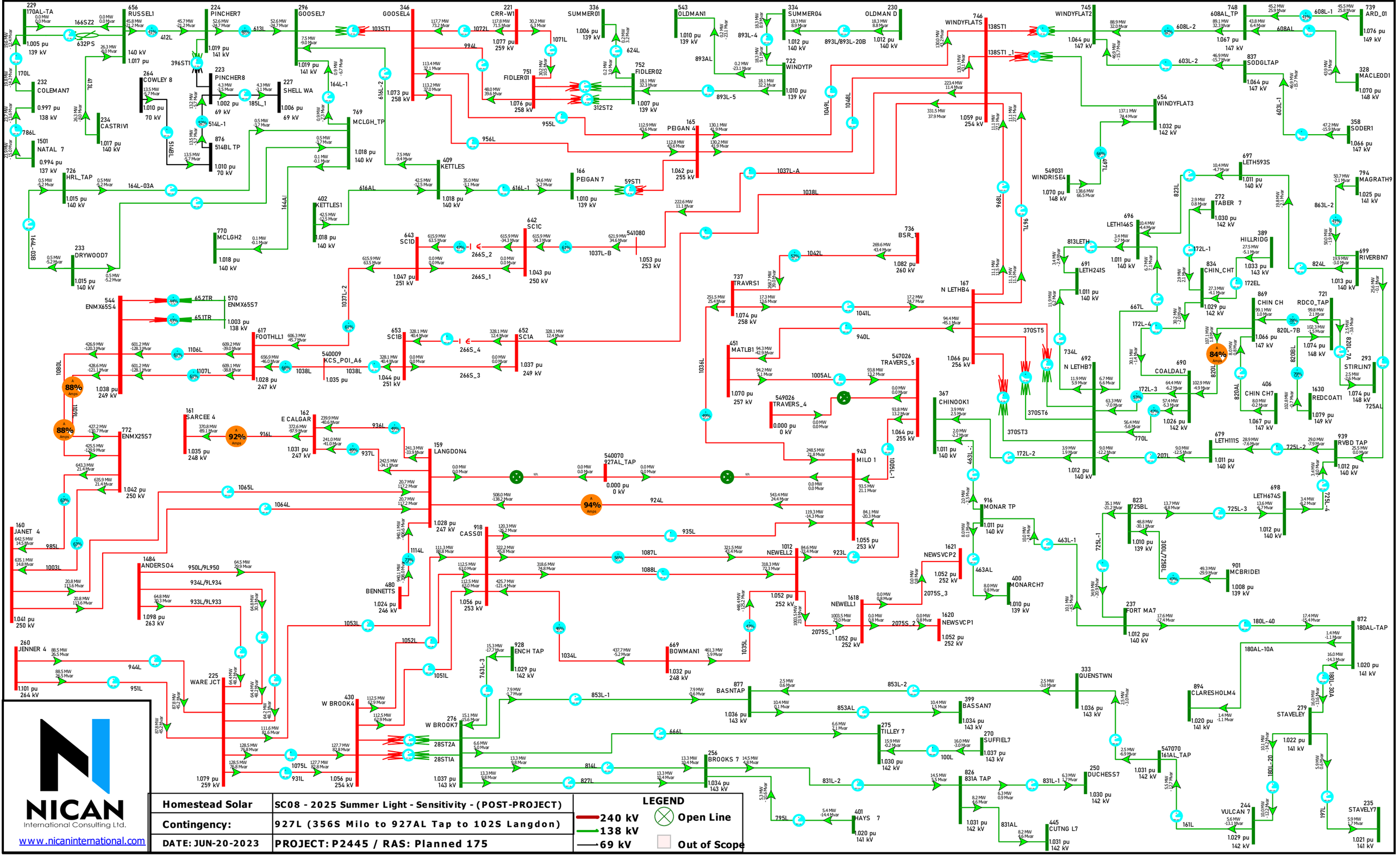
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1080L (SS-25 Shepard to SS-65)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: Modified Planned RAS 193
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
1.003 pu
138 kV
632PS
166SZ2
656
RUSSEL1
141 kV
1.019 pu
412L
224
PINCHER7
1.021 pu
141 kV
613L
396ST1
223
PINCHER8
1.003 pu
69 kV
185L_1
227
SHELL WA
1.007 pu
69 kV
264
COWLEY 8
1.010 pu
70 kV
514L-1
876
514BL TP
1.011 pu
70 kV
296
GOOSEL7
1.021 pu
141 kV
164L-1
769
MCLGH_TP
1.019 pu
141 kV
346
GOOSEL4
103ST1
1.076 pu
258 kV
616L-2
616L-1
409
KETTLES
1.020 pu
141 kV
616AL
402
KETTLES1
1.020 pu
141 kV
770
MCLGH2
1.019 pu
141 kV
164L-03A
164AL
170L
232
COLEMAN7
1.000 pu
138 kV
234
CASTRIVI
1.019 pu
141 kV
786L
1501
NATAL 7
1.004 pu
139 kV
726
HRL_TAP
1.017 pu
140 kV
164L-03B
233
DRYWOOD7
1.017 pu
140 kV
221
CRR-W1
1.080 pu
259 kV
1072L
994L
1071L
751
FIDLER01
1.079 pu
259 kV
336
SUMMER01
1.009 pu
139 kV
624L
752
FIDLER02
1.009 pu
139 kV
312ST2
955L
956L
543
OLDMAN1
1.012 pu
140 kV
893AL
893L-5
893L-4
334
SUMMER04
1.014 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.014 pu
140 kV
722
WINDYTP
1.012 pu
140 kV
165
PEIGAN 4
1.065 pu
256 kV
166
PEIGAN 7
1.012 pu
140 kV
59ST1
1037L-A
1038L
1040L
1048L
1049L
746
WINDYFLATS
138ST1
138ST1_1
1.063 pu
255 kV
745
WINDYFLAT2
1.067 pu
147 kV
608AL_TP
608AL
1.070 pu
148 kV
608L-2
608L-1
739
ARD_01
1.079 pu
149 kV
603L-2
837
SODGLTAP
1.067 pu
147 kV
328
MACLEOD1
1.073 pu
148 kV
603L-1
358
SODER1
1.068 pu
147 kV
654
WINDYFLAT3
1.035 pu
143 kV
549031
WINDRISE4
1.072 pu
148 kV
1497L
697
LETH593S
1.009 pu
139 kV
794
MAGRATH9
1.023 pu
141 kV
863L-2
272
TABER 7
1.030 pu
142 kV
823L
172L-1
696
LETH146S
1.009 pu
139 kV
813LETH
691
LETH241S
1.010 pu
139 kV
389
HILLRIDG
1.032 pu
142 kV
834
CHIN_CHT
1.028 pu
142 kV
172EL
824L
699
RIVERBN7
1.011 pu
140 kV
869
CHIN CH
1.065 pu
147 kV
820L-7B
820L-7A
721
RDCO_TAP
1.073 pu
148 kV
293
STIRLIN7
1.074 pu
148 kV
725AL
820BL
820AL
406
CHIN CH7
1.066 pu
147 kV
1630
REDCOAT1
1.078 pu
149 kV
172L-4
667L
172L-3
690
COALDAL7
1.024 pu
141 kV
172L-2
679
LETH111S
1.009 pu
139 kV
939
RVBD TAP
1.010 pu
139 kV
725L-2
698
LETH674S
1.010 pu
139 kV
725L-4
725L-3
823
725BL
1.009 pu
139 kV
725L-1
3001/725BL
901
MCBRIDEI
1.007 pu
139 kV
237
FORT MA7
1.010 pu
139 kV
180L-40
872
180AL-TAP
1.019 pu
141 kV
180AL-10A
894
CLARESHOLM4
1.019 pu
141 kV
180L-30A
279
STAVELEY
1.021 pu
141 kV
180L-20
244
VULCAN 7
1.029 pu
142 kV
161L
547070
161AL_TAP
1.030 pu
142 kV
197L
235
STAVELY7
1.020 pu
141 kV
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1.024 pu
141 kV
617
FOOTHLL1
1.053 pu
253 kV
1106L
1107L
1080L
1109L
1059 pu
254 kV
540009
KCS_POI_A6
1.053 pu
1038L
643
SC1D
1.055 pu
253 kV
266S_2
266S_1
642
SC1C
1.062 pu
255 kV
653
SC1B
1.055 pu
253 kV
266S_4
266S_3
652
SC1A
1.062 pu
255 kV
541080
1037L-B
1060 pu
255 kV
1037L-2
1036L
736
BSR_1
1.079 pu
259 kV
1042L
737
TRAVRS1
1.071 pu
257 kV
1041L
940L
451
MATLB1
1.069 pu
257 kV
1005AL
547026
TRAVERS_5
1.060 pu
255 kV
549026
TRAVERS_4
0.000 pu
0 kV
943
MILO 1
1.049 pu
252 kV
1005L-1
1005L-2
540070
927AL_TAP
1.039 pu
249 kV
795L
401
HAYS 7
1.020 pu
141 kV
831L-2
831L-1
826
831A TAP
1.031 pu
142 kV
831AL
445
CUTNG L7
1.031 pu
142 kV
250
DUCHESS7
1.029 pu
142 kV
333
QUENSTWN
1.035 pu
143 kV
853L-2
853AL
399
BASSAN7
1.033 pu
143 kV
275
TILLEY 7
1.030 pu
142 kV
100L
270
SUFFIEL7
1.036 pu
143 kV
877
BASNTAP
1.036 pu
143 kV
853L-1
666L
814L
827L
256
BROOKS 7
1.034 pu
143 kV
276
W BROOK7
1.037 pu
143 kV
28ST2A
28ST1A
430
W BROOK4
1.054 pu
253 kV
1035L
669
BOWMAN1
1.030 pu
247 kV
763L-3
928
ENCH TAP
1.028 pu
142 kV
1034L
1051L
1052L
1053L
480
BENNETTS
1.042 pu
250 kV
1087L
1088L
1012
NEWELL2
1.049 pu
252 kV
923L
1618
NEWELL1
1.049 pu
252 kV
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1.049 pu
252 kV
1621
NEWSVCP2
1.049 pu
252 kV
463AL
463L-1
916
MONAR TP
1.009 pu
139 kV
400
MONARCH7
1.008 pu
139 kV
367
CHINOOK1
1.009 pu
139 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.010 pu
139 kV
690
COALDAL7
1.024 pu
141 kV
667L
172L-3
172L-2
770L
207L
679
LETH111S
1.009 pu
139 kV
725L-2
939
RVBD TAP
1.010 pu
139 kV
167
N LETHB4
1.066 pu
256 kV
1066L
1067L
1068L
1069L
1070L
1071L
1072L
1073L
1074L
1075L
1076L
1077L
1078L
1079L
1080L
1081L
1082L
1083L
1084L
1085L
1086L
1087L
1088L
1089L
1090L
1091L
1092L
1093L
1094L
1095L
1096L
1097L
1098L
1099L
1100L
1101L
1102L
1103L
1104L
1105L


229 170AL-TA
656 RUSSEL1
224 PINCHER7
296 GOOSEL7
346 GOOSEL4
221 CRR-W1
336 SUMMER01
543 OLDMAN1
334 SUMMER04
230 OLDMAN D
746 WINDYFLATS
745 WINDYFLAT2
748 608AL_TP
739 ARD_01
608L-1
608L-2
608AL
1072L
1071L
994L
624L
752 FIDLER02
751 FIDLER01
312ST2
893L-4
893L/893L-20B
722 WINDYTP
893L-5
893AL
1049L
1048L
1059 pu 254 kV
138ST1
138ST1_1
603L-2
837 SODGLTAP
328 MACLEOD1
603L-1
358 SODER1
1066 pu 147 kV
654 WINDYFLAT3
1032 pu 142 kV
549031 WINDRISE4
1070 pu 148 kV
1497L
1068 pu 147 kV
1064 pu 147 kV
1070 pu 148 kV
1005 pu 139 kV
632PS
166SZ2
412L
396ST1
140 kV
1018 pu
1019 pu 141 kV
1035 pu 249 kV
264 COWLEY 8
1010 pu 70 kV
223 PINCHER8
1003 pu 69 kV
227 SHELL WA
1007 pu 69 kV
185L_1
514L-1
876 514BL TP
1010 pu 70 kV
514L
170L
232 COLEMAN7
0.998 pu 138 kV
786L
1501 NATAL 7
0.995 pu 137 kV
234 CASTRIV1
1018 pu 140 kV
164L-1
616L-2
769 MCLGH_TP
1018 pu 140 kV
1073 pu 258 kV
103ST1
955L
956L
165 PEIGAN 4
1062 pu 255 kV
112.9 MW 43.5 Mvar
112.8 MW 43.5 Mvar
130.1 MW 41.9 Mvar
130.2 MW 41.9 Mvar
409 KETTLES
1018 pu 141 kV
616AL
616L-1
166 PEIGAN 7
1010 pu 139 kV
59ST1
1037L-A
1038L
222.1 MW 10.6 Mvar
726 HRL_TAP
1016 pu 140 kV
164L-03A
164L-03B
233 DRYWOOD7
1016 pu 140 kV
402 KETTLES1
1018 pu 141 kV
164AL
770 MCLGH2
1018 pu 140 kV
642 SC1C
643 SC1D
266S_2
266S_1
1047 pu 251 kV
1043 pu 250 kV
541080
1037L-B
1053 pu 253 kV
621.4 MW 33.7 Mvar
736 BSR_1
1082 pu 260 kV
1042L
737 TRAVRS1
1074 pu 258 kV
1041L
940L
451 MATLB1
1070 pu 257 kV
1005AL
549026 TRAVERS_4
0.000 pu 0 kV
547026 TRAVERS_5
1064 pu 255 kV
1036L
1037L-2
1106L
1107L
1080L
1109L
544 ENMX65S4
570 ENMX65S7
1004 pu 139 kV
65.2TR
65.1TR
617 FOOTHLL1
540009 KCS_POI_A6
1038L
1028 pu 247 kV
1035 pu
653 SC1B
652 SC1A
266S_4
266S_3
1045 pu 251 kV
1038 pu 249 kV
1039 pu 249 kV
167 N LETHB4
1066 pu 256 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7
690 COALDAL7
667L
172L-4
172L-3
172L-2
207L
770L
1026 pu 142 kV
1012 pu 140 kV
367 CHINOOK1
1011 pu 140 kV
1069L
463L-2
916 MONAR TP
1011 pu 140 kV
463L-1
463AL
1621 NEWSVCP2
1051 pu 252 kV
2075S_3
400 MONARCH7
1010 pu 139 kV
1620 NEWSVCP1
1618 NEWELL1
2075S_1
2075S_2
1051 pu 252 kV
1012 pu 140 kV
1042 pu 250 kV
1003L
985L
160 JANET 4
1484 ANDERS04
950L/9L950
934L/9L934
933L/9L933
1098 pu 263 kV
480 BENNETTS
1026 pu 246 kV
1053L
1052L
1051L
1056 pu 253 kV
1034L
1035L
669 BOWMAN1
1032 pu 248 kV
1087L
1088L
1012 NEWELL2
1052 pu 252 kV
923L
935L
918 CASS01
1055 pu 253 kV
1114L
1029 pu 247 kV
159 LANGDON4
540070 927AL_TAP
1026 pu 246 kV
524.1 MW -67.7 Mvar
525.1 MW -74.8 Mvar
545.6 MW 25.6 Mvar
924L
1005L-1
943 MILO 1
1020 pu 141 kV
249.0 MW 22.2 Mvar
1064L
1065L
1043 pu 250 kV
1035 pu
936L
937L
1032 pu 248 kV
916L
161 SARCEE 4
1035 pu 249 kV
162 E CALGAR
772 ENMX25S7
1075L
931L
1056 pu 254 kV
1079 pu 259 kV
1028 pu 247 kV
944L
951L
260 JENNER 4
1101 pu 264 kV
225 WARE JCT
430 W BROOK4
276 W BROOK7
28ST2A
28ST1A
1037 pu 143 kV
763L-3
928 ENCH TAP
1029 pu 142 kV
853L-1
853L-2
853AL
877 BASNTAP
1036 pu 143 kV
399 BASSAN7
1034 pu 143 kV
333 QUENSTWN
1036 pu 143 kV
666L
814L
827L
831L-2
831L-1
275 TILLEY 7
1030 pu 142 kV
100L
270 SUFFIEL7
1036 pu 143 kV
256 BROOKS 7
1034 pu 143 kV
826 831A TAP
1031 pu 142 kV
831AL
445 CUTNG L7
1031 pu 142 kV
250 DUCHESS7
1030 pu 142 kV
547070 161AL_TAP
1031 pu 142 kV
161L
795L
401 HAYS 7
1020 pu 141 kV
1041 pu 142 kV
1022 pu 141 kV
279 STAVELEY
1021 pu 141 kV
235 STAVELY7
1761L
180L-30A
180L-20
244 VULCAN 7
1029 pu 142 kV
894 CLARESHOLM4
1020 pu 141 kV
180AL-10A
180L-40
872 180AL-TAP
1020 pu 141 kV
1012 pu 140 kV
180L-7A
820L-7A
820L-7B
820BL
820AL
1066 pu 147 kV
1074 pu 148 kV
1067 pu 147 kV
1630 REDCOAT1
1079 pu 149 kV
406 CHIN CH7
869 CHIN CH
721 RDCO_TAP
293 STIRLIN7
1074 pu 148 kV
725AL
725L-1
725L-2
725L-3
725L-4
823 725BL
1010 pu 139 kV
3001L/7256L
698 LETH674S
1012 pu 140 kV
901 MCBRIDE1
1008 pu 139 kV
237 FORT MA7
1012 pu 140 kV
679 LETH111S
1011 pu 140 kV
939 RVBD TAP
1012 pu 140 kV
697 LETH593S
1011 pu 140 kV
794 MAGRATH9
1025 pu 141 kV
863L-2
699 RIVERBN7
1013 pu 140 kV
824L
823L
272 TABER 7
1030 pu 142 kV
696 LETH146S
1011 pu 140 kV
813LETH
691 LETH241S
1012 pu 140 kV
834 CHIN_CHT
1029 pu 142 kV
1033 pu 143 kV
389 HILLRIDG
172EL
172L-1
88%
92%
89%
90%
84%
Amps
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
924L (102S Langdon to 356S Milo)
DATE: JUN-20-2023
PROJECT: P2445/ RAS: Planned
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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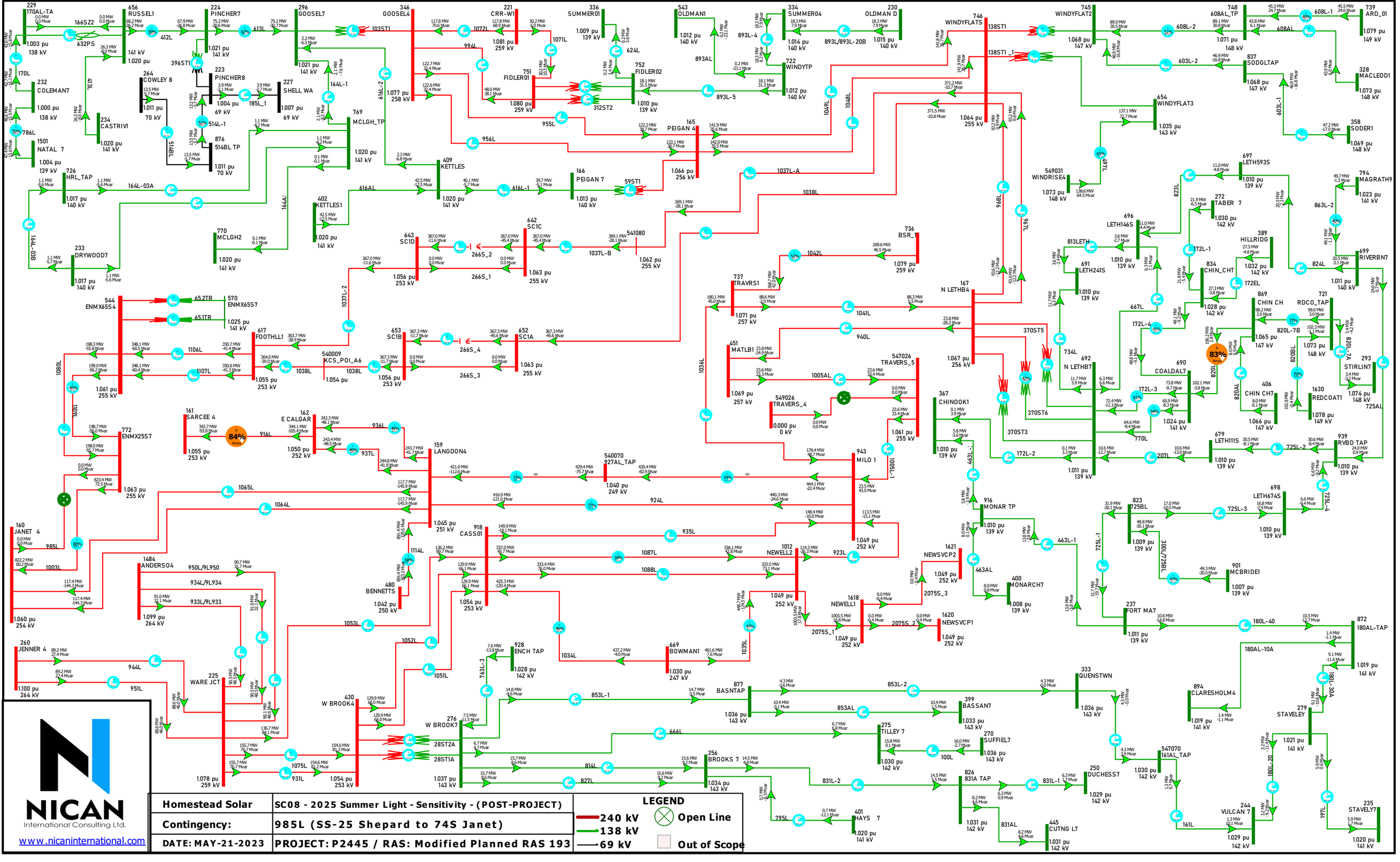
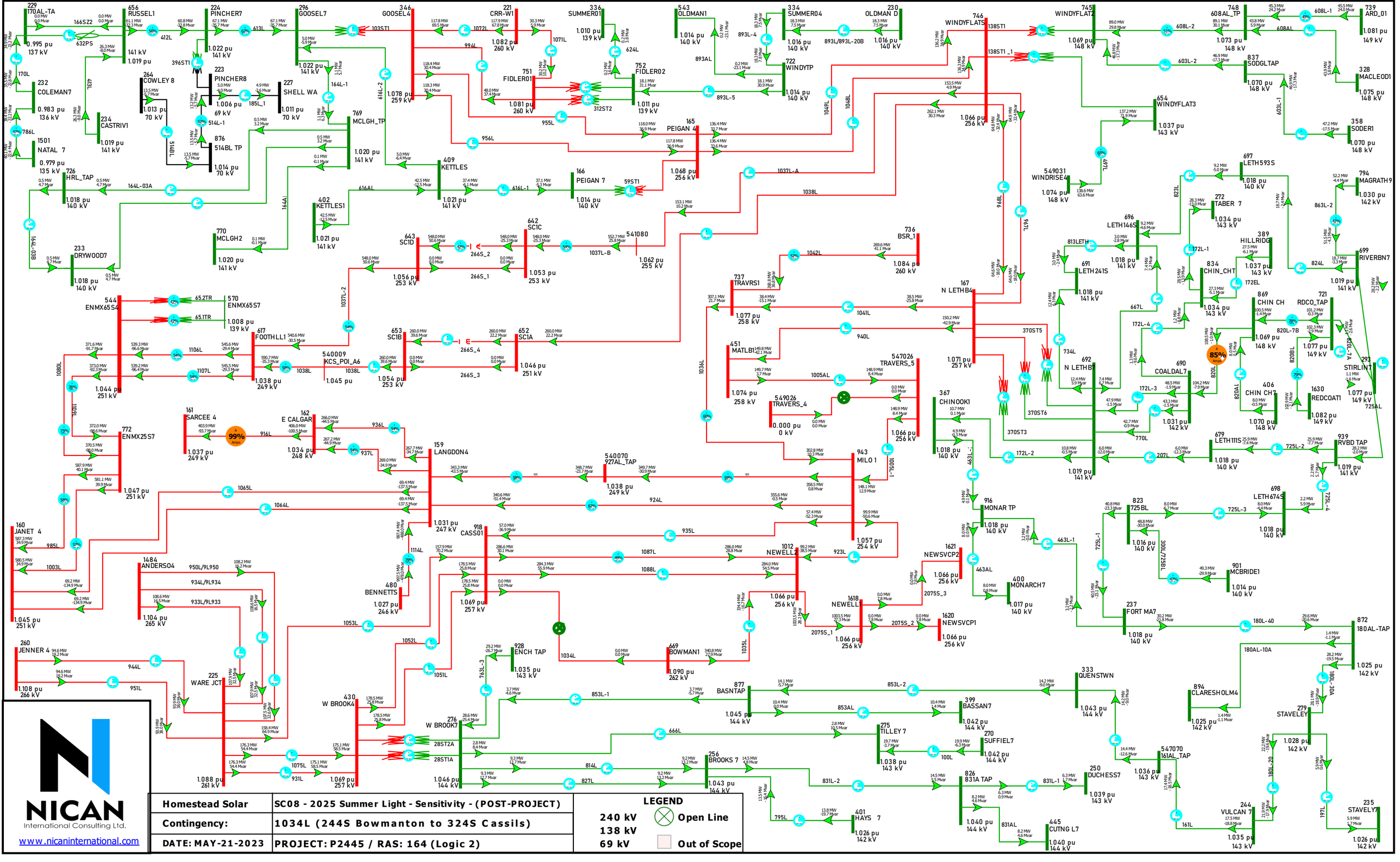
Homestead Solar	**SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)**
Contingency:	**927L (356S Milo to 927AL Tap to 102S Langdon)**
DATE: JUN-20-2023	**PROJECT: P2445 / RAS: Planned 175**


229
170AL-TA
1.003 pu
138 kV
166SZ2
632PS
656
RUSSEL1
1.020 pu
141 kV
412L
224
PINCHER7
1.021 pu
141 kV
613L
296
GOOSEL7
1.021 pu
141 kV
396ST1
223
PINCHER8
1.004 pu
69 kV
185L_1
227
SHELL WA
1.007 pu
69 kV
264
COWLEY 8
1.011 pu
70 kV
514L-1
876
514BL TP
1.011 pu
70 kV
164L-1
769
MCLGH_TP
1.020 pu
141 kV
346
GOOSEL4
1.077 pu
258 kV
103ST1
616L-2
221
CRR-W1
1.081 pu
259 kV
1072L
994L
1071L
751
FIDLER01
1.080 pu
259 kV
955L
336
SUMMER01
1.009 pu
139 kV
624L
752
FIDLER02
1.010 pu
139 kV
312ST2
543
OLDMAN1
1.012 pu
140 kV
893AL
893L-5
334
SUMMER04
1.014 pu
140 kV
893L-4
893L/893L-20B
230
OLDMAN D
1.015 pu
140 kV
722
WINDYTP
1.012 pu
140 kV
746
WINDYFLATS
1.064 pu
255 kV
138ST1
138ST1_1
1040L
1048L
745
WINDYFLAT2
1.068 pu
147 kV
608AL_TP
608AL
608L-1
608L-2
603L-2
748
1.071 pu
148 kV
837
SODGLTAP
1.068 pu
147 kV
739
ARD_01
1.079 pu
149 kV
328
MACLEOD1
1.073 pu
148 kV
603L-1
358
SODER1
1.069 pu
148 kV
654
WINDYFLAT3
1.035 pu
143 kV
137.1 MW
72.7 Mvar
371.2 MW
-10.7 Mvar
371.5 MW
-10.8 Mvar
1064L
1049L
1047L
549031
WINDRISE4
1.073 pu
148 kV
1.9 MW
64.5 Mvar
1.8 MW
64.5 Mvar
786L
1501
NATAL 7
1.004 pu
139 kV
726
HRL_TAP
1.017 pu
140 kV
164L-03A
164AL
233
DRYWOOD7
1.017 pu
140 kV
194L-03B
234
CASTRIVI
1.020 pu
141 kV
232
COLEMAN7
1.000 pu
138 kV
170L
402
KETTLES1
1.020 pu
141 kV
616AL
409
KETTLES
1.020 pu
141 kV
616L-1
166
PEIGAN 7
1.013 pu
140 kV
59ST1
165
PEIGAN 4
1.066 pu
256 kV
1037L-A
1038L
770
MCLGH2
1.020 pu
141 kV
642
SC1C
643
SC1D
1.056 pu
253 kV
266S_2
266S_1
1.063 pu
255 kV
541080
1037L-B
1.062 pu
255 kV
736
BSR_1
1.079 pu
259 kV
1042L
737
TRAVRS1
1.071 pu
257 kV
1041L
940L
451
MATLB1
1.069 pu
257 kV
1005AL
547026
TRAVERS_5
549026
TRAVERS_4
0.000 pu
0 kV
1061 pu
255 kV
1005L-1
943
MILO 1
1.040 pu
249 kV
540070
927AL_TAP
1.045 pu
251 kV
924L
935L
1087L
1088L
1114L
480
BENNETTS
1.042 pu
250 kV
918
CASS01
1.054 pu
253 kV
1012
NEWELL2
1.049 pu
252 kV
923L
1618
NEWELL1
1621
NEWSVCP2
1.049 pu
252 kV
2075S_3
463AL
400
MONARCH7
1.008 pu
139 kV
463L-1
916
MONAR TP
1.010 pu
139 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.049 pu
252 kV
1035L
1034L
669
BOWMAN1
1.030 pu
247 kV
1053L
1052L
1051L
944L
951L
1100 pu
264 kV
260
JENNER 4
1099 pu
264 kV
934L/9L934
933L/9L933
950L/9L950
1484
ANDERSO4
1060 pu
254 kV
1003L
985L
160
JANET 4
225
WARE JCT
1.078 pu
259 kV
1075L
931L
1054 pu
253 kV
430
W BROOK4
276
W BROOK7
1.037 pu
143 kV
28ST2A
28ST1A
763L-3
928
ENCH TAP
1.028 pu
142 kV
877
BASNTAP
1.036 pu
143 kV
853L-1
853L-2
853AL
399
BASSAN7
1.033 pu
143 kV
666L
814L
827L
256
BROOKS 7
1.034 pu
143 kV
275
TILLEY 7
1.030 pu
142 kV
100L
270
SUFFIEL7
1.036 pu
143 kV
831L-2
831L-1
826
831A TAP
1.031 pu
142 kV
831AL
445
CUTNG L7
1.031 pu
142 kV
795L
401
HAYS 7
1.020 pu
141 kV
333
QUENSTWN
1.036 pu
143 kV
250
DUCHESS7
1.029 pu
142 kV
547070
161AL_TAP
1.030 pu
142 kV
161L
244
VULCAN 7
1.029 pu
142 kV
180L-20
180L-30A
180L-40
180AL-10A
894
CLARESHOLM4
1.019 pu
141 kV
872
180AL-TAP
1.019 pu
141 kV
279
STAVELEY
1.021 pu
141 kV
235
STAVELY7
1.020 pu
141 kV
197L
823
725BL
1.009 pu
139 kV
310L/725BL
725L-1
725L-3
725L-4
698
LETH674S
1.010 pu
139 kV
901
MCBRIDE1
1.007 pu
139 kV
237
FORT MA7
1.011 pu
139 kV
1080L
1090L
1106L
1107L
1038L
540009
KCS_POI_A6
1.054 pu
1.055 pu
253 kV
617
FOOTHLL1
1.061 pu
255 kV
570
ENMX65S7
1.025 pu
141 kV
544
ENMX65S4
65.2TR
65.1TR
653
SC1B
652
SC1A
1.056 pu
253 kV
266S_4
266S_3
1.063 pu
255 kV
1037L-2
1065L
1064L
772
ENMX25S7
1.063 pu
255 kV
161
SARCEE 4
1.055 pu
253 kV
84%
Amps
162
E CALGAR
1.050 pu
252 kV
916L
936L
937L
159
LANGDON4
1.045 pu
251 kV
1114L
1053L
1051L
1052L
944L
951L
1034L
1035L
1036L
1037L-2
1038L
1039L
1040L
1048L
1049L
1050L-1
1051L-1
1053L-1
1054L-1
1055L-1
1056L-1
1057L-1
1058L-1
1059L-1
1060L-1
1061L-1
1062L-1
1063L-1
1064L-1
1065L-1
1066L-1
1067L-1
1068L-1
1069L-1
1070L-1
1071L-1
1072L-1
1073L-1
1074L-1
1075L-1
1076L-1
1077L-1
1078L-1
1079L-1
1080L-1
1081L-1
1082L-1
1083L-1
1084L-1
1085L-1
1086L-1
1087L-1
1088L-1
1089L-1
1090L-1
1091L-1
1092L-1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International Consulting Ltd.
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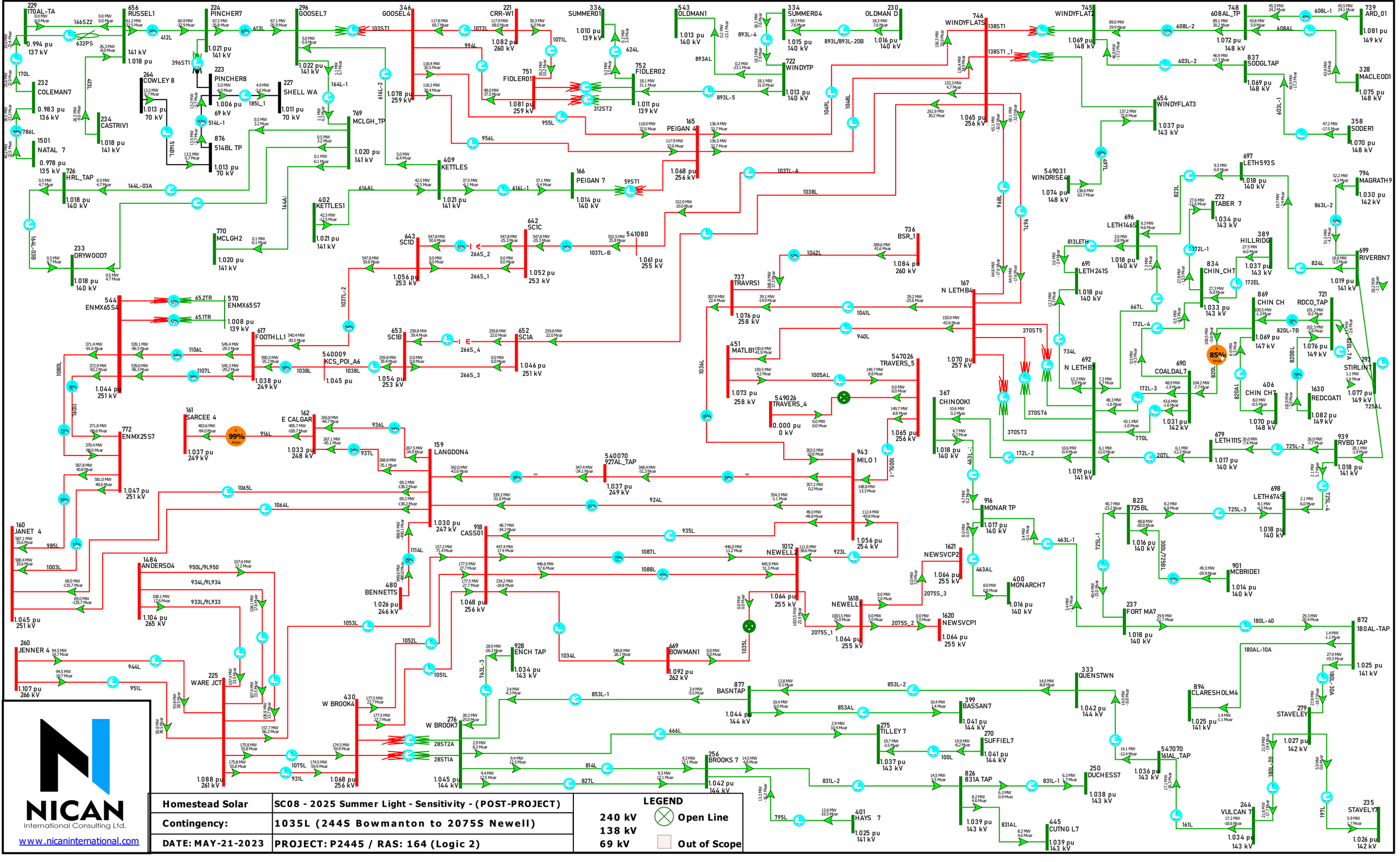
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1034L (244S Bowmanton to 324S Cassils)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: 164 (Logic 2)
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope


229
170AL-TA
0.994 pu
137 kV
632PS
166SZ2
656
RUSSEL1
141 kV
1.018 pu
412L
224
PINCHER7
1.021 pu
141 kV
613L
396ST1
223
PINCHER8
1.006 pu
69 kV
185L_1
264
COWLEY 8
1.013 pu
70 kV
227
SHELL WA
1.011 pu
70 kV
296
GOOSEL7
1.022 pu
141 kV
164L-1
346
GOOSEL4
1.078 pu
259 kV
103ST1
616L-2
769
MCLGH_TP
1.020 pu
141 kV
514L-1
876
514BL TP
1.013 pu
70 kV
514BL
170L
232
COLEMAN7
0.983 pu
136 kV
234
CASTRIV1
1.018 pu
141 kV
786L
1501
NATAL 7
0.978 pu
135 kV
726
HRL_TAP
1.018 pu
140 kV
164L-03A
164L-03B
233
DRYWOOD7
1.018 pu
140 kV
164AL
770
MCLGH2
1.020 pu
141 kV
402
KETTLES1
1.021 pu
141 kV
616AL
409
KETTLES
1.021 pu
141 kV
616L-1
166
PEIGAN 7
1.014 pu
140 kV
59ST1
165
PEIGAN 4
1.068 pu
256 kV
955L
956L
994L
221
CRR-W1
1.082 pu
260 kV
1072L
1071L
751
FIDLER01
1.081 pu
259 kV
312ST2
336
SUMMER01
1.010 pu
139 kV
624L
752
FIDLER02
1.011 pu
139 kV
543
OLDMAN1
1.013 pu
140 kV
893L-4
893AL
893L-5
336
SUMMER04
1.015 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.016 pu
140 kV
722
WINDYTP
1.013 pu
140 kV
746
WINDYFLATS
1.065 pu
256 kV
138ST1
138ST1_1
1040L
1048L
1037L-A
1038L
1039L
1036L
1037L-2
1037L-B
541080
1.061 pu
255 kV
642
SC1C
1.052 pu
253 kV
643
SC1D
1.056 pu
253 kV
266S_2
266S_1
653
SC1B
1.054 pu
253 kV
652
SC1A
1.046 pu
251 kV
266S_4
266S_3
544
ENMX65S4
1.044 pu
251 kV
65.2TR
65.1TR
570
ENMX65S7
1.008 pu
139 kV
617
FOOTHLL1
1.038 pu
249 kV
1106L
1107L
1038L
540009
KCS_POI_A6
1.045 pu
1080L
1101L
772
ENMX25S7
1.047 pu
251 kV
1065L
1064L
160
JANET 4
1.045 pu
251 kV
985L
1003L
161
SARCEE 4
1.037 pu
249 kV
99%
916L
162
E CALGAR
1.033 pu
248 kV
936L
937L
159
LANGDON4
1.030 pu
247 kV
540070
927AL_TAP
1.037 pu
249 kV
924L
1114L
480
BENNETTS
1.026 pu
246 kV
918
CASS01
1.068 pu
256 kV
935L
1087L
1088L
1012
NEWELL2
1.064 pu
255 kV
923L
1618
NEWELL
1.064 pu
255 kV
2075S_1
2075S_2
2075S_3
1620
NEWSVCP1
1.064 pu
255 kV
1621
NEWSVCP2
1.064 pu
255 kV
463AL
400
MONARCH7
1.016 pu
140 kV
916
MONAR TP
1.017 pu
140 kV
463L-1
463L-2
1035L
669
BOWMAN1
1.092 pu
262 kV
1034L
1051L
1052L
1053L
763L-3
928
ENCH TAP
1.034 pu
143 kV
430
W BROOK4
1.088 pu
261 kV
276
W BROOK7
1.045 pu
144 kV
28ST2A
28ST1A
666L
814L
827L
795L
877
BASNTAP
1.044 pu
144 kV
853L-1
853L-2
853AL
831L-2
831L-1
831AL
826
831A TAP
1.039 pu
143 kV
256
BROOKS 7
1.042 pu
144 kV
401
HAYS 7
1.025 pu
141 kV
445
CUTNG L7
1.039 pu
143 kV
943
MILO 1
1.056 pu
254 kV
1005L-1
1005L-2
1005AL
736
BSR_1
1.084 pu
260 kV
1042L
737
TRAVRS1
1.076 pu
258 kV
1041L
940L
451
MATLBL1
1.073 pu
258 kV
547026
TRAVERS_5
1.065 pu
256 kV
549026
TRAVERS_4
0.000 pu
0 kV
167
N LETHB4
1.070 pu
257 kV
370ST5
370ST6
370ST3
734L
692
N LETHB7
1.019 pu
141 kV
367
CHINOOK1
1.018 pu
140 kV
463L-3
770L
172L-2
207L
679
LETH111S
1.017 pu
140 kV
725L-2
939
RVBD TAP
1.018 pu
141 kV
745
WINDYFLAT2
1.069 pu
148 kV
608AL_TP
1.072 pu
148 kV
608L-1
608AL
608L-2
739
ARD_01
1.081 pu
149 kV
603L-2
837
SODGLTAP
1.069 pu
148 kV
328
MACLEOD1
1.075 pu
148 kV
603L-1
358
SODER1
1.070 pu
148 kV
654
WINDYFLAT3
1.037 pu
143 kV
137L
549031
WINDRISE4
1.074 pu
148 kV
149L
698
LETH674S
1.018 pu
140 kV
725L-4
725L-3
823
725BL
1.016 pu
140 kV
3001/7250L
901
MCBRIDE1
1.014 pu
140 kV
237
FORT MA7
1.018 pu
140 kV
180L-40
872
180AL-TAP
1.025 pu
141 kV
180AL-10A
894
CLARESHOLM4
1.025 pu
141 kV
333
QUENSTWN
1.042 pu
144 kV
399
BASSAN7
1.041 pu
144 kV
275
TILLEY 7
1.037 pu
143 kV
270
SUFFIEL7
1.041 pu
144 kV
100L
250
DUCHESS7
1.038 pu
143 kV
547070
161AL_TAP
1.036 pu
143 kV
161L
244
VULCAN 7
1.034 pu
143 kV
279
STAVELEY
1.027 pu
142 kV
180L-20
180L-30A
1971L
235
STAVELY7
1.026 pu
142 kV
696
LETH146S
1.018 pu
140 kV
813LETH
691
LETH241S
1.018 pu
140 kV
172L-1
834
CHIN_CHT
1.033 pu
143 kV
172EL
389
HILLRIDG
1.037 pu
143 kV
823L
697
LETH593S
1.018 pu
140 kV
272
TABER 7
1.034 pu
143 kV
863L-2
794
MAGRATH9
1.030 pu
142 kV
824L
699
RIVERBN7
1.019 pu
141 kV
667L
172L-4
172L-3
690
COALDAL7
1.031 pu
142 kV
820L
820AL
820L-7B
869
CHIN CH
1.069 pu
147 kV
406
CHIN CH7
1.070 pu
148 kV
820BL
721
RDCO_TAP
1.076 pu
149 kV
820L-7A
293
STIRLIN7
1.077 pu
149 kV
725AL
1630
REDCOAT1
1.082 pu
149 kV
85%
Amps
NICAN
International Consulting Ltd.
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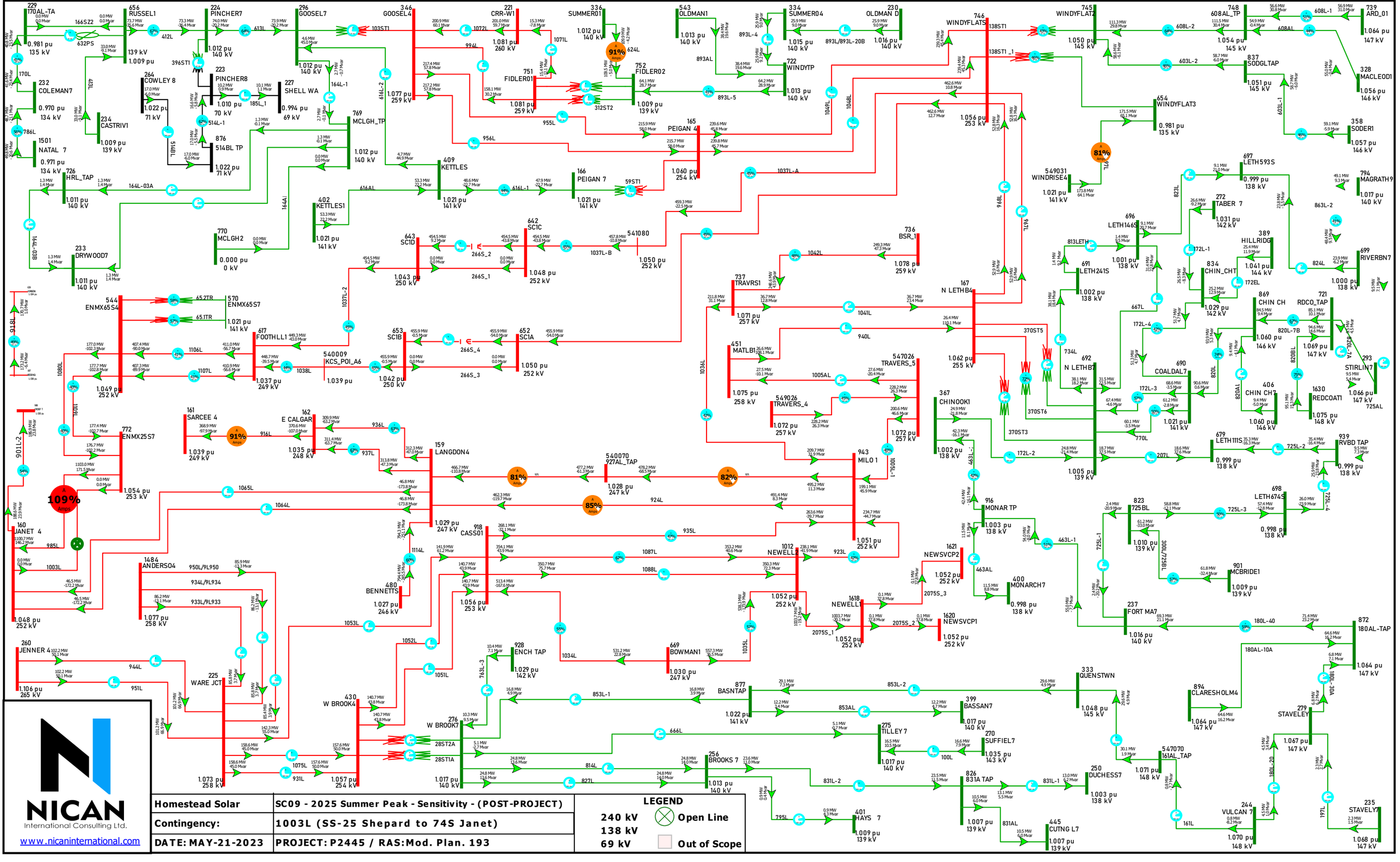
Homestead Solar
SC08 - 2025 Summer Light - Sensitivity - (POST-PROJECT)
Contingency:
1035L (244S Bowmanton to 2075S Newell)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: 164 (Logic 2)
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

2025 SUMMER Peak (Sensitivity)

Single Line Diagrams
P2445 - POST-PROJECT
RAS RESPONSE SC09

NICAN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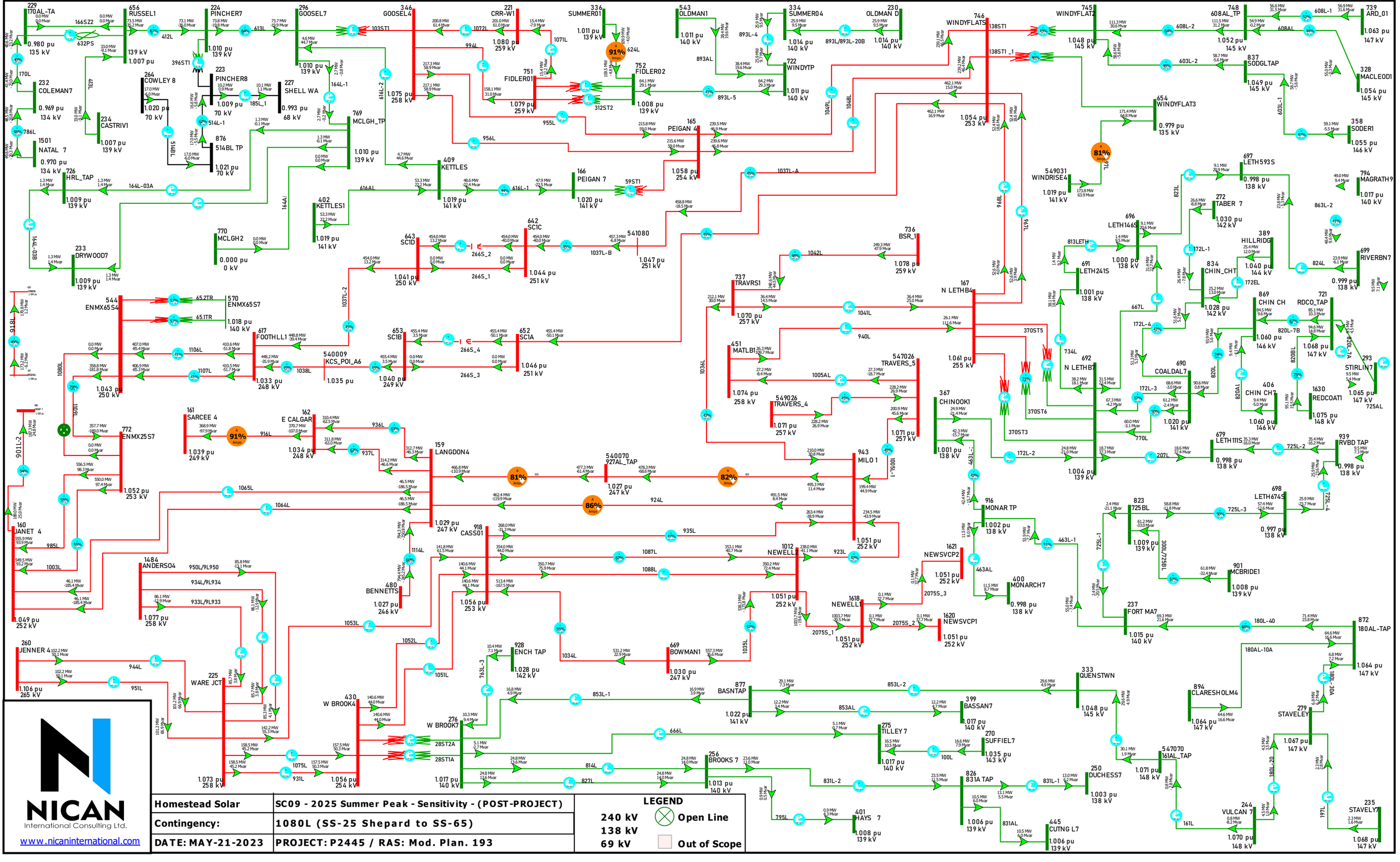
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1003L (SS-25 Shepard to 74S Janet)
DATE: MAY-21-2023
PROJECT: P2445 / RAS:Mod. Plan. 193
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1080L (SS-25 Shepard to SS-65)**
DATE: MAY-21-2023	**PROJECT: P2445 / RAS: Mod. Plan. 193**

LEGEND

240 kV

138 kV

69 kV

⊗ **Open Line**

☐ **Out of Scope**

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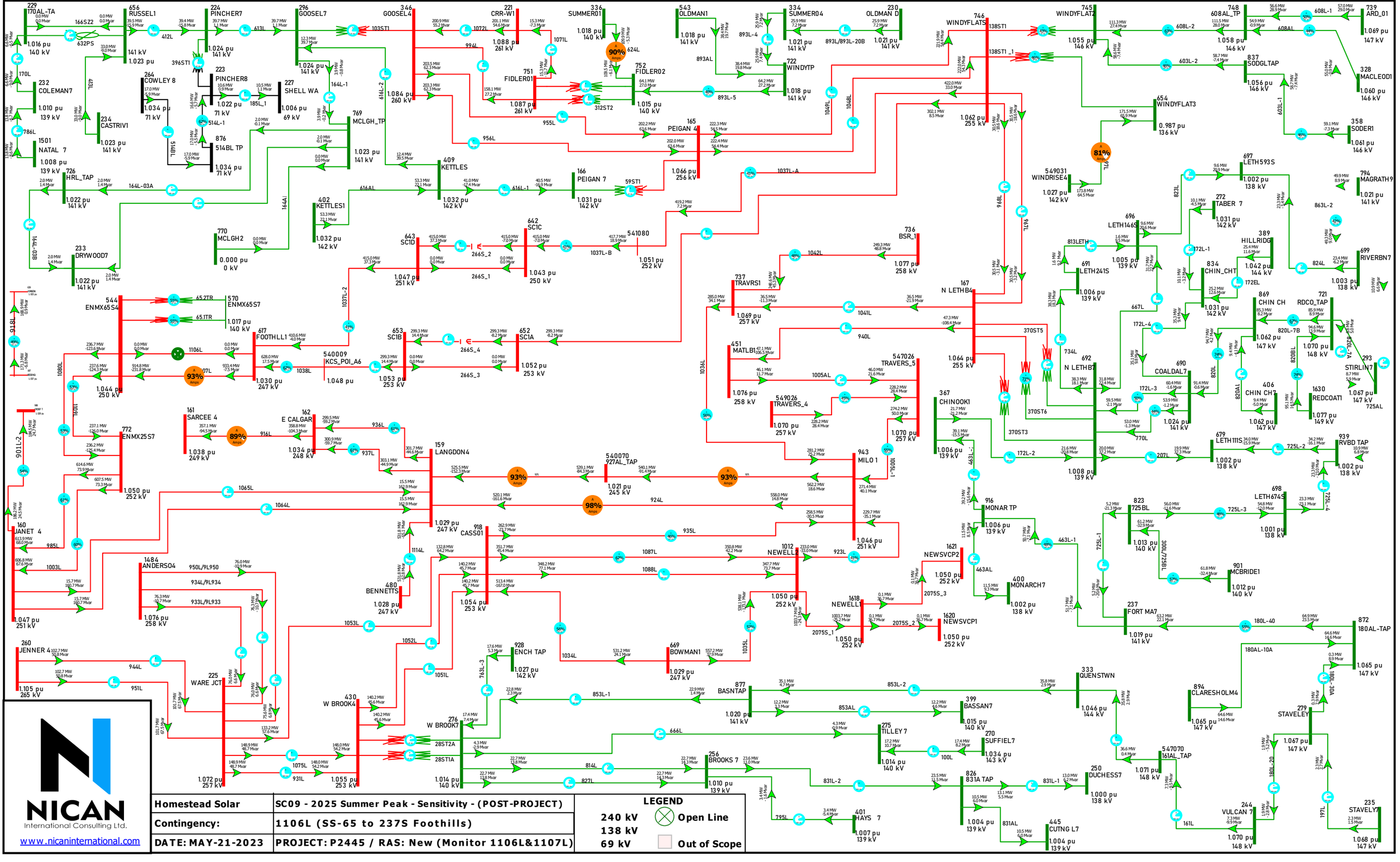
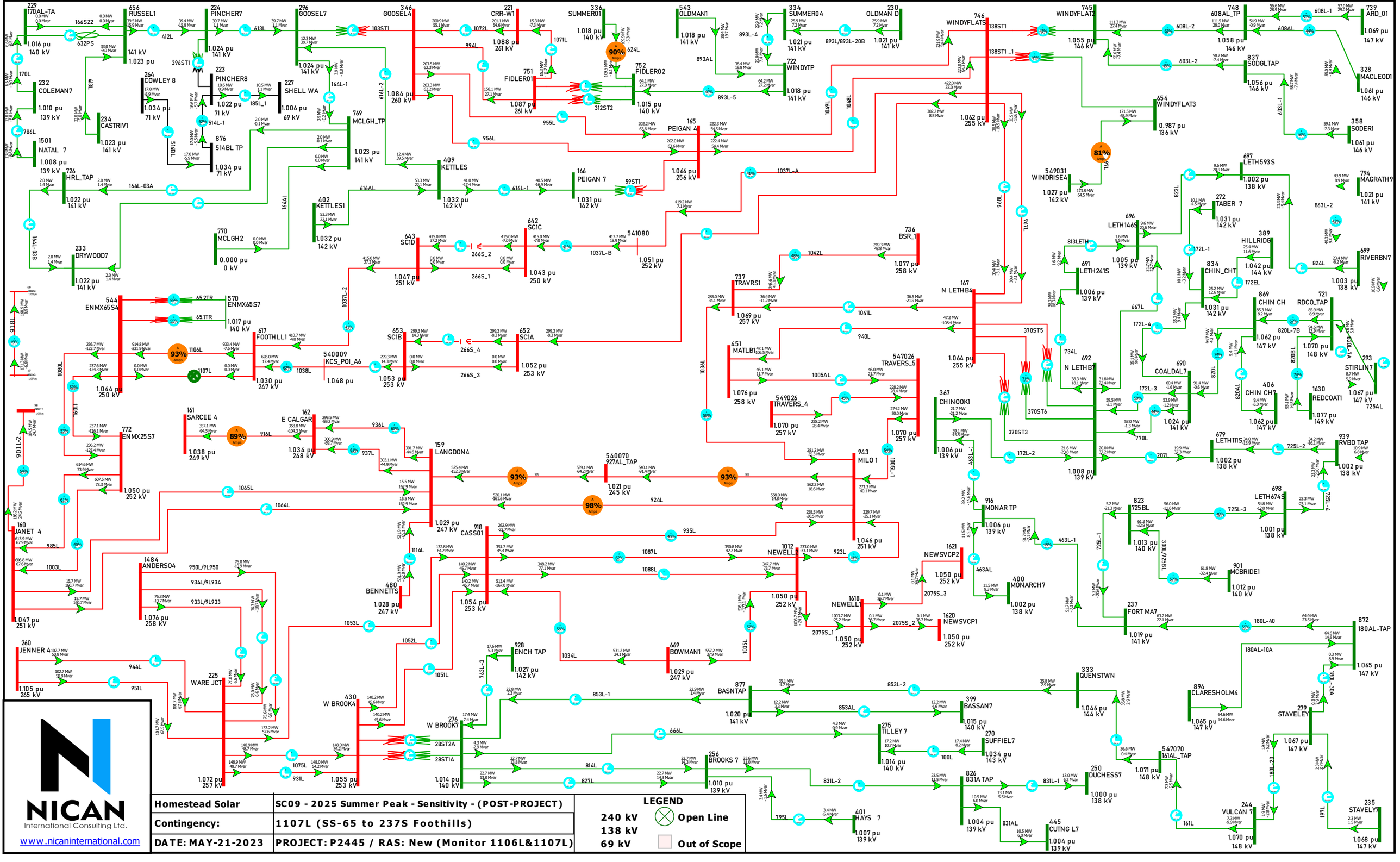

229 170AL-TA 1.016 pu 140 kV
166SZ2
632PS
656 RUSSEL1 141 kV 1.023 pu
412L
224 PINCHER7 1.024 pu 141 kV
613L
396ST1
223 PINCHER8 1.022 pu 71 kV
185L_1
227 SHELL WA 1.006 pu 69 kV
264 COWLEY 8 1.034 pu 71 kV
514L-1
876 514BL TP 1.034 pu 71 kV
514BL
296 GOOSEL7 1.024 pu 141 kV
164L-1
103ST1
346 GOOSEL4 1.084 pu 260 kV
161L-2
769 MCLGH_TP 1.023 pu 141 kV
409 KETTLES 1.032 pu 142 kV
616AL
616L-1
166 PEIGAN 7 1.031 pu 142 kV
59ST1
165 PEIGAN 4 1.066 pu 256 kV
1037L-A
1037L-B
541080 1.051 pu 252 kV
402 KETTLES1 1.032 pu 142 kV
164L-03A
164AL
770 MCLGH2 0.000 pu 0 kV
726 HRL_TAP 1.022 pu 141 kV
164L-03B
233 DRYWOOD7 1.022 pu 141 kV
1501 NATAL 7 1.008 pu 139 kV
786L
232 COLEMAN7 1.010 pu 139 kV
170L
234 CASTRIV1 1.023 pu 141 kV
514BL
410L
221 CRR-W1 1.088 pu 261 kV
1072L
994L
1071L
751 FIDLER01 1.087 pu 261 kV
955L
956L
336 SUMMER01 1.018 pu 140 kV
90% Amps
624L
312ST2
752 FIDLER02 1.015 pu 140 kV
543 OLDMAN1 1.018 pu 141 kV
893L-4
893AL
893L-5
334 SUMMER04 1.021 pu 141 kV
893L/893L-20B
230 OLDMAN D 1.021 pu 141 kV
722 WINDYTP 1.018 pu 141 kV
746 WINDYFLATS 1.062 pu 255 kV
138ST1
138ST1_1
1049L
1048L
745 WINDYFLAT2 1.055 pu 146 kV
748 608AL_TP 1.058 pu 146 kV
608L-1
608L-2
608AL
739 ARD_01 1.069 pu 147 kV
603L-2
837 SODGLTAP 1.056 pu 146 kV
328 MACLEOD01 1.060 pu 146 kV
603L-1
654 WINDYFLAT3 0.987 pu 136 kV
358 SODER1 1.061 pu 146 kV
549031 WINDRISE4 1.027 pu 142 kV
697L
81% Amps
697 LETH593S 1.002 pu 138 kV
794 MAGRATH9 1.021 pu 141 kV
863L-2
823L
272 TABER 7 1.031 pu 142 kV
172L-1
696 LETH146S 1.005 pu 139 kV
813LETH
691 LETH241S 1.006 pu 139 kV
389 HILLRIDG 1.042 pu 144 kV
834 CHIN_CHT 1.031 pu 142 kV
172EL
824L
699 RIVERBN7 1.003 pu 138 kV
172L-4
667L
869 CHIN CH 1.062 pu 147 kV
820L-7B
721 RDCO_TAP 1.070 pu 148 kV
820L-7A
293 STIRLIN7 1.067 pu 147 kV
725AL
406 CHIN CH7 1.062 pu 147 kV
820AL
820BL
1630 REDCOAT1 1.077 pu 149 kV
690 COALDAL7 1.024 pu 141 kV
172L-3
820L
736 BSR_1 1.077 pu 258 kV
1042L
737 TRAVRS1 1.069 pu 257 kV
1041L
940L
451 MATLBT 1.076 pu 258 kV
1005AL
547026 TRAVERS_5 1.070 pu 257 kV
549026 TRAVERS_4 1.070 pu 257 kV
1036L
167 N LETHB4 1.064 pu 255 kV
370ST5
370ST6
370ST3
734L
692 N LETHB7 1.008 pu 139 kV
367 CHINOOK1 1.006 pu 139 kV
463L-1
770L
207L
679 LETH111S 1.002 pu 138 kV
725L-2
939 RVBD TAP 1.002 pu 138 kV
916 MONAR TP 1.006 pu 139 kV
463L-2
463AL
1621 NEWSVCP2 1.050 pu 252 kV
2075S_3
400 MONARCH7 1.002 pu 138 kV
725L-1
823 725BL 1.013 pu 140 kV
725L-3
698 LETH674S 1.001 pu 138 kV
3001/7258L
901 MCBRIDE1 1.012 pu 140 kV
725L-4
237 FORT MA7 1.019 pu 141 kV
180L-40
872 180AL-TAP 1.065 pu 147 kV
180AL-10A
894 CLARESHOLM4 1.065 pu 147 kV
180L-30A
279 STAVELEY 1.067 pu 147 kV
180L-20
197L
235 STAVELY7 1.068 pu 147 kV
1618 NEWELL1 1.050 pu 252 kV
2075S_1
2075S_2
1620 NEWSVCP1 1.050 pu 252 kV
1012 NEWELL2 1.050 pu 252 kV
923L
1087L
1088L
935L
1053L
1052L
1051L
1034L
1035L
669 BOWMAN1 1.029 pu 247 kV
928 ENCH TAP 1.027 pu 142 kV
763L-3
1029 pu 247 kV
1046 pu 251 kV
1054 pu 253 kV
480 BENNETTS 1.028 pu 247 kV
1114L
1484 ANDERSO4 1.076 pu 258 kV
950L/9L950
934L/9L934
933L/9L933
1047 pu 251 kV
985L
1003L
160 JANET 4 613.9 MW 68.0 Mvar 606.8 MW 67.6 Mvar
260 JENNER 4 1.105 pu 265 kV
944L
951L
225 WARE JCT
430 W BROOK4 1.055 pu 253 kV
276 W BROOK7 1.014 pu 140 kV
28ST2A
28ST1A
1075L
931L
1072 pu 257 kV
1044 pu 250 kV
1080L
1109L
1106L
93% Amps
544 ENMX65S4
65.2TR
65.1TR
570 ENMX65S7 1.017 pu 140 kV
617 FOOTHLL1 1.030 pu 247 kV
1038L
540009 KCS_POI_A6 1.048 pu
653 SC1B 1.053 pu 253 kV
266S_4
266S_3
652 SC1A 1.052 pu 253 kV
643 SC1D 1.047 pu 251 kV
266S_2
266S_1
642 SC1C 1.043 pu 250 kV
1037L-2
1047L
1106L
1107L
1048L
1049L
772 ENMX25S7 1.050 pu 252 kV
1065L
1064L
161 SARCEE 4 1.038 pu 249 kV
916L
162 E CALGAR 1.034 pu 248 kV
936L
937L
159 LANGDON4 1.029 pu 247 kV
540070 927AL_TAP 1.021 pu 245 kV
924L
98% Amps
943 MILO 1 1.046 pu 251 kV
1005L-1
1005L-2
256 BROOKS 7 1.010 pu 139 kV
666L
814L
827L
795L
401 HAYS 7 1.007 pu 139 kV
831L-2
831L-1
826 831A TAP 1.004 pu 139 kV
831AL
445 CUTNG L7 1.004 pu 139 kV
250 DUCHESS7 1.000 pu 138 kV
333 QUENSTWN 1.046 pu 144 kV
853L-2
853L-1
853AL
877 BASNTAP 1.020 pu 141 kV
399 BASSAN7 1.015 pu 140 kV
275 TILLEY 7 1.014 pu 140 kV
100L
270 SUFFIEL7 1.034 pu 143 kV
547070 161AL_TAP 1.071 pu 148 kV
244 VULCAN 7 1.070 pu 148 kV
161L
1065 pu 147 kV
1027 pu 142 kV
1042 pu 144 kV
1003 pu 138 kV
1077 pu 149 kV
1062 pu 147 kV
1070 pu 148 kV
1024 pu 141 kV
1008 pu 139 kV
1001 pu 138 kV
1013 pu 140 kV
1012 pu 140 kV
1019 pu 141 kV
1046 pu 144 kV
1071 pu 148 kV
1067 pu 147 kV
1068 pu 147 kV
1070 pu 148 kV
1004 pu 139 kV
1000 pu 138 kV
1007 pu 139 kV
1010 pu 139 kV
1014 pu 140 kV
1020 pu 141 kV
1027 pu 142 kV
1029 pu 247 kV
1046 pu 251 kV
1050 pu 252 kV
1054 pu 253 kV
1072 pu 257 kV
1044 pu 250 kV
1038 pu 249 kV
1034 pu 248 kV
1029 pu 247 kV
1021 pu 245 kV
1047 pu 251 kV
1105 pu 265 kV
1076 pu 258 kV
1028 pu 247 kV
1055 pu 253 kV
1014 pu 140 kV
1010 pu 139 kV
1007 pu 139 kV
1004 pu 139 kV
1000 pu 138 kV
1046 pu 144 kV
1020 pu 141 kV
1015 pu 140 kV
1014 pu 140 kV
1034 pu 143 kV
1071 pu 148 kV
1070 pu 148 kV
1004 pu 139 kV
NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1106L (SS-65 to 237S Foothills)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: New (Monitor 1106L&1107L)
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

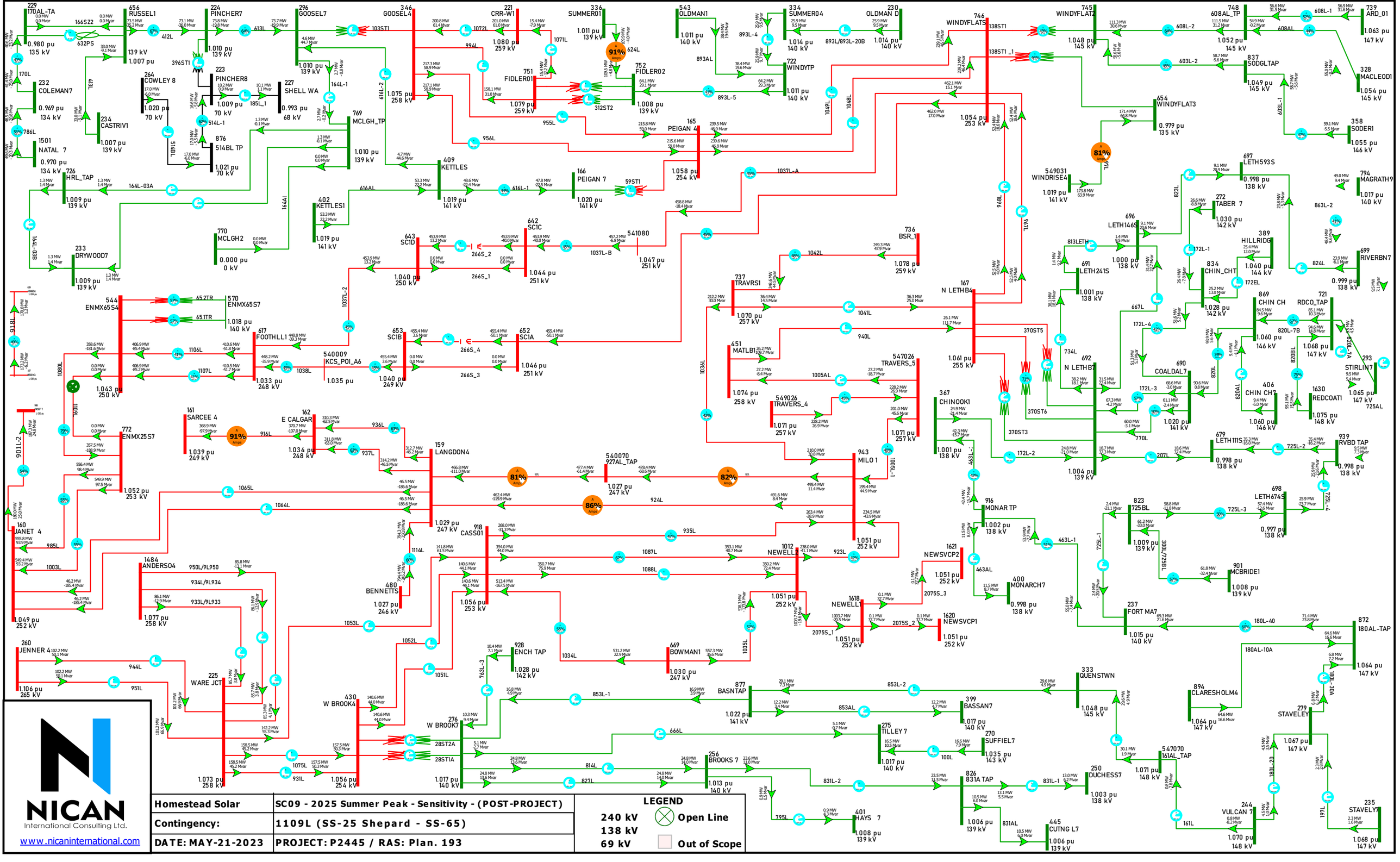


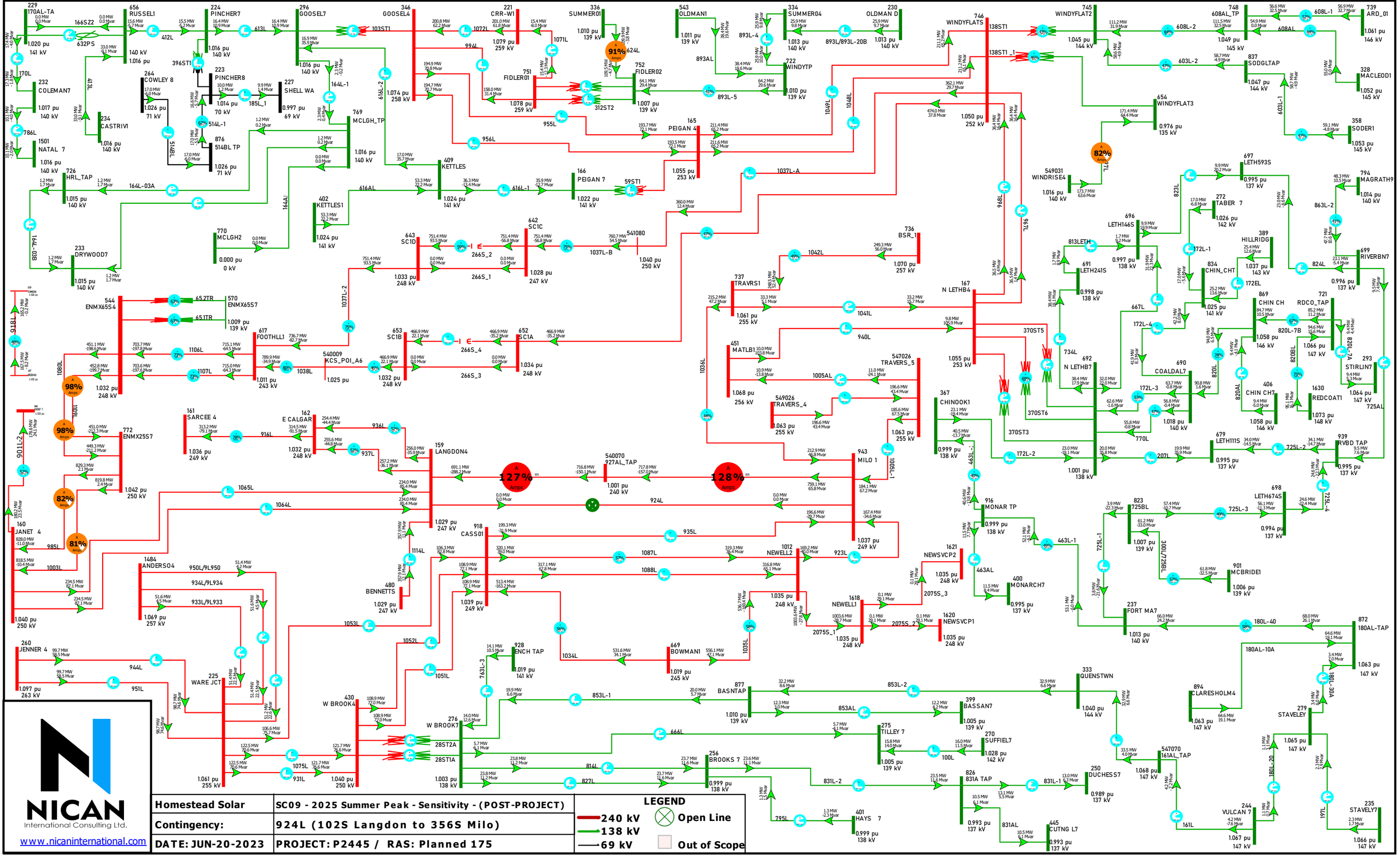
NICAN
International Consulting Ltd.
www.nicaninternational.com

Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1107L (SS-65 to 237S Foothills)**
DATE: MAY-21-2023	**PROJECT: P2445 / RAS: New (Monitor 1106L&1107L)**

LEGEND

240 kV
138 kV
69 kV
⊗ Open Line
▢ Out of Scope


NICAN
International Consulting Ltd.
www.nicaninternational.com
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1109L (SS-25 Shepard - SS-65)
DATE: MAY-21-2023
PROJECT: P2445 / RAS: Plan. 193
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope



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International Consulting Ltd.
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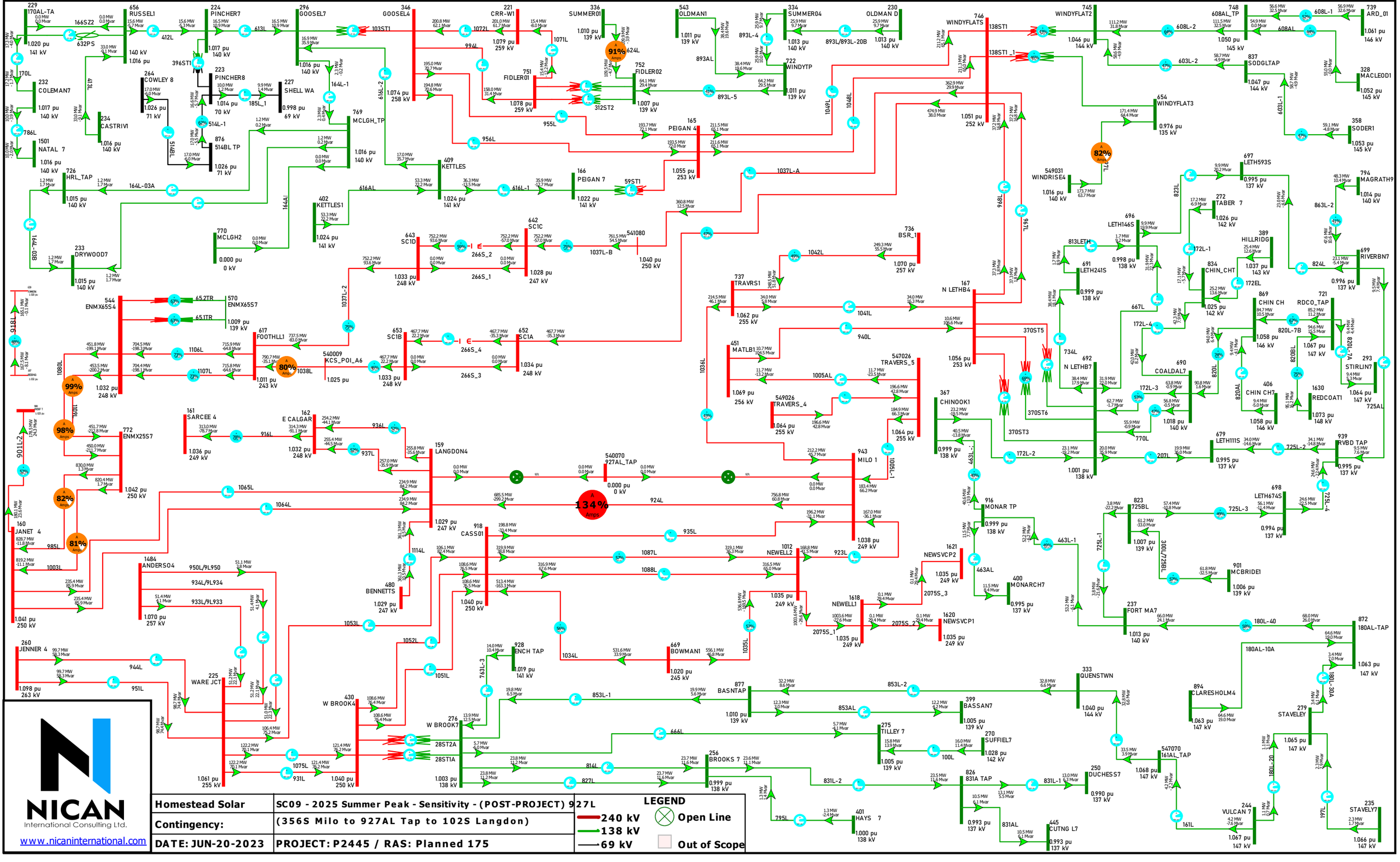
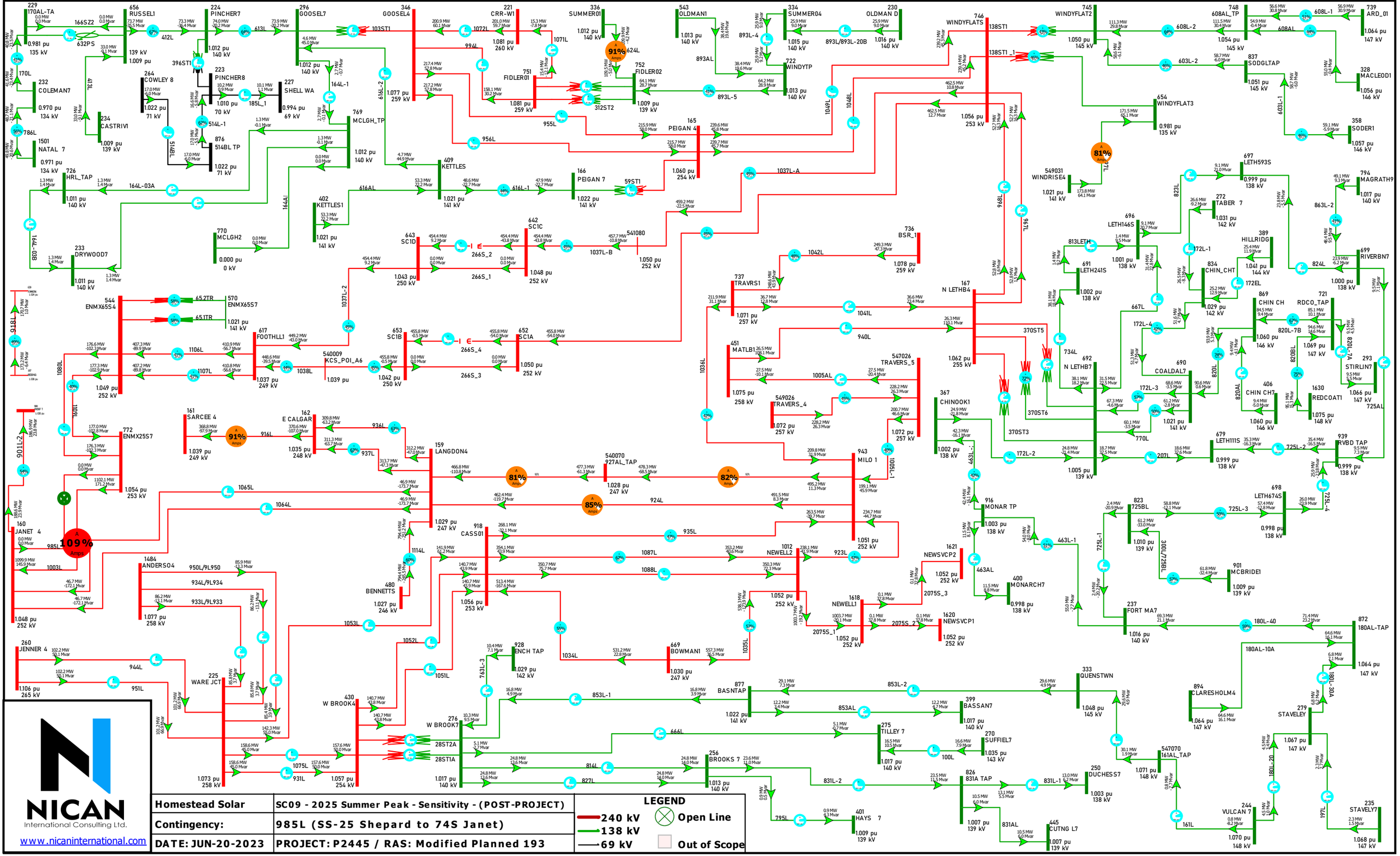
Homestead Solar	SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:	924L (102S Langdon to 356S Milo)
DATE: JUN-20-2023	PROJECT: P2445 / RAS: Planned 175

LEGEND
- 240 kV
- 138 kV
- 69 kV
- ⊗ Open Line
- ☐ Out of Scope


229
170AL-TA
1.020 pu
141 kV
656
RUSSEL1
1.016 pu
140 kV
632PS
166SZ2
412L
224
PINCHER7
1.017 pu
140 kV
613L
396ST1
223
PINCHER8
1.014 pu
70 kV
185L_1
227
SHELL WA
0.998 pu
69 kV
264
COWLEY 8
1.026 pu
71 kV
514L-1
876
514BL TP
1.026 pu
71 kV
514L1
296
GOOSEL7
1.016 pu
140 kV
164L-1
616L-2
769
MCLGH_TP
1.016 pu
140 kV
346
GOOSEL4
103ST1
1.074 pu
258 kV
994L
956L
955L
221
CRR-W1
1.079 pu
259 kV
1071L
751
FIDLER01
1.078 pu
259 kV
336
SUMMER01
1.010 pu
139 kV
91%
624L
312ST2
752
FIDLER02
1.007 pu
139 kV
543
OLDMAN1
1.011 pu
139 kV
893L-4
334
SUMMER04
1.013 pu
140 kV
893L/893L-20B
230
OLDMAN D
1.013 pu
140 kV
893AL
722
WINDYTP
1.011 pu
139 kV
893L-5
746
WINDYFLATS
138ST1
138ST1_1
1.051 pu
252 kV
1040L
1048L
745
WINDYFLAT2
1.046 pu
144 kV
748
608AL_TP
1.050 pu
145 kV
608L-1
608L-2
608AL
739
ARD_01
1.061 pu
146 kV
603L-2
837
SODGLTAP
1.047 pu
144 kV
328
MACLEOD1
1.052 pu
145 kV
1609
654
WINDYFLAT3
0.976 pu
135 kV
358
SODER1
1.053 pu
145 kV
549031
WINDRISE4
1.016 pu
140 kV
927L
82%
165
PEIGAN 4
1.055 pu
253 kV
1037L-A
166
PEIGAN 7
1.022 pu
141 kV
59ST1
409
KETTLES
1.024 pu
141 kV
616L-1
616AL
402
KETTLES1
1.024 pu
141 kV
164L-03A
164AL
786L
1501
NATAL 7
1.016 pu
140 kV
726
HRL_TAP
1.015 pu
140 kV
233
DRYWOOD7
1.015 pu
140 kV
764L-03B
770
MCLGH2
0.000 pu
0 kV
643
SC1D
1.033 pu
248 kV
266S_2
266S_1
642
SC1C
1.028 pu
247 kV
541080
1037L-B
1.040 pu
250 kV
736
BSR_1
1.070 pu
257 kV
1042L
737
TRAVRS1
1.062 pu
255 kV
1041L
940L
451
MATLB1
1.069 pu
256 kV
1005AL
547026
TRAVERS_5
549026
TRAVERS_4
1.064 pu
255 kV
1064L
167
N LETHB4
1.056 pu
253 kV
370ST5
370ST6
370ST3
1796
1679
734L
692
N LETHB7
1.001 pu
138 kV
172L-2
367
CHINOOK1
0.999 pu
138 kV
172L-1
916
MONAR TP
0.999 pu
138 kV
463L-1
1621
NEWSVCP2
1.035 pu
249 kV
463AL
400
MONARCH7
0.995 pu
137 kV
2075S_3
1618
NEWELL1
1.035 pu
249 kV
2075S_1
2075S_2
1620
NEWSVCP1
1.035 pu
249 kV
1087L
1088L
1012
NEWELL2
1.035 pu
249 kV
923L
1038L
1039L
1034L
1035L
669
BOWMAN1
1.020 pu
245 kV
928
BENCH TAP
1.019 pu
141 kV
763L-3
480
BENNETTS
1.029 pu
247 kV
1114L
918
CASS01
1.029 pu
247 kV
1053L
1052L
1051L
1029L
1030L
1031L
1032L
1033L
1034L
1035L
1036L
1037L-1
1037L-2
1038L
1039L
1040L
1041L
1042L
1043L
1044L
1045L
1046L
1047L
1048L
1049L
1050L
1051L
1052L
1053L
1054L
1055L
1056L
1057L
1058L
1059L
1060L
1061L
1062L
1063L
1064L
1065L
1066L
1067L
1068L
1069L
1070L
1071L
1072L
1073L
1074L
1075L
1076L
1077L


229
170AL-TA
0.0 MW
0.0 Mvar
0.981 pu
135 kV
656
RUSSEL1
73.7 MW
-35.5 Mvar
139 kV
1.009 pu
166SZ2
632PS
0.0 MW
0.0 Mvar
33.0 MW
-9.1 Mvar
224
PINCHER7
74.0 MW
-20.2 Mvar
1.012 pu
140 kV
613L
412L
396ST1
223
PINCHER8
10.2 MW
0.9 Mvar
1.010 pu
70 kV
185L_1
227
SHELL WA
0.994 pu
69 kV
264
COWLEY 8
17.0 MW
-6.0 Mvar
1.022 pu
71 kV
514L-1
876
514BL TP
1.022 pu
71 kV
1414L
1416L
170L
232
COLEMAN7
0.970 pu
134 kV
234
CASTRIVI
1.009 pu
139 kV
786L
1501
NATAL 7
0.971 pu
134 kV
726
HRL_TAP
1.011 pu
140 kV
164L-03A
164L-03B
233
DRYWOOD7
1.011 pu
140 kV
164AL
770
MCLGH2
0.000 pu
0 kV
296
GOOSEL7
4.6 MW
-45.0 Mvar
1.012 pu
140 kV
103ST1
164L-1
769
MCLGH_TP
1.012 pu
140 kV
616L-2
346
GOOSEL4
200.9 MW
60.1 Mvar
1072L
994L
217.4 MW
57.8 Mvar
217.2 MW
57.8 Mvar
1.077 pu
259 kV
221
CRR-W1
201.0 MW
59.7 Mvar
1.081 pu
260 kV
15.3 MW
-7.8 Mvar
1071L
751
FIDLER01
15.4 MW
-1.5 Mvar
158.1 MW
30.2 Mvar
1.081 pu
259 kV
955L
956L
336
SUMMER01
1.012 pu
140 kV
91%
Amps
624L
109.5 MW
-50.1 Mvar
312ST2
752
FIDLER02
64.1 MW
28.7 Mvar
1.009 pu
139 kV
543
OLDMAN1
1.013 pu
140 kV
893L-4
893L-5
893AL
334
SUMMER04
25.9 MW
9.0 Mvar
1.015 pu
140 kV
893L/893L-20B
230
OLDMAN D
25.9 MW
9.0 Mvar
1.016 pu
140 kV
722
WINDYTP
38.4 MW
13.6 Mvar
64.2 MW
28.9 Mvar
1.013 pu
140 kV
746
WINDYFLATS
138ST1
138ST1_1
292.2 MW
462.5 MW
10.8 Mvar
462.5 MW
12.7 Mvar
1.056 pu
253 kV
1049L
1048L
745
WINDYFLAT2
1.050 pu
145 kV
111.3 MW
29.8 Mvar
-38.6 Mvar
-6.1 Mvar
608L-2
603L-2
748
608AL_TP
111.5 MW
30.4 Mvar
1.054 pu
145 kV
608AL
608L-1
739
ARD_01
1.064 pu
147 kV
837
SODGLTAP
58.7 MW
-6.0 Mvar
1.051 pu
145 kV
603L-1
328
MACLEOD1
1.056 pu
146 kV
654
WINDYFLAT3
171.5 MW
65.1 Mvar
0.981 pu
135 kV
358
SODER1
59.1 MW
-5.9 Mvar
1.057 pu
146 kV
165
PEIGAN 4
215.9 MW
58.0 Mvar
215.7 MW
58.0 Mvar
239.6 MW
45.8 Mvar
239.7 MW
46.7 Mvar
1.060 pu
254 kV
1037L-A
166
PEIGAN 7
1.022 pu
141 kV
59ST1
409
KETTLES
4.7 MW
44.9 Mvar
1.021 pu
141 kV
616L-1
616AL
402
KETTLES1
53.3 MW
22.2 Mvar
1.021 pu
141 kV
642
SC1C
454.4 MW
-43.8 Mvar
1.048 pu
252 kV
643
SC1D
454.4 MW
9.2 Mvar
1.043 pu
250 kV
266S_2
266S_1
541080
457.7 MW
-10.8 Mvar
1037L-B
1.050 pu
252 kV
459.2 MW
-22.5 Mvar
1037L-2
653
SC1B
455.8 MW
-0.5 Mvar
1.042 pu
250 kV
266S_4
266S_3
652
SC1A
455.8 MW
-54.0 Mvar
1.050 pu
252 kV
736
BSR_1
249.3 MW
-47.3 Mvar
1.078 pu
259 kV
1042L
737
TRAVRS1
369.1 MW
-48.9 Mvar
1.071 pu
257 kV
211.9 MW
31.1 Mvar
36.7 MW
12.8 Mvar
1041L
940L
451
MATLB1
26.5 MW
108.1 Mvar
27.5 MW
-10.1 Mvar
1.075 pu
258 kV
1005AL
547026
TRAVERS_5
27.5 MW
-20.4 Mvar
228.2 MW
26.3 Mvar
200.7 MW
46.6 Mvar
1.072 pu
257 kV
549026
TRAVERS_4
228.2 MW
26.3 Mvar
1.072 pu
257 kV
1004L
1005L-1
943
MILO 1
209.8 MW
31.9 Mvar
199.1 MW
45.9 Mvar
1.009 pu
139 kV
167
N LETHB4
26.3 MW
110.1 Mvar
1.062 pu
255 kV
1049L
1048L
370ST5
370ST6
370ST3
734L
692
N LETHB7
38.1 MW
18.2 Mvar
31.5 MW
22.5 Mvar
67.3 MW
-4.6 Mvar
60.1 MW
-3.5 Mvar
770L
1.005 pu
139 kV
172L-2
207L
679
LETH111S
35.3 MW
-16.3 Mvar
0.999 pu
138 kV
725L-2
939
RVBD TAP
9.5 MW
7.3 Mvar
0.999 pu
138 kV
367
CHINOOK1
24.9 MW
-21.8 Mvar
42.3 MW
-16.1 Mvar
1.002 pu
138 kV
463L-2
916
MONAR TP
1.003 pu
138 kV
463L-1
463AL
1621
NEWSVCP2
1.052 pu
252 kV
2075S_3
1618
NEWELL1
1003.7 MW
-20.1 Mvar
1003.7 MW
-19.2 Mvar
2075S_1
1012
NEWELL2
238.1 MW
-41.9 Mvar
1.052 pu
252 kV
923L
1620
NEWSVCP1
1.052 pu
252 kV
2075S_2
400
MONARCH7
0.998 pu
138 kV
549031
WINDRISE4
1.021 pu
141 kV
173.8 MW
64.1 Mvar
81%
Amps
927L
697
LETH593S
0.999 pu
138 kV
9.1 MW
21.0 Mvar
794
MAGRATH9
1.017 pu
140 kV
49.1 MW
9.3 Mvar
863L-2
824L
699
RIVERBN7
1.000 pu
138 kV
23.9 MW
-6.2 Mvar
272
TABER 7
1.031 pu
142 kV
26.6 MW
-9.2 Mvar
823L
172L-1
696
LETH146S
9.1 MW
20.7 Mvar
1.001 pu
138 kV
1.4 MW
9.5 Mvar
813LETH
691
LETH241S
1.002 pu
138 kV
667L
172L-4
834
CHIN_CHT
25.2 MW
12.9 Mvar
1.029 pu
142 kV
26.5 MW
-18.3 Mvar
389
HILLRIDG
25.4 MW
11.9 Mvar
1.041 pu
144 kV
172EL
869
CHIN CH
84.5 MW
9.4 Mvar
1.060 pu
146 kV
820L-7B
820L-7A
721
RDCO_TAP
85.1 MW
10.1 Mvar
94.6 MW
14.6 Mvar
1.069 pu
147 kV
293
STIRLIN7
9.5 MW
6.5 Mvar
1.066 pu
147 kV
725AL
690
COALDAL7
90.6 MW
0.6 Mvar
68.6 MW
-3.5 Mvar
61.2 MW
-2.8 Mvar
1.021 pu
141 kV
172L-3
820L
820AL
406
CHIN CH7
9.4 MW
-5.0 Mvar
1.060 pu
146 kV
820BL
1630
REDCOAT1
1.075 pu
148 kV
1071L
1072L
1073L
1074L
544
ENMX65S4
65.2TR
65.1TR
570
ENMX65S7
1.021 pu
141 kV
617
FOOTHLL1
449.2 MW
-45.0 Mvar
448.6 MW
-39.5 Mvar
1.037 pu
249 kV
1038L
540009
KCS_POI_A6
1.039 pu
1106L
1107L
1080L
1.049 pu
252 kV
1109L
772
ENMX25S7
177.0 MW
-102.8 Mvar
176.3 MW
-102.3 Mvar
1102.1 MW
171.2 Mvar
1.054 pu
253 kV
1106L-2
160
JANET 4
0.0 MW
0.0 Mvar
1099.9 MW
145.9 Mvar
985L
1003L
46.7 MW
-172.1 Mvar
1.048 pu
252 kV
1484
ANDERSO4
950L/9L950
934L/9L934
933L/9L933
1.077 pu
258 kV
260
JENNER 4
102.2 MW
50.1 Mvar
1106 pu
265 kV
944L
951L
225
WARE JCT
85.8 MW
3.9 Mvar
1.073 pu
258 kV
1075L
931L
1.057 pu
254 kV
430
W BROOK4
140.7 MW
43.8 Mvar
276
W BROOK7
10.3 MW
9.5 Mvar
28ST2A
28ST1A
1.017 pu
140 kV
161
SARCEE 4
368.8 MW
-97.9 Mvar
91%
Amps
1.039 pu
249 kV
162
E CALGAR
309.8 MW
-63.2 Mvar
370.6 MW
-107.0 Mvar
311.3 MW
-63.7 Mvar
1.035 pu
248 kV
916L
936L
937L
159
LANGDON4
312.2 MW
-47.0 Mvar
313.7 MW
-47.3 Mvar
46.9 MW
-173.7 Mvar
46.9 MW
-173.7 Mvar
1.029 pu
247 kV
1114L
480
BENNETTS
794.4 MW
-52.4 Mvar
1.027 pu
246 kV
1053L
1052L
1051L
466.8 MW
-110.8 Mvar
81%
Amps
540070
927AL_TAP
477.3 MW
-61.3 Mvar
478.3 MW
-68.5 Mvar
1.028 pu
247 kV
462.4 MW
-119.7 Mvar
82%
Amps
924L
85%
Amps
491.5 MW
8.3 Mvar
495.2 MW
11.3 Mvar
1087L
1088L
1034L
1035L
763L-3
928
BENCH TAP
1.029 pu
142 kV
669
BOWMANI
531.2 MW
22.8 Mvar
557.3 MW
36.5 Mvar
1.030 pu
247 kV
877
BASNTAP
1.022 pu
141 kV
853L-1
853L-2
853AL
399
BASSAN7
1.017 pu
140 kV
333
QUENSTWN
1.048 pu
145 kV
894
CLARESHOLM4
1.064 pu
147 kV
180AL-10A
180L-30A
872
180AL-TAP
1.064 pu
147 kV
180L-40
666L
814L
827L
831L-2
831L-1
831AL
275
TILLEY 7
1.017 pu
140 kV
100L
270
SUFFIEL7
1.035 pu
143 kV
256
BROOKS 7
1.013 pu
140 kV
826
831A TAP
1.007 pu
139 kV
250
DUCHESS7
1.003 pu
138 kV
547070
161AL_TAP
1.071 pu
148 kV
279
STAVELEY
1.067 pu
147 kV
180L-20
795L
401
HAYS 7
1.009 pu
139 kV
445
CUTNG L7
1.007 pu
139 kV
244
VULCAN 7
1.070 pu
148 kV
235
STAVELY7
1.068 pu
147 kV
191L
161L
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope
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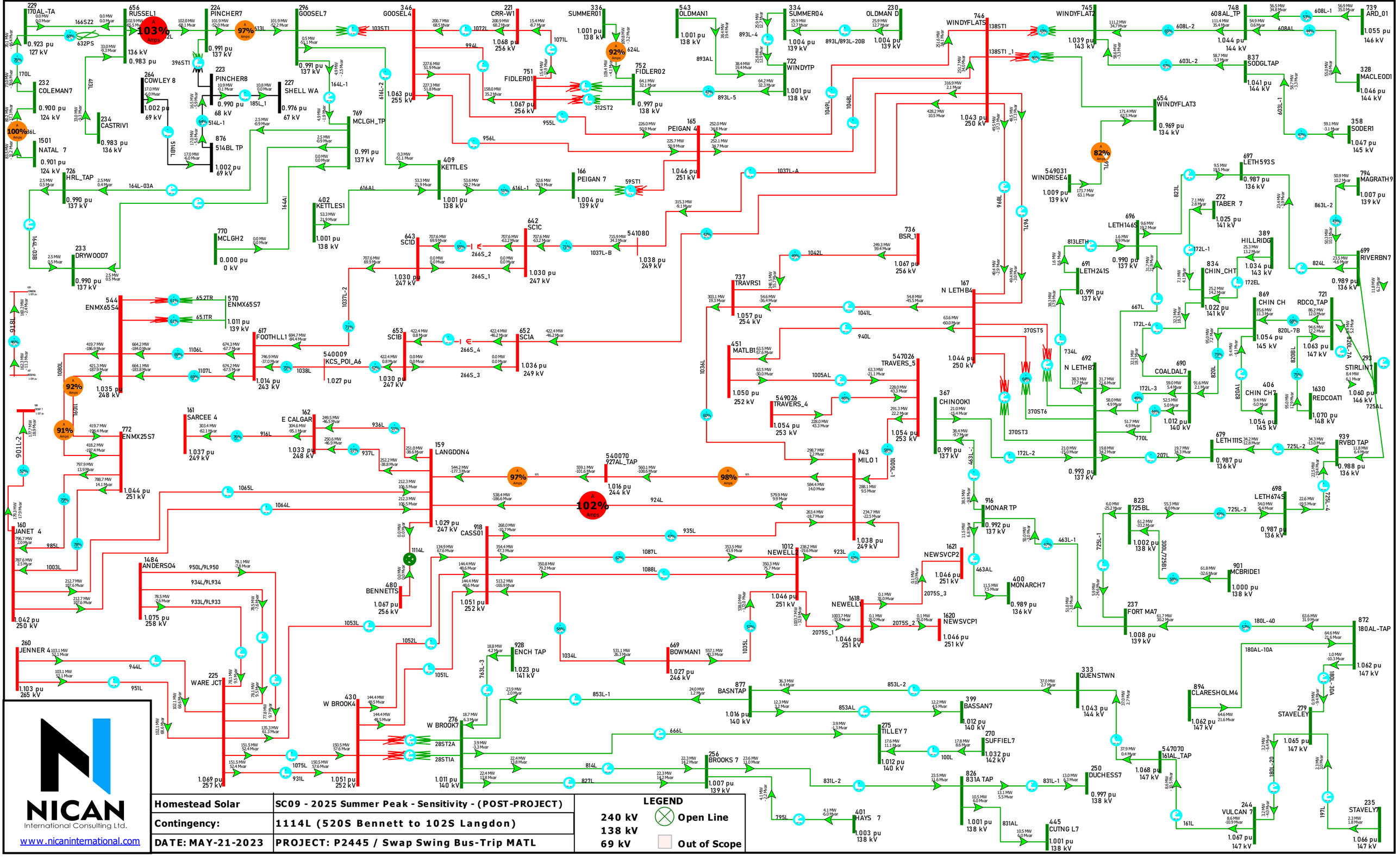
Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
985L (SS-25 Shepard to 74S Janet)
DATE: JUN-20-2023
PROJECT: P2445 / RAS: Modified Planned 193



Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1114L (520S Bennett to 102S Langdon)**
DATE: MAY-21-2023	**PROJECT: P2445 / Swap Swing Bus-Trip MATL**

LEGEND

240 kV	⊗ **Open Line**
138 kV	
69 kV	☐ **Out of Scope**

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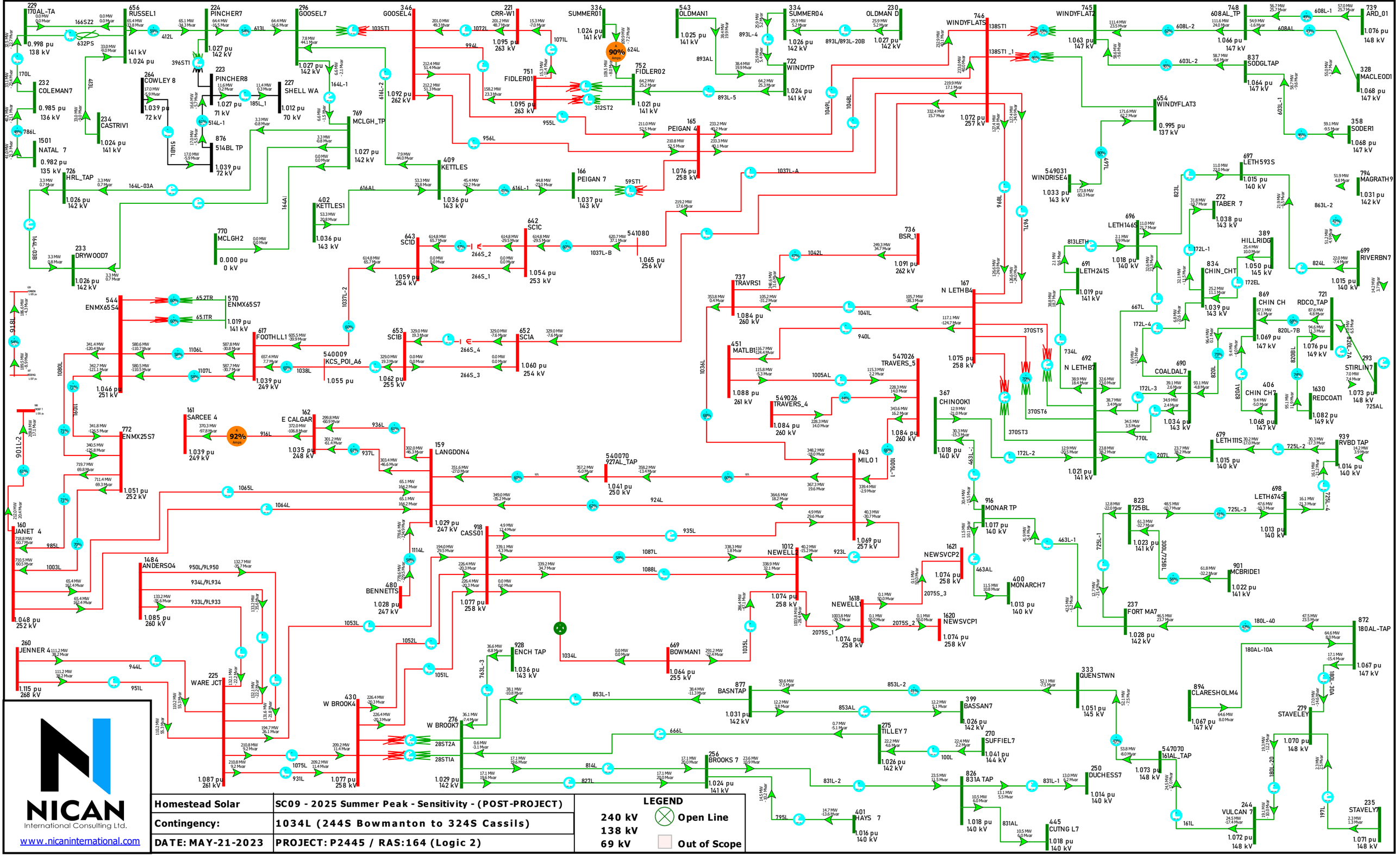

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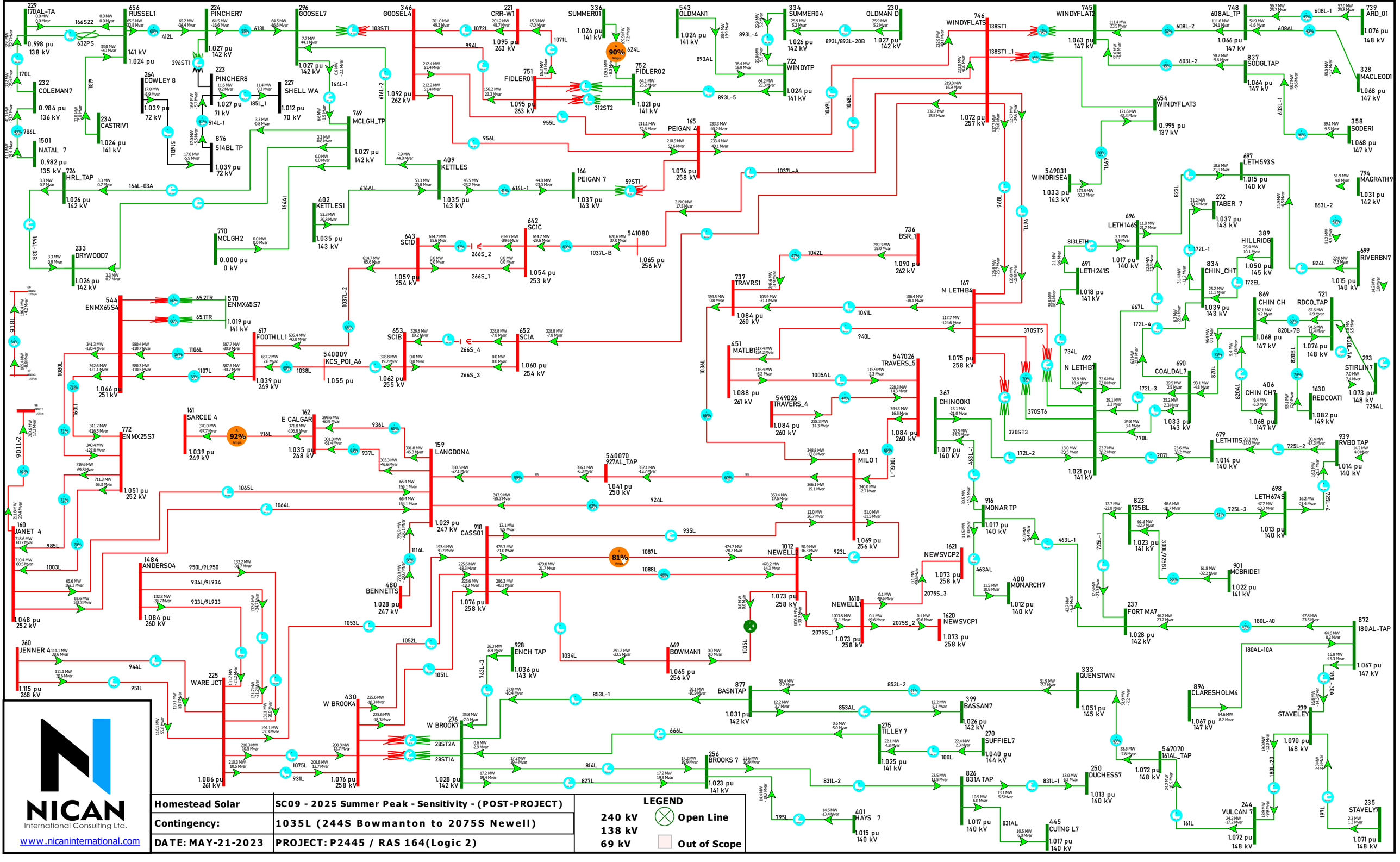
Homestead Solar	**SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)**
Contingency:	**1034L (244S Bowmanton to 324S Cassils)**
DATE: MAY-21-2023	**PROJECT: P2445 / RAS:164 (Logic 2)**

LEGEND

240 kV
138 kV
69 kV

Open Line

Out of Scope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Homestead Solar
SC09 - 2025 Summer Peak - Sensitivity - (POST-PROJECT)
Contingency:
1035L (244S Bowmanton to 2075S Newell)
DATE: MAY-21-2023
PROJECT: P2445 / RAS 164(Logic 2)
LEGEND
240 kV
138 kV
69 kV
Open Line
Out of Scope

Attachment A7
Constraint Effective Factors Table

Scenario 3

Contingency	Violation \ Generator (Bus Number)	Ardenville Wind	Bantry	Bassano 435S DER Solar	Blackspring Ridge	Blue Trail Wind	Blue Trail Wind	Brooks Solar	Brooks Solar 1	Brooks Solar 2	Buffalo Plains	Castle River	Castle Rock Ridge 2	Castle Rock Wind Farm	Chin Chute	Coaldale	Coaldale Solar	Cowley Ridge	Cutting Lake	Enterprise Solar	Greengate Travers Solar	Homestead Solar	Kettels Hill	Kirkcaldy MPC Solar	Lethbridge DER	McBride Lake Windfarm	Monarch	Old Man River Wind	Oldman River Hydro	Parkland	Riverview Wind	Soderglen Wind	Solar Krafte Brooks	Stavely 349S DER Solar	Stirling WAGF	Summerview	Suncor Chin Chute	Tilley	TransAlta Windrise	Vulcan Faribault Farms DG PV	Vulcan 255S DER Solar
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	0.3904	0.1501	0	0.2062	0.3827	0.381	0.1494	0.1494	0.1494	0.1423	0.3504	0.3809	0.3789	0.2384	0.267	0.2573	0.3484	0.1502	0.228	0	0.4295	0.37	0	0.2975	0.2679	0.2944	0.3762	0.3862	0.2517	0.3762	0.378	0.137	0.2517	0.2261	0.3826	0.238	0.1501	0.3835	0.2313	0.2313
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	0.1639	0.2703	0	0.2489	0.161	0.162	0.2719	0.2719	0.2719	0.299	0.1483	0.1604	0.1599	0.1867	0.2144	0.2311	0.1499	0.274	0.2452	0	0.118	0.1568	0	0.2177	0.2062	0.221	0.159	0.1622	0.2371	0.1591	0.1599	0.273	0.2371	0.1759	0.161	0.2092	0.2704	0.1624	0.2439	0.2439
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	0.4441	0.1667	0	0.2335	0.4377	0.4456	0.1658	0.1658	0.1658	0.1591	0.3974	0.4333	0.4331	0.2785	0.2953	0.2809	0.3953	0.1664	0.2486	0	0.5034	0.4217	0	0.3237	0.3052	0.3183	0.4319	0.4372	0.2724	0.432	0.4368	0.152	0.2724	0.2689	0.435	0.272	0.1667	0.4433	0.252	0.252
1088L (324S Cassils to 207SS Newell)	1087L (324S Cassils to 207SS Newell)	-0.0097	0.3142	0	-0.0433	-0.0098	-0.0108	0.3185	0.3185	0.3185	-0.0659	-0.0077	-0.0093	-0.0095	0.0295	0.0465	0.094	-0.0075	0.3233	0.1608	0	-0.0071	-0.0088	0	0.0145	0.0286	0.0251	-0.0096	-0.0092	0.1144	-0.0096	-0.0102	0.3336	0.1144	0.0244	-0.0093	0.0702	0.3147	-0.0103	0.1539	0.1539
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	0.4438	0.1666	0	0.2334	0.4374	0.4454	0.1657	0.1657	0.1657	0.159	0.3971	0.4331	0.4328	0.2784	0.2951	0.2807	0.395	0.1663	0.2484	0	0.5031	0.4215	0	0.3235	0.305	0.3181	0.4317	0.437	0.2723	0.4317	0.4366	0.1519	0.2723	0.2688	0.4348	0.2719	0.1666	0.4431	0.2519	0.2519
918L (SS-162 Beddington to 281S Johnson)	916L (SS East Calgary to 42S Sarcee)	-0.0384	-0.0441	0	-0.0297	-0.0376	-0.0372	-0.0429	-0.0429	-0.0429	-0.0271	-0.0426	-0.0388	-0.0385	-0.0317	-0.0364	-0.0385	-0.0391	-0.0432	-0.0402	0	-0.0375	-0.0404	0	-0.0372	-0.0348	-0.0376	-0.0382	-0.0394	-0.0394	-0.0382	-0.037	-0.0426	-0.0394	-0.0298	-0.039	-0.0353	-0.0442	-0.0376	-0.04	-0.04
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	0.206	0.3789	0	0.343	0.2026	0.2052	0.3809	0.3809	0.3809	0.4146	0.1867	0.2016	0.2015	0.2544	0.2909	0.3151	0.19	0.384	0.3371	0	0.1598	0.1977	0	0.2933	0.28	0.298	0.2008	0.2039	0.3239	0.2007	0.2018	0.3839	0.3239	0.2401	0.2026	0.286	0.3791	0.2073	0.3351	0.3351
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	0.2055	0.3777	0	0.342	0.2022	0.2048	0.3797	0.3797	0.3797	0.4132	0.1864	0.2012	0.2011	0.2537	0.2901	0.3143	0.1896	0.3828	0.3362	0	0.1595	0.1973	0	0.2925	0.2793	0.2972	0.2003	0.2035	0.323	0.2002	0.2014	0.3827	0.323	0.2395	0.2022	0.2853	0.3779	0.2069	0.3341	0.3341
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	0.3901	0.15	0	0.206	0.3824	0.3807	0.1493	0.1493	0.1493	0.1422	0.3501	0.3806	0.3786	0.2383	0.2668	0.2571	0.3482	0.1501	0.2278	0	0.4292	0.3697	0	0.2973	0.2677	0.2941	0.3759	0.386	0.2515	0.3759	0.3777	0.1369	0.2515	0.2259	0.3824	0.2379	0.15	0.3832	0.2311	0.2311

Scenario 4

Contingency	Violation \ Generator (Bus Number)	Ardenville Wind	Bantry	Bassano 435S DER Solar	Blackspring Ridge	Blue Trail Wind	Blue Trail Wind	Brooks Solar	Brooks Solar 1	Brooks Solar 2	Buffalo Plains	Castle River	Castle Rock Ridge 2	Castle Rock Wind Farm	Chin Chute	Coaldale	Coaldale Solar	Cowley Ridge	Cutting Lake	Enterprise Solar	Greengate Travers Solar	Homestead Solar	Kettels Hill	Kirkcaldy MPC Solar	Lethbridge DER	McBride Lake Windfarm	Monarch	Old Man River Wind	Oldman River Hydro	Parkland	Riverview Wind	Soderglen Wind	Solar Krafte Brooks	Stavely 349S DER Solar	Stirling WAGF	Summerview	Suncor Chin Chute	Tilley	TransAlta Windrise	Vulcan Faribault Farms DG PV	Vulcan 255S DER Solar
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	0.3724	0.1484	0.1403	0.2062	0.365	0.3622	0.1471	0.14	0.14	0.1472	0.337	0.364	0.3617	0.2436	0.2669	0.2208	0.336	0.1492	0.1939	0.2066	0.4031	0.3575	0	0.2948	0.2545	0.2776	0.3594	0.3689	0.2176	0.359	0.3592	0.1369	0.2141	0.2358	0.3653	0.2374	0.1486	0.3627	0.198	0.1953
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	0.1729	0.2607	0.2295	0.2552	0.1701	0.172	0.2609	0.245	0.2448	0.3135	0.1574	0.1696	0.1691	0.2035	0.2235	0.2042	0.1592	0.2667	0.2109	0.2598	0	0.1661	0	0.2261	0.2077	0.2183	0.1686	0.1713	0.2089	0.1685	0.1691	0.2631	0.2056	0.197	0.1702	0.2181	0.2614	0.1715	0.2115	0.2083
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	924L (102S Langdon to 356S Milo)	0.1671	0.2581	0.2273	0.2504	0.1644	0.1657	0.2584	0.2428	0.2426	0.3111	0.152	0.164	0.1635	0.1982	0.2186	0.1991	0.1537	0.2642	0.2065	0.2553	0.1217	0.1604	0	0.2209	0.2022	0.2128	0.1629	0.1656	0.204	0.1628	0.1633	0.2605	0.2008	0.1917	0.1645	0.2132	0.2588	0.1655	0.207	0.2039
1038L (138S Windy Flats to 266S SC1 to P2373 Tap to 237S Foothills)	927L (102S Langdon to 356S Milo)	0.1682	0.2598	0.2287	0.252	0.1654	0.1667	0.2601	0.2444	0.2442	0.3131	0.153	0.165	0.1645	0.1995	0.22	0.2004	0.1547	0.2659	0.2079	0.2569	0.1225	0.1614	0	0.2223	0.2035	0.2142	0.1639	0.1667	0.2054	0.1639	0.1643	0.2622	0.2021	0.1929	0.1656	0.2146	0.2605	0.1666	0.2083	0.2052
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	0.4403	0.164	0.1569	0.2333	0.4338	0.4421	0.1624	0.1548	0.1549	0.1592	0.3963	0.431	0.4305	0.2862	0.2967	0.2619	0.3931	0.1645	0.227	0.2336	0.4998	0.4174	0	0.3237	0.2975	0.3149	0.4295	0.4344	0.2555	0.4295	0.4331	0.1493	0.2519	0.28	0.4323	0.2736	0.1641	0.44	0.232	0.2294
1088L (324S Cassils to 207SS Newell)	1087L (324S Cassils to 207SS Newell)	-0.0089	0.3041	0.2461	0.1488	-0.0436	-0.0088	-0.0094	0.3063	0.2805	0.2797	-0.0703	-0.007	-0.0085	-0.0086	0.0396	0.0501	0.0872	0.0712	-0.0063	0.3177	0.1266	-0.0446	-0.0064	-0.0076	0	0.0159	0.0302	0.0203	-0.0086	-0.0085	0.087	-0.0086	-0.009	0.3258	0.0853	0.0372	-0.0085	0.0782	0.3058	-0.0092	0.1215	0.1188
1106L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	0.1524	0.2508	0.2201	0.2418	0.1499	0.1514	0.2511	0.2356	0.2354	0.3039	0.1387	0.1495	0.1491	0.1884	0.2081	0.1899	0.1406	0.2569	0.1981	0.2465	0.1248	0.1463	0	0.2097	0.192	0.202	0.1485	0.151	0.195	0.1485	0.1489	0.2537	0.1918	0.1821	0.15	0.2035	0.2515	0.151	0.1985	0.1954
1106L (SS-65 to 237S Foothills)	927L (102S Langdon to 356S Milo)	0.1534	0.2524	0.2215	0.2433	0.1509	0.1523	0.2527	0.2371	0.2369	0.3058	0.1396	0.1505	0.1501	0.1896	0.2094	0.1911	0.1415	0.2586	0.1994	0.2481	0.1256	0.1473	0	0.211	0.1933	0.2033	0.1495	0.152	0.1962	0.1495	0.1499	0.2553	0.1931	0.1833	0.151	0.2048	0.2531	0.1519	0.1997	0.1967
1107L (SS-65 to 237S Foothills)	924L (102S Langdon to 356S Milo)	0.1524	0.2508	0.2201	0.2418	0.1499	0.1514	0.2511	0.2356	0.2354	0.3039	0.1387	0.1495	0.1491	0.1884	0.2081	0.1899	0.1405	0.2569	0.1981	0.2465	0.1248	0.1463	0	0.2096	0.192	0.202	0.1485	0.151	0.195	0.1485	0.1489	0.2537	0.1918	0.1821	0.15	0.2035	0.2515	0.151	0.1985	0.1954
1107L (SS-65 to 237S Foothills)	927L (102S Langdon to 356S Milo)	0.1534	0.2524	0.2215	0.2433	0.1509	0.1523	0.2527	0.2371	0.2369	0.3058	0.1396	0.1505	0.15	0.1896	0.2094	0.1911	0.1415	0.2586	0.1994	0.2481	0.1256	0.1473	0	0.211	0.1933	0.2033	0.1495	0.152	0.1962	0.1494	0.1499	0.2553	0.1931	0.1833	0.151	0.2048	0.2531	0.1519	0.1997	0.1967
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	0.44	0.1639	0.1568	0.2332	0.4335	0.4418	0.1623	0.1547	0.1548	0.1591	0.3961	0.4307	0.4302	-0.286	0.2965	0.2617	0.3929	0.1644	0.2269	0.2335	0.4995	0.4171	0	0.3235	0.2973	0.3147	0.4293	0.4342	0.2553	0.4293	0.4328	0.1492	0.2518	0.2798	0.4321	0.2734	0.164	0.4397	0.2319	0.2292
1114L (520S Bennett to 102S Langdon)	412L (396S Pincher Creek to 632S Russell)	-0.0378	-0.0178	-0.0174	-0.0232	-0.0378	-0.0404	-0.0177	-0.0172	-0.0172	-0.0172	0.8507	-0.0468	-0.0474	-0.0291	-0.026	-0.0268	-0.0711	-0.0177	-0.0237	-0.0231	-0.0312	-0.0724	0	-0.0269	-0.0288	-0.0282	-0.0479	-0.0466	-0.026	-0.048	-0.0386	-0.0166	-0.0257	-0.0292	-0.047	-0.0265	-0.0178	-0.0396	-0.0241	-0.0239
1114L (520S Bennett to 102S Langdon)	613L (103S Goose Lake to 396S Pincher Creek)	-0.0376	-0.0154	-0.0149	-0.0212	-0.0375	-0.0396	-0.0153	-0.0149	-0.0149	-0.0157	0.8749	-0.0482	-0.0487	-0.0174	-0.0195	-0.0205	0.6283	-0.0154	-0.0186	-0.0211	-0.0307	-0.0762	0	-0.0205	-0.0214	-0.0222	-0.0489	-0.0481	-0.0201	-0.049	-0.038	-0.0147	-0.0198	-0.0167	-0.0484	-0.0202	-0.0154	-0.0389	-0.0189	-0.0187
1114L (520S Bennett to 102S Langdon)	786L/1L275 (799S Coleman to Natal)	-0.0341	-0.0163	-0.0158	-0.0211	-0.034	-0.0361	-0.0161	-0.0157	-0.0157	-0.0158	-0.0894	-0.0424	-0.0428	-0.0261	-0.0239	-0.024	-0.0641	-0.0162	-0.0213	-0.0221	-0.0307	-0.0281	-0.0649	0	-0.0248	-0.026	-0.0257	-0.0431	-0.0423	-0.0234	-0.0432	-0.0346	-0.0152	-0.0231	-0.0261	-0.0425	-0.024	-0.0162	-0.0355	-0.0217	-0.0215
1114L (520S Bennett to 102S Langdon)	924L (102S Langdon to 356S Milo)	0.1031	0.2104	0.1848	0.2021	0.1016	0.1031	0.2111	0.1983	0.1981	0.2626	0.0966	0.1016	0.1015	0.1487	0.164	0.1524	0.0974	0.2158	0.1616	0.2062	0.0729	0.1012	0	0.1632	0.151	0.1581	0.1012	0.1026	0.1567	0.1011	0.1012	0.2145	0.1545	0.1439	0.102	0.1625	0.211	0.1027	0.1616	0.1592
924L (102S Langdon to 356S Milo)	927L (102S Langdon to 356S Milo)	0.2087	0.3594	0.3131	0.3436	0.2056	0.2085	0.3593	0.3358	0.3354	0.4336	0.1902	0.2049	0.2045	0.2679	0.295	0.2711	0.1933	0.3683	0.2831	0.3504	0.1635	0.2003	0	0.2965	0.2729	0.2866	0.2039	0.2067	0.2782	0.2038	0.2047	0.3637	0.2738	0.2592	0.2055	0.2897	0.3606	0.2077	0.2835	0.2792
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	0.2081	0.3582	0.312	0.3425	0.205	0.2079	0.3581	0.3346	0.3342	0.4319	0.1896	0.2042	0.2039	0.267	0.2941	0.2702	0.1927	0.3671	0.2822	0.3493	0.163	0.1997	0	0.2955	0.2721	0.2857	0.2033	0.2061	0.2773	0.2032	0.2041	0.3624	0.2729	0.2584	0.2049	0.2887	0.3593	0.2071	0.2826	0.2783
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	0.3722	0.1483	0.1402	0.206	0.3648	0.3619	0.147	0.1399	0.1399	0.1471	0.3368	0.3638	0.3615	0.2434	0.2668	0.2207	0.3358	0.1492	0.1938	0.2065	0.4029	0.3573	0	0.2946	0.2544	0.2774	0.3591	0.3687	0.2175	0.3588	0.359	0.1369	0.214	0.2357	0.365	0.2373	0.1485	0.3625	0.1979	0.1952
WATL_CS	916L (SS East Calgary to 42S Sarcee)	-0.0379	-0.0395	-0.0344	-0.0283	-0.0372	-0.037	-0.0382	-0.0364	-0.0364	-0.0253	-0.0423	-0.0384	-0.0382	-0.0324	-0.0355	-0.0318	-0.039	-0.0387	-0.0324	-0.0285	-0.0374	-0.0405	0	-0.0361	-0.0328	-0.0346	-0.0379	-0.0389	-0.0325	-0.0379	-0.0367	-0.038	-0.0319	-0.0313	-0.0385	-0.0345	-0.0395	-0.0371	-0.0326	-0.0321

Scenario 8

Contingency	Violation \ Generator (Bus Number)	Ardenville Wind	Bantry	Bassano 435S DER Solar	Blackspring Ridge	Blue Trail Wind	Blue Trail Wind	Brooks Solar	Brooks Solar 1	Brooks Solar 2	Buffalo Plains	Castle River	Castle Rock Ridge 2	Castle Rock Wind Farm	Chin Chute	Coaldale	Coaldale Solar	Cowley Ridge	Cutting Lake	Enterprise Solar	Greengate Travers Solar	Homestead Solar	Kettels Hill	Kirkcaldy MPC Solar	Lethbridge DER	McBride Lake Windfarm	Monarch	Old Man River Wind	Oldman River Hydro	Parkland	Riverview Wind	Soderglen Wind	Solar Krafte Brooks	Stavely 349S DER Solar	Stirling WAGF	Summerview	Suncor Chin Chute	Tilley	TransAlta Windrise	Vulcan Faribault Farms DG PV	Vulcan 255S DER Solar
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	0.4	0.1529	0	0.2102	0.3943	0.394	0.1522	0.1522	0.1522	0.1454	0.3614	0.3936	0.392	0.2485	0.2717	0.2619	0.3626	0.1529	0.232	0	0.4336	0.3815	0.4935	0.3012	0.2769	0.298	0.404	0.3996	0.2559	0.3901	0.39	0.1396	0.2559	0.2385	0.4035	0.2439	0.1529	0.3956	0.2353	0.2353
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	916L (SS East Calgary to 42S Sarcee)	-0.046	-0.0494	0	-0.0358	-0.0453	-0.0451	-0.0483	-0.0483	-0.0483	-0.0335	-0.0507	-0.0469	-0.0466	-0.038	-0.0429	-0.0452	-0.0472	-0.0486	-0.0465	0	0	-0.0485	-0.0525	-0.0441	-0.0418	-0.0446	-0.0485	-0.0477	-0.046	-0.0463	-0.0447	-0.0477	-0.046	-0.0361	-0.0483	-0.0412	-0.0494	-0.0454	-0.0464	-0.0464
1080L (SS-25 Shepard to SS-65)	1109L (SS-25 Shepard to SS-65)	0.4391	0.1659	0	0.2307	0.4333	0.4387	0.165	0.165	0.165	0.1577	0.3939	0.43	0.4298	0.278	0.2932	0.2801	0.395	0.1656	0.248	0	0.4934	0.4169	0.5453	0.3214	0.3032	0.3166	0.4328	0.433	0.272	0.4287	0.4325	0.1512	0.272	0.27	0.4336	0.2694	0.1659	0.4377	0.2514	0.2514
1088L (324S Cassils to 207SS Newell)	1087L (324S Cassils to 207SS Newell)	-0.0082	0.3146	0	-0.0426	-0.0081	-0.0088	0.3189	0.3189	0.3189	-0.0659	-0.006	-0.0076	-0.0077	0.0334	0.0484	0.0955	-0.0057	0.3232	0.1617	0	-0.006	-0.0069	-0.0034	0.0162	0.0332	0.0267	-0.0067	-0.0072	0.1154	-0.0078	-0.0085	0.3352	0.1154	0.0289	-0.0069	0.0727	0.315	-0.0085	0.1549	0.1549
1106L (SS-65 to 237S Foothills)	1107L (SS-68 to 237S Foothills)	0.4599	0.1769	0	0.2451	0.4537	0.4579	0.1761	0.1761	0.1761	0.1692	0.4098	0.4504	0.4498	0.2925	0.31	0.2967	0.4122	0.1768	0.2632	0	0.5107	0.4354	0.5681	0.34	0.3198	0.3353	0.4554	0.4544	0.2885	0.4484	0.4519	0.1615	0.2885	0.2836	0.456	0.2844	0.1769	0.4576	0.2668	0.2668
1107L (SS-65 to 237S Foothills)	1106L (SS-68 to 237S Foothills)	0.4599	0.1769	0	0.2451	0.4537	0.4579	0.1761	0.1761	0.1761	0.1692	0.4098	0.4504	0.4498	0.2925	0.31	0.2967	0.4122	0.1768	0.2632	0	0.5107	0.4354	0.5681	0.34	0.3198	0.3353	0.4554	0.4544	0.2885	0.4484	0.4519	0.1615	0.2885	0.2836	0.456	0.2844	0.1769	0.4576	0.2668	0.2668
1109L (SS-25 Shepard - SS-65)	1080L (SS-25 Shepard to SS-65)	0.4388	0.1658	0	0.2306	0.433	0.4384	0.1648	0.1648	0.1648	0.1576	0.3937	0.4297	0.4295	0.2779	0.2931	0.2799	0.3948	0.1655	0.2478	0	0.4931	0.4167	0.545	0.3212	0.303	0.3164	0.4325	0.4327	0.2718	0.4285	0.4322	0.1511	0.2718	0.2698	0.4334	0.2693	0.1658	0.4374	0.2513	0.2513
918L (SS-162 Beddington to 281S Johnson)	916L (SS East Calgary to 42S Sarcee)	-0.0396	-0.0444	0	-0.0302	-0.039	-0.0389	-0.0431	-0.0431	-0.0431	-0.0275	-0.0443	-0.0404	-0.0402	-0.033	-0.037	-0.0391	-0.0411	-0.0434	-0.0406	0	-0.0382	-0.0421	-0.0415	-0.0377	-0.0361	-0.0381	-0.0418	-0.0412	-0.0399	-0.04	-0.0385	-0.0428	-0.0399	-0.0315	-0.0417	-0.036	-0.0444	-0.0391	-0.0405	-0.0405
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 102S Langdon)	0.2181	0.3898	0	0.3689	0.2151	0.2173	0.3918	0.3918	0.3918	0.4419	0.1994	0.2146	0.2145	0.2786	0.3057	0.3282	0.2047	0.3937	0.3490	0	0.1667	0.2100	0.1458	0.3055	0.3017	0.3095	0.2168	0.2165	0.3350	0.2138	0.2144	0.3977	0.3350	0.2677	0.2171	0.3057	0.3899	0.2171	0.3469	0.3469
924L (102S Langdon to 356S Milo)	927L (P2378 Tap to 356S Milo)	0.2056	0.3785	0	0.3428	0.2027	0.2043	0.3805	0.3805	0.3805	0.418	0.1873	0.2024	0.2021	0.2587	0.2912	0.316	0.1925	0.3835	0.3375	0	0.158	0.1978	0.1373	0.2932	0.2845	0.2982	0.2052	0.2045	0.3245	0.2014	0.2018	0.384	0.3245	0.2464	0.2054	0.2863	0.3787	0.2044	0.3354	0.3354
925L (63S Red Deer to 74S Janet)	916L (SS East Calgary to 42S Sarcee)	-0.04	-0.0458	0	-0.0309	-0.0394	-0.0393	-0.0445	-0.0445	-0.0445	-0.0284	-0.0445	-0.0408	-0.0406	-0.0337	-0.0378	-0.04	-0.0414	-0.0447	-0.0416	0	-0.0385	-0.0424	-0.0418	-0.0383	-0.0368	-0.0388	-0.0421	-0.0415	-0.0407	-0.0404	-0.0389	-0.0442	-0.0407	-0.0321	-0.042	-0.0369	-0.0458	-0.0395	-0.0415	-0.0415
927L (356S Milo to 927AL Tap to 102S Langdon)	924L (102S Langdon to 356S Milo)	0.2051	0.3773	0	0.3417	0.2023	0.2038	0.3793	0.3793	0.3793	0.4165	0.1869	0.2019	0.2016	0.2579	0.2904	0.3151	0.1921	0.3823	0.3365	0	0.1577	0.1973	0.137	0.2924	0.2837	0.2974	0.2047	0.204	0.3236	0.2009	0.2013	0.3828	0.3236	0.2456	0.2049	0.2854	0.3775	0.2039	0.3344	0.3344
929L (74S Janet to 287S Hazelwood)	916L (SS East Calgary to 42S Sarcee)	-0.04	-0.0457	0	-0.0309	-0.0394	-0.0393	-0.0444	-0.0444	-0.0444	-0.0283	-0.0445	-0.0408	-0.0406	-0.0337	-0.0377	-0.0399	-0.0414	-0.0446	-0.0415	0	-0.0385	-0.0424	-0.0418	-0.0383	-0.0368	-0.0388	-0.0421	-0.0415	-0.0407	-0.0403	-0.0389	-0.0441	-0.0407	-0.0321	-0.042	-0.0368	-0.0457	-0.0395	-0.0414	-0.0414
932L (74S Janet to SS-162 Beddington)	916L (SS East Calgary to 42S Sarcee)	-0.0386	-0.0423	0	-0.029	-0.038	-0.0379	-0.0411	-0.0411	-0.0411	-0.0263	-0.0435	-0.0394	-0.0392	-0.0319	-0.0357	-0.0377	-0.0402	-0.0413	-0.039	0	-0.0373	-0.0411	-0.0406	-0.0365	-0.0349	-0.0369	-0.0407	-0.0402	-0.0383	-0.039	-0.0375	-0.0407	-0.0383	-0.0304	-0.0407	-0.0347	-0.0423	-0.0381	-0.0389	-0.0389
985L (SS-25 Shepard to 74S Janet)	1003L (SS-25 Shepard to 74S Janet)	0.3997	0.1528	0	0.21	0.394	0.3937	0.152	0.152	0.152	0.1453	0.3612	0.3933	0.3917	0.2483	0.2715	0.2617	0.3623	0.1528	0.2318	0	0.4333	0.3812	0.4931	0.301	0.2767	0.2978	0.4037	0.3993	0.2557	0.3898	0.3897	0.1395	0.2557	0.2383	0.4032	0.2438	0.1528	0.3953	0.2352	0.2352

Scenario 9

Contingency	Violation \ Generator (Bus Number)	Ardenville Wind	Bantry	Bassano 435S DER Solar	Blackspring Ridge	Blue Trail Wind	Blue Trail Wind	Brooks Solar	Brooks Solar 1	Brooks Solar 2	Buffalo Plains	Castle River	Castle Rock Ridge 2	Castle Rock Wind Farm	Chin Chute	Coaldale	Coaldale Solar	Cowley Ridge	Cutting Lake	Enterprise Solar	Greengate Travers Solar	Homestead Solar	Kettels Hill	Kirkcaldy MPC Solar	Lethbridge DER	McBride Lake Windfarm	Monarch	Old Man River Wind	Oldman River Hydro	Parkland	Riverview Wind	Soderglen Wind	Solar Krafte Brooks	Stavely 349S DER Solar	Stirling WAGF	Summerview	Suncor Chin Chute	Tilley	TransAlta Windrise	Vulcan Faribault Farms DG PV	Vulcan 255S DER Solar
1003L (SS-25 Shepard to 74S Janet)	985L (SS-25 Shepard to 74S Janet)	0.3727	0.1476	0.1424	0.2048	0.3653	0.3631	0.1462	0.1397	0.1394	0.1444	0.3375	0.3647	0.3626	0.2424	0.2648	0.2227	0.3359	0.1484	0.1976	0.2048	0.4059	0.3576	0.4713	0.2919	0.2547	0.2764	0.3601	0.3691	0.2194	0.36	0.3603	0.1352	0.2164	0.2343	0.3662	0.237	0.1477	0.3642	0.2013	0.199
1037L (138S Windy Flts to Homestead Tap to 266S SC1 to 237S Foothills))	924L (102S Langdon to 356S Milo)	0.1704	0.2